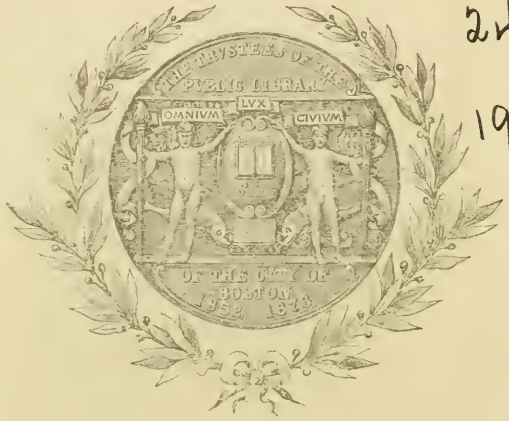

NATIONAL DEFENSE MIGRATION

HEARINGS

BEFORE THE

SELECT COMMITTEE INVESTIGATING NATIONAL DEFENSE MIGRATION HOUSE OF REPRESENTATIVES

SEVENTY-SEVENTH CONGRESS

FIRST SESSION

PURSUANT TO

H. Res. 113

A RESOLUTION TO INQUIRE FURTHER INTO THE INTERSTATE MIGRATION OF CITIZENS, EMPHASIZING THE PRESENT AND POTENTIAL CONSEQUENCES OF THE MIGRATION CAUSED BY THE NATIONAL DEFENSE PROGRAM

PART 24

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DECEMBER 22 AND 23, 1941

TESTIMONY ON POSSIBILITIES OF SPEEDY CONVERSION OF AUTOMOTIVE PLANTS OF THE NATION TO WAR PRODUCTION

Printed for the use of the Select Committee Investigating National Defense Migration

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NATIONAL DEFENSE MIGRATION

MONDAY, DECEMBER 22, 1941

MORNING SESSION

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE INVESTIGATING
NATIONAL DEFENSE MIGRATION,
Washington, D. C.

The committee met, pursuant to call, at 9:30 a. m., in room 1326, New House Office Building, Washington, D. C., Hon. John H. Tolan (chairman) presiding.

Present were: Representatives John H. Tolan (chairman) of California, John J. Sparkman of Alabama, Laurence F. Arnold of Illinois, and Carl T. Curtis of Nebraska.

Also present: Dr. Robert K. Lamb, staff director.

The CHAIRMAN. The committee will please come to order. Mr. Taub, will you please take the stand?

Mr. Taub, the committee has asked you to appear once more as a witness because, in the interval since your last appearance,[1] a new curtailment order for the automobile industry has been announced by the Division of Civilian Supply. This order, as already reported in the press, has precipitated a new and drastic situation on top of the difficulties already arising from the curtailment order of August 30.

According to testimony at our Detroit and Washington hearings, this earlier order had not been followed by a plan sufficiently comprehensive to provide defense employment for the automobile workers. Even more important, since your last appearance, this country has been forced into the World War by the events at Pearl Harbor on December 7. In common with the rest of the country this committee is no longer primarily interested in the alleviation of individual hardship, although we are still deeply concerned about it. Our first interest is in the full utilization of every available man, machine, and item of material for maximum output of war production with which our country can achieve victory.

We have requested your presence here today as a witness whose experience, both in England since the outbreak of the war and in this country over a period of many years, qualifies you to assist the committee with certain technical questions which seem to us fundamental in a discussion of the subject of full utilization of the capacity of the automobile and other metal working industries.

Because of the technical character of the discussion, I am going to ask the committee's staff director, Dr. Lamb, to begin questioning you. Although he and his staff are not engineers, they have attempted to familiarize themselves with the major technical problems which are in-

[1] Mr. Taub appeared before the committee on October 28, 1941. See Washington hearings, pt. 20, pp. 8080–8093.

volved, and have prepared a list of questions which they would like you to clarify.

I should like to say to representatives of the press that they must realize, as we do, how important it is, in reporting this testimony, to report both the questions and the answers in order that there shall be no misunderstanding.

This committee is calling today and tomorrow on officials responsible for the war production program and others representing organizations participating in this program. Because the subjects we are discussing combine the technical and policy-making aspects of the job, it will undoubtedly embarrass the witnesses if the public does not understand that they are submitting to this questioning and giving their best answers out of a sense of patriotic duty, in an effort to push ahead the work of the program.

Now, Mr. Taub, Dr. Lamb will question you, and later my colleagues and I may have some further questions.

TESTIMONY OF ALEX TAUB, CHIEF, PRODUCTION ENGINEERING GROUP, OFFICE OF THE ASSOCIATE DIRECTOR GENERAL, OFFICE OF PRODUCTION MANAGEMENT, WASHINGTON, D. C.

Dr. Lamb. Mr. Taub, I hope you have had time to familiarize yourself with the committee's second interim report, which we have sent you, and especially with its recommendations.

I may say, for the benefit of the press, that bound copies of that report will be over here later in the morning, and available to the press and the public.

At this time we are particularly interested in the specific application of those recommendations to the automobile industry. At the committee's last Washington hearing, you gave it as the opinion of yourself and other technicians that 50 percent or more of the equipment used to manufacture passenger cars could be converted to the production of military goods. Testimony to the committee has indicated that only a small fraction of that equipment is now being utilized on defense work. The committee is of the opinion that a prerequisite to rapid conversion of this industry is a centralized civilian board for production planning and procurement, which we have recommended. This is for industry as a whole—an over-all central civilian board of production planning and procurement.

The committee's findings and recommendations indicate the need of a single body whose sole responsibility would be to plan and arrange for the rapid conversion of the entire automobile industry.

We would like to know, in the event you think such a board would be useful—for purposes of discussion let's call that board an industry management council—what suggestions you may have as to the composition of such a board; that is, should it be a board composed entirely of Government representatives; should it be a board of representatives of industry alone; or, possibly, a joint board of industry and labor representatives, with some arrangement to give the Government all sanction, whether the members were duly constituted as representatives of the Government by taking some oath of office for the duration of the emergency, or whether a Government representative were to be included on the board? Just what type of board would you think is needed—if you agree that one is needed? And if you do not, I would like to have you indicate that.

Mr. TAUB. In this emergency, to get the most out of this industry which has a reputation for being able to produce things, it must recognize that in the nine units that make up this industry there must exist a tremendous amount of duplication. There would have to be. These firms have been in competition with each other. To get the most out of that industry this council you are speaking of would be necessary.

COMPOSITION OF PROPOSED BOARD

Obviously, it shouldn't be composed only of Government men. That would be placing such a restriction on the industry that I doubt whether it could survive. It would seem that a proper admixture of industry and labor would be right. Undoubtedly there will be severe problems where labor is involved, and their counsel will be needed at the highest possible level. And likewise, the members of that board who must plan, must assume commitments for everybody. They must be at a high level. They would doubtless have a chairman, as any council would; and along the lines of your suggestion, if that chairman would take an oath of office, then he, notwithstanding his position as chairman of that industrial council, could still function with the forgotten man in mind—meaning Uncle Sam. That certainly would, it seems to me, make a very useful set-up.

I am mindful of the fact that to bring this about you have to deal with an industry that consists of nine units, three of those units, perhaps, doing 85 percent of all the business done by the nine; and a good deal of judgment is going to be required to set up this council so as to get representation satisfactory to the big three and also satisfactory to the small six.

Dr. LAMB. I would like to interrupt you there to observe that you are limiting your field to the producers of cars rather than including the parts manufacturers and small producers responsible to the industry or to affiliated undertakings, such as the rubber or glass industry.

Mr. TAUB. You are right. We mustn't overlook the large number of sources of supply. As you mentioned, the rubber companies, and the glass companies, and many others—transmission manufacturers, axle companies—these are all part of the industry. But to date they have been used by these nine units, and one is inclined to look at the nine as units, each with its own large family group of sources.

You are right in that you would have to consider a representation of those sources in your council since, in the aggregate, they are so large that they probably equal, in dollar output, let us say, 25 percent of the actual industry itself, which is a tremendous aggregate.

Dr. LAMB. In number of employees, how do the parts manufacturers compare?

Mr. TAUB. They are very nearly equal.

Dr. LAMB. I didn't mean to interrupt you.

Mr. TAUB. But your question was very much to the point.

Dr. LAMB. Assuming that such a council were to be set up, what functions should this board be charged with in order to insure as rapid and efficient a conversation as possible? For example, do you think it should be unitary, or should it operate through a set of subcommittees having to do with various phases of the job, such as labor transfer and labor training, or engineering processes, or relations with the parts producers and smaller firms?

OPERATION THROUGH SUBCOMMITTEE

Mr. TAUB. It must be broken down to at least three fundamental subcommittees that in themselves have a tremendous undertaking. Beneath this policy and planning committee must be a technical committee whose job it is to plan for the actual production and actual utilization of the equipment in all of the plants, that is, the motorcar companies and their suppliers. A technical committee of this kind would have to be made up of the very best types of technical people in the industry, and it would be their job to determine, in detail, where the components can be best made, and, in some instances, how they shall be best made.

Then, there should be a committee on labor, which will have the best possible information as to how to move labor about within the industry to the best advantage of labor and industry, and, most important, to the advantage of national defense.

Then, again, there is the extremely important assignment of a subcontracting job. There is no question but what the automotive industry, as such, has been doing a good subcontracting job, but it is not nearly broad enough for the picture we now have in mind. Although they themselves may not be able to use the facilities of small plants, we must realize that this small-plant group represents something like 150,000,000 man-hours per week. Regardless of the percentage, that is a terrific producing capacity.

It is well worthy of consideration of a separate section. Within this small group of manufacturers are around 700,000 machine tools that might take us 2 years to make.

Dr. LAMB. Does that figure of 150,000,000 man-hours per week apply to the entire metal-working industry, or only to those plants connected with the automobile industry?

Mr. TAUB. I am speaking of those that we believe are convertible to defense work, whatever they are making. We need a lot of things that are not metal. The automotive industry is not going to make all of those.

Dr. LAMB. Throughout American industry, then, there are 150,000,000 man-hours per week of small-plant capacity?

Mr. TAUB. That is right.

Dr. LAMB. Capable of producing defense products of some kind?

POSITION OF SUBCONTRACTING COMMITTEE

Mr. TAUB. That is right, sir. And I merely bring out that point because the use of that capacity is in the offing. That is one of our assets. Therefore, we must have a real, upstanding contracting department, whose job it is really, honestly to subcontract.

As I mentioned, subcontracting has been going on, more or less, but there are some definite cases where subcontracting has been ignored. I believe we have got to pay much more attention to it.

The automotive organizations have always had outstanding purchasing agents—the ablest, I believe, anywhere in the world. These men, in the past, have done miraculous things in bringing the bits and pieces from the outside to the inside, on time. When you undertake to build 300 motorcars in an hour, you have undertaken to have on the spot a tremendous amount of diversified material at a given time. The men responsible for that are not going to be as busy as

they have been, and therefore it is that type of man that ought to be organized into a definite subcontracting organization, so that nothing in the world can stop those fellows from going out and getting the stuff.

And at this point I would like to tell a short, sad story, the point of which is that mistakes can be made, and have been made. In Toledo, where we have attempted to form a pool, the only way we can load Toledo up with work is by having the small manufacturers there take the work through agents, at from 5- to 15-percent commission.

I tried to find out where the work came from, because I was having a hard time finding work for them. Apparently it is in the form of subcontracts from some of the larger companies.

The CHAIRMAN. Mr. Taub, would you, for the purpose of the record, describe what you mean by "pool"?

Mr. TAUB. I am speaking of a pool of small manufacturers, so organized that together they can find tools to make a particular object, whereas individually none of them could tackle the job.

I am trying to bring out a story with reference to the Toledo pool, a story of carelessness on the part of people who have work to be subcontracted, and who probably toss it across a desk to somebody they know and say, "You have nothing to do; why don't you go out and place this?"

That picture must change. We have got to recognize the fact that we cannot do that. Subcontracting is so important a part of this job that there can be no more tossing work across the desk and asking a friend to take it out and place it. It has got to be a part of the job, and so big a part of the job that I think a subcontracting committee must be up on a level with the technical committee.

THREE MAJOR COMMITTEES

So, we have your joint committee that you mentioned. I would say that they ought to have three major subcommittees—a technical committee, a labor committee, and a subcontracting committee.

Does that answer your question, sir?

Dr. LAMB. Yes; although I would like to go back to the question of your industry management council, and ask you what, in your opinion, such a top organization would have in the way of functions, as compared with the three subcommittees.

Mr. TAUB. That major committee would have the task of correlation of those three committees, which will be quite a job. Their job will be to commit the industry for various contracts. They will decide on whether it shall be tanks, airplanes, small guns, large guns, or what. They will undertake the over-all contracts, and then pass them down to their other committees and decide where these shall be placed for operation.

But the industry management council must, it seems to me, have the right and the authority to decide—I hope not how little, but how much—they would like to undertake. Nobody from Washington should be in position to tell these fellows, "Well, you ought to take this." They could say it, but they should not be able to enforce it. We hope that the committee will come in with open arms and grab off a great deal. But they will say whether they are taking too much or too little, and that is perhaps one of the most important

things. They cannot be expected to determine in what factories and by what methods these things should be manufactured. That would be in the hands of the technical committee.

Dr. LAMB. It seems to me that the technical decisions here are really the ruling decisions, and since your experience qualifies you to talk on this subject, I would like very much to ask you what technical problems you see in taking such an over-all proposal as this and applying it to the specific industry. How, for example, can you deal with the question of the machine tool situation in the industry? You have a vast supply of machine tools, as I understand it. How are you going to put those to work? You have machine tools of all levels, everything from the most specialized machinery to the most general. The committee—if you remember the committee's report—came out strongly for an inventory. I should think the taking of an inventory would be a first step which any technical subcommittee of such an over-all joint committee would have to make pretty early in the game.

Mr. TAUB. That is right. Insofar as the larger units are concerned, they have a perpetual inventory on machines, and what those machines have been or are being used for. They would have to obtain inventories of their sources. To some extent they already know what a source can do, but they cannot know what those sources can do with the inspiration of a war. One man may look at a milling machine, and all he can do with it is cut a key slot, a very simple slot. Another man can look at it, and see where he can almost cut a gear on it, or do something quite complicated. Nobody can tabulate or catalog ingenuity. You can catalog machinery, but I have found that if you are not careful you also limit your activities to that cataloging, and you don't do as much good as you should.

However, there is no doubt that you are right. You must have a complete inventory of equipment, the committee must have that, and they undoubtedly also would be calling to their committee room representatives of the different concerns which are given jobs to do. They must never be very far from the equipment, they must always know what equipment there is on hand.

This committee is the particular committee that will probably decide how far you are going to go with the equipment you have. It is possible to gather a committee together, I suppose, who would look at the machinery in an industry, and feel there wasn't much the industry could do. On the other hand, you could probably have an admixture of optimism which might suggest that you could do a lot more than you think you can, and you may thus end up by doing it.

In a war, one has to reach forward, trying to do just a little more than is normally possible. Otherwise, we make no progress. And nobody in this country today expects any industry to find a great deal of use for all of the punch presses that there are about. We realize that this type of equipment is going to be a drug, but we also recognize the possibility that even a portion of that equipment can be used. If you are counting noses among machines, and you pick out the types that just can't be used, and base your percentage on that, then it may become a very small percentage indeed.

But apart from the fact that we have a lot of sheet-metal shops within the industry, we must still move forward. There will be need of a tremendous amount of ammunition. It will still be possible to

modify some machines. There will still be some sheet-metal work to be done. And I believe with a proper reexamination of the entire war equipment by engineers, we would quickly find that there is a great deal that might be made by punch presses. It isn't too late to make that reexamination, and bring in this punch-press equipment.

Dr. LAMB. If I understand your idea of an inventory correctly, you regard a paper census as a dead thing. You think a committee of this kind, if it is to be useful, would have to have on it representatives of the engineering divisions of all of the leading companies, and I suppose the parts people as well, and that their knowledge would have to be continuously exchanged in order to take advantage of improvements and ingenuity of the kind you mention.

You said that one man using a milling machine would be in a position to make only slots, whereas another might find that he could do gear cutting, or something of that kind?

Mr. TAUB. Something more complicated. That is why I think you are right in having this mixture in your technical committee, so that you have the viewpoint of the fellow who has had to be ambidextrous to get by.

ACHIEVEMENTS EXPECTED OF AUTOMOBILE INDUSTRY

We must bear in mind that the technicians in the automotive industry include some of the finest brains in this country. There is no doubt about it. And they also combine engineering experience with marvelous executive talent. You have a reservoir of fine men to pick from; and once they are out of their sphere of direct competition, their whole viewpoint will change, and I would expect that those men would do a job for this country in the way this country would expect them to. There will be no falling down on the job from here on, I can assure you, if the right men are selected, and there is no reason why they shouldn't be, because they certainly are available.

Dr. LAMB. You are saying, in effect, that this country can count on the automobile industry to reach within, let us say, a period of a year or a year and a half——

Mr. TAUB. Or less. I would say in the least possible time.

Dr. LAMB. You are saying that within such a time this country can count on the automobile industry for an achievement which even the industry itself doesn't dream it can do?

Mr. TAUB. I believe that explains it. Today they don't realize that they can do it, but they will do it once they get started, with nothing else on their minds.

Dr. LAMB. Now I would like to draw on your experience in England, since the war began, and also in this country, during the past year, with the conversion problem, to ask you what the major technical problems are which would be involved in such an over-all plan for converting the industry to all-out-production? For example, I think we all know that there is a serious bottleneck in machine tools, both within and outside the industry, and I would like to know how you would overcome that.

Mr. TAUB. England had a reservoir of machine tools to draw from which we do not have. They hadn't a large machine tool industry in England, but they had America, and where there was a shortage of machine tools, they were able to go to the American pool. So that, if

you take into the picture the compactness and size of the country, at no time has England been in the same position as America with regard to machine tools.

I know this much: With the spirit that existed in England, had there been no America from which to obtain machine tools, a large manufacturing company with five or six divisions would have been told to set one division at work making machine tools, because the tools to make tools are just as important as anything else, and if the tools to make tools are the neck of the bottle, then that is the thing you work on first, not last.

I believe that that is something we may have to ask the automotive industry to do. I believe the Fisher Body Co. is making some large machine tools now, and I am certain that each one of the three major companies in the automotive industry could set up and make machine tools, and they would be good ones, too. This would do two things: It would help relieve the bottleneck so they can get on with the job, and it would absorb more labor.

Dr. LAMB. How much of the capacity of these companies do you think would have to be set aside for this purpose, and for how long a period?

Mr. TAUB. I would say that we might take 20 percent of factory units, bearing in mind that this will not take up too many machines that you might normally use on production. They would have to pool their tool shops, as it were, and go on with making tools. I have the feeling that if a large institution were to give roughly 20 percent of its time eliminating tool bottlenecks, for as long as it is necessary—once some real effort of that kind is started—some of the manufacturers of machine tools might wake up and put in enough hours to do a real job.

Dr. LAMB. You are speaking of the——

Mr. TAUB. Of the present machine tool industry, that I believe, in some cases, are not doing all they could do. I think if they once woke up to the fact that America might not have to lean on them as heavily as now appears, they might go out and try just a little harder than they have tried.

SHOULD WORK 150 HOURS A WEEK

When I say that, I mean that there should be no machine tool organization in this country that isn't working 150 hours. Each machine should be working 150 hours a week. Some of those companies have not been operating over 50 hours. It is just wrong that any company in that division of industry should be doing no better than that; and I think that bringing the automotive manufacturers into the machine tool picture is going to have the double effect of inspiring those fellows to do a better job and of actually producing more machines and employing more labor.

I feel so keenly about this that I have been trying to organize small independent tool shops together with the foundries of stove factories, to make one or two machine tools, and we intend to do it if we can. So I really do feel rather deeply that organizations such as exist in the automotive industry can be asked to take on some of those jobs. They might find making a machine tool even less difficult than making an antiaircraft gun. We need both, but we will get a lot more antiaircraft guns if we lay the foundation and protect ourselves against being caught short of machine tools.

Dr. Lamb. In other words, we are still stepping up production at such a rate that we need to expand the machine-tool capacity and continue expanding it until such time as we know that we can afford to level off. Any production plan we might make now which has to be revised upward will require an upward revision of the machine-tool making capacity; and if we freeze that set of operations at this time, we will surely have to unfreeze it later. Is that your thought?

Mr. Taub. That is right, sir. You cannot carry out an expanding plan of production without an expanding plan of tools.

Dr. Lamb. And any freezing now will delay by so much the delivery dates at which we can later secure the finished products?

Mr. Taub. That is right.

Dr. Lamb. I would like to turn now to the operations of the proposed subcontracting committee and discuss what the smaller firms might do—for instance, the parts manufacturers—in connection with such a subcontracting committee. Who should be the members of such a committee?

Mr. Taub. I think that the membership of that committee should be the representatives of the present purchasing organizations of the automotive industry, and they should have technical guidance; somebody from the technical committee should be there; and they should also have the inspiration of somebody from labor.

LET SMALL MANUFACTURERS SHARE THE WORK

They should also have substantial representation from the parts manufacturers. A substantial number of small manufacturers can be used, which are not now considered within the range of the automotive parts makers. We want those in the picture. How to bring their representation into that committee, we don't know, except through somebody at Washington. If, in Washington, we are going to organize the conversion of some forty-thousand-odd plants all over the country; then there must be a policeman on that committee to see that a reasonable share of the work goes out to those smaller manufacturers.

To give you a picture of what sources of supply, plus smaller factories, could do, I think the small, outside companies in southern Michigan could make 40 percent of the components of a tank.

If you tear a tank down into its subassemblies and simple components and accessories, I think you would find that possible. That would leave, in the hands of the tank maker, the larger and more complicated pieces; but even of those, he buys the engine, for instance, as an accessory; and if his operations are properly organized, he should also buy the transmission as an accessory. That still leaves him plenty to do; there are large, complicated bits, which only a well-organized factory could handle.

I merely give you that as my own personal opinion of how the parts maker, plus the small manufacturer, fits into the picture, even on such a big unit as a tank.

Dr. Lamb. Would you tie in these smaller producers to the larger, through this subcontracting committee or through pools, or both?

Mr. Taub. May I explain what we are trying to do in Chicago at the moment? Members of our staff are now in Chicago, where we are going over the physical properties of 3,000 factories. There are

a lot of unusables among them, but we are selecting 100 central factory units out of the 3,000, and each of the 100 we expect will be responsible and large enough and have the kind of management to be able to help others.

We are creating—in Chicago—a warehouse full of parts. We presume that we will have a warehouse which will include everything that is being made for defense. On the assumption that there isn't anything being made today in sufficient quantity to control anything, we feel that we can approach a central manufacturer and say, "Here, you can take an armful of these pieces. What can you make? And here is a directory, including 3,000 factories in your area. Who can you use?" And we let him decide how he can organize his operations to make the pieces that he has selected, and his own means of progressing. Then we hope to be able to check with him to make sure he is right. We can then announce, "Here are 100 pools that can make these 100 collections of different items."

Mr. CURTIS. Do we vest in somebody authority to close a deal and negotiate a contract with that manufacturer, after he has been to the warehouse and has said, "I can make this article." How are we going to handle that?

PROCUREMENT PROCEDURES NOW "WORKING BACKWARD"

Mr. TAUB. You know that we haven't been able to do this in a straightforward manner; we haven't been able to come forward and place the cards on the table and say, "Here it is." If we were able to do that, we wouldn't work backward. We should come to the procurement agencies and say, "We have this group of factories. What can we take to them that you want?" Instead of that, we have to go backward and say, "Here is a factory that can make this and that."

The answer, then, is that we intend to create so much pressure from below that nobody can turn us down. We are going to create this pressure until there is a revision in the set-up so that we can come through the proper doors.

Mr. CURTIS. Now, in that revision, do you need any new legislation? Or does the O. P. M. and the procurement officers have authority now to go ahead and do that, and make a deal with the small contractor after he has said what he can make?

Mr. TAUB. There is the difference. As you know, the only serious limitation that we have is in the law controlling bidding. We need reform in the bidding law, and we need conversion—conversion of the state of mind of a lot of people. I don't think that they are being limited by law so much as they have limited themselves by their own outlook; and those are things you can only change by Executive order.

Probably better minds than mine can tell you the details of what is required to straighten this thing out. But I am in the position—I was going to say "unfortunate," but I don't think it is unfortunate—I am in the position of trying to look after the little fellows; and if we can't get through one door, we will get through another; if you don't let us through the doors, we will break through windows and get in anyway; we must. If you will simplify the set-up so that

everybody understands that everybody has got to be used, then we can come in nice and clean and respectable.

Mr. CURTIS. Don't misunderstand me. My question was not intended to be critical of you or anyone else. But what I would like to know is, Should there be some basic changes in our laws governing procurement?

Mr. TAUB. There should be changes. What they are, in detail, I couldn't tell you; but over the week end I have been fussing around with that problem. There are many changes that can be made, but few directly by law. It is largely a question of conversion of the state of mind, and those things you cannot do until the boss comes down and says, "Boys, this is what must be done, as of today." That is the kind of thing we want; we want a series of orders. We want the Army to be told, for instance, "You cannot give a contract without definite understanding about subcontracts." That is one type of order. I don't believe that requires a law. It may require a modification of the law to suspend the restrictions that bidding brings about. And I don't say we should throw bidding overboard.

Mr. CURTIS. I think what you are saying, and what is being done along that line, is very good. I approve of these defense clinics, trains, and all that sort of thing. I think it is helpful to take the small manufacturer to a warehouse and show him, and have him pick out something he can make. But at the present time, here is what is about to happen. If he decides that here are some articles he can make, then he is told, "We will put you on the list to receive notification of bids." Then he gets a request to bid, and he lives hundreds of miles from here, and when that request comes, on it is written the instruction to get his bid back in 3 days, or 7 or 8 or 9 at the most, and he goes through the highly complicated process of competitive bidding and ends up with no contract at all.

It seems to me that the essence of this program is that after you deliver this information to the small manufacturer and determine what he can make, then you have an individual who has authority to go ahead and make a deal.

Mr. TAUB. Yes, sir. But we want to find that fellow.

Mr. CURTIS. What I want to know is, What do you need in the way of legislation or rules to adopt a plan that gives somebody such authority?

Mr. TAUB. I am sure you don't want me to answer that question.

Mr. CURTIS. Don't you think somebody should answer it?

Mr. TAUB. Yes, indeed. I believe preparations are being made, sir, right now, to answer some of those questions. But if I might be so bold, this committee could formulate the answer to that. If you could, it would be very helpful, because you have put your finger on a weakness. I wanted you to know we do recognize our trouble. We are going to be an awful lot of bother to a lot of people before we get through, but they are not going to turn us back.

Dr. LAMB. Going back to the automobile industry and its conversion of existing equipment, what proportion of the military goods now needed could be made on the converted machinery, or perhaps to put it the other way around, how much of the converted machinery could produce military goods, in your estimation?

FIFTY PERCENT OF AUTOMOTIVE EQUIPMENT CONVERTIBLE

Mr. Taub. I still think 50 percent of the present automotive equipment can be used on defense work. Some of this may necessarily be of the simplified types of defense work, and while preparation is being made for the more complicated, we should at least be going all-out on the simplified stuff. Sooner or later we have to recognize that the automotive industry will be carrying the major load on its back, because it can, by virtue of the use of present equipment, modified present equipment, and the addition of new equipment.

Dr. Lamb. How quickly do you think that 50 percent could be put into effective operation?

Mr. Taub. I would say that for most defense pieces that could be made on those types of machines, you could make the necessary tools, jigs, and fixtures within between 4 and 6 months.

Dr. Lamb. Take a sheet-metal works, clear it out, and use it as a shed. Could you use that building and assemble your machines in there, in such a way, with the proper jigs and fixtures, as to go into production within, say, 6 months time?

Mr. Taub. Yes, indeed; I think you could. Your suggestion, I think, is worthy, because if you have a large punch-press factory that you are not going to use, you can clear it out and either begin to plan putting in the new equipment that you intend to use, or to line it up with the necessary equipment for assembly purposes—the assembling of mobile guns or tanks. It only requires reinforcement of building. Incidentally, in most of the large punch-press shops you have the necessary crane equipment right there for the handling of heavy parts.

Dr. Lamb. Taking your figure of 50 percent as a base figure, and allowing for the conversion of the tool rooms to quantity production, whereby the technical division of the over-all committee speeds up defense production in the automobile industry, how long would it take to increase this 50 percent, and how much could it be increased?

SPEEDING OF CONVERSION

Mr. Taub. That is a very difficult question to answer. If I understand you, you are asking how long it would take to go all-out if we should use the captive tool rooms and other tool-room capacities available to the automotive industry to make new machine tools as well as jigs, tools, and fixtures.

Starting today, if they got the green light and really went to work, to have the program complete and everything going and the necessary machine tools made, might easily take 9 months to a year. The processes that must be gone through include making machines and tools, installing them, and setting them up. However, it would depend a great deal upon what products you were working on. But what is most important is that while we go on talking about the impossibility of doing these things or the length of time it takes to do them, we eat up more and more time; whereas we ought to be using some of it in actually starting out with the idea of, "Let's try, and if we fall down on the job, we will get up and try again." We must forget about the chance that we might get licked, and go ahead.

Too many things don't get started because somebody feels that we might not be able to do it. Well, so what? Let's do what we can.

Dr. LAMB. This committee, as you realize, is particularly interested in the full utilization of the available labor supply, and consequently the question of what we can do in the way of stepping up capacity seems to the committee to be closely related to the solution of this employment problem which has arisen as a result of the curtailment order. That is why we press on the question of how rapidly this conversion could take place. If I understand you correctly, you estimate that 50 percent of the automobile industry's capacity could be converted within 6 months?

Mr. TAUB. Say 4 months.

Dr. LAMB. Four to six months?

Mr. TAUB. Yes.

Dr. LAMB. Would you estimate further that you could get, say, another 30 or 40 percent—something approaching the full utilization of the automotive industry for war-production purposes—by the pooling of tool-room facilities, company by company, and to some extent, perhaps, retooling within the industry, making new machine tools, and new jigs and fixtures, and that within another year, or slightly over, the completion of that conversion process might be achieved?

Mr. TAUB. If we allow ourselves 4 to 6 months to get the first part of the program on its way, and if we start the larger program now, certainly within 9 months we should have 75 percent of our major program on its way, and well within the year we ought to be going very strong.

But at each point we should be doing a lot of constructive work; at no time should the reorganization of our factories proceed on the assumption that they have to wait for a year before somebody pushes a button and production starts. I think that is a mistake.

MOBILITY FOR CHANGE

The other mistake that we can very easily make is to forget that we need—and this is important—we need mobility for change; we must not produce lay-outs in such a way that the slightest change in product will wreck the whole line. We want to give to those who will conduct the actual fighting enough freedom of action so that if they want changes we can take such changes in our stride. That must be borne in mind, because I don't know of a better way of crippling an army than by telling the fighting men that they have got to go on letting us manufacture things they don't want, simply because we cannot change our manufacturing processes. This production has got to be set up by men who are quick on their feet, and I think mobility for change is the best way I can express it. I think that is extremely important, and also easily overlooked.

Dr. LAMB. Where are you going to get the skill, first on the working level—the skill of the man on the machine—and, second, on the level of superintendence—the skill of the foreman—in order to expand at the rate we have been talking about? Do you think there will be a shortage of skills in this field?

Mr. TAUB. I don't think there will be a shortage if we look far enough ahead to see where such skills might come from. We know definitely that we must have trainable mechanics, and we also know just as definitely that we need thousands of superintendents, supervisors, and foremen. If you undertake to draw that type of individual from factories having 200, 400, 600, and 1,000 employees, you will destroy their usefulness.

SKILLED LABOR

We have already gone far enough in the program, however, to know that we may have something like 80,000 unusable small factories, and among these 80,000 will be found the finest possible recruits for superintendents, supervisors, and even small managers, because you will have that many owner-managers—the kind of man who thinks enough of himself to be willing to start in business and spend his own money on his own O. K. That kind of man is needed by the Government today, needed very badly, and he will be available without destroying any usable capacity. So I think care, real care, must be taken to make sure that these men are taken from the proper source.

The same thing is true of the mechanics. A mechanic who works in a small company must be ambidextrous; he must use his hands and his feet; because those small companies just haven't got the tools. He is the most easily trainable man, and he is quite often multiskilled. There are thousands and thousands of those men available from the extremely small factories, and in pooling or arranging for this type of labor, labor people and industry and everybody else must be sure that the men come from these unusable groups. Thus we shall be making use of one of our finest assets, rather than carelessly destroying another asset, the usable small factory.

The CHAIRMAN. Mr. Taub, I have just two or three brief questions to ask you.

What you say about the Chicago undertaking is very interesting to me. I am impressed with the thought that what we have lacked from the very start is a survey or inventory of what we have in this country. You are taking such an inventory in Chicago.

The little manufacturer and the little businessman in the United States will go down in this defense effort if he has to, but he does not want to go down unnecessarily.

Mr. TAUB. That is correct.

The CHAIRMAN. Because if he does, you are hitting at morale, and when you hit at morale you hit at national defense.

Mr. TAUB. Yes, sir.

The CHAIRMAN. Now, I can't understand why what you are doing in Chicago can't be done throughout the United States through regional offices.

In our hearing at St. Louis we found that there were many machines there that were usable and were not being used in defense.

But new machines were being manufactured to do work that could have been done by some of that idle machinery.

We are talking now about converting the automobile production to the defense effort. You say you think you can get conversion up as high as 50 percent. Now, you have been in England. What percentage did they convert over there of the automobile production?

Mr. TAUB. All of it, sir. But there the circumstances were different. You see, in England we never could afford to have the type of equipment used here. Our factory made as many units as any over there, but the most we made was, I think, 390 units—that is, trucks and passenger cars—per day. In America you are set up to make that many an hour. So we never could afford to use that kind of equipment, and on many occasions my American colleagues would come over to our factory and they would just get terribly put out because we wouldn't change a line where we were drilling one hole at a time. But we drilled all the holes we needed per day simply by that one machine, so it wouldn't do us any good to drill 20 at a time.

Almost 95 percent of our multiple-purpose equipment was used.

The CHAIRMAN. But while the conditions are not the same, still the English did convert, didn't they?

Mr. TAUB. Yes; because within the first 2 weeks we were told that motorcar production was to be cut in half, and within 90 days it was cut down to nothing but export; and then within another month we were told we couldn't even export except on order by the Government; whenever the Government needed exchange we were allowed to manufacture a few motorcars. So we had nothing but defense work to do.

And since in England you just did as you were told, for the best interest of the Government, you were given a job to do and you went ahead and did it.

The CHAIRMAN. What about Germany? Did they convert automobile production to defense?

Mr. TAUB. Oh, yes. They knew precisely what they were going to do long before they did it, so it was just a matter of pushing buttons and deciding how to swing over. Some of the large American plants were held to the last for conversion, but that was simply because they made a pretty good truck that was easily converted to military use.

The CHAIRMAN. Is Germany or England manufacturing any passenger automobiles now?

Mr. TAUB. Not that I know of, sir, except such cars as can be used for carrying machine guns or military people. None is being made for export, I am sure, because the company we were associated with—that is, Opal—is making none.

The CHAIRMAN. Thank you very much, Mr. Taub; you have been very kind to us, and you have made a very valuable contribution.

Mr. TAUB. Thank you, sir.

The CHAIRMAN. We will have a 5-minute recess.

(Whereupon, a short recess was taken.)

The CHAIRMAN. The committee will please come to order.

TESTIMONY OF PANEL REPRESENTING HON. MURRAY D. VAN WAGONER, GOVERNOR OF THE STATE OF MICHIGAN

Will the representatives of Governor Van Wagoner, of Michigan, please come forward?

Before we go on, gentlemen, I want to ask you to carry back to the Governor the thanks of this committee, and to say to you that you gentlemen were very courteous to us while we were there, and so was the Governor.

Now, we would like to obtain from you gentlemen some idea of the present situation in Michigan. I will ask Congressman Arnold, of Illinois, to ask you some questions.

Mr. ARNOLD. Mr. Steinbaugh, will you state your name and the capacity in which you are appearing before the committee? You might also at this time introduce the gentlemen who are appearing with you on the panel representing Governor Van Wagoner.

Mr. STEINBAUGH. My name is V. B. Steinbaugh, liaison officer, State of Michigan, O. P. M.; this is Mr. Wendell Lund, director of Michigan Unemployment Compensation Commission; and this is Mr. Paul Stanchfield, director of research, Michigan Unemployment Compensation Commission.

Mr. ARNOLD. Mr. Steinbaugh, I understand that Mr. Stanchfield and Mr. Lund have prepared written statements which are in the mails. These, when received, will be incorporated into the record.

(The statements referred to above are as follows:)

STATEMENT BY PAUL L. STANCHFIELD, CHIEF, RESEARCH, STATISTICS AND PLANNING SECTION, MICHIGAN UNEMPLOYMENT COMPENSATION COMMISSION, DETROIT, MICH.

EXTENT OF WARTIME "TRANSITION UNEMPLOYMENT" IN MICHIGAN

DECEMBER 20, 1941.

About 260,000 workers will be unemployed in Michigan before the end of this year as a result of reduced production quotas and material shortages which have become even more severe since the United States' entry into the war. Surveys made before December 7 had shown that large-scale unemployment could be expected in the State at about this time—but the pre-war estimates anticipated less than half of the enormous volume of labor displacement which is actually taking place at this very moment.

DECEMBER LAY-OFFS

In the week that ended December 20, preliminary reports indicate that about 110,000 workers filed claims for unemployment compensation—an increase of about 70,000 from the preceding week. Lay-offs this week will be at least as heavy. A special survey of the major plants in Michigan's automobile industry, completed last week, shows that 152,000 of the 351,000 workers employed by these companies before December 7 will have been laid off by the end of the year. At least 40,000 more workers will have been laid off by other plants in the industry, and another 10,000 to 20,000 workers will probably be released by firms in other industries. To these lay-offs must be added the 40,000 workers who were unemployed and filing unemployment compensation claims before the present wave of lay-offs began—bringing the total above 250,000.

LARGE VOLUME OF UNEMPLOYMENT IN 1942 ANTICIPATED

The extent and duration of unemployment after the first of the year depends primarily upon the speed with which defense work can be expanded. The most recent data we have on the prospects for expansion of defense employment were collected before war began—the actual tempo of expansion will be more rapid. But on the basis of existing contracts in November, new jobs in military production were expected to be barely sufficient, within a year, to offset the total of about 130,000 unemployed which was then expected to result from material shortages and an average 50 percent cut in civilian automotive output. Unless Michigan's defense employment can be nearly doubled from its present total

of about 290,000 in the very near future, the State will be faced with an extremely large volume of unemployment and possible large-scale migration of workers away from the State.

My statement before your committee in September [1] mentioned a State-wide survey made in July of this year, showing that net unemployment of automobile workers and others displaced by shortages would amount to at least 93,000 in January if automobile production were curtailed by 50 percent. (This in addition to "normal" January unemployment of 30,000 in other industries.) The same survey estimated that a 75-percent cut would mean displacement of at least 176,000 automobile workers. After recall of some of the workers now being laid off, this figure may be quite close to the actual number who remain unemployed through January if the latest announced quota is not cut further. With complete elimination of passenger-car production, it was estimated in July that 277,000 automobile workers would be idle—a number only slightly higher than the current estimate of unemployment which is expected immediately.

UNCERTAINTIES FOR CIVILIAN AUTOMOBILE PRODUCTION

The number of workers who will be recalled by automotive plants to work on production of passenger cars and commercial trucks appears to be impossible to estimate at present, since civilian automobile production schedules seem to be subject to day-to-day revision on the basis of currently accumulated knowledge regarding the Nation's supplies of critical materials. While the quota for January has been officially established at about 25 percent of the United States output of 411,258 passenger cars in January 1941, recent developments make it likely that actual production will be even less, primarily because of the need for conserving rubber.

Reports obtained from over 1,400 manufacturers (with about 749,000 employees in November) show that these employers expected to hire about 38,000 workers by the end of April 1942, virtually all of them for work on production of military goods. It is obvious that these hires will permit reabsorption of only a small fraction of the workers for whom lay-offs are anticipated in various manufacturing fields. On the basis of contracts awarded through November, not more than 150,000 additions to defense employment were necessary to reach the anticipated peak after April 1942, and it was expected that this peak would not be reached until early 1943. The only solution to the State's unemployment problem is obviously a great expansion in the amount of military production and in the rate of expansion. Possibly ways in which this objective may be achieved have been discussed in Mr. Steinbaugh's statement.

Although more than 10 000 manufacturing workers had already been laid off because of material shortages and production quotas by late November, total industrial employment in Michigan has actually continued the upward trend which has prevailed since the first large defense contracts were awarded in the middle of 1940. From June 1940 to June 1941, total reported unemployment covered by unemployment compensation rose by 229 000 to 1,282,000, and covered manufacturing employment rose 188,000 to 851,000. From September to November of this year, employment of 1,448 plants in selected manufacturing industries advanced from 733,000 to 749,000.

The beginning of large scale lay-offs caused by production cuts, prompted first by needs of the defense program and increased in severity by the war, was reflected in an increase of about 10,000 over the previous week in the number of claims, received by the State's unemployment compensation commission during the week ending December 13. Preliminary reports obtained last Saturday, December 20, indicate that about 110,000 workers filed claims for benefits last week, about 70,000 more than during the preceding week. It is expected that the claim load during the present week, ending December 27, will show another rise of similar volume.

CENTERS EXPECTING SEVERE UNEMPLOYMENT

The impact of various factors causing curtailment of nondefense production is particularly serious in the major industrial centers of the State. Of the total of about 260.000 industrial workers expected to be unemployed in the State in the immediate future, about 135,000 will be out of work in the Detroit area. Hiring expected by about 550 Detroit plants, with 422,000 employees in

[1] See Detroit hearings, pt. 18, pp. 7169–7197.

November, during the 6 months ending April 1942 would reduce this unemployment total by only 28,000. Additional, but only eventual, expansion of aircraft manufacturing and other defense manufacturers' labor needs in the area will provide jobs for perhaps 110,000 more workers in the Detroit area by 1943. In the meantime, unless remedial steps are immediately taken, severe unemployment, and associated out-migration, will be suffered in this community.

In Flint, where a new embryonic tank-production program may eventually employ about 15,000 workers, about 30,000 are faced with immediate joblessness. Production of airplane engines, and perhaps of more machine guns, may provide jobs for several thousand additional Flint workers, but here again, without relieving the displacement problem for at least several months.

In Lansing large defense contracts have recently been awarded, which, together with the contracts previously held for production of shells, airplane propellers, and engine parts, will probably provide more than enough jobs to reabsorb the 10,000 or more workers who are being laid off at present. However, most of the displaced workers will be unemployed for many months, in spite of the large amount of defense employment eventually scheduled for Lansing, unless steps can be taken greatly to accelerate production of materials required for the victory program.

Despite the large contracts for trucks held by Pontiac plants and the possibility that several thousand workers will be needed for ordnance production in that city, there is little current prospect that even peak requirements for fulfillment of present contracts will reabsorb more than half of the 11,000 workers experiencing unemployment.

In all of the individual cities mentioned so far, the curtailment of automobile production is the primary reason for current and anticipated unemployment. Other Michigan cities have already experienced quite severe "priorities unemployment" primarily because of dislocation in other industries, including refrigerator manufacturing and metal-furniture production. In Grand Rapids at least 3,000 workers have been laid off mainly because of production curtailment forced by the defense program upon nonautomotive industries, and 3,500 additional workers have lost or are expected to lose their jobs, primarily because of the cuts in automotive output. In Muskegon at least 2,000 workers have already been laid off, and 3,000 to 4,000 more may soon find themselves unemployed.

EFFECT OF REDUCTIONS ON NONDEFENSE EMPLOYMENT

The effect of sharp reduction in activity among various nondefense manufacturing plants has, of course, widespread ramifications in the State's entire economic system, with many thousands workers in nonmanufacturing enterprises to be affected by the virtual elimination of products which they use in their work or sell. Many of the 18,000 persons who are employed by automotive dealers covered by unemployment compensation (in September 1941) and many thousand more persons working for dealers too small to come under the present provisions of the State's Unemployment Compensation Act may lose their jobs for lack of automobiles to sell. An unknown, but undoubtedly substantial, portion of Michigan's 450,000 covered nonmanufacturing workers (in September 1941) are also likely to be laid off so long as advances in defense employment are not sufficient to offset drops in employment in civilian production.

We do not have data necessary for anything like an adequate estimate of the effect of curtailment of automotive production upon employment in the entire country, but it is known that about one-third of the industry's total manufacturing employment is outside Michigan. If defense expansion in the communities where these non-Michigan plants are located is on relatively the same scale as in Michigan, about 100,000 automobile-manufacturing workers outside of Michigan may be thrown out of work. In an estimate based upon figures obtained in the 1935 census of business, the Automobile Manufacturers Association reported that more than 1,175,000 workers were engaged in automotive sales and servicing. There may be little unemployment in automobile service and repair, but if the proportion of these workers who are engaged in selling corresponds to the proportion in Michigan's covered employment, more than 400,000 of these workers are engaged in distribution and, therefore, likely to experience unemployment as a result of the virtual elimination of automobile production for civilian use.

What I have discussed so far is the question of how many workers are employed in Michigan as a result of the war emergency. Much important, of

course, is the question of how long they will be idle. The testimony of representatives of the industry today will no doubt include revised estimates of the extent to which new defense production can be speeded up.

"A quarter of a million unemployed" has serious implications in terms of human hardship. Counting in the families and children of the unemployed workers, it will involve insecurity and a lower standard of living for a million persons in Michigan alone. These hardships will be only partly offset by the existing machinery of unemployment compensation, public relief, and Work Projects Administration.

COSTLY DELAYS

But even if we had completely adequate machinery for providing income to the unemployed, we would not have solved the most important problem. Every day that 250,000 men are idle means the loss of 2,000,000 man-hours which we ought to be using to produce bombers and tanks and ordnance needed for victory. Even in the last 2 weeks, battles have been lost in the Pacific because of the lack of the material needed for air superiority and greater striking power on land.

When we realize that even the Chrysler Tank Arsenal, at its peak production, will be using only about one-twentieth as many man-hours per day as are represented by 250,000 unemployed, it is clear that each week's delay in mobilizing Michigan's manpower and machines completely is a catastrophe.

We are in the war. To win we must go to work.

* * * * * * *

(A supplementary statement on the relationship between unemployment and migration, as indicated by unemployment-compensation claims, is attached to bring up-to-date previous data submitted to your committee.)

SUPPLEMENTARY STATEMENT BY P. L. STANCHFIELD

OUT-MIGRATION AS REFLECTED IN UNEMPLOYMENT COMPENSATION CLAIMS

One measure of the movement of workers out of Michigan is the number of unemployment compensation claims filed in other States by Michigan workers (table A).

Although the actual number of claims filed in other States by former Michigan workers is somewhat lower in 1941 than in 1940, the ratio of such claims to total claims filed against Michigan is approximately the same, 3.8 percent in 1940 and 3.7 percent in 1941.

The ratio of claims filed in other States has been increasing steadily, however, from 2.7 percent in August to 6.3 percent in the first 2 weeks of December. This may foreshadow a future outmovement of Michigan workers as lay-offs become more widespread. A total of about 8,200 workers with wage records in Michigan filed claims in other States in the last half of 1941.

IN-MIGRATION AND OUT-MIGRATION AS REFLECTED IN UNEMPLOYMENT COMPENSATION CLAIMS

Comparison of claims filed in other States by former Michigan workers and claims filed in Michigan by workers from other States in the last half of 1941 shows a large increase in the net migration into Michigan (table B).

In the 5 months, July through November 1940, claims filed in Michigan by workers from other States were equal to only 64 percent of the claims filed in other States by Michigan workers. In 1941, however, claims filed in Michigan by workers from other States were almost equal to claims filed in other States by Michigan workers (97 percent). In 3 months of this 1941 period, claims filed in Michigan by out-of-State workers exceeded claims filed in other States by Michigan workers.

The change in the Michigan employment situation brought on by further restrictions on passenger cars and other nondefense production will no doubt again reverse this trend. Unemployed Michigan workers then may be expected to migrate to other States in search of work unless there is definite planning for training during the lay-off and for local rehiring in defense work as plants are converted.

Michigan unemployment compensation claims filed in other States as percent of all claims filed against Michigan, July to December 1940 and 1941

TOTAL CLAIMS, ALL TYPES

Month	Total claims filed against Michigan		Claims filed against Michigan in other States		Claims filed in other States as percent of total claims	
	1940	1941	1940	1941	1940	1941
July	593,392	260,232	17,717	7,311	3.0	2.8
August	559,879	361,325	18,334	9,649	3.3	2.7
September	235,837	221,136	10,387	7,360	4.4	3.3
October	151,821	146,550	8,495	7,439	5.6	5.1
November	107,611	127,170	7,237	7,447	6.7	5.9
December	130,665	[1] 71,189	7,092	[1] 4,518	5.4	6.3
Total	1,779,205	1,187,602	69,262	43,724	[2] 3.8	[2] 3.7
TOTAL CONTINUED CLAIMS (COMPENSABLE CLAIMS AND WAITING AND DISQUALIFICATION WEEKS SERVED)						
July	429,804	134,529	13,788	5,589	3.2	4.2
August	504,714	305,332	17,166	7,702	3.4	2.5
September	210,627	183,180	9,383	6,262	4.5	3.4
October	128,216	112,266	7,387	5,984	5.8	5.3
November	88,497	100,171	6,218	6,216	7.0	6.2
December	101,649	[1] 53,181	5,728	3,786	5.6	7.1
Total	1,463,507	888,659	59,664	35,539	[2] 4.1	[2] 4.0
INITIAL CLAIMS						
July	163,588	125,703	3,929	1,722	2.4	1.4
August	55,165	55,993	1,174	1,947	2.1	3.5
September	25,210	37,956	1,004	1,098	4.0	2.9
October	23,605	34,284	1,108	1,455	4.7	4.2
November	19,114	26,999	1,019	1,231	5.3	4.6
December	29,016	[1] 18,008	1,364	[1] 732	4.7	4.1
Total	315,698	298,943	9,598	8,185	[2] 3.0	[2] 2.7
ACCUMULATIVE INITIAL CLAIMS FROM JULY 1						
July	163,588	125,703	3,929	1,722	2.4	1.4
August	218,753	181,696	5,103	3,669	2.3	2.0
September	243,963	219,652	6,107	4,767	2.5	2.2
October	267,568	253,936	7,215	6,222	2.7	2.4
November	286,682	280,935	8,234	7,453	2.9	2.6
December	315,698	[1] 298,943	9,598	[1] 8,185	3.0	2.7

[1] Includes only first 2 weeks of December 1941. [2] Average.

Source: Research, Statistics, and Planning Section Michigan Unemployment Compensation Commission.

Comparison of interstate claims filed in other States against Michigan and claims filed in Michigan against other States, July to December 1940 and 1941

Month	Claims filed in other States against Michigan		Claims filed in Michigan against other States		Claims against other States as percent of claims against Michigan	
	1940	1941	1940	1941	1940	1941
July	17,717	7,311	9,357	7,715	52.8	105.5
August	18,334	9,649	8,477	7,509	46.2	77.8
September	10,387	7,360	7,611	7,828	73.3	106.4
October	8,495	7,439	7,677	7,924	90.4	106.5
November	7,237	7,447	6,845	6,902	94.6	92.7
Total	62,160	39,206	39,967	37,878	[1] 64.3	[1] 96.6

[1] Average.

Source: Research, Statistics, and Planning Section, Michigan Unemployment Compensation Commission.

STATEMENT BY WENDELL LUND, EXECUTIVE DIRECTOR, MICHIGAN UNEMPLOYMENT COMPENSATION COMMISSION, DETROIT, MICH.

DECEMBER 20, 1941.

WARTIME POLICY ON LABOR SUPPLY AND UNEMPLOYMENT

Our major civilian objective in the present war effort is to make complete use of our labor resources and our productive equipment in the production of the essentials of war.

Some of the ways in which the conversion to war production can be speeded have been outlined by Mr. Steinbaugh's statement. I should like to add a few comments regarding national policies in connection with (1) the development and utilization of our labor supply during the war emergency, and (2) the problem of providing income (especially during training) to those unemployed workers who cannot be immediately reabsorbed.

GOVERNMENT POLICY IN THE FULL UTILIZATION OF LABOR RESOURCES

While the immediate problem we face is one of creating additional jobs and planning the full use of plant facilities, we also have a problem of using our labor resources to the best advantage. Control of migration—the original subject studied by your committee—is only one phase of the labor supply problem.

A telegram from President Roosevelt to the Governors of all States last Friday laid the basis for transforming the United States Employment Service and its aggregation of affiliated but autonomous State agencies into a unified, Nation-wide Federal agency with direct lines of authority and responsibility. Governor Van Wagoner immediately turned the facilities of the Michigan State Employment Service over to the United States Employment Service. No doubt other Governors have also complied with the President's request.

The working out of organizational adjustments necessary to place the new Nation-wide employment service on an effective operating basis may well provide opportunity for putting into universal operation a number of policies on the recruiting, transfer, hiring, and training of workers which have already been recommended by the Office of Production Management. These policies will facilitate the fullest use of the Nation's manpower and aid the preparation of additional workers as needed for defense and essential nondefense jobs.

In this connection it may be worth while to mention a few specific policies which might help the new Federal Employment Service to control migration and to assure full use of our manpower.

1. All hiring of new workers for defense jobs should be channeled through the Employment Service—in order to prevent needless migration and to assure the full utilization of local workers before outsiders are brought in.

2. For the same reasons, newspaper advertising for workers should probably be put under legislative control so that no newspaper will accept an outside advertisement for workers without approval of the employment service.

3. Labor scouting in distant communities should also be controlled and permitted only with Employment Service approval.

We already have an Office of Production Management statement of policy which contains this and the preceding two points, but it may be desirable to establish these principles by legislation rather than moral suasion.

4. In cases where it is necessary to move workers from one community to another, Government funds should be made available as grants or loans to defray the cost of transportation and getting settled in the new community. Loans for this purpose were provided in the last war and may be equally desirable now.

5. With regard to skilled occupations in which shortages exist or are impending, we need some system similar to the priorities system which controls scarce materials. The Employment Service should be given some authority to direct the movement of key workers from nonessential jobs to essential jobs wherever this will speed production.

6. We need an increasingly close coordination between the Employment Service and the various agencies responsible for training programs—to make sure that the right sort of training is being given to the proper number of workers, and to avoid future shortages of qualified men and women.

7. In individual communities and labor market areas we need small working councils representing labor, management, and government to establish and direct basic community policy concerning labor supply. At present we often have several advisory councils in a single community, with overlapping duties and membership, but no single point at which policy decisions can be made.

8. We must do everything possible to see that local labor supply is used fully (without racial or other discrimination) before outside sources of labor are tapped. Failure to observe this rule creates unnecessary migration, and inevitably brings problems of overcrowding and overtaxed governmental services in defense areas, which we must try to minimize.

9. It must be our aim to develop an increasingly close relationship between employers and the Employment Service—the labor supply branch of government. A lot of lost motion can be avoided if the employer goes first to the Employment Service with al labor supply problems. If the local employment office is too weak to do the job, the National office, the Office of Production Management, or some other top Federal agency must have the authority to correct the weakness and develop proper relationships.

10. We must have close cooperation between the labor supply agency and the armed forces (or the Division of Supply) in solving labor shortages which result from the habits of preferences of individual employers. We cannot afford to have production delayed by labor shortages which result from low pay, unsatisfactory working conditions, or bad industrial relations.

UNEMPLOYMENT AND TRAINING DURING THE CONVERSION PERIOD

The points I have outlined are concerned primarily with filling jobs when jobs exist. We also have another problem in dealing with our labor supply, the problem of making some provision for those workers who suffer unemployment due to the shift to war production and the curtailment of nondefense work.

For a few months we may have a mass unemployment problem which in many respects is similar to that in a minor depression. The first line of defense for the unemployed will be unemployment compensation. Every State and two Territories have unemployment compensation laws which provide benefits for a limited time to workers who are laid off through no fault of their own.

There is a great deal of variation between these different State laws. Some of them pay relatively small benefits for only a few weeks—others are more adequate. The Michigan law is fairly close to the national average, but we consider that it pays benefits which are too small and too restricted in duration to meet the needs of the mass unemployment which lies immediately ahead.

The financial resources of the existing State funds are also unequal in terms of their ability to meet a serious drain of mass unemployment. Some States can weather the storm easily—others might be seriously endangered by benefit payments on the scale that will be needed.

Since the unemployment problem that we face is one which is caused directly by the war emergency, and the united national policies of sacrificing nonessential civilian production to defense, it appears to me that there is good reason for the Federal Government to consider bearing a part of the cost of unemployment which occurs during this transition period. The exact nature of the machinery which might be required for this and the exact nature of the financing involved should, of course, be left to the judgment of Congress.

Since it became apparent last summer that material shortages and the conversion of plants to defense production would cause widespread unemployment, it has been widely agreed that the period of transitional unemployment should be utilized for the preparation of workers for defense jobs. Within the past few weeks a local of the United Automobile Workers in one of the "big three" automobile firms proposed a mass training program for all seniority workers on lay-off with a special cash allowance during the training period.

The union proposal—with which management has expressed sympathy—would provide a training income to workers taking training courses to fit them for eventual defense jobs. The training income would supplement whatever unemployment compensation benefits the workers is regularly entitled to receive and bring his net income to the equivalent of a reasonable hourly rate for 30 or 32 hours of training per week.

Such a program would speed up the process of qualifying workers for new and unfamiliar tasks and at the same time it would reduce the tendency for those on lay-off to migrate haphazardly in search of work, when in a matter of a few months they will be needed in their own locality. The program, of course, would not preclude workers from being placed in local or distant jobs as needed.

In ordinary industrial practice, through the "breaking-in" system, it is possible for workers to be trained for most jobs after they are actually on the job. But now that time is so important in producing the armaments we need, we should not wait until after the plant is ready before we start to train the men for the job.

Here again some congressional action would be needed to establish funds from which training allowances might be paid. Some such widespread training program, however, would help to maintain the morale of the unemployed workers and prepare them to produce immediately with high efficiency when the plants and machines are ready to roll.

RECOMMENDED CHANGES IN THE MICHIGAN LAW

In the absence of Federal action, individual States may be able to help the situation by making suitable changes in their unemployment compensation laws. I am attaching a copy of recommendations submitted last week to a special committee of the Michigan Legislature, which outlines the recommendations of Governor Van Wagoner and the Michigan Unemployment Compensation Commission for amendments which might be adopted at a special session to meet this emergency. This statement also explains the reasons for each recommendation.

(The memorandum containing the recommendations referred to above is as follows:)

MICHIGAN UNEMPLOYMENT COMPENSATION COMMISSION

DETROIT, *December 15, 1941.*

To the Special Legislative Committee on Unemployment Compensation and Transition Unemployment:

At your meeting of December 12, 1941, we submitted a series of selected statistics and charts describing past experience under Michigan's unemployment compensation program, and the possible effect of changes in the benefit provisions of the present law. We submit herewith, for your consideration, specific recommendations for changes in the law.

The balance in the Michigan unemployment compensation fund has increased steadily during the past 2 years, and is now nearly $125,000,000 as compared to a low of less than $37,500,000 in December 1938. By the end of January 1942, the balance available for benefits will approach $140,000,000. During 1941 and 1942, Michigan's fund has been accumulating surplus more rapidly than in most other industrial States.

Although the average yield from contributions will be lower in 1942 than in 1941, because of reduced rates granted to many employers under "experience rating" provisions of the act, it is estimated that total income of the fund in 1942 will be close to $45,000,000. Benefit payments under the present law will amount to about $40,000,000 in 1942. Thus, even a change in benefit provisions which increased total disbursements by 30 percent (or $12,000,000), would involve a deficit in 1942 of less than $10,000,000. In 1943, with industry on a war footing, unemployment should be considerably reduced and no deficit should be expected, even with a liberalized law.

In view of this situation, the Michigan Unemployment Compensation Commission recommends the following changes in the existing unemployment compensation law:

1. The minimum weekly benefit amount should be increased from $7 per week to $10.

The present minimum of $7 does not provide adequate protection to low paid workers. Since individuals eligible for unemployment compensation are not able to receive aid through Work Projects Administration, their inadequate unemployment compensation benefits must in many cases be supplemented by welfare relief from public funds. A higher minimum benefit rate will reduce the need for such supplementary aid.

It is estimated that in a normal year (in which benefits under the present law would amount to $40,500,000) this change would increase the cost of benefits by 3 percent, or $1,215,000.

2. The maximum weekly benefit amount should be increased from $16 per week to $20.

The Michigan law was originally designed to pay unemployed workers a weekly benefit equal to half of their full-time weekly earnings. However, with the present maximum of $16 per week, many workers receive benefits which are considerably less than half the weekly wage. The average wage of Michigan factory workers has risen from less than $30 in 1938 to more than $40 in 1941. The cost of living has also increased sharply, so that $16 represents far less purchasing power now than in 1938. In order to maintain an equitable relation-

ship between benefits and the wage loss suffered by unemployed individuals, a maximum rate of at least $20 would be necessary.

The increased cost of this change is estimated as 8.7 percent of benefit payments in a normal year or $3,523,500.

3. All eligible unemployed workers should be eligible for a minimum of 16 weeks of benefits per year.

Experience has shown that the period for which benefits are available is too short to cover the entire unemployment period of a large percentage of the individuals receiving benefits. This deficiency is especially serious for those who now qualify for less than 16 weeks of benefits. More than 80 percent of the claimants who qualified for less than 12 weeks in 1938–39 remained unemployed after using up all benefits to which they were entitled. Even in the prosperous year of 1940 more than 50 percent of the beneficiaries in this group exhausted their benefits. The duration of 16 weeks for all eligible insured workers would greatly increase the adequacy of the unemployment compensation system by granting increased protection to the group which is most in need of it.

The increased cost of this change in a normal year is estimated as 8.2 percent, or $3,321,000.

4. The maximum duration of benefits should be increased from 18 to 26 weeks.

Many workers who receive benefits have sufficient wage credits in their base period to qualify for more than the present maximum duration of 18 weeks. The unemployment which occurs during the war emergency will probably involve long periods of unemployment for those individuals whose employers have been completely forced out of business or compelled to cease civilian production for a long period before they can undertake defense production.

The 26-week maximum will give greater protection to those employees who have had the steadiest employment, and whose services will eventually be most valuable in defense production. The increased cost of this change in a "normal year" is estimated as 4.1 percent, or $1,660,000.

5. The waiting period which is required before benefits begin should be reduced from 2 weeks to 1 week.

Under the present law, it is impossible for an unemployed worker to receive his first benefit check until the fourth or fifth week after he becomes unemployed. He must first serve two waiting period weeks for which no compensation is paid, and then complete 1 more week of unemployment. His first compensable claim cannot be filed before the fourth week and his actual first check reaches him in the fourth or fifth week. A shorter waiting period will reduce the likelihood that the unemployed worker will exhaust his other resources before receiving his first check.

The increased cost of this change in a normal year is estimated as 6 percent, or $2,430,000.

The combined effect of the five changes recommended above would be to increase the cost of benefit payments about 30 percent in a normal year, or by somewhat more than $12,000,000. This cost should be considered in the light of (1) the large surplus now available for benefits, and (2) the gains to civilian morale which will result from giving each insured worker a greater confidence that unemployment compensation offers sufficient protection to tide him through the transition unemployment of the war period. The Commission believes that the increased cost is justified and that these changes would not endanger the fund.

Very truly yours,

WENDELL LUND,
Executive Director, for the Commission.

TESTIMONY OF V. B. STEINBAUGH, WENDELL LUND, AND PAUL STANCHFIELD—Resumed

The CHAIRMAN. We would like to have you summarize the situation in Michigan today as Governor Van Wagoner sees it.

Mr. STEINBAUGH. Mr. Chairman. Governor Van Wagoner has asked me to express his regrets in not being able to be present today, and he has asked me to represent him. I have prepared a brief summary in the limited time that I was given, and I believe this, in general, sum-

marizes the Governor's ideas in respect to this problem. With the permission of the committee, I would like to read this brief summary.

Mr. ARNOLD. You may do so.

(Following is the statement read by Mr. Steinbaugh:)

STATEMENT BY VARNUM B. STEINBAUGH, SPECIAL REPRESENTATIVE OF HON. MURRAY D. VAN WAGONER, GOVERNOR OF MICHIGAN, LANSING, MICH.

DECEMBER 20, 1941.

WHAT CAN WE DO TO MAKE 250,000 JOBS?

The war emergency, which is expected to cause a greater and earlier curtailment of automobile production than was previously expected, will create a major unemployment problem in Michigan. When Governor Van Wagoner appeared before this committee earlier this year in Detroit, he estimated that about 110,000 Michigan automobile workers would be unemployed in January under curtailment plans then in effect. We now expect that about 260,000 Michigan wage earners will be unemployed by the first of the year—a figure which confirms predictions made several months ago by the Michigan State Employment Service as to the effects of a 75 to 100 percent cut in passenger-car production.

I shall leave a detailed discussion of our unemployment estimates and the problems of national policy with respect to labor supply and unemployment in a war period to be presented by Mr. Lund and Mr. Stanchfield. A total of a quarter of a million unemployed is enough to indicate the size of the problem and the need for rapid conversion of idle plants and labor to military use.

Before discussing possible remedies, I would like to emphasize that we have more than one kind of conversion problem in Michigan. Everyone is aware of the crisis faced by the automobile industry—both the large companies which produce finished automobiles and the hundreds of suppliers of parts and equipment who have depended on automobile production. Complete utilization of the machines and manpower of this great industry is absolutely essential to our war effort, and the normal channels of subcontracting will make work for the suppliers as well as the large companies in producing tanks, bombers, and ordnance. The pattern for the eventual solution is quite clear; the problem is how to speed up conversion.

But we also have a second type of dislocation which must not be ignored. This is the problem of the small businessman outside of the automobile industry who has been an independent final producer of products for which he can no longer obtain materials. In this group there are many different kinds of plants and equipment, and no established channels by which the small plant can take over part of the job given to a prime contractor. The plight of this group of small businesses is going to be harder to solve but it must be solved if we are to achieve our war-production goal—full use of all facilities.

The unemployment picture I have outlined is a black one. Stoppage of passenger-car production strikes at the very heart of Michigan's normal economic life. Before Pearl Harbor, we might perhaps have questioned whether the cut in passenger-car production should be postponed a little, or made more gradual, in order to ease the shock of unemployment. But in a Nation at war, we must accept the judgment of the armed forces and the Government agencies responsible for production as to whether we can afford to continue producing any passenger cars at all. Certainly the great majority of normal jobs in automobile factories will be eliminated.

As far as Michigan is concerned, then, our problem is to create somewhere near a quarter of a million new jobs in defense production as quickly as we can. This we must do not only because each unemployed worker is suffering an economic loss for which he is not personally responsible, but also because every unemployed man represents labor power that we could be using to produce planes and tanks and armaments for victory. The same problem exists in every State—ours is merely the most dramatic example of a Nation-wide problem.

12-POINT PROGRAM

We can see now that we have been moving too slowly in converting our industries to war production, and that some drastic changes in our system of purchasing and our ways of stimulating production may be needed. The most important parts of the 12-point program I shall outline for getting men back to

work may call for a centralized procurement set-up, operating with streamlined methods and a less meticulous regard for the habits and prerogatives of management and labor and officialdom.

If we go to work with all our energy on the type of program that Governor Van Wagoner has asked me to present, we can do a great deal to reduce the volume of unemployment and shorten the period during which the skilled hands and brains of Michigan's workers are idle. Here are the suggestions:

1. Eliminate every obstacle which prevents the adoption of a 24-hour day, 7-day week (with the "swing shift") in those plants which are now tooled up and actually engaged in producing war materials. Certainly it should be possible to reach some compromise agreement concerning the payment of extra pay for Saturday and Sunday work, and to take any drastic measures that are needed to fill gaps in the equipment needs or key labor requirements of defense plants where this is necessary to permit capacity operation.

2. Immediately expand and extend existing contracts (especially by "open-end" orders) for production of items on which defense plants are already at work. Many plants state that their only reason for not operating full time is the lack of sufficient orders. Let's give them the orders, and produce the goods.

3. Use existing facilities where possible, rather than building new plants. There have been a good many cases in the past in which contracts for defense material have been given to a low bidder who then has to build a new plant and obtain new machinery before he can go into production. At the same time plants whose existing equipment is suitable have failed to get contracts. From here on, we must be sure that we are using our existing capacity to the full before we undertake the slower process of building new plants.

4. Adopt a more flexible attitude concerning some of the nonessential elements in specifications for defense equipment. There are many instances in which a slight change in specifications—such as the substitution of press work for castings—would permit material to be produced with existing equipment of an idle plant, without reducing the military effectiveness of the product. In other words, specifications should be subject to any minor changes that are necessary to permit production with existing facilities.

5. Centralize the purchase of war materials and the letting of contracts in a single governmental agency with enough authority to make sure that we use all our available resources, and use them immediately. At present there are at least half a dozen separate procurement agencies, with the Office of Production Management serving largely in an advisory capacity but not directly controlling production. The separate purchasing divisions to some extent compete with one another and duplicate each other's functions. What is needed is an agency able to work out a single coordinated production plan—a division of supply—which can determine the entire schedule of military and naval requirements and then see that these needs are filled.

6. Give the procurement agency full authority to use productive facilities or any other factor in production in whatever way fits best with the national plan. It may even be necessary in some cases to take labor, equipment, or materials away from one employer for use in another plant, if a shortage of these is impeding full-time operation, or delaying new production in the other plant.

7. Set up machinery by which the Government will direct—instead of merely encourage—the use of small and medium-sized plants to supplement the production of large plants. We may need compulsory as well as voluntary subcontracting. Voluntary pooling of facilities by employers in a given industry or area should be encouraged—but where this fails, the Government should see that pooling occurs if it will speed production and employment.

8. The Government should have a greatly expanded corps of industrial engineers and other technical experts—drafted from the top ranks of industry—to guide and avise the management of smaller concerns in utilizing their facilities for war production. This same technical group should work with military authorities in adopting their specifications to fit industrial technique. Thus far most of the initiative has been with employers, who have to learn what products are needed and then bid for the job of building them. In the future, the procurement agency may have to go out in some cases and show the employer how he can build what is needed, and get him started.

9. Set up definite machinery which will give organized labor a voice in planning and accelerating the conversion to war production. Labor's stake in the creation of new jobs should stimulate many suggestions as to methods, pooling

of facilities, and short-cuts, which might be overlooked by individual management—as some of labor's suggestions have been overlooked in the past.

10. Even a combination of all these methods will not make work immediately for every man displaced from his usual civilian work. Since some civilian production, will, no doubt, be allowed to continue—at least for replacement purposes—it should be allocated to those communities which have most difficulty or delay in conversion. The same principle of allocation to distressed communities should be observed in connection with certain military items which are produced in ordinary plants—such as heavy trucks.

11. If we have a labor surplus in the months ahead, we should use at least part of it in Government work projects which are useful for defense—paying a real wage for the work that is done. Labor power that might otherwise be idle can be used in building defense highways and defense housing, air-raid shelters, sanitation facilities, and so forth—which we may not have manpower to create later.

12. Eventually, we will reabsorb all of our displaced workers in defense production. While we wait for the plants and plans to be ready, we ought to train these people in the skills that will be needed. It would be a good investment to appropriate funds to pay the equivalent of real wages while they are being trained.

SOLUTION OF SMALL BUSINESS PROBLEMS REQUIRED

The points I have outlined might constitute part of a general program to speed the conversion of our productive facilities to war use. But a general program must be translated into a variety of solutions for individual businesses. While Michigan is known for its giant factories, we feel very strongly that we must find a solution for small concerns as well as large. The Government has spent billions for new defense plants to be operated by larger industries. Some credit provision for small plants, to help them convert to defense or to help them in using substitute materials for civilian goods, may be necessary for the survival of enterprises that are vital in small communities.

We may also have to give special treatment to small firms in the allocation of materials where the amount needed is small and the harm of closing the plant is widespread. A "bits and pieces" defense contract, a loan, or engineering aid in converting to new production may also help in the case of small concerns.

To do our war time job properly, we cannot afford to let small businesses go under. The job of saving them is one of the most difficult problems this Nation has ever undertaken—but they are necessary to maintain something that is essential to America—the diversified character of our economy and the independence and self-reliance of our people. To do the job of conversion—and do it all the way—we must have administrative machinery that can translate general principles into action on individual cases. The automobile industry is an outstanding case of facilities which can and must be converted to defense use—but we must use all other industries as well.

If we carry out the principle that every plant that is convertible to defense work will be converted, we should then be able to concentrate a large part of our nondefense production in the plants where conversion is impossible, thus saving many which might otherwise be forced out of their place in our economic system.

TESTIMONY OF PANEL REPRESENTING THE GOVERNOR OF MICHIGAN—Resumed

Mr. STEINBAUGH. I thank you, gentlemen, very much for the opportunity to appear before you. As you know, this subject is very vital to all of us in Michigan, including our State government, and we certainly appreciate this opportunity.

Mr. ARNOLD. We are very glad, Mr. Steinbaugh, to have these recommendations of the Governor. They coincide very closely with the recommendations made by this committee, which, I understand, the Governor has no knowledge of.

Mr. STEINBAUGH. He hadn't seen your committee's recommendations yet.

Mr. ARNOLD. Of course, the recommendations of this committee were based on our hearings throughout the country. You have arrived at the same conclusions within the State of Michigan.

The 260,000 that you estimate will be unemployed by closing down the automobile industry is limited to the State of Michigan, and doesn't include the neighboring States that produce some parts?

Mr. STEINBAUGH. That is entirely true, it is entirely within the limits of the State of Michigan.

Mr. Stanchfield will go into more detail in regard to the figures, and the subdivision and break-down.

Mr. ARNOLD. Thank you very much Mr. Steinbaugh. Mr. Lund, I would like to have you and Mr. Stanchfield provide between you the testimony on unemployment in Michigan, and what the Unemployment Compensation Commission is in a position to do about it. You will probably want to discuss questions of policy affecting the Commission, and Mr. Stanchfield perhaps will talk about the current statistics on unemployment.

Mr. LUND. You are right, Mr. Arnold. I think Mr. Stanchfield should cover the statistics, because he has a far better grasp of them than anyone else in the Commission. He has been working with them for 3 years now. Of course, the source for his figures is the employers in the State of Michigan.

UNEMPLOYMENT BENEFIT CLAIMS

In connection with the unemployment that Mr. Steinbaugh has referred to the burden on our Michigan unemployment compensation fund will be very considerable. For the week ending December 11, there were 40,000 claims filed for benefit payments; for the week ending December 18, that figure rose to 110,000; for the week ending December 25, that figure will increase another 70,000, in all probability, and reaching a total of 180,000. Now this blow is hitting us sooner than we had anticipated, because of the more drastic curtailments that have been announced in the past couple of weeks.

The status of our fund, as you gentlemen heard when you were in Michigan in September,[1] is as follows:

The fund, as of December 15, was approximately $125,000,000.

By February 1 we will have made our collections for the fourth quarter of 1941, and we will have in the fund an additional $17,000,000. In the meantime, of course, we will be drawing on the fund, so that the net might be somewhere between $138,000,000 and $140,000,000.

The Governor has felt that it is tremendously important to increase the amount paid our unemployed workers, and also increase the duration of the benefit payments.

The CHAIRMAN. What is the duration now?

Mr. LUND. Eighteen weeks is the maximum. The average would probably be 12 or 13. The minimum for all practical purposes, even though it isn't stated in the act, is 8 weeks; at least that is the way it works out.

[1] See Detroit hearings, pt. 18.

The CHAIRMAN. How much do you pay?

Mr. LUND. The maximum is $16. The average is about $12 or $13 a week.

Mr. SPARKMAN. How do you get that variation in duration of the payments?

Mr. LUND. I am going to ask Mr. Stanchfield to explain that to you; it is rather a complicated formula.

VARIABLE DURATION OF BENEFITS

Mr. STANCHFIELD. In some States all eligible claimants are allowed the same number of weeks of benefits. For example: In Ohio every man who is eligible can draw up to 18 weeks if he remains unemployed that long. However, the majority of the States, including Michigan, set up a variable duration of benefits, depending upon the amount the unemployed man earned during his past year. In Michigan, the total amount he may draw cannot be more than 25 percent of his base year earnings if those earnings were over $800; 30 percent if those earnings were less than $800.

That means that some individuals who qualify for a weekly rate of, say, $16 only have enough earnings to draw perhaps $160 altogether in benefits. That would be true of a man who earned $800 in his preceding year. Therefore, some people can qualify for as much as 18 weeks, and some for as little as 8 weeks. Mathematically no one can get less than 8 weeks. In general it works out so that the man who has had the least steady employment, and is therefore in greatest need of protection during his unemployment, qualifies for a short number of weeks, and the man who has had the steadiest work in the past gets the maximum number of weeks. So that short-duration benefits are usually associated with the greatest need.

The CHAIRMAN. Mr. Lund, when your funds become exhausted what will happen?

Mr. LUND. I don't know that we are prepared to answer that.

As we see it, if that load were to remain at an average of 125,000 to 150,000 for the next 6 or 7 months, the cost to our fund wouldn't be more than from $27,000,000 to $33,000,000. So that we can certainly weather this present storm.

Mr. ARNOLD. In other words, it won't go below $100,000,000?

Mr. LUND. Probably not in the next year.

Now, the Governor feels that it is important to maintain the morale of these unemployed workers, and also give them enough to live on for a sufficient period so that they can retrain to take their place in the defense program. One way to do that is to increase the amount of their benefits, and also to increase the duration of the benefits.

GOVERNOR'S COMMITTEE ON BENEFIT INCREASES

A couple of months ago the Governor constituted a special legislative committee, and they have been studying this problem; and our commission, at the request of the Governor, has made certain recommendations to them for extending the act; of increasing the amount paid to the workers and also increasing the duration. I don't know if you would be interested in hearing the different recommendations the Governor has made.

The CHAIRMAN. You might, for the purpose of the record, give them to us later.[1]

Mr. ARNOLD. It would take new legislation to extend and increase benefits, will it not?

Mr. LUND. Yes; it would. The commission proposes to increase the amount from $16 to $20 as a maximum and establish a minimum of $10 instead of $7. On duration, to provide a minimum of 16 weeks and a maximum of 26 weeks, and to reduce the waiting period from 2 weeks to 1 week.

Mr. ARNOLD. How soon do you anticipate that the legislature will meet?

Mr. LUND. It is at the call of the Governor; it might meet any time in the next few months.

Mr. ARNOLD. Quick action would be necessary, would it not?

EXTENT OF DISEMPLOYMENT

Mr. LUND. Yes; it would.

Mr. ARNOLD. Mr. Stanchfield, I saw in Sunday's New York Times a story quoting the Michigan Unemployment Compensation Commission as indicating that production curtailment in the automobile industry would mean idleness for 206,000 workers in the next 7 days. The report added that 130,000 would be affected in the Detroit area alone.

We shall be glad to have you take these figures as a starting point and explain in detail to the committee what the magnitude of the lay-offs will be and what the reemployment possibilities are on the existing war contracts in the automobile industry.

Mr. STANCHFIELD. I am not sure of the 206,000 figure that is given there, I would rather talk about the maximum of 260,000 that we expect. I imagine that was an estimate of what would occur within 1 week after the date when the figures were released.

During the last week, we made a special spot survey of the major plants in the automobile industry in Michigan, plants which altogether employ about 351,000 workers. We found that those plants were expecting to lay off by the end of the year at least 152,000 employees.

We also estimate that if the same general trend of lay-offs applies to the plants we did not contact, then from 40,000 to 50,000 others will be eliminated in the automobile industry itself.

To that number add 40,000 who were already unemployed and filing claims before the present wave of lay-offs began, and lay-offs of 20,000 to 30,000 in nonautomotive industries which we are expecting to shut down because of material shortages and in some cases because of normal seasonal shut-downs, and you have an over-all picture of 260,000 unemployed. It is not quite correct to say that all of that is in the automotive industry. That total is really the anticipated unemployment load for Michigan, resulting mostly from the automotive quotas, but in part a result of material shortages in such industries as refrigerator manufacturing, hardware, metal furni-

[1] Not received at time of printing.

ture, and every other type of enterprise which is subject to dislocation under the defense program.

Now the extent and duration of this unemployment after the first of the year is, of course, something we can't predict today. I believe your panel from the industry this afternoon can come closer to giving you the picture of how fast men are going to be reabsorbed in defense work, than we can.

REABSORPTION

We have estimates which we obtained from the industry during November, and on the basis of those estimates the immediate absorption would be very slight. In fact, for Michigan as a whole, it was expected in November that there would be only 38,000 additional jobs by the first of April. That 38,000 is very small in proportion to the quarter of a million unemployment figure we are discussing.

We know, of course, that some of the quarter of a million are going to get back to work for a few weeks in January or February, if passenger cars are produced in those months. Quotas that have been announced seem to be subject to change or modification almost from day to day. The problem such as the rubber supply has a very definite effect upon the unemployment prospect.

So we have to assume that there may be practically no passenger-car production. In that case we have got 260,000 less the number of men you can put back to work in defense work.

Any production of passenger cars that we do have during the first month or two of next year certainly isn't a permanent cure, because every indication is that if we produce cars at all in the first 2 months, that will be at the very end of the tapering-off process, with very little production after that.

You may be interested in the prospect of defense employment as it was predicted to us in November.

In our survey then it was indicated that after April, at which time there would be 38,000 additional jobs, there are only 150,000 additional jobs in sight. In order to reach those 150,000 additional jobs, it will be necessary to carry the figures on into the early part of 1943.[1]

LOSS IN MAN-HOURS

Now of course, I believe the whole objective of our discussions here, and the presentation that will be made by the industry this afternoon, is to increase that number. Certainly there is a much greater defense potential and a much greater employment possibility in Michigan than the 38,000 plus the 150,000 after April. It is something to think about when you realize what a quarter of a million men means in terms of man-hours. That means 2,000,000 man-hours a day, as long as you have a quarter of a million unemployed, that could be used in producing bombers, ordnance, or some other defense equipment, and which won't be used until we get it back to work.

Roughly, that is about 15 to 20 times the number of man-hours we expect to use at the peak in the Chrysler tank arsenal, which will be

[1] See p. 9428, this volume.

turning out 15 to 30 tanks a day. So it is a lot of production, and it is more important, I think, to consider these unemployment figures in terms of the man-hours and the potential production that is lost, than in terms just of the sufferings and hardships of individual people, although that also is a factor.

STATE-WIDE UNEMPLOYMENT

You will probably be interested in knowing a little about the situation in individual parts of the State. Detroit, of course, is the main center in which the unemployment will hit.

We expect that defense hiring from November to April in Detroit will be only about 128,000. That compares with about 135,000 immediate lay-offs expected in the Detroit area or the immediately adjacent communities. It leaves a net unemployment figure, under the contracts issued up to November, of better than 100,000 after the first of the year, in Wayne County alone.

In Flint, the immediate lay-offs amount to about 30,000 workers. We have an embryonic tank contract which won't immediately create a large number of jobs, but which will absorb perhaps 15,000 or more. In addition, there may be work on airplane engines, machine guns, and various other types of defense work. But Flint is one of the most seriously affected communities because of its complete dependence on the automobile industry. In fact, out of approximately 48,000 workers in factories in Flint, around 44,000 to 45,000 are in the automobile industry itself.

In Lansing there are large defense contracts which have been awarded, but the peak production on those apparently won't come until the middle of the year or later. The immediate problem is that about 10,000 workers are going to be displaced, and the duration of that unemployment will depend on how fast we can throw additional work into that community.

In Pontiac, another automobile center, approximately 11,000 will be laid off. And there is very little prospect in that city, under contracts that we thus far know of, for absorbing more than a very small part of that 11,000 men.

Now the towns that I have been mentioning so far are, of course, the automobile centers, the ones which have been most drastically affected by the declaration of war. However, we also ought to mention the nonautomotive centers, like Grand Rapids and Muskegon, dependent to some extent on diversified industries, but not primarily affected by automobile curtailment.

In Grand Rapids we already have about 3,000 workers who have been laid off because of dislocation in the refrigerator industry, the manufacturing of metal furniture, and other nonautomotive trades. In addition, there will be 3,500 more, bringing the total up to between 6,000 and 7,000—3,500 more to be laid off primarily because of the automobile cuts.

In the city of Muskegon, we have more than 2,000 workers already laid off because of material shortages and priorities, and from 3,000 to 4,000 more who are expected to be unemployed in the very near future.

FACTORS LIMITING UNEMPLOYMENT

Now I think I might add merely the fact that employment up to this date has held fairly level; there has been a good deal of displacement of workers from individual plants and curtailment of operations in some passenger car plants, but there have been two or three factors which have helped us to avoid the early impact of the unemployment we discussed with you in September.[1]

One has been the general adoption of a shorter work week in many of the nondefense operations. This, of course, means that we are losing the use of some manpower, and that workers are losing part of their normal income, but that you are able to keep more men at work, at least part of the time.

The second factor has been that we have been able to increase the flow of defense contracts and to speed up the tempo of defense production to some extent. The Labor Supply Division of O. P. M., Mr. Steinbaugh's liaison work in Washington, the individual planning and enterprise of producers in the State, all have made it possible to bring in some contracts that we didn't know about in September, and to speed up others.

And finally, there is the fact that the decline in employment that we talked of in September,[2] as likely to occur at about this time, has not yet become effective. The full weight of the blow may not be felt until after the turn of the year, and at that time, owing to new curtailment orders, it will exceed the estimates we were then able to make. Instead of an estimate of about 100,000 or 110,000, we now have 260,000 who will be unemployed at the start of the year, and even if some of those are called back for a week or two on passenger-car production, we certainly will have a net unemployment in January of somewhere around 175,000 to 200,000.

PERIPHERAL INCREASE IN UNEMPLOYMENT

The CHAIRMAN. Will not the wave of unemployment starting in Michigan—unemployment caused by the reduction in automobile production—reach out to various parts of the United States? Will not salesmen and dealers in parts and different things be hit seriously?

Mr. STANCHFIELD. Very definitely. Even in our own State we have example after example of plants that are now informing us that all of their contracts or orders as subcontractors for passenger-car production have been absolutely stopped now for the time being.

The CHAIRMAN. Has any survey been made in Michigan as to what becomes of those unemployed people? Do you know if they are leaving the State?

Mr. STANCHFIELD. I have added to my written statement a few figures on the evidence about migration, both out of, and into the State. It appears that up to now there hasn't been a very large volume of workers moving out of the State. In fact, the net trend of movement has been to the State rather than away from it.

[1] See Detroit hearings, pt. 18, pp. 7169–7213.
[2] See p. 9427, this volume.

The CHAIRMAN. In other words, the workers think their chances of reemployment are better in Michigan than any other place?

Mr. STANCHFIELD. That is what they thought up to December 7.

The CHAIRMAN. But your figures wouldn't indicate that, would they?

JUMPS IN CLAIM LOAD

Mr. STANCHFIELD. Our figures do indicate that there has been a slight increase in that outward movement. Up to now there hasn't been a very large net unemployment. The total employment of all plants in the automotive industry 2 weeks ago was only about 6,000 below what it was before the model changed in May or June of this year. Thirty thousand or forty thousand workers had been cut out of nondefense production, but they had been pulled into defense production, sometimes within the same corporation, and other times in some other corporation, but in the same community. So that the real impact of mass unemployment is something we are just beginning to feel today. It is really impressive to see the claim load. Our claim load has run about 20,000 to 30,000 unemployed workers covered by the Compensation Act during the last several weeks. It has been very stable and that is a very low figure. Two weeks ago it jumped from 30,000 to 40,000; last week it jumped from 40,000 to 110,000; this week it will go from there to perhaps 180,000; the week after that it will be higher still. It will not be until after you actually lay the men off that they will start to consider the possibility of going somewhere else to hunt for jobs.

Mr. CURTIS. Do you gentlemen feel that the real answer to this is further extension and enlargement of unemployment benefits and other items of social security, or the putting of these people to work in defense?

Mr. LUND. Certainly the latter, Mr. Curtis, putting the people to work. As Mr. Stanchfield has said, the thing that concerns us most is the loss of man-hours and man-days. But a stopgap proposition and something that also would be useful to the defense program would be to extend our act so as to hold skilled workmen in Michigan, to make their living a little better from the morale side while they are unemployed, to make them available for retraining, and to give them something to live on while they are being retrained.

Dr. LAMB. I want to call the committee's attention to the fact that in Mr. Lund's written statement, which will be included in the record, the Unemployment Compensation Commission goes on record as favoring some of the things which the committee urged the Congress seriously to consider, in its first interim report, which was published in November.

RECOMMENDATIONS FOR EMPLOYMENT SERVICE

The committee knows that last Friday the President sent a telegram to the Governors of all States in which he laid the foundation for transferring—I suppose it is for the duration of the emergency—the State employment services to the operation of a Federal organization. The committee urged that Congress give serious consideration to that.

The paper which you have submitted, Mr. Lund, goes somewhat further than the committee's recommendations, although a good deal of the evidence to support your points is probably to be found in the committee's findings in that report.

You suggest: All hiring of new workers for defense jobs should be channeled through the Employment Service; that labor scouting should be controlled and permitted only with Employment Service approval; that it may be necessary to establish these principles by legislation; that movement of workers should be done with Government funds made available as grants or loans where it is necessary to move these workers——

Mr. LUND (interposing). Incidentally, Dr. Lamb, that is being done, I understand, in moving some of these bureaus out of Washington, and we think it may be necessary to give some of the workers some help.

Dr. LAMB. You suggest that the Employment Service be given authority to direct the movement of especially skilled key workers from one job to another, from nonessential to essential work, to speed production; and that the Employment Service be closely coordinated with the training program, so that the right sort of training be given. I take it you mean training for a specific job. This process of training without a job in sight is, I am sure we all feel, to be deplored.

Mr. LUND. Yes.

Dr. LAMB. You say in individual communities and labor-market areas we need small working councils representing labor, management, and Government to establish and direct basic community policy concerning labor supply.

Would you say a word about that? You say that often we have several advisory councils in a single community at present.

Mr. LUND. Right now we find that in some communities we have got a council on training within industry, and another council on vocational education, and perhaps a third council, or a group of advisers, anyway, on N. Y. A. retraining. Then the unions frequently have a committee on training, and sometimes the employers, we understand, have committees working on this thing.

We think that this thing could be aided considerably if there was one central committee working with the employers, the unions, and also with the Employment Service on this problem of retraining.

Dr. LAMB. Your eighth point is that we must do everything possible to utilize the local sources of labor.

Mr. LUND. Correct, decentralize the thing.

Dr. LAMB. Without discrimination. The committee is already on record in its first interim report with respect to that, endorsing the President's order of last summer.

And then you go on to say that a lot of lost motion is avoided if the employer goes first to the Employment Service with his labor-supply problems; and that it may require some top Federal agency to have the authority to correct the previous situation and develop the proper relationships.

The CHAIRMAN. Thank you very much, gentlemen. We deeply appreciate your coming here.

TESTIMONY OF PANEL REPRESENTING THE AUTOMOBILE INDUSTRY

The CHAIRMAN. We will next call on the automobile industry panel.

Gentlemen, we are very happy to have you with us.

At our hearing in Detroit last September we investigated the effects of the order curtailing automobile production by approximately 50 percent for the coming model season. On the basis of the figures you submitted at that time, it was apparent that employment on defense would fall short, by about 100,000, of providing employment for the displaced auto workers. These figures were necessarily estimates.

Just a few days ago the original allotments were drastically reduced, and there is some probability of civilian auto production ceasing entirely. We should like at this time to review your previous statements in the light of the actual developments of the past 3 months, and determine to what extent measures have been initiated to minimize unemployment in the industry. We should like to know what the effect of the latest order will be on employment in the plants of your companies.

The prepared statements which Mr. Anderson and Mr. Waldron have submitted will be inserted as a part of the record at this point.

(The statements referred to above are as follows:)

STATEMENT BY H. W. ANDERSON, GENERAL MOTORS CORPORATION, DETROIT, MICH.

The corporation has undertaken the production of many different defense items for the Army and Navy, and is also an important subcontractor for other corporations who have prime contracts for defense material.

Since the beginning of the emergency in June 1940, the corporation has been prepared to produce every defense item which the Army, Navy, and Office of Production Management were willing to allot to us and which fitted our production experience or our facilities. We have turned down only one important project, and that was a purely management contract which excluded the use of any of the corporation's plant or equipment. In addition we have actively solicited defense business in the effort to have defense work for each of our plants and plant cities, especially where such defense work would importantly use existing facilities While in total we have substantial defense orders on the books, these orders are not large in relation to the corporation's ability to produce. Since the beginning of the defense program we have been continuously trying to get more defense work than has been awarded to us.

In the interests of the defense program and to hasten the winning of the war, and in the interests of our hundreds of thousands of employes, we hope the demonstrated capacity and ability of the corporation to produce will be recognized and more defense work awarded to us. The organization's ability to get the most out of defense production facilities and to promptly handle the manufacturing and engineering problems that always come up when new products are to be put into mass production is fully as important as the collection of the bare facilities themselves.

AHEAD OF SCHEDULE

The corporation is substantially ahead of schedule on practically all defense projects, is doing everything possible to expedite defense production and now has important items like aircraft engines, Diesel engines for tanks and naval craft, machine guns, aircraft and antiaircraft cannon, Army trucks, gun housing, shells, fuzes, cartridge cases, fire-control equipment, and many similar items in quantity production.

For example, the corporation has delivered to date more than twice as many machine guns as its contracts called for. Rapid progress is being made in the preparation of facilities and starting of production of additional items for which money was only recently appropriated by Congress and for which our contracts have been received during the last few weeks.

The corporation started defense production promptly when the first defense material was ordered in the summer of 1940. By June of 1941, 37,000 employees were working on defense. By November 1941, 68,000 employees were working on defense; and by February 1942, 71,000 employees wil be working on defense.

Defense employment is currently increasing at the rate of approximately 7,000 per month on contracts already placed with the corporation, and this rate of increase will probably continue during 1942 if new bottleneck machinery is received as expected, necessary materials obtained, and if repeat orders for defense material are placed with the corporation to keep the defense-production facilities being prepared operating at full capacity.

There has been a great deal of discussion and statements made by poorly informed people regarding the percentage of the automotive industry's capacity which can be converted to defense production. The percentage of automobile facilities which can be used, of course, depends entirely on the defense product to be manufactured. The corporation has capable and experienced executives who have been continuously working on this problem. In particular, we have not found any defense products which can use any important percentage of our gray iron foundry capacity, the capacity of our large sheet-metal and stamping facilities, or of our assembly plants which have little or no machinery in them and have been laid out specifically for sheet-metal assembly and finishing operations with welding fixtures, paint, and spray booths, enameling ovens, and assembly conveyor lines.

The corporation has been able to use existing buildings and equipment on many projects, and the following figures show that the corporation has been able to do a much better job than the average of the country in the ratio of supply contracts to facility contracts where the money had to be supplied by the Government.

The corporation has been granted $148,000,000 of the $4,462,000,000 granted the industry, a ratio of 9.6% to the supply contracts held, in comparison to 22.6% for the industry as a whole.

These figures indicate very clearly that the corporation has converted its own facilities to defense work at an importantly greater rate than has the Nation's industry as a whole.

The corporation has asked for less than 10 cents to be invested by the Government for facilities for every dollar's worth of war material to be produced, while on the average the industry of the country has asked for more than 20 cents to be invested by the Government for facilities for every dollar's worth of material to be produced.

The sudden and unfortunate Japanese war which threatens the rubber supply of the Nation has made necessary the additional sudden restriction of the passenger-car business and the corporation regrets that temporarily many thousands of its employees will have to be out of work on this account. The table on following page gives the employment facts by locations.

(Additional data received after hearing:)

NOTE.—Although the change-over of the Chevrolet and Fisher plants at Buffalo and the Chevrolet plant at Tonawanda to the manufacture of aircraft engines constitutes the largest single complete rearrangement of General Motors plant facilities formerly manufacturing civilian products, the total of such conversion includes—

The Oldsmobile Forge plant in Lansing, which was equipped with new machinery about 2 years ago for automotive production, never functioned in its original role but was retooled to manufacture of shells early in the defense program.

In addition to this, the Fisher Body plant at Memphis, which was formerly a lumber operation, has been completely rebuilt and expanded to care for the manufacture of bomber sections, while Fisher No. 21 Stamping, and the Fisher Die and Machine Shop in Detroit and the Rochester Products plant have discontinued all of their civilian production and now manufacture only defense items which are unrelated to their peacetime production but can be made in large part with the same equipment.

A number of plants, such as the Hyatt and New Departure bearing plants and the three Diesel Engine plants, which in peacetime manufactured civilian products, have been recently almost exclusively devoted to military or other priority production.

In addition to these 15 plants in which almost complete conversion has already been effected, most other General Motors plants have been devoting important sections of their capacity to military products. In many cases this involved the complete conversion of substantial departments or sections of existing plants with the transfer or employment of thousands of persons to military production, e. g. the AC machine gun plant, the Cadillac-Allison engine parts plant, the Pontiac Oerlikon gun plant, etc.

General Motors total United States employment

Area	Civilian			Military			Total			
	Actual		Forecast February 1942 [1]	Actual		Forecast February 1942 [2]	Actual			Forecast February 1942
	June 1941	November 1941		June 1941	November 1941		January-June 1940	June 1941	November 1941	
United States factory locations:										
Flint	44,764	41,224	10,259	2,951	6,705	8,823	40,666	47,715	47,929	19,082
Detroit	36,923	30,620	6,837	6,011	10,387	12,636	30,392	42,934	41,007	19,473
Dayton area	24,928	16,842	7,169	2,923	7,397	9,891	19,497	27,851	24,239	17,060
Pontiac (including Y. T.)	23,424	21,371	9,009	3,207	4,504	7,601	19,581	26,631	25,875	16,610
Saginaw and Bay City	12,169	10,901	3,756	1,330	2,382	3,060	10,332	13,499	13,283	6,816
Anderson	12,716	11,302	4,350	1,833	3,282	4,375	10,607	14,549	14,584	8,725
Chicago area	3,986	4,296	4,341	667	2,588	5,210	2,881	4,653	6,884	9,551
Indianapolis	1,357	1,054	397	9,352	12,113	12,353	2,583	10,709	13,167	12,750
Lansing	12,220	11,994	1,047	1,182	1,852	2,083	10,284	13,402	13,846	3,130
Bristol and Meriden	9,369	8,101	7,635	1,250	3,272	4,045	6,739	10,619	11,373	11,680
Buffalo area	7,988	3,169	450	1,031	2,563	4,953	6,420	9,019	5,732	5,403
Newark area	8,805	7,020	2,264	171	529	984	5,782	8,976	7,549	3,248
Cleveland	4,185	3,599	120	1,382	1,663	2,000	4,410	5,567	5,262	2,120
Memphis	254	8	8	161	1,036	1,375	1,230	415	1,044	1,383
Rochester	2,737	1,802	700	1,617	3,315	5,885	3,034	4,354	5,117	6,585
Grand Rapids and Ionia	3,327	2,624	128	72	353	332	3,350	3,399	2,977	460
St. Louis	3,239	2,445	1,047	117	484	1,056	3,610	3,356	2,929	2,103
Tarrytown	2,936	2,731	692	79	532	422	3,169	3,015	2,263	1,114
Warren	2,487	2,122	1,066	181	388	899	1,971	2,668	2,510	1,965
Oakland	2,431	2,017	893	171	189	145	2,329	2,602	3,296	1,038
Muncie	2,357	2,251	1,176	8	119	156	2,054	2,365	2,370	1,332
Kansas City	2,220	2,007	584	67	108	111	2,492	2,287	2,115	695
Janesville	2,330	2,309	511	6	3		2,447	2,336	2,312	511
Baltimore	2,314	2,351	620	174	262	240	2,350	2,488	2,613	860
South Gate	2,085	2,189					1,913	2,085	2,189	
Trenton	3,119	2,525	123		20		2,893	3,119	2,545	123
Syracuse	1,414	1,224	230	285	683	1,210	1,166	1,699	1,907	1,440
Norwood	1,912	1,898	430	40	112	104	1,930	1,952	2,010	534
Kokomo	1,353	1,207	815		55	200	1,401	1,353	1,262	1,015
Toledo	513	744	397	582	653	846	702	1,095	1,397	1,243
Atlanta	1,453	1,392	654	90	104	156	1,705	1,543	1,496	810
Miscellaneous branches and zones	25,165	23,922	21,003	63	91	106	21,429	25,228	24,013	21,109
Total United States, including Y. T. & C.	266,480	229,351	88,711	37,003	67,744	91,257	231,349	303,483	297,095	179,968

[1] Civilian production eliminates all passenger cars and accessories, and half of light trucks, but leaves medium and heavy trucks and replacement parts unchanged at previously scheduled levels. The work week is reckoned at 32 hours.

[2] Military production assumes the extension of contracts to sustain or increase rates of production wherever possible and as rapidly as possible under the limitations imposed by machine-tool deliveries.

The rate at which these laid-off employees can be reemployed will depend on the receipt of machine tools required to balance the facilities for contracts in hand, the number of additional contracts, and the type of contracts which can be immediately placed with the corporation, and the working out of a swing-shift plan of operation where it can be effectively used to increase production and employ more people on a 40-hour-week basis.

The corporation believes that on production operations where under the present conditions the production of defense material is a necessary continuous operation, such of its defense plants as can be operated in this way should be operated on the same basis as has been the practice in the steel industry and in transportation and utility operations where employees work 5 days and have 2 days off, but do not insist that these days be Saturdays and Sundays, or if they happen to work on Sunday as part of their regular workweek, they do not insist on being paid double time for such work.

The labor laws of the country call for time and a half after 40 hours a week without specifying which days are to be worked. No defense production is currently being lost because this plan is not in operation, due to the fact that bottleneck machinery is now being operated Sundays. It will, however, shortly be a problem as additional machinery is obtained to balance the facilities.

It is also generally recognized that it is not efficient or reasonable to ask men to work for any great number of weeks on a 7-day-week basis. It seems as though the proper policy for this type of operation should be agreed upon as a national plan of operating facilities to get the most out of them for war needs.

We are asking our employees to work Christmas and New Year's on defense production where materials are available and where working these days will increase the production of completed defense products.

STATEMENT BY R. G. WALDRON, PERSONNEL DIRECTOR, HUDSON MOTOR CAR CO., DETROIT, MICH.

DECEMBER 20, 1941.

Included in our report dated September 19,[1] we indicated that in August 1941 we employed 10,233 hourly rate men on nondefense automobile production and 880 employees in defense activities.

Shortly after the first of September a reduction was ordered by the Office of Production Management which reduced the automobile employment figures to 6,749. During September those employed on defense work increased to 1,722, showing a decrease of 3,484 in nondefense and an increase of 842 in defense, or a net loss of 2,642.

We have been operating since September and until last week, at a rate of automobile production which maintained an approximate pay roll of 6,749 employees. During such time between September and December 19 we have increased our productive defense pay roll to 2,621 employees, an increase of 899 persons. Certain other preparatory employees have been added for tooling-up purposes.

On December 15 we were obliged to cut our production further, which brought about an additional lay-off of 1,054 people. A further lay-off was indicated but it was decided to run at this reduced production at half time during January; in other words, operate the first 2 weeks of January followed by a shut-down during the last 2 weeks, rather than still further reduce the hourly rate of production. At present there is no information as to what is contemplated for February or the following months.

This leaves a balance of 2,797 employees who have not been absorbed in defense activity at the present time, when the possibility that nearly 5,700 additional employees might have no work after January 17. Our absorption of seniority employees during the next few weeks will be approximately 500, leaving a balance unabsorbed of approximately 2,300 on January 1. A further 275 or 300 may be transferred by January 17. It is, therefore, indicated that 2,000 employees will still be unabsorbed at the middle of January, in addition to the 5,700 that will have no employment if no automobile work is continued after that date.

As shown in the above figures, we expect to employ on defense work approximately one-half or 50 percent of the employees laid off during the last lay-off within the next few weeks.

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[1] See Detroit hearings, pt. 18, p. 7352.

TESTIMONY OF PANEL REPRESENTING THE AUTOMOBILE INDUSTRY—Resumed

The CHAIRMAN. Dr. Lamb, do you have some questions?

Dr. LAMB. I have some prepared questions. I would like to ask these around the circle. I believe Mr. Anderson has turned over copies of them to the members of the panel for a few moments' study. I shall read them and pass from one member of the panel to the next.

TESTIMONY OF H. W. ANDERSON, GENERAL MOTORS CORPORATION, DETROIT, MICH.

Dr. LAMB. Mr. Anderson, what is the present number of employees in the manufacturing divisions of the General Motors Corporation?

Mr. ANDERSON. Well, sir, we do not have it broken down as to strictly manufacturing employees. I can give you the best figures we have, but they are in part estimated. In November we had 297,095 employees. At the time I came away we did not have the total number of employees laid off as a result of the recent order. However, we estimate that figure to be 120,000. That would give us a net of 177,095 employees, if our estimate is correct.

Dr. LAMB. Of those, how many are employed on war production?

Mr. ANDERSON. In November we had 67,744 on defense work, and it is estimated that by February we will have 91.257.

Dr. LAMB. What is the number employed on nonwar goods, exclusive of trucks?

Mr. ANDERSON. We have a record here that in November, on civilian production, we had 229,351.

On the civilian production for February we estimate that we shall have 88.711, and on the military or defense work we estimate there will be 91,257. I can give you that by steps as of last June and November and February, if you care to have those figures.

Dr. LAMB. Please.

Mr. ANDERSON. In June 1941 we had 37,003 people on defense work; by November the figure was 67,744; and the February forecast is 91.257.

Dr. LAMB. You have laid off, to date, 120,000?

Mr. ANDERSON. That is our estimate.

Dr. LAMB. To what extent has your company taken on additional defense orders, following the automobile curtailment program of August 30?

Mr. ANDERSON. I perhaps can best answer that by referring to the testimony we have already given in Detroit.

At that time we stated that we had contracts closed, or in the process of negotiation, of $1.200,000.000; and on November 30 the closed contracts, not including those under negotiation, totaled $1,528.000,000.

Dr. LAMB. That $1,528,000.000, as of November 30, are all closed contracts. Can you give us the total, as of that date, of both closed contracts and contracts then in process of negotiation?

Mr. ANDERSON. I don't have those figures.

Dr. LAMB. Will the recent curtailment order result in your taking more defense work?

Mr. ANDERSON. Only to the extent of our ability to get contracts that we have been trying to get continually at all times. I don't think this can speed it up any, so far as our efforts are concerned.

Dr. LAMB. Your efforts have been going on and will go on, and it is entirely a question of what contracts you will get?

Mr. ANDERSON. That is correct.

Dr. LAMB. It is wholly a question of what more you are allowed to undertake?

Mr. ANDERSON. That is right.

TESTIMONY OF C. C. CARLTON, MOTOR WHEEL CORPORATION, PRESIDENT, AUTOMOTIVE PARTS AND EQUIPMENT MANUFACTURERS ASSOCIATION, INC., DETROIT, MICH.

Dr. LAMB. I will now ask the same questions of Mr. Conder. I am passing over you, Mr. Carlton, at this time, because you would have to give the figures of the Motor Wheel Corporation, which is not engaged in the manufacture of complete cars. Would you be in a position, Mr. Carlton, to provide figures for all the parts manufacturers at this time?

Mr. CARLTON. I have only some estimates at this time which were made up hurriedly.

Dr. LAMB. Suppose you give them to us.

Mr. CARLTON. I would like this opportunity to say, Mr. Chairman, that I know that all of us who had breakfast together this morning were not at all worried about the inconvenience of getting here; it was only the worry of trying to get accurate information to present; we don't like to use estimated figures.

We have every desire to cooperate with you. It is probable that I am the only one who has read every bit of your new December 19 report, which I got at about 10:30 last night, and which I read until the small hours of this morning.[1] And while there might be many things that I didn't perfectly agree with, I must say that it is a very intelligent, beautifully prepared report. The committee is certainly to be complimented on a tremendous job.

The CHAIRMAN. Thank you very much, Mr. Carlton.

Mr. CARLTON. Since we appeared before you the last time, there has been a major economic upset that none of us anticipated when we were testifying in Detroit.[2] That upset has been so sudden that its full impact is unknown at the present time.

When we try to give you figures, we do not know whether there will be any passenger cars produced after January 31. Therefore, we are probably going on the assumption that there may not be any produced after that time. We do not know at the moment what the impact will be upon the replacement-parts industry. There seems to be no definite policy determined as yet as to whether or not the 32,000,000 vehicles on the highways are going to be allowed to operate. Therefore, any assertion that we make here will have to be on the assumption that those replacement-parts people will be allowed to operate, although it is very doubtful if they will run at the rate they have been going.

[1] Second Interim Report, Select Committee Investigating National Defense Migration.
[2] See Detroit hearings, pt. 18, p. 7309 ff.

ARTIFICIAL SHORTAGE OF REPLACEMENT PARTS

The committee probably knows, and maybe you have felt it personally, that we have what I would call an artificial shortage of replacement parts. That may be unavoidable. Up to the present moment, passenger cars and trucks in considerable number are unable to operate because of the lack of functional parts.

The CHAIRMAN. What are some of those functional parts?

Mr. CARLTON. The wearing parts of your engine; for example, the valves. I haven't a list of them here. People became scared, thinking that there was going to be a shortage.

We have tried to find out if there has been any hoarding of replacement parts, and we can't find that there has been. There has been an increase in the use of replacement parts because you and I, fearing that we might not be able to repair our cars, have, individually, been foresighted, possibly, and repaired when we knew we could get it done. Therefore, there has been a much greater use of replacement parts than we have had in the past.

I think I previously testified as to the size of the parts industry. The parts industry as of October 10 was employing 269,000 people.

The CHAIRMAN. All over the country?

Mr. CARLTON. In about 135 cities in about 33 States. But 90 percent of those people are employed within a radius of 300 miles of Detroit, and 90 percent of the products are produced in that area. Those employees are divided into 2 major classes, those who produce original equipment for the automotive manufacturer and those who manufacture replacement parts.

The reason that it is very difficult or impossible to give you the exact division between replacement parts and original equipment is that every replacement parts manufacturer also manufactures some original equipment. It may run as low as 2 percent, in some cases, of his total volume of business.

There are approximately 850 manufacturers of automotive parts in the United States. Of that number a small number, fewer than 100, produce about 80 percent of all of the original equipment. But of that 850, there are certainly 600 who manufacture practically no original equipment, whose sole business is taking care of your car after it needs repairs.

EXTENT OF REPLACEMENT PARTS INDUSTRY

The volume of business of the industry is really very great. It is a billion dollar industry in original equipment in normal times, or it was up until the recent catastrophe. The replacement parts business is more than a one-half billion dollar industry, and we could say, as a rough guess, that slightly over 100,000 people are engaged solely in the manufacture of replacement parts, and that probably 160,000 are engaged in original equipment. That is a rough guess which may be wide by 10 percent, but it gives you an idea of the situation.

Therefore, if no automobiles are produced, a large number of those people will be laid off—not all of them, because some are engaged in the manufacture of original equipment for trucks, and there again we can't give you a definite division as to how many people are engaged in the manufacture of truck parts and how many in passenger

car parts. But certainly 100,000 people, at a very minimum, are already laid off or will be laid off by January 31 in the automotive parts industry. Many of these people have no defense work of any kind.

Having read your report through, I should like to comment, if I may, on one or two items. It seemed to me that there might have been a little undercurrent there, a feeling that this industry had not used its energies to assist the defense program to the extent that it could have used them. I wonder if you know that all of the larger industries—and I am sure all the companies represented by the people around this table—have full-time representatives in Washington. We have sales representatives, we have engineering representatives, and our job has been to pry orders loose in order that our factories might be employed.

COOPERATION OF AUTOMOBILE INDUSTRY

I know of no job that has been offered to the automotive industry that hasn't been tackled quickly and willingly and wholeheartedly, and the business has been welcome. There is possibly a rare case in which something has been offered to the industry that they felt some other industry could do much better because it might have been something entirely foreign to our business.

I think your committee will be interested to know also that ordnance material is a very large proportion of the war business that is now in the hands of the parts manufacturers, and we have found very little of existing equipment that could possibly be used to produce ordnance material.

Our equipment, as parts manufacturers, is for the manufacture of iron and steel, and its formation into various parts. It consists of huge numbers of heavy presses. We don't like to call them punch presses because some of them are exceedingly large, higher than this ceiling, presses that cost $150,000 to $200,000; and there has been no way to adapt these presses to anything this war effort needs, except automotive vehicles for the Quartermaster Corps and other divisions.

We must always remember that while we are talking about an all-out effort, the appropriations, while very large, have not been sufficient to pass out enough business so that we could see that we were going to be able to employ our men.

My own company, less than a month ago, early in December, was exceedingly happy in the fact that we could see that by March we were going to employ every man whom we had formerly had on our pay roll. Now we find ourselves with maybe 30 percent of those people out of work, due to this sudden economic catastrophe that has met us.

This crowd, I am sure, reflects your opinion that we haven't been looking backward in a desire to criticize anyone as to what has been done in the past. We would like to look entirely to the future, and I am sure you will find us ready to do anything and everything that our machinery and equipment will do.

Also, please remember that we have been salesmen up to now; we have been down here begging for business. The Governor of Michigan has been assisting in every way he could, through his own personal representative here, to see that we get more business.

Mr. CURTIS. Were you here for Mr. Taub's testimony?

Mr. CARLTON. Yes.

PROCUREMENT

Mr. CURTIS. Do you agree that our procurement side of the business—the Government itself—has not been as aggressive in employing concerns to do certain things as it should have been?

Mr. CARLTON. I wouldn't want to make that statement, Mr. Curtis, because our business has been to do whatever we could for the Army and the Navy and the Quartermaster Corps. In the Office of Production Management, in the automotive branch, we have been limited there by a curtailment program, and we have been struggling to get enough priorities and allocations to keep our factories running on the quotas that were allocated to us.

I have heard of very little planning on the question of what we could do to take over any additional business. You must always remember that the purchasing and procurement end has rested entirely within the armed forces of the country, and not in any planning division.

Mr. CURTIS. That is what I am referring to—the Army and the Navy.

Mr. CARLTON. Well, I have been trained so long, Mr. Curtis, as a parts supplier, where the customer is always right, that we have just been salesmen, trying to get all the business we could possibly get, and there never has been unfolded before us any plan as to how much we could get. We just consider ourselves very lucky to have the business we now have, and we have obtained our business by a competitive bidding system, which is certainly an obstruction to the quick placing of orders.

Mr. CURTIS. You say it is an obstruction?

Mr. CARLTON. Very greatly so. In the State of Michigan, for example, we who are paying labor rates of $1 to $1.10 an hour, have to bid on a job in competition with somebody in a distant part of the country who may be paying labor rates as low as 55 cents an hour. How in the world, then, are we going to get business by competitive bidding? In spite of that, by better machinery and better planning and better engineering, we have been able to get a considerable amount of business through the competitive-bidding system.

TESTIMONY OF ROBERT W. CONDER, CHRYSLER CORPORATION, DETROIT, MICH.

Dr. LAMB. Mr. Conder, I will now ask you the questions which I have asked Mr. Anderson. What is the present number of employees of the Chrysler Corporation?

Mr. CONDER. I have prepared my figures in a slightly different way, Dr. Lamb. I didn't know exactly what you were going to ask, and I had to guess before coming down here.

EMPLOYMENT ESTIMATES

I have estimates of what our employment is going to be for the week of January 5, and we expect that level to be carried through the month of January. I have also the number who have been laid off since December 15. In making the estimate of the working force for January 5, the total of those two would answer your question.

The number of people we will have on our rolls, estimated on January 5, 1942, is 50,029. The number we have laid off, over our pay roll of December 15, 1941, is 16,272.

Dr. LAMB. How many of these present employees—the 50,000 as of January 5—will be working on war production?

Mr. CONDER. Approximately 21,000.

Dr. LAMB. And the balance on civilian goods?

Mr. CONDER. Yes; that would be about 29,000.

Dr. LAMB. Is the Chrysler Corporation making any trucks for the war program?

Mr. CONDER. Yes; it is.

Dr. LAMB. What would be the employment on trucks deductible from this?

Mr. CONDER. I haven't broken the figures down on that. I can give you a rough estimate. We have been instructed by the various employment agencies, in furnishing statistics, to include all of our truck employees as employees on defense work, the reason for that being that the Army trucks come down the same line with the civilian trucks, and consequently it is impossible to say who is working on defense and nondefense. We have approximately 3,800 employees in our Dodge truck plant. There are several thousand other employees in our other plants who are making parts for trucks. If you want to eliminate the truck production from the 21,000 figure, you would have to deduct at least 3,800, and I should say several thousand in addition to that.

DEFENSE ORDERS

Dr. LAMB. Can you give any figure on the extent to which your company has taken on additional defense orders following the August 30 curtailment order?

Mr. CONDER. We are taking on whatever defense work we can do, and what we can get. We have taken on some orders since that time. We have had an increase in our gun contract, the 40-millimeter antiaircraft gun. We have had an increase in our tank program. We have some contracts for shells, and there are various miscellaneous items that we have taken on since the original curtailment order.

The employment in these new jobs will not be reflected, of course, until later months. It isn't shown in the January figures that I just gave you. We haven't taken on the people to fill those orders, or all of them, at this time.

Dr. LAMB. So there is reason to hope that of those laid off now, and to be laid off under the order in January or February, you will probably be able to reemploy some on these orders already contracted for?

Mr. CONDER. That is right; it will be a small percentage of them, however.

Dr. LAMB. And I assume that the recent order will occasion your going out for more business, or is your situation, as stated, that you have been asking for all the business you can get and it is a question of what you are given?

Mr. CONDER. That is right, and we hope we will get some more.

TESTIMONY OF ROBERT G. WALDRON, HUDSON MOTOR CAR CO., DETROIT, MICH.

Dr. LAMB. Now, Mr. Waldron, for the Hudson Motor Car Co., will you give us those figures? What is the present number of your employees?

Mr. WALDRON. We have 5,696 on automobiles, and we have productive operators to the number of 2,621 on defense, plus about 800 or 900 in preparatory work, such as die making and tool designing. These total somewhat over 9,000 at the present time. That will be increased by the middle of January another eight or nine hundred people.

We have laid off, in the last lay-off, 1,054 people, but reduced our schedule for January, with no operation on automobiles the last 2 weeks; and, of course, we don't know what is going to happen after that. The 5,696 employees, if automobile work is curtailed entirely, could not be absorbed in our defense operations for several months.

WAR PRODUCTION EMPLOYMENT

Dr. LAMB. Did you give the number you have employed on war production?

Mr. WALDRON. It is 2,621 as of today, and it will be 3,421 as of the middle of January, plus these—and I didn't get the actual count—tool and die makers and tool designers, whom I would estimate at around 800.

Dr. LAMB. You will have a total of how many, employed on the 15th of January?

Mr. WALDRON. With 9,117 actual productive operators it might be close to 10,000 people.

Dr. LAMB. What about the question of the additional orders that your company has taken on since August 30?

Mr. WALDRON. For the past 2 or 3 months we have been taking on additional ordnance work in our naval ordnance plant—certain instruments—and we have added ordnance parts. We have added to our bomber program a number of auxiliary brackets and things that we had originally not contemplated doing ourselves.

Dr. LAMB. How does that increase your production; what, for example, was your figure on the 30th of August on war production?

Mr. WALDRON. I would estimate that the added load that we have taken on since then might total somewhere between 1,500 and 2,000 people.

Dr. LAMB. Out of a total of somewhere around 3,500 to 4,000?

Mr. WALDRON. Yes; but as Mr. Conder said, a number of those parts, especially some ordnance parts, will not be ready for production for another few months, 6 weeks to 3 months.

Dr. LAMB. So that by the end of 3 months you will be able to take back some of the people who will be laid off during December and January?

Mr. WALDRON. Yes, sir; we will take back 50 percent of the people who were laid off in the last lay-off, by the first of the year.

Dr. LAMB. But as the civilian-production-curtailment order carries on, you will have some more lay-offs?

Mr. WALDRON. That is right.

Dr. LAMB. What about taking on more defense work? Suppose that you were to step up the operations in your ordnance plant. How many shifts are you operating there now?

Mr. WALDRON. Three shifts.

Dr. LAMB. So there wouldn't be much leeway for increasing your rate of output and putting on more men?

Mr. WALDRON. Not a great deal; there would be some, if we could go into the swing shift on certain operations, more than we have now.

TESTIMONY OF R. I. ROBERGE, FORD MOTOR CO., DETROIT, MICH.

Dr. LAMB. Mr. Roberge, will you give, first, the total number of employees of the Ford Motor Co.?

Mr. ROBERGE. We have about 130,000 employees at the present time, and as a result of this recent curtailment—that is last week—we have laid off about 42,000. We have about 30,000 on defense work at the present time, and about 58,000 on civilian trucks and other automotive parts.

Dr. LAMB. The effect on your employment of the recent curtailment order has already been felt to some extent, but it can be foreseen that there will be a further cut?

Mr. ROBERGE. The cut that I have given you, of 42,000, is based on no more passenger cars.

Dr. LAMB. Your employment of 130,000 includes that 42,000?

Mr. ROBERGE. The 130,000 does include the 42,000.

Dr. LAMB. I see. In other words, subtracting the lay-offs, you have at the present time about 88,000, of whom about 30,000 are now engaged on defense production?

Mr. ROBERGE. Yes.

Dr. LAMB. And the remaining 58,000 on civilian work?

Mr. ROBERGE. We have assumed, for the purposes of these figures, that there will be no more passenger cars.

Dr. LAMB. Since August 30, to what extent has your company taken on additional orders as a result of the original curtailment program?

Mr. BOBERGE. We have taken on the tank contract and the Sperry director contract, both since August, and a great many miscellaneous items that are difficult to mention—armored cars and things of that sort—that I think are restricted for public discussion.

Dr. LAMB. Will the recent order result in your taking more defense work?

Mr. ROBERGE. We have tried and we will continue to try. That is all I can say.

Dr. LAMB. I am going rapidly around the circle on this second question.

MAJOR WAR PROJECTS AND NEW PLANTS

Mr. Anderson, what are the major war projects of the General Motors Corporation, and which of these projects are located mainly in new plants?

Mr. ANDERSON. We are making aircraft engines, Diesel engines for tanks and naval craft, machine guns, aircraft and antiaircraft cannon, army trucks, gun housings, shells, fuzes, cartridge cases, fire-control equipment, and many smaller items in quantity production.

Dr. LAMB. Can you tell us which of these projects are located mainly in new plants?

Mr. ANDERSON. There is the machine gun made at Saginaw; the Pratt & Whitney engine, made at Melrose Park, Ill.; the Allison engine at Indianapolis and at Anderson, Ind., and a propeller plant at Dayton.

Dr. LAMB. Those are all new plants?

Mr. ANDERSON. Yes; plants set up specifically for the operation.

Dr. LAMB. Would you have any estimate of the number employed in these new plants, as against the old?

Mr. ANDERSON. These five new plants accounted for 26 percent of our total factory man-hours devoted to military production in December.

CHRYSLER CORPORATION

Dr. LAMB. Mr. Conder, do you want to give me answers to those same questions? What are the major war projects of the Chrysler Corporation, and which of these projects are located mainly in new plants?

Mr. CONDER. Tanks, fuselage sections for the Martin bomber, anti-aircraft guns, shells, marine units, army trucks, and a number of miscellaneous items. I have no figures breaking down the employment on those various projects.

Dr. LAMB. I think you have already given the total war employment for the Chrysler Corporation as 21,000?

Mr. CONDER. That is right.

Dr. LAMB. Can you estimate the number located in new and old plants?

Mr. CONDER. We have the assembly of tanks and the manufacture of certain tank parts in a new building built for that purpose. We also manufacture a number of tank parts in our present plants. We have leased new space for the assembly of the fuselage sections of the Martin bomber. That is not a new plant, built for that purpose, but we have leased it. The manufacture of parts is going to be done in our existing plants. The other jobs are being done in our present plants.

Dr. LAMB. Your experience has been that a considerable amount of the preparatory work can be done, such as the manufacture of parts, in your own existing plants, but that the finishing operations and the assembly are now being done in new plants?

Mr. CONDER. The final assembly work on both the bomber and the tank will be done in plants we did not have before we received those contracts. Some of the parts for the tanks are also being made in those new plants. Other parts for the tanks are being made in the old ones. I think I am correct in saying that all or practically all of the parts for the bomber will be made with our present facilities. There will be minor assemblies in this leased property, and the final assembly will be there.

Dr. LAMB. I ask because at Detroit I got the impression that the Chrysler Corporation had been unusually successful in their ability to use existing facilities for many of the operations on war production.

Mr. CONDER. As of the latter part of November, or the first of December, we had about 50 percent of the machines that were being used on defense production taken from our automobile equipment up to

that time, 3,000 out of 5,100. We have made some additions to present plants for war work, particularly on the gun job. But those are not very extensive.

HUDSON MOTOR CAR COMPANY

Dr. LAMB. Mr. Waldron, will you answer these same questions for Hudson?

Mr. WALDRON. In our new plant, the naval ordnance plant, we have around 2,000 productive employees; the preparatory employees, such as the tool and die makers, are in our main plant, and will be transferred over there next month. I haven't any figures on the aftersection of the Martin bomber, or the Wright piston and rocker arm which are manufactured with our existing facilities in space that has been cleared for the bombers and the fixtures and also for new equipment on the pistons and rocker arms.

We have miscellaneous small things, such as I mentioned before, spread around through the plant.

MAJOR FORD PROJECTS

Dr. LAMB. And, Mr. Roberge? What are the major war projects of the Ford Co., and which of these are located mainly in new plants?

Mr. ROBERGE. The major items we are working on at the present time are the Pratt & Whitney aviation engines, the Consolidated bomber, a tank, military armored vehicles, the Sperry director, reconnaissance trucks, army trucks of various types, and gun carriages.

At the present time some of the bomber parts are being made in our present facilities. There are about 8,800 employees on Pratt & Whitney aviation engines, 5,000 employees on the bomber; about 525 on tanks, which we are just starting; and about 100 on the Sperry director. Altogether we have about 29,500 employees on defense production, which is about 23 percent of our total.

Dr. LAMB. Can you give any figures on the numbers of these men located in new plants, as against the old?

Mr. ROBERGE. The bomber plant is in the course of construction, and while there are some men working there, they are comparatively minor in number.

Dr. LAMB. As I understand it, ultimately that plant will employ 60,000?

Mr. ROBERGE. Eventually, that is correct; and on the Pratt & Whitney job we have about 8,800 now, and those employees eventually will amount to 23,000. Our peak, as we estimate it, on defense production, will be 119,814 men.

Dr. LAMB. On existing contracts?

Mr. ROBERGE. Yes.

Dr. LAMB. Which would be slightly below those employed all told? I am not including the civilian trucks and parts, so that perhaps if you add those in, it will be above.

Mr. ROBERGE. At the present time we have 130,000 employees, roughly, and our estimate, based on present defense contracts, is 119,000. It is very likely that the remainder would be employed on civilian parts and miscellaneous items.

Dr. LAMB. Have you any estimate of the period necessary to get that number employed?

Mr. ROBERGE. Yes, I have. I would say at the present time we have about 29,500 on defense work, and by next June we estimate 53,000; by the end of next December, 113,000 and we have projected the total for March 1943, as 119,814.

Dr. LAMB. So that it will take a year, with your present contracts, to permit you to approximate your existing employment as of December 15?

Mr. ROBERGE. That is correct.

Dr. LAMB. What proportion of these employees are employed in the Pratt & Whitney plant at River Rouge?

Mr. ROBERGE. For Pratt & Whitney, I believe, I said 8,800 at the present time. On the bomber I mentioned 5,000 at the present time, but they are employed in our present plants, mostly.

Our present employees in new plants would consist largely of the Pratt & Whitney engine employees.

Dr. LAMB. So that, out of a figure of about 30,000 now at work on defense production, you would figure about 21,000 as in old plants?

Mr. ROBERGE. About that; yes.

Dr. LAMB. One more question for the group, and then I am through with my list of questions. I think all of us, since December 7, have a different feeling about the national need and the world situation. The President called for a full four-shift operation of all war plants, immediately after Pearl Harbor.

I know the committee would be interested in a statement of what proportion of the war operations of the four manufacturers of automobiles here represented are already on a four-shift operation, and by what date the balance of their operations will be or can be on a full four-shift basis.

Would you be able to answer that, Mr. Anderson?

Mr. ANDERSON. I have never heard the four shifts discussed, Dr. Lamb.

Dr. LAMB. I cite it only because the President, in the speech which he made immediately after Pearl Harbor, mentioned the four shifts as the goal of our war-industry production.

MULTIPLE SHIFT OPERATION

Mr. ANDERSON. Personally, I think four shifts per day would be a very inefficient way of operating. The three shifts, or "swing-shift" method, will probably attain the maximum amount of production. Four shifts per day would require an excessive amount of lost time as a result of shift changes and lunch periods, but the three-shift operation is the method that we now have in force.

The three shifts are running, in practically all cases, 6 days a week, and on the seventh day at the present time we are picking up the lack of material that we lose during the week as a result of machine break-downs, or giving the necessary maintenance to the equipment.

Dr. LAMB. I understand what you are driving at.

Suppose you are operating on a three-shift basis at the present time, what proportion of your employees would be on the first shift?

Mr. ANDERSON. That would depend entirely upon the product you are manufacturing. It would change with each type of material.

As an illustration, if you are producing shells, as we are, you could have an equal number of employees on each of the three shifts because there is no assembly that goes along with the manufacture of a shell.

If you had an assembly operation, you could probably assemble on one shift all you could produce in the other two shifts. So that, logically, you wouldn't have the same number of employees on all three shifts.

Dr. LAMB. Do you think there is a margin within which you can step up the ratio, so that the first shift, for example, would not be out of line with the other shifts? That is to say, by reorganizing your production plans, would it be possible to increase, say from a schedule in which the first shift has 50 percent of the workers, to one in which the first shift would drop down to 30 percent and the other shifts would come up?

BALANCING PRODUCTION

Mr. ANDERSON. Dr. Lamb, we would do it in the most efficient way to get the maximum production. If that meant splitting up the assembly so we would have it on all three shifts, we would do it that way.

Dr. LAMB. I am trying to see what the effect of increased contracts, which the Government might let, would be on the plants' present operating schedules, and whether, by reorganizing the present allocation of shifts, production in present facilities could be speeded to rates which may be required in an expanded defense program. Suppose you increased the production of parts.

Mr. ANDERSON. If you increase the production of parts on the first, second, and third shifts, particularly the second and third shifts, then I think you probably could put an assembly on all three shifts; but it gets down to the item itself, as to whether you can get the maximum production by doing certain operations on all three shifts.

Dr. LAMB. Would the same situation apply to your operations, Mr. Conder?

Mr. CONDER. Yes; it would. We are now operating on defense work, 6 or 7 days. We do not have the swing shift. What we are trying to do is to operate in a way that will get the greatest production in the shortest length of time. That isn't necessarily a three-shift operation or a swing-shift operation.

Different parts, different situations, require different methods of operation. When you asked Mr. Anderson about increasing the number of parts, and increasing the possibilities of the shifts upon which assembly is made, I assume that you meant that all the parts that go into the assembly are increased, because if you increase some of them and don't increase others, you are out of balance, and that is one of the problems. It is just impossible to put your entire plant on the same method of operation. We have never been able to do it in automobile production.

Dr. LAMB. Will you answer this for Hudson, Mr. Waldron?

Mr. WALDRON. In certain of our operations, we have to run through three shifts solidly, and even, in some bottleneck operations, on Sunday; but there are other capacities of machine tools that can get the production in a balanced machine shop in less than that time. So we usually find we don't have as many people on the third shift as

we do on the first, and that varies depending on the unit you are producing, as to how closely you can balance the productivity of those machines. To increase the second and third shifts to their fullest capacity would mean having to put in more equipment on your first shift, and that would never be in balance because you would keep adding plants and plants. or space and space.

There is a limit to what you can do in leveling out your three-shift production.

Dr. LAMB. Mr. Roberge, for the Ford company?

Mr. ROBERGE. I will reiterate more or less what these other gentlemen have said about the balance of production. I just want to point out that on November 18, which is the latest record I happen to have with me, at the River Rouge plant we had 8,281 on the first shift, 44,588 on the second, and 23,614 on the third. Of course, we are trying to step up production as fast as we can by increasing the unbalanced items or the time spent on items which are short.

EFFECT OF TRUCK CURTAILMENT

Mr. SPARKMAN. I would like to ask one question of any one of these gentlemen here, or all who may care to answer. What is the effect of the recent curtailment order on truck production?

Mr. ROBERGE. In what respect?

Mr. SPARKMAN. Will the employment in truck production be affected one way or the other?

Mr. ANDERSON. Certainly.

Mr. CONDER. Definitely.

Mr. SPARKMAN. My recollection of the testimony given when we were in Detroit is that at that time it was not believed that the employment in truck production was going to be greatly affected by curtailment orders.[1]

Mr. ANDERSON. Although the matter has never been cleared up, Congressman, it is my understanding that trucks below a certain carrying capacity, such as a ton and a half, are considered to be civilian trucks. Now, whether there is any change in that distinction as a result of this latest order, I don't know.

Mr. SPARKMAN. Yes; I recall that; but it was my recollection also that the testimony was to the effect that while that small truck, which you might classify as a civilian truck, would probably be curtailed somewhat, there was to be a stepping up in the heavier truck production that probably would offset it, as far as employment is concerned. I was just wondering if that condition still prevailed under this most recent order.

Mr. CONDER (Chrysler). We are going to have some lay-offs on truck work.

Mr. SPARKMAN. Is that true with all of you?

Mr. ROBERGE (Ford). We are on a quota basis on trucks of a ton and a half or more, and that quota, as far as we know, remains the same as it has been during the past month. Whether they will curtail that due to the scarcity of rubber, we don't know as yet.

[1] See Detroit hearings, pt. 18.

TRUCK PRODUCTION EMPLOYMENT

Mr. SPARKMAN. Can you give us some idea as to approximately what the employment in production of trucks has been in recent months?

Mr. ROBERGE. I am afraid I can't break it down in our case.

Mr. CONDER. I can't break it down, considering the number of employees working in the plants other than the Dodge truck plant, on truck parts. On December 15 we had approximately 3,800 people working at our Dodge truck plant. We expect that we will have about that number working through January. Our estimated employment for February, at the Dodge truck plant, is 2,100.

Truck operation is affected not only by curtailment of nondefense trucks but also by the volume of orders for Army trucks. It just happens that our orders for Army trucks are running out along about that time.

Mr. SPARKMAN. And you don't know what to expect, of course, as to future orders?

Mr. CONDER. No, sir.

Mr. CARLTON (Motor Wheel). As a producer of parts, I think maybe we have a little broader insight into your question. The light truck is the little paneled delivery job that the florist and the tailor and what-have-you use. Many of those parts are interchangeable with passenger cars. Therefore, the producer of passenger-car wheels, for example, has no conception of how many light trucks are built because they are all shipped out on a schedule, and we don't know whether they become passenger-car wheels or truck wheels.

But there is a curtailment of these light trucks in proportion to the curtailment of passenger cars at the present time. If they build no passenger cars at all, we are going to be faced with a different problem, trying to build few enough parts for the light truck, when we are building no passenger cars.

COMPLIANCE WITH CURTAILMENT ORDER

Mr. CURTIS. Mr. Anderson, in what way did your company conform to the order of August 30, curtailing automobile production? Was your compliance with that order effected through the shutdown of some plants and the concentration of production in others, or through reduced production in all plants?

Mr. ANDERSON (General Motors). Generally through a reduced production in all plants, except the plant at Buffalo, which was sold to the United States Government. That was an assembly plant.

Mr. CURTIS. Then does it follow that when we curtail production of, say, passenger cars, so far as the defense program is concerned all we save is material, and we do not save that equipment to be converted into production?

Mr. ANDERSON. I don't follow your question.

Mr. CURTIS. I understood you to say that in your case, the curtailment was effected through all the plants alike?

Mr. ANDERSON. The general scheme, under reduction, would be that first you would carry it straight through. Our procedure was to tag

off our temporary employees—those not having any particular seniority status. Then we would try to run the plant on the basis of 40 hours, and then perhaps drop down to 32 hours.

Mr. CURTIS. Would that policy not make it impossible to convert some of that equipment into war production?

Mr. ANDERSON. No; because much of our equipment was converted into war production.

Mr. CURTIS. Mr. Carlton, how did you carry out that order of August 30? Was your compliance in the form of a general slowing up, or shut-down, or did you close some plants entirely and concentrate in the others?

Mr. CARLTON (Motor Wheel). As a supplier to practically every manufacturer of passenger cars, we were affected more or less by every one of them, and that resulted in a general curtailment in all of our plants. You will find, in the parts plants, more complete 24-hour lay-outs than in the other plants, I believe. That is due to the necessity of the parts fellow being a little more flexible; so that as production is reduced he can first cut his hours on all three shifts, and eventually cut one shift off entirely; and it has been necessary for us first to cut the hours of all three shifts, and then to drop one shift.

Mr. CURTIS. Is conversion to war production just as easy under that system as if you made your curtailment in a portion of your industry and concentrated the remaining civilian production in another part?

Mr. CARLTON. Unfortunately, in our lay-out, what affects one department affects all departments equally, and consequently our defense work, some of it, is laid out on a 24-hour basis by request. Since the outbreak of the war, we have had orders from the Navy to get into a full 24-hour production as rapidly as possible, and that is being done.

TIME OUT FOR MACHINE REPAIR

There is a grave question as to whether that should be 6 days a week or 7. You run your automobile so many miles a year and you have plenty of time in there to repair that automobile. If you put three drivers on your automobile and run your automobile 24 hours a day, you would first be met with minor break-downs that would reduce your number of miles; secondly, you would meet with a major break-down that would require a major overhaul job. There must be some time for repairs in the 24-hour period.

Many of these machines are automatic, miraculous things in their production, for instance, of shell casings. They are very delicate machines. They require constant attention and watching; and without an hour, or a half a day, or a day, occasionally, to overhaul them, those machines will break down and production will be completely lost and everyone laid of.

Mr. CURTIS. Mr. Conder, how did your company conform to this August 30 curtailment order?

Mr. CONDER (Chrysler). We had a curtailment in each of our plants, rather than a discontinuance of operations in any particular plant.

Mr. CURTIS. And do you think it would have been possible to convert to war production just as easily as if you had laid it out in some other manner?

CONVERSION DEPENDENT ON TYPE OF PRODUCTION

Mr. CONDER. I don't see how anyone could answer that question without knowing more of the facts. For example, we ought to know what war production you want us to do. If that war production was particularly adaptable to a certain plant, naturally if you discontinued operations in that plant, you would be able to go on with defense work. On the other hand if it were a type of work that was adaptable to several plants, and you cut your production in all those plants, you could go ahead just as well that way.

Mr. CURTIS. And it wasn't possible, or at least it hasn't been possible up to date, to know what defense business you could have at the time you were making your plans to curtail civilian business?

Mr. CONDER. That is right. I don't think that that method of complying with the order has slowed up the defense work.

Mr. CURTIS. What is your answer to that proposition, Mr. Waldron?

Mr. WALDRON (Hudson). We only have one set of plants; we are not like Chrysler and General Motors; we are a smaller unit.

Mr. ROBERGE (Ford). We got a late start after the cut in August, and we didn't curtail employment to any extent until we caught up; in fact, we haven't curtailed employment to any extent until last week, I would say.

Now our defense contracts haven't been affected because you might call them entirely separate from the automotive operation.

Mr. ARNOLD. Mr. Anderson, in what plants of your company have production lines been rearranged completely from automotive to nonautomotive, from civilian to war production?

Mr. ANDERSON (General Motors). The most complete rearrangement would be at Buffalo, where we are to operate plants for Pratt & Whitney motors, and they are not in operation yet. In that plant all the automotive fixtures, equipment, and facilities for the production of automotive equipment have been either retooled or taken out of the plants.

ASSEMBLY PLANTS

But in the other plants, like assembly plants, the lines that manufacture army trucks also manufacture and assemble civilian trucks.

Mr. ARNOLD. What will happen to employment in the assembly plants throughout the country now that curtailment of civilian production is being extended?

Mr. ANDERSON. Well, that all depends on what we are going to do in January in the way of production, and unless we are permitted to assemble automobiles in February, all of the assembly plants with the exception of those plants that have truck lines will have to close up.

Mr. SPARKMAN. That means, then, that there either is no defense work in those assembly plants, or else they are not capable of getting or doing defense work, doesn't it?

Mr. ANDERSON. I would like to extend an invitation to the committee to visit our plant in Baltimore. I think that would give you a very good picture of an assembly plant; because an assembly plant is a building designed entirely for putting together parts that

have been manufactured at other plants and shipped to the assembly plants. There are no primary manufacturing operations performed at assembly plants.

Mr. SPARKMAN. The only way such facilities could fit into the defense scheme would simply be as a building in which machinery could be installed?

Mr. ANDERSON. That is correct.

Mr. SPARKMAN. Has the O. P. M. made any survey of your facilities to determine to what extent they might be converted to war uses?

SURVEYS OF PLANT FACILITIES

Mr. ANDERSON. I can't say that O. P. M. has, but the Army and the Navy have complete records of all of our equipment, the amount of floor space, size of buildings, and locations. They have a fair idea of what we can produce in those plants.

Mr. SPARKMAN. Is that true with all of you?

Mr. ROBERGE. I believe that is substantially true.

Mr. CONDER. Yes.

Mr. SPARKMAN. Have those surveys been general surveys, or have they been made, either by the agencies you mentioned or by yourselves, with reference only to some particular line of defense production?

Mr. ANDERSON. In our case I believe that the surveys have been made and are being kept up to date constantly, and that was true even before the war took place. Even ahead of the emergency, the Army and the Navy were well informed as to our facilities.

Mr. SPARKMAN. Is that true with all of you?

(Unanimous response in the affirmative.)

Mr. CARLTON. You might be interested to know, Congressman, that since the last war some of these divisions have kept yearly revised surveys of plant capacities available at all times in their offices.

STIPULATION FOR USE OF EXISTING FACILITIES

Mr. CURTIS. Has the Government, in awarding a contract, ever stipulated and suggested that existing facilities be used in place of the construction of new plants?

Mr. CARLTON. Yes, indeed.

Mr. CURTIS. What has been your experience in that connection, Mr. Anderson?

Mr. ANDERSON (General Motors). I have no first-hand experience in connection with the awarding of contracts by the Government.

Mr. CARLTON (Motor Wheel). I am very familiar with the operation of the Army and Navy ordnance departments. It has been customary to bid on jobs in two ways. For instance, we can use so much equipment which can be adapted to producing ordnance material, and if that equipment is used, our facilities' total necessity will be so much, and the rate of production per hour will be so much, and therefore the cost per piece will be so much.

However, if we put in more modern and fast-moving machinery, the rate per hour and the cost per piece is so much, but the facilities cost is very much higher.

They have a chance to choose between using our old facilities at a lesser rate of production, at a higher cost per piece, or new facilities;

and in one case they have chosen the old facilities, where the necessity for speed didn't seem to be so urgent; and in other cases they have said that the required volume was so great that we must get under heaviest production at the earliest possible time, and that meant, in many cases, all new machinery.

Mr. CURTIS. You are speaking primarily of ordnance now?

Mr. CARLTON. Yes.

Mr. CURTIS. What comment do you have to make on that, Mr. Conder?

Mr. CONDER (Chrysler). I haven't had any contacts with any of the Government agencies from whom we have endeavored to obtain war work, so I don't know whether they have asked us to use our existing facilities. However, I have sat in on a number of meetings with our own operating people, where it has been stated that in accordance with the planning to perform a certain Government contract, certain machines are expected to be assigned to that work, and they have been taken off automobile work and put on the defense work.

So I know we are using some of our machines on defense work; but whether the Government has insisted on it, I cannot say.

Mr. CURTIS. Do you have any comment to make on that, Mr. Waldron?

Mr. WALDRON (Hudson). They decided, in the case of the Martin bomber fuselage section, to move certain machine-tool equipment aside and use that space for the assembly of the fuselage section; and in connection with the piston and the rocker arm for the Wright aeronautical engine, it was decided to use an entire floor of a certain building, and because of the lack of specialized equipment for that size piston, to install new equipment in that particular business. So they used the space, and put in new equipment.

Mr. CURTIS. Is that equipment which was set aside in order to make space of the type that may be used in war production?

Mr. WALDRON. I doubt it. It was gear-cutting equipment for rear-axle differentials, and things of that sort.

Mr. CURTIS. Mr. Roberge, what is your comment on this situation?

Mr. ROBERGE (Ford). I believe that many of the ordnance contracts specify that you are to use your present equipment and also to use subcontractors. My recollection is that there is a standard clause that they put in the ordnance contracts to that effect.

Mr. CURTIS. Is it true in reference to production of other than ordnance to the same degree that it is true in respect of ordnance?

Mr. ROBERGE. If you are speaking of, say, military transport for the Quartermaster Corps, that would come in on the present equipment, naturally; but if you are referring to such items as the Sperry directors and the bombers, obviously they require some new equipment.

STIPULATION FOR SUBCONTRACTING

Mr. ARNOLD. Could any of you tell me whether, in awarding a contract, the Government ever stipulated that subcontracting had to be employed to the maximum extent?

Mr. ROBERGE. I believe that specification is in the standard ordnance contract.

Mr. CARLTON (Motor Wheel). A survey has been made from time to time as to the percentage of total business that is being subcontracted. We are subcontractors for a very large amount of material for trucks and tanks and other parts, and we are subcontracting at the present time about 45 percent of our total ordnance business. I know that these gentlemen are calling us in now and asking us to look at their line of production and pick out things that we could take out of that plant and move into our plant in order that they might use that machinery for something else.

Mr. ARNOLD. You are prime contractors, too?

Mr. CARLTON. Yes; both.

Mr. ARNOLD. Has it ever been stipulated in your contract that you must subcontract a certain percentage?

Mr. CARLTON. Not a definite percentage, but we are required to use our best efforts to subcontract, and they make a survey later.

Mr. ARNOLD. No one of you knows that a certain percentage was ever stipulated?

Mr. ROBERGE. No; I don't think they could do that, practically, without a very exhaustive investigation.

EMPLOYMENT IN TANK ARSENAL

Mr. SPARKMAN. I want to ask Mr. Conder a question about his tank arsenal. I believe you told us awhile ago the number of your employees who were engaged in war work, and also I think you broke it down as to the tank arsenal; did you not?

Mr. CONDER (Chrysler). I think I did, in Detroit; I gave you the exact figures.[1] On the tank arsenal I don't believe I gave you the exact figures, but I can tell you approximately how many people we have in the tank arsenal itself—5,800. That doesn't represent all the people who are working on tanks, however, because we are making tank parts in several of our other plants.

Mr. SPARKMAN. What proportion of the contracts given the tank arsenal, measured either in terms of man-hours or in cost, is subcontracted?

Mr. CONDER. I can't give it to you in either of those ways. At the time of the hearing in Detroit I asked our purchasing department to tell me the number of subcontracts we had in connection with the tank job, and there were over 950 of them.

Of course, some of those are what we call processing contracts or productive contracts, and the others are material contracts or nonproductive contracts. At that time we had not sublet all the work that we were going to sublet. I haven't brought those figures down to date.

Mr. SPARKMAN. How many shifts do you work at that plant?

Mr. CONDER. Three shifts—not on all operations, but there are three shifts at the tank arsenal, working 6 days. On the seventh day we make up production necessary to keep our operation in balance and make repairs to machinery, and the things that can't be done during the 6 days.

Mr. SPARKMAN. When was that plant placed in operation?

[1] See Detroit hearings, pt. 18.

Mr. CONDER. We broke ground in September of 1940, and we turned out our first tank, I believe, in April of 1941; or it may have been March.

Mr. SPARKMAN. You haven't reached peak production yet; have you?

Mr. CONDER. No, sir. We are coming fairly close to it on present facilities, but there is to be an expansion.

SUBCONTRACTING ON DEFENSE WORK

Mr. CURTIS. I would like to ask this question of all of you. Has subcontracting on defense work been extended beyond the customary suppliers on civilian production, and, if so, to what extent?

Mr. ANDERSON (General Motors). If it is permitted, I would like to read the policy that we have been following on subcontracting.

Mr. CURTIS. You may file that with the committee.[1]

Does anyone have anything to say on that?

Mr. Conder, is your subcontracting about the same as it was with civilian products?

Mr. CONDER (Chrysler). There, again, I haven't anything on dollar volume or man-hours. At the time of the hearing in Detroit, in addition to finding out the number of subcontracts on the tank job, I asked about the number of subcontracts on other defense jobs, and the number of subcontracts on normal automobile production, and I was informed that we have about 2,500 subcontracts in connection with normal automobile production, and that is divided between the nonproductive and the productive contracts.

On the tank job we have over 950 subcontracts; on the bomber job, at that time, I believe, we had over 750, and on the gun job, over 950. I may have the bomber and the gun reversed, I am not sure of that.

Then we had subcontracts on our other defense work. There is probably some overlapping; that is, a subcontractor on the gun job may also be a subcontractor on the tank or bomber job; but I think it indicates that we have carried over our policy of subcontracting in automobile production to defense work.

Mr. CURTIS. Mr. Waldron?

Mr. WALDRON (Hudson). I haven't any specific figures, but on the 20-millimeter gun I believe we are making 21 out of some three or four hundred parts. So the subcontracting there is pretty large.

Mr. CURTIS. Mr. Roberge?

Mr. ROBERGE (Ford). We normally have about 6,500 suppliers, or subcontractors, as you call them, and about 3,000 of those are major contractors. With the tank job, which is just coming into the picture as far as we are concerned, we will break that down and find out whether we can make those parts or whether somebody else can make them better, and we will proceed accordingly. I can't tell you how many contractors there will be on the tank job.

Dr. LAMB. I would like to ask certain questions related to the testimony of Mr. Taub. I think you were all present when he was testifying, were you not?

Mr. CARLTON. We only heard a very small part of it where we were sitting.

Dr. LAMB. Perhaps, then, I ought to recapitulate what seems to be the main points in what he said.

[1] See pp. 9573–9575, this volume.

INDUSTRY MANAGEMENT COUNCIL

He suggested an industry management council of some kind for the automobile industry. That arose out of my asking him whether he had read the committee's second interim report, and also out of the discussion of what the industry might do under a civilian supply board. The committee was not concerned primarily with the question of whether Mr. Taub did or did not favor a central civilian board for planning, production, and procurement, but simply whether, assuming that such a board existed, or possibly even assuming the existing set-up, an industry management council for the whole automobile industry, composed jointly of labor and industry representatives—that was his suggestion—would convert the industry to war production as rapidly as possible.

He pointed out in his testimony in October, when he appeared before the committee on the panel of engineers, that the job this council would do would be necessary to avoid duplication and use all the ingenuity in the industry for a single plan of all-out production.[1]

What I am asking you now is contingent upon your having a sufficient number of contracts to go "all out," and I take it from your testimony this morning that so far your contracts are not sufficient for that purpose.

But assuming that you had the contracts, and that this civilian board would remove certain obstacles to your full efforts, what do you think of the establishment of an industry management council, and under it, three special subcommittees as advocated by Mr. Taub—a technical committee, a subcontracting committee, and a labor transfer committee?

Would such a set-up make it possible for the industry to increase its total output, in your opinion, by enabling it to operate under an over-all plan, with adequate contracts but with an industry management council supervising it?

Mr. ANDERSON. I hadn't thought about it until you propounded the question, but there are so many contingencies that come into it that I would hesitate to say anything. It assumes a full utilization of all the equipment and management.

Dr. LAMB. It assumes that the objective is to use all the equipment possible; which doesn't necessarily mean that 100 percent of all the equipment now standing in those plants can be used.

Mr. ANDERSON. I don't really have any preconceived ideas on it at all.

Dr. LAMB. How about you, Mr. Carlton?

Mr. CARLTON. I heard so little of what Mr. Taub said that it was very difficult for me to follow. From your analysis it seems reasonable. On the other hand, I note in the report of your committee a very definite recommendation, and in my reading early this morning and late last night of your report, I found myself agreeing with so many things you said that I would rather drop it there.

Dr. LAMB. What about you, Mr. Conder?

Mr. CONDER. I don't feel qualified to answer.

Dr. LAMB. Mr. Waldron?

Mr. WALDRON. I have no remarks on that.

[1] See Washington hearings, pt. 20.

Dr. LAMB. Mr. Roberge?

Mr. ROBERGE. It seems to be a duplication of what we have in O. P. M. We have an advisory committee, we have a technical subcommittee and a labor committee, a truck committee, a passenger-car committee, and the set-up seems to be a duplication of what we already have.

DIRECT PLACEMENT OF CONTRACTS BY PROPOSED COUNCIL

Dr. LAMB. I take it, from what Mr. Taub said, that the industry management council would be in a position to apply for and secure contracts for the industry, and allocate them within the industry; that the council would be representative, especially of the larger companies, and of labor, on the top council.

Mr. ROBERGE. Do you mean that this advisory council would directly place a contract with a manufacturer capable of making the article referred to?

Dr. LAMB. That is right.

Mr. ROBERGE. Without competitive bidding?

Dr. LAMB. That is right.

Mr. ROBERGE. That might be an addition to the present procedure.

Mr. CARLTON. The present industry advisory committees have merely been advising on curtailment and have had nothing to do with production.

Dr. LAMB. As to the subcommittees, perhaps a description of the functions of those three subcommittees will throw more light on the possibility of the plan.

PROPOSED SUBCOMMITTEES

The first is a technical committee—I take it, an engineering committee. Mr. Anderson, if you had such an engineering committee, subordinate to an industry management council, could you increase the output of the automotive industry for war production, for example, by setting aside a certain part of your facilities not now being used for retooling and the manufacture of jigs and fixtures, to meet a long-run program laid down by the council, and thereby increase your total output of war goods over a period of, let's say, a year? The emphasis is on the technical division using the existing facilities of toolrooms within your company for maximum output.

Mr. ANDERSON. From the illustration you used, I don't see how it could work, because the toolrooms are being used to their maximum now.

Dr. LAMB. Are those toolrooms being used to turn out defense goods, or are they being used to turn out machine tools and jigs and fixtures? In other words, have you turned over your toolroom facilities for direct defense production?

Mr. ANDERSON (General Motors). Indeed, at the present time we are actually making machines for production that you can't buy from the machine-tool people.

Dr. LAMB. Are your toolrooms fully utilized?

Mr. ANDERSON. When you say "fully utilized," that assumes a 7-day operation, 24 hours a day, with an adequate supply of tool makers. I don't think we have reached that schedule.

Dr. LAMB. You don't think the adequate supply of tool makers is there?

Mr. ANDERSON. That is right.

Dr. LAMB. Would you say that that is the bottleneck?

UPGRADING PROGRAM

Mr. ANDERSON. It is part of it. In our corporation we have worked out what we call an "upgrading" program, to anticipate that, and under that program men who have similar experience on production can go into the toolroom and run a machine or learn to run one in a reasonably short time. We are moving those people into the toolrooms even though they are not qualified tool makers; and that releases certain tool makers to devote their skills more nearly 100 percent to the production of tools as well as machines.

Dr. LAMB. Would you say that the automobile industry at the present time is using the available tool makers 100 percent?

Mr. ANDERSON. I believe it is, because there are standing orders out now to hire every tool maker we can get hold of.

Dr. LAMB. How many hours a week would you say they are working? Are they averaging 40 or 50?

Mr. ANDERSON. Strange as it may seem, we have had one request from a toolroom, and they are working 56 hours, that we reduce the hours to 40. Generally speaking, I would say that the tool makers are doing everything they reasonably can to produce the maximum amount of tools. If you, as a tool maker, to use an illustration, work more than 60 hours a week, you are losing efficiency all the way around. Your productive ability drops.

Dr. LAMB. In his discussion, I believe Mr. Taub suggested that the industry segregate a definite proportion of the industry and parts production to manufacture jigs and fixtures so that 50 percent of the industry, which he believes could be immediately converted, could be put to use within 4 months. Do you think that 50 percent of the General Motors plants are immediately convertible to some kind of defense production?

PERCENT OF CONVERTIBILITY

Mr. ANDERSON. You mean the equipment or the buildings?

Dr. LAMB. I mean the equipment.

Mr. ANDERSON. That is a very high figure. My answer is that 50 percent of the equipment couldn't possibly be used.

Dr. LAMB. Let's leave the assembly plants out of the picture. What about the remainder?

Mr. ANDERSON. I don't believe it would be possible, because in building an automobile you are working a great deal on sheet metal, and this isn't a sheet-metal war.

Dr. LAMB. Let's suppose that you have 4 months in which to manufacture jigs and fixtures for the 50 percent, leaving out the assembly plants. What could you do then?

Mr. ANDERSON. I don't understand that question. Will you restate it, please?

Dr. LAMB. You said, earlier, that you would have to rule out the assembly plants in order to arrive at a 50-percent-of-capacity figure

which would have a meaning. If you take 50 percent of your plants, other than assembly plants, and allow 4 months in which to manufacture jigs and fixtures for the retooling of that 50 percent, could you, at the end of those 4 months, use that 50 percent on defense production, if you had the orders?

Mr. ANDERSON. Any statement I would make on that would be pure guesswork. Personally, I doubt if 50 percent of the facilities, outside of the assembly plants, can be converted into defense work, and that again goes back to the question of what kind of items you are going to make. Some of our facilities can be converted 100 percent into defense work; there is no question about it; but the facilities of that kind which we have already converted have been retarded in production by orders from the Government.

As an illustration of that point, we had at one of our plants an order for making shell casings, and we had three shifts working. The result was that we got so many casings on hand that we had to shut off two shifts.

Mr. ROBERGE (Ford). I think any plan that will speed up the placing of contracts or the acceleration of what the Government wants the industry to make would be helpful. Whether it is necessary to have the kind of arrangement suggested, I don't know, frankly.

Dr. LAMB. What about segregating that part of your plant not now working on defense but capable of conversion to defense, either at present or through retooling with new jigs and fixtures, and estimating on that basis what your maximum production of defense products would be within 4 months?

BOTTLENECK IS IN THE TOOLROOM

Mr. ROBERGE. At the present time the bottleneck of our place is the toolroom. We are blocked up in the toolroom. We are working full capacity there, and we will be for months to come. We have employed all the outside tool-hours that we can possibly get. So that any new contract would be dependent upon our ability to employ tool-hours from the outside.

Dr. LAMB. You would have to subcontract?

Mr. ROBERGE. Yes. We are doing that now to the extent of hundreds of thousands of tool-hours.

Dr. LAMB. So that any plan of this kind would have to include, in your estimation, a new pooling of machine-tool capacities outside of the industry?

Mr. ROBERGE. Exactly.

Dr. LAMB. And such pooling would transform your situation?

Mr. ROBERGE. It would help if a committee could find outside tool-hours which we haven't been able to find at the present time.

Dr. LAMB. But you wouldn't be prepared to say that you could take your existing equipment and convert it?

Mr. ROBERGE. You can't convert it without tool makers.

Mr. CARLTON. Convert to what, would be a good question to ask right now. We are talking about converting something, in generalities, and you can only do that by actualities.

Dr. LAMB. Perhaps the only way you can determine what you can convert to is to have the contracts standing in line waiting for you, and the suggestion of Mr. Taub, I take it, calls for that, through the

operations of this industry-management council, which will be in a position to solicit orders on a scale larger than any which you have been able to get so far.

Mr. CARLTON. That entails a complete revolution of your whole procurement program, which is at the moment in the hands of the armed forces, to do all the buying and procurement, and these various committees have been down here week after week, and all we are talking about is curtailment, and allocations, and priorities, and this is something entirely different.

I think we have too many committees already. We are wasting time in committee meetings. I think your own recommendation is much better.

The CHAIRMAN. Well, gentlemen, we are extremely grateful to you for coming here. The next witness will be Mr. Knudsen, at 2:30, and the committee will recess until that time.

(Whereupon, at 1:20 p. m., a recess was taken until 2:30 p. m., of the same day.)

AFTERNOON SESSION

The committee met at 2:30 p. m.

The CHAIRMAN. The committee will please come to order.

Mr. Knudsen will be our first witness.

TESTIMONY OF WILLIAM S. KNUDSEN, MEMBER SUPPLY, PRIORITIES, AND ALLOCATION BOARD, AND DIRECTOR GENERAL, OFFICE OF PRODUCTION MANAGEMENT, WASHINGTON, D. C.

The CHAIRMAN. Mr. Knudsen, for the purposes of the record and for ourselves personally, we certainly welcome you here today.

We know you are a very busy man. We are a legislative committee, however, and we are trying to help out in every way we can, as a fact-finding body.

We are glad to welcome you, Mr. Knudsen, both as a representative of the Supply, Priorities, and Allocations Board, and as Director General of the Office of Production Management.

I am ordering included in our record our letter to Vice President Wallace asking him to testify as Chairman of the Supply, Priorities, and Allocations Board. I am also including in our record Mr. Wallace's reply designating you as the representative of the board.

(The correspondence referred to above is as follows:)

[Copy]

HOUSE COMMITTEE INVESTIGATING NATIONAL DEFENSE MIGRATION,
Washington, D. C., December 17, 1941.

Hon. HENRY A. WALLACE,
Chairman, Supply, Priorities, and Allocations Board,
Washington, D. C.

MY DEAR MR. WALLACE: For the past 6 months this committee has been observing the progress of the defense program as reflected in employment in armament industries. The opportunity for this observation arose by reason of the concern of Congress over the social and economic problems occasioned by the movement of large numbers of people in search of work.

Events of the last few days, plunging this country into world-wide war, demonstrate clearly that we must remain constantly on the alert on the production front as well as the military front. In the committee's opinion, no distinction is possible between the two, since both affect equally the safety of the Nation.

The committee has recently concluded hearings in Detroit, Washington, and St. Louis on the subject of national defense migration and its causes. The com-

plete findings and recommendations of the committee with respect to these hearings will shortly be submitted to Congress. However, we believe that the need for action dictated by this information is so urgent that we have taken the unusual step of presenting some of these facts to you in your capacity as Chairman of the Supply, Priorities, and Allocations Board.

Although our inquiry was directed to several industries, the most detailed information came from the automobile industry. This industry controls approximately one-third of the Nation's metal working capacity. It controls a vast portion of our labor force which is most skilled in the requirements of mass production. The facilities of this industry constitute a single overwhelming industrial factor in our favor in the present war. To date the full potential of these enormous facilities has been enrolled in the defense effort to a negligible degree. On Thursday, December 11, the Division of Civilian Supply announced curtailment orders for the auto industry which will lay off in the near future most of the workers employed on non-military production.

Now the Nation is at war, a total war which calls for the maximum effort from all of our citizens and all of our resources.

With further reference to the automobile industry, information made available to the committee showed that defense employment in the automotive plants during the year 1941 would constitute only a small fraction of their normal employment. According to its own estimate, the largest of the automobile corporations controls approximately 13 percent of the Nation's metal-working capacity. Yet, at the time of the committee's hearing at Detroit in late September, less than one-seventh of its working force was employed in defense production. Of its auto facilities a much smaller proportion was so engaged. Yet the president of this corporation was able to testify that "production is on schedule." In this industry, controlling over one-third of existing metal facilities, as of last September two and one-half times as many workers were employed on defense in new, specially constructed plants as were employed in the facilities of the auto industry.

As a result of the failure to utilize fully the vast productive facilities of the automobile industry, the huge orders allotted to the industry on the strength of their industrial capacity are being fulfilled, in large measure, in newly constructed plants. In other instances, fabrication awaits new plants. The construction of these new plants consumes time, drains vital materials, and imposes a burden on our other productive facilities, particularly machine tools. It has also resulted in dislocation and migration of labor which will be badly needed later on. We cannot permit needless sacrifices such as these, which can only reduce the morale of our people.

From the foregoing, and from other data compiled by the committee, it becomes abundantly clear, Mr. Vice President, that the all-out war production demanded for America's security will not be achieved at this rate. The people of the Nation have been asked to do an "impossible" job. If we are to do the impossible, as we have so many times in the past, the Government must supply labor and industry with a comprehensive, over-all plan of action. The time for further delay and debate has run out.

It is, of course, unnecessary to bring to your attention the fact that in England facilities of the automobile industry have been converted to war work. The same, of course, is true of Germany. Ar. Mr. William L. Batt pointed out as long ago as February 1941, "We must reassess the size of the job of defending democracy in terms of the effort being expended by the opponents of democracy. The hitting power of British production plus United States shipments must not only equal but surpass the war production of Germany and the occupied countries" (p. 220, H. Rep. No. 369, April 3, 1941). The coming of war to America has only reaffirmed the truth of this statement.

Mindful of the gravity of the situation, this committee has determined to invite representatives of industry, labor, and Government to appear in Washington at hearings on the mornings of December 22 and 23 to discuss the problems described above. I am, therefore, requesting that you appear before the committee at 9:30 o'clock the morning of December 23 to contribute whatever suggestions you may have for meeting this crisis which confronts us.

Because I know you will agree with me that this is a matter in which all of our citizens are concerned, I am taking the liberty of making this letter available to the press.

With kindest personal regards, I am

Sincerely yours,

JOHN H. TOLAN, *Chairman.*

[Copy]

OFFICE OF THE VICE PRESIDENT,
Washington, December 18, 1941.

Mr. JOHN H. TOLAN,
Chairman, House Committee Investigating
National Defense Migration.

DEAR MR. TOLAN: I have been deeply interested for some time in the subject matter of your letter to me of December 17. It is, however, impossible for me to rearrange my schedule to appear before your committee on December 23.

I know from personal conversation with Mr. Knudsen and Mr. Donald Nelson that they have been engaged, especially since December 7, in trying to solve the problem with all possible speed. Therefore, I am requesting Mr. Knudsen to appear before your committee on December 23 to discuss this general subject with you.

We are all exceedingly interested in having methods such as you have suggested bring about the greatest possible increase in production in the shortest possible time.

Sincerely yours,

H. A. WALLACE.

The CHAIRMAN. We are a fact-finding committee, and in this series of hearings we are trying to find out what can be done to put all of American industrial capacity and labor supply to work to manufacture the military goods which are needed for our forces and for those of our Allies.

We are all interested in this subject, particularly since the attack on Pearl Harbor.

Our committee is investigating methods of maximizing production. Our travels all over the country and our studies of migration for the past year have shown that the most direct way of solving the problem of unemployment and unnecessary migration is to maximize the war production.

In the words of the report which the committee has just submitted to Congress:

> Unnecessary and unplanned migrations are a reflection of failure of the Nation to organize effectively to put men to work on military or essential civilian production.

This morning we heard that the curtailment of passenger-car production in the month of January alone would result in more than 200,000 automobile workers being idle in the State of Michigan, and 350,000 in the country.

LOSS IN PRODUCTIVE MANPOWER

This seems to be a staggering loss in production manpower which should be used immediately for war production. In the opinion of the committee these workers should be reemployed as rapidly as possible through the immediate conversion of the civilian passenger-car industry.

We would like to ask you some questions, as representative of the Supply, Priorities, and Allocations Board, and also as Director General of the Office of Production Management, as to what plans the Government is making for such conversion and reemployment.

We would also like to have your reactions and ask you some questions in regard to the committee's report and recommendations, a copy of which was sent to you.

Congressman Curtis will ask you some questions, Mr. Knudsen.

Mr. CURTIS. Mr. Knudsen, the Division of Civilian Supply of the Office of Production Management submitted a statement for our Detroit hearings, held on the 23d and 25th of September. The statement was to the effect that automobile producers, who estimated before curtailment was announced that only 15 percent of their capacity could be converted to defense, found upon reconsideration that as much as 50 percent conversion was possible. Later on, the statement reads:

> In order to promote reemployment and speed defense production, the Office of Production Management sent out a group of engineers to find out whether automobile manufacturers could produce more defense items.

Can you tell us whether any comprehensive study has been made by any war agency or by the Army as to what percentage of the existing facilities of passenger-car production can be converted to war production, and what volume of military goods can be manufactured in this way?

Mr. KNUDSEN. You are asking me what percentage of the automobile-manufacturing facilities can be converted into munitions manufacture, is that it?

Mr. CURTIS. That is part of the question; yes.

Mr. KNUDSEN. There isn't anybody that knows that.

Mr. CURTIS. Can you tell us whether any comprehensive study has been made by anyone to determine that answer?

Mr. KNUDSEN. I could tell you this: That a study was made first of what the automobile production was going to be, and a plan was submitted to the industry on August 15 that laid out the car schedules for the entire year.

Mr. CURTIS. Now, that was a schedule of curtailment, was it not?

CONVERSION DEPENDENT UPON CURTAILMENT

Mr. KNUDSEN. Yes. Whatever schedule we have of conversion is dependent on the schedule of curtailment.

Mr. CURTIS. Suppose you have a complete curtailment, still you have got to ascertain what you can convert to defense production, and how much.

Mr. KNUDSEN. I will come to that in a minute, if you will permit me. If you plan conversion on the basis of a 50-percent curtailment, and then have to plan it on the basis of 100-percent curtailment, it wouldn't be the same program. So a schedule was furnished the automobile industry in August. This schedule was agreed to and maintained up to December, and the labor displacement was figured in accordance with that schedule.

The tightest point in the schedule was copper. We thought we had some means of increasing the copper production so as to be able to meet that schedule, but we didn't guarantee it.

However, 2 weeks ago Sunday something happened that shifted the critical material from copper to rubber. The schedule for December was cut in half for the last half of the month, or 25 percent of the total month's schedule was cut. Fifty percent of the January schedule has been cut, and it is now proposed to bring the industry to Washington on the 1st of January to find out what further can be done.

Now, if we talk about conversion of an industry to war production, you are taking in an awful lot of territory.

What is war production? You can talk in terms of trades or items. There are only four main items in the program, and they are: Planes, tanks, ships, and guns and ammunition. There might be 10,500 different articles in those 4, but those 4 are the groups that we want.

AUTOMOBILE COMPANIES SUBCONTRACT BOMBERS

Let's start with planes. In October 1940 I went to the automobile industry to get them to assist in plane manufacturing, and the thing was worked out in this way: The most important planes at the time were the big bombers, so we made a cooperative arrangement whereby certain of the automobile companies and the body companies went in as subcontractors on the big bombers.

Off the record I will tell you who they are.

The CHAIRMAN (to the reporter). This is off the record.

(Discussion off the record.)

The CHAIRMAN. Let's get back on the record now.

Mr. KNUDSEN (continuing). Yes. That is a problem that must be managed by somebody. We should have someone as manager of it so he can be responsible for what the subcontractors do.

SPREAD OF WAR PRODUCTION

Now, let us take tanks. The American Car & Foundry Co. was fairly well organized in tank production, meaning the light tank that weighs 13 tons.

The orders were let in two independent factories, each one of which could turn out complete tanks with the help of subcontractors.

On the medium tank we had to start right from scratch. That was given to the Chrysler Corporation, plus six other manufacturers, also depending on subcontractors.

We selected the company that was responsible for the production and rendered technical assistance in helping to find the subs.

Now take shipbuilding. A ship only lends itself to subcontracting as far as the equipment is concerned: machinery and all the little odd furnishing items of the ship. But the ship itself has to be built at the water edge.

We can't build ships unless we can get them through the Canal, so the subcontracting and spreading of the work on the ships has been mainly in the middle western area where we could get engine-building capacity, boiler-building capacity, and auxiliary-building capacity.

On guns and ammunition, only the largest guns are manufactured by the arsenal.

All the small guns have been spread all over the country starting with 37 to 40 millimeter guns right down to the smallest machine gun. If you ask me what percentage of the automobile industry could be converted at that time I will say I don't know. Nobody else could know, regardless of who he is.

Mr. CURTIS. Is there any way of finding out? Would any comprehensive study be helpful?

Mr. KNUDSEN. Studies take a long time, and often produce very little result.

Mr. CURTIS. Because the picture changes by the time your study is completed?

Mr. KNUDSEN. I feel that we ought to be spending our time taking each item of defense munitions that we want and get that spread as much as possible.

As for the automobile proper, there has been about $2,500,000,000 given to the automobile business in contracts. Those are rough figures. I can give them to you correctly, if you want me to. They are not off very much.

Of that, about $392,000,000 has been given to them in plants to build the material, where we didn't have existing tools.

That ratio will follow pretty well, taking the country as a whole—15 to 20 percent plant investment of total contract.

It won't be correct by items, but in the over-all it will be very close.

Mr. CURTIS. Has S. P. A. B. or O. P. M. taken any steps to assure that the passenger-car facilities of the automobile industry will be converted into the maximum amount of defense production possible?

DIFFERENCE BETWEEN S. P. A. B. AND O. P. M.

The committee would like to have you distinguish between the actions of S. P. A. B. and O. P. M., because we are particularly interested, as you may know from our report, in determining the separate responsibilities and activities of the various agencies.

Mr. KNUDSEN. There is no difference between S. P. A. B. and O. P. M. Mr. Hillman and I are members of S. P. A. B. S. P. A. B. is a policy-making body It lays down the policies for us to carry out.

Mr. CURTIS. How would you define the O. P. M. sphere of authority and activity?

Mr. KNUDSEN. O. P. M. is an engineering body that advises the Army and Navy how to place work to the best advantage, in the best locality, so as to get the best delivery.

Mr. CURTIS. Has either group taken any steps to assure that the passenger-car facilities will be converted to the maximum degree possible?

Mr. KNUDSEN. They will be converted as fast as the tooling can be done.

Conversion means that the different fixtures have to be made for the machine if it can be used at all.

I told your colleague here the other day in the office about our experience in Germany.

GERMAN EXPERIENCE

I used to be the president of General Motors up to a year and a half ago, and we had two factories in Germany. One was a truck factory in Brandenburg; the other one was a car factory near Wiesbaden and Russelsheim, which made 130,000 passenger cars a year.

You would think that when the German Government took over both plants you would get the greatest example of efficiency in conversion. A lot has been told about that. Now, here is what happened:

The truck factory was taken over in toto, and has been working 24 hours a day 7 days a week ever since.

The passenger-car factory that had 22,000 employees was shut down. The men were carted elsewhere; the forging machines were put to

work making small forgings and airplane parts, and 2,000 women were put into plants making airplane parts.

That made a total employment of about 4,000 people out of the 22,000 they had before. The balance were carted away to some other place.

Mr. CURTIS. What happened to the facilities?

Mr. KNUDSEN. They are still there.

Mr. CURTIS. Not being used?

Mr. KNUDSEN. No, sir.

Mr. CURTIS. How recent was your report on this?

Mr. KNUDSEN. Three months ago.

Mr. CURTIS. Who has the responsibility to see to it that this industry is converted to the maximum degree possible?

We know that S. P. A. B. has as its goal putting every man and machine to work.

Mr. Odlum has an Executive order to investigate and arrange for the conversion of American industry to war production.

The War Department has, of course, its industrial mobilization studies, and there are other divisions within O. P. M. which have various responsibilities.

Who does have this responsibility of conversion?

KNUDSEN AND HILLMAN RESPONSIBLE FOR CONVERSION

Mr. KNUDSEN. Hillman and I.

Mr. CURTIS. Has there been any appreciable change in the production plan of the automobile industry particularly along the lines of converting passenger-car facilities to war production after the first curtailment program which was issued August 30, 1941?

Mr. KNUDSEN. Yes, sir. More work has been taken on by the industry.

Mr. CURTIS. Mr. Knudsen, I am going to ask some questions regarding the findings of our committee and recommendations made in the interim report we just issued and reported to Congress, which is before you. I am going to read to you one part of our second interim report called "Present plant capacity must be used."

At the middle of page 3 we find this language [reading]:

> The testimony before the committee was almost universal that production to date has been a failure, measured against the available facilities and the visible needs for military purposes. The largest and most efficient manufacturing facilities are not being used in the armament effort.
>
> At the same time, the system of contract awards in effect excludes from production the facilities of tens of thousands of small producers. As a result, the mass production of critical military materials is awaiting, to a considerable extent, the completion of new plants.
>
> Thus, when speed in production is vital to the Nation, the potentially greatest arsenals stand unused and their unemployed workers are waiting for new plants to open. The battles of today cannot be waged with deliveries from the plants of tomorrow.

Our committee is not interested in going over past failures except insofar as they will reflect what is going to happen from here on. We would like to hear your opinion on our findings.

CHANGE IN ATTITUDE SINCE ATTACK ON PEARL HARBOR

We would also like you to answer, for yourself and the war agencies with which you are connected, whether there has been a serious

change, since the attack on Pearl Harbor, in an approach toward converting American consumer durable-goods industries into war production, and also toward using small industries.

Mr. KNUDSEN. If you ask me what has happened since the attack on Pearl Harbor, I want to say this: I feel that the industry you mention has done a tremendous amount toward unifying the defense efforts. I don't need to tell you that before the attack there were divergent opinions as to both the program and who was responsible for it.

I am not talking about Washington, but in the plants themselves. I think that has all been wiped out. I think from now on we can depend on everybody pitching in and doing everything they can, and as you well know, the first thing our President asked for was that the critical items be put under a 24-hour 7-day week production schedule, and we find no difficulty in getting that accomplished.

Mr. CURTIS. For the purpose of the record, what are you referring to as "critical items"?

Mr. KNUDSEN. Certain portions of the four items I gave you.

We have held meetings, Mr. Harrison and I, every day since 2 weeks ago. In fact, we had them planned before Pearl Harbor was attacked. We receive the utmost cooperation, and find a desire to do more, throughout industry and labor.

Now, when you talk about conversion I want you to understand what you are talking about.

FROM PASSENGER CARS TO MACHINE GUNS

You have a line that makes passenger cars, and you want to make machine guns. The same line that makes passenger cars can't make machine guns.

What do you have to do? You have to reset your machines; take out the machines that can't be made over and pick out the machines that can be; then you have to make a fixture for that machine to perform that particular operation.

The automobile is 30 years old, and your machine gun, as far as we are concerned, is 15 months old.

So we have to make every fixture. Something has been said about the automobile industry being able to change their cars every year. Well, they didn't change the whole car at any time. They changed a piece of it, changed the appearance, and it was called a new model, and a certain amount of tooling was made every year, but not the complete set.

Now, when we want to make a gun or a shell, or even a fuze, we have to make a complete set of tools for it because it hasn't been made before except on a very small scale.

That applies to every small company that goes into war production, and you either have to find out what kind of fixtures he wants for a particular job, or whether he has to improvise one himself.

A good many mechanics in this country are very clever in being able to improvise fixtures, and I have every sympathy and every desire to get every small shop making some piece for the defense program; but if he is making coffee grinders today and you want him to make fuzes tomorrow, the conversion will take a certain length of time, sir, and there isn't anybody can change that.

Mr. CURTIS. But, as you say, the ingenuity of individual mechanics and machinists over the country will all help, will it not?

Mr. KNUDSEN. Sure. My dear sir, that is the father of mass production, somebody's ingenuity in the small shop. That started up in New England 125 years ago.

It is just an arbitrary division, this division that is made between mass production and small factories, and it is certainly silly in a period of emergency.

We have got to do everything we can, and everybody has got to subscribe to a portion of it.

The CHAIRMAN. The time element is also pressing, isn't it?

Mr. KNUDSEN. Yes; but the saving of time is what the individual can do, you see. We have work enough out there for anybody to get into, but we shall have to spread it more, I will admit that.

I don't know how many subcontractors there are in the United States. I haven't taken time to find out. I thought it was much more important to get some pieces out of the plant rather than to find out how many people are working on them. But there are plenty, I can assure you.

AUTOMOBILE INDUSTRY FOUNDED ON SUBCONTRACTING

You gentlemen probably know that I came from an industry that was founded on subcontracting. I was a parts maker for Henry Ford in 1907, and Mr. Ford probably was not manufacturing 10 percent of each of his automobiles at the time. The work was being done by subcontractors even then. As the business grew, some of those subcontractors were consolidated, that is true. Methods were introduced to reduce the cost and increase the output. But the founding of it was all on subcontractors.

I made the crankcase and the rear axle. Dodge made the transmission and the steering gear, someone else made the frame, and someone else made the wheels. That is how it was collected.

Mr. CURTIS. Do you agree in general with the finding of the committee that to date the great industrial resources of the country haven't been put to use anywhere near the extent that they might be?

Mr. KNUDSEN. Of course they have not. The war is only 2 weeks old.

Mr. CURTIS. Our committee has recommended that a single civilian board of the Federal Government be charged with the responsibility for procurement and planning for production for military and essential civilian needs, and that a special technical division, manned by a staff skilled in engineering and production, be organized under the board.

This division should compile and keep up to date a complete inventory of industrial facilities, of supplies of critical materials, and of the supply of labor. In accordance with a policy of full use of existing industrial capacity, a system, and a plan of putting to work all idle capacity and converting consumer goods industries to war production should be instituted.

We would like to have your comment on that recommendation.

ATTITUDE TOWARD CIVILIAN BOARD

Mr. KNUDSEN. There isn't a single country today that has a system of that sort. You would embark on an entirely new venture. You are talking about getting the job done through industry committees, splitting up the work by trades, rather than putting it all in a general mass pot. You know that the metal industry is the one you would use to the greatest extent.

You could divide all of the metal industries into various units that work on that kind of stuff. And that is the industry to which you would go.

Mr. CURTIS. Do you believe procurement should be left with the military and naval agencies or placed in a centralized board?

Mr. KNUDSEN. It is there by law now, by statute.

Mr. CURTIS. I realize that. Do you think it should be left there?

I am not asking from the standpoint of law; I am asking from the standpoint of possible accomplishment.

Mr. KNUDSEN. I could give you a good argument for either side, but right in the middle of it here, when we have $45,000,000,000 worth of contracts placed, I don't think it is the time to begin changing.

I was going to say, "monkey with a buzz saw." I don't mean to be flippant about it, but I mean to say that if we have been able to place $45,000,000,000 this way, I think we could speed it up.

We all agree that the procurement of the War and Navy Department will have to be speeded up.

LEGAL REQUIREMENTS FOR PROCUREMENT

Mr. CURTIS. Mr. Chairman, in connection with legal requirements for procurement, I would like to put in the record at this point title II of Public Law No. 354 of the Seventy-seventh Congress.

The CHAIRMAN. That will be permitted.

(The section referred to is as follows:)

SEC. 201. The President may authorize any department or agency of the Government exercising functions in connection with the prosecution of the war effort, in accordance with regulations prescribed by the President for the protection of the interests of the Government, to enter into contracts and into amendments or modifications of contracts heretofore or hereafter made and to make advance, progress and other payments thereon, without regard to the provisions of law relating to the making, performance, amendment, or modification of contracts whenever he deems such action would facilitate the prosecution of the war: *Provided*, That nothing herein shall be construed to authorize the use of the cost-plus-a-percentage-of-cost system of contracting: *Provided further*, That nothing herein shall be construed to authorize any contracts in violation of existing law relating to limitation of profits: *Provided further*, That all acts under the authority of this section shall be made a matter of public record under regulations prescribed by the President and when deemed by him not to be incompatible with the public interest.

Mr. CURTIS. At our St. Louis hearing on November 26 a representative of Mr. Odlum's division testified that they had subdivided the M-3 tank into its component parts, and that through this method the manufacture of tanks could be widely distributed throughout American industry.

I am sure you are personally acquainted with this technique. You know, of course, that the present plans for the production of the

M-3 tanks called for the construction of a new tank plant at Flint, and the new addition to the Chrysler tank arsenal.

Do you see any reason why, instead of concentrating our energies on the production of these new plants, which will take many months before they are completed, we shouldn't concentrate on this farming out throughout American industry?

Wouldn't we be able, through this method of tank manufacture, to utilize more effectively not only the big plants of the automobile industry but also hundreds and perhaps thousands of small plants throughout the country?

REASON FOR BUILDING NEW PLANT

Mr. KNUDSEN. The only reason for the building is that you have to have a building with a crane to sling the units in that tank. The tank weighs 27 tons, and it is going up to 30 tons. You can't handle it by hand. You have got to have something with a crane in it. You have six small manufacturers making the same tank now, and we decided here that we would get another big assembly plant. But that doesn't mean the entire tank must be manufactured in that plant.

Mr. Harrison can give you a list of the subcontractors involved in it, and you will find there are plenty of them.

The assembling plant, with a crane in it, can be built in a very short time. You seem to have the idea that the entire manufacturing processes of the tank will go on in that building. They will not.

Mr. CURTIS. I realize that. But the only way those processes can be distributed is through subcontracting, isn't it?

Mr. KNUDSEN. Yes, sir.

OPPOSES DIRECT SUBCONTRACTS

Mr. CURTIS. The procurement agencies themselves do not go out and employ these smaller concerns to make a part of a tank?

Mr. KNUDSEN. No.

Mr. CURTIS. What do you think of that idea?

Mr. KNUDSEN. I don't like it.

Mr. CURTIS. Why?

Mr. KNUDSEN. Because it scatters responsibility through thousands of associations and it leaves the responsibility for inspection entirely with the service. That would be a terrific job. You would have to have a thousand inspectors going around the country to follow up the execution of the direct subcontract for the services.

I think when you do it through the prime contractor, and you hold him responsible for it, then you get the proper coordination.

Your suggestion has been tried. It is being done. The English have tried it. They are doing it now. It is not successful.

Mr. CURTIS. The English are abandoning the system of "exploding"? They call that "exploding," don't they—taking a complex machine down and seeing what parts can be made by various manufacturers?

Mr. KNUDSEN. They are contracting direct with the parts manufacturers. I don't believe it will work.

Mr. CURTIS. Mr. Knudsen, at our St. Louis hearing one of the witnesses was a gentleman who seemed to me to be typical of the small manufacturer out in the various parts of the United States, and he argued that whereas a tank was a very complicated, heavy item and there were but a few concerns that could take contracts for them, at almost every crossroad throughout the United States there were concerns that could very efficiently make individual parts of that. He said all these things look complicated; but if you break them down and have an individual part on the table and nothing else in the room, it becomes very simple.

Now, those small concerns throughout the United States aren't going to have any material for civilian production. Many of them are manned by very able and skilled mechanics.

Couldn't a system be worked out whereby they could be assigned some of those jobs without the necessity of getting the contract through a prime contractor?

BRINGING SMALL MANUFACTURER AND PROCUREMENT OFFICE TOGETHER

Mr. KNUDSEN. Mr. Odlum will have a man in every procurement office in the United States within a very few days. He has been giving approval to those appointments; that is, men to assist in closing of contracts between the small manufacturer and the Procurement Office.

He will suggest them to the prime manufacturer, so that they will have a friend in court now. They will try to short cut the distance between subcontractor and prime contractor.

Mr. CURTIS. Do you think we could reach the same volume of production by that method?

Mr. KNUDSEN. All the civilian manufacturing in the United States is done on that principle.

Mr. CURTIS. Don't you think that the system of "exploding" would enable us to increase our volume of output of war machines?

Mr. KNUDSEN. It might explode the wrong way.

Let's understand that the munitions manufacturing problem is a technical problem. It is "know how." That is the only basis on which it can be approached, and all that we who are charged with the job of speeding up the execution of it can try to do is to disseminate technical information.

You hear much talk about quantities. People think as soon as you have a line something rolls off that line. But that isn't what makes the line. It is the skill behind the line that makes it, the technical part of it, and unless we make this a technical job we are not going to get anywhere.

In other words, somebody must know what is wanted technically. Quantities mean very little, once you learn how to make a product.

M–3 TANK

Mr. CURTIS. Who are the prime contractors for this M–3 tank?

Mr. KNUDSEN. There are seven, I think, or eight. I will give you a list if you want it.

The CHAIRMAN. Supply us with a list, will you please?

Mr. KNUDSEN. There is Ford and Chrysler and General Motors and Coleman and American Locomotive and Lima Locomotive Works.

Mr. HARRISON. Baldwin Locomotive and Pressed Steel Car.

Mr. KNUDSEN. Baldwin Locomotive and Pressed Steel Car. There is one Canadian company.

These are all working on medium tanks. So you have both the big factory and the small factory working on the same thing.

Mr. CURTIS. Mr. Knudsen, it has been testified before our committee that one of the reasons why the small plants have never got a chance to get into war production has been the desire on the part of the Army to procure military equipment through a few large contracts to large companies and the Army's unwillingness to engage in all the complicated planning required to bring in more facilities.

Furthermore, we have found that there is considerable lack of coordination in the defense program. Mr. Odlum testified before a committee last Thursday on just this type of a situation.

Referring to the contract for the construction of the $18,000,000 addition to the Chrysler tank arsenal, Mr. Odlum said that the plan was put on his desk complete. He was sure that at least 25 percent of it could be subcontracted, and vetoed it on that basis. The Army asked him how long it would take him to find the subcontractors, and he admitted that it would take time. They then told him that they couldn't wait for him to look for all these subcontractors, and he admitted that they were right in going ahead because of the time that it would take him.

Mr. Odlum stated that he thought that his division should have been called in while the plans were being drawn up, and that that was the only way that he could function effectively. Otherwise he would always be in a position of holding up the program.

The committee looks upon this case as an illustration: One, of the tendency to concentrate contracts in large companies without attempting to draw on the resources of small companies; and, two, of the lack of coordination in planning and arranging for war production.

Have you, as the director of the Office of Production Management, had similar experiences in your relations with the Army procurement officers?

APPROVED CHRYSLER CONTRACTS

Mr. KNUDSEN. No. But I approved that Chrysler contract for the simple reason that there wasn't time to get it laid out on any other basis.

We will furnish you with a list of Chrysler subcontractors any time you want it. We have it. We could not get transmission capacity as quickly into a lot of small places as we could get it into that one big place.

In other words, the smaller tank manufacturers that we have now have absorbed all the transmission capacity in that size transmission.

The transmission was 7,000 pounds. Is that right, Mr. Harrison?

Mr. HARRISON. That is right.

Mr. CURTIS. We would like to ask you some questions about procurement.

As I understand it, the authority for procurement lies primarily in the hands of the military forces.

Mr. KNUDSEN. That is correct. And the Treasury.

O. P. M. APPROVES CONTRACTS FOR $500,000

Mr. CURTIS. I understand further that the O. P. M. must give its approval on every contract over $500,000.

Mr. KNUDSEN. That has been the custom up to now.

Mr. CURTIS. Concerning the above example testified to by Mr. Odlum, it seems to the committee that in order that the O. P. M. may be able to discharge its responsibility properly when it has to approve or disapprove a contract, O. P. M. should sit in on the original analysis and planning of the project.

Could you tell us whether your personnel is actually working in the field with, for example, the Army district procurement officers, on the original plans? Or is the contract usually submitted to O. P. M. very much in its final form?

Mr. KNUDSEN. It depends on what part of the job you are talking about.

For instance, in aircraft no contract is placed before we have the full details in the aircraft section. In ordnance it is pretty much the same way. We get in before the contracts are actually placed, and we advise with them where they should go.

We have full access to the procurement offices in the field, which deal mostly with ammunition. We can send men there to inspect everything. But we do most of that through General Lewis, who is the head of it here in Washington, and who has the original proposals before they go to procurement officers. But there are no strings tied to it.

We can go anywhere and talk about anything at any time. Within the last 2 weeks Mr. Odlum's people have been given the same privilege, so as to have people in there who are looking out for the interests of subcontractors. Mr. Odlum has men at Wright Field; he has men down here in the Ordnance Department; and he has been offered men in every subcontracting office—14 of them in the United States. We are willing to go the limit on that.

Mr. CURTIS. I understand that you have taken the position that it is better to get in early, while the plans are being made, rather than to be in the position where any suggestion you might make would be holding up the job.

Mr. KNUDSEN. I am going to confess to you that I am the fellow who got that $500,000 limit put on the contract. I did that when I came down here. It was a personal request of mine to the President, and it was granted for the simple reason that I wanted to see that the contracts were spread in the United States as much as possible, and didn't get all into one locality. That was the prime object.

Mr. CURTIS. We are told that in Great Britain the military services traditionally were responsible for procurement; but that because of the duplication and the lack of coordination between the various services, a supply board was set up in 1934 to coordinate the activities of the various procurement agencies, and that eventually, in the summer of 1939, after this type of coordination was found ineffectual, a single Ministry of Supply was set up which took over the procurement and production planning functions.

Mr. KNUDSEN. For the Army?

Mr. CURTIS. For every one.

Mr. KNUDSEN. Not for the Navy. The Admiralty has a separate set-up.

Mr. CURTIS. I see. But is our understanding of that situation in Great Britain correct as to the Army?

Mr. KNUDSEN. Yes, sir.

Mr. CURTIS. Our committee is making certain recommendations, based on the American experience during the 18 months since May 1940, when we were committed to war production. Our committee, as I have already mentioned to you, has recommended that a single civilian board be set up.

The establishment of such a board would be intended to eliminate the division of responsibilities which exists today among the Army, O. P. M., and S. P. A. B. We intended by this recommendation to free the military for the job of military strategy and action, which is their primary responsibility, and that the new Board would utilize the best Government engineers and production men in mobilizing American industrial capacity.

We would like to know whether, in your opinion, the committee's recommendation would actually accomplish this objective of mobilizing American industrial capacity better than existing machinery.

OPPOSES CIVILIAN BOARD

Mr. KNUDSEN. You asked me that question once before, didn't you, in a slightly different form? I told you that I didn't think this was the time to change, in the middle of it. Now, I have a different idea, sir, if you don't mind.

I feel that if you want to mobilize the little fellow, you can go out and mobilize him. That is why we set up Mr. Odlum's department, on the scale it has reached, so as really to go out and deal with that particular job.

In procurement alone, it doesn't do the job. Suppose I could give 10,000 contracts out tomorrow morning. That wouldn't mean you would get more work. If I can get 10,000 people to understand the technical requirements better, then you will get more work.

Mr. CURTIS. Well, then, as I understand it, your position would be not to change the procurement to a civilian board.

Mr. KNUDSEN. Yes, sir. I think the problem can be solved. I want all the attention and all the effort put on spreading the technical part of the problem out to the small manufacturer.

Mr. SPARKMAN. Mr. Knudsen, there is one thing I would like to get clear in my mind. We have been talking a good deal today about the conversion of the automobile industry.

Of course, we know it has been pretty severely curtailed already, its production. Is there any definite policy set as yet with reference to the production of passenger automobiles for civilian use? Is there to be any at all after January?

Mr. KNUDSEN. Well, the industry, first, sir, is going to talk about what we can do by cutting further than we have cut now.

In the case of rubber, for example, there really isn't much rubber left for that industry.

Mr. SPARKMAN. The plan for further automobile curtailment has not yet been made definite and will not be after the first; is that right?

PREPARATION OF PROGRAM

Mr. KNUDSEN. No, Mr. Sparkman. What we do is to bring representatives of the industry down, and we talk the whole thing over. Then there is made what we call a program, and this program comes to me or to civilian supply, or whoever is involved, and if there is any disagreement as to the program, it goes to S. P. A. B., you see.

That is the understanding. So that this program that we made last August was agreed upon right down the line until the rubber shortage made it necessary for us to cut it again. The preliminary step that was taken was to cut half of December, which made 25 percent of the whole and 50 percent off January, until we could get men of the industry down here and see how much further we could go.

Mr. SPARKMAN. Then the great difficulty is the rubber supply?

Mr. KNUDSEN. That is right.

Mr. SPARKMAN. Mr. Knudsen, I gather from what you have said in answer to some of the questions that Mr. Curtis put to you that while you would not be in favor of changing the method of procurement, as was recommended by this committee, you would be in favor of using some kind of industry management counsel, or making use of industrial and production engineers to the fullest, in order to round up our productive capacity to its utmost. Am I correct?

Mr. KNUDSEN. I was talking about the industry committee. We have such committees set up now.

Mr. SPARKMAN. Committees formed within and as a part of each industry?

Mr. KNUDSEN. Yes, sir.

Mr. SPARKMAN. What about mobilizing the industrial and production engineers of the country?

ENGINEERING COMMITTEE

Mr. KNUDSEN. We have them already mobilized, sir. We have a whole engineering committee set up that is headed by a man by the name of McConnell.[1] He has enlisted some of the best engineers of the country—I have forgotten how many members, all told, but there are over 400 in practically every location—who meet and take up every engineering problem that arises.

Mr. SPARKMAN. At our hearings back in October here in Washington, we heard a panel of engineers. In making suggestions as to how our productive capacity might be best utilized, the testimony at that time was to the effect that while a survey had been made of the availability of engineers, only a very few of them had actually been used; and this morning Mr. Alex Taub was before us and he agreed with the recommendation of the committee that such a board or management council might be set up. I mean over all, not just a part of one particular trade or one particular industry, but over all the defense-production program. Furthermore, he suggested that there be three special subcommittees: One, a technical committee; second, a subcontracting committee; and third, a labor-transfer committee. These would each carry out the representative programs of the entire industry.

[1] R. E. McConnell, pp. 9490–9492.

The technical committee, according to his suggestion, would apparently include the outstanding engineering forces of the major producers, and representatives of the parts producers, and also labor representatives. Their job would be to pool all of the technical resources and, in cooperation with labor, to arrange for speedy conversion.

He went on and outlined what each one of the subcommittees would do.

Now, what do you think of that suggestion?

Mr. KNUDSEN. If the chairman desires, I will send him the set-up of the engineers' committee that is in existence now, and you can see the subcommittees that have been set up under it. I will be glad to furnish that. I haven't got it in my head.

Mr. SPARKMAN. You do have in operation already something similar to that?

Mr. KNUDSEN. I will be glad to send you a paper on it. McConnell is the head of the office.

(The paper referred to above, received subsequent to the hearing, is as follows:)

[Copy]

DECEMBER 23, 1941.

The Honorable JOHN H. TOLAN,
Chairman, House Committee Investigating National Defense Migration,
House of Representatives, Washington, D. C.

MY DEAR MR. TOLAN: With further reference to my testimony before your committee on December 22, I am attaching a copy of a report explaining the purposes and planning of organization of the Engineers Defense Board.

Attached also is a list of the representatives of the various organizations serving on the Board.

Very truly yours,

[Signed] WILLIAM S. KNUDSEN.

(The attachments referred to above are as follows:)

ENGINEERS' DEFENSE BOARD

STATEMENT OF PURPOSES AND PLAN OF ORGANIZATION

Purpose.

In view of the existing national emergency, six national engineering societies have joined to organize the Engineers' Defense Board in order to provide a central agency that will be prepared to assist the various branches of the Government with engineering knowledge and experience connected with military preparedness. Among the functions of this organization will be:

(1) To serve as a channel to inform engineers generally regarding defense problems, especially those involving shortages of materials.

(2) To implement and make applicable reports and recommendations of the advisory committees of the National Academy of Sciences.

(3) To urge engineers (*a*) to adopt procedures looking toward accomplishment of the objectives of defense agencies; (*b*) to promote means of increasing production of raw materials in which shortages exist; (*c*) to conserve the supply of industrial materials; (*d*) to find substitutes; and (*e*) to simplify operations and production.

(4) To act as a clearing house between engineers or engineering groups of information regarding substitute materials, waste prevention, and conservation.

(5) To appoint, on request of the Army, Navy, or other defense agency, special committees of engineers to deal with specific engineering problems related to defense.

(6) To select problems or projects dealing with defense and to study them with due regard to activities of existing agencies.

Organization.

For the purpose of organization, the Engineers' Defense Board shall consist initially of five representatives from each of the following six national engineering

societies: American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Mechanical Engineers, American Institute of Electrical Engineers, Society of Automotive Engineers, and American Institute of Chemical Engineers, such representatives to be appointed by the governing bodies of such societies. To these may be added one or more representatives of such other national engineering societies as may be invited to participate by the executive committee of the Engineers' Defense Board, such representatives to be designated by the governing body of their respective society; and such additional representatives of the six organizing societies as may be requested by the executive committee of the Engineers' Defense Board.

The activities of the Engineers' Defense Board shall be administered by an executive committee consisting of (*a*) a chairman, a vice chairman, and a secretary, elected by the other members of the executive committee, and (*b*) one representative of each of the six societies heretofore named, appointed by the governing body of their respective societies. The officers need not be representatives of any of the participating societies.

The duties of the executive committee shall include:

1. To name all standing and special committees, the chairman of which shall be selected from the membership of the Board.
2. To consider reports from special and standing committees and to have exclusive authority to issue reports in the name of the Board.
3. To arrange for appropriate publicity for the work of the Board and its committees.
4. To exercise the full authority of the Board between meetings of the Board.

Meetings.

The Board shall hold an annual meeting during the month of January in each year, at which officers will be elected. Additional meetings of the Board will be held from time to time at the call of the executive committee for the purpose of considering reports and transacting other business.

Term of office.

The officers shall serve for 1 year, but there is no limitation on the number of successive terms any officer may serve.

REPRESENTATIVES OF CONSTITUENT BODIES

R. E. McConnell, Chairman, 20 Exchange Place, New York, N. Y.

Harry S. Rogers, Vice Chairman, president, Brooklyn Polytechnic Institute

A. B. Parsons, Secretary, secretary, American Institute of Mining and Metallurgical Engineers, 29 West Thirty-ninth Street, New York, N. Y.

(*1*) *American Society of Civil Engineers*

Carlton S. Proctor (executive committee), construction engineer, 420 Lexington Avenue, New York City.

Richard E. Dougherty, vice president, Improvements and Developments, New York Central System, 230 Park Avenue, New York City.

Charles F. Goodrich, chief engineer, American Bridge Co., Frick Building, Pittsburgh, Pa.

Robert R. McMath, chairman of board, Motors Metal Manufacturing Co., 5936 Milford Avenue, Detroit, Mich.

J. P. H. Perry, vice president, Turner Construction Co., 420 Lexington Avenue, New York City.

(*2*) *American Institute of Mining and Metallurgical Engineers*

John F. Thompson (executive committee), executive vice president, International Nickel Co., 67 Wall Street, New York City.

Zay Jeffries, technical director, lamp department, General Electric Co., Nela Park, Cleveland, Ohio.

Wilber Judson, vice president, Texas Gulf Sulphur Co., 75 East Forty-fifth Street, New York City.

Frederick Laist, metropolitan manager, Anaconda Copper Mining Co., 25 Broadway, New York City.

Wilfred Sykes, president, Inland Steel Co., 38 Dearborn Street, Chicago, Ill.

(3) American Society of Mechanical Engineers

R. M. Gates (executive committee), president, Air Preheater Co., 60 East Forty second Street, New York City.

H. V. Coes, industrial department, Ford, Bacon & Davis, Inc., 39 Broadway, New York City.

K. H. Condit, dean of engineering, Princeton University, Princeton, N. J.

J. W. Parker, vice president and chief engineer, Detroit Edison Co., 2000 Second Avenue, Detroit, Mich.

W. R. Webster, chairman of board, Bridgeport Brass Co., Bridgeport, Conn

(4) American Institute of Electrical Engineers

H. H. Barnes, Jr. (executive committee), commercial vice president, General Electric Co., 570 Lexington Avenue, New York City.

C. A. Adams, construction engineer, E. G. Budd Manufacturing Co., Philadelphia, Pa.

C. B. Jolliffe, engineer in charge, frequency bureau, Radio Corporation of America, 30 Rockefeller Plaza, New York City.

R. L. Jones, director of apparatus devices, Bell Telephone Laboratories, 463 West Street, New York City.

Philip Sporn, vice president in charge of engineering, American Gas & Electric Service Corporation, 30 Church Street, New York City.

(5) Society of Automotive Engineers

C. L. McCuen (executive committee), vice president and chief engineer, General Motors Corporation, General Motors Building, Detroit, Mich.

Frank W. Caldwell, director of reserves, United Aircraft Corporation, East Hartford, Conn.

C. E. Frudden, Allis Chalmers Co., Milwaukee, Wis.

Arthur Nutt, vice president, Wright Aeronautical Corporation, Paterson, N. J.

N. G. Shidle, editor, Society of Automotive Engineers Journal, 29 West Thirty-ninth Street, New York City.

James C. Zeder, chief engineer, Chrysler Corporation, Detroit, Mich.

(6) American Institute of Chemical Engineers

F. W. Willard (executive committee), president, Nassau Smelting & Refining Co., 170 Fulton Street, New York City.

Webster Jones, Carnegie Institute of Technology, Pittsburgh, Pa.

R. L. Murray, vice president, Hooker Electrochemical Co., Niagara Falls, N. Y.

A. J. Weith, manager of research, Bakelite Corporation, 230 Grove Street, Bloomfield, N. J.

R. E. Wilson, president, Pan American Petroleum & Transport Co., 122 East Forty-second Street, New York City.

ORGANIZATION CHANGE IN OFFICE OF PRODUCTION MANAGEMENT

Calling for a greater degree of industrial mobilization, the Office of Production Management today announced an organization change designed to speed up conversion of civilian industry to wartime production.

The change involves transfer of industrial branches under the Division of Civilian Supply and the Division of Purchases to the direct jurisdiction of the Director General and the Associate Director General.

No other organization changes are made for the time being.

The present shift applies only to the industrial branches of the Civilian Supply and Purchases Division, which are largely concerned with nonmilitary products, produced by industries that must shift ever more rapidly to war work, and does not affect the set-up of the Division of Materials or the Production Division.

The over-all policy, planning, and staff functions of the Civilian Supply and Purchases Divisions remain the same, and these functions will continue to be under the supervision of the present directors (Douglas MacKeachie, Purchases, and Leon Henderson, Civilian Supply).

But the actual operating work of the branches themselves—aimed at conversion, priority applications, limitation orders, etc.—will be carried on directly under Mr. Knudsen's and Mr. Hillman's supervision.

Under the joint direction of Mr. Knudsen and Mr. Hillman, each Branch will speed up its inquiry into 1942 prospects for the industry concerned.

One necessary step will be the over-all determination of the minimum civilian production that should be made available.

On the basis of this determination, each end-product branch, coordinated with other branches through the Director General and the Associate Director General, will then make every effort to shift the remaining industrial capacity to military work.

The changes announced today are organizational and administrative changes, and it is felt that the pushing of war production and conversion as fast as possible can be carried on more smoothly under the new organization.

The functions of the industry and labor advisory committees are to be enlarged to permit a closer and more continuous consultation and collaboration with Government agencies concerned with war production. There are now 24 industry advisory committees, and more will be created as necessary. There are now 9 labor committees, and it is planned to create additional committees as industries are converted more and more to war work.

The Supply Priorities and Allocations Board will remain the top policy-making body in the defense organization. Its decisions will be handed on to the Office of Production Management for execution.

The branches under the Division of Purchases which are now transferred are as follows: Food Supply; Textile, Clothing and Equipage; Shoes, Leather, Hides and Skins; Health Supplies and Fire Equipment, and Containers.

The branches under the Division of Civilian Supply which are now transferred are as follows: Pulp and Paper; Printing and Publishing; Lumber and Building Materials; Plumbing and Heating; Electrical Appliances; Automotive Transportation and Farm Equipment; Industrial and Office Machinery; Rubber and Rubber Products; and State and Local Government.

An Office of Production Management memorandum on the new changes and a copy of Administrative Order No. 37 which puts it into effect are attached.

TESTIMONY OF WILLIAM S. KNUDSEN—Resumed

Mr. SPARKMAN. One other suggestion that Mr. Taub made with reference to the conversion of the automobile industry.

I believe he said that about 50 percent of the equipment could be immediately converted to defense use and that that could probably be converted within a period of 4 months, and also he said that, probably through an industry pool, new tools and machines could be manufactured, so that within approximately a year's time the entire industry could be converted to the defense program.

I wonder what your comment would be as to that suggestion?

Mr. KNUDSEN. Well, of course, Mr. Taub is a former employee of mine.

Mr. SPARKMAN. Yes; I knew that.

Mr. KNUDSEN. And I don't think it is proper for me to change his opinion.

Mr. SPARKMAN. We wouldn't ask you to do that. We just ask you to help us form our opinions.

COMMENTS ON CONVERSION TESTIMONY

Mr. KNUDSEN. Pools are good when they can be formed. I am for pools in manufacturing anything. If Alex figures on the conversion percentage, I will let you have somebody else check them. I don't want to do it myself. Cooperation in manufacture in any industry at a time like this is of the greatest help. But to set a time limit on brains, sir, I don't believe that always works out.

It is not what a single individual can do; it is what you can get a whole lot of people to do. I would suggest that you consult certain automobile manufacturers, other than myself.

I sent Alex Taub to England. I sent him there to fix the Vauxhall Motors, and he did a good job. He is a good engineer. He has had some experience in the English Ministry of Supply and they sent him over here, and I borrowed him, and Mr. Hillman got him, and now Mr. Odlum has him.

I think he can do some good. I would like to have someone else check his production estimates. You know, sometimes when you have too intimate a knowledge of a man, it is better to have someone else check on him.

I might say that I discussed very frankly with the committee the great difficulty that the industry would confront in an effort to make a complete conversion.

Mr. Arnold. Mr. Knudsen, you say a great amount of subcontracting is being done. In St. Louis we heard testimony from manufacturers who had attended a number of meetings in Chicago and elsewhere with large prime contractors. They went back home without any subcontracts and the prime contractors subcontracted to each other instead of subcontracting to the smaller manufacturer.

Now, one of those manufacturers, the Mueller Iron Works in Decatur, Ill., has a plant in Canada that is performing war work entirely.

They have a subsidiary plant in Tennessee or Alabama that is almost entirely on a war basis, yet in the Decatur plant, even in combination with some other manufacturers, they haven't been able to get any prime contracts and very few subcontracts.

Can you think of any remedy for that?

Mr. Knudsen. It is a little difficult for me to pass judgment on it—I don't know what the article is—but I would imagine if you are making a standard article in Canada similar to what they make here, it shouldn't be very difficult to get a contract to manufacture that particular article.

Mr. Arnold. Dr. Lamb, do you recall whether the plant in question was located in Alabama or Tennessee?

Dr. Lamb. It was in Tennessee. They tooled up the Tennessee and Decatur plants for production for which they have been unable to get contracts. They were unable to get contracts for the Decatur plant, according to their testimony.

Mr. Knudsen. I think that would take care of itself, now that we have so much more material coming through. You understand that when we get an appropriation from Congress, each item is specified and we must buy that item with the money we have, or we are in wrong.

I have one suggestion to make for the procurement. That a certain amount of contract authorization be set aside to deal with just such things as that. I can't imagine why if one plant is making goods of accepted quality the other one couldn't do the same thing.

Mr. Arnold. The plant at Decatur is the largest plant at Decatur, Ill., and hasn't been able to get the quantities.

Mr. KNUDSEN. I imagine there wasn't a sufficient quantity to go around.

Mr. ARNOLD. Of course, the labor is higher in Tennessee.

Mr. KNUDSEN. You will have to see Mueller about that and not me.

Mr. ARNOLD. Do you know whether the Government is contemplating stipulating, in their contracts with prime contractors, that a certain percentage of subcontracting must be indulged in?

Mr. KNUDSEN. You mean by item or generally? Generally, you can't do it.

Mr. ARNOLD. You would have to do it by item?

Mr. KNUDSEN. Yes.

Mr. ARNOLD. Is there anything like that under contemplation?

SUBCONTRACTING CONSIDERED DESIRABLE

Mr. KNUDSEN. There is a recommendation by the War Department that subcontracting is a desirable and most wanted feature in new contracts. That wasn't in in the beginning, but it is in there now in the form of the directive to the procurement branches, and I have found that the Army is quite sympathetic and anxious to get subcontractors in on the job.

Mr. ARNOLD. And then they later checked to see how much subcontracting was being done?

Mr. KNUDSEN. Yes, sir.

Mr. ARNOLD. And that is all they do at the present time?

Mr. KNUDSEN. That is right. There wasn't any percentage set, was there, Mr. Harrison?

Mr. HARRISON. No.

Mr. KNUDSEN. We disagreed with it; we didn't want it.

Mr. CURTIS. Do you have any suggestion as to the small plants throughout the United States who haven't been able to get any defense orders, largely because of the lack of time allowed them to get in their bids?

Small manufacturers testified that after receiving their invitation to bid, the time in which they had to prepare that bid and submit it here in Washington, or some place in the East, would only be 3 days, and at the most 7 or 8 days.

Mr. KNUDSEN. You will find that will be changed.

Mr. CURTIS. That will be changed?

MOST CONTRACTS TO BE NEGOTIATED

Mr. KNUDSEN. You will find that will be changed. Most contracts will be negotiated. The bid system will still be in existence on standard items, such as food, shoes, and things like that, but in mechanical items, where there is no general market, I think you will find a lot of negotiated contracts being placed, both large and small. And we are in favor of it.

Mr. CURTIS. Where will the authority to negotiate be located?

Mr. KNUDSEN. With the Procurement Office.

Mr. CURTIS. And will that be, in turn, delegated on to regional procurement offices?

Mr. KNUDSEN. He is the procurement officer, sir, as far as I am concerned.

Mr. CURTIS. The regional one?

Mr. KNUDSEN. Yes, sir.

You will find that, in a recent directive, I have been given a great deal more leeway in order to facilitate the negotiation of contracts and speed up the procurement proceedings.

Dr. LAMB. With reference to the small producer, will the procurement officer deal only with prime contracts, so that the subcontractor or small producer will have to come in as a subcontractor for an intermediate subcontractor?

Mr. KNUDSEN. Yes, sir; that is right.

Dr. LAMB. In other words, he will have to find the subcontractor?

Mr. KNUDSEN. That is Mr. Odlum's job—to find a prime contractor for that chap.

He has men in every city where there is a procurement office, and in a good many more cities Mr. Odlum has an office to further justify that very thing you are talking about. That is his duty.

The CHAIRMAN. Mr. Knudsen, I have heard you before my Judiciary Committee, and I have heard you before this committee twice, and I want to say that both committees have the deepest respect for you personally, and for the fine work you have been doing, and we thank you very much for taking the time off and coming here today.

Mr. KNUDSEN. Thank you very much, sir. The feeling is mutual, I assure you.

The CHAIRMAN. Mr. Harrison is our next witness.

TESTIMONY OF W. H. HARRISON, DIRECTOR, DIVISION OF PRODUCTION, OFFICE OF PRODUCTION MANAGEMENT

Mr. SPARKMAN. Mr. Harrison, would you tell us just what the responsibilities and authorities of your division of the Office of Production Management are?

Mr. HARRISON. Broadly, to aid and assist the services to get the end product at the time they want it and of the quality that they want. That is a broad characterization.

Mr. SPARKMAN. You are pretty closely associated right now with the Army and Navy procurement agencies and the Treasury?

Mr. HARRISON. Yes, sir. And the Maritime Commission.

Mr. SPARKMAN. Just what is the connection between you and them?

Mr. HARRISON. As the different appropriations come through, and as the Army and Navy have decided on certain broad types of munitions that are required, we discuss those things with our staff and we, generally, have fairly complete agreement as to the basic costs and procedure with respect to procurement. It is more through the medium of informal discussions and contacts.

Mr. SPARKMAN. Has your Division ever made a survey of existing facilities of the industry, particularly of the automobile industry, to see what convertible and idle facilities could be used for the production of tanks, airplanes, and other types of equipment?

Mr. HARRISON. Only in the sense that we are looking for capacity for specific items. We do then contact and discuss the problem with individual manufacturers.

SPECIFIC SURVEYS

Mr. SPARKMAN. Specific surveys, then, rather than general surveys?

Mr. HARRISON. That is right.

Mr. SPARKMAN. You never would be called upon, then, to make a survey that would show you the complete picture as to the convertibility of any particular industry, would you?

Mr. HARRISON. Well, up to the present, sir, we have been taking the individual items and trying to place them in cooperation with the Army and the Navy in those places where it was clear that we would get the quality wanted and in the necessary time, considering, likewise, the price that is involved. But from the standpoint of taking an overall industry and analyzing and surveying its capacity; no.

Mr. SPARKMAN. Your problem is not so much one of speeding up production as it is of insuring that you are going to get the product?

Mr. HARRISON. I rather think our principal problem is to make certain that the armed services get what they want when they want it.

Mr. SPARKMAN. And the matter of going into productive capacity, do you leave that problem up to the man who undertakes to furnish the article to you?

Mr. HARRISON. No; we generally attempt to satisfy ourselves that the individual manufacturer is sound, and in the direction capable of giving us the end product under the conditions that we think are proper.

Mr. SPARKMAN. What production method do you use in order to insure constant operations of plants? Do you use the four-shift plan?

Mr. HARRISON. Yes. We must think in types of operations. There are some operations that have been on a continuous 7-day 24-hour-shift basis from the start. Explosives are a good example. Also some of the small-arms ammunition plants. The type of operation that normally adjusts itself to a continuous program.

Mr. SPARKMAN. Do you send your engineers into those plants to check the production possibilities, or do you simply rely upon what the manufacturer tells you?

MEETINGS TO ACCELERATE PRODUCTION

Mr. HARRISON. We have our engineers in the field, and within the course of the last few weeks we have selected each of the items known to be critical from the standpoint of the armed services, and have held a series of meetings with each manufacturer to determine what he, as an individual, can do to accelerate his production schedules.

Mr. SPARKMAN. What about subcontracting? Do you urge the maximum amount of subcontracting?

Mr. HARRISON. Absolutely; and we analyze each particular instance to see what more that particular manufacturer can do to accelerate his production.

Mr. SPARKMAN. And if, by subcontracting, he can do it, do you require him to subcontract?

Mr. HARRISON. We don't require him, but usually it is worked out on a mutually satisfactory basis.

Mr. SPARKMAN. You urge it as strongly as possible?

Mr. HARRISON. Yes, sir.

Mr. SPARKMAN. Now, Mr. Harrison, I want to ask you a question—I am sure you heard the same question asked of Mr. Knudsen—it has to do with the procurement.

You heard the question propounded to him about the setting up of a single civilian board for procurement of supplies?

Mr. HARRISON. Yes, sir.

Mr. SPARKMAN. I won't repeat the whole question, but are you in agreement with him in that regard?

OPPOSES CHANGE AT THIS TIME

Mr. HARRISON. Yes; I am; and I would like to restate it. I think that the immediate situation is one that demands complete energy toward getting out the finished product now, and anything that would tend to disturb the immediate situation I think would be unfortunate. In the broad sense as to whether or not we ought to have one central procurement agency or two or three or four, I would rather not express an opinion on that.

Mr. SPARKMAN. I get your idea that had we been able to start this single procurement agency, say, 12 or 15 months ago, that we might have given it consideration, but now it is too late?

Mr. HARRISON. Well, really, sir; I haven't thought through all the pros and cons to conclude in my own mind as to whether or not there is merit in the plan or not. I just haven't thought the thing through.

Mr. SPARKMAN. Would you agree with this: That it could have received consideration, but it is now too late for that, that we had better go on as we are going?

Mr. HARRISON. I would rather not say that it is ever too late for anything. Perhaps Mr. Knudsen and I are thinking of the immediate situation rather than in terms of any long-term arrangement. I don't believe we should ever set anything aside just because we have seemed to delay making a decision at some time earlier. I think we ought to study it and consider it, but I have no considered opinion as to the merits of it.

Dr. LAMB. You said a moment ago, Mr. Harrison, that you and Mr. Knudsen are primarily interested in the maximization of output as rapidly as possible.

Take, for example, the curtailment order of August 30. At that time, according to Mr. Knudsen's testimony, the industry was approached and they were asked to base an increase of defense work on a 50-percent curtailment, and contracts were let on that basis. That is a correct summary of his statement, isn't it?

LOOKING BACKWARD ON CURTAILMENT

Mr. HARRISON. That is correct.

Dr. LAMB. If you had been able in August to foresee the curtailment order of the week following December 7, which was put out by the Division of Civilian Supply, reducing automobile production almost to zero, I presume that in order to maximize output, you would have called in the auto manufacturers and given them larger contracts, and asked them to undertake a bigger amount of defense work than you did at that time; is that correct?

Mr. HARRISON. No, sir; I think that the decisions and conclusions made in August were reached on the basis of the considerations then

available and I haven't seen anything that has happened since August up to now, to indicate that those considerations were wrong.

Dr. LAMB. As of August 30?

Mr. HARRISON. Yes; I haven't seen anything that has happened between now and August 30 to indicate that, had some other decision been made on August 30, we might have been better or worse off than we are now.

Dr. LAMB. You mean that if on August 30 you had been able to foresee the necessity of complete curtailment of the auto industry, you would not have acted differently with respect to the orders let?

Mr. HARRISON. That is correct. With the procurement problems then present. That is, with the amounts of war material then thought to be required. I think they were placed in a manner to give them most expeditious production.

Dr. LAMB. That raises the question of whether at that time your sights shouldn't have been higher, in view of the existing situation?

Mr. HARRISON. Please, sir, the question of the quantity of war materials required is a military function.

Dr. LAMB. That is exactly the point—that the committee's recommendations have to do with. You don't have the decision and, therefore, you are in a position to say what you have just said to me, namely, that not having the decision on these military matters, you couldn't say whether that was or was not a wise decision which was made on the 30th of August. The Procurement people told you on the 30th of August that that was what was needed, and you went to the automobile manufacturers and asked them to give it to you?

Mr. HARRISON. Yes; but the Procurement people of the armed services received their requirements from the military people, decided by strategical considerations; and no civilian group, or any group, in my opinion, would be able to act unless they had the military requirements made known.

Dr. LAMB. Of course, that raises the question—in the light of our experience between the 30th of August and the present time—whether the sights are again too low, and whether it will be necessary in the next 6 months to again raise those sights. And whether it will be seen in the next 6 months' time to have been forthcoming too late.

Mr. HARRISON. Please, sir, I am not enough of a military strategist to know whether we ought to have capacity for two or three or five million men. That is what we are talking about, and that is what has to be decided by the military.

ARE WE UTILIZING INDUSTRIAL CAPACITY?

Dr. LAMB. I thought, from the President's speech, the issue at the moment is: Have we the need at the present moment for the full capacity of American industry, and are we making plans to utilize it?

Mr. HARRISON. I think the point of view from which we are approaching the job is to try and take the requirements as established by the military and make certain that the full resources of America are used to produce those requirements at the earliest possible date.

Dr. LAMB. The testimony today, with respect to the Mueller Co., at Decatur, indicates that you are not using the Mueller plants. Could you, by speeding up, for instance, subcontracting, or reviewing con-

tracts, redistribute them in such a way that the Mueller Co. would be working immediately and not wait until the sights are raised to the point where the Mueller Co. is needed?

Mr. HARRISON. Naturally, we are analyzing particular instances to see what can be done to accelerate production. That will take several forms. It will take the form of further subcontracting, more hours of work, and probably some more expansion, and in all of these things I think we are talking about a question of degree. There always have been subcontracts. There probably always will be more, and as our requirements increase, naturally, our base must be broadened and there must be more people brought into production.

Dr. LAMB. But we already have a large number of contracts which are let. I don't know the exact figure.

Mr. HARRISON. Some forty-odd billions.

Dr. LAMB. Forty-odd billions. We have heard talk of 60 billions. There has even been talk of 150 billions in the press within the last couple of months. One hundred and fifty billions are certainly not being planned for at the present time according to your testimony?

Mr. HARRISON. I am sorry. I have no notation as to what, sir, it is we are planning.

Dr. LAMB. I am talking about procurements. Orders they are not. If they were, you people would be out hunting for the companies like the Mueller Co., to go into immediate production if it was humanly possible.

PROGRAM OF TAKING FIRST THINGS FIRST

Mr. HARRISON. I think very likely, sir, that is so. But it is like everything else, you have got to take the first things first, and the first thing at the moment is the immediate necessity of accelerating those things that we now have in the mill, so to speak.

Dr. LAMB. The only reason I was raising these questions with you was the fundamental question, whether by taking first things first, it has not, by a demonstration between August 30 and the present time, been shown that you get less done than if you take thought with respect to this over-all planning situation?

Mr. HARRISON. Well, one might very well consider that. Of course, we folks that have been working close to it, really frequently get some wrong points of view. Our considered judgment is no, but that doesn't mean, sir, that that is right.

Dr. LAMB. Well, events will be the only test, I presume?

Mr. HARRISON. Well, I think events demonstrate the soundness of the procedure, because the current production results will indicate that.

Dr. LAMB. Against the program already laid down?

Mr. HARRISON. No. I am sorry. Not against any program. I am thinking in terms of actual results.

Dr. LAMB. That is all I have.

Mr. SPARKMAN. Now, as I understand the way this limitation of production of civilian consumer goods is controlled, you get the estimate from the services as to what their needs will be. That is to be an absolute priority and if there is any left over, then you decide whether or not it goes into civilian goods. Is that right, roughly stated?

Mr. HARRISON. Are you thinking, sir, in terms of materials?

Mr. SPARKMAN. Yes.

Mr. HARRISON. Yes; broadly, with this possible reservation: We have undertaken it to be our responsibility to satisfy ourselves that none of

the critical materials will be needlessly used in the munitions program, so that there would be a maximum available for the civilian economy.

OFFICE OF CIVILIAN SUPPLY

Mr. SPARKMAN. Now, I want to ask you about the Office of Civilian Supply. To whom is it responsible? Is it responsible to you or Mr. Knudsen, or to Mr. Henderson, or to S. P. A. B.?

Mr. HARRISON. As I understand it, sir, it reports through Mr. Henderson to Mr. Knudsen and Mr. Hillman. It is a division of O. P. M., just the same as is the Production Division of O. P. M. There are six or seven division heads, each of whom report to Mr. Knudsen and Mr. Hillman.

Mr. SPARKMAN. And this is one of them?

Mr. HARRISON. Civilian Supply is one of them. Production Division is one of them. Priorities Division is another, and Subcontract, Mr. Odlum's division, is still another, and so it goes.

Mr. SPARKMAN. I didn't quite get clear as to what Mr. Henderson's connection with that is. Does he exercise a check over it?

Mr. HARRISON. Mr. Henderson is in charge of the Civilian Supply Division.

Mr. SPARKMAN. He is in charge of that, and he reports to Mr. Knudsen and Mr. Hillman?

Mr. HARRISON. In that capacity, and then in addition, I gather, he is the Price Administrator, which is a separate agency from O. P. M.

Mr. SPARKMAN. That is all, Mr. Chairman.

REGIONAL OFFICES OF O. P. M.

The CHAIRMAN. As I understand, Mr. Harrison, the O. P. M. is establishing regional offices throughout the United States, isn't it?

Mr. HARRISON. The O. P. M. is. From the standpoint of the Production Division, we have always had individual people located here and there where they could be nearest to the contractors and the district offices of the Army and Navy.

Mr. Knudsen made reference to the agreement recently reached with respect to the Subcontract group, whereby their people will be placed in the local procurement offices of the Army.

The CHAIRMAN. How many regional offices have you in the United States?

Mr. HARRISON. I wouldn't know. In the Production Division we have not established offices as such. We have some men out on the Pacific coast, for example, so they won't have to be trotting back and forth.

We have other men out around the Detroit area. We have some men in the St. Louis area, but we do not establish offices in the same sense that the Army or the Navy establishes their district offices. That is, the Production Division doesn't.

Now, the Priorities Division of O. P. M. has some district offices. The Contract group has some district offices. I don't know how many.

The CHAIRMAN. Well, Mr. Harrison, we thank you very much for coming here. Your testimony has been very valuable and interesting to us, and we will let you go back to work now. We will resume the hearing at 9:30 tomorrow morning.

(Whereupon, at 4 p. m. the hearing was adjourned until 9:30 o'clock the following morning, December 23, 1941.)

NATIONAL DEFENSE MIGRATION

TUESDAY, DECEMBER 23, 1941

MORNING SESSION

HOUSE OF REPRESENTATIVES,
SELECT COMMITTEE INVESTIGATING
NATIONAL DEFENSE MIGRATION,
Washington, D. C.

The committee met, pursuant to recess, at 9:30 a. m., in room 1326, New House Office Building, Hon. John H. Tolan (chairman) presiding.

Present were: Representatives John H. Tolan (chairman), of California; John J. Sparkman, of Alabama; Laurence F. Arnold, of Illinois; and Carl T. Curtis, of Nebraska.

Also present: Dr. Robert K. Lamb, staff director.

The CHAIRMAN. The committee will please come to order.

Mr. R. J. Thomas and his associates will testify at this time. Mr. Thomas, at this point I am instructing the reporter to enter your prepared statement as a part of the record.

(The statement referred to above is as follows:)

STATEMENT BY R. J. THOMAS, PRESIDENT, UNITED AUTOMOBILE, AIRCRAFT AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA, CONGRESS OF INDUSTRIAL ORGANIZATIONS, DETROIT, MICH.

Auto workers this winter will face the heaviest unemployment that they have known since the winter of 1932 or 1933. By the end of January, 300,000 in Michigan will be without work, and throughout the country about 450,000 will be forced out of private employment.

According to the present outlook, major passenger-car plants in the industry will close down entirely after 2 weeks of much-reduced production in January.

For this sudden disruption of their security and living standards, the membership of my union knows exactly where to place the primary responsibility. They recognize this hardship as a thing brought on them by the vicious force of Axis aggression. The aggressors who have brought death, starvation, and degradation to the people of Europe and Asia have already carried the milder misery of unemployment to the workers of this country.

Auto workers today are not asking that regular passenger-car production be continued. They know that is impossible now. Their primary demand is not even for relief or special assistance from their Government—though such measures will be essential in the months immediately ahead.

What the auto workers want above everything else is the right to produce the planes, tanks, and guns which will spell out defeat for the aggressors. Auto workers know that this can be done. The American auto industry has been able to turn out 100 units for every 12 produced by the combined auto industries of all the Axis countries.

For more than a year the United Automobile Workers has been urging upon Government and industry the importance of swinging the tremendous producing power of this industry into the production of essential arms and munitions.

U. A. W. WANTS ALL-OUT PRODUCTION

They have known for more than 2 weeks that a war has been going on. And the United Automobile Workers has also disagreed with the Director General of the Office of Production Management in feeling that the great corporations of the auto industry should be forced into all-out production of arms—even at the expense of peacetime profits and competitive relationships.

The story of the auto industry's failure to plan for arms production has already been told to the committee. I do not intend to repeat that account on this occasion.

But I must submit that even under the impact of the present crisis not all the "business as usual" spirit has been purged from the industry. To our knowledge no basic changes have been made in the arms production plans of the General Motors or Chrysler Corporations since the 7th day of December.

So far as we can learn neither the procurement agencies of Government nor the Production Division of Office of Production Management has worked out a program for the full utilization of this industry, which is the world's most powerful productive resource. We view this problem, therefore, not only as an employment problem of 500,000 auto workers. For its solution will bring, in addition to work for auto workers, victory to the people of America and the world in their struggle against Hitlerism.

Testifying before this committee yesterday, representatives of the auto industry asserted that fuller and more rapid conversion of the auto industry to arms production could not be expected. Tooling facilities of the industry are now being used to their fullest extent, they said.

I am glad to report that the United Automobile Workers has gathered facts which demonstrate that this is very far from the actual situation. In recent weeks our skilled tool and die workers carried through a survey of the machine tools in Detroit shops of the auto industry. Reports were received from 35 captive shops of the large auto producers and from 79 independent tool and die jobbing shops.

LESS THAN 50 PERCENT OF CAPACITY USED

It was found that the 4,624 machine tools in these 114 shops were idle 53.7 percent of the week. In other words, the tooling capacity of the auto industry (which determines the rate of possible conversion) is not now working at even 50 percent of capacity.

This single fact is the best demonstration that initiative by the defense agencies of Government, together with genuine cooperation from industry, will mean that our industry can make more than double the contribution so far asked of it in the arms program.

I am appearing here today to ask your help in assuring to the auto workers and the automobile industry an opportunity for full participation in the coming defeat of Hitlerism.

For this purpose the United Automobile Workers has a definite plan to offer for your consideration.

It has been drawn up by men who are admittedly not trained engineers. But they do have a full knowledge of industry and its technical processes—they have had experience with the various agencies now charged with responsibility for arms production. The plan is submitted, therefore, as one important contribution toward victory in the present war.

COORDINATED PROCUREMENT AGENCY

1. We call upon the President of the United States to establish in the immediate future a central body to coordinate and regulate policies of all procurement agencies of the armed forces. Only by such a measure can genuine planning and organization, essential to full production, be implemented. It will be the duty of such a centralized body to advance delivery dates on present arms contracts. It will, by placing contracts to the limit of productive capacities, guarantee that selfish corporate interests do not hold out essential equipment from the service of the victory program.

If the productive power of such an industry as the automobile industry is to be called on, an agency of this kind is imperative: for experience has shown that the initiative of manufacturers in this industry is not sufficient for an all-out effort. The continued refusal of certain major companies of this industry to

prepare for war work is a crime against the Nation which must no longer be tolerated. Auto workers will support any move by the United States Government to end this situation.

We call for this coordinated procurement agency empowered to place contracts upon the basis of standard costs wherever they may be fulfilled, and to demand full performance in the name of national safety.

In addition, such a procurement agency alone can be the instrumentality for effective subcontracting on military orders. It can write provisions for subcontracting into every contract let out to a major manufacturer.

2. Further, we call upon the President of the United States to establish a national industry council representing labor, Government, and management, as outlined by President Philip Murray, of the Congress of Industrial Organizations.

In each of the primary defense industries a similar council should be empowered to work out basic policy for the full utilization of productive power and for the successful conclusion of the victory program. Establishing basic policy for, and operating through such a procurement agency as has been described, these industry councils will unleash the giant forces of American industrial power.

3. We call upon the Supply, Priorities, and Allocations Board to meet at once with the representatives of the United Automobile Workers. Such a conference should lay the groundwork for establishing jointly with industry specific plans for the full conversion of the auto industry to military production.

ADDITIONAL STEPS NECESSARY

4. We call upon the Office of Production Management—

(*a*) To take immediate steps for the convening of a joint conference between its representatives and the representatives of labor and management in the machine-tool industry. Such a conference should be devoted to expanding the production of the machine-tool industry.

(*b*) To work out arrangements for the transfer, at Government expense, of displaced auto workers whose services may be immediately needed elsewhere in the expanding program of military production.

5. We call upon the Congress of the United States, in the interests of preserving civilian morale, in the interests of avoiding disruption to the established labor force of the automobile industry, to take the following steps:

(*a*) To appropriate additional funds for the purpose of supplementing present unemployment compensation payments. Such supplementary payments will be used to insure income to workers displaced through conversion unemployment during the waiting periods, to eliminate the disparity between present benefit payment levels and a living wage level, and to continue payments following established expiration dates.

(*b*) To appropriate the necessary sums for the payment of automobile workers as they undergo training for arms-production jobs which will be available in the months to come.

(*c*) To establish control of wholesale and retail prices without freezing of wage rates.

6. We call upon the automobile and aircraft industries to discharge their fundamental obligations to their workers and to the program of production for victory in the following ways:

(*a*) To provide a lay-off bonus for all displaced workers.

(*b*) To adopt immediate plans for conversion to military production and forget considerations of competitive advantage which have so far paralyzed any large move in this direction. Essential to this purpose are the following measures:

(1) The coordination of research and engineering resources of the industry in planning conversion.

(2) The use of auto-industry equipment in all possible cases for the manufacture of machine tools and machine-tool parts necessary for the retooling of automobile plants.

(3) The coordination of jobbing and captive tool and die shops for all-out production of jigs, dies, and fixtures needed to retool auto plants.

(4) The establishment of a 7-day workweek without sacrifice of established union conditions for all-out production in the conversion program. This will mean in the event that supplies of skilled workers are exhausted, the adoption of the upgrading principle as established in collective bargaining contracts.

Table of idle machine tools—Second Tool and Die Council survey

Machine	35 captive shops and departments		79 jobbing shops		114 combined shops	
	Number	Percent hours idle	Number	Percent hours idle	Number	Percent hours idle
Lathes	315	53.4	353	52.0	668	52.7
Planers	62	50.4	71	51.3	133	50.9
Shapers	301	61.0	291	52.8	592	57.0
Vertical mills	140	39.6	154	55.1	294	47.7
Horizontal mills	121	61.1	162	52.4	283	56.1
Boring mills	60	40.7	108	35.3	168	37.2
Kellers	45	40.9	29	44.1	74	42.2
Slotters	32	55.7	19	84.3	51	66.4
Small drills	346	48.7	481	57.0	827	53.6
Surface grinders	128	49.2	348	51.4	476	50.8
External grinders	101	59.8	166	48.1	267	52.5
Internal grinders	69	54.3	106	54.6	175	54.5
Cutter grinders	269	76.4	23	58.7	292	75.1
Screw machines	27	40.5	38	41.4	65	41.0
Bullard lathes	10	43.9	12	54.6	22	49.7
Radial drills	106	46.3	117	57.5	223	52.2
Jig borers			14	50.4	14	50.4
Total	2,132	55.0	2,492	52.6	4,624	53.7

SUMMARY

Shops and departments	Machine-hours available	Machine-hours idle	Percent idle
Captive (35)	358,176	197,057½	55.0
Jobbing (79)	418,656	220,252	52.6
Combined	776,832	417,309½	53.7

TESTIMONY OF R. J. THOMAS, PRESIDENT, UNITED AUTOMOBILE, AIRCRAFT AND AGRICULTURAL IMPLEMENT WORKERS OF AMERICA, CONGRESS OF INDUSTRIAL ORGANIZATIONS; JAMES WISHART, RESEARCH DIRECTOR, UNITED AUTOMOBILE WORKERS, CONGRESS OF INDUSTRIAL ORGANIZATIONS; WALTER REUTHER, DIRECTOR, GENERAL MOTORS DIVISION, UNITED AUTOMOBILE WORKERS, CONGRESS OF INDUSTRIAL ORGANIZATIONS; AND RICHARD FRANKENSTEEN, DIRECTOR, AIRCRAFT AND CHRYSLER DIVISIONS, UNITED AUTOMOBILE WORKERS, CONGRESS OF INDUSTRIAL ORGANIZATIONS

Mr. ARNOLD. Mr. Thomas, at our hearing in Detroit last September, we investigated the effect of the order curtailing civilian auto production by 50 percent. The figure on prospective unemployment which you submitted at that time has proved to be an underestimate, owing to the recent order further restricting production.

We are particularly interested in asking you, as we did the representatives of the automobile industry yesterday, what steps have been taken in the interval since our September hearing to meet the threat of unemployment and lagging war production.

Mr. THOMAS. Our organization has tried in every way to get additional work in the industry. There has been practically nothing done, however, to relieve the situation since that hearing. The atti-

tude of the manufacturers, I think, was expressed yesterday by Mr. Knudsen when he said we had been at war only 2 weeks. That is a fact; yet everybody knows, and has known for months and months, the direction in which we were going. I believe he did express the attitude of the industry in giving that response.

Mr. ARNOLD. At the Detroit meeting the desirability of more prime contracts in Detroit was frequently mentioned. Have additional contracts been let to the Detroit manufacturers since that meeting, to your knowledge?

Mr. THOMAS. Some tank contracts have been let, but nothing will be done on those jobs, I would estimate, for at least 6 months. That is because the manufacturers claim those contracts require the construction of new buildings. It is going to take at least that long, and they will have to rush at that, to make absolutely any showing at all within 6 months.

Mr. ARNOLD. We are particularly interested, in view of the outbreak of war, in learning whether, in your opinion, the factors which you named in September as restricting war production have since been eliminated in the war effort.

Mr. THOMAS. I don't quite understand your question.

Mr. ARNOLD. In the September hearing you outlined a number of factors that were prevalent in the Detroit area as being restrictive of war production.[1] Have they been eliminated?

Mr. THOMAS. No.

Mr. ARNOLD. And particularly we would like to ask whether, in your belief, the facilities of this industry, which controls one-third of the durable metal goods capacity of the Nation, are being used in the most effective way in the national war effort.

Mr. THOMAS. Are you asking that question with regard to raw material or machinery?

Mr. ARNOLD. With regard to all phases of operation of the automobile industry.

Mr. THOMAS. The productive capacity is not being used at all, if that is the question you are asking, neither in machines or buildings or men.

Mr. ARNOLD. Hasn't there been some conversion to war effort?

Mr. THOMAS. Very little.

Mr. ARNOLD. In the existing facilities?

Mr. THOMAS. That is right.

USE OF NEW FACILITIES

Mr. ARNOLD. I believe it was testified yesterday that some of the parts being assembled in the newly built plants are produced in the old facilities. Is that correct?

Mr. THOMAS. It is a very, very small percentage. I have here a wire. It shows what is happening. This wire is from our research department. [Reading:]

The Briggs Aircraft is using all new machinery; the Hudson Ordnance, all new machinery; Hudson bomber, about 10 percent old machinery; Murray aircraft, all jigs and fixtures had to be built new, some auto presses being used; Budd shell casings partly built in new plant, partly in old, in old plant using old machinery, in new plant using 50 percent new machinery; Packard aircraft

[1] See Detroit hearings, pt. 18, pp. 7259–7294.

engine, new machinery in new buildings, few departments in old plant which are on aircraft work use old machines, particularly automatic screw machines; no information on Kelsey yet. Recent survey Michigan Department of Labor and Industry shows in October 1941 only 14.4 percent workweek in auto industry devoted to defense work; 47 percent in auto parts; 69 percent in machine tools.

Mr. SPARKMAN. Will you please repeat those last figures?

Mr. THOMAS. 14.4 percent in the auto industry——

Mr. SPARKMAN (interposing). That is of what?

Mr. THOMAS. Of the workweek.

Mr. SPARKMAN. That is in terms of man-hours, isn't it?

Mr. THOMAS. Yes, sir.

Mr. SPARKMAN. 14.4 percent of the auto industry?

Mr. THOMAS. That is right.

Mr. SPARKMAN. Now the next figure?

Mr. THOMAS. 47 percent in the auto-parts industry.

Mr. SPARKMAN. That is still man-hours?

Mr. THOMAS. Yes.

Mr. SPARKMAN. All right.

Mr. THOMAS. 69 percent in the machine-tool industry—that is, in the tool-and-die job shops in the city of Detroit.

Mr. SPARKMAN. Thank you.

Mr. THOMAS. I would like to ask a question on procedure. When you are asking me these questions, if these gentlemen who are with me can elaborate on or explain these figures, would you like to have them answer?

The CHAIRMAN. Yes.

Mr. FRANKENSTEEN. I would like to give you a few statistics on the Chrysler Corporation. I was here yesterday, and I think some of the figures given were, to say the least, erroneous.

DEFENSE EMPLOYMENT

I have some specific figures on the Dodge plant, with 25,000 employees. It is not an assembly plant, it is a manufacturing plant. Only 25 people out of 25,000 are engaged in defense work, and they are working on the guns. That plant is a huge plant; it has tremendous floor space, a foundry, a heat-treat room, a core room, and an excellent machine shop; and yet only 25 people are engaged in defense.

Mr. SPARKMAN. May I interrupt you?

Mr. FRANKENSTEEN. Surely.

Mr. SPARKMAN. Unfortunately, I don't have my notes of the Chrysler testimony yesterday. What was the testimony of Mr. Conder?

Mr. FRANKENSTEEN. Mr. Conder gave testimony that there would be 50,029 people engaged during the month of January in the Chrysler Corporation, that 16,272 had been laid off, out of a total of 66,000 on the pay roll. That figure is based on a normal month. It is based on an expectancy of production that certainly was applicable long before the happenings of 2 weeks ago.

First of all, the production of automobiles has been cut only 25 percent of the total output of automobiles to be used for the month of January, even if they have the tires. That figure contemplates production as usual.

Mr. Conder said there were 21,000 people on defense in the Chrysler Corporation. There are only 12,000 people working on defense in the

Chrysler Corporation. The figure of 21,000 that he gave you takes in all of the truck employees, those employees who work on all kinds of trucks, the parts assembly in other plants of the corporation. Actually, there are 12,000 people, including those who are making Government trucks, engaged in defense in the Chrysler Corporation.

Mr. SPARKMAN. I believe that explanation was given us—that all trucks for civilian uses and for Government use came down the same line, and that the number of workers could not be distinguished or broken down. He made that statement.

Mr. FRANKENSTEEN. That is right; but 21,000 is certainly a glowing picture of defense workers.

Mr. SPARKMAN. I just wanted the record to show that. I did not want the record to show that there was a deliberate effort to give us erroneous information, because he did make that statement.

Mr. FRANKENSTEEN. Unless there are 14,000 truck orders issued to Chrysler between February 15 and May 15, the Government truck line in the Lynch Road plant, which is the big truck line, will be down for 90 days. There is a tooling change-over; the new tooling won't be ready until May, and unless they can get these other lines going, that plant will go down also, and that figure again, of 21,000, will take on a bad look.

Mr. THOMAS. When you are talking about civilian and Army trucks, I don't think it is quite true to say that you add them in together, that you can't split up such production. There are 100 men working on a line producing, let us say, 50 trucks a day. If 25 of those trucks are military trucks, it is obvious that it is going to take just half of the men to put out those military trucks.

Mr. ARNOLD. In other words, they could tell from the completed trucks how many men were engaged on defense work?

Mr. THOMAS. That is right.

PLANTS NOT CONVERTED

Mr. FRANKENSTEEN. In the other plants, at DeSoto, out of 2,600 workers, only 150 people are working on defense. There is no reason in the world why that plant couldn't be converted to other uses.

Then there is the Plymouth plant, which is a modern building. It is long, and has high corridors. It could be utilized for aviation production. Yet in the Plymouth plant only 350 people out of 11,500 are working on defense. That plant is, as I say, well equipped; it has a fine machine shop; it has a great big, high ceiling; it is perhaps a mile or a mile and a half long—one of the longest plants in the world—and yet nothing is being done in that plant in the way of defense work.

Mr. CURTIS. Is anything being done there?

Mr. FRANKENSTEEN. They have been building Plymouth automobiles.

Mr. CURTIS. I can't see anything sinister or unpatriotic that has been shown to this committee about the automobile industry. Who do you think is responsible for conversion, and what are you advocating—that the companies be destroyed and that the Government take them over? I think these companies have been very diligent in attempting to secure Government contracts. There has been nothing placed before this committee to indicate the contrary.

Mr. THOMAS. I think they have been very diligent in trying to get new factories, new machines, and new equipment. I think they have been very diligent in that, and every time they testify before any Government committee, they claimed that they can't use their present equipment. We are trying to show that they can use it.

Mr. CURTIS. I think that you will find that the universal experience of manufacturers over the country, not alone in the automobile industry, is that they find it quite difficult to get a Government contract. Now, I am not blaming anyone. I think all of these men are doing a patriotic service. I think Mr. Knudsen has a tremendous load on his shoulders, and he is a fine, patriotic man. I don't want to be critical of anyone. But the fact remains that these Government contracts are hard to get, and I don't like to see this committee used to foment and create a clash between management and labor when there is no evidence here that the automobile industry hasn't tried to get all the defense contracts it can handle.

FACILITIES ALREADY AVAILABLE

Mr. THOMAS. We are not discussing that problem. I think perhaps they have been recently trying to get defense contracts. But we are saying—and you seem to miss the point completely—that every time they got a defense contract they wanted a new plant and new machinery to go with it.

I think I testified before about General Motors Corporation—and I think Mr. Knudsen had something to do with this—about building a new plant in the city of Chicago to turn out Pratt & Whitney motors, when in the city of Flint for months and months there is going to be practically a blacked-out city in this country, as far as production is concerned. When we brought it to Mr. Knudsen's attention, Mr. Knudsen told us that was done because there was going to be an overdemand for labor in Flint. There are not enough contracts in the city of Flint today to take care of the men who have been working on automobile production in the city of Flint.

Mr. FRANKENSTEEN. May I say, too, that we are not interested in indicting anybody, but we think your committee is entitled to know that these plants are available and to be informed of the kind of facilities that are there.

Whether the fault lies with the industry or Government is not for us to determine. We know that the facilities are there, and that they are not being used. Our people want to work, and whether the fault lies with the Army, the Navy, the Procurement Division, or Mr. Knudsen, or the manufacturers, we don't particularly care. We do want to get our people to work producing the things that are necessary.

Mr. CURTIS. I realize you are very anxious to get jobs for your members, and I think that that is a worthy objective, but at the same time I think the businessmen of America and the factories have been very diligent in trying to get defense orders.

Mr. REUTHER. We are of the opinion that unless the full resources and the over-all productive capacity of our industry is fully mobilized, we won't be able to carry out the victory program, and to a very large extent the question of victory or defeat in the present conflict will hinge upon our ability to organize and mobilize our industry. There is no other industry in the world that has such a tremendous unused potential as ours.

INDUSTRY'S RESPONSIBILITY

Now, that raises the question of the responsibility of the people who own and operate these factories. We don't think that their obligation is only just to sit by and wait until the Government brings a contract. We think they ought to use their engineering and managerial experience to help formulate a program that will make it possible to get the full mobilization of that industry behind the war effort.

Industry hasn't done that. My particular responsibility is handling the affairs of our union in the plants of General Motors, and I am very familiar with what they have been doing, and I know that the General Motors Corporation, as far as trying to use their automotive facilities for the production of war materials, have done very little.

The over-all figures that they give you, in terms of dollars, of their war effort, do not reflect the true position that they occupy in the industry, because the bulk of their work, their war production, to date is being done in plants that were constructed especially for war production, and if you will take out of their over-all war production the amount of work being done in newly constructed plants, and then take out of it the automotive work that is part of the military, so that that reflects the actual amount of conversion, you will find that a very, very small percentage of General Motors' productive facilities were converted for war production.

And I would like to supplement that by giving you some figures of the situation in Michigan, which is the main center of the General Motors operations, and in Flint in particular.

SITUATION IN MICHIGAN

In the city of Flint, in June of this year there were 43,211 people on the pay roll—that is, hourly rated workers on the pay roll of the General Motors Corporation in the city of Flint. Based on the figures that Mr. Wilson, president of the General Motors Corporation, gave you in the conference in Detroit, on the basis of a 40-hour week, there will be 12,940 people working on the 1st of February. If you take out of the 12,940 people who will be working on February 1 of next year those people who are working on trucks, I don't think you will find that, out of the 43,000 people who were on the pay roll in June, more than 4,000 of them are on purely defense work in the city of Flint, and that is true all the way through the General Motors Corporation.

In the State of Michigan, there were 128,516 General Motors employees on the pay roll as of June 1941. On the basis of a 40-hour week, in Michigan there will be 96,000 fewer people working on defense in February.

We are not interested in just criticizing, because we realize that that won't create goods and it won't create jobs. What we are concerned about is our desire to see industry and labor and Government sit down in a sensible way and begin to work out a constructive, practical plan by which these unused facilities can be brought into the whole war effort. We think that that can be done. We proposed a plan more than a year ago which, if they had carried it out, would have made it possible today not only to take care of the unemployment problem but also to speed up defense production. Where we are now getting one tank, we could be getting 3 or 4 tanks. Where we are getting one airplane, we could be getting many more.

These are the things we are interested in, and our testimony here today is primarily concerned with trying to give you people an understanding of what can be done if industry is willing to go along, and if Government is willing to give leadership to the effort.

Mr. Arnold. Don't you think the automobile industry would have been better off if they had started converting at the time you recommended?

1942 MODEL

Mr. Reuther. Just a year ago we submitted a plan to the President of the United States, and our plan called upon the industry to agree to postpone the tooling for the 1942 model and thus release, for tooling for defense, some 25,000 of the most skilled mechanics in our industry, plus a large group of technicians who do the designing and the engineering.

At that time the industry said that they were not willing to postpone the tooling for the 1942 model, but they would agree not to have a 1943 model. At that time we pointed out that agreeing to sacrifice a '43 model was a completely empty and idle gesture, because it didn't contribute to the immediate conversion of the facilities for war production. Instead of actually taking us up on our proposition, and taking these 25,000 mechanics and putting them to work building the special tools, dies, jigs, and fixtures that are necessary to be adapted to the basic production machinery for conversion, they went ahead and made a new model, and I think that the industry made a terrific mistake, because they put more gadgets—we in the industry call it the "Christmas tree model"—more shiny things on this year's model than ever before. From our point of view it reflected a complete misunderstanding of what we were getting into.

If they had taken these 25,000 toolmakers, and instead of making these gadgets for a new model, had put them to work building the tools, dies, jigs, and fixtures, we could have adapted those now to the basic machinery, we could get the industry into full war production, and our people would have work.

At the time we raised this argument for not having a 1942 model, they told us that the American public demanded that they put these gadgets on. We doubted that, because we considered such a statement to be a reflection upon the patriotism and the intelligence of our people; we said that if our people knew that this industry had to make its contribution to war production, the people would be willing to ride in automobiles without the shiny gadgets.

Mr. Thomas. I would like to make plainer some of the things we have been bucking our heads against. You don't have to take my word for this. The committee can come out and look the situation over. Even though the automobile industry should have known the difficulty this country was having with steel and other metals, the average 1942 automobile was heavier than the 1941 model. I think that goes for 90 percent of the industry.

The decision was handed down that after a certain date—I think originally it was set for the 15th of December—no bright work should be used. But all 1942 models, or practically all, had twice as much bright work on them as they had ever had before.

I don't know what you call it—neglect or what—but I certainly don't call it patriotism. There might be some other word for it.

But it is either poor judgment or actual sabotage, I don't know which.

Mr. ARNOLD. What is your belief as to the object of the automobile industry in not converting their existing plants? Do you think they thought they could go ahead manufacturing automobiles?

BUSINESS AS USUAL

Mr. THOMAS. I have talked with the heads of various companies in the industry. I think the automobile industry felt that they should go on with "business as usual"; and that any national-defense program should be superimposed upon a program of "business as usual" in that industry. There is not a man in the industry who knows the industry better than Mr. Knudsen does. And I think the statement he made here yesterday admitted that fact by implication when he said we only got into the war 2 weeks ago.

Mr. SPARKMAN. Mr. Thomas, in that connection, don't you think that that spirit has very largely prevailed throughout the country, and not just with the automobile industry?

Mr. THOMAS. It perhaps did with the rank and file of Americans. But Mr. Knudsen, every time I talked to him, was telling us how we should rush to do certain things. And it seems to me that he could have done a little more rushing himself.

Mr. REUTHER. In all of the conferences with the executives of our industry at the time we proposed our plan a year ago, there was evident an attitude that the automobile industry could superimpose its war efforts upon normal production, and that it was going to be able to continue its high-production schedules.

One of these industrialists raised the point that because of war spending there was going to be a considerable increase in purchasing power, and more people would be buying automobiles, and that instead of curtailing automobile production, they would actually need an increase to meet this demand.

We pointed out that there would be a very serious shortage of critical defense materials, and that that wouldn't be possible; but we could never get them to accept the idea that you couldn't superimpose a war economy upon a normal economy.

I would like to quote, in conjunction with this question you asked about why the industry didn't understand this, from the December 6, 1941, issue of Business Week, which is a trade magazine published by the McGraw-Hill Publishing Co. This is an article discussing the automobile shutdown, and what is going to happen to our industry because of the curtailment. [Reading:]

> Influencing the attitude of the manufacturers is the fact that their prices will soon be held down by Henderson. Regardless of the present issue, they see rising costs, as production quotas decrease, with the likelihood that it will soon be just about as profitable to build tanks as to build automobiles.

BASIS FOR ATTITUDE

That is the key to their attitude. The automobile industry has been a very profitable industry because of mass-production techniques, and the industry didn't want in any way to interfere with their production schedules because that is where they made their money. As you cut down the volume in a mass-production industry, the law of diminish-

ing returns sets in, and it becomes unprofitable because the volume is too small. Now they are scouting around—these same people whom we couldn't interest in defense production a year ago—coming to us now and asking us to come down to Washington and put pressure on the Government to get them defense contracts.

It is only because they now realize that because of priorities and the shortage of critical materials they won't be able to maintain production schedules of automobiles, that they are now interested in defense production; and I think that is a crime against the defense effort, because these people have known all along, as they know now—some will admit and some won't—that the basic production machinery in the automobile industry can be converted to defense production with the proper adaptation of the special tools, dies, jigs, and fixtures, and many new defense plants are being equipped with machinery that duplicates the very machinery that will stand idle in our factories this winter.

Mr. ARNOLD. We will probably need all those facilities. Do you think now they will be ready to convert?

ONE YEAR OF VALUABLE TIME LOST

Mr. REUTHER. Yes; I think that the industry will be much more willing now to go along with the program of conversion. But we have lost 1 year of very valuable time. Furthermore, unless they approach the problem of conversion on an intelligent basis of coordinating the over-all facilities of the industry, both as to tooling and to the question of organizing for production after tooling, it will take them months to get under way, and their rate of production will be much lower.

Mr. THOMAS. In the present war effort we talk about a united country, and I think it is going to take all the ingenuity of management, Government, and labor to get this thing set up properly.

I agree with Brother Reuther in what he says—that they will now be looking towards conversion in a better light than they did before.

I prophesied some figures on unemployment, at your September hearing, which Mr. Wilson and others of General Motors said were foolish; and now, as one of the gentlemen said, it appears that I was too optimistic, that more men are being laid off than even I had predicted.

Representing labor, the men working in the plants, we know something about this problem. We predicted what would happen. And I now predict that we will still have the same trouble in trying to point out to industry anything constructive in getting that conversion over as quickly as possible. I predict that industry will still resist, and they will think that they have a monopoly on the brains. They will resist anything that labor or Government will try to offer them in the way of advice.

NEW PLANTS

Mr. CURTIS. Isn't it true that the defense effort in New Jersey and St. Louis and southern California and elsewhere has been largely in new plants? I am not justifying it, but I am asking the question. Isn't it true that most of our defense manufacturing throughout the entire country has been in new plants?

Mr. THOMAS. In California, I think, it is true. Practically all you have in southern California is an expanding aircraft industry.

Mr. CURTIS. The mayor of St. Louis complained to us about the building of a new factory and putting in three or four machines that were being made new, when they had eight of them on hand in St. Louis.

I am not an engineer, I don't know how far you can convert and how far you can't. But it seems to me that the situation as to building new plants is something that is not peculiar, necessarily, to Detroit, or to the automobile industry, but to the entire country.

Mr. THOMAS. That is true, but that doesn't prove that it is the correct line to follow, does it?

Mr. CURTIS. No, no; I am not trying to justify it. I am admitting that I am not an engineer, and I don't know how far you can go in conversion.

Mr. THOMAS. The thing that I am afraid of—and I don't say this maliciously—is that today management is thinking more about wiping out deferred maintenance costs, getting new plants, getting new machinery. I think that they are thinking more of the post-war period than of the present period.

USE OF OLD MACHINES

Mr. FRANKENSTEEN. Yesterday Mr. Knudsen made the statement that 25 percent of the tank contracts could be sublet, but that the tank contract was given to Chrysler intact. Mr. Conder made the statement that 50 percent of the machinery used by the Chrysler Corporation in defense production was old machinery which had been converted. I think that indicates, to a degree, the ability, without the technical knowledge, that the industry has of making these machines over to essential defense uses.

Mr. SPARKMAN. Isn't it true that a lot of this machinery which will be needed in defense production will not be useful after that program is over? Mr. Thomas, you just said something about post-war thinking and planning.

Mr. THOMAS. You don't use as much specialized machinery on defense work as you would in normal automobile production. I will say that. It is more likely that the machinery bought for defense purposes can be converted more easily than the way we have to go now. That applies to a large percentage.

For instance, an automobile is built on a production basis. For the war effort, except to build shells, I don't know of anything that takes specialized machinery.

I happen to know that the Continental Motor Co., which is turning out aircraft motors, needs some additional screw machines right now. Now, a screw machine is not a special machine at all. I know where there are lots of screw machines standing idle. There is just no reason, as far as I can see, why the Continental Motors should be going around looking for screw machines.

Mr. SPARKMAN. Well, now, as a matter of fact, under a law which we have recently passed, can't Continental appeal to the War Department or the Secretary of War?

Mr. THOMAS. I have some representatives here in Washington now who have been contacted by that company, asking that they go to the O. P. M., and see if they can secure those machines.

Mr. SPARKMAN. We enacted such a law within the last month or two.

Mr. REUTHER. The question as to how to get the machine, the defense job, and the man together, so the same three can work on the job, is the crux of this whole problem of converting and organizing an industry into an all-out war production.

RESUBMITS PLAN

Our industry is highly competitive, and you haven't got the teamwork between one company and another that you might find in some less competitive industries. The trouble here is that there is no over-all agency to plan and supervise production. You can't expect due process of law to jar a screw machine out of one plant and get it to another; the war will be over before that process can carry through. There has got to be an agency, with its technical staff, planning and following through with day-to-day detail, and that is the thing that we planned. I would like to submit, before we leave, copies of the plan we submitted a year ago.[1]

What we called for at that time was an over-all management production board, made up of Government, labor, and industry, and this board would have the authority and the responsibility for organizing and supervising the production of war materials in our automobile industry. They would hire a competent technical staff. This technical staff would work out the technical aspects of production and carry those through. Without such an agency, the automobile industry never will make its contribution, because unless such an agency comes into being, it will be an impossibility to coordinate the over-all productive facilities of our industry.

The same thing is true of tooling. We get no satisfaction out of being able to say today, "We told you so a year ago." Our people are on the streets, and the war effort is not being pushed. Many of the things that we said a year ago are still true, and certainly if we are now going to try to get a quick conversion, such an agency will have to be created immediately.

ADAPTING MACHINES

We proposed, at a conference we had in Detroit last Saturday, where we had some 350 of our key people from all over the industry together, that if such an industry agency were created, this top management production board then would hire their technical staff, and we could get into tooling. There are two problems in tooling, in converting an industry. One is the building of the tooling program—tools, dies, jigs, and fixtures which you adapt to the basic machinery in the industry. You have a milling machine, say, that makes a Chevrolet part. You can move that machine into any other factory, and by changing the jigs, fixtures, and cutters you can machine some other part for defense.

Mr. SPARKMAN. When we speak of converting a plant to wartime production, does that necessitate the shoving back or removing of a major portion of the machines, or can you use the same machines with added parts or changed parts?

[1] See p. 9561.

Mr. REUTHER. In what we call a manufacturing plant, where they do machining, and as an automobile motor plant that has general machining equipment, the machinery can be adapted to the production of airplane motors or tank motors or tank parts by adapting to the basic machine—say a milling machine, a boring mill, a grinding machine—special jigs and fixtures and cutters, depending on the nature of the machine.

Now, that is the whole tooling process that we go through each year when we make a new model—nothing more than the adaptation to the same basic production machinery of new tools and fixtures. That is the tooling program, and that is the job that we proposed should be done a year ago by postponing the new 1942 model so we could put 25,000 mechanics to work on that.

Mr. SPARKMAN. I still want to know this. What percentage of the basic machines could be utilized in that way? In other words, had your program been carried through, what part of the industry would have been converted?

Mr. REUTHER. There are some plants where the conversion could have been 98 percent; there are other plants where it could have been 50 percent. It would vary, depending upon the nature of the plant. You would need some new machines. We admit that, and we have stated that all the way through. But the thing that we pointed out a year ago was that the machine-tool industry was overtaxed, not because of the defense effort but because of the fact that new plants were going up and the machine-tool industry was being called upon to duplicate machinery that was going to be idle in our industry.

SHOULD AVOID DUPLICATION

What we propose be done is that we work out, again through this top production management board and our technical staff, the use of existing facilities by conversion, and thus relieve the machine-tool industry of this tremendous job of duplication and permit them to concentrate on that percentage of machines that had to be built specially for defense production. That still is possible.

We had a situation just 2 weeks ago wehere some of our representatives were meeting with the Mack truck management in New Brunswick. They aren't able to step up the production of transmissions for the M–3—that is the 28-ton tank. Mr. Knudsen referred to that yesterday, and stated that the transmission capacity was limited. They are being held up because they need certain universal Gleason gear cutters. Those gear cutters are standing idle now in the city of Detroit, and yet they are waiting for those from the machine-tool industry.

What we propose to do is to create an agency which has sufficient authority to approach this thing in its broadest aspects. That agency can go in and say, "O. K., if we need so much transmission capacity, we are going to use that capacity, no matter where it is, who owns the machines, or where they may be standing. We are going to get that capacity together on an industry-wide basis."

Thus we will relieve the machine-tool industry of the task of duplicating the gear-cutting machines so that they can concentrate on that

percentage of special machines we must have to fit into the over-all production process.

Mr. CURTIS. As Congressman Sparkman said, Congress has passed legislation granting authority for that very thing to be done—to lift a machine from any place and put it down in any other place.

NEED DIRECTING AGENCY

Mr. REUTHER. There is no agency to implement the law. The authority is there, but it is a question of creating the agency to implement it.

Mr. ARNOLD. Isn't the War Department the agency to do that?

Mr. SPARKMAN. The Secretary of War, the Secretary of the Navy, and the President.

Mr. REUTHER. It is one of these practical managerial things that you have got to follow through with a technical staff, and no agency in America is equipped to do that job.

Mr. SPARKMAN. Did you read our recommendation about the creation of the civil agency to look after procurement? [1]

Mr. REUTHER. We think that your recommendations are very sound and practical, and we think they are along the lines that we have been discussing for the last year. They represent a very realistic approach to this whole question of how we are going to get maximum war production.

Mr. ARNOLD. Labor seemed to have the correct view a year ago. Suppose industry had converted at that time. Hitler said that this war would be over by the end of 1941. If the war had ended then, industry would have been in pretty bad shape, wouldn't they?

Mr. REUTHER. We made it clear that one of the things that you couldn't expect was that any one automobile company should step out and say, "We will convert our plants to defense production," because that would destroy its competitive position in the industry. But if the Government moved in with an over-all production planning agency, and all companies were treated on an equal basis, then no one would be penalized and they would all maintain their respective competitive standing. But there was no agency to get anybody to move because no one would take the initiative.

Mr. THOMAS (to Mr. Arnold). I think the correct answer to your question, though, is much simpler. You say, Wouldn't they have been in pretty bad shape if what Hitler had said had come true? Well, if Hitler had been correct, then Hitler would have won the war and if Hitler won the war, I am afraid that nobody now in the automobile industry would be very much interested in that business. Hitler would have more interest in it than any one of us.

Mr. SPARKMAN. Let me ask a related question, but looking to ultimate victory for us. Suppose, instead of building new plants, you converted the existing plants to war production—that would take care of the slack now and enable your people to work continuously or regularly?

Mr. THOMAS. It wouldn't now.

Mr. SPARKMAN. I am assuming that it had started early enough.

Mr. THOMAS. Yes.

[1] See Second Interim Report, pp. 19–24.

PRIMARY AIM

Mr. SPARKMAN. Now, when this war is over, and the demand comes for automobiles for civilian uses, you have got to reconvert?

Mr. THOMAS. That is right.

Mr. SPARKMAN. Aren't you going to have a lag then that will be just as long as the lag now, and perhaps much more disastrous?

Mr. THOMAS. There will be a lag anyway. But I think America has got to make up its mind today as to what its first objective is. Is it winning the war, or is it thinking about a few years from now, when the war will be over, of getting back into production then? I think that our first aim should be winning the war.

Of course, there will be a lag at the conclusion of the war, even if we win; but I think that that lag will be there regardless, because it will take time to get tools and dies and mechanics back. It doesn't matter whether they build new plants. If you let an automobile plant stay idle for 5 years, you can't just go in and snap your fingers and start off.

Mr. FRANKENSTEEN. Unemployment is a major problem with us, but not the major problem. Our people are used to 8- or 10-week lay-offs. I don't think we would be here, or that there would be so much discussion on the part of your committee, if it were just an ordinary lay-off. The point is that our people ought to be utilizing their activity in building the things essential to the defense of this country.

Mr. THOMAS. We think that had our ideas been carried out long ago there would be enough bombers and other war equipment so that we could be attacking Japan today, rather than sitting back and fighting defensively. We are in a critical position just because the whole war program has been held back. I am not accusing anybody of responsibility for that, but I do say that there is a great lack of coordination. And our people do want to win the war.

Mr. SPARKMAN. Well, of course, the airplane production—you used that as an example—is beyond what it was predicted it would be.

Mr. THOMAS. Yes; that is true. But, also, the appropriations that you gentlemen are making in Congress today are far beyond what you expected to make when you started out. When you set up any program, that doesnt mean that that is going to be your ultimate program.

GERMAN PLANT OF GENERAL MOTORS

Mr. SPARKMAN. Now, I should like to ask your comment on the statement that Mr. Knudsen made to us yesterday, that of the two General Motors plants in Germany, one of them, at the last report he had, which I believe he said was about 2 months ago, still had not been converted to wartime production. That is in Germany, where we think of efficiency as being at its height.

Mr. THOMAS. This is the first time I had heard of that. I would like to ask a question, if I may be permitted. Did he say anything about whether the machinery had been taken out of that plant?

Mr. SPARKMAN. No, that question was not asked him. We simply asked, I believe, whether it had been converted.

Mr. SPARKMAN. Of course, the inference which I think we all fairly drew from it was that the plant had been left idle and none of it was being used.

Mr. THOMAS. We are not saying that every automobile plant can be used. For instance, I worked in a plant that perhaps couldn't build tanks, because it had wooden floors, and those floors won't carry a tank, and it had very low ceilings. But what we are saying is that the major part of the facilities can be used.

For instance, Mr. Frankensteen mentioned the Plymouth plant, which is a new plant, and one which I have been in many times. It has very high ceilings. And many other plants are the same way, and could be converted. We are not saying that all of them could be. Maybe that plant they have in Germany is an old wooden plant that won't carry anything.

Mr. REUTHER. Mr. Knudsen was talking about the Opal plant, which is the General Motors plant in Germany. I had an opportunity to go through that plant some years ago, and I think the point he made was that at the time that they were operating at peak production on passenger cars, they had 22,000 workers in the plant, and at the present time there are only 5,000 people in the plant.

Now, he didn't say—and I listened to him very carefully—he didn't say that they hadn't utilized or fitted the equipment into the over-all war effort. What he said was that there were 22,000 originally there, and now only 5,000. What they may have done is problematical. They may have shifted their production so that they could absorb only 5,000, but they may have shifted a lot of machinery out of there to other plants.

The English experience proves that that can be done, and I am familiar with the British automobile industry because I had a chance to study it. They have converted to war production. I think Mr. Taub, who worked on that job, told you that.

Mr. Knudsen didn't say that the machinery was standing idle in the Opal plant. They probably did shift a lot of their machinery. I don't think that the industrial capacity of Germany could have created the tremendous mechanized armed force which they have, and which we have seen march over and destroy civilization in Europe; they couldn't have created that in the period in which they did create it unless they fully utilized every machine and every man in their country; and if we do the same thing in our country, and organize production on an industry-wide basis, coordinating these facilities, we can produce 10 tanks to every tank they build, and 100 airplanes to every one they build. But we aren't utilizing our facilities, that is the trouble. And we are interested now—I am not talking about the past—we are interested in doing what we can now to speed this thing up.

WILLING TO DEMONSTRATE

We have proposed many times that if our arguments on technical matters are questioned, let's don't discuss them around the table, let's go into the factories and let's see whether the machinery we say can be converted to war production is convertible or not.

We made that offer, we made it a year ago. We proposed to Mr. Knudsen that he arrange to have the union and Government and

management—and we told him he could take some newspapermen with him if he cared to—go into these plants, and we told him, "If we say we can build tanks in this plant, and aircraft motors in this plant, and wing assemblies and fuselages in this plant, don't just discuss it because we said it could be done, but if you think that technically it is not feasible, let's go into the factories and look at the machines and see what can be done." But we were denied that opportunity.

Now, labor is trying to make its contribution, and we think that certainly it is asking little if the people who have created this wealth, who have built these things all their lives and know something about the technical aspects of it, say, "Give us a chance to go into the factories and prove that what we are saying is feasible." Mr. Knudsen said that he "couldn't obtain the authority" to get us into the factories.

We don't think that a democracy, trying to mobilize its all-out efforts, ought to function on that basis.

Mr. ARNOLD. (to Mr. Thomas): I remember in Detroit you said that the tool makers were not being utilized fully at that time.

You heard the representative of the Ford Motor Co., I believe, say yesterday that they were being utilized now and that any toolmaker could get a job. Do you agree with that?

Mr. THOMAS. I think they are being pretty well utilized at this time.

Mr. ARNOLD. That is, for war effort?

Mr. THOMAS. Yes.

7,000 TOOLMAKERS AVAILABLE

Mr. WISHART. One exception might be made there. You had at least 7,000 toolmakers in the city of Detroit a few weeks ago who were engaged in regular automobile production. With the curtailment of that regular production, you will have that force of 7,000 men who can be swung immediately over into the tool and die work involved in this conversion program.

More than that, of course, the union has worked out agreements on upgrading—that is, raising production workers or machine-shop operators to positions in the toolroom where they can contribute their services on specialized operations in turning out the tools, dies, and fixtures necessary for defense conversion. So we don't think that labor, in that particular place, will be a bottleneck.

Mr. ARNOLD. Do you believe, from your experience there in Detroit, that they will utilize all these men?

Mr. THOMAS. Yes; they will now.

Mr. FRANKENSTEEN. The question, though, is now how they will utilize them, whether to the greatest extent of their ability or not.

We have proposed a pooling of the resources of these people—in other words, utilizing the entire group of tool and die makers, utilizing these jobbing shops to sublet the work of the plants into these shops, and thus avoid keeping these people engaged on an activity that is part defense and part nondefense.

Mr. REUTHER. One of the troubles is that the prime contractor has a thousand and one problems dumped in his lap, and he cannot break through the bottleneck of tooling. That is one reason why we want

this over-all top agency to be able to farm out this work and get the tooling job, plus the production job, into as many companies as possible.

That simplifies the engineering and tooling problem, and gets us into production much quicker. But that is not being done. There are a lot of tooling facilities that can be developed on a coordinated plan, but they will not be developed if each prime contractor is out on his own. We are going to be months and months getting into production because the prime contractor can't break through this tooling bottleneck.

WOULD SUPPLY UPGRADE TRAINING

Concerning the upgrading that we proposed—and which Mr. Anderson of General Motors discussed yesterday—months ago the union started to push for upgrading. We said, "If we haven't enough skilled mechanics in the tool and die trades, we agree to pick out the most skilled workers on the production mills and we will give them intensive training for a few weeks and then move them into the toolroom milling machines."

And we can do that, and we can step up our tooling considerably. It is proved by our survey that some of the tooling machinery itself—that is, lathes, milling machines, shapers, and toolroom equipment—is being utilized to the extent of only 50 percent. We can upgrade enough people to keep that going 100 percent, and if necessary there are certain machines on production—what we call universal production machinery—that can be brought into a tooling pool until we get the tooling job done.

If we have this over-all agency we can do the tooling work in half the time that it is going to take by the present approach.

Mr. FRANKENSTEEN. Another factor that hasn't been brought out with regard to these tool and die makers is that each company tries to protect its own interests by maintaining these workers, even when their work is utilized on the basis of new jobs coming in. If you had a central agency, full activity could be directed toward the actual work that was essential to be done. That hasn't been worked out.

PRESENT PROGRAM INADEQUATE

And may I raise another question on this training program? At the present time, when we are looking forward to what is going to come in the next year, there is a very inadequate training program among the auto workers who are not in the skilled brackets. For instance, in the trim, paint, foundry, and inspection units, there are thousands of workers who are not being trained to go into defense work when it will become essential.

Now, we are all looking forward. The figures that were given yesterday looked forward to the utilization of the majority of these people in defense. Today is the time to start training these people for the jobs that they are going to have to do. We should not wait until the need becomes so great that another bottleneck is created.

I think there again that a central planning agency could utilize the activities of these people, hold them in the community so they don't migrate—which is one of the questions raised yesterday—keep them in a central spot by training them, give them a sufficient wage while

training them, and break them into the industry as the needs become apparent.

Mr. ARNOLD. Mr. Thomas, are those airplane-engine plants in Chicago, which you mentioned, in operation now?

Mr. THOMAS. They just have a few hundred men—I think around 400 at the most—and a great many of those 400 are maintenance men.

Mr. ARNOLD. Are those plants bidding for your mechanics now?

Mr. THOMAS. They are transferring a few, but most of the people whom they have been taking up to now are N. Y. A. trainees in the city of Chicago. I stated, if you will recall, that I thought they would have difficulty, in the city of Chicago, getting experienced men for that plant. And that is true; they are having difficulty.

MIGRATION OF UNEMPLOYED

Mr. REUTHER. One of the things that General Motors is worrying about in Flint is that the amount of unemployment there will force a lot of their people to go to other communities; and when they do get back into production in Flint, whether it is a year from now or longer, the functioning organization, the personnel will be dissipated and disintegrated so badly that they won't be able to operate efficiently.

That is why we are interested in starting training programs and in doing anything we can to try to hold the organization and the top personnel together in these various communities, because they operate these plants.

Mr. ARNOLD. Let's get back to the unemployment. The Michigan Unemployment Compensation Commission estimated yesterday that approximately 20,000 would be unemployed in the State of Michigan alone. What would be the effect of the new curtailment order on employment in the automobile industry nationally, Mr. Thomas.

Mr. THOMAS. I think the figure given to you by the Michigan Unemployment Commission is too low. I think it is going to run up better than 300,000 for the State of Michigan. Nationally, in our industry, it could go as high as half a million.

Mr. ARNOLD. Mr. Frankensteen, to what extent has the automobile industry been able to secure subcontracts for the production of airplanes?

Mr. FRANKENSTEEN. There are two major plants of the automotive industry in the city of Detroit, the Briggs Manufacturing Co. and the Murray Body Manufacturing Co., which have gone into airplane production, one having built new plants and the other having converted, but neither has had very much success in output. Murray Body has yet to turn out its first wing assembly.

I think the problem there is one of getting sufficient supervision and proper direction to make it roll. They are just not doing it.

AUTO WORKERS ABLE TO DO WORK ON PLANES

Mr. ARNOLD. Have the automobile workers been readily transferrable to such aircraft work?

Mr. FRANKENSTEEN. Yes; they have. I think a good example of the convertibility of the auto workers to defense work can be shown in the Continental plant. The statement of the management of Continental is that they have had 100-percent efficiency in the transfer of

auto workers into their plant, and yet they had a 40-percent turn-over in people who have been hired at the gates. In other words, the auto workers, with their experience, have been able to step in and carry through.

NUMBER OF WORKERS IN DEFENSE WORK

Mr. ARNOLD. What percentage of Chrysler nonautomotive defense employment is in new plants and what percentage is produced with their regular automotive facilities?

Mr. FRANKENSTEEN. Chrysler converted the old Graham-Paige plant to production of Martin bombers. They have only 400 people, perhaps 500 at the present time, employed in that plant. There are 5,800 people in the tank plants. Other than that, all of the workers, the other workers, are in the old plants of Chrysler. There are about 6,000, out of 12,000, working in the old plants.

Mr. ARNOLD. Mr. Reuther, could you answer the same with respect to General Motors? How much is in new plants, and what percentage is in old plants?

Mr. REUTHER. As I stated before, the bulk of General Motors defense production is being carried on in newly constructed plants, and in a place like Flint, where, as I pointed out, they had 143,000 workers on the pay roll in June of this year, I think that no more than 4,000 of those people are on nonautomotive defense production at the present time.

They have done the most defense production by adapting their old plant in the A-C spark-plug unit, where they are doing a machine-gun job in the city of Flint. There are about 3,500 workers in that plant at the present time, and there must be between five and six hundred more workers in the other General Motors plants. That would mean Buick and Chevrolet and Fisher 1 and Fisher 2 in Flint.

But the bulk of General Motors' work is being done in newly constructed defense plants.

Mr. FRANKENSTEEN. The statement was made yesterday that the Chrysler plant is operating on three shifts. That is true, but they are only asesmbling on one shift. The other two shifts, because of bottlenecks, and because, in my opinion, of lack of subletting contracts and subletting jobs, are tied up. They are only able to assemble on one shift.

Mr. SPARKMAN. I have a few questions I want to ask in order to make the record complete.

USE OF MACHINE TOOLS

Mr. Thomas, at the Detroit hearings, you and your panel were sharply critical of the industry's failure to utilize fully the machine-tool capacity controlled by the auto manufacturers, especially because the union described this as the main bottleneck in defense production. At this time you have submitted an exhibit which indicates that such machines in the shops surveyed are being used only to the extent of about 50 percent.[1]

Mr. THOMAS. The average is 54 hours per week, on defense.

Mr. SPARKMAN. Then it is less than 50 percent?

[1] See p. 9506.

Mr. THOMAS. Yes.

Mr. SPARKMAN. Was this survey made following the President's order to use every man and every machine to the fullest possible extent?

Mr. THOMAS. That survey was made 3 weeks ago, I am told.

Mr. SPARKMAN. We understand that the order requiring the abolition of chrome trim has necessitated considerable new tooling. It has been reported in the press that the change-over is considerable. Do you have any estimate of the machine-tool man-hours so required?

Mr. REUTHER. They had to replace some of the parts that were made by plating, such as the window molding and the grille. For that they had to tool up. I don't know exactly what percentage of their tooling facilities had to be used in making those changes, but it represented quite a big tooling job because General Motors told me that there was a good chance that they would have to shut their plants down for some weeks to accomplish it.

The Government then extended the use of bright work to the 1st of January, and that gave them a breathing spell. But quite a few tool makers and quite a bit of machinery would have to be used to make those changes.

Mr. SPARKMAN. It is quite a big job?

Mr. REUTHER. Yes.

SHORTAGE OF SKILLED HELP AND THE REMEDY

Mr. SPARKMAN. Now, Mr. Reuther, Mr. Anderson, of General Motors, yesterday stated that a shortage of skilled workers prevents the utilization of machine tools on a full workweek basis. Do you agree with that?

Mr. REUTHER. That is because each company is shifting for itself. It is true that there have been companies which couldn't get an adequate supply of skilled mechanics, and that is why we proposed an over-all agency to supervise the general tooling problem. Even then, if the plants try to utilize all of their toolroom facilities, a shortage of skilled help will develop. But that is where we propose the use of the upgrading principle, of moving skilled people from production into the toolroom, intensifying their training for a few weeks and then using them.

We think if such a program were worked out, there is no reason why we can't man every toolroom and keep it going 7 days a week, three shifts a day.

Mr. SPARKMAN. Provided you have this set-up which you propose, to take care of it?

Mr. REUTHER. That is right. You have a situation now where one company, being further advanced in its program, may have a shortage of toolroom mechanics for a month or 6 weeks. Some other company has those same mechanics, doing less-skilled jobs, but hanging on because their tooling program is still in the blue-print stage. This latter company's tooling program will materialize 4 months from now, and it is hanging on to those skilled mechanics because it is going to need them 4 months later.

If we had an agency that could use that over-all reservoir of skilled mechanics, they could be sent into the plants where they are

needed now, and not kept in the other plants because of a program that will materialize 4 months hence. You can't approach the tremendous productive job that the war effort demands on the basis of every company operating as an individual production unit, meeting its tooling problems, its labor supply problems, its priority problems, all within the framework of its own organization. You have got to do this on an industry-wide basis.

Mr. THOMAS. In this statement which I have brought with me this morning, and which I would like to have included in the record, I wonder if you have had an opportunity to read the concrete proposals that I have made.

Mr. SPARKMAN. The entire statement will be made a part of the record, and many of these questions which we have been submitting to you have been drawn up from that statement.

TRAINING PROGRAM MUST BE INTENSIFIED

Now, Mr. Reuther, you mention the upgrading of skilled workers. Mr. Anderson also referred to that yesterday in his testimony. How far has that policy progressed?

Mr. REUTHER. It hasn't progressed far enough. We are going to develop a shortage of skilled mechanics, and now is the time to prepare people to meet that need. That job is not being done. The amount of upgrading that has been done in General Motors is very small, and I don't think any other company, at least to my knowledge, is doing any at all. I don't think the Chrysler Corporation has been upgrading at all.

There ought to be an intensive educational training program initiated to upgrade these people.

Mr. SPARKMAN. Why has it been slow?

Mr. REUTHER. It has been slow because each company is figuring, "Well, we can go out and somehow shake the bushes and get some mechanics, even though we have to raid the other fellow."

Mr. SPARKMAN. Has there been any active opposition to it?

Mr. REUTHER. No; I don't think so. We worked it out with General Motors and I think on the whole we have got a very satisfactory upgrading agreement, and I think that we ought to have the same kind of agreement for the whole industry.

Mr. THOMAS. And then make the agreements work after you get them.

MECHANICS OF TRANSFER OF MEN TO DEFENSE WORK

Mr. SPARKMAN. Mr. Thomas, we were impressed with the industry-wide agreement which was negotiated under the auspices of the Labor Division of O. P. M., providing for the orderly transfer of skilled workers to defense jobs. Can you tell us how that agreement has worked out in actual practice?

Mr. THOMAS. We were very proud ourselves when we were able to negotiate that agreement with industry. The agreement has been satisfactory, but management has tried in every possible way to avoid living up to it, so we have kept discussing the problem with management continually to prevent them from forgetting it altogether.

Mr. SPARKMAN. How has management failed to live up to it? Has there been a reluctance to accept these workers?

Mr. THOMAS. It was agreed that a man with seniority who could get a job in another plant to work full time on national-defense work could be transferred to that job, and through the State unemployment service he would be certified as a defense worker from his original employment.

But we find that when a man goes to a manufacturer and asks for a job on defense work, what actually happens is that the company which he goes to calls the man's original company and asks, "Is this man necessary?" Well, it doesn't matter what he is working on; we find that the management of the second plant refuses to hire the man.

In my opinion, the managements, to avoid this agreement made with us, have some sort of understanding among themselves to refuse to take these employees.

ADVOCATES INCREASE OF UNEMPLOYMENT COMPENSATION

Mr. FRANKENSTEEN. Yesterday I was very much interested in the testimony of Mr. Lund and Mr. Steinbaugh with regard to the unemployment compensation in the State of Michigan. Your committee has dealt largely with the migration of workers. It seems to me that we are going to face a tremendous migration from the State of Michigan unless something is done with regard to the unemployment-compensation law.

First of all, I think it is fair to point out that many of our people are from outside of the State of Michigan. Many thousands of them have come into the State over a period of several years, to work in the auto industry. Those people, during their lay-off season of 8 to 10 weeks, of just a couple of years ago, found it necessary to go to their homes and live with their parents until they were called back into the industry.

More than ever it is essential that those people should remain in the territory where this defense work is going to come. They ought to be trained; we ought to have them in training schools. In the State of Michigan the unemployment-compensation commission is very fair, and I think their recommendations yesterday showed their attitude toward an increase in unemployment benefits. But, unfortunately, in the State of Michigan we have a legislature that has not been too favorable and has turned down practically every proposal that has been made for increasing these benefits.

Now, unless the benefits are increased, this migration is going to take place and create a very serious situation. The Federal Government has taken over the employment agencies. I would just like to read from the statement that was made by Mr. Lund yesterday in his report. He says [reading]:

> Since the unemployment problem that we face is one which is caused directly by the war emergency, and the united national policy of sacrificing nonessential civilian production to defense, it appears to me that there is good reason for the Federal Government to consider bearing a part of the cost of unemployment which occurs during this transition period.

I think the Federal Government should also, as well as taking over the employment service, take over the unemployment compensation and make it uniform throughout the country. There has been

some talk of them taking over in outlying cities, raising the minimum benefits in some of the low States. But I don't believe that would solve the problem.

In Michigan the cost of living has risen 12 percent. Wholesale prices, however, have risen 23 percent. The difference between that 12 and 23 percent is going to be reflected in the near future, in prices that are going to be charged to the people for necessities. When that happens I think our problem again is going to become acute, and there will be a new impetus to migrate.

The CHAIRMAN. The committee is aware of the importance of your suggestion. We have heard considerable testimony on that.

Now, if there isn't anything more, we have several other witnesses here whom we would like to hear. I would like to say that any statement you have already presented will, of course, be inserted in full in the record, and if there is anything that occurs to you as a result of this hearing we will keep the record open for a few days.

The committee will now take a 5-minute recess.

(Whereupon, a short recess was taken, after which the hearing was resumed.)

The CHAIRMAN. The committee will please come to order.

Mr. Patterson.

Gentlemen, the committee is very happy to have you appear today on this important subject of planning the conversion of the automobile industry to defense production, and the related problem of utilizing small business in our war effort. We are conscious that your duties at the War Department are exceedingly heavy at the present time. It is only because we believe the morale of the whole Nation, on which our military morale is built, is at stake that we have taken the liberty of asking you to come here to testify.

I have your prepared statement, and I am ordering that it be included in our record.

(The statement referred to above is as follows:)

STATEMENT BY HON. ROBERT P. PATTERSON, UNDER SECRETARY OF WAR, WASHINGTON, D. C.

The day after I received your invitation to appear before this committee, I learned that you had filed your second interim report containing a number of important recommendations. I did not obtain a copy until Saturday. Inasmuch as you desired my statement in your hands on Monday, I have not had the opportunity to give to your report the detailed study which it deserves. I assume that you desire comment from me with respect to your report and recommendations.

If I understand your conclusions, I believe they are that munitions production to date has been a failure measured against the available facilities and the visible needs for military purposes. You believe that the largest and most efficient manufacturing facilities are not being used in the armament effort and also that our system of contracting excludes from production the facilities of thousands of small producers. As a result, you have decided that mass production of critical matériel is awaiting the completion of new plants. You are also of the view that unnecessary labor dislocation has occurred with unnecessary migration and unemployment.

You recommend changing the situation by placing in the hands of a single civilian board the full responsibility for munitions procurement and also for planning war production and production for essential civilian needs. Contracts would be let by this board or its branch offices, based on findings of a technical civilian staff. There are other findings and recommendations contained in the report, some of which I may mention, but the foregoing are the principal ones.

At the outset may I state the War Department likewise is not satisfied with production to date. I hope we never shall be satisfied. I believe that we are going to need all-out American production and that at no stage should we relax our efforts by reason of any feeling of satisfaction. On the other hand, and in all deference, I do not believe our production has been a failure to date or that placing procurement in a new board and taking it away from the armed forces would improve the situation. On the contrary, it is my judgment that such action would not be a step forward.

The War Department did not go into what was called its defense program, starting in the summer of 1940, without plans and without consideration of the productive capacity of American industry. For more than 20 years the War Department and the Army and Navy Munitions Board have been conducting surveys of American manufacturing establishments, large and small, with a view to their most effective use in munitions production.

More than 11,000 different establishments were selected as a result of this survey to meet specific munitions requirements and were earmarked on our records for the purpose. So far as possible, and within the meager appropriations available, educational orders and procurement planning were carried on with those plants. The machines in the establishments and the available labor were fully investigated with a view to making mass utilization of the existing facilities and equipment where they could be best used in a war effort. It was fully realized that earliest production would come from these sources. These surveys have been conducted and enlarged and kept up to date since the beginning of the emergency. The facts obtained from these surveys are generally recognized as constituting the most complete and reliable record of the munitions capacity, both actual and potential, in existence. I can assure you that we did not proceed with the erection of new plants except where necessary, and that existing facilities have been used in accordance with plan. In fact, some 90 percent of the Ordnance Department's orders have been placed with preselected plants best qualified to do the work.

The doctrine of converting a large fraction of our industrial capacity to war production is not something new. It has been written into the various studies on industrial mobilization prepared in the War Department, prior to the emergency, and it has been carried out in great degree and will be followed farther as our armament requirements become greater and greater.

The tremendous plant-expansion program which we have undertaken is not in any way inconsistent with use of existing facilities, or with conversion of such facilities to munitions manufacture. In many fields of military production there was no usable or convertible capacity in America. We had no munitions industry. We were compelled to build and equip smokeless power plants, ammonia plants, TNT plants, shell-loading plants, bag-loading plants, small-arms ammunition plants, and numerous other facilities including those for the manufacture of components and materials. In some fields where there was some capacity for our needs, that capacity was altogether insufficient, and the products required were of a type that could not be made in other existing factories through conversion or otherwise. Of course, the construction of these essential new plants has caused migration of labor. When a new plant is built, or an existing plant is of necessity enlarged, or more shifts are put in existing plants, there have to be employees, and they have to come from somewhere. However, in each case the availability of labor in the vicinity was one of the factors primarily considered in determining the location of the plant, although the strategic location, accessibility to essential materials, and other factors entered in the decision.

To alleviate the problem of labor migration as much as possible, we have, in consultation with the Office of Production Management, endeavored to locate new plants so as to utilize best the workmen who might be thrown out of employment in neighboring communities. This effort is still being pursued.

When the defense program was instituted in the summer and fall of 1940, the War Department naturally turned first to the facilities which were best able to produce the equipment we needed, and to produce it in short time limits. Much of it was of a type which only the best equipped and managed plants, plants with a strong engineering staff, could manufacture. As a result, many of our orders, particularly for difficult items, were placed with large industrial establishments. This was the one way in which we could speedily obtain essential items where delay would have been fatal. We were fortunate in having such industrial organizations which could undertake the task. I assume you agree with this policy, inasmuch as one of the points mentioned in your interim report

is that we have not made sufficient use of some large facilities such as the automobile plants.

However, in addition to going to larger plants, we have also made use of smaller concerns wherever our surveys indicated that they could give rapid and efficient assistance. In items of the kind which could be manufactured in numerous places, we have spread the work as far as possible throughout the country among plants of all sizes. We have continually made efforts to spread the work by splitting orders, by bringing about subcontracting, and by letting to different sources various components of an assembled item. Any conclusion which you may have reached to the contrary is, I submit, at variance with the facts.

It likewise would be incorrect to assume that we have not been engaged in the conversion of plants from civilian production to war production. If such conversion had not taken place, we would have practically no war production, as almost no plants in America were able to engage in munitions manufacture without conversion from the making of products needed for civilian supply. Our Government arsenals, expanded to their utmost, could not be expected to produce more than 10 percent of our gun and ammunition requirements.

If you desire, I can submit to you supplemental reports indicating the extent to which conversion, subcontracting, and other methods of spreading the base of defense production have been carried. Adding-machine manufacturers are making automatic pistols. Washington-machine manufacturers are making gun mounts. Automobile manufacturers are making airplane parts, airplane and tank engine parts, machine guns, and ammunition components. I could extend the list indefinitely. As far as possible, this manufacture has taken place in existing plants with existing machines, although to some degree, new equipment has been indispensable. Any conclusion that mass production is awaiting the completion of new plants is, therefore, not borne out by the facts. We have such production now, both from previously existing plants and new plants. The products, for example tanks and machine guns, are already on the firing line.

It has been our constant aim, as far as possible, to restrict expansion of facilities where this requires the building of additions to plants or the acquisition of new machine-tool equipment. So many new tools have been necessary that tool manufacturers have been unable to meet the absolute minimum demands. So the use of existing facilities, wherever possible, has been insisted upon. This we control in cooperation with the Office of Production Management by denying priorities and allocations for new machines where existing machines can be used.

I do not doubt that there are many industries or separate establishments which have not been converted to defense production. There are many business concerns without defense orders and whose production and employment have been badly affected due to the shortage of materials. There are reasons for this, some of which I shall mention.

But it is a fact that in spite of unemployment and dislocation in some industries or areas, the defense effort has created an increase rather than a decrease in total employment. Between October 1940 and October 1941, nonagricultural employment, according to the Bureau of Labor Statistics, rose by 3.4 million. Every effort has been made to prevent the employers of these additional workers from seeking employees from outside their own communities, whenever their needs can be met from local sources. A number of workers have had to be transferred, and this has been done through development of training programs and transfer arrangements in which the War Department plays an important part in cooperation with other governmental agencies and public employment services. I doubt that the Work Projects Administration can be equipped to handle the entire training of workers now coordinated by the Office of Production Management and the War Department.

It is also the fact that the defense program up until recently has not been of such magnitude as to make use of all the available facilities of American industry. Our country's productive capacity is so great that even the large appropriations made for defense have not brought into munitions manufacture every available facility. Although appropriated funds have seemed staggering, a very large part has been for airplanes, ships, and other highly specialized military items, leaving the smaller part for helping out small plants and preventing labor migration.

Again, our supply of raw materials was based upon peacetime needs. Take aluminum. Aluminum became needed in such vast quantities in airplane manu-

facture that virtually none of it was available for civilian needs. Accordingly, while the program was large enough to use a substantial part of America's facilities, many plants, dependent upon scarce materials, had to curtail production. This is a dislocation due to the facts of the case and not to failure of the War Department to spread the work or to convert existing factories in defense production.

I would, therefore, like to emphasize the impossibility of avoiding distress in industry and among certain parts of our labor supply, when our war effort requires that primary emphasis be placed upon the rapid production of munitions. No possible method of handling war production would have given orders to every manufacturer for production with his existing plant facilities and labor. This is borne out by the recorded experience of England and of Germany itself.

No one is more fully aware than I am of the gap between the accomplishments of the past 18 months and the desperate needs of the next 12 months. I have no doubt that we could have done better than we did and that we could have engaged more of industry in war production. I, however, would be in error were I to state that this gap is due to deficiencies in our organization. The roots of the trouble go much deeper. We have had to combat the view that we could arm ourselves in our spare time, i. e., by utilizing our idle capacity and idle labor and leaving the level of civilian activity untouched. In fact, until last spring there was a prevalent attitude of "business as usual," and our country permitted civilian activity to rise to record figures in the production of civilian supplies. We have had to overcome the effects of an attitude which did not lead to an all-out effort, but confined us to supplementing the efforts of the victims of aggression. The events of the last 2 weeks have swept aside these inhibitions, and from now on we need not hesitate to pursue a policy under which there is a single objective, and that is to increase the output of military goods. The objectives of the War Department and of your committee are the same—to put every plant and every worker into effective production.

But prior to the last 2 weeks, neither the Congress nor the people of the country were prepared to authorize a program which would utilize every factory and every scrap of equipment and every worker we can spare for the military objective. In other words, we have not had enough orders to go around with respect to many commodities. The use of some of the less effective parts of civilian industry would not have produced the volume of munitions which we were authorized to procure as rapidly as the facilities we did use. Conversion of the plants less well equipped to do the work takes time. In cases where an industry could handle the orders at all, we were in many cases able to place them with plants better equipped and without calling upon producers who could not compete as to either speed or price. I believe that with the passage of the third supplemental bill last week and with the further appropriations that may be expected, we shall soon be calling on every possible manufacturer, large and small, and the dislocation which your committee very properly has noticed will be in part cured.

However, we can never make use of all existing industry. Some plants are wholly unable to make the items we need. If such plants cannot get sufficient materials necessary for their continued operation for civilian supplies, they will have to close, as was the case in England and Germany under similar circumstances. There are other kinds of industrial capacity which war makes use of in part, but which our munitions industry, even in an all-out effort, can use only in part. Thus I believe there are far more punch presses installed than we shall need for the munitions program. The rest must become idle if materials for their operation are unavailable. Grey iron foundries and sheet-metal shops are also examples of kinds of large industries that are difficult to use in our program to their full extent.

Another reason for the troubles of industry which you have noted is that during 1940 and throughout much of 1941 a great share of civilian industry did not desire war orders but wished to continue making civilian consumers' items for which there was a great and increasing demand. No one has urged more than I the curtailment of such civilian manufacture and the conversion of such facilities to war production. Last spring and at other times I urged the curtailment of passenger-automobile manufacture. The armed services have not had the power to control such matters. The shortage of materials, however, has gradually during 1941 brought about such curtailment. It may be that had this curtailment taken place sooner there would have been even more idle machinery and labor, as the volume of defense orders which we were authorized to place at the time would not have used the facilities.

In the taking of testimony you have learned of the troubles of industry, the shortage of materials, and the lack of utilization of many plants. But it does not follow that these ills are due to poor management of procurement on the part of the armed services. I respectfully submit that there has not been poor management.

Mention is made by the committee of the partial nonconversion of the automobile industry and of the continuance of manufacture of unnecessary civilian supply. The War Department has always put the defense effort first and will continue to do so. No one has protested more strongly than the armed services the use of materials and labor in making unnecessary consumers' goods. You can depend upon the armed services more than anyone else to carry out your views that war production is the first thing and that everything must be subordinated thereto. In fact, it has been only our constant vigilance which has prevented a larger continued use, or a larger diversion of materials, machines, and labor for nonmilitary goods. No civilian board could possibly feel more strongly than the War Department on this subject. If the War Department is given the appropriations and the support of the Congress and of the Nation, then no usable existing facility, large or small, will be left out of our program.

The armed services are the only agencies competent to determine what we need, how much we need, and when we need it, as well as the relative urgency or priority of the needs, as these factors apply to plans for strategic operations. I do not understand that there is disagreement on these points. Likewise the War and Navy Departments are the only agencies that have technical military experts informed, as a result of many years of training and experience, as to the country's industrial facilities which can be used by conversion or otherwise in the production of munitions. This I have referred to previously in connection with our plans for industrial mobilization.

Many, perhaps most of our items must meet difficult specifications required in modern mechanized warfare. We must be certain that we supply to our soldiers products meeting the requirements. Otherwise their lives and the whole future of the country are imperiled. The placing of orders or subcontracts by civilian authority would not only disrupt the system of procurement now in effect, which is the result of plans and experience developed over many years, but might lead to the production of articles which would have to be rejected, although the need was great. We cannot effectively change our system in the middle of the stream. Those responsible for delivering what we need, namely, the armed forces, must also have the duty of seeing that we get it and that it works. There should be no divided responsibility here.

The idea of a civilian board of ministry of supply is not new. It was considered during the last war and discarded after careful consideration in favor of the method of strengthening a going and successful organization of men who knew their job. I do not believe you will find those civilians who are most familiar with the problems favoring the taking of procurement of munitions away from the armed services and placing it in inexperienced hands.

By this I do not mean that civilian engineers and production men are not needed. We have many of them in the War Department, and we need many more. Numbers of others have sacrificed their careers and are now in the divisions of the Office of Production Management where they have been of the greatest aid to us. Our plans are submitted to these men. They have the power to veto our important contracts. We have close liaison with them. We are making our teamwork more and more effective. At the present time we are placing in all of our procurement offices, both in Washington and in the field, representatives of the Office of Production Management to assist us at every point of our planning and procurement. The contract distribution work of the Office of Production Management ties in with ours and is being decentralized to the field with our contracting officers. We desire all the aid we can obtain from the competent men of industry. We are getting it, and we need it. But the War Department, along with the Navy Department, is charged by law with the responsibility of providing for the defense of America and the defeat of our enemies. It will encounter difficulties in fulfilling this responsibility if its plans are made and its orders placed by a civilian board. However, competent such a board may be, however, able its technical branches, its members would not be specialists, as are the men of the armed services, in the procurement and manufacture of munitions. It is my considered judgment that the people of this country look to the armed services primarily to take this responsibility.

With the assistance of able civilians, we are spreading the work. We are relieving distress. But we cannot spread the work, we cannot prevent labor migration, we cannot prevent civilian distress, except to the extent that the military objective makes this possible. If the military objective is disregarded and the war is lost, all industry, whether large or small, all labor, whether migratory or not, and whether employed or not, and whether employed in munitions manufacture or not, will be destroyed.

I, therefore, respectfully submit to you that the pains we have been undergoing are due to the partial transition from a peace economy to a war economy and not to inefficiency of the armed services. Now that we are at war and the Nation is ready for a tremendous all-out effort calling on all production resources, some of the pains will be alleviated. All possible industry will be used in munitions manufacture, but no matter who controls the program, I cannot say that we will not face continued sacrifices. Civilians as well as soldiers in a total war must face the facts. If we do, I have no doubt as to the final outcome.

The CHAIRMAN. Let me say further to you that if, as a result of these hearings, there are any additional points you desire to bring out, of course, we will hold the record open for you.

Mr. PATTERSON. Thank you.

The CHAIRMAN. Dr. Lamb has some questions to ask you.

TESTIMONY OF HON. ROBERT P. PATTERSON, UNDER SECRETARY OF WAR, ACCOMPANIED BY JULIUS AMBERG, SPECIAL ASSISTANT TO THE SECRETARY OF WAR; EDWARD McGRADY, LABOR CONSULTANT TO THE SECRETARY OF WAR; COL. JOSEPH F. BATTLEY; AND COL. RAY M. MARE

Dr. LAMB. These questions have been prepared on the basis of your prepared statement.

WORK OF MUNITIONS BOARD

Mr. PATTERSON. I might mention one thing not covered in the prepared statement, and that is the work that was done prior to this time by the Army and Navy Munitions Board, which is the joint agency of the War Department and the Navy Department toward strategic stock piles. That was another measure of planning that was done by the Army and Navy Munitions Board in addition to the plant facilities survey that they built up over the years.

The Army and Navy Munitions Board sponsored the legislation passed a few years ago which allowed the accumulation of strategic materials in stock piles. We have realized a great deal of benefit from the operations under that act.

The operations, of course, are in charge of the R. F. C. or one of its subsidiaries, but that is a topic upon which the Munitions Board has devoted a great deal of time.

I wanted to point that out as another measure of the planning that has actually been done. I don't like the impression to prevail that this is simply a hit or miss job on the part of the War Department and the Navy Department. We have made mistakes, of course, but it isn't just a thing that we went into without the slightest preparation. We had considerable preparation.

The work done by the Munitions Board, not only in the matter I just mentioned of the stock piling, and not only in the plant facil-

ities survey, but also in the preparation of the industrial mobilization plan of 1939, which was a revision of earlier industrial mobilization plans, evidenced, I think, a high order of planning.

Dr. LAMB. I think that you will find in the committee's report for last March an analysis, in part 3 of the technical supplement to that report, of the development of the mobilization plans from the end of the last war until the present time, or at least until last March, and the committee, I believe, is familiar with that material, and if they seem to imply in this last report that there was a lack of planning, I am sure that that was not their intention.[1]

Mr. PATTERSON. Of course, no plan is perfect, and the conditions that you actually face always introduce new elements that the plan did not contemplate. The industrial mobilization plan of the Munitions Board did not foresee the condition where we would be called upon to equip not only our own armies but other armies. That is a new element, and there are others.

Of course, that element I just mentioned makes more acute than ever the conditions that the committee has commented upon in its interim report. It makes more necessary than ever, and more vital than ever, the complete mobilization of the industrial resources of the Nation. In the last World War we relied upon our Allies for most of our military equipment. Today it is just the other way around; they now rely upon us for a good share of theirs. This is, of course, in addition to the equipping of our own forces.

"BUSINESS AS USUAL" NO LONGER POSSIBLE

Dr. LAMB. The committee is not so much concerned with the past as with the plans ahead. As far as the past is concerned, the questions which will be asked have to do with it only insofar as a change of plan might expedite this all-out production which, as you say, the necessities of recent months have thrust upon the country.

In your prepared statement you say:

> Until last spring there was a prevalent attitude of "business as usual" and our country permitted civilian activity to rise to record figures in the production of civilian supplies.

Of course, this is one of the questions with which the committee has been very concerned, beginning in September with the hearings in Detroit, and since that time in Washington and St. Louis.

You give this as one of the reasons why:

> * * * there is a gap between the accomplishments of the past 18 months and the desperate needs of the next 12 months.

You say, in fact, that—

> We have had to combat the view that we could arm ourselves in our spare time.

Of course, that is directly on the point of the committee's concern and yours. The committee, I am sure, would be interested in having you amplify that statement, if you care to, with any illustrative examples which you feel disposed to give.

Mr. PATTERSON. I believe that statement can be amply supported. The general current of opinion in this country was that we could maintain our usual civilian economy, satisfy all the needs of people for new automobiles, new washing machines, new ice boxes—sales of those

[1] See H. Rept. 369.

things rose to record heights—and at the same time fulfill the munitions program; that the munitions program might be, perhaps, a relief for the condition of unemployment that was then vexing us.

I protested it in speeches and in recommendations. I was concerned for one thing with the great amount of steel that was going into production of certain items, particularly automobiles. We were concerned over the delays that were being encountered by our contractors in getting those same raw materials, particularly steel. Those delays began along in February and increased.

We were assured from the industry that they would be cured by April—that they were temporary. We recommended action, but none was taken. Many people, whose opinions are entitled to some respect, believed that conditions were temporary.

SHORTAGES SHOWED UP EARLY IN PROGRAM

Now of course the over-all production of steel in this Nation was ample to take care of the needs of the Army and Navy on our program at that time. Our program at that time didn't consume more than 10 percent of the Nation's steel output. And yet we were faced with instances where we couldn't get it, or where a delayed delivery was the only thing in sight. That was due, as I take it, to an attitude prevalent at the time that you didn't need to interfere with the production of any of these nondefense items, that there was an over-all capacity in the country sufficient to take care of both.

I recommended in the spring that the production of automobiles be cut. It seemed to me that was where the steel was going. I am not here saying that there was enough steel of all types and of all fabrications to go around; there were then, and there are now, some tight places, I think, in structural shapes.

The first difficulties we encountered were in the construction of our munitions plants. That required structural steel—structural shapes—and there was a vast amount of civilian building going on at the same time; I don't mean little houses that take lumber; I mean large industrial buildings that take steel.

We had trouble later on this summer with some cement that was going to the west coast—I believe it was going into a dam that was being constructed there. It took all of the cement there was in sight, and there wasn't any priority on cement that would give us relief.

INDUSTRY WAS NOT ANXIOUS FOR WAR ORDERS

Dr. LAMB. On this same point, in your prepared statement you say:

> In fact, it has been only our constant vigilance which has prevented a larger continued use, or a larger diversion of materials, machines, and labor for nonmilitary goods.

You also stated that—

> a great share of civilian industries did not desire war orders.

Can you give the committee examples to support this statement that the automobile industry, for example, refused any war orders?

Mr. PATTERSON. I don't know that the automobile industry squarely refused any war or defense orders. For a long time, until just a few months ago, a great many industrial concerns were not interested; they thought of the business as being temporary, upsetting to their

regular routine, and that if they went into it their competitors would walk off with their customers. There is no doubt at all of that fact. I don't recall right now chapter and verse on it, but I believe I could think of some.

The CHAIRMAN. Judge, can you furnish the committee with some concrete examples?

Mr. PATTERSON. I can furnish you with those.

Mr. SPARKMAN. If I may interrupt there, Judge, it was not so much a case of orders being offered and an industry declining the order; it was simply a case of their not going after the orders; isn't that true?

Mr. PATTERSON. That is true.

Mr. SPARKMAN. I recall, for instance, a survey that was made down in my own State, at the instigation of the Governor. The people were rather startled to find that only a small percentage of the manufacturing plants there had made any effort or had expressed any desire whatsoever for defense orders.

Mr. PATTERSON. One thing, of course, that caused the change of attitude some months ago was the feeling that the usual sources of raw materials were no longer going to be available. That caused a complete change; it caused a complete change in the automobile industry. They came down then looking for business along in September.

Mr. SPARKMAN. And all of its goes back to the statement you made, that there was a popular belief that we could carry on the defense program in our spare time?

Mr. PATTERSON. That is right.

PROCUREMENT PROCEDURE IN WAR DEPARTMENT

Dr. LAMB. On that point, Judge, I am sure the committee would like you to describe briefly the procurement procedure of the War Department, including both the operations of your Washington and your field offices. Could you tell us how the suitability of a particular contract is determined, and where the authority for approving contracts of various sizes rests?

Mr. PATTERSON. Yes. The War Department has eight supply arms and services, three large ones—the Air Corps, the Ordnance, and the Quartermaster. Possibly I should include the Corps of Engineers in that, because recently they have been given the entire job of building construction on behalf of the Army.

Each of those supply arms and services has a program. The program is given out to them by the General Staff, G–4, which determines military requirements as to kind, quantity, and time when needed. Those requirements are stated to my office, and I release them down to the supply arms and services—the eight supply arms and services. Each of those supply arms and services has the office of the Chief here in Washington, and each one of them has field offices—district offices. The numbers vary. The Ordnance has 14 of such district offices scattered throughout the country. That is a system that has been built up in the last 10 or 15 years. The idea was to decentralize purchases. Instead of everybody having to come to Washington, they go to the district office in their own area, which is authorized to negotiate contracts.

Now, I can take the Ordnance as typical, and also it is the hardest, because they have the heaviest burden, both in terms of money and

in the range of items to be procured. They arrange a program, as soon as they get their appropriations. These are set in cooperation between the General Staff, which fixes the requirements, and the Ordnance. The Ordnance, of course, has to fix the money values, because the General Staff doesn't know the money value or the money required to purchase, let us say, 1,000 37-millimeter antiaircraft guns.

When they get that, they then arrange the program in their own organization, as to what each district is to be responsible for buying, and they send it out to the Chicago district and the Detroit district, and the Cleveland district, and so forth.

The Ordnance district officer is the executive of that office. The head of the office in the Chicago district is a civilian—a man who is supposed to be familiar with industry. Of course, the Ordnance officer, who is the executive officer in that district, is more familar with the technical problems of the Ordnance Department than is the civilian chief.

As soon as he gets what his district is supposed to procure, he contacts sources in his district. That is supplemented by the records we have here in the Army and Navy Munitions Board, which constitute a complete industrial inventory of the country and indicate conversions from civilian use to military use. The papers carrying descriptions of plants contain also suggested military items that these plants, with a minimum amount of conversion of machinery, could produce.

The Ordnance officer then asks those people who he thinks qualified to produce a particular item, to submit informal bids to him. They may be made by telephone or by letter. It is not formal competitive bidding.

When he gets the bids in, he submits them to Washington, and the business is then allocated out to the districts finally for procurement.

Until recently, the limit in contract amount that the Ordnance district officers were authorized to place in a district, without reference to Washington, was $50,000. That amount has recently been raised to $1,000,000. That is to say, the Ordnance District Office in Chicago, after it gets a requirement to be filled—whether shells or guns of some type—can place finally, without reference to Washington, orders for that item provided they don't exceed a million dollars. If they do exceed a million dollars, they have to come in and be reported to the Chief of Ordnance here in Washington, and then have them cleared through the O. P. M.

I have recently relaxed rules in my own office. I am charged with the supervision of procurement by the Supply Arms and Services. I used to take all contracts in excess of $500,000 to my office for my approval. I now take only contracts in excess of $5.000,000.

Now it seemed to me that the policies of the War Department with regard to many matters you are interested in, subcontracting, spreading the work, and so forth, had been thoroughly enough understood over the last 6 or 8 months by the people in the field to entrust them more liberally with the carrying out of those policies. It seemed to me it would speed up our procurement program appreciably, if the orders did not have to clear so many officers.

I am not critical of the clearance of orders by any one office, O. P. M. or any one office, or the Chief of the Supply Arms Service here. But in the bulk they took a good deal of time, and paper work, and a

good deal of the attention of people whose time could be more profitably devoted to some real procurement problems rather than just clearing papers.

That is, in general, the Army procurement system. If you would like, I could take a particular item from the expenditure program, which is made up as soon as an appropriation bill is passed by Congress, and trace that item down until the contract is signed—say in Chicago—and I could give you instances, too, from other supply arms and services, such as the Signal Corps. They have field offices, though not as many as the Ordnance because their load is nothing like as heavy.

The arrangement for increasing the money limits and decentralizing the work, in trying to substitute informal contacts for the formal contacts that formerly prevailed, contemplates that the men from the O. P. M.—from Mr. Odlum's division, Mr. MacKeachie's division, and perhaps Mr. Harrison's division—shall go out into our district offices and be there for assistance.

RELATIONS BETWEEN WAR DEPARTMENT AND CIVILIAN AGENCIES

Dr. Lamb. Right on that point, Judge, could you describe for the committee what, in your opinion, are the responsibilities and authorities of the existing civilian-defense agencies with respect to your operations, including S. P. A. B. and the major divisions of O. P. M.? Also, is the approval of S. P. A. B. or O. P. M. required in connection with any of your procurement operations, and if so, for which?

Mr. Patterson. On all of our plant programs, such as TNT, smokeless powder, and all of those things, wherever the Government is investing any funds in a new plant, we submit those to the Plant Site Board of the O. P. M. We have to have their approval before we can locate a facility in a particular spot. Also, we now have to clear with the Office of Production Management all orders of $1,000,000 or over. It was $500,000 or over until last week; now it is $1,000,000 or over. But I would not be doing full justice to the contribution the O. P. M. makes to the War Department unless I mentioned the informal contacts that prevail.

For more than a year now, the people from the Advisory Commission, as it was then, and later the O. P. M., have been in the Quartermaster Corps office here in Washington. On all of our programs for the purchase of woolen cloth, uniforms, shoes, and all of the personal equipment items that a soldier gets, those men from Mr. MacKeachie's office have been of great assistance to the Quartermaster Corps. They have been consulted on all awards; in fact they help make up the awards to the people who finally get the orders.

The same thing is true, to a more limited extent, in the association of the Production Division of the O. P. M.—that is, Mr. Harrison's Division—with the Ordnance Department. There are men there who are quite familiar with the programs as they are made up by the Ordnance Department, and who are cooperating and who are consulted with frequently.

Dr. Lamb. I got the impression from what you said that the representatives of the O. P. M., for example, participate on the level of decentralization, but that the approval of S. P. A. B. or O. P. M. is

not required in connection with your procurement operations. Is that correct?

Mr. Patterson. No approval by S. P. A. B. is required. Approval is made by the O. P. M.; formal approval is given here in Washington on contracts of $1,000,000 or more. But the assistance we get from them in informal ways relates to everything.

Dr. Lamb. Do you feel that the stage at which the O. P. M. comes into the approval picture in these operations is so late as to hold up your operations?

O. P. M. SHOULD BE IN THE PICTURE ALL THE WAY

Mr. Patterson. In some ways; yes. I have discussed that a good many times with Mr. Odlum, and it seemed to me very plain that—and he agrees with me—the men from his contract distribution division should be in from the very outset in order to be of effective help. To submit the contract to them after it is all made up, and they not knowing what had gone on out in the field, results either in a bottleneck or a rubber-stamp approval. If they hurry it through because I tell them it is very urgent—and I generally do tell them that—then it is just a rubber-stamp procedure. And if they don't, there is a bottleneck. For example, I have made arrangments with Mr. Odlum for his men to go to Wright Field, where most of our Air Corps contracts are negotiated. They have a very active unit in the Air Corps at Wright Field devoting their time to possibilities of subcontracting to avoid the use of new facilities where existing facilities might be made to serve. They have studied a particular item for, say, 2 or 3 weeks, seeing what they can do about it.

Of course, the time for Mr. Odlum to contribute what he can to help is right while those men are making those plans. We have had instances where, after the contract came here to Washington and they wanted to suggest procedures, they were often the very things that had been considered at Wright Field and, for good reasons, disregarded. The company where they had planned on subcontracting may have had other orders that were taking all of its time and facilities.

The answer is yes; the work of the O. P. M. ought to be at the very outset of the program, rather than at the end.

Dr. Lamb. You have a subcontracting division of your own?

Mr. Patterson. Yes, sir; Colonel Hare is in charge of it.

Dr. Lamb. Do you feel that Mr. Odlum's division duplicates the operations of yours, Colonel?

Colonel Hare. No; I do not; I think Mr. Odlum's activities are very helpful to our activities.

Dr. Lamb. Provided they are pushed back far enough?

Colonel Hare. Yes.

Mr. Patterson. I think that Mr. Odlum's men—and he has some very capable men—ought to be in our supply arms and services. We need them, and the work ought to be going on under one responsibility rather than two.

Dr. Lamb. Are there any other types of activity where the Office of Production Management or S. P. A. B. duplicates the functions of the military services?

Mr. PATTERSON. Yes. In the Production Division they had for some time a unit on tank production. Now last summer tank production became an urgent matter. In fortifying the section of the Ordnance Department charged with the responsibility of tank production, we asked for a transfer to the Ordnance Department of O. P. M. personnel devoted to following up tank production. The need for those men was urgent; they were able men and we wanted them. It was done, and I think with benefit. They had been following up tank production independent of the Ordnance Department, whose duty also was to follow it up. I think the results of that transfer have been good. I think the step-up of tank production has been due in a degree to the better organization of that tank section in the Ordnance Department.

PLANNING FOR PRODUCTION FOR 20 YEARS

Dr. LAMB. I would like to turn back to something you said at the beginning of your remarks, and also something which is referred to on the first page of your release, the last paragraph on the first page:

In your prepared statement you state—

> The War Department did not go into what was called its defense program, starting in the summer of 1940, without plans and without consideration of the productive capacity of American industry. For more than 20 years the War Department and the Army and Navy Munitions Board have been conducting surveys of American manufacturing establishments, large and small, with a view to their most effective use in munitions production. More than 11,000 different establishments were selected as a result of this survey to meet specific munitions requirements and were earmarked on our records for the purpose.

The committee assumes that in your surveys you covered the major plants in the automobile industry. Could you say whether you ever determined the following questions on the assumption that the entire passenger-car industry would be available for war production:

First, the proportion of facilities that could be converted to war production simply on the basis of jigs and fixtures;

Second, the proportion of major implements of war, such as tanks, airplanes, antiaircraft guns, and so forth, which could be produced on the basis of such conversion.

Mr. PATTERSON. I will turn that question over to Colonel Hare, who has charge of the inventory, and knows much more about the details of it than I do.

Colonel HARE. A number of years ago on effort was made by the Air Corps, the Army Ordnance Department, the Quartermaster Corps, and the Corps of Engineers to fit their war requirements to the machines and tools of the automotive industry. There was a special committee established in General Motors' home office in Detroit, working with Mr. Knudsen, to talk with our engineers and our procurement-planning officers. The work with that committee included a careful appraisal of the machine-tool equipment, dies, jigs, fixtures, the subcontracting sources, and practically all elements of the productive set-up of General Motors. At one time, within the last 3 years, Mr. Knudsen, Mr. Budd, and a number of the top executives of General Motors, came to Washington and in the office of the Under Secretary

went over the completed plans for the use of the automotive industry——

Mr. PATTERSON. That was some years ago.

Colonel HARE. At that time there was considerable uncertainty with regard to just how much the tooling of the model that would then be in production would fit the type of airplane that we were going to try to make in an actual emergency. We weren't able to draw a very fine bead on this appraisal of actual machine tool equipment; but in a general way we knew that General Motors would be a prime source for such things as tanks, airplane engines, and things that had some similarity to the normal product.

But it wasn't possible to get too close a focus on it.

PERCENTAGE OF MACHINE TOOLS AVAILABLE FOR CONVERSION

Mr. PATTERSON. I can add just this, it doesn't come from the inventory but from my own inquiries about it last spring. And I can't remember who told me, but I inquired from a good many people, and I got the information then that from 10 to 20 percent of the tools that were right there could be readily converted.

Now I, of course, have no industrial knowledge of my own, but that seemed to be the consensus of opinion, and I inquired from a good many people who ought to know.

Another thing I asked was this: "How much benefit are we going to get from this cut, a cut that ought to be made in the production of ordinary automobiles?"

And they said that unless the cut was very severe, none at all, because each plant would be continuing to make its output of automobiles, the only difference would be that they wouldn't work as many shifts as they did, but the same assembly line would be there for producing, say, 50 percent instead of 100 percent, and they said, "Unless you are going to put some company completely out of business and place the civilian demand on the other plants, you have got to convert the whole plant or none. You can't interrupt that assembly line and have them produce some automobiles and some other thing at the same time out of that machinery." That seemed to me sensible.

WAR DEPARTMENT HAS AUTHORITY TO USE INDUSTRIAL FACILITIES

Dr. LAMB. In the light of the latest curtailment order, which comes pretty close to shutting the industry down—and the testimony of Mr. Knudsen yesterday indicated that the rubber shortage may actually do so in a very short time—am I correct in assuming that the War Department has both the authority and the responsibility of putting as much of these facilities to work as possible?

Mr. PATTERSON. Yes, sir. We are now engaged, of course, in trying to place the business under the appropriations act just passed last week, and you may be sure that we will take full account of the facilities of the automobile industry in placing that business. Those plans are just now being laid out. They have been in the making for some time, because we knew that there was a very good prospect of the passage of that appropriation bill.

I wouldn't have you think that we don't start our work until after the money is legally ours. We, of course, are going to use part of the automobile facilities for the production of military trucks. We have, I think, orders about to be placed this month for some 215,000 trucks, largely for our own Army and partly for lend-lease. Of course, I am sure I am right when I say that is not the end of the orders for military trucks.

The military truck, as you doubtless know, is different from the civilian truck, principally in the fact that it is an all-wheel drive instead of just part-wheel drive.

Dr. LAMB. But the change-over of the plant is not material?

Mr. PATTERSON. That wouldn't exhaust them, of course; we have got to use them for more than that.

Dr. LAMB. At the committee's Detroit hearings, the auto industry said that the reason they were not engaging more actively in defense production—this was around the end of September—was because they had not been asked to do so by the procurement agencies, and in the committee's record it appears that they said, "You were not asking us to do enough."

The committee would like to know your opinion on that.

Mr. PATTERSON. Well, I don't agree with that.

POSSIBILITIES FOR MULTIPLE MANUFACTURING

Mr. ARNOLD. Let me ask you, Judge Patterson, in the manufacture of those military trucks, will they be distributed over all plants, or will you select certain plants and let the others convert to as high a percentage as possible?

Mr. PATTERSON. When we placed our orders under the large program a year ago, we tried to place the order for one type or weight of truck, with one source, like Chevrolet; for the next-sized truck, with another source, like Dodge; so as not to have a multiplicity of trucks of different types in the field. The spare-parts problem is very tough if we maintain varying types of military vehicles in the field. You just can't stock up with spare parts.

So in general the answer would be that they will go to the sources—there aren't many, five or six—that have already furnished us with our equipment.

Now, there is just this variation to that. Within the last 2 months, one automobile company has offered to give us the identical car, with fully interchangeable parts, that has heretofore been supplied us by another automobile company. I believe it is the small "jeep" car that Willys had a relatively large order for. One of the other companies has offered to duplicate that car so you can't tell it from a Willys car. That is all right, because that assists in spreading out the work, and also it doesn't give us these vexing problems in the field—maintenance of parts.

Mr. ARNOLD. What I am wondering is if those assembly lines in all the plants will continue to prevent conversion of the plants to war production. Suppose a plant just has enough of those truck orders to run one shift, the other two shifts would be lost.

Mr. PATTERSON. It would if they had only one plant, but I think most of them now have several plants, and they could run this in one plant and convert completely the other plants.

The CHAIRMAN. Judge, I would like to ask you a question. Just as you said awhile ago, there isn't a single problem that isn't based on different facts; you are up against that all the time. But I was thinking the Chrysler is not like the Hudson; they have different tools and different machinery; isn't that true?

Mr. PATTERSON. Yes, sir.

POOLING OF TOOLS AND MACHINES BY MANUFACTURERS

The CHAIRMAN. Do you think it would be feasible to have a pooling of tools or machinery between those plants? Do you think that would be more effective than having them acting alone?

Mr. PATTERSON. Yes; I think it would.

The instance I just mentioned is one where the Willys people are going to furnish their engine, as I understand it, to the other producer—I think it is Ford—for the production of those small "jeep" cars.

I will say that Willys is also producing that same item currently, so that it isn't a complete shift of the business from Willys to Ford; they are both going to produce, but they are going to produce the identical car that Willys has been making.

THE QUESTION OF SUBCONTRACTING ON TANK PRODUCTION

Dr. LAMB. In your prepared statement, you say:

> But prior to the last 2 weeks, neither the Congress nor the people of the country were prepared to authorize a program which would utilize every factory and every scrap of equipment and every worker we can spare for the military objective. In other words, we have not had enough orders to go around with respect to many commodities. The use of some of the less effective parts of civilian industry would not have produced the volume of munitions which we were authorized to procure as rapidly as the facilities we did use.

The committee understands the need for having some precedents. Let's take, however, a specific case. The $18.000,000 addition to the Chrysler tank plant was vetoed by Mr. Odlum because he thought there could be a great deal more subcontracting arranged in connection with that particular project. According to testimony before a Senate committee last week, the project was put on Mr. Odlum's desk for approval in completed form. He was sure that there could be a great deal more subcontracting than was included in the plans and refused to give his approval. He was asked to produce the subcontractors, and he replied that it would take time. Thereupon, the project was contracted for over his objections. Mr. Odlum stated he was put in the position of holding up an important defense project if he raised any further objection. He took the position that the subcontracting could have been easily included in the original planning and that tank production would have been greatly speeded up by requiring less new machine tools and a smaller plant expansion.

I take it from your statement that you think Mr. Odlum's way of handling contracts slows up war production?

Mr. PATTERSON. Well, Mr. Odlum went along with us on that, under pressure of time. We had to get going as fast as we could on that tank production.

Now, Chrysler had built a plant for us—it is a Government plant, but they operate it—and their production came out ahead of schedule.

It has been ahead of schedule right along, and furnishes now the bulk of our medium-tank output; they don't make light tanks. I was informed that they have 700 subcontractors.

We were looking for sources for the tanks under the expenditure program authorized by the first supplemental that was passed in August 1941. The Ordnance Department thought part of that should go to an expansion of the facilities of Chrysler.

Now, bear in mind that Chrysler had proved to be a tried and true performer; they had exceeded their promises to us; they had bettered their performance; and they were regarded by us as an extremely strong source for tank production. They said they would handle this expanded order on the same basis; that they would subcontract it out to the limit of effective subcontracting.

Now, the only question there was whether we should take their general assurance of that, backed by what they had done, or whether we should, on the contrary, specify that this, and this, and this must be subcontracted out, irrespective of their opinion as to whether it would slow down or speed up tank production. Faced with that alternative, and with the urgent need of tanks, it seems to me that we could safely take the assurance of this tried and true performer that they were going to turn them out for us in the way that would be quickest and best for us.

Dr. LAMB. I think I can say that the committee was impressed, both at its Detroit hearings and here, with the testimony of the Chrysler Corporation with respect to their record on subcontracting.

Mr. PATTERSON. Now, I may have been wrong on that, but I submit that I had a pretty strong case put up to me. The call from the British and from our own armed forces, too, in the armored divisions, being as urgent as it was, and those fellows having done the job and done it extremely well and ahead of schedule, I thought, "Well, that is a good, strong source; they have performed once; now they say they can perform again and quickly."

I also want to say—and I think it is worth mentioning—that we had Mr. Keller's assurance that he would subcontract that work to the limit of efficiency. He said he would not build any new facilities except where they would be required for speedy production.

Dr. LAMB. As I said, Judge, this committee has been impressed by their testimony; with the extent to which they seem to have been subcontracting. In the committee's record this is an unusual degree of subcontracting.

THE NECESSITY FOR CENTRALIZING PROCUREMENT AND PLANNING

Returning to your prepared statement you say:

> Last spring and at other times, I urged the curtailment of passenger-automobile manufacture. The armed services have not had the power to control such matters.

Would you say that the situation you have described shows the necessity of centralizing the responsibility for procurement and planning of war production?

Mr. PATTERSON. Yes, it is too decentralized now; I agree with that. If you want my views, I believe in the industrial mobilization plan of 1939. That is fairly centralized.

Dr. LAMB. Of course, as you point out in your prepared statement, there is a difference of opinion between the committee and yourself with respect to the question of central operation of such a plan——

Mr. PATTERSON (interposing). Well, the industrial mobilization plan, of course, represented a study that had been made by the War Department and the Navy Department out of the 1918 experiences. It followed the general lines of the organization that had finally evolved in 1918. It advocated a system much like that under the planning agency headed by Mr. Baruch in 1918, not the earlier forms of that development, but the final form that was in effect in the latter part of 1918.

In general, it seems to me that the responsibility for procurement of munitions and military equipment is placed by law on the Army and on the Navy, it is right there in the law. Of course, the law can be changed. But it is in the law, and that is the system that has been in effect.

Now, in normal times, the Army and the Navy don't need to worry about the fulfillment on schedule of their orders. They are an insignificant fraction of our whole industrial economy. The manufacturers, under those orders, don't have any trouble getting raw materials or labor or machine tools, and they deliver on schedule. The Army and Navy officers are very familiar and trained in the placing of those orders.

On the other hand, when you have an emergency—a war—the manufacturers immediately do have trouble on account of the volume of the orders and the great displacement of the civilian economy that they require. They do have trouble, and you can't just take it for granted that without assistance and without Government intervention of any kind, your material will be forthcoming on the promised dates; it just won't.

CIVILIAN PRODUCTION MEN NEEDED BY ARMED SERVICES

The War Resources Administration, under the industrial mobilization plan, was supposed to assist those contractors and manufacturers with the supply of raw materials and machine tools and facilities. They were to assist the armed services also in that way; those are things that civilians are more familiar with than military officers are. As I say, their usual experience doesn't train them in those extraordinary production conditions. Those are things where they sorely need the help and assistance of civilian production men, and we need that assistance right now, too. We haven't nearly enough of them in our supply arms and services.

Dr. LAMB. You are saying that, at a time such as this, once the country is in war, the problem consists in the need for collaboration between the military and the civilian, particularly those civilians experienced in achieving all-out production?

Mr. PATTERSON. Right.

Dr. LAMB. And that, nevertheless, there is always this problem of the centralization of administration, and hence the question of which of the two groups involved is to administer, or what kind of division of authority can be worked out which will produce a smooth result?

Mr. PATTERSON. Yes.

Dr. Lamb. In that connection, I would like to read a portion of the Executive order of January 7, 1941, with respect to the O. P. M., and also the Executive order of September 4, 1941, with respect to the Contract Distribution Division.

In the O. P. M. order I am quoting it said:

Formulate plans for the mobilization for defense of the production facilities of the Nation, and to take all lawful action necessary to carry out such plans. Determine the adequacy of existing production facilities and to assure their maximum use; and, when necessary, to stimulate and plan the creation of such additional facilities and sources of production and supply as may be essential to increase and expedite defense production.

And the Contract Distribution Division order read:

INDUSTRIAL MOBILIZATION PLANS

Develop programs for the conversion of plants and industries from civilian to defense production, with the assistance of the Government, if necessary.

The committee's view of that would, I believe, be that the establishment of these agencies under the Executive order was an indication that these additional means were necessary to supplement the Army plans and organization for the job of mobilizing American industry for war production. Would that correspond to your view?

Mr. Patterson. Yes.

Colonel Battley. That was the theory behind the industrial mobilization plan.

Dr. Lamb. I realize that; but somewhere the production plans have failed to follow those which were set up in 1937 and 1939, and so on, those beginning back at the end of the World War, and the division of authority has, by various Executive orders, been such as to separate some of the functions. The committee's report substantiates their view that this division has made for a lack of all-out production and planning for all-out production such as seems to be needed.

Colonel Battley. I don't think that that action separated any of the functions that we hadn't planned on separating in time of an emergency. The industrial mobilization plans were based on the fact that when these superagencies were set up the Army and Navy officers who had been working in these fields would be merely liaison to furnish information to the superagencies.

That was the set-up of the Army and Navy Munitions Board. And I think if you go back over the actions in setting up these civilian agencies, you will see that certain principles and agencies that we felt were inevitable have been adopted throughout the years, just what we hoped would be done under the industrial mobilization plan.

Dr. Lamb. By the statement which Judge Patterson has submitted, and by the record which the committee has secured throughout the country, it would appear that the plan and its execution have, to some extent, parted company, and that a recentralization is necessary.

Mr. Patterson. The plan has not been followed, of course.

Dr. Lamb. That is what I meant.

Mr. Patterson. Certain parts of it have been, but the plan in general has not been followed.

Dr. Lamb. I have only a few more questions.

Mr. PATTERSON. I think that the thought of the committee, from the interim report, is that the industrial mobilization plan does not go far enough.

Dr. LAMB. I think that would be correct.

Mr. PATTERSON. That is worthy of a great deal of consideration, there is no doubt of it. The report is an able paper. I read it—I didn't have time to read it before I prepared this statement, but I took quite a little time reading it last night—and it is a matter that is of pressing importance.

DOUBTS WORKABILITY OF PLAN FOR CIVILIAN BOARD

Dr. LAMB. In the report, as you know, the committee has recommended that the planning of procurement be concentrated in a single civilian board, and that the armed forces be freed for the jobs of strategy and military combat, and, of course, to determine the schedule of military requirements and submit it to the board, who would secure it for them.

Mr. PATTERSON. The difficulty that I have with that is that the Army and the Navy must judge the performance of the contracts. Civilians cannot do that. The Armed Services have to be the judges of whether the weapons will shoot, or whether the pieces will fit together. No production men can do that for you.

Dr. LAMB. I want to call your attention to the fact that in your statement you seem to indicate that the setting up of this proposed civilian board would leave out competent trained technical forces you now have in the Army.

Wouldn't that be taken care of, that question of the participation of the Army, by the committee's suggestion in the report—I am quoting:

> The centralization of procurement under this board will require the setting up of a new civilian procurement division to take over all military and lend-lease procurement functions. This division should include the best personnel from existing military and civilian agencies experienced in this work.

Mr. PATTERSON. That shifts the responsibility. Suppose the Army and Navy have one man out of seven, and he says that the weapon won't shoot, and the civilians say, "Oh, it is good enough, it will shoot." Or suppose they direct the source of production, absolutely direct it, and it is the judgment of the Air Corps that the airplane won't fly, and the civilian majority on the board says: "Yes; it will fly, it is all right, it is good enough." I don't like that. I don't think the military experts should be overruled on such a matter as that.

Of course, I am not saying that anybody contemplates that the fixing of requirements will be shifted from the Army. Of course, it is not so contemplated. But suppose the Services think that under the requirements a better product will be turned out by one plant than another plant suggested by a civilian agency. What is the answer? I know my answer.

Mr. SPARKMAN. Right at that point, Judge, aren't those objections technical rather than practical? Don't you believe that a civilian board or any board charged with that responsibility would have just

as great a concern in the workability of the whole plan and of the product?

Mr. PATTERSON. Well, I hope so; yes.

Mr. SPARKMAN. We would be in a bad fix if they didn't.

Mr. PATTERSON. If I were sitting there with a civilian and a fellow who had been flying military airplanes for 23 years told me, "You are making a sad mistake on this," I would say, "You can have your way on that; I have never flown a plane. I will defer to you on the military characteristics of the plane." That would be my view.

SCHEDULING OF NEEDS FOR WAR ON OVER-ALL BASIS

Dr. LAMB. I have one or two other questions, Judge.

The first is, In the Executive order of January 7, 1941, which I quoted before, setting up the O. P. M., there is a passage which reads:

shall survey, analyze, and summarize for purposes of coordination the stated requirements of the War and Navy and other departments and agencies of the Government, and of foreign governments for materials, articles, and equipment needed for defense.

I believe that Mr. Nelson, testifying before this committee in October, stated that as yet no such schedule had been developed.

Mr. PATTERSON. Well, it may not have been done at one sitting, but in considering the various items, of course, and the planning for the separate items, it has been carried out right along. That is, there are no set papers that would show the thing in consolidated form.

Dr. LAMB. I had reference to the committee's report showing the necessity for such an over-all review at an early date. Consideration would be taken of the closing down of civilian production on many fronts, which is already going on, by curtailment orders; it would require a reconsideration, not only plant by plant or even industry by industry, but on a much more comprehensive basis, because of the convertibility of the metal-working capacity of the country and its transferability from one set of operations to another.

Mr. PATTERSON. I don't know of any such plan having been worked out by S. P. A. B.

BRITISH PLANS FOR PROCUREMENT

Dr. LAMB. Finally, I think the committee would be interested in having your observations on the English experience with respect to the British Army procurement. Mr. Knudsen said yesterday that the Navy is still running its own procurement, but a Ministry of Supply, however, was supervising the Army.

Mr. PATTERSON. My understanding of the British system—I don't know it in detail—is that the admiralty run its own supply; the R. A. F. runs its own supply through the Air Ministry; and that the Ministry of Supply is supposed to furnish equipment to the ground troops of the Army. So they have three. That is my understanding.

I saw some months ago a confidential chart of the Ministry of Supply. I think it has been changed since then, and I haven't seen their latest organizational chart. The Ministry of Supply has been changed a number of times, I am informed, as to its make-up. They have been charged with the duty of supplying the ground troops of the British Army.

Of course, Lord Beaverbrook became head of that Ministry of Supply. He first was in the Air Ministry, which had been charged with the duty of producing airplanes for the R. A. F.

I understand that in their set-up—that is only hearsay, and it may not be right—the control of a raw material like aluminum, which is used primarily for aircraft production, but not fully so, because the others may use some, is with the Air Ministry, as it is the main customer. And I suppose that on other materials like steel, and so on, where probably the major use is for ground troops, the control is in the Ministry of Supply.

Dr. LAMB. In closing I want to say that I have asked you so many questions, and in such detail, because your paper is both comprehensive and provocative in a good many respects relating to the committee's report. It seemed necessary to get these questions and answers into the record.

Mr. PATTERSON. I had not given, as I said, the careful study that the committee's report deserves when I prepared the statement, and I read it with some care last night, and I would like to read it again. It is a pretty concise and succinct statement, and it is one of those things that you don't get all of the meaning of on a first reading.

Of course, I agree with the bulk of that report. The needs are stated there in a way that I don't think anyone who was honestly interested in getting the armed forces equipped as fast as possible would differ with. The present ills that we have from dislocations are clearly stated, and they can't be laughed off by anybody.

PROBLEMS OF "EXPLODING" AND SUBCONTRACTING

Mr. CURTIS. Judge, I have a question or two.

I would like to know the reaction of you and your aides to the system that the English call "exploding." Take, for instance, the M–3 tank. Instead of letting a contract with someone to make tanks and they in turn subcontracting, the Government itself starts out to negotiate contracts with people to make certain portions of that tank, and someone else is given the job of assembling.

Mr. PATTERSON. Of course, the problem with the British is more that way than with us. They have not got the large accumulations of industrial facilities that this country has. I am in favor of the bits and pieces. The War Department is committed to it by policy. However, there are certain problems that are hard problems in carrying it out. You have got to be sure that your pieces will fit when they come together. If they don't, it is all off. You also, of course, have to have them geographically so situated that there isn't a long haul back and forth.

Some of our worst delays right now are on pieces that are subcontracted out and on which the subcontractor has fallen down. The whole thing waits until that piece appears. Now, that is no argument against subcontracting. I am for it, but it does show the need of careful organization, and you can't take any Tom, Dick, or Harry that comes along and says, "I can make it." They have got to be selected with some reference to their skill and reliability, and it also involves a very careful follow-up system. It does you no good to follow up the Glenn L. Martin Co. in Baltimore, if the piece that is missing is a

piece that is made in Cleveland by a subcontractor. You have got to go out there.

Mr. CURTIS. I was referring in my question primarily to getting your reaction to the possibilities of exploding rather than subcontracting.

Mr. PATTERSON. We do that. I think Chrysler does it in the production of their medium tank. Baldwin has something like 2,000 subcontractors on the medium tank job they are doing up in Philadelphia.

We do it; we have got to do it more; there is no doubt about that, but the extension of it will introduce problems that we will have to control, and I think we can control them.

DIRECT CONTRACTING FOR "BITS AND PIECES"

Mr. CURTIS. This question was asked me by small manufacturers—would it ever be practical to carry it to the point where someone representing the procurement agencies visits a concern, makes an estimate of what they can make, and leaves an article or two with them, and says, "See if you can make this, and if you can, and if you can make it to the necessary degree of perfection, we will negotiate a contract with you for that"? Would you comment on that?

Mr. PATTERSON. Yes; we do that. We have on exhibit in each of our Ordnance district offices—there are 14 of them—a room with everything laid out there, assembled and in pieces, for all prospective contractors to come and look over.

Now that has been there for some time. That is part of the ordinary Ordnance procurement work. I am not referring to the special exhibits which have been going around the country, and with good effect; but any manufacturer who wants an Ordnance contract can go in there and the piece is all laid out.

I went to one of those rooms less than 2 weeks ago. It is a room about the size of this one, and they have everything from little tiny pieces of fuzes, up to, well, they haven't got the biggest guns, they couldn't have those, but up to a pretty large piece of equipment.

Now some people say we ought to have everything there. Well, it is obvious we can't do that. We can't move a medium tank into that room, and besides, we need the medium tanks. They will have to study those from the blueprints. We can't move a four-engine bomber into that room. It wouldn't produce anything except perhaps satisfy someone's curiosity. But they do have everything there that they can conveniently get, and that will help people who are interested in producing defense items.

I will just say one further thing about this subcontracting. I have discussed it a great deal with people. One man said to me, "Why, you have got to subcontract even though the subcontractor is incompetent; even though he will take and break half of your pieces; even though half of the pieces come off imperfect and have to be discarded."

I said, "Well, of course, we can't afford to do that; the shortage of raw materials won't allow that." He said, "Well, you can order double of what you are going to need, and 50 percent will come out right."

Well, I don't think you can afford that kind of waste. If it is a thing that is made of nickel, I know perfectly well you can't afford that waste.

Mr. CURTIS. I would like to make one other observation.

LACK OF TIME FOR PROPER BIDDING

We have held some hearings in the Middle West, and small manufacturers tell us that when they get these lists of invitations to bid—I am speaking now not of highly technical instruments, or great tanks, or anything of that sort, but small articles—that when they get those, many times they see articles on there that they could make. But the time in which that list arrives in their hands, and the time in which their bid must be submitted is too short.

Now we had some lists presented to our committee in which the time allowed was very short—3 days, maybe 5, 6, 7, 8, or 10 days—and those individuals could not get their blueprints, make their estimates, get in touch with the materialmen, and get the bid back here in that length of time. I realize you are busy, and this involves smaller articles, but it does mean a great deal to the total war effort, as well as to these people who would like to make their contribution to the defense program.

Colonel HARE. We require in our instructions to the purchasing contracting officers, that a minimum of 15 days be allowed between the time they request the bids and the opening of those bids. Now, also, we do not turn a man's bid down in all cases if he is a little bit late. We are trying, if it does give an opportunity of spreading the load and going into one of the certified distressed areas, to consider that man's bid even if he is 4 or 5 days late.

Mr. CURTIS. When do you start to count your 15 days?

Colonel HARE. From the time that the proposal is issued and in the mail, the mailing date of the proposal. Now we use air mail where it is necessary.

Mr. CURTIS. Now is that proposal mailed to some State or regional office, and then mailed again, or is it 15 days from the time it is mailed to the individual who has asked that his name be placed on the list?

Colonel HARE. The latter is correct.

Mr. CURTIS. How long has that been in effect?

Colonel HARE. It was made mandatory on September 5, but before that the controlling thing was, "Give them just as much time as you can," and in many cases 30 days were allowed.

Mr. CURTIS. In order that I might keep informed on these things, I have had myself put on the mailing list. Of course, that is the O. P. M. office at Omaha, and it takes about 1 day longer to get the mail here than it would be in my State, and I find that the time is usually quite short on those things.

Mr. PATTERSON. I got from one of the Senators, some months ago, a list that was made up for bids, and the time allowed was very short, but most of those were not War Department items at all.

Colonel HARE. There is a general Treasury Procurement list that goes out.

Mr. PATTERSON. That was it; most of them were not War Department items at all.

Mr. SPARKMAN. I was wondering if that might not be an argument for one body to do all of the procuring?

Mr. PATTERSON. Maybe so.

Colonel HARE. In many instances we send out proposals offering everybody an opportunity to bid when the quantity we want is very small, and maybe we will have a thousand bidders for a very small,

insignificant item like tent pins, or something that anybody can make. So in those cases there has been a tendency on the part of the services to make the bidding time rather short.

Mr. SPARKMAN. I remember one case that was called to our attention at Omaha, in which some man from some small town nearby was very much interested in bidding on one item in connection with incendiaries—the fuze or cap, or something; I don't remember what the part was. He felt certain he could make it, but he had to get in touch with someone to see if he could get either a changed machine or the material, and he couldn't possibly meet that dead line on that particular bid.

I believe he testified to us that, had he been able to get the contract, it would have enabled him to keep his plant going. It was just a small plant, and it appeared then inevitable that he was going to have to close down and throw those people out of employment.[1]

Colonel HARE. That incendiary-bomb program was decentralized to our districts; it was on a regional-procurement basis, so the office that he got his proposal from should have been quite close to him.

Mr. SPARKMAN. It was; but, as I recall, he had only about 6 days to get his bid in.

MUNITIONS BOARD AVOIDS COMPETITION BETWEEN ARMY AND NAVY

Here is a question I wanted to ask Judge Patterson:

During the early part of the last World War there was considerable competition, I believe, between the Army and Navy in their purchases. Has that been pretty well eliminated at this time?

Mr. PATTERSON. Yes; the Munitions Board, on which the Army and Navy have joint representation, as part of its work of making up the inventory of industrial facilities, allocated some to the Army and some to the Navy. In the Army it suballocated some to Ordnance, some to Chemical Warfare, some to the Signal Corps, and so on, so that there has not been a rush of business from all supply arms and services and all bureaus of the Navy into some one plant, leaving another entirely neglected. I have heard no complaint of that at all this time.

Mr. SPARKMAN. Well, I haven't, either.

Mr. PATTERSON. It was a very bad condition in 1917, so I have read.

Of course, that does show the need, too, of clearing your orders somewhere. There isn't the competition and the conflict today that I know of, but if it should prevail I suppose it would be for the Purchasing Division of the O. P. M. to regulate it.

The CHAIRMAN. Judge Patterson, you and the other gentlemen of the panel here have been extremely patient and kind and very helpful to us, and I know it is going to be a very valuable contribution to us, and we are very grateful to you for appearing here this morning. Thank you very much.

Mr. PATTERSON. You have been very kind, indeed, to us, gentlemen.

The CHAIRMAN. We will next hear from Mr. Wheeler and his associates.

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[1] See Omaha hearings, pt. 22.

TESTIMONY OF WALTER H. WHEELER, JR., DEPUTY DIRECTOR, DIVISION OF CONTRACT DISTRIBUTION, OFFICE OF PRODUCTION MANAGEMENT, WASHINGTON, D. C.

The committee is glad to have you here today. As you know, Mr. Nehemkis, of Mr. Odlum's office, appeared before the committee in St. Louis and gave the committee some excellent testimony.[1]

NECESSITY FOR USING FACILITIES OF SMALL BUSINESS

The committee believes that the Division of Contract Distribution has attempted to do a difficult job. We appreciate the critical importance of employing small business. How can we attain maximum output in the shortest possible time unless we do use small business, and how can we maintain the morale of small businessmen, their workers, and the small industrial communities of the country if we do not utilize small business?

The committee is convinced that small business must be drawn much more rapidly into the defense program. The problem is how to do it.

Mr. Curtis has a few questions to ask you.

Mr. CURTIS. Mr. Wheeler, referring to the Executive order creating the Defense Contract Distribution Division, we find that it contains language along this line:

* * * Develop programs for the conversion of plants and industries from civilian to defense production, with the assistance of the Government, if necessary.

And it requires that:

The committee shall, from time to time, upon request by the Director, make findings and submit recommendations to the Director with respect to procurement practices and procedures; contract placements and distribution; industry conversion problems; formation of local production associations; subcontracting; and for such other matters as the Director may require advice and assistance.

Now here is a question or two.

What programs have you developed for the conversion of the automobile industry from civilian to war production?

DIFFICULTIES OF CONVERSION OF INDUSTRY TO WAR WORK

Mr. WHEELER. May I answer your question generally, sir, first? We have really been able to do relatively little on conversion. There are two reasons for that. The first is that there does not seem to have been a large enough procurement program to have taken care of all small business. Second, it costs a great deal more to bring small business and moderate-sized business into the defense picture. It costs a great deal more, particularly on the initial order.

When a company is converted from its normal business to defense production, it is like bringing out a new model. There is considerable education, tooling, and expense.

Until Pearl Harbor, the Army and the Navy, as I understood it, were not able to pay substantially more for the specific purpose of spreading orders among small business. I understand that they can do that now.

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[1] Mr. Wheeler was accompanied by Peter Nehemkis and Edwin Weisl, consultants of the Division of Contract Distribution, Office of Production Management.

I don't believe that we can bring every small garage and every tinshop into the defense program, but I do believe that if we are going to achieve the speed necessary for the victory program we have got to bring into the picture every available resource, and in large part those resources are in moderate-sized plants, plants running from perhaps 50 employees up to several hundred. They are the plants, for the most part, that I feel could have done a job in the defense picture and which have not as yet been able to do so.

We have done some conversion. We have certified some 11 areas, and we have certified 1 industry, and there has been a total volume of business placed by the armed services with them of approximately $66,000,000.

Mr. CURTIS. What industry was that?

Mr. WHEELER. The washer and ironer industry.

SURVEY LOOKING TO CONVERSION OF AUTOMOTIVE INDUSTRY

Mr. CURTIS. Have you done anything on conversion of the automobile industry?

Mr. WHEELER. We have just completed a survey of some of the major industries. I should say at the outset that it is rather an overall survey; it is not specific, but just an effort to get a general idea as to what might be done. I will be glad to give you some of the figures that I have here.

The CHAIRMAN. Suppose you give us a typical example now, and we will have the remainder of the list inserted in the record.

(The following list was supplied for the record:)

Industry	Usable capacity, first half of 1939 (in dollars)	Potential use when converted
Farm implement	231 millions	Tanks.
Cooking utensils, aluminum ware.	54 millions	Hurricane lamps, bomb components, tail fin assemblies, magazine holders, engine cowlings.
Household appliances	36 millions	Bombs, aircraft components.
Metal furniture	76 millions	Airplane fins, rudders, boilers, bombs, ammunition boxes.
Refrigerator cooling and air conditioning.	481 millions	Fuel tanks, general sheet metal work, including engine cowlings, small compressors, fuze cylinders, mine sinkers, engine castings, magneto parts, bomb components, searchlight and motor parts and smoke shells.
Bolts	51 millions	30 and 50 caliber ammunition.
Sewing machines	18 millions	Rifle and pistol parts.
Railroad and street cars	101 millions	Tanks, gun mounts, projectiles.
Fountain pens and pencils	15 millions	Primers, igniters, fuze components.
Office machinery	90 millions	Ammunition, rifle and pistol components.
Light fixtures	75 millions	Cartridge cases, fuze and primer components.
Stoves	125 millions	Main assemblies, such as wings, rear fuselages, etc., general aircraft sheet metal work, small assemblies such as fins, tail planes, rudders, etc., radiators, boilers, smoke bombs, ammunition boxes, shell casings, cylinder and fuze containers, smoke floats, shell turnings, land mines, trench mortar bombs.
Automobile industry	2½ billions	Airplane components, gun mounts.
Wiring devices	57 millions	Ammunition components.
Rubber tires	Undetermined	Tanks, turret parts, treads, etc.

Mr. WHEELER. With respect to the farm-implement industry, we believe that they can make components of tanks. If they were cut to one-half of their 1939 production, they would have available a production of about 231 millions of dollars. These 16 industries, on that same basis of a half of their 1939 production, would give about 4 billion dollars of victory program production.

Now that doesn't take in every industry. The automotive industry is included; that is 2½ billion dollars.

Dr. LAMB. Over how long a period, Mr. Wheeler?

Mr. WHEELER. On an annual basis.

Mr. CURTIS. Mr. Nehemkis told us at our St. Louis hearings about the conversion program developed for the domestic laundry equipment industry. Could you tell the committee how large a staff was used for the preliminary investigations in the development of this program?

Mr. WHEELER. I should say a staff of about 10 or a dozen. Mr. Nehemkis can check me on that because he is more familiar with that. Is that about the number?

Mr. NEHEMKIS. Fewer than that. Only three or four.

PLANNING BEGAN AFTER AUTO CUT IN AUGUST

Mr. WHEELER. That happened before I was in the Division.

Mr. NEHEMKIS. The discussions with the industry began on August 1, at the time that the then Office of Price Administration and Civilian Supply—Mr. Henderson's organization—had effected a 50-percent curtailment program. The War Department announced the award to the industry of a $12,500,000 contract for gun mounts in October; and the industry is now in production. So that it took altogether a little over 4 months.

Mr. CURTIS. Mr. Wheeler, I would like to call your attention to page 32 of our second interim report, which includes a list of only some of the industries which, it was generally recognized, would be curtailed. You will notice that the domestic laundry equipment is virtually at the bottom of this list, with approximately 10,000. Would you tell us whether conversion programs have been developed by your Division or cleared through your Division, with respect to any other of the industries on this list, or in fact for any other consumer durable-goods industry?

Mr. WHEELER. The O. P. M., of which we are a part is just now approaching the question of conversion in an industry-wide manner. So far, with our limited staff, we have concentrated on distressed areas, on helping pools that have been organized, and in trying to get prime contractors to subcontract.

We have not had the staff, as yet, but we are building it up and we have a staff now that is adequate to start in, to tackle it industry by industry, and that is the program that the O. P. M. has in mind—to bring down here a panel of engineers from each of the major industries, to get together with members of the Navy and the Army, and to determine just what those industries can do.

CONVERSION IS PROCEEDING IN MANY SMALLER PLANTS

Mr. CURTIS. In other words, this laundry equipment industry is the only example in that list where conversion has been completed?

Mr. WHEELER. That is true of the industry as a whole. We have converted individual plants in other industries.

Mr. CURTIS. How many individual plants?

Mr. WHEELER. I should say many thousands. I haven't the figures here and I don't know that there is any way to compile them exactly,

but the number of establishments is great in the areas which were certified.

Dr. LAMB. You have reference to the distressed areas?

Mr. WHEELER. Yes: which have been certified. That number would probably run into, I should think, several hundred concerns.

DEFINITION OF "DISTRESSED AREAS"

The CHAIRMAN. What are these so-called distressed areas?

Mr. WHEELER. A distressed area is one which has been certified to us by the Labor Division of O. P. M. as one in which there is acute unemployment or threatened unemployment. When they certify to us, we in turn make a survey of that area, find out what the individual plants in that area may do, and then we certify that to the Army and the Navy through the O. P. M., and the Army and the Navy make their awards.

The problem of individual plant conversion has really been going on for a long time, but not on an industry-wide basis.

Dr. LAMB. In that connection, Mr. Wheeler, the committee has heard testimony which would indicate that this procedure leaves much to be desired. It is the squeaky axle that gets the grease. Some communities have protested loudly enough so that a precedence has been established on the basis of their ability to make themselves heard.

Mr. WHEELER. There have been so many squeaky axles that we have been able to take care of only a fraction of 1 percent of them. That is the premise I first made, that the procurement program to date simply hasn't been large enough to care for all the individual plants that have been pressed by material shortages.

Mr. CURTIS. Are you familiar with the aluminum processors at Manitowoc, Wis., and the other town near there?

Mr. WHEELER. I am, generally.

Mr. CURTIS. What have you been able to do there?

Mr. WHEELER. We have been able to do very little there. We got several of those companies into contact with some aircraft companies. You are speaking of a certified area, are you?

Mr. CURTIS. Yes.

Mr. WHEELER. They got an order for canteens.

Mr. CURTIS. They came down here and told our committee that the order for canteens didn't amount to anything much; and here they were, people used to working with aluminum, and they had had a man in Washington 7 months, and they couldn't get any defense work amounting to anything.

Mr. WHEELER. I understand the Army has all the canteens it can use at the moment.

Mr. CURTIS. Their point was that there were many, many things beside canteens that they could make—for instance, in connection with the airplane industry—and that they had had years of experience in dealing with aluminum.

Mr. WHEELER. We put some of them in touch with the aircraft people in the hope that something would be worked out between them. I don't think the industry as a whole made the effort that they might have made in that respect. You understand that we do not have the power to make the award. All we can do is to advise, and if the Army hasn't authorized current procurement of the items that these plants can handle, there is nothing we can do about it.

AUTHORITY FOR PLANNING AND ORDERING CONVERSION

Mr. CURTIS. Yesterday, when Mr. Knudsen testified before the committee, he was asked which of the various defense and military agencies are charged with the responsibility of conversion. The committee was told by Mr. Knudsen that he and Mr. Hillman were personally responsible for that problem. I presume Mr. Knudsen was referring to administrative order No. 37, issued by the O. P. M. on December 18, 1941, to the effect that all the industrial branches were to be assigned to the director general or the associate director general. I have a copy of this order before me, and also of the statement which accompanied this administrative order, which said that, effective December 18, 1941, the industrial branches now reporting to the Division of Civilian Supply and the Purchases Division will report directly to the director general and the associate director general. It says later that the chief of each industrial branch will work with the industry and labor advisory committees and with representatives of all divisions and bureaus of the O. P. M. in planning for conversion of manufacturing to war material.

Would you interpret this administrative order to mean that your Division is no longer charged with the responsibility of developing and clearing conversion programs?

Mr. WHEELER. No; I most certainly would not. I have discussed that with Mr. Knudsen. There is no question of that kind at all. The set-up of the O. P. M. may be somewhat confusing to many people who are not in it, but if you are in it and see how it works, it isn't as confusing as it may appear from the outside.

The Purchases Division of the O. P. M., aside from clearing purchases, advises primarily with respect to staples, items that the Quartermaster Corps may use. Then we have the Production Division, which specializes primarily on technical bottlenecks, and the Division of Contract Distribution, whose job it is to search the country from one end to the other to bring in all available facilities, either subcontracting or prime contracting. And I understand that this program is going to work with all three of those divisions sitting in at the industry conferences which will be called in Washington.

Mr. CURTIS. We would like to have your frank opinion, Mr. Wheeler, as to whether you see any change in approach in organization which has taken place in the rate of conversion of American industry since the O. P. M. was set up on January 7, 1941.

Mr. WHEELER. Well, I have been in it a little less than 3 months, and frankly my time has been wholly taken up in my own shop, in my own division, in getting organized and getting additional field offices established.

We started with a staff of 39 here in Washington, and we have a staff now of around 375 in Washington; and in the field we had some 39 offices, with a personnel of approximately 450, and now we have 95 offices. We have an office in every State, and we have a field organization of about 800. And it has been quite a job to organize that. Consequently, I haven't had the opportunity to observe the workings of the balance of the O. P. M. as well as I will have in the future.

Mr. CURTIS. Have you had an opportunity to glance at our second interim report?

Mr. WHEELER. I am sorry, sir, but I have not. I understand it is a very able report, and I want to read it at the first opportunity.

AGREES THAT PRESENT SET-UP CAN HANDLE PROBLEM

Mr. Curtis. In that report we recommend the creation of a single civilian board for procurement and production planning in the defense effort. Do you have any comment you would like to make on that?

Mr. Wheeler. I am not prepared to give a definite opinion on that subject. I would say that at any time any change is made in any organization set-up, it must be realized that such a change is going to set the operations back, for a period of time, until we are adjusted to the new set-up.

It seems to me that the O. P. M. set-up which we have now can function and can do the job, and offhand I would say, let the O. P. M. have a go at it for several months, at least, before making another change.

I think there is grave question as to whether civilians should dictate procurement in detail. I heard what Judge Patterson said, and I certainly sympathize with a very large part of it. I think civilians can advise, that they can be an adjunct to the procurement agencies. We are going to place one or more of our men in each of the Army field procurement offices, and the same with the Navy, and their job will be to help and advise those procurement agencies, and to search out sources of supply for them.

Dr. Lamb. Does that mean that, in effect, your division becomes an adjunct of the Army procurement?

Mr. Wheeler. Yes, I think that that is a fair statement. I think that that is what it is.

Dr. Lamb. Would you say, then, that there are now two organizations working side by side on this same problem?

Mr. Wheeler. No, I don't think they are working on exactly the same problem. There appears to be some duplication, particularly if you consider that the Army and the Navy both have divisions of Contract Distribution. But we are concentrating on unearthing all available sources of supply. The procurement agencies are concentrating on getting what they want in operable condition, when they want it.

CHANGE IN PROCUREMENT PROCEDURE

Dr. Lamb. Their functions are to announce their needs and to let the bidders fill those needs, are they not?

Mr. Wheeler. That procedure has been changed somewhat now.

Dr. Lamb. How?

Mr. Wheeler. An act went through last week—the first War Powers Act, I believe—which gives the Army and Navy full right to negotiate bids, and not simply to award them to the lowest bidder. I would like to come back to that point for a moment because I think that is the most important thing in speeding up the victory program.

The Army procurement officers are in a very difficult spot. A prime contractor, say, with 40 or 50 subcontractors working for him, submits a bid which may be 30 to 40 percent higher than the previous bid. That Army procurement officer must satisfy himself that that is a reasonable additional cost. He may know generally that some additional cost is warranted; he knows that the smaller concerns do not have modern machinery, by and large, or the single-purpose, high-speed machinery that the larger concerns have. But

to determine whether that increased cost is reasonable and fair is an exceedingly difficult thing for him to do. If he takes too much time in making up his mind about that, the defense program is going to be delayed, and if he hesitates, the business is not going to be farmed out in all the places that it should.

EXCESS-PROFITS TAX RECOMMENDED

In my opinion there is only one asnwer, and that is to have an excess-profits tax that takes all corporate profits above 1941. Then the question of price is not an important one. That I consider to be fundamental and essential.

Dr. LAMB. Just what part does your Division play in this new set-up of negotiated contracts?

Mr. WHEELER. Well, we advise.

Dr. LAMB. Do you also review? Do you have the same review powers as you had before?

Mr. WHEELER. I don't quite understand what you mean by "reviewing"?

Dr. LAMB. As I understand it, in the Washington office O. P. M. has had the power to review specific contracts.

POWER OF APPROVAL OF CONTRACTS

Mr. WHEELER. That is the power of approval of contracts before they are awarded. That is the work of the Purchases Division.

Dr. LAMB. You say "before they are awarded." As I understand it, a preliminary contract has already been drawn and most of the arrangements made before you people in the Washington office ever have it for review.

Mr. WHEELER. That has been the case in the past, but I don't expect it will be so in the future, because now we have placed the men with the planning sections of the procurement agencies both in Washington and in the field.

Dr. LAMB. You said a moment ago that your role there was purely advisory, and that you have no veto power.

Mr. WHEELER. That is true, but I think if we protested to the Purchasing Division strongly enough, and we had a good enough case, the Purchasing Division wouldn't clear the contract.

Dr. LAMB. Well, by that time wouldn't you be open to the charge that you were holding up the procedure, as you have been in the past?

Mr. WHEELER. We would. That is why we want to get in on the planning stage of this thing.

Dr. LAMB. If you are in on the planning only in an advisory capacity, and without direct powers of review——

Mr. WHEELER. Well, you can't review it until the terms of the contract have been drawn up. That is the final point where you can express approval or disapproval. As it develops, you can advise, and you know generally where it is going, but you don't know what the final price is going to be until it is finished.

Dr. LAMB. What I am getting at is that your responsibilities and theirs are quite different; in fact, they have the responsibility and you have, relatively speaking, none, except this advisory respon-

sibility. And consequently your actions would seem to be only those of complicating and delaying the flow of the contracts at this stage of the game.

Mr. WHEELER. I think we can only tell that after we have worked under this new procedure for a while. It is our hope that by working with the procurement officers in the planning stage, the plans that are finally evolved will be joint plans, and that there won't be any great difference of opinion which would put us in a position, in many cases, in the end of wanting to hold up an award.

The CHAIRMAN. Have you regional offices in various parts of the United States now?

Mr. WHEELER. Yes; we have 95 offices of our Division, sir, and about 750 field men. We have a main office in each State.

The CHAIRMAN. Is it the idea to augment the personnel throughout the United States?

Mr. WHEELER. Yes, it is; to get all the skilled production men that we possibly can get, because we do have to give some technical help and assistance to the small- and moderate-sized plants, in conversion, and we do have to do, or probably will have to do, a good deal of follow-up work with them, of the nature that was mentioned here in Judge Patterson's testimony.

The CHAIRMAN. Gentlemen, we thank you very much for coming here today; we appreciate it and I know your testimony will be very helpful.

Dr. LAMB. At this time, Mr. Chairman, I should like to offer for the record various prepared statements from sources not represented by witnesses at this hearing for inclusion in the record as exhibits.

The CHAIRMAN. That will be permitted. The committee will stand adjourned.

(Whereupon, at 1:10 p. m., the committee was adjourned, subject to the call of the chairman.)

(The exhibits referred to above appear on following pages:)

EXHIBITS

Exhibit 1.—500 Planes a Day—A Program for the Utilization of the Automobile Industry for Mass Production of Defense Planes

By Walter P. Reuther

Foreword by Philip Murray—Introduction by George Soule

FOREWORD

The Congress of Industrial Organizations has given to the Government a proposal for mass production of defense aircraft. The immediate effect has been an encouraging lift for national defense—through widespread publication and discussion. Valuable as this is, we are convinced that the program merits more than verbal praise and piecemeal application.

The C. I. O.'s proposal was drafted at my request and the request of R. J. Thomas, president of the United Automobile Workers of America, affiliated with the C. I. O. It is the result of the experience of a group of skilled automobile workers, headed by Walter P. Reuther, who studied this problem for months and arrived at the conclusions contained in the report. Their findings bear the imprint of the unanimous approval of the executive board of the C. I. O.

Our program was born out of the C. I. O.'s desire to make its utmost possible contribution to national defense. The specific program for mass production of defense aircraft indicates the great extent to which organized labor's knowledge and abilities may be utilized in our present national emergency. The program implements a general program already outlined by the C. I. O. for a larger recognition of labor's responsibilities and prerogatives in this emergency.

The efforts of our country to preserve and perfect our democratic institutions finds no greater response than in the ranks of American labor. Our aircraft production program is concrete evidence of that fact; and it also bespeaks the logic of our desire for a greater recognition of organized labor's role in national defense.

Philip Murray,
President, Congress of Industrial Organizations.

AUTHOR'S NOTE

This program is an outgrowth of the American automobile workers' conviction that the future of democracy and all that our people hold dear are dependent upon the speedy and successful prosecution of our national defense.

I have discussed the general outlines of the program with Assistant Secretary of War Robert Patterson; Philip Murray, president of the Congress of Industrial Organizations; Sidney Hillman, member of the National Defense Advisory Commission; and R. J. Thomas, president of the U. A. W.-C. I. O.

Upon being urged by these leaders of Government and labor to complete the survey, I consulted with a number of highly skilled designing engineers, tool and die makers, jig and fixture men, and pattern and model makers, employed for years by General Motors, Chrysler, Packard, Hudson, Briggs, Murray Body, and other automobile companies. Individually and jointly, we made first-hand studies of aircraft motor parts and wing and fuselage assemblies. All of these men are members of the U. A. W.-C. I. O. and are recognized by managements as well as by the union as master technicians. They have contributed to the formu-

lation of this program which we now present as part of labor's contribution toward the solution of a grave national problem.

WALTER P. REUTHER.

INTRODUCTION

By George Soule [1]

Here is a plan to speed up warplane production to aid the defense of Britain and the United States. It asserts that within 6 months the automobile industry could be turning out 500 fighting planes a day, in addition to whatever the airplane industry itself may be able to do. Such a plan is certainly worth careful investigation.

The plan is sponsored by men who have an intimate technical knowledge of the automobile industry. It is proposed by Walter P. Reuther, an official of the United Automobile Workers of America, after consultation with designing engineers and highly skilled specialists employed in numerous auto plants. Any proposal by such a body of men deserves a hearing. Again and again it has been demonstrated in American industry that suggestions arising from those who do the work, and through long personal experience understand industrial problems, are immensely valuable.

The plan points out indubitable facts that few Americans know. The automobile industry is operating at only about 50 percent of capacity, largely because of seasonal production. If its output were spread evenly throughout the year, half its plant and manpower could be used for something else. Could this something else be warplanes? Here is where serious disagreement arises. Some connected with the plane industry say it could not, because plane engines and bodies are more complicated and require more exact and refined processes. This report answers the objection by detailed facts and figures. Machinery, plant, and manpower, it asserts, are available to do the necessary jobs. To the layman, it offers convincing evidence that if we want mass production of warplanes, the automobile industry can give it to us.

The layman, of course, is not qualified to decide the technical questions at issue. But all of us, as American citizens, have a right and duty to insist that the questions be carefully investigated and decided by those competent to judge, without the influence of private interest or prejudice. We cannot be satisfied with a negative response on the part of the aircraft industry itself, which has an obvious interest in avoiding competition. Nor can we be satisfied with the judgment of Army experts who through experience only with special production of frequently changed models do not understand the quality potentialities of mass production. Nor, finally, can we be satisfied with a reluctance of certain automobile employers to sacrifice competitive advantage by planning production for the whole industry as a unit.

It would seem that little could be lost even if the plan were unsuccessful. At present half our productive capacity in automobiles is going to waste. Let us not permit this plan to be shoved aside by the inertia of vested interests.

500 PLANES A DAY—A PROGRAM FOR THE UTILIZATION OF THE AUTOMOBILE INDUSTRY FOR MASS PRODUCTION OF DEFENSE PLANES

By Walter P. Reuther [2]

England's battles, it used to be said, were won on the playing fields of Eton. This plan is put forward in the belief that America's can be won on the assembly lines of Detroit.

In an age of mechanized warfare, victory has become a production problem. The automotive workers for whom I speak think our industrial system a productive giant capable of any task, provided it is not forced into battle with one hand tied behind its back. They also believe that we need send no men to a future conflict with the Axis powers if we can supply enough machines now to our first line of defense in Britain. The machines we and the British need most are planes, and the survival of democracy depends on our ability to turn them out quickly.

[1] Editor, New Republic; chairman, National Economic and Social Planning Association; director-at-large, National Bureau of Economic Research.

[2] Director, General Motors Department, United Automobile Workers of America, C. I. O.; member, Committee on Training in Industry, National Defense Advisory Commission.

The workers in the automotive industry believe that the way to produce planes quickly is to manufacture them in automobile plants. The automotive industry today is operating at only half its potential capacity. This plan proposes that the unused potential of the industry in machines and men be utilized in the mass production of aircraft engines and planes. It is our considered opinion that it would be possible, after 6 months of preparation, to turn out 500 of the most modern fighting planes a day, if the idle machines and the idle men of the automotive industry were fully mobilized and private interests temporarily subordinated to the needs of this emergency.

Time, every moment of it precious, its tragic periods ticked off by bombs falling upon London and the Midlands, will not permit us to wait until new mass production factories for aircraft and aircraft engines finally swing into action late in 1942. Emergency requires short-cut solutions. This plan is labor's answer to a crisis.

Mr. William F. Knudsen says that airplane production is 30 percent behind schedule. It will continue to be behind schedule so long as we continue to rely on the expansion of existing aircraft plants, and on the construction of new plants. Expansion of existing aircraft plants means the expansion of plants utilizing the slow and costly methods of an industry geared to hand-tooled, custom-made production.

New plants cannot be built and put into operation in less than 18 months. In 18 months Britain's battle, for all her people's bravery, may be lost, and our own country left to face a totalitarian Europe alone.

Packard and other companies are still digging the ditches and pouring the concrete for their new airplane engine factories. The Axis Powers will not wait politely until these factories are finished.

New plants, when finally erected, must be filled with new machinery and this new equipment largely duplicates machinery already available in our automobile plants. The machine industry is overtaxed. The emergency of war cannot be met in the normal time necessary to construct new plants and equip them with the required production machinery.

We propose, instead of building entirely new machines, to make the tools required to adapt existing automotive machinery to aircraft manufacture.

We propose to transform the entire unused capacity of the automotive industry into one huge plane production unit. Production under this plan would not replace the output of the aircraft industry proper, which would continue to construct the large bombers and planes of special design.

FIFTY PERCENT OF AUTOMOBILE INDUSTRY'S POTENTIAL CAPACITY IS UNUSED

No industry in the world has the tremendous unused potential productive capacity of the American automotive industry, and no industry is as easily adaptable to the mass production of planes. A careful survey will show that the automobile industry as a whole is not using more than 50 percent of its maximum potential capacity if that capacity were properly coordinated and operated to the fullest degree.

The automobile industry could produce 8,000,000 cars a year. It is producing approximately 4,000,000. These unused plant reserves, as shown by the figures given in the Federal Trade Commission's report on the motor vehicle industry, are greater than the total motor plant capacity of England, Germany, France, Italy, Russia, and Japan combined. Adapted to plane production, this unused potential capacity would give us world plane supremacy within a short time.

At present the automotive industry never operates at more than 80 to 90 percent of its maximum potential capacity, and then only for a few months each year. The rest of the year it operates on reduced schedules, and many plants shut down completely. If automobile production were spread evenly over a 12-month period, it would be possible, without reducing the total output of automobiles, to convert a large portion of this machinery to the manufacture of planes.

During the automotive year ending August 1940, Nash used only 17 percent of its productive capacity; Dodge used 36½ percent. Nash, working at maximum capacity, could have manufactured its total output for the 12 months in 49½ working days; Dodge in 111 working days. Chevrolet, the largest single producer of motor cars, turned out over a million cars during the last model year, and yet used less than 50 percent of its potential productive capacity. The main Chevrolet Motor plant at Flint, Mich., produced 380

completed motors per hour at the peak of the 1937 production season, utilizing all four of its complete motor machining and assembly lines. At the present time, at the peak of the 1940 production season, the Chevrolet Flint plant is producing 282 motors per hour, with one motor line standing completely idle, while the three remaining lines are operating on a two-shift basis. Since 1937, Chevrolet has built a new motor plant in Tonawanda, N. Y., which at the present time is producing 65 complete motors per hour, with a plant capacity of 90 motors per hour. This would indicate that at the peak of the production season Chevrolet is only building 347 motors per hour, with an actual capacity of 470 motors per hour. With an unused capacity of 123 motors per hour at the peak of the production season, it is obvious that Chevrolet has an unused reserve which becomes tremendous during the month of reduced operating schedules.

The availability of automotive production facilities for plane production in Chevrolet is again shown in the case of the Chevrolet drop forge plant in Detroit, the largest drop forge shop of its kind in the world. If this shop were operated at full capacity, it could produce all the drop forgings required for the production of 500 airplane motors per day, and still supply the Chevrolet company with sufficient drop forgings for 1,000,000 Chevrolet cars a year. Skilled labor to operate this shop at full capacity is available. Other forge shops, including the Buick and the Dodge forge shops, are also working at far less than capacity. (See appendix for shop equipment and production schedules.)

AUTOMOBILE MOTOR BUILDING FACILITIES CAN BE ADAPTED TO MAKE PLANE MOTORS

Are the facilities used in manufacturing automobile motors adaptable to the manufacture of airplane motors? The answer is that they are.

Both the automobile and airplane motors are combustion engines, essentially the same mechanism for generating power by exploding gas. Both motors contain cylinders, carburetors, pistons, crankshafts, camshafts, valves, spark-plugs, ignition systems, etc.

The same basic machinery is utilized in the manufacture of these basic parts common to both motors. True, there are differences between the automobile and the airplane engine, as there are differences of a lesser degree between the engine of the Chevrolet and the engine of the Cadillac. These differences between different engines are produced by adding certain tools, dies, jigs, or fixtures to the basic machine in order to make a difference in the product. The same "tooling" process adapts the same basic machinery to the production of the airplane engine. Graphic proof of this statement is even now being supplied by General Motors. Many of the most difficult and precise parts of the Allison aviation engine are being manufactured in the Cadillac plant in Detroit, much of it with retooled Cadillac machinery. The new Allison plant in Indianapolis, still in process of expansion, is being used largely for assembly.

The experience of General Motors in making Allison parts with retooled Cadillac machinery should also dispose of the bugaboo of "tolerances." "Tolerances" are the allowable fractional variations in size of engine parts, and they must be far finer in the plane engine than in the automobile engine. But these more precise dimensions can be obtained by more precise tooling.

When the contemplated airplane motor plants are completed, it will be necessary to equip them with the same kind of basic production machinery already standing idle half of the time in the Nation's automotive factories. This basic machinery will be duplicated, and after it is duplicated it will still be necessary to construct the special tools, dies, jigs, and fixtures required to adapt this machinery to the manufacture of plane engines.

In the process of duplicating basic machinery lies the most serious delay. This lag, which from all indications may continue, may well defeat our national-defense program. An additional burden is placed on the already overloaded machine tool industry. We propose to short-cut the process by building only the tools, dies, jigs, and fixtures necessary to convert idle automotive machinery into plane engine machinery. A few special machines will be necessary, but these will be but a small part of the total equipment. In this way a job that will otherwise take at least 18 months can be done in 6 months.

Certain basic machines are necessary to build both automobile and aircraft types of engines. These include gear cutters, gear shapers, screw machines, bullards, drill presses, punch presses, broaching machines, turret lathes, various types of milling machines, various types of lathes and Fay machines, lapping

machines, various types of grinding machines, die casting machines, forge presses, header machines, foundry equipment, welding and riveting equipment.

AUTOMOBILE INDUSTRY ADAPTABLE FOR STAMPING OF WINGS AND FUSELAGES

The plane has three main parts: Engine, wings and fuselage. Just as there is unused capacity for the production of motors, so there is unused capacity for the production of the wings and fuselage. The large body plants and the parts plants have metal stamping equipment now used for stamping out parts for the body of the automobile which can be adapted to stamping out the parts which make up the wings and fuselage of the plane. Proof of this is provided by the tentative plans being made by the automotive industry at the suggestion of Mr. Knudsen to manufacture parts of the wings and fuselages for large bombers.

A survey of the large body plants will show that their equipment for pressing and stamping metal parts is also not being used to full capacity. Murray Body, Briggs, and the Fisher Body plants show a 50 percent over-all unused capacity in their pressrooms. Striking is the example of the Fisher Body plant in Cleveland, which contains one of the largest pressrooms in the industry. At present it is operating at but 40 percent of capacity, although automobile body production is now at its peak. In 1936–37 this plant made all the stampings for Chevrolet bodies, employing 9,200 employees. Today it employs but 3,500, for Fisher has built a new plant at Grand Rapids, Mich., further adding to body capacity. (See appendix for equipment in the Cleveland Fisher plant.)

Technical problems are involved, of course, in constructing new dies to stamp the lighter aluminum alloys used in plane production. That these problems are not insuperable is shown by the fact that Murray and Briggs are already stamping wing parts for Douglas bombers.

SKILLED AND PRODUCTION LABOR AVAILABLE IN THE AUTOMOBILE INDUSTRY

Skilled and labor is necessary to turn out the tools and dies required to adapt these various types of automotive machinery to plane production. The auto industry has the largest reservoir of skilled labor in the world. More than 25,000 tool and die workers, jig and fixture men, pattern makers, draftsmen, and designers, and allied craftsmen are employed in the auto industry at the peak of its tooling program.

Tooling is even more seasonal than production. Each year thousands of the industry's most skilled craftsmen work at top speed for a few months to complete the necessary tooling work to adapt the old machinery to the new models. When the tooling program is completed, only a skeleton crew of these skilled craftsmen are retained for maintenance and duplicate tooling. Three or four thousand skilled craftsmen are shifted to ordinary production jobs while more than 10,000 are laid off entirely until their labor is needed for the next tooling season. During the past 5 years more than half of the tool and die makers in the industry, or more than 10,000, averaged less than 6 months work per year. At the present time there are approximately 3,000 tool and die makers unemployed in the auto industry; some 2,500 have been transferred to ordinary machine-tending production jobs. Many of the remainder are on a short work week.

In addition to the men who are unemployed, those working on production and those employed only part time, there are at least 2,000 tool and die men who have permanently gone into production jobs because of the short work year in the tool and die industry. These mechanics could be combed out of production departments and made available again for tool and die work.

Thus, in manpower, as in machines, we have unused capacity; the highly specialized and valuable skills of 7,500 tool and die workers are available to do the necessary tooling for the plane-production program here outlined.

Fisher Body Corporation, a division of General Motors, is now working on wood models for a new body design. Chrysler also is working on new models, for which some die work is likewise under way. If the automobile industry goes ahead with plans for new models, it will absorb unemployed tool and die workers. However, if the introduction of new models in the auto industry could be delayed for 6 months, from 12,000 to 15,000 skilled mechanics could be made available to build the necessary tools, dies, jigs, and fixtures for the production of an all-metal pursuit ship on a mass-production basis.

The tool and die shops of the automotive industry, like the tool and die workers themselves, are partially idle. The 90 tool and die jobbing shops in the Detroit area affiliated with the Automotive Tool and Die Manufacturers Association employ 7,000 tool and die workers when operated at full capacity. In addition to these shops in the Association, there are some 75 additional tool and die shops which employ 1,500 tool and die workers at capacity production. And, in addition to these independent enterprises, there are large tool and die departments within the auto, body, and parts plants proper. These are known as "captive" tool and die shops. These great "captive" tool and die shops have a capacity beyond the available manpower if all the skilled men in the entire industry were employed on a full-time basis.

A typical example of the tremendous unused capacity of these captive shops is that of Fisher Body No. 23 at Detroit. This is the largest tool and die shop in the world. It builds the sheet metal dies, welding bucks and fixtures, and special machinery for all Fisher Body plants in the General Motors Corporation. In 1931 Fisher Body Plant No. 23 employed 4,800 tool and die makers at the peak of the tooling program. In 1940 Fisher Body Plant No. 23 employed 1,400 tool and die makers at the peak of the tooling season. In December 1940 this plant employed only 175 tool and die makers and even these few were on a reduced work week.

As important as the tool and die worker is the engineer who designs the tools and dies. Here, too, the same situation repeats itself. There are in the Detroit and metropolitan areas about 2,100 designing engineers. Their drawings would be needed for the new tools and dies required to adapt automotive machinery to plane production. Designing engineers, like tool and die workers, are largely unemployed between tooling seasons. Here, too, a 6 months' delay in new automobile models would make available an ample supply of the necessary skilled men.

Just as there is no shortage of skilled labor in the automobile industry, so there is no shortage of unskilled labor. Despite the defense program, there is a minimum of 100,000 former automobile workers unemployed or on W. P. A., not to speak of the thousands of young people in automobile production areas who would welcome an opportunity to work in plane production.

THE PROGRAM IN OPERATION

We propose that the President of the United States appoint an aviation production board of nine members, three representing the Government, three representing management, and three representing labor. We propose that this board be given full authority to organize and supervise the mass production of airplanes in the automobile and automotive parts industry.

The first task of the board would be to organize a staff of production and tooling engineers and assign them to make a plant-by-plant survey of the industry to determine the capacity of each plant, and the extent to which it is being utilized. The next task of the board would be to break down a blueprint of the type of plane chosen for mass production into its constituent parts and allocate the various parts of the engine, wings, and fuselage among the different automotive plants in accordance with their unused capacity and the kind of work to which that unused capacity is being adapted. Work is to be parcelled out with an eye to spreading it as widely as possible, for much quicker results will be obtained if each plant has to cope with but one or two problems of design and tooling. As contrasted with the present method, which dumps half a hundred technical problems into the lap of one manufacturer who must build an entire engine or plane, this method has all the advantages of division of labor.

The production board should have power to allocate the tooling and designing necessary among the various tool and die shops in accordance with their capacity and their specialized qualifications.

Power to appoint inspectors for each plant in accordance with its part in the general plan should be given the production board and there should be close inspection of each part manufactured before its release.

We propose the establishment of a central motor assembly plant to which all complete parts shall be shipped after they pass inspection.

The automotive industry has unused floor space as it has unused men and machines. We suggest that the Hupmobile plant in Detroit (a plant which produced only 371 cars in 1939, and which at the present time is completely idle) be leased by the Government for a central motor assembly plant. The plant is large enough for five assembly lines with a daily total production capacity of 500

complete aircraft engines a day. The plant could be operated on a three 7½-hour shift basis and the unused machinery now in the building could be placed in other plants in accordance with the general production plan.

Similar methods can be applied to the manufacture and assembly of the wings and fuselage, and here, too, there is ample unused floor space for new assembly lines. Six complete floors of a building one block long and a half block wide are available at Fisher Body Plant No. 21, Detroit, which formerly made bodies for Buick. (This work has now been transferred to Fisher Body Plant No. 1 at Flint, Mich.) Several floors are also available at the Fisher Body Plant No. 23 in Detroit, and there is also floor space available at the Briggs Highland Park plant and at the old Ford Highland Park plant.

Outstanding example of idle floor space is the Murray Body Corporation in Detroit, the third largest body-making corporation in America. Since its loss of the Ford body contract, Murray is not producing a single automobile body. There are 234,375 square feet of floor space in Building 107 in Murray Plant No. 1, 300,000 square feet available in Building No. 121, and 20,000 square feet available in Building No. 129. This available space will probably be needed for the contract Murray has obtained to stamp the metal parts and assmble the wing sections for Douglas bombers, but there is still 200,000 feet more of modern floor space in the Murray plant which is now being used for storage. This could be turned to the uses of this production program.

Similar is the situation at the Fisher Body plant in Cleveland. The third, fourth, and fifth floors of this building are now being used for storage, and could easily be made available for assembly lines. This plant at one time made all metal stampings for Chevrolet bodies. Additional floor space is also available in the Cleveland area.

A final assembly plant would also be needed for the job of assembling the engine, wings, and fuselage into the completed plane. For this purpose we suggest the construction of cheap flat hangars in the open space around the Wayne County airport. Completed engines, wings, and fuselage would be trucked from the subassembly plants to these hangars and the completed planes could be flown from the airport. Similar flat hangars could be erected for final assemblies at the Cleveland airport.

We suggest that the subassemblies and the final assemblies be placed under the control of men carefully selected upon the basis of skill and experience from the various assembly staffs in our motorcar and body plants, and that these picked men be used as the core of the assembly staffs to be developed under this plan. Provisions for protecting the seniority of these men must be guaranteed.

The first few thousand planes produced will not meet 100-percent performance requirements, for in mass production of planes as in mass production of automobiles a few thousand jobs must always be run before the "bugs" (technical problems of machining and assembly) are worked out. This is not serious since the first few thousand planes will more than meet the requirements as training ships.

MANAGEMENT RESPONSIBILITY AND LABOR COOPERATION

The automotive-industry workers believe that this plan is the only one which offers hope of quick production of planes. It seeks solution of our problems not in the costly and lengthy work of erecting entire new plants, but in the efficient organization of existing idle manpower, machines, skill, and floor space.

By dividing the parts among many manufacturers, the greatest possible number of minds is brought to bear on the production problems involved.

Though we propose payment of a fair profit to each manufacturer in accordance with his share in the work, we can foresee the fears this plan may arouse on the part of some managements. They may prefer a method whereby the Government finances entire new engines and aircraft plants. Aviation companies may look with misgiving on a production program that would inevitably cut the cost of planes by putting their production on a mass-production basis. But we believe the average management executive would not put forward these selfish considerations at a time of crisis.

Labor offers its whole-hearted cooperation. All that labor asks is intelligent planning, a voice in matters of policy and administration, recognition of its rights, and maintenance of its established standards.

The merit of our plan is that it saves time, and time is our problem. Normal methods can build all the planes we need—if we wait until 1942 and 1943 to get them. This plan is put forward in the belief that the need for planes

is immediate, and terrifying. Precious moments pass away as we delay. We dare not invite the disaster that may come with further delay.

Appendix I

Number of cars and trucks produced in United States and Canada

Name of company	September 1936 through August 1937	September 1939 through August 1940
Chevrolet	1,149,662	1,044,100
Pontiac	235,065	224,475
Oldsmobile	199,569	196,732
Buick	220,214	291,021
Cadillac-LaSalle	45,668	38,032
General Motors Truck	56,410	52,275
Plymouth	552,610	412,545
Dodge	378,510	304,455
DeSoto	81,390	69,660
Chrysler	103,210	83,680
Ford-Mercury	1,279,003	913,900
Lincoln	32,803	22,681
Graham	21,067	2,547
Hudson-Terraplane	125,207	97,632
Hupmobile	300	371
Nash-Lafayette	86,695	57,216
Packard	121,301	90,674
Studebaker	104,931	114,682
White-Indiana	14,035	12,727
Willys	65,302	32,930
Grand total [1]	5,068,803	4,228,706
Total General Motors	1,906,588	1,846,815
Total Chrysler	1,115,720	869,980
Total Ford	1,311,716	936,581
Total "Big 3"	4,334,204	3,653,376

[1] Grand total also includes production of Diamond T Truck, Federal Truck, International Harvester, Mack Truck, Reo Truck, Stutz, and miscellaneous not listed separately.

Source: Ward's Automotive Reports.
NOTE.—Canadian production represents approximately 4 percent of the total production.

Appendix II

Production possibilities of major plants

Name of plant	Percentage of production capacity from September 1939 through August 1940	Possible increased output over year ending August 1940	Total output at peak capacity on basis of 2 8-hour shifts per day 50 weeks in year	Work days needed to build 12 months' total production on basis of 2 8-hour shifts per day at peak production	12 months' total production from September 1939, through August 1940	Highest past production of completed motors per hour	Present production of completed motors per hour
Cadillac	22	134,768	172,800	66	38,032	36	36
Dodge	36½	530,745	835,200	108	304,455	174	174
Studebaker	31	221,318	336,000	103	114,682	70	70
Plymouth	43	552,255	964,800	128	412,545	201	172
Chrysler and DeSoto	24	494,660	648,000	75	153,340	135	87
Oldsmobile	54½	163,268	360,000	167	196,732	75	73
Willys-Overland	17	207,070	240,000	41	32,930	50	50
Hudson	40	118,368	216,000	135½	97,632	45	32
Pontiac	51	217,125	441,600	147	224,475	92	78
Nash	17	288,384	345,600	49½	57,216	72	63
Chevrolet	49	1,091,900	2,136,000	147	1,044,100	445	347
Buick	42	430,479	[1] 721,500	121	291,021	185	179

[1] On basis of 13-hour day.

Appendix III

FACILITIES AVAILABLE FOR PLANE PRODUCTION IN THE CHEVROLET FORGE PLANT, DETROIT

The following equipment in the Chevrolet drop forge plant at the present time—the peak of the plant-production program—is operating at approximately 60 percent of capacity used:

Number of machines	Size of machines	Types of machines	Number of machines	Size of machines	Types of machines
19	1,500 pounds	Steam hammer.	5	3,000 pounds	Board hammers.
29	2,500 pounds	Do.	1	250 tons	Forge press (hydraulic).
12	3,500 pounds	Do.			
9	5,000 pounds	Do.	1	950 tons	Do.
6	12,000 pounds	Do.	2	1,000 tons	Do.
15	1,000 pounds	Board hammers.	3	1,600 tons	Do.
11	2,000 pounds	Do.	11	1,500 pounds	Board hammers.

In addition to the hammers and presses listed, numerous large and small upsetting (header) presses are available. If the above equipment were used at full capacity, this plant alone could produce all the necessary drop forgings required for the production of 500 airplane engines per day, and still supply the Chevrolet Motor Car Co. with sufficient forgings for 1,000,000 Chevrolet cars in the coming year. Skilled hammermen are available to operate these forge hammers at full capacity.

In addition to the Chevrolet forge plant, there are many other forge plants, such as the Buick forge plant, Dodge truck and forge, etc., which have considerable unused capacity.

Appendix IV

FACILITIES AVAILABLE IN AUTOMOBILE INDUSTRY FOR STAMPING METAL SECTIONS FOR WINGS AND FUSELAGE

The following stamping presses in the Cleveland Fisher Body plant are at the present time—the peak of the body-production season—operating at less than 50 percent of capacity:

Number of machines:

	Type of machines
74	Double-crank presses.
19	Toggle presses.
26	No. 78 single-crank presses.

Numerous small blanking and stamping presses.

To appreciate the full significance of the above list of equipment, one must realize the tremendous size of these presses, their cost, and the time it would require a new plant to get delivery of such presses. A big Toggle press, for example stands 40 feet from the base to the top of the press and is large enough to hold and operate a draw or flange die which itself weighs from 70 to 80 tons. Such presses cost from $150,000 to $175,000 and it would require years to get delivery of the number and type of such press equipment that is now standing idle more than 50 percent of the time at the Cleveland Fisher plant.

Present employment in the Fisher Cleveland press room reflects the extent to which the presses are now idle. There are 600 men on the day shift, 300 on the afternoon shift, and 67 on the midnight shift.

In addition to Cleveland Fisher Body, every major body plant in the automobile industry has unused press room capacity which can, with the necessary special dies, be adapted to plane production.

Appendix V

REPLY TO OBJECTIONS

Virtually all of the criticisms of the program have been anonymous—aircraft and automotive industry executives refusing, for some reason, to lend

their names to their printed views. The criticisms do not in any case run against the feasibility of the program. By and large, they indicate either a sad lack of imagination or an insistence by automotive interests to continue with "business as usual." However, since some misconceptions of the program have gained credence it is advisable to discuss and dispose of these matters.

BOMBERS OR PURSUIT SHIPS

It has been wrongly assumed that the program contemplated the production only of pursuit ships. Our reference to the possible production of 500 fighting planes a day was used only to indicate the over-all productive capacity of an automobile industry whose idle machines and idle men were fully mobilized and whose private interests were temporarily subordinated. The productive capacity we have indicated can as readily be adapted to the production of medium-sized or heavy bombers. If these latter types are built rather than pursuit ships, the daily production would be scaled down in proportion to the increased amount of work required on each plane. Nevertheless, our program could build many more bombers, large or small, than are now being built or are contemplated, and in much shorter time.

MAN-HOURS REQUIRED

Some sources in the automobile industry assert our plan is impractical because of the relatively small percentage of machine-hours in manufacturing an automobile as compared with the total man-hours required to build a plane. These sources contend that out of 18,000 man-hours necessary to build a pursuit ship, 10,000 are devoted to construction of air frames, work on which is usually done by hand. In attempting to prove their point, these sources simply multiply 10,000 man-hours by 500 planes a day which gives them a tremendous and impressive figure. It would be as logical to take the number of hours required to custom-build a Chevrolet car by hand and then multiply this figure by Chevrolet's daily production and use that tremendous figure to prove that Chevrolet could not possibly produce 6,000 cars a day. Custom-building of an automobile, it has been estimated, requires 1,100 man-hours of work. This means that it would have required 4,400,000,000 man-hours to produce the 4,000,000 cars of the 1939 model. To carry the contention of our critics on this score to their logical conclusion: It would have required 2,200,000 men working 40 hours a week 50 weeks a year to produce last year's 4,000,000 automobiles.

The persons who argue thus speak of mass-production quantities but use the mathematics of custom-built production methods. It is an elementary fact that the number of hours spent doing things by hand as compared to the number of hours spent operating machines (machine-hours) varies in ever increasing proportion to the extent that mass-production techniques are introduced into the production process. The number of hours spent in building an automobile is less than one-sixth of what it was when the industry started, and as the over-all man-hours decrease the machine hours increase in percentage as compared to the work done by hand. One can go into a modern continuous strip steel mill and see this in its sharpest form.

FLOOR SPACE REQUIRED

This mistake of thinking of mass production of planes in the mathematics of custom-built hand production also raises the question of the practicality of providing the necessary floor space for assembly work. Another elementary fact is that the number of days necessary to complete the production cycle (in machining and fabricating industries such as autos and aircraft) is shortened in proportion to the extent that mass production technique is applied. The shorter the production cycle the less floor space is needed. This is true because the number of jobs in the process of production is held at a minimum. If the Chevrolet Motor Company had to build 6,000 cars a day by the same methods that are now being used to build planes, the total manpower and floor space of the

entire automobile industry would not be adequate to turn out its present production.

Our original report cited the availability of floor space—785,000 feet—at the Hupmobile plant, in Detroit, for the assembling of motors. A further striking example of available floor space is the Reo plant at Lansing, Mich., which has the following vacant space: Mount Hope Avenue plant, 553,237 square feet; Building No. 4800, 247,931 square feet; Building No. 4700, 104,247 square feet. In Reo's main plant 500,000 square feet is fully equipped with production machinery. Starting January 13, 1941, Reo will be producing five motors per day in a plant that at one time produced 160 trucks and 125 passenger cars in one 8-hour shift.

DIFFERENCE IN ENGINES

Doubts have been expressed on the adaptability of automobile production machinery to production of aircraft motors because of the reduced weight of aircraft motors. These doubts are without foundation.

The reduced weight of an aircraft motor per horsepower as compared with automobile motors is secured firstly by the difference in the design of the motor and secondly by the fact that all parts of an aircraft motor are reduced to a minimum weight by removing all surplus metal. This is done by a process of machining. The same basic machinery is used to machine parts for an aircraft motor as for an automobile motor, excepting that a more complete and precise machining job is done in the case of the aircraft motor. The available machinery in the automobile industry can be retooled to turn out aircraft motors of 1,000 or 2,000 horsepower of either the air-cooled or liquid-cooled design.

The objection has also been raised that aircraft engines must be made in more precise dimensions than automobile engines. As our program points out, more precise parts are obtained by more precise tooling.

SHORTAGE OF ARMAMENTS

Any possible bottlenecks in armaments, instruments, etc., is not a legitimate criticism of our plan. Such bottlenecks can be met if production of such armament, instruments, etc., is spread over existing industries whose machine capacities and production facilities are adaptable to such production. The pooling of such productive capacity with central assembly plants using the same approach we suggest for aircraft production will make it possible to eliminate any possible bottlenecks in armaments, instruments, etc.

SIMILARITY OF BASIC MACHINERY

In our program we state that basic machinery used for automobile production can be adapted for producing aircraft parts. We point out that precise and difficult parts of the Allison engine are being made in the old Cadillac plant in Detroit with machinery which duplicates existing unused automobile plant machinery. These statements have been challenged in some quarters. Herewith is a list of machinery, newly constructed and installed in the Allison division in Detroit, which duplicates existing automobile plant machinery.

Grinding machines: Cincinnati centerless, Exol internal and external, Bland, Norton, Landis, Blanchard, Brown and Sharpe (Bryant), and Held. (These machines are used to produce the following parts which are common to both aircraft and automobile motors: Camshafts, crankshafts, bearings, connecting rods, wrist pins.) Milling machines: Milwaukee, Cincinnati, Sunstrand, and Brown and Sharpe. Keller machines: Wickes lathes, Greenlee lathes and Cincinnati lathes. Spline machines: Sunstrand, and Brown and Sharpe. Hones: Exlo and Wickes.

PRESENT USE OF FACILITIES

It is argued that the facilities of the automobile industry are already being employed for production of aircraft parts. Our surveys indicate that not 10 percent of the available facilities are being brought into play for defense purposes. The present plans do not contemplate the coordination and full use of facilities which alone can produce a large number of planes within a comparatively short period.

Exhibit 2.—Impending Unemployment in Oakland, Calif., and Flint, Mich.

International Union

United Automobile Workers of America

Amalgamated Local 76

affiliated with congress for industrial organization

Oakland, Calif., *December 17, 1941.*

Hon. John H. Tolan,
House of Representatives, Washington, D. C.

Dear Congressman: We wish to bring to your attention the General Motors plants here will soon be closed due to curtailment of passenger-car production. We are, therefore, asking you do everything in your power and use every means at your command to stop this move.

If these plants are allowed to be closed approximately four to five thousand men and women will be affected. All this number do not work directly in these plants but in other plants that act as source of supply. We do not object to curtailment of passenger-car production, but since we have the plants, tools, and experienced men and our country's armed forces need the materials to bring this conflict to a speedy and victorious conclusion, we implore you to help us get defense orders and materials into these plants so we can do our share.

Needless to point out, under the circumstances, we cannot buy defense stamps, bonds, or contribute to the Red Cross as much as we would like to.

May we have your immediate and serious consideration, also your views on this matter?

Yours very truly,

(Signed) Thomas E. Sawyer,
Chairman, Legislative Committee.

Pattern Makers' Association

affiliated with the detroit and wayne county federation of labor
american federation of labor of detroit and vicinity

Flint, Mich., *December 18, 1941.*

Hon. J. H. Tolan,
Select Committee Investigating National Defense Migration,
Washington, D. C.

Dear Sir: Having read in the paper about your meeting on Monday December 22 next in regard to national-defense work, we, as members of the Flint branch of the Pattern Makers League of North America, would like to draw your attention to the fact that even though there seems to be a great shortage of pattern makers all over the country, here in Flint the pattern makers are almost idle. We have about 150 men in three shops, most of them have their homes here and would like to stay here. All these shops have very good equipment that should be utilized in this hour of national emergency. We feel that something could and should be done to bring the skilled men and work together. More so since we realize that in order to get the great mass of our unemployed back to work, patterns must first be made, and we are all anxious to do our best for our country in the best way we know how.

Trusting this will help you in your problem of getting production under way, I am,

Sincerely yours.

[Signed] J. T. Guilbault, *Recording Secretary.*

Exhibit 3.—Curtailment of Production in Plants

Packard Motor Car Co.,
Detroit, Mich., December 18, 1941.

Hon. John H. Tolan,
Chairman, House Committee on National Defense Migration,
Congress of the United States, Washington, D. C.

Dear Mr. Tolan: This will acknowledge your telegram of December 17, directed to Mr. C. E. Weiss, regarding hearings to be conducted by your committee on labor displacement problems.

The curtailment of automobile production presents a number of serious problems for the Packard Motor Car Co. Although we are well advanced in war work, we shall have an unfavorable labor situation at the factory due to the proposed earlier curtailment of motor-car production. We shall not be able to transfer all of those displaced by the end of January. Furthermore, the proposed ruling will greatly increase the amount of training necessary in order to convert these people into defense workers ahead of the anticipated time.

Unfortunately, Mr. Weiss is in the hospital and we have no one else we could send to your meeting who would be helpful to you. We want to cooperate with your committee in the solution of its problems and if we can assist you in any other way, please advise.

Very truly yours,

(Signed) M. M. Gilman, *President.*

Chrysler Corporation,
Detroit, Mich., December 24, 1941.

Mr. Robert K. Lamb,
House Committee Investigating National Defense Migration,
Congress of the United States, Washington, D. C.

Dear Mr. Lamb: The statements which I signed and the testimony which I gave at the hearings before the Select Committee Investigating National Defense Migration at Detroit in September were confined to our Detroit plants only. By this, I mean the plants in the Detroit area. I did not give information relative to our Marysville, Mich., plant which is approximately 60 miles from Detroit; our New Castle, Kokomo, and Evansville, Ind., plants; our Los Angeles, Calif., plant; or our Airtemp plant at Dayton, Ohio.

It was my impression at the hearings in Washington last Monday that you wished the information which was given in Detroit brought up to date. Consequently, the figures which I gave you were in reference to our Detroit plants only.

If you wish information relative to our employment and the number of employees on defense and nondefense work in the other plants of the corporation which I have referred to, I will be glad to furnish it to you.

Yours very truly,

Robert W. Conder.

General Motors Corporation,
Detroit, Mich., December 31, 1941.

Hon. John H. Tolan,
Chairman, Select Committee Investigating National Defense Migration,
Washington, D. C.

Dear Sir: During the hearing before your committee on Monday, December 22, the writer agreed to submit a statement of our policy and practices in connection with subcontracting.

General Motors, through its operating divisions, probably does more subcontracting than any other concern in the United States and has had, through the years, a great deal of experience in this type of work. This is due to our policy of decentralized operations and to the type of businesses in which we are engaged.

In our normal operations we have been doing business with more than 6,700 suppliers.

On February 11 of this year we defined our internal policy on subcontracting and the following instructions were issued to all manufacturing divisions:

"To purchase, outside the corporation, component parts for all our defense projects to the limit of the current capacity of the sources, equipped for the specific type of manufacture, which we know from past experience to be

dependable and competent, and from such other sources in the particular field as we can establish with reasonable certainty, through investigation, are dependable and competent. The responsibility to deliver good material, at a fair cost and on time, on the over-all projects rests with the corporation as prime contractors. We will use subcontractors, outside the corporation, to the extent to which they are able, in our best judgment, to relieve us of any portion of this responsibility.

"To sublet to other activities, within the corporation, component parts for all our defense projects to the limit of the current capacity of such activities to contribute to the program in the combined judgment of the activity which has the prime contractual obligation and the central office executive charged with the responsibility for expediting national-defense production throughout the corporation."

When competent and dependable sources with the necessary equipment and organization cannot be located either outside or inside the corporation, then—

"To organize to produce in the activity of the prime contractor—or in separate facilities under his jurisdiction, if necessary—the balance of the component parts and the assemblies necessary to an adequate and timely discharge of the over-all obligation."

This policy was predicated on the necessity of using existing facilities wherever possible, both in the interest of the most speedy performance as a Nation and to avoid the additional load on the machine-tool and building industry, which would have been required if entirely new facilities were created.

In the 6 months' period, January 1 through June 30, 1941, General Motors' total sales in the United States were $1,236,000,000, all of which were fabricated metal products, a measure of its productive capacity. As indicative of the amount of subcontracting involved in its business, General Motors' outside purchases from other companies during this same period were more than 59 percent of the cost of sales. This means that approximately 1,500 persons were working for others for each 1,000 employed by us.

While General Motors is an experienced subcontractor, with its 6,700 and more suppliers and has located and is using many new suppliers in connection with its defense production of aviation engines, Diesel engines, machine guns, etc., it is in a somewhat different position than are many other manufacturers, in that its normal business is being so rapidly curtailed. It seems to me there is a definite difference between greatly expanding facilities and capacity of a large concern and simply using the organizations and facilities already existing. While the more than 60,000,000 square feet of floor space and the machinery organized by General Motors in its regular business cannot, in all cases, be adapted for defense production, still a substantial part of it can be reorganized for defense projects more quickly and with less expense than new facilities can be acquired and organized.

The drastic curtailment of production of General Motors' normal products leaves us with a large number of employees for whom we are unable to provide an adequate amount of work for a period of several months. Under these circumstances, it is only natural that we seek, insofar as possible without the purchase of new equipment, to employ our own men and women on the defense work obtainable before subcontracting any items which can be made advantageously with our own facilities.

This curtailment will cause the loss of pay rolls in the communities where our various plants are located and will seriously damage a vast number of small businesses in these communities, with loss of employment in these small concerns. This, of course, will be in addition to the laying off of the men and women working for other concerns who have been supplying the parts, materials, supplies, and services required to keep our employees working.

To support the concerns and employees with defense business where they are now located and working will result in the least migration of workmen and the least disturbance to the social and business structure of the country.

To repeat, General Motors has about 8 percent of the durable metal goods manufacturing capacity of the country, and the thousands of competent workmen employed by us and General Motors' engineering and executive experience in manufacturing is now a national asset in the defense program which should be fully used. If this is done, thousands of suppliers and subcontractors will also benefit, and their employees will also obtain work due to General Motors' subcontracting policies and experience.

Since the beginning of the emergency, General Motors has been willing to take those defense projects which the proper authorities were willing to award. We

do not yet have our proportion of the defense load, measured by the size of our working force, capacity of our organization, and our ability to produce.

It is earnestly hoped that our facilities in manpower, plant, and equipment, experience in subcontracting, and ability to make good on contracts will be fully recognized, and that more defense contracts will be obtained by us to keep our employees and suppliers working.

Yours very truly,

H. W. ANDERSON.

HUDSON MOTOR CAR CO.,
Detroit, Mich., December 20, 1941.

REPORT OF HUDSON MOTOR CAR CO. CONCERNING LAY-OFFS DUE TO AUTOMOBILE CURTAILMENT AND ABSORPTION OF EMPLOYEES IN DEFENSE ACTIVITIES

Included in our report to Mr. Abbott dated September 19, we indicated that in August 1941 we employed 10,233 hourly rate men on nondefense automobile production and 880 employees in defense activities.

Shortly after the first of September a reduction was ordered by the Office of Production Management which reduced the automobile employment figures to 6,749. During September those employed on defense work increased to 1,722, showing a decrease of 3,484 in nondefense and an increase of 842 in defense, or a net loss of 2,642.

We have been operating since September and until last week at a rate of automobile production which maintained an approximate pay roll of 6,749 employees. During such time between September and December 19 we have increased our productive defense pay roll to 2,621 employees, an increase of 899 persons. Certain other preparatory employees have been added for tooling-up purposes.

On December 15 we were obliged to cut our production further which brought about an additional lay-off of 1,054 people. A further lay-off was indicated, but it was decided to run at this reduced production at half time during January; in other words, operate the first 2 weeks of January followed by a shut-down during the last 2 weeks; rather than still further reduce the hourly rate of production. At present there is no information as to what is contemplated for February or the following months.

This leaves a balance of 2,797 employees who have not been absorbed in defense activity at the present time, with the possibility that nearly 5,700 additional employees might have no work after January 17. Our absorption of seniority employees during the next few weeks will be approximately 500, leaving a balance unabsorbed of approximately 2,300 on January 1. A further 275 or 300 may be transferred by January 17. It is, therefore, indicated that 2,000 employees will still be unabsorbed at the middle of January, in addition to the 5,700 that will have no employment if no automobile work is continued after that date.

As shown in the above figures we expect to employ on defense work approximately one-half or 50 percent of the employees laid off during the last lay-off, within the next few weeks.

R. G. WALDRON.

EXHIBIT 4.—LETTER FROM CHAIRMAN TO WILLIAM H. DAVIS, CHAIRMAN OF CONFERENCE OF INDUSTRY AND LABOR

WASHINGTON, D. C.
December 18, 1941.

Mr. WILLIAM H. DAVIS,
Chairman, National Labor Mediation Board.
Washington, D. C.

DEAR MR. DAVIS: Now that our Nation has been forced into war, this committee believes that a full reexamination of the production policies of our war effort should be made. Particularly does the committee believe that our failure to convert our durable consumer goods industries and our failure to utilize small business cannot be reconciled with the imperative necessity of employing every man and machine for war production.

We wish to urge you, and through you, the conference of industry and labor, to consider production policies after the strike question has been settled. We

do not believe that a more auspicious time could be found than now for such a study. The present conference, representing as it does both industry and labor, is in an excellent position to tackle these critical questions. Obviously no solution of the labor problem which is not geared to an over-all production plan will be permanent.

To indicate to you the situation now arising which has moved me to suggest that the conference consider production problems, I am enclosing a copy of a letter which I have just sent to Vice President Wallace, in his capacity as chairman of the Supply, Priorities, and Allocations Board. As you will see, the auto industry, with one-third of the metal-working capacity of the country, is faced with almost complete shut-down of its existing passenger-car facilities and unemployment of the great majority of its workers at a time when both should be converted to war production. Failure to plan the full use of the auto industry is characteristic of our whole previous war effort.

The President, in calling this conference, indicated that it should undertake to find the way, to fully employ our manpower and our industrial facilities for our war effort. We urge you, therefore, to retain the objective stated in the original call to the conference, and continue its meetings to deal with these broader questions so vital to victory.

Because I know you will agree with me that this is a matter in which all of our citizens are concerned, I am taking the liberty of making this letter available to the press.

With all good wishes,

Sincerely,

(Signed) JOHN H. TOLAN.

EXHIBIT 5.—LETTER FROM THE CHAIRMAN TO ANDREW STEVENSON, CHAIRMAN, AUTOMOTIVE INDUSTRY ADVISORY COMMITTEE

HOUSE COMMITTEE INVESTIGATING NATIONAL-DEFENSE MIGRATION,
Washington, D. C., January 6, 1942.

MR. ANDREW STEVENSON,
Chairman, Automotive Industry Advisory Committee,
Office of Production Management, Washington, D. C.

DEAR MR. STEVENSON: In view of the fact that the Automobile Manufacturers Association and the United Automobile Workers have both found this committee's record a useful source, I am sending you, as chairman of the joint conference of the industry, the union, and the Government, the galley proofs of our last Washington hearing. I am also enclosing a copy of our second interim report. Additional copies of the report have been sent you for distribution to all members of the conference.

In the advertisements published by both the manufacturers and the union, we have looked in vain for any recognition of the need or any proposals for a comprehensive plan for conversion of the full facilities of the industry. This morning's newspapers contain the important news that the Under Secretaries of War and Navy are going to offer the automobile industry $5,000,000,000 of war contracts. The newspaper reports mention that this will enable conversion of the industry's facilities, but again there is no indication that a plan for such conversion exists.

On December 22 the Director General of the Office of Production Management and on December 23 the Under Secretary of War testified to this committee that no comprehensive plan for such conversion existed at that time.

The committee feels that no useful purpose has been served by arguments such as those presented in the current exchange of advertisements as to who is responsible for past failures. Current discussion can only advance the war effort if it is recognized that a new understanding of the meaning of total war production is needed to enable us to win this war. This committee believes that to date all parties to this controversy—Government officials, both civilian and military, manufacturers and organized labor—have set their sights too low.

To date the industry has received $4,000,000,000 of war contracts. Aside from truck production it is questionable whether as much as 5 percent of the existing automotive facilities of the industry have been used on these contracts. Instead, many new plant facilities are still under construction, a number of which will not come into full production until a year from today.

This committee believes that the new $5,000,000,000 of contracts, like the previous four billions, will not emerge in early and sufficiently large scale deliveries if the policies followed to date are not fundamentally altered. These deliveries, indispensable to the transformation of our war effort from its present paper status to the arming of military forces capable of taking the offensive, can only be attained under a comprehensive plan for the full use of all American industry.

This controversy over the conversion of the automobile industry is of paramount importance, not only because the automobile industry controls one-third of the metal-working capacity of the country, but also because piecemeal attempts to use the facilities of this industry will deprive the Nation of the opportunity for full use of most of America's small- and medium-sized industry in the war effort. Only an over-all plan for combining the strength of automobile facilities with the remainder of our metal-working capacity will mobilize our productive capacity for war.

In the stress of argument, both sides seem to have overlooked the fact that on December 7, 1941, this Nation was dealt a stunning blow by a treacherous enemy. The crisis in our national security demands that there must be no further dissension within the ranks of those responsible for the production of the weapons of war. At this very hour, the defenders of this Nation's outposts are hard pressed.

The groups now arguing must not only compose their differences. The Government must bring them together for the operation of a plan for the industry. The mere award of contracts, no matter what the sum of money, is not going to provide the country with the needed goods nor will it speed up the delivery dates. A proposal has just been presented to this committee for a joint board to operate the industry's war program and we summarize it here in the belief that it affords a valuable point of departure for any discussion by the conference of a plan for the industry.

This joint board, being responsible for assuring rapid and complete conversion, would have authority to make plans and commitments for the entire industry and to distribute production among the various corporations and plants of the industry according to technical needs of conversion. Those needs dictate that the major assembly plants, whether of tanks, airplanes, or antiaircraft guns, shall be fed with the necessary component parts from every suitable plant in the industry whether or not these plants are controlled by the same corporation which does the final assembly.

This joint industry-labor council will require at least three important subcommittees to effectuate its industrywide policies. It will require, first of all, a technical committee which includes the best engineering personnel of the nine automobile companies, as well as representatives of parts producers and of labor. This subcommittee will have to organize the engineering activity of the automobile companies and plan the conversion of basic automotive facilities and the distribution of production among these facilities with a minimum of duplication and wasted effort.

Second, to assure an adequate supply of skilled labor, a labor supply and transfer committee will be essential to transfer skilled labor to most vital production points within the entire industry and to upgrade and retrain displaced workers.

Finally, the joint industry-labor council will require for its successful operation a subcontracting committee composed of the best purchasing agents of the automobile companies, of the best technical personnel of the parts producers, and of representatives of labor. This committee will have to insure that the facilities of automotive parts companies and other automotive suppliers shall be used to the maximum and that furthermore the tens of thousands of small plants for which no provision has yet been made in the war effort will be drawn upon to remove every bottleneck to the rapid conversion of this industry and supply it with essential parts in huge numbers.

I am certain that the conferees share the desire of the American people to evolve a plan that will result in the most rapid and fullest utilization of our productive capacity. I know that you realize how vital are your decisions to the war program of this Nation and its Allies. The findings of this committee make it clear that with such a proper production scheme using the entire automobile industry it will be possible for that industry to contribute, within each year this country is at war, several times more than the $5,000,000,000 program now before you.

The results of your conference will serve either to start us along the road to a total war effort or leave us still enmeshed in the half-measures which have hitherto served to spread confusion from industry to industry. The ultimate goal must be a united America mobilizing every man, machine, and resource.

With all good wishes, I am

Sincerely,

JOHN H. TOLAN, *Chairman.*

EXHIBIT 6.—DEFENSE PROGRAM FROM THE FARM VIEWPOINT

LETTER FROM M. W. THATCHER, CHAIRMAN, NATIONAL LEGISLATIVE COMMITTEE, FARMERS EDUCATIONAL AND COOPERATIVE UNION OF AMERICA, WASHINGTON, D. C.

WASHINGTON, D. C., *December 22, 1941.*

Hon. JOHN M. TOLAN,
Chairman, Select Committee of the House Investigating Defense Migration, House Office Building, Washington, D. C.

DEAR CONGRESSMAN TOLAN: The report just issued by your committee seems to me the most important document yet presented to the American people by our Congress relative to winning total victory in this war.

On behalf of the National Farmers Union, I want to record our organization in eager support of the recommendations your committee makes for the immediate improvement of industrial production in this country's great peril. It is our earnest hope those recommendations will be translated into action by the administration as soon as possible. To that end we suggest and urge that the President's Joint Industry-Labor Conference, and others, be moved to propose to the President the immediate summoning of another conference adequate to deal with the urgent basic problems your report poses, and to deal with them in the same cogent and realistic manner. Of necessity such a conference must include farm-organization representatives, and perhaps representatives of other important economic groups not yet consulted on production problems. The proposal for such a conference, of course, does not exclude the advisability of immediate consideration and prompt decision upon your committee's recommendations by the agencies presently entrusted with responsibility for meeting such problems, including the Board of Economic Warfare, the Supply Priorities and Allocations Board, Office of Production Management, and others.

Among the conclusions of your committee we want especially to single out those which pertain to the automotive industry, where large-scale unemployment is impending because of failure by the industry to convert its plant to the production of war materials, and because of our Government's procrastination in compelling it to convert. You are right in focusing attention on that giant of American mass production, as well as being fully justified in insisting upon full subcontracting operations to speed up that conversion and to prevent the shutting down of a multitude of small- and medium-sized shops and factories which would bring further criminal wastage of valuable labor and equipment.

Your report convinces us that the automotive industry is potentially the key war industry, whereas in the last war it was with the railroad industry that the Government had to work most intimately, a problem which is not now as threatening precisely because of the marvelous accomplishment of the automotive industry during the intervening years. Since this is a war of mass-produced mobile weapons it seems essential to us that the pooling of resources under complete Government control for the duration which was so essential in the key industry of the first World War is now just as essential, if not more so considering the lateness of the hour, for the automotive industry. For this emergency we need a panel of industrial engineers in charge of integrated plans and methods to step up war production to the uppermost limits in this strategic industry.

To our knowledge, ever since the first tendering of the so-called Reuther plan, it has been abundantly clear that labor in the automotive industry is sincere and zealous in its desire to cooperate along the lines of your report. Perhaps, if there had been more democratic receptivity toward that plan, there would not now be thousands of workers, a majority of them skilled, now walking the streets in search of a chance to help their country. We can well understand the feelings of this great body of producers, foremost in mass-production skills in the world, as they look for a chance to make their contribution. Farmers, too, as skilled producers, have had such experiences. We believe that the difference between victory

and defeat depends upon giving all skilled producers the speedy and complete opportunity to participate in truly all-out production.

You may wonder why our organization, representing a half million working farmers, concerns itself with these problems of industrial production, so brilliantly analyzed by your committee. Working farmers have come to understand with deep conviction that agriculture's fate is bound up inextricably with a rapidly and steadily expanding industrial output both for our war effort and for the peace that we must win after the war. Farmers are now engaged in sharply revising upward their planned contribution to the Nation's effort, despite the fact that each of the last 3 years has seen record-breaking abundance from farmers, something which can be said of no other large industry. With the needs for all-out war and for power at the peace table so self-apparent, we cannot see how any other economic group in good faith can hesitate to do as we are doing, regardless of their temporary fears about balance sheets or about excess plant capacity after the war. If anyone should be alarmed, it should be we farmers who can't shut down our expanded operations at will as can industry, if worst comes to worst. All-out war must mean all-out for every section of our national life. It is not "war as usual."

For a more detailed explanation of our concern I refer you to the enclosed copy of a resolution submitted by our national board of directors to Senator Elbert Thomas, of Utah, chairman of the Senate Committee on Education and Labor; to the enclosed copy of a wire sent to W. H. Davis, moderator of the President's Joint Industry-Labor Conference, by our national president, James G. Patton; and to the enclosed copy of a joint radio broadcast during the national conventions of the C. I. O. and the Farmers Union by Mr. Patton and James B. Carey, secretary of the C. I. O. The broadcast was printed in the Congressional Record for December 4, 1941, pages A5788–89, at the request of Senator James Murray, of Montana.

Again let me offer to you and your committee the commendation of our organization for rendering so great a patriotic service as is embodied in your report, and let me again pledge our aid in helping to put your recommendations into effect. Please let us know if there are any special ways you think we might be of aid.

Yours sincerely,

M. W. THATCHER,
Chairman, National Legislative Committee, Farmers Educational and Cooperative Union of America.

(The enclosures referred to above are as follows:)

RADIO BROADCAST, NOVEMBER 18, 1941

BY JAMES G. PATTON, PRESIDENT OF THE FARMERS EDUCATIONAL AND COOPERATIVE UNION OF AMERICA, FROM THE CONVENTION OF THAT ORGANIZATION IN TOPEKA, KANS., AND JAMES B. CAREY, SECRETARY OF THE CONGRESS OF INDUSTRIAL ORGANIZATIONS, FROM THE CONVENTION OF THAT ORGANIZATION IN DETROIT, MICH.

Speech by Mr. Patton:

Standing before this annual convention of the Farmers Educational and Cooperative Union of America at Topeka, Kans., it is my privilege as president of the organization to broadcast a message to labor representatives now assembled in the Congress of Industrial Organizations convention at Detroit.

The working farmers of America—whether we are owners, tenants, sharecroppers, or farm laborers—want industrial workers to know that the interest of working farmers and of industrial workers is a common one. Inescapably we are dependent upon each other. The forces now threatening our institutions and our chosen way of life deepen our awareness of this mutual interdependence. We approach you with no thought of seeking aid for selfish factional or organizational purposes. On the contrary, we come with the deep conviction that all sound elements in our national life will be benefited by mutual understanding and cooperation between us. We earnestly, therefore, ask your collaboration, and offer you ours, in a resolute effort to solve the extremely difficult problems which confront us all.

We proceed in the certainty that our two organizations are sincerely committed to the fact that the first necessity of this hour is to defeat that threat which we

term "Hitlerism" and immediately to achieve our Nation's full program of defense. This means all-out material aid to the nations bearing the brunt of military battles against that menace to our civilization. Proceeding in this certainty of understanding, we propose that you and we pool our brains and our energies to help our Government devise a program genuinely to increase industrial production to the limit—both in the defense crisis and after the war is won—as agricultural production is likewise increased. We studied with admiration the Reuther plan to utilize idle machinery, plants, and manpower in the automotive industries for desperately needed aircraft production, the Murray steel plan, and the aluminum plan presented to President Roosevelt by your aluminum workers. We know the misery of past experiences makes you acutely aware that industry always throws you on the street when conditions threaten rates of profit demanded by controlling ownership. You and we both understand that if this happens again, the resultant drying up of your purchasing power will again contribute to plunging farmers' prices to bankrupting levels and that farmers cannot cut off production at will. We therefore ask you to join us in plans to develop defense production to its maximum with no greater sacrifices of consumer goods than is thus made necessary, and further definite plans to transform full defense production at the end of the defense period immediately into production of peacetime goods so that our economic system may function on the sound basis of abundance rather than on the basis of scarcity as in the past. Farmers will provide abundant food and fiber and will in turn afford an almost limitless market for industrial production. Such an economy is sound and feasible in peace as it is necessary in defense.

We urge that you establish labor cooperatives on a far wider scale to deal directly with farmers' marketing cooperatives. We believe the relationships thus established will hasten progress toward common goals and mutual understanding of one another's problems. We ask your cooperation in obtaining governmental credit policies which will keep working farm families on farms rather than send them in despair down the agricultural ladder from ownership to tenancy, to sharecropping, to farm labor.

We ask your help in obtaining governmental policies of benefit payments based on the human element of families and their needs rather than on acres and volume of production, so that the present gross maldistribution of income among farm families may be overcome. We earnestly ask your support in getting legislation to stop the steady decrease of faily-type farming which is being forced to the wall by privately or corporately owned "factories of the field." Your supplies of food and fiber are neither increased nor helped by this change, the social cost of which will be heartbreaking to you and us. You men and women in industrial employment know what a threat to hard-won labor standards is constituted by a wandering multitude of disinherited farm families and how negligible a market for the products of your toil such a multitude provides. You and we recognize the intimate correlation between farm income and industrial pay rolls. You realize that farmers must receive equitable prices for their products so that they can purchase yours. We see that you must have equitable wages so that you can buy more bacon, more milk, more bread, more eggs, more pounds of vegetables, and more textiles.

We have common agreement in recognizing that the best price-control mechanism is expanding production. Agricultural abundance will act automatically to limit inflation, but only a similar mass production of your industrial products at low-unit costs will establish sound price controls for them and a sound economic relationship of agriculture to industry.

What we ask of you—and what we conscientiously believe to be the public's interest—is to work with us for these objectives, and while we declare our intention to devote every energy to expand the organization of working farmers for these purposes, at the same time we pledge to you our full and active support in the expansion of labor organization under responsible leadership. We hope for your support in trying to thwart misguided attempts to emasculate or destroy the Farm Security Administration and the Surplus Marketing Administration whose operations are of such value to working farmers. The present crisis does not remove the need for them but rather increases that need.

As we work to extend our membership among working farmers, we shall also point out to the small businessman and professional people—whose future depends on the farm family and the workingman's home and job far more than they realize—that hindrances to production are much more those of avaricious financial and industrial management than of labor. We have an abiding faith in the men and women who work in our Nation—in the great masses of common people.

We build the Farmers' Union so that we, like you, are prepared to defend our democracy against military threat from without and socially evil forces within. In that we go forward, confident and unafraid.

Speech by Mr. Carey:

On behalf of the C. I. O. I wish to express our deep appreciation of the position so sincerely stated by President Patton, of the Farmers' Union. So far as I know, this is the first time in the history of organized labor that a national farm organization has formally and publicly voiced sympathetic understanding of labor's problems and their relationship to agriculture, and has offered to make common cause with labor in striving to solve our mutual problems. We in the C. I. O. have long urged that there should be a conference of labor and farmers and the Government to meet our basic problems. Mr. Patton's radio address is not the only sign of his organization's earnestness in respect to labor. I am advised that the Farmers' Union plans to open an office in Washington for the single purpose of making the interest of working farmers in labor a matter of real operation and not a mere use of words. His organization expects to fill that office with a man versed in both labor and agricultural problems soon after the new year.

The C. I. O. welcomes this move by the working farmers, and will follow its words of welcome with action, so that our working together will become practical and thus be an added force for the cause of the common man. Through this relationship we hope and believe the farm families who till the soil will soon come to see through the misrepresentation about labor flooding the press which has redoubled since the defense emergency began. Selfish industrial and financial interests, resentful of labor's exposure of their willful denial and willful concealment of shocking shortages in basic defense materials, and incensed at labor's insistence on genuine expansion and speeding up of defense production, have sought to poison the public's mind against the whole of labor by blaming the main break-downs in defense production upon labor. They have found voluble spokesmen in certain politicians who have directed their demagogery especially at the rural areas.

The tenor of Mr. Patton's remarks shows that he, as spokesman for the country's working farmers, understands the obstacles with which labor has to contend in endeavoring to play its full role in the defense of the Nation and the democratic processes which it cherishes. President Murray has again and again stated C. I. O.'s unwavering determination to do all in its power to hasten the defeat of Hitlerism. The C. I. O., at its convention this afternoon, adopted a resolution pledging its support to the foreign policy of our Government and all-out aid to the nations fighting Hitler. The position of our organization on that most crucial issue of our lives is exactly that stated by Mr. Patton. But as we sweat and strain in mills and shipyards to turn out a swelling stream of materials to beat Hitler, we, like the working farmers, see gross inequities operating to impede the defense program—inequities sapping morale and constituting trends pointing to turmoil and disintegration in the post-war years unless plans of action are put into effect to remedy them. We agree wtih the working farmers who are being relentlessly tractored off the land year by year that strong and cohesive organization under dependable leadership is one of the most effective methods of tackling this and other inequities. The use of such organization to achieve and maintain equitable standards cannot justly be called an interference with defense, since it provides the basis, psychologically and materially, for steadily expanding production. And that is what we need, and all of us want to help obtain—for the military struggle now racking the world, and for the years after the battle is won, so that the tillers of the soil and the industrial workers will not be left holding the bag as they always have been after wars in the past.

We are eager to have the working farmers become more intimately acquainted with labor's difficulties in all their ramifications. We are confident such acquaintance will lead to ever more active ties. For our part it is both necessary and wise to understand much more completely the problems of farm families. We recognize that nothing accomplished in the industrial phase of our society will be able to stand if the agricultural side does not make equal progress. We believe Mr. Patton's earnest analysis of the problems of his people in relation to labor is an accurate and telling one, of vital importance to the entire community. We members of the Congress of Industrial Organizations assembled in convention at Detroit take his words very much to heart and give him our assurances that we will work with his organization in sincere effort to achieve the programs he sketched and have them adopted by our Government.

In accepting this proffer of collaboration we appreciate that labor has an obligation so to conduct itself that the working farmers can at no point say with justice that labor's actions are against the best interests of the community as a whole. As I understand Mr. Patton's words at the close of his talk he was saying that our uniting of thought and effort must not and cannot be fairly interpreted as likely to squeeze any other elements in the community. Quite the contrary. We agree thoroughly with him that the small businessmen and professional people of our Nation—the middle classes—who are already being pinched by the defense program, have a greater stake in the fate of labor and the farmer than they realize and must be educated to see that. There is no conflict between the interests of the producers in the factories and on the farms—and the interest and well-being of the Nation as a whole.

In conclusion we join with the Farmers' Union in faith and determination to see the defense of our country through to a successful outcome and, by the application of the highest intelligence we can summon, to help fashion a society out of this crisis in which the dignity and integrity of the individual will be cherished more than it ever has been in the past.

RESOLUTION OPPOSING EXTREME TYPES OF LABOR LEGISLATION

THE NATIONAL FARMERS UNION,
December 11, 1941.

The following telegram from Des Moines, Iowa, was received yesterday afternoon by Senator Elbert Thomas, chairman of the Senate Committee on Education and Labor, from President Patton, of the Farmers Union, and Tom Cheek, chairman of the National Board of the Farmers Union:

"As president of the organization whose national board adopted the following resolution, I want you to know that copies of this resolution have been sent this day, air mail, special delivery, to each member of your committee, and that our national board earnestly and respectfully requests your committee in the interest of public understanding and morale to give this resolution serious consideration and to enact no legislation of the type referred to in it without full public hearings, at which responsible representatives of this organization are afforded an opportunity to be heard:

Whereas, as President Roosevelt told Congress, our country has been subjected to an unprovoked and dastardly attack by Japan; and

Whereas this treacherous assault has united our people in solid determination to win the war whatever the cost, as the vote of Congress adequately demonstrates; and

Whereas this brutal attack, timed no doubt at the direction of Berlin, redoubles the need for an immediate increase to top limits in our production for the battle against Hitlerism and its dupe Japan, so that we, England, China, and all peoples fighting heroically against this murderous menace to democratic civilization may be supplied with the means of conquering our foes; and

Whereas all delays and stoppages in production, whether strikes and slowdowns of capital or strikes and slow-downs of labor, are to be deplored in this crisis; and

Whereas we, the working farmers of this country, now engaged in extending agricultural production for the common cause, see that our fate is closely tied up with steadily expanding industrial production; and

Whereas we working farmers believe that the overwhelming majority of industrial workers and their leaders are as patriotically eager as we are to contribute without interruption the best efforts of which they are capable in this crucial period; and

Whereas there is shockingly ample evidence that the demands of finance and industry for profits, amortization privileges, and taxation limitations have caused incomparably greater delays in defense production than strikes of labor, and that the denial and concealment for many months by key defense industries of critical shortages in basic raw materials have likewise caused major delays and are now leading to serious priorities unemployment; and

Whereas the centralizing of supply contracts by the Army and Navy in the hands of only the large industrial corporations is so marked—56 such corporations having 74 percent of the supply contracts at this date—that the small- and medium-sized factory and shop owner is being forced to the wall through woeful inadequacy of

subcontracting, this similarly causing unnecessary limitations in defense production and creating unemployment; and

Whereas, except in a minority of instances, strikes have been resorted to by labor only after the prolonged indifference of management has forced that action; and

Whereas the public clamor and focussing of attention on strikes as the chief obstacle to the defense program is in large measure the result of covering up agitation of interests hostile to the very concept of trade unions and collective bargaining; and

Whereas the Smith bill recently passed by the House of Representatives is the product of that type of agitation and is a dangerous incursion on the fundamental democratic processes we all are devoting our energies to preserve and to extend against the onrushing totalitarian brutality; and

Whereas legislation of this sort runs counter to the fact that morale cannot be legislated into existence and this legislation is, on the contrary, bound to lower the production morale of millions of industrial workers: Therefore be it

Resolved, That the national executive board of the Farmers Educational and Cooperative Union of America assembled in Des Moines, Iowa, on December 8, 1941, hereby expresses its opposition to the Smith bill and all similar extreme types of legislation and that it urges the President of the United States to summon a conference as soon as possible of representative leaders of industry, organized labor, and organized farm movements to agree on a production and labor policy serving the interests of the country as a whole; and be it further

Resolved, That the responsible leadership of labor be given a genuine role in the planning by government of production policies as agricultural leadership is given participation in the agricultural defense councils; and be it finally

Resolved, That copies of this resolution be transmitted immediately to the President, the Vice President, the Speaker of the House, and the chairman of the Senate Committee on Education and Labor.

FARMERS EDUCATIONAL AND COOPERATIVE UNION OF AMERICA,
JAMES G. PATTON, *National President*,
TOM W. CHEEK, *Chairman, National Board of Directors*.

FARM PARTICIPATION IN FORMING WAR LABOR POLICY

THE NATIONAL FARMERS UNION,
Washington, D. C., December 18, 1941.

The National Farmers Union, through its President, James G. Patton, of Denver, today wired Mr. William H. Davis, Chairman of the President's Industry-Labor Joint Conference, the following message requesting the enlargement of the conference to include representatives of organized agriculture, and to consider production policies as well as industrial relations:

DENVER, COLO., *December 18, 1941.*

In its resolution addressed to Senator Elbert Thomas, chairman of the Senate Committee on Education and Labor, opposing antilabor legislation typified by the Smith bill, our national board of directors requested the President to call a conference of industry and labor to establish a national production and labor policy. Because we, of the Farmers Educational and Cooperative Union of America, representing the working farmers of our country, see clearly that our fate in the war against Hitlerism and following victory is "closely tied up with expanding industrial production," we also asked that representative farm leaders be included in the conference.

We are encouraged by the conference convening today at the President's direction with you presiding, but we are sincerely troubled at press indications that the conference is directed to limit itself solely to industrial relations. Considering as but one example the imminent large-scale unemployment in the automotive industry due to Government's failure to insist on adequate conversion, training, and employment policies, we believe much industrial strife is based in a deep sense of insecurity on the part of labor because of Government's failure in these important respects. As we stated in our resolution, we have complete faith in the patriotic eagerness of the overwhelming majority of labor and its leaders to extend their utmost efforts in our Nation's grave peril. We pointed to the fact that ahere is incontestable evidence proving

an immeasurably greater loss of production through delays and stoppages by industry and finance while seeking amortization privileges, taxation limitations, and extraordinary profit assurances than through strikes of labor. Similarly we called attention to the serious loss of production through industry's concealment and denial of dangerous shortages in essential defense and war materials and to major additional loss of production through the procurement policy of the Army and Navy of concentrating contracts in only the large corporations and failing dismally to compel any substantial subcontracting, with the result that many medium-sized and small shops and factories are being forced to close and thus cause further unemployment. In the light of these and other equally basic considerations, we therefore repeat our request that the conference over which you are presiding be broadened to consider production methods and policies as inextricable elements of industrial relations. We again respectfully request that for the sake of greater national understanding and cohesion representative farm leaders be asked to sit in. And finally we ask that this communication be presented to the conference in session as soon as possible after its receipt and that it be given the serious consideration we earnestly believe it should have.

JAMES G. PATTON,
President, Farmers Educational and Cooperative Union of America.

EXHIBIT 7.—MACHINE TOOL OUTPUT AND EMPLOYMENT

COMPILED BY THE NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION JANUARY 15, 1942

Number of companies building machine tools.—There are now over 300 companies building machine tools of the type that cut metal and coming within the definition "power driven, complete metal working machines not portable by hand, having one or more tool and work holding devices, used for progressively removing metal in the form of chips."

Many of these are newcomers into the industry, since the outbreak of war in Europe in September 1939. The types of machines they build include variations of over 50 different types of machines, ranging from small bench type machines that weigh less than 300 pounds to the special boring mills and planers that may weigh a hundred tons or more.

EXHIBIT A. TYPES OF MACHINE TOOLS

A list of the main types of machine tools and their most usual variations is attached as exhibit A.

Of the more than 300 builders, 153 companies comprise the National Machine Tool Builders' Association, organized 40 years ago to promote the lawful interests of the machine tool industry. The association has an unbroken record of cooperative activity on behalf of the industry since 1902.

EXHIBIT B–C. LIST OF MACHINE TOOL BUILDERS

A list of companies who comprise the association and the products they manufacture is appended as exhibit B.

A list of other builders of machine tools as far as the association has record of them is appended as exhibit C. This list was compiled in cooperation with the Office of Production Management and includes those companies to whom the association has voluntarily extended its information service on matters relating to defense. While every effort has been made to keep the list up to date, new companies are constantly entering the field, and many of those already established are adding to their lines. This list may be regarded only as reasonably comprehensive.

Shipments.—Since March 1941 an irregular number of companies up to 239 have reported shipments in dollars through the association, and from their figures an industry total has been estimated monthly. Prior to March 1941 the association contributed its own data on shipments, from which the industry's output has been estimated over a period since 1937.

EXHIBIT D. INDUSTRY SHIPMENTS FROM 1937 TO DATE

A tabulation of the estimated industry output from 1937 on is given as exhibit D.

The shipments reveal, as no other data can, the extent to which the industry has expanded to meet defense demand. The industry began to increase its capacity late in 1935 with the installation of new equipment, following a wave of improved design brought out for the association's machine tool show in that year. Expansion of floor space, through new building, began in 1937 in order to meet the demand from England and France to counter Germany's then obvious preparation for war.

A third period of expansion through further increases in floor space and installation of equipment followed immediately upon the outbreak of war in Europe in September 1939 and continued unabated through 1941. A fourth period of adding still further to capacity is under way at the present time.

In view of a normal operating experience over many years at $100,000,000, and a capacity of not over $150,000,000 in 1937, the volume of output over $760,000,0000 in 1941 represents an expansion of more than five times the industry's capacity to produce in 1937.

Estimates of output are based upon the assumption that the cross-section of the industry who comprise the association produce approximately 90 percent of the industry's output. The figures received from a cross-section of other companies averaging 94 reports over the period from March to November, inclusive, add about 6 percent more. A remaining 4 percent has been added to take in the output of all other companies who build machine tools, for which no data are available at this time.

Illustrative of the extent of participation of known groups in the industry estimate is the following:

For the 9 months during which reports were received on an industry-wide basis—	
Members of the association reported aggregate shipments, March to November, inclusive, (90 percent) of	$524,500,000
Other companies (averaging 94 reports per month) (6 percent)	35,400,000
Total reported (96 percent)	559,900,000
Estimated additional output to cover all companies not reporting (4 percent)	24,300,000
Industry estimate for March to November, inclusive (100 percent)	584,300,000

EXHIBIT E. EMPLOYMENT AND SHIFT OPERATION

Employment.—Total employment reported at the end of November by 129 companies is 97,598. Assuming an additional 10 to 15 percent employed in plants whose figures are not available, a fair estimate for the industry as a whole would be around 110,000, more than double the highest employment in 1939, according to Department of Labor figures for that year. This is set out in table I of exhibit E.

Shift Operation.—To interpret properly the significance of the data on shift operations it is necessary to understand some of the problems peculiar to machine tool manufacture that make an equal distribution of men over two or three shifts, or the equal utilization of machines in terms of hours of operation impossible of attainment.

Machine tools cover a wide variety of types. Exhibit A lists more than 75 main categories of machines and approximately 150 variations of type. A further break-down by sizes of each type would greatly extend the latter figure.

Each type of machine tool requires a variety of equipment, including some special equipment suited to its manufacture, that may differ widely from that required for other types. The machine tool builder's problem is to bring about the best utilization of all the equipment required for the given type of machine he builds.

Comparative figures on employment have been compiled only from the reports of members of the association. Representing approximately 90 percent of the total output, association experience may be regarded as typical of the established concerns throughout the industry.

Table II of exhibit E shows the distribution of total employment by shifts as of the end of November for 129 members of the association. The first shift

is necessarily heavily weighted with so-called nonproductive employees; such as the administrative, engineering, sales, accounting, and clerical staffs necessary to the operation of each plant. The proportion of employees on first, second, and third shifts based on total employment therefore is misleading.

The effective utilization of equipment is better reflected in the distribution of machine operators by shifts (table III of exhibit E).

The proportion of machine operators to the total employed varies with each company, depending upon type of product manufactured, type of equipment used, volume of output, and size of engineering, supervisory, and service staffs required. Added to all these factors are differences in company requirements, in administration sales, and accounting policies. A large company building a variety of product, a large part of it "special" or designed and built to order, to do an out-of-the-ordinary kind of work and selling direct, will require a larger staff of engineers and draftsmen, a larger sales organization, more service men, more accountants and clerical help in the office in proportion to output than does a smaller concern making a standard machine of relatively simple process of manufacture selling through dealers.

An industry average of the proportion of machine operators to total employment therefore is of little value.

The proper proportion of operators on each shift to total machine operators likewise is difficult to appraise because of the wide difference in conditions as between shops.

Some managers, pressed for production, have found that because of the nature of their type of product and the limited supply of men in their localities that it has been impossible as yet to adopt a three-shift plan. In such cases two long shifts have proven more satisfactory than three understaffed short shifts.

In every machine tool plant there is a need to balance out operations. That is, some departments and some machines must be kept in operation longer hours than others in order to provide an unbroken flow of parts to the assembly floor in the quantities needed. In most cases the third shift and part of the second is needed to balance production. For this reason, the capacity on first shift limits the number of men and machines that can effectively be used on second and third shifts.

While conditions vary with every plant, it is reasonable to expect that, given a rate of demand exceeding one shift capacity distributed widely over all types of machines, and an accessible supply of men reasonably well trained, the gaps between third and second shift and second and first shifts will tend to close, although only in rare cases, because of nature of the product, ever attaining equal distribution of employment in each shift.

The foregoing explanation is necessary to and will assist in a fair appraisal of the exhibits presented.

EXHIBIT A. TYPES OF MACHINE TOOLS DEFINED AS "POWER DRIVEN, METAL WORKING MACHINES, NOT PORTABLE BY HAND, THAT CUT METAL IN THE FORM OF CHIPS"

COMPILED BY NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION, MARCH 1, 1941

Abrasive cut-off machines.
Bar cutters.
Bar machines:
- Automatic.
- Single spindle.
- Multispindle.

Bolt cutting and finishing machines.
Bolt threading machines.
Boring heads.
Boring machines:
- Car wheel.
- Cylinder.
- Deep hole.
- Diamond tool.
- Horizontal.
- Jig.
- Multispindle.
- Vertical.
- Way type.

Boring, drilling, and milling machines.
Boring and honing machines.
Boring and turning mills.
Broaching machines and presses:
- Horizontal.
- Internal.
- Pull and push.
- Surface.
- Vertical.

Buffing, burnishing, and polishing machines.
Burring machines.
Cap screw finishing machines.
Centering machines.
Chambering machines.
Chamfering machines.
Chucking machines:
- Multispindle.
- Single spindle.
- Tool rotating.
- Work rotating.

Counter bore machines.
Cutting-off machines.
Die-making machines:
- Duplicating.
- Filing.
- Grinding.
- Sawing and filing.
- Shaping.
- Sinking.

Drill heads.
Drilling machines:
- Automatic.
- Bench.
- Deep hole.
- Drilling and turning.
- Duplex.
- Gang drills.
- Horizontal.
- Multispindle.
- Plain.
- Radial.
- Sensitive.
- Turret type.
- Upright.
- Way and column type.

Drilling units.
Duplicating machines (die).
Engraving machines.
Facing machines.
Filing machines.
Finishing machines.
Flanging machines.
Flash trimming machines.
Gear machinery:
- Burnishing.
- Burring.
- Chamfering.
- Cutting.
- Finishing.
- Generating.
- Grinding.
- Hobbing.
- Honing.
- Lapping.
- Milling.
- Planing.
- Rack cutting.
- Roughing.
- Shaping.
- Shaving.
- Gear tooth burring.
- Gear tooth chamfering.
- Gear tooth pointing.
- Gear tooth rounding.

Grinding machines:
- Abrasive belt.
- Bench.
- Brake shoe.
- Broach.
- Cam and contour.
- Centerless.
- Chaser.
- Cutter.
- Cylindrical.
- Diamond wheel.
- Die.
- Disc.
- Drill and tap.
- Face and ring wheel.
- Face mill.
- Floor type.
- Frog and switch.
- Gear.
- Hack saw blade.
- Head and end.
- Internal.
- Knife and shear blade.
- Link.
- Piston ring.
- Planer type.
- Pulley.
- Radius.
- Roll.
- Spline shaft.
- Surface.
- Swing frame.
- Tap.
- Thread.
- Tool and cutter.
- Universal.
- Valve.

Hobbing machines.
Honing machines.
Jog boring machines.
Keller automatic machines:
- Die sinking.
- Form turning.

Keyseaters.
Lapping machines.
Lathes:
- Automatic.
- Axle turning.
- Bench.
- Brake drum.
- Buffing and polishing.
- Car wheel.
- Engine.
- Gap.
- Gun boring.
- Polishing.
- Shell turning.
- Toolroom.
- Turret.
- Vertical turret.

Milling Machines:
- Bed type.
- Bench type.
- Cam.
- Duplex.
- Form.
- Hand.
- Hob.
- Knee type:
  - Horizontal.
  - Vertical.
- Plain.
- Planer type.
- Planetary.
- Profile.
- Rotary.
- Thread.
- Universary.

Milling and drilling machines.
Milling and boring machines.
Milling, boring, and shaping machines.
Nibbling machines.
Notching machines.
Nut tapping machines.
Pantograph machines.
Pinion cutting—drilling machines.
Pipe cutting and threading machines.
Planers:
- Crank.
- Die block.
- Double housing.
- Frog and switch.
- Gear.
- Milling.
- Openside.
- Plate.
- Post type.
- Shaping.
- Upright generating.

Pointing machines.
Polishing machines.
Profiling machines.
Rack cutting machines.
Reaming machines.
Reboring machines.
Regrinding machines.
Retoothing machines.
Rifle reaming machines.
Rifling machines.
Roll grinding machines.
Roll threading machines.
Sawing machines, for metal.
Screw driving and inserting machines.
Screw machines:
- Hand.
- Automatic single spindle.
- Automatic multispindle.

Shapers:
- Crank.
- Draw cut.
- Duplex.
- Gear.

Shaper planers.
Sharpening machines.
Shaving machines.
Shell machines.
Slotters.
Tapping machines.
Thread cutting machines.
Thread grinding machines.
Thread milling machines.
Turning machines.
Turret lathes:
- Ram type.
- Saddle type.
- Vertical.

EXHIBIT B. MACHINE TOOLS AND RELATED PRODUCTS BUILT BY MEMBERS OF THE NATIONAL MACHINE TOOL BUILDERS' ASSOCIATION AS OF JANUARY 1, 1941

Abrasive Machine Tool Co., Dexter Road, East Providence, R. I.:
- Surface grinding machines: Horizontal and vertical spindle of reciprocating table type.
- Face grinders.
- Abrasive ring wheel chucks.
- Index centers.
- Wet grinding attachment.
- Dust exhaust attachment.
- Motorized dust exhaust units.
- Radius truing devices.

The Acme Machine Tool Co., 4955 Spring Grove Avenue, Cincinnati, Ohio:
- Turret lathes: Plain and universal type.
- Screw machines: Ram and saddle type.
- Complete tooling requirements.

The Acme Machinery Division, Hill-Acme Co., 4533 St. Clair Avenue, NE, Cleveland, Ohio:
- Acme "XL" threading machines.
- Bolt threading, pointing, heading machines.
- Rivet heading machine.
- Rolled threading machines.
- Acme "XN" forging machines (upset method).
- Hot pressed nut machines.
- Nut burring machines.
- Nutting-up machines.
- Nut tapping and coupling tapping machines semiautomatic multiplespindle.
- Coupling chamfering machines (automatic).

The Ajax Manufacturing Co., Euclid Branch Post Office, Cleveland, Ohio:
Forging machinery:
- Bolt headers.
- Upsetters.
- Forging machines (open or solid die).
- Forging presses.

The Ajax Manufacturing Co.—Continued.
Forging machinery—Continued.
Rivet (hot) making machines.
Rolls;
Forging.
Scrap reclaiming.
Bulldozing bending machines.
Sawing machines, hot metal.
Cold metal working machinery:
Wire drawers for cold headers.
Bar drawers and straighteners.
Rod drawing, straightening and cut-off machines.
Charles G. Allen Co., Barre, Mass.: Ball bearing drilling and tapping machines.
American Broach & Machine Co., Division of Sundstrand Machine Tool Co., Ann Arbor, Mich:
Broaching machines:
Internal and surface.
Vertical and horizontal.
Hydraulic and mechanical.
Pull and push type.
Rotary surface.
Presses:
Broaching.
Vertical and horizontal.
Hydraulic.
Forcing.
Broaching tools.
The American Tool Works Co., Pearl and Eggleston Avenue, Cincinnati, Ohio:
Metal working engine lathes:
Diameter swings 12 to 48 inches:
Heavy duty.
Precision tool room.
Multiproduction:
Oil country.
Gun boring.
Glass mold.
Metal working radial drills:
Lengths of arm 3 to 12 feet.
Column diameter, 9 to 26 inches:
Plain.
Universal.
Metal working shapers:
Lengths of stroke 16 to 36 inches:
Plain.
Universal.
Railroad.
Die shop.
Tool room.
Armstrong-Blum Manufacturing Co., 5700 West Bloomingdale Avenue, Chicago, Ill.:
Hack sawing machines.
Metal band sawing machines.
Arter Grinding Machine Co., 15 Sagamore Road, Worcester, Mass.:
Grinding machines:
Rotary surface.
Automatic piston ring.
Automatic head and end.
Automatic angle wheel head shoulder.
Automatic cylindrical.
Magnetic chucks.
The Avey Drilling Machine Co. Works, Covington, Ky.; Post Office, Cincinnati, Ohio:
Sensitive drilling and tapping machines, belt and motor driven.
Horizontal and vertical drilling units.
"Milband" cutting-off machines, 6½- by 6½-inch capacity, bandsaw type.

Axelson Manufacturing Co., Post Office Box 98, Vernon Station, Los Angeles, Calif.:
- Heavy duty lathes.
- Also oil well pumping equipment, gray iron foundry.

Baker Bros., Inc., Post Street, Toledo, Ohio:
- Drilling machines:
  - Heavy duty, single spindle.
  - Multiple spindle and way type.
- Tapping machines.
- Keyseaters.
- Grinders (contour).

Barber-Colman Co., Rockford, Ill.:
- Standard and special spur and spiral gear hobbing machines.
- Standard and special spline shaft hobbing machines.
- Cutter sharpening machines.
- Hob sharpening machines.
- Reamer sharpening machines.
- Milling cutters.
  - All standard and special types.
  - Inserted tooth and solid.
- Reamers, inserted blade and solid.
- Hobs, standard and special, ground and unground:
  - Gear.
  - Spline shaft.
  - Special forms.
  - Bench centers.

Bardons & Oliver, Inc., 1133 West Ninth Street, Cleveland, Ohio:
- Turret lathes.
- Cutting off machines.

W. F. & John Barnes Co., 301 South Water Street, Rockford, Ill.:
- Special way type drilling, tapping, boring, and milling machines.
- Hydraulic self-contained drilling units.
- Hydraulic pumps and controls for machine tool actuation.
- Honing machines: Horizontal and vertical.

Barnes Drill Co., 814–830 Chestnut Street, Rockford, Ill.:
- Drilling machines:
  - Hydraulic and geared:
    - Multiple spindle.
    - Vertical.
    - Heavy duty.
- Drilling and tapping machines.
- Boring machines, hydraulic, cylinder, vertical.
- Honing machines, Hydraulic:
  - Internal and external.
  - Vertical.
  - Horizontal.
  - Mechanical (formerly Hutto).
- Tapping machines:
  - Single spindle.
  - Multiple spindle.
- Lapping machines, hydraulic:
  - Vertical.
  - Horizontal.
- Cylinder reboring machines, floor type.

Baush Machine Tool Co., Springfield, Mass.:
- Drilling, boring, and tapping.
- Machines, also worm gears and universal joints.

Beaver Pipe Tools, Inc., Warren, Ohio:
- Hand and power, pipe and bolt machinery.

Charles H. Besly & Co., 118–124 North Clinton Street, Chicago, Ill.:
- Besly flat surface and special grinding machines.
- Besly Titan Steelbac abrasive discs.
- Taps.

The Blanchard Machine Co., 64 State Street, Cambridge, Mass.:
- Blanchard surface grinding machines:
  - Nos. 11, 16, 18, and 27 high power.
  - Nos. 16–A, 16–A dual, and 16–A2 automatic.
- Grinding wheels for Blanchard grinders, solid cylinder, sectored and segment.
- Demagnetizers.

Bodine Corporation, 317 Mountain Grove Street, Bridgeport, Conn.:
Bodine automatic dial type drilling, tapping, and screw inserting machines.
Multi-Universal.
The Breckenridge Machine Co., 23000 St. Clair Avenue, Cleveland, Ohio:
Pipe threading machinery.
Pipe coupling machinery.
Special machinery of various types.
Medium and large machine work.
Brown & Sharpe Mfg. Co., 235 Promenade Street, Providence, R. I.:
Adapters.
Arbors.
Attachments:
Grinding machine.
Milling machine.
Screw machine.
Castings, gray iron.
Chucks, spring.
Chucks, magnetic.
Collets.
Countershafts.
Cutters:
Angular.
Coarse tooth.
End mills.
Face milling.
Form.
Gear.
Helical.
Inserted tooth.
Milling.
Side milling.
Special.
Staggered tooth.
Saws.
Expansion bushings.
Fixtures.
Gages:
Center.
Cylindrical.
Depth.
Dial.
Drill.
Height.
Plug and ring.
Railroad.
Screw pitch.
Surface.
Thread.
Telescoping.
Thickness.
Wire.
Gear testing fixture.
Gears.
Grinding machines:
Surface.
Universal.
Plain.
Universal and tool.
Cutter.
Ground flat stock.
Hobs.
Index plates.
Index centers.
Indicators, speed and test.
Machinists' tools.
Magnetic chucks (permanent magnet type).
Mandrels.
Micrometers.

Brown & Sharpe Mfg. Co.—Continued.
Milling machines:
Universal.
Omniversal.
Plain.
Vertical.
Semi-Automatic.
Manufacturing.
Pumps:
Geared.
Centrifugal.
Motor driven.
Oil.
Vane.
Screw machine tools.
Screw machines:
Wire feed.
Automatic.
Turret forming.
Cutting-off.
Screw threading.
Verniers.
Vises.
Bryant Chucking Grinder Co., 257 Clinton Street, Springfield, Vt.:
Grinding machines—
Internal:
Plain.
Tool room.
Automatic sizing.
Deep hole.
Internal cam and contour.
Two spindle hole and face.
Wheelheads.
Chucking fixtures.
Buffalo Forge Co., Postoffice Box 985, Buffalo, N. Y.:
Drilling machines (sensitive and power feed types):
Bench.
Floor.
Pedestal.
Motor spindle.
Variable speed.
Single and multiple spindle.
Tapping machines.
Punching and shearing machinery (hand and power operated) (single and double end):
Bar cutters.
Sprue cutters.
Angle shears.
Billet shears.
Slitting shears.
Cut-off shears.
Bending rolls, for all structural shapes.
Wrapping rolls.
Buhr Machine Tool Co., 839 Greene Street, Ann Arbor, Mich.:
"Buhr" drill heads, adjustable and fixed-center type.
Index tables.
"Buhr" micro-lock adjustable holders.
Jigs and fixtures.
Special drilling and tapping machines:
Cam or hydraulic feed.
Hand-operated or automatic.
The Bullard Co., 286 Canfield Avenue, Bridgeport, Conn.:
Spiral drive vertical turret lathes, 24 to 54 inches (4 sizes).
Cut master vertical turret lathes, 30 to 64 inches (5 sizes).
Multiple spindle vertical lathes (automatic):
Station type—Mult-Au-Matics.
Continuous type—Contin-U-Matics.
Bullard-Dunn electrochemical cleaning process.

The Carlton Machine Tool Co., Spring Grove Avenue and Meeker Street, Cincinnati, Ohio:
Radial drilling machines.
Chambersburg Engineering Co., Chambersburg, Pa.:
Accumulators—hydraulic.
Cranes—hydraulic.
Castings—gray iron, semi-steel cecolloy.
Dies.
Hammers:
Forging, steam or air.
Drop and stamping.
Hoists—hydraulic.
Intensifiers—hydraulic.
Machinery: Special designed and built to specifications.
Presses:
Bushing.
Trimming.
Wheel.
Hydraulic.
Power.
Punches—hydraulic and power.
Pumps—hydraulic.
Riveters—hydraulic.
Valves—hydraulic.
The Sheffield Corporation, Cimatool Division, Dayton, Ohio:
Bearing machines.
Chamfering machines (gear and bushing chamfering).
Burnishing machines (gear burnishing).
Sheffield gages.
Vibration frequency meters.
Thread grinding machines.
The Cincinnati Bickford Tool Co., Oakley, Cincinnati, Ohio:
Radial drilling machines: Plain, from 3- to 12-foot arm lengths and from 9- to 26-inch column diameters.
Radial drilling machines: Sensitive high speed 2½-foot with 7½-inch diameter column.
Upright drilling machines: 21-, 24-, and 28-inch sizes, all geared type, general purpose or single purpose.
Jig boring machines.
Gang drills, 2 to 6 spindles.
Tapping machines.
Horizontal drilling machines.
Simplified manufacturing units.
The Cincinnati Gilbert Machine Tool Co., 3366 Beekman Street, Cincinnati, Ohio:
3- to 8-foot multi-duty ball-bearing radial drills.
20-inch Universal monitor lathes.
Horizontal boring, drilling, and milling machines.
Cincinnati Grinders, Inc., Oakley, Cincinnati, Ohio (subsidiary, Cincinnati Milling Machine Co.):
Cincinnati precision grinding and lapping machines: Plain self-contained cylindrical grinding machines—14- and 16-inch with distance between centers up to 168 inches. 20, 24, and 28 inches with distance between centers up to 192 inches.
Roll grinding machines (traveling table type) 20, 24, and 28 inches with distance between centers up to 192 inches.
Roll grinding machines (traveling wheel head type) 36, 44, 50 and 60 inches with distance between centers 36-inch machines—240 inches; and 44-, 50-, and 60-inch machines—288 inches.
Plain hydraulic grinding machines: 6 and 10 inches with distance between centers up to (6-inch machines) 30 inches and (10-inch machines) 72 inches.
Universal grinding machines:
Hydraulic—12-inch swing; 24 to 72 inches between centers.
Hydraulic—14- and 16-inch swings; 36 to 72 inches between centers.
Piston rod grinding machines.
Centerless grinding machines: Nos. 0, 2, 3, 4, 5, and 6.
Hoppers for automatic centerless grinding attachments for centerless and centertype grinding machines.
Centerless lapping machines.
Cincinnati chucking grinding machines.

The Cincinnati Lathe & Tool Co., 3207–3211 Disney Street, Oakley, Cincinnati, Ohio:
Engine lathes, Sizes 14-, 16-, 18-, 20-, 22-, 24-, 27-, 30-inch, either geared head single pulley or direct motor drive, and in 2-foot lengths of bed from 6 feet and up.
Single purpose or special tooling for each customer's requirements.
Cincinnati tool room lathes are furnished complete in the 14-, 16-, 18-, and 20-inch sizes.
The Cincinnati Milling Machine Co., Oakley, Cincinnati, Ohio:
Cincinnati milling, surface broaching, and cutter grinding machnes.
Milling machines:
No. 2–L (knee and column) type, plain and universal.
No. 2–MH (knee and column) type, plain and universal.
Nos. 2, 3, and 4 medium and high speed dial type (knee and column), plain universal, and vertical.
Nos. 4 and 5 high power (knee and column) plain and universal.
No. 4 high power (knee and column) vertical, Hydro-tel (fixed bed) horizontal and vertical, with 48-, 60-, 72-, 84-, 96-, 108-, 120-inch table travels.
No. 0–8 plain automatic.
No. 0–8 vertical.
Nos.1–12 and 1–18 plain automatic.
Nos. 2–18 and 2–24 plain automatic.
Nos. 2–18 and 2–24 automatic rise and fall.
Hydromatic (fixed bed) milling machines, plain, duplex, and multiple spindle with 24-, 36-, 48-, 60-, 72-, and 90-inch table travels.
Hydrobroach machines (for surface broaching):
Single and double ram vertical.
Horizontal.
Cutter grinding machines: No. 2 plain and universal.
Standard attachments for milling and cutter grinding machines.
The Cincinnati Planer Co., 3120 Forrer Street, Oakley, Cincinnati, Ohio:
Planers:
Double housing.
Openside.
Crank.
Die block.
Frog and switch.
Boring and turning mills—vertical.
Milling machines—Planer type.
The Cincinnati Shaper Co., Hopple, Garrard, and Elam Streets, Cincinnati, Ohio:
Shapers.
Press brakes.
Squaring shears.
Cleereman Machine Tool Co., Green Bay, Wis.:
Cleereman all geared sliding head drilling machines: 1½-inch capacity; swing, 21-, 25-, 30-inches.
Mechanics drills (Rockford Machine Tool Co. Line).
Gang drill, all sizes above mentioned.
Rail drilling machinery.
Special drilling machinery.
Cleereman jig borers:
Table sizes, 16 by 30, 16 by 36, 22 by 44.
Table travel, 18 by 24, 18 by 30, 18 by 36.
The Cleveland Automatic Machine Co., 2269 Ashland Road, Cleveland, Ohio:
Single spindle automatic bar machines ½- to 8-inch capacities.
Multiple spindle automatic bar machines:
4 spindle, ⅝- to 3½-inch capacities.
6 spindle, ⅝- to 2$^{3}/_{16}$-inch capacities.
Multiple spindle automatic chucking machines:
4 spindle, 6½- to 9-inch capacities.
6 spindle, 4¾- to 6½-inch capacities.
Chucking machines can be arranged as full or semiautomatic and with magazine feed where work will permit.

The Cleveland Hobbing Machine Co., 1170 East One hundred and fifty-second Street, Cleveland, Ohio:
Cleveland spiral bevel rigidhobber.
Cleveland 8-spindle rotary rigidhobber.
Cleveland single spindle rigidhobber.
The Cleveland Planer Co., 3148 Superior Avenue, NE., Cleveland, Ohio: Cleveland open side planers, 26 to 72 inches, inclusive.
Cochrane-Bly Co., 15 St. James Street, Rochester, N. Y.:
Metal sawing machines.
Saw sharpening machines.
Filing Machines.
Circular tables.
Universal vertical miller shapers.
Universal vertical milling machines.
Universal vertical shapers.
Abrasive cut-off machines.
Automatic cut-off saws for steel and nonferrous metals.
Colonial Broach Co., 147 Joseph Campau, Detroit, Mich.:
Broaching machines and presses:
Horizontal.
pull and push.
Surface.
Vertical.
Broaches.
Broach sharpening machines.
The Columbia Machine Tool Co., Hamilton, Ohio:
Bending machines:
Horizontal, bending, and punching.
Combined, bar, rail, bending, and forming, bulldozers.
Copers and notchers:
I-beam, channel, angle, Z bar, etc.
Horizontal straightening machines: Pipe, rail, beam.
Power punching and shearing machinery (the former "L. & A." line).
Press brakes.
Punching machines:
Punching and coping.
Punch and shears combined.
Single ended, double ended, beam, flange, fluehole, high-speed, horizontal, lever, manhole, multiple, rail, sheet metal, splice bar, structural, tie plate.
Riveters: Riveting and punching, stake type.
Shapers, crank (metal working).
Shears: Shears and punch combined, angle, bar, billet and bloom, gate, guillotine, lever, plate, rolling mill, scrap, sheet metal, splitting, squaring.
Spacing tables:
Various types, hand operated.
Mechanically or electrically operated.
Sprue cutters: Brass, steel casting.
Cone Automatic Machine Co., Inc.,
Windsor, Vt.:
Cone multiple spindle automatic bar machines, 7/8 to 6 inches, 4, 6, 8 spindle models.
Cone 4 spindle vertical type cut-off machines, 1 to 2 5/8 inches.
Cone 5 spindle automatic chucking machines, capacity, 8 3/4-inch chucks.
Consolidated Machine Tool Corporation, Rochester, N. Y.:
Alligator shears (Hilles & Jones):
Lever or alligator shears.
Double angle shears.
Boring mills, vertical:
Standard and heavy duty (Betts).
Standard and heavy duty (Colburn).
Boring machines, horizontal.
Horizontal boring, drilling, and milling machines (Betts).
Railway motor frame boring machines (Newton).

Consolidated Machine Tool Corporation—Continued.
Bending machines (Hilles & Jones):
Plate bending rolls.
Bender and straightener.
Rail bending.
Beveling machines, angle bar (Hilles & Jones).
Car wheel borers (Betts):
Standard and heavy duty.
Hydraulic feed.
Chucks (modern magic).
Clamps (Hilles & Jones): Pneumatic and hand flanging clamps.
Cold saw cutting-off machines (Newton):
Hydraulic feed.
Armor plate.
Column facing machines (Newton).
Cutters, face milling (modern).
Cylinder boring machines (Newton): Locomotive cylinder boring machines.
Die heads (modern): Self opening; solid.
Drill presses (Colburn).
Drilling machines:
Multiple spindle (Colburn).
Horizontal, hydraulic, and mechanical feed (Colburn).
Vertical, hydraulic, and mechanical feed (Colburn).
Wall type radial drills (Newton).
Deep hole (Colburn).
Gantry (Colburn).
Grinding machines:
Chaser grinders (modern).
Radius link grinders (Newton).
Joggling machines (Hilles & Jones):
Plate roll type.
Structural hydraulic type.
Lathes (Betts-Bridgeford):
Engine, 26- to 128-inch swing or larger.
Roughing.
Oil country.
Plain turning.
Gun boring.
Gun rifling.
Axle:
Burnishing.
For car axles (center drive).
For locomotive axles (end drive).
Journal truing.
Combination J. T. and axle.
Milling machines (Newton):
Planer type.
Planer type (unit head).
Slab.
Vertical continuous.
Planetary.
Column facing.
Drum type.
Profile.
Rise and fall.
Special.
Vertical rod.
Radius link.
Locomotive axle key seat.
Key seat.
Mill-N-Shaver: Combination rough milling and finish shaving machines.
Planers:
Heavy duty (Betts).
Frog and switch (Betts).
Locomotive frame.
Pit (Betts).
Crank (Newton).

Consolidated Machine Tool Corporation—Continued.
Planers—Continued.
Rotary (Newton).
Upright generating (Newton).
Plate edge and scarf (Hilles & Jones).
Angle bar (Hilles & Jones).
Punches and shears (Hilles & Jones).
Punching machines (Hilles & Jones):
Single punches.
Multiple punches.
Riveters and rapid-action punches.
Rod boring machines:
Locomotive (Newton).
Locomotive (Colburn).
Rail drilling machines (Newton).
Rail ending machines (Newton).
Slotters:
Crank (Betts).
Locomotive frame (Betts).
Screw-driven (Newton).
Shearing machines (Hilles & Jones):
Gate.
Open throat.
Guillotine bar.
Rotary bevel.
Special machines.
Straightening machines (Hilles & Jones):
Straightening rolls.
Rail straightening.
Horizontal bending and straightening.
Stud setters (Modern).
Tapping attachments (Modern).
Taps, collapsible (Modern).
Threading Machines (Modern):
Single spindle.
Double spindle.
Staybolt (Colburn).
Tire mills (Betts):
Fixed-rail type.
Movable-rail type.
Covel Manufacturing Co., Benton Harbor, Mich.:
Surface, tool and cutter, and drill-grinding machines.
Cross Gear & Machine Co., 3250 Bellevue Avenue, Detroit, Mich.:
Gear tooth rounding, pointing, chamfering, and burning machines.
"Cross MilLathe."
Automatic chuckers.
Special machinery.
Automatic multi-cut lathes.
Vertical milling machines.
Jig borers.
Davenport Machine Tool Co., 167 Ames Street, Rochester, N. Y.:
Multiple spindle automatic screw machines:
Capacity—9/16" round.
1/2" hexagon.
3/8" square.
Special machines.
Davis & Thompson Co., 6619 West Mitchell Street, Milwaukee, Wis.:
Continuous drilling machines.
Drum type milling machines.
Pipe-threading machines.
Tubular bow and bar micrometers.
Defiance Machine Works, Inc., Defiance, Ohio: Horizontal boring mills and production drills (also scale parts, plastic machines).
The Eastern Machine Screw Corporation, Truman and Barclay Streets, New Haven, Conn.:
H & G self-opening die heads (and chasers).
H & G threading machines.
H & G chaser grinders.

Edlund Machinery Co., Inc., Cortland, N. Y.: Sensitive drilling machines.
Erie Foundry Co., Erie, Pa.:
Steam- or air-operated self-contained tool-dressing hammers.
Steam- or air-operated single-frame forging hammers.
Steam- or air-operated double-frame forging hammers.
Steam- or air-operated drop hammers.
Belt-driven board drop hammers.
Direct motor-driven board drop hammers.
hot and cold trimming presses.
Hydraulic steam platen presses.
Mechanical forging presses.
Sheet mill equipment including galvanizing machines, levellers, picklers, cooling wheels and squaring shears.
Gray iron and semi-steel castings.
Ex-Cell-O Corporation, 1200 Oakman Boulevard, Detroit, Mich.:
Precision boring, turning, facing machines.
Heavy duty precision boring machines (angular type).
Precision thread grinders (external and internal).
Special machinery.
Hydraulic power units.
Internal lapping machines.
Carbide tool grinders.
Center lapping machines.
Spindles, internal and surface grinding.
Drill jig bushings.
aircraft engine parts.
Airplane parts.
Diesel fuel-injection pumps.
Pure Pak machines for packaging milk.
Counterbores; counterbore sets.
Ground form tools.
Special cutting tools.
Broaches; broaching fixtures.
Carboloy tipped tools.
Milling cutters—special.
Inserted tooth milling cutters.
Railroad bushings.
Railroad pins.
Precision ground thread parts.
Miscellaneous jobbing.
Farrel-Birmingham Co., Inc., Ansonia, Conn.: Roll grinders in sizes 20- to 60-inch diameter and 8- to 26-foot roll lengths.
Farrel-Birmingham Co., Inc., 344 Vulcan Street, Buffalo, N. Y.:
Sykes gear generators in sizes 1- to 26-foot diameter and ¼-inch to 60-inch face width.
Gear lapping and testing machines.
Gear tooth comparators.
Cutters for Sykes gear generators.
The Fellows Gear Shaper Co., Springfield, Vt.:
Fellows gear shapers (6, 6A, 7, 7A, and 30 types).
Straight line gear generator.
Fine pitch gear shaper.
Horizontal Z. model gear shaper.
Rack shaper.
Gear finishing machines.
Enveloping gear generators.
Gear shaper, hourglass worm type.
Thread generators (straight worm and hourglass types).
Gear burnishing machines.
Flame hardening machines.
Gear lapping machines for spur, helical, and herringbone gears.
Helical cutter sharpening machine.
Gear measuring machine.
Red liner.
Involute measuring machines.
Master gears.
Burnishing gears.
Laps.
Original Fellows gear shaper cutter.

Fitchburg Engineering Corporation, Fitchburg, Mass.: Milling and boring machines.
The Foote-Burt Co., 13000 St. Clair Avenue, Cleveland, Ohio:
- Drilling machines:
  - Boiler shell.
  - Center column machines.
  - Continuous.
  - Gang.
  - High duty:
    - Single spindle.
    - Multiple spindle.
    - Horizontal.
    - Vertical.
  - Independent feed.
  - Inverted:
    - Single spindle.
  - Multiple spindle.
  - Mud ring and flue sheet.
  - Multiple spindle:
    - Hydraulic feed, vertical.
    - Mechanical feed, vertical.
  - Portable.
  - Rail.
  - Sensitive high speed.
  - Way:
    - Cam feed.
    - Hydraulic feed.
- Boring machines:
  - Cylinder:
    - Hydraulic feed.
    - Mechanical feed.
  - Horizontal.
  - Multiple spindle, vertical.
  - Single spindle, vertical.
- Tapping machines:
  - Multiple spindle:
    - Hand feed, vertical.
    - Lead screw feed, vertical.
  - Way:
    - Hand feed.
    - Lead screw feed.
- Reaming machines:
  - Multiple spindle.
  - Single spindle.
- Screw machines: Single spindle, automatic.
- Special boring and drilling machines.
- Station type machines.
- Surface broaching machines:
  - Continuous.
  - Vertical.

The Fosdick Machine Tool Co., Blue Rock and Apple Streets, Cincinnati, Ohio:
- Radial drills.
- Upright drills.
- Sensitive drills.
- Special drilling equipment.
- Jig borers.

Foster Division, International Machine Tool Corporation, 1100 Beardsley Avenue, Elkhart, Ind.:
- Hand screw machines.
- Universal turret lathes:
  - Ram type.
  - Saddle type.
- Automatic chucking machines:
  - Platen type.
  - Indexing turret type.
  - (Trade name "Fastermatic.")
- Foster-Barker wrenchless chucks and vises.
- Foster superfinishers.
- Railroad air-brake reamers and forming tools.

The Frew Machine Co., 124 West Venango Street, Philadelphia, Pa.:
- Tapping machines.
- Hand milling machines.
- Profiling machines.
- Cam milling machines.
- Duplex drilling machines.
- Special machinery.

Galimeyer & Livingston Co., Grand Rapids, Mich.:
- Grinders ("Grand Rapids"):
  - Hydraulic feed surface:
    - Horizontal spindle—20 sizes.
    - Vertical spindle—1 size.
  - Hand feed surface—4 sizes.
  - Cutter and reamer—5 sizes.
  - Twist drill—6 sizes.
  - Tap—3 sizes.
  - Combination drill and tap—6 sizes.
  - Hydraulic feed universal and tool grinders—2 sizes.

Gardner Machine Co., Beloit, Wis.:
- Abrasive discs and wheels.
- Grinders ("Gardner").
  - Automatic.
  - Disc.
  - Face.
  - Surface.
  - Ring wheel.
  - Special.
- Polishing and Buffing Lathes ("Gardner").

The Gear Grinding Machine Co., 3901 Christopher Avenue, Detroit, Mich.:
- Gear, spline, rack and worm grinding machinery.
- Constant velocity universal joints.
- Custom grinding.

General Machinery Corporation, Hamilton, Ohio:
- Boring machines: Horizontal and vertical.
- Boring mills.
- Drills: Multiple and radial.
- Gougers.
- Lathes.
- Milling machines.
- Peelers.
- Planers.
- Quartering Machines.
- Special Tools.

The Geometric Tool Co., Blake and Valley Streets, New Haven, Conn.:
- Geometric chasers for die heads and taps.
- Die Heads—Self opening:
  - Stationary Use.
  - Rotary use.
- Die Heads—Solid adjustable:
  - Stationary use.
  - Rotary use.
- Die heads—Taper threading: Stationary use.
- Taps—Collapsing:
  - Stationary use.
  - Rotary use.
- Taps—Taper threading (receding type):
  - Stationary use.
  - Rotary use.
- Taps—Solid adjustable:
  - Stationary use.
  - Rotary use.
- Threading machines
- Chaser grinding machines.
- Chaser grinding fixtures.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis..
G & L high power precision horizontal.
Boring, drilling and milling machines:
Table type: With main spindles from 2½ inches to and including 8 inch diameter.
Floor type: With main spindles from 3 inches to and including 8 inches in diameter with adjustable quills from 8 inches to and including 18 inches in diameter.
Planer type: With stationary and adjustable columns and main spindles from 3 inches to and including 8 inches in diameter.
Multiple head planer type: With one or two horizontal or vertical headstocks, adjustable quills and bore spindle diameters from 3½ inches to and including 7 inches in diameter.
Accessories and attachments for the above machines.
Gisholt Machine Co., 1245 East Washington Avenue, Madison, Wis.:
Turret Lathes:
Ram type.
Standard saddle type.
Heavy duty saddle type.
Single spindle automatic lathes.
Balancing machines:
Static.
Dynamic.
Chucks.
Reamers.
Boring bars.
Turret lathe tools.
Gleason Works, 1000 University Avenue, Rochester, N. Y.:
Straight bevel-gear planers.
Combination straight bevel and spur-gear planers.
Straight bevel-gear generators.
Straight bevel gear roughing machines.
Straight bevel-gear completing machines.
Spiral bevel, zerol bevel, and hypoid gear generators.
Spiral bevel, zerol bevel, and hypoid gear grinders.
Spiral bevel, zerol bevel, and hypoid gear and pinion roughing machines.
Bevel gear-testing machines.
Bevel and hypoid gear-testing machines.
Universal gear-testing machines.
Spiral bevel and hypoid pinion burnishing machines.
Spiral bevel and hypoid gear lapping machines.
Spiral bevel, zerol bevel, and hypoid cutter sharpeners.
Bevel gear tool sharpeners.
Gear quenching presses.
Surface-hardening machines for gears.
Straight bevel gear tools.
Spiral bevel, zerol bevel, and hypoid gear cutters.
Arbors, dies, and chucking equipment.
Straight bevel, spiral bevel, zerol bevel, and hypoid cut gears.
George Gorton Machine Co., Racine, Wis.:
Pantograph engraving machines, 16 standard styles and sizes from 50 pounds to 5 tons.
Die-duplicating machines, three sizes.
High-speed profilers, six styles and sizes for small high-speed cutters.
Vertical milling machines, No. 1 and smaller, three sizes, with hand or power feeds. Also arranged for jig boring.
Universal milling machines, No. 1 and smaller, with two fully universal heads.
Graduating machines, hand and semiautomatic, for accurate production graduating of discs and dials.
Universal cutter grinders, with radius attachment, for cutters and mills up to ⅝-inch-diameter shank.
Tools and cutters, circular and universal tables, plain and universal vises and holders.
Collets, special tools, and fixtures.
Carbon, high-speed steel, and hard-alloy end mills and cutters in small sizes.
Diamond cutters.

The Goss & De Leeuw Machine Co., New Britain, Conn.:
- Multiple-spindle chucking machines:
  - Tool revolving, four-spindle, 6-, 8½-, and 11-inch swing.
  - Work rotating:
    - Four-spindle (quadradial).
    - 18-inch swing.
    - Four-spindle, 9½-inch swing.
    - Five-spindle, 8-inch swing.
    - Six spindle, 7½-inch swing.
    - Eight-spindle, 6-inch swing.

Gould & Eberhardt, 433 Fabyan Place, Newark (Irvington), N. J.:
- Metal-crank shapers, available with 14-, 16-, 20-, 24-, 28-, 32-, and 36-inch stroke.
- Gear-hobbing machines:
  - Spur type: For spur gears, sprockets, spline shafts, and worm gears. Available in 12-, 16-, 24-, 36-, 48-, and 60-inch sizes.
  - Universal type: For spur gears, single and double helical gears, sprockets, spline shafts, and worm gears. Available in 12-, 16-, 24-, 36-, 48-, 60-, 72-, 84-, 96-, and 120-inch sizes.
- Worm-gear hobbing machines:
  - Straight type worm gears only. Infeed and tangential cutting methods. Available in 20-, 30-, 40-, 50-, 60-, 70-, 80-, and 90-inch sizes.
  - Enveloping (cone type) worms and gears only. Available in 20-, 30-, 40-, 50-, 60-, 70-, 80-, and 90-inch sizes.
- Gear-cutting machines:
  - Disc type.
  - Single spindle, for spur and worm gears only and spur, bevel, and worm gears. Available in 36- and 60-inch sizes.
  - Multiple spindle, two and three spindles for spur and bevel gears.
  - Special turret type, with four, six, and eight spindles suitable for spur and bevel gears.
- Rack-cutting machines: Available in 36- and 72-inch sizes.
- Bevel-gear roughing shaper, universal, for roughing bevel pinions, rock-drill bits, etc.
- Thread-milling machine for rock-drill tool joints, etc.

The G. A. Gray Co., 3611 Woodburn Avenue, Cincinnati, Ohio.:
- Planers:
  - Double housing.
  - Openside.
  - Switch and frog.
  - Die block.
- Milling planers.
- Milling machines (planer type).
- Horizontal boring machines (floor-type).

Greenlee Bros. & Co., 2100–2400 Twelfth Street, Rockford, Ill.:
- Drilling machines, multiple spindle, way and column type.
- Boring machines, multiple spindle.
- Tapping machines, multiple spindle, individual or master lead screw.
- Automatic screw machines, four and six spindle.
- Snagging and cleaning bench.

The Hall Planetary Co., Fox Street and Abbotsford Avenue, Philadelphia, Pa.:
- Planetary external and internal.
- Threading and form milling machines:
  - Horizontal:
    - Single head (three sizes).
    - Double head (three sizes).
    - Triple head (three sizes).
  - Vertical:
    - Single head (three sizes).
    - Double head (three sizes).
    - Triple head (three sizes).
  - Vertical (continuous milling), multiple heads (three sizes).
- Planetary external and internal threading and form milling.
- Cutterheads: Blade type, tangent and radial blades, button type.
- Tooling up fixtures for above machines.
- Hall standard arbors.

Hammond Machinery Builders, Inc., 1600 Douglas Avenue, Kalamazoo, Mich.:
Grinding and polishing machinery.
Hanchett Manufacturing Co., Big Rapids, Mich.:
Grinders:
Face:
Traveling wheel.
Traveling table.
Surface:
Vertical reciprocating.
Vertical rotary.
Disc:
Single spindle.
Double spindle.
Vertical spindle.
Hannifin Manufacturing Company, 621 South Kolmar Avenue, Chicago, Ill.:
Chucks, air-operated:
Two-jaw.
Three-jaw.
Collet.
Drill press.
Cylinders:
Air rotating.
Air nonrotating.
Hydraulic rotating.
Hydraulic nonrotating.
Grinder: Universal tool grinder.
Mandrels, air-operated, expanding.
Presses:
Air-operated arbor.
Air-operated platen.
Hydraulic.
Plastic mold.
Riveters, portable and stationary:
Hydraulic.
Pneumatic compression.
Special hydraulic production equipment.
Special pneumatic production equipment.
Tool room machine: Combination lathe, drill press, horizontal and vertical mill.
Valves:
Air control:
Hand-operated.
Foot-operated.
Electrically operated.
Spring return.
Three-way.
Four-way.
Blow.
Pressure regulating.
Hydraulic control.
Vises: Air-operated:
Bench.
Drill press.
Milling machine.
The Hanson-Whitney Machine Co., 169 Bartholomew Avenue, Hartford, Conn.:
Universal semiautomatic thread milling machines.
Universal vertical tool and die shaping machines.
Rapid precision centering machines.
Zig-zag oil groove planing attachments.
Taps.
Multiple thread milling cutters.
Thread gages.
Hardinge Bros., Inc., Elmira, N. Y.:
Precision high-speed tool room lathes.
Precision bench lathes.
Precision second operation machines.
Precision bench milling machines.
Precision floor type milling machines.

R. G. Haskins Co., 615 South California Avenue, Chicago, Ill.:
- Tapping machines:
  - Motor drive.
  - Air controlled.
- Grinding machines, portable, flexible shaft.
- Screw driving machines, portable:
  - Flexible shaft.
  - Motor drive.
- Nut setting machines, portable:
  - Flexible shaft.
  - Motor drive.

The Heald Machine Co., 10 New Bond Street, Worcester, Mass.:
- Grinding machines:
  - Internal:
    - Plain.
    - Tool room.
    - Chucking, automatic sizing.
    - Centerless, automatic sizing.
    - Aircraft engine cylinder.
    - Automotive repair.
    - Special purpose.
  - Rotary surface: 8-, 12-, 16-, 24-, and 30-inch magnetic chucks.
  - Bore-Matic precision boring machines:
    - Single end and double end.
    - Single or multiple spindles.
  - Magnetic chucks.

The Hendey Machine Co., Torrington, Conn.:
- Precision tool room lathes.
- Engine lathes.
- Heavy duty manufacturing lathes.
- Crank shapers.
- Centering machines.

The Henry & Wright Mfg. Co., Hartford, Conn.:
- Drilling machines.
- Drilling machine accessories.
- Dieing machines.
- Automatic presses.
- Steel presses.

Hoefer Mfg. Co., Inc., Jackson and Chicago Streets, Freeport, Ill.:
- Multiple spindle heads for drilling and allied operations.
- Self-contained hydraulic feed units.
- Jigs and fixtures for drilling and allied operations.

Hunter Engineering Co., Blaine and Pachappa Streets, Riverside, Calif.:
- Draw cut saws.
- Milling lathes.
- Worm gear hobbing machines.
- Drill press bases.
- Coolant supply systems.

Illinois Tool Works, 2501 North Keeler Avenue, Chicago, Ill.:
- Broaches.
- Carbide tools.
- Cutter sharpening testers.
- Die filing machine.
- Gear charting machine.
- Gear cutters.
- Gear-measuring blocks.
- Gear shaper cutters.
- Ground form tools.
- Helical lead measuring machine.
- Hob lead measuring machine.
- Hob tooth profile measuring machine.
- Hobs.
- Illinite tool bits.
- Involute profile measuring machine.
- Master gears.
- Metal slitting saws.

Illinois Tool Works—Continued.
Milling cutters.
Normal pitch and space measuring machine.
Reamers.
Rotary shears.
Special tools.
Universal hob and worm testing machine.
Shakeproof lock washers.
Shakeproof locking set screws.
Shakeproof locking terminals.
Shakeproof thread-cutting screws.
Special stampings.
Spring washers.
Sems fastener units.

The Ingersoll Milling Machine Co., Douglas and Willoughby Avenues, Rockford, Ill.:
Milling machines:
Adjustable rail; fixed rail.
Openside.
Keyway.
Drum type; rotary; circular.
Special horizontal, vertical, and rotary.
Multiple spindle drilling or tapping machines:
Horizontal, vertical, rotary.
Drum type, way type, special.
Boring machines:
Horizontal, vertical.
Way type, special.
Boring, drilling, and milling machines.
Openside table and floor types.
Special.
Milling cutters, inserted tooth; special.
Boring tools:
Boring heads inserted blades.
Boring bars.
Special boring tools.
Grinders for face milling cutters.
Fixtures; milling; drilling; tapping; boring; special.

International Machine Tool Corporation, Libby Division, 1118–1134 West Twenty-First Street, Indianapolis, Ind.: Turret lathes—heavy duty (Libby heavy duty).

Jones & Lamson Machine Co., Clinton and Whitmore Streets, Springfield, Vt.:
Fay automatic lathes for work between centers and held in chuck or fixture.
Turret lathes—ram type and saddle type for bar work or chucking work.
Comparators—optical projection machines for shop, toolroom, and laboratory inspection:
Bench type for comparing objects with master.
Pedestal type—a comparator and measuring machine for height, depth, and angle; lead or spacing.
Dies, screw thread: Radial and tangent type automatic opening dies, revolving and stationary types.
Automatic double end milling and centering machine for milling to length and centering to depth in one machine cycle, both ends of shafts and similar pieces.
Automatic thread-grinding machines.

Kearney & Trecker Corporation, 6784 West National Avenue, Milwaukee, Wis.:
Milling machines:
Knee type:
Sizes 1 to 5, plain, universal, or vertical.
Manufacturing and automatic.
Bed type: Simplex or duplex from 1½- to 11-foot table feed.
Rail type: With one or more vertical spindle and side heads.
Special single-purpose machines.
Rotary die milling machines.
Milling machine accessories: Attachments, arbors, inserted tooth cutters with high speed steel stellite or TC blades.
Face mill grinder.

Kent-Owens Machine Co., 958 Wall Street, Toledo, Ohio:
Milling machines:
Hand.
Plain.
Power feed.
Hydraulic feed.
Automatic.
The King Machine Tool Co., Winton Place Station, Cincinnati, Ohio:
Vertical boring and turning mills.
Special grinding heads for vertical boring and turning mills:
Sizes 30, 36, 42, 52, 62, 72, 84, 100, and 120 inches.
Sizes 30 and 36 inches—one head on rail with or without side head.
Sizes 42 to 120 inches, inclusive. One or two heads on rail with or without side heads.
Kingsbury Machine Tool Corporation, Keene, N. H.:
Unit type drilling and tapping heads.
Way type machine of 1¼-inch capacity.
Turret type drilling machines.
W. B. Knight Machinery Co., 3920 West Pine Boulevard, St. Louis, Mo.:
Knight vertical milling machines.
Knight jig boring machines.
Dividing heads.
Circular milling tables.
Machine vises.
Landis Machine Co., Church and Fifth Streets, Waynesboro, Pa.:
Landis chasers.
Threading machines:
Landis standard (hand operated).
Landmaco (hand operated).
Landis staybolt.
Landis bolt factory threaders.
Landis four spindle semiautomatic threading machines.
Landis automatic forming and threading machines.
Pipe threading and cutting machines (Landis): 2-inch Little Landis semiportable.
Pipe and nipple threading machines:
Landis standard.
Landmaco.
Roller pipe cutters.
Landis chaser grinders.
Die heads, rotary type:
Landis standard bolt threading.
Landis standard pipe and nipple threading.
Landis reverse taper.
Landis stationary pipe threading die heads.
Landis stationary heads for threading casing, drill pipe, and tubing.
Landmatic heads for turret lathes and screw machines.
Landex heads for automatic screw machines.
Lanco heads for automatic, semiautomatic, and hand operated threading machines.
Lanco pipe and nippel threading die heads.
Landis collapsible taps.
Landis solid adjustable taps.
Lanhydro threading machines: Automatic and semiautomatic machines, hydraulically operated.
Landis Tool Co., Sixth and Ringgold Streets, Waynesboro, Pa.:
Cylindrical grinding machines:
Plain:
4-, 6-, 10-, 14-, 16-, 20-, 24-, and 28-inch swings, in lengths ranging from 12 inches between centers in the smaller sizes to 192 inches between centers in the larger sizes.
Universal: 10 by 24 inches, 12 by 30 inches, 12 by 36 inches, 12 by 40 inches, 12 by 48 inches, 12 by 72 inches, 14 by 36 inches, 14 by 48 inches, 14 by 72 inches, 16 by 36 inches, 16 by 48 inches, 16 by 72 inches, 18 by 36 inches, 18 by 48 inches, 18 by 72 inches.

Landis Tool Co.—Continued.
Cylindrical grinding machines—Continued.
Universal and tool: 12 by 28 inches.
Ball race:
Internal.
External.
Crank pin: 10 by 16 inches, 10 by 34 inches, 14 by 16 inches, 14 by 34 inches, 16 by 32 inches, 16 by 42 inches, 16 by 62 inches, 16 by 72 inches.
Cam: 5-inch swing and in cradle lengths ranging from 26 to 40 inches.
Roll:
16-, 20-, 24-, 28-inch swings in lengths ranging from 96 to 192 inches between centers; 36-, 44-, 50-, and 60-inch swings in lengths ranging from 120 to 288 inches between centers.
Gap: 16 by 96 inches, 16 by 120 inches, 16 by 144 inches, all with 40-inch swing in gap.
Valve.
Chucking.
Piston.
Radial cam.
Automotive reconditioning.
The Lapointe Machine Tool Co., 34 Tower Street, Hudson, Mass.:
Mechanical screw type broaching machines, 7 sizes.
Horizontal hydraulic type broaching machines, 7 sizes.
Hydraulic vertical broaching presses.
Hydraulic surface broaching machines, variable speed.
Broach sharpener, mechanical.
Hydraulic pumps, variable, constant, and reversible delivery.
Broaching tools, for all makes of machines.
The R. K. Le Blond Machine Tool Co., Madison and Edwards Roads, Hyde Park, Cincinnati, Ohio:
Lathes:
Heavy duty engine, 12- to 48-inch swing.
Tool room lathes, 12- to 18-inch swing.
Regal: 10- to 24-inch swing.
Sliding bed gap.
Rapid production.
Multi-cut.
Automatic.
Crankshaft.
Universal turret.
Gun boring, rifling and lapping.
Cutter grinders:
Deep hole borer.
Hollow spindle or oil country.
Lehmann Machine Co., 3560 Chouteau Avenue, St. Louis, Mo.
Engine lathes.
Oil groove milling machines.
Piston ring grinders.
Large hollow spindle lathes.
Leland-Gifford Co., 1025 Southbridge Street, Worcester, Mass.:
Lempco Products Inc., Dunham Road, Bedford, Ohio:
Crankshaft grinders.
Surface grinders.
Brake drum lathes.
Line boring machines.
Bench type drilling machines.
Bench type tapping machines.
Sensitive drilling machines.
Ball bearing.
Motor spindle.
Multiple spindle.
Tapping machines.
Hydraulic feed drilling machines.
Precision boring machines.
Multiple adjusable spindle drilling machine.

W. C. Lipe, Inc., Syracuse, N. Y.:
- Chamfering machines (gear chamfering).
- Burring machines (gear burring).
- Lathes (formerly Porter-Cable):
  - 12 by 18 mechanical carbo.
  - 12 by 18 hydraulic carbo.
  - 9 by 20 production lathe.
  - 16 by 30 carbomatic.
- Special lathes.
- Special machinery.
- Cutters (chamfering).
- Reamers:
  - Pin.
  - Taper, roughing and finishing.
  - Special, taper.

The Lodge & Shipley Machine Tool Co., 3055–3065 Colerain Avenue, Cincinnati, Ohio:
- Lathes:
  - Engine.
  - Toolroom.
  - Manufacturing.
  - Duomatic (automatic).
  - Oil country.
  - Gap.
  - High speed.

Logansport Machine, Inc., Logansport, Ind.:
- Standard air and hydraulic equipment including:
  - Arbor and forcing presses.
  - Chucks, all types.
  - Cylinders, all types.
  - Clamping devices.
  - Expanding mandrels.
  - Work ejectors.
  - Drilling fixtures.
  - Holding devices.
  - Milling fixtures.
  - Valves, all types.
  - Vises, drilling and milling.
  - Electric hydraulic power devices.
- Special air and hydraulic operated equipment including:
  - Presses—Hydraulic.
  - Assembly machines and devices.
- Centrifugal pumps.
- Hydraulic pumps.

The Lucas Machine Tool Co., East Ninety-ninth Street and New York Central Railroad, Cleveland, Ohio: Lucas horizontal boring, drilling, and milling machines, table type, 3-, 4-, and 5-inch spindle sizes.

Mattison Machine Works, Blackhawk Park Avenue, Rockford, Ill.:
- Surface grinders.
- Sheet grinders and polishers.
- Internal tube grinders and polishers.
- Abrasive belt grinders and polishers.
- Strip grinders and polishers.

Michigan Tool Co., 7171 East McNichols Road, Detroit, Mich.:
- Gear finishing machines.
- Gear lapping machines.
- Special machines.
- Gear testing equipment.
- "Cone" worm gears.
- "Cone" speed reducers.
- Hobs (ground and formed).
- Gear cutters.
- Metal cutting tools.

Micromatic Hone Corporation, 1345 East Milwaukee Avenue, Detroit, Mich.:
Honing machine tools.
Cylinder honing tools.
Honing fixtures.
Microfinishing equipment.
Moline Tool Co., 102 Twentieth Street, Moline, Ill.:
Vertical and horizontal or way type, multiple spindle drilling machines:
Heads adjustable in a straight line.
Universal joint type.
Vertical multiple spindle cylinder boring machines:
Fine boring machines.
Single spindle and multiple spindle.
Horizontal or way type boring machines.
Multiple spindle reaming machines.
Multiple spindle tapping machines.
Multiple spindle counterbore machines.
Multiple spindle honing machines.
Single spindle honing machines.
Hones for all diameters of bores.
Also special machines of the above general types covering a wide range of drilling, boring, reaming, milling, and tapping operations, particularly where high production is required.
The Monarch Machine Tool Co., Sidney Ohio:
Engine lathes, sizes 12- to 36-inch rated capacity.
Toolmakers lathes, 10, 12, 14, 16, 18, and 20 inches.
12-inch semiautomatic manufacturing lathe.
Monarch Keller automatic form turning machines.
Monarch Keller Kelley shaping machine.
Monarch Keller Magna-Matic double carriage automatic lathe.
Single purpose specially tooled lathes.
Automatic sizing lathes, 12 to 36 inches, inclusive.
The Morris Machine Tool Co., Court and Harriet Streets, Cincinnati, Ohio:
Radial drills.
Production machinery.
Morton Manufacturing Co., Broadway and Hoyt, Muskegon Heights, Mich.:
Stationary keyway cutter and slotting machines, 18-, 24-, 30-, 48-, 60-, and 72-inch stroke.
Portable keyway cutters, 24-, 36-, 48-, and 72-inch stroke.
High duty draw-cut geared type shapers, 32-, 38-, 48-, and 60-inch stroke.
Special high duty draw-cut railroad shapers, 38-, 48-, and 60-inch stroke.
Heavy duty draw-cut frog and crossing shapers, 48- and 60-inch stroke.
Roll wabble shapers and traveling head roll wabble planers.
Portable planers, 36-, 48-, and 60-inch stroke, any length bed.
Horizontal boring, drilling, milling machines and draw-cut traveling head planers, 36-, 48-, 60-, 72-, 84-, 96-, 108-, and 120-inch stroke.
Horizontal and vertical feeds to suit customer's requirements.
High duty draw-cut flash trimming and rolling machines, 60- to 120-inch stroke.
Car journal bearing finishing miller.
Car journal boring and grinding machines.
Finished machine keys, HI-PRO keys, special shapes.
Murchey Machine & Tool Co., 951 Porter Street, Detroit, Mich.:
Collapsible and solid adjustable taps.
Self-opening dies.
Solid adjustable die heads.
Bolt threading machinery.
Pipe threading machinery.
Pipe cutting machinery.
Double end reaming, chamfering, drilling, and threading machines.
The National Acme Co., 170 East One Hundred and Thirty-first Street, Cleveland, Ohio:
Acme-Gridley automatic bar machines, 4-, 6-, and 8-spindle.
Acme-Gridley single spindle automatics.
Acme-Gridley automatic chucking machines, 4-, 6-, and 8-spindle.
National Acme horizontal coupling boring machine.

The National Acme Co.—Continued.
National Acme vertical coupling tapping machine.
Positive centrifugal clarifying and separating machines.
Namco self-opening threading dies.
Namco collapsing taps.
Radial and circular chasers.
Namco chaser grinding fixtures.
Surface grinder and chaser grinder, hand feed, horizontal spindle.
Aircraft wheels, brakes.
Chronolog for idle time control.
Electric counters.
Contract manufacturing.
Solenoids and limit switches.

The National Automatic Tool Co., South Seventh and N Streets, Richmond, Ind.:
Single and multispindle drilling.
Tapping and boring equipment, vertical and horizontal.

National Broach & Machine Co., 5600 St. Jean Avenue, Detroit, Mich.:
Gear shaving machines.
Gear lapping machines.
Gear measuring machines.
Gear sound testing machines.
Gear burring machines.
Rotomilling machines.
Rotoshaving machines.
Gear grinding machines.
Automatic profiling machines.
Special production machines.
Broaching tools, Naloy.
Broaching fixtures.
Gear finishing cutters.
Shaper cutters.
Laps.
Form tools.
Master gears.
Broaching and lapping compounds.
Trade name, "Red Ring."

The National Machinery Co., Greenfield and Stanton Streets, Tiffin, Ohio:
Forging machines.
Hot headers.
Cold headers.
Progressive headers.
Boltmakers.
Electric headers.
Maxipresses.
Nut making machinery.
Nut tappers.
Bolt cutters.
Roll threaders.
Wire nail machinery.
Washer machines.
Chaser grinders.
Nutting machines.
Spike machines.
Bolt pointers.
Gimlet pointers.
Rod shears.

Newark Gear Cutting Machine Co., 69 Prospect Street, Newark, N. J.:
Gear cutting machines.
Cutter sharpening machines.
Gear testing machines.

New Britain-Gridley Machine Division, The New Britain Machine Co., Chestnut Street, New Britain, Conn.:
Automatic screw machines: 4 and 6 spindle.
Automatic chucking machines:
Work rotating: Single, 4, 6, and 8 spindle.
Tool rotating: 3 and 4 spindle.
Automatic tube machine: Single spindle.

Norton Co., Worcester, Mass.:
- Grinding machines:
  - Plain cylindrical, 6-inch to 36-inch swing, 18-inch to 264-inch length, mechanical, hand, hydraulic, semi and full automatic.
  - Surface.
  - Double head crankpin and crankbearing.
  - Cam, plain and automatic.
  - Universal.
  - Universal tool and cutter.
  - Cutter and tool.
  - Roll, traveling table type.
  - Roll, traveling wheel type.
  - Piston rod.
  - Car wheel.
  - Autopart.
  - Aeroplane crankshaft.
- Running balance indicating machines.
- Lapping machines:
  - Flat.
  - Cylindrical.
  - Crankshaft.
  - Camshaft.
- Superfinishing machines.

The Ohio Machine Tool Co., South Leighton Street, and Erie Railway, Kenton, Ohio:
- Shapers.
- Planers.
- Horizontal, boring, drilling, and milling machines.
- Production milling machines.
- Revolving tables.

The Oilgear Co., 1403 West Bruce Street, Milwaukee, Wis.:
- Broaching machines, hydraulic:
  - Pull type, horizontal:
    - Vertical cyclematic.
    - Vertical single slide surface.
    - Vertical double slide surface.
    - Vertical pull down.
  - Push type, vertical.
- Presses, hydraulic:
  - Vertical and horizontal:
    - Assembling.
    - Straightening.
    - Forming.
    - Broaching.
    - Manufacturing.
- Machine tool feeds, hydraulic.
- Pumps, hydraulic.
- Motors, hydraulic.
- Cylinders, hydraulic.
- Valves, hydraulic.
- Variable speed drives, hydraulic.

Oliver Instrument Co., Adrian, Mich.:
- Die-making machines.
- Filing machines.
- Twist drill grinders.
- Arc face mill grinders: Hand operated and fully automatic.
- Universal tool and cutter grinders.
- Tap grinders.
- Drill point thinners.
- Template tool bit grinders.

The Oster Manufacturing Co. (Oster-Williams Threading Equipment), plant and general office 2057 East Sixty-first Place, Cleveland, Ohio, also plant at Twelfth and Liberty Streets, Erie, Pa.:
- Pipe-threading machinery (portable and stationary).
- Bolt-threading machinery (portable and stationary).
- Pipe-threading tools.

The Oster Manufacturing Co.—Continued.
Nipple-threading machinery.
Pipe-cutting machinery.
Gas-cutting machinery.
Stocks and dies for threading pipe.
Threading oil.
Chaser grinding machines.
Hand screw machines.
Power vise stands.
Electric sewer cleaners.

Peerless Machine Co., Racine, Wis.:
Sawing machines, "Peerless":
Improved universal type, 6 by 6 inch; 10 by 10 inch; 13 by 13 inch capacity.
High duty type, without automatic bar feed, 6½ by 6½ inch, 10 by 10 inch, 14 by 14 inch capacity.
High duty type, with automatic bar feed, 6 by 6 inch, 9 by 9 inch capacity.
Standard type high speed, 6 by 6 inch, 9 by 9 inch, 13 by 16 inch capacity.
Gap saw type; nominal capacity 13 by 16 inches, (capacity with gap open 16 inches wide and 26 inches deep by cutting down 13 inches and turning work over).
Dry cut type; 4½ by 4½ inches.
Heavy duty vertical type; 16 by 16 inches and 24 by 10 inches.
Pipe cutting and threading machines, "Peerless" Universal No. 2.

The Pipe Machinery Co., 930 East Seventieth Street, Cleveland, Ohio:
Pipe threading machines, ⅛ to 4 inches.
Taps, tap chasers.
Threading dies; die chasers.
Boring bars, boring tools.
A. P. I. master pipe gages.

Potter & Johnston Machine Co., 1027 Newport Avenue, Pawtucket, R. I.: Automatic chucking and turning machines.

Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford, Conn.:
Jig borers.
Centering machines.
Die sinkers.
Deep hole drillers.
Multiple spindle drillers.
Surface grinders.
Gear grinders.
Worm grinders.
Cutter grinders.
Toolroom lathes.
Automatic lathes.
Bench lathes.
Bench millers.
Bench machine tool equipment.
Thread millers.
Profilers.
Vertical shapers.
Kellerflex flexible shaft equipment.
Keller automatic die sinking machines.
Keller automatic toolroom machines.
Keller automatic bottle mold cutting machines.
Keller straight line reducing machines.
Keller electric machine tool controls.
Special machine tools.
Taps.
Dies.
Screw plates.
Milling cutters.
Reamers.
Punches.
Drills.
Burs.
Miscellaneous tools.
Hoke precision gage blocks.

Pratt & Whitney—Continued.
Toolmaker's flats.
Standard measuring machines.
Super-micrometers.
Cylindrical gages.
Thread gages.
Trusform snap gages.
Roll thread snap gages.
Railroad gages.
Oil country gages.
Camshaft comparator.
Precision levels.
Taper gages.
End measures.
Spline gages.
Electrolimit gages.
Gages for interchangeable manufacture.
Star gages.
Special gages.
Arsenal equipment.

The Producto Machine Co., 990 Housatonic Avenue, Bridgeport, Conn.:
Producto milling machines (automatic station type millers).
Automatic cam milling machines.
Automatic gear millers.
Automatic riveting machines.
Utility presses.
Die sets for power presses.
Milling machine vises.
Drill press vises.
Cam actuated vises.
Milling cutters.
Set-up tools.

Racine Tool & Machine Co., State and Carlisle Avenues, Racine, Mich.:
Racine utility saws: Hydraulic feed, dry cut and wet cut, 6 by 6 inches.
Racine oil cut machines: Hydraulic feed and pressure, 6 by 6 inches.
Racine shear cut production saws: Positive progressive screw feed 6 by 6 inches and 8 by 9 inches.
Racine hydraulic heavy duty machines: Production types, 10 by 10 inches, 12 by 12 inches, 10 by 16 inches, 13 by 16 inches, 10 by 20 inches, 14 by 20 inches.
Racine automatic stock feed machines: 6 by 6 inches, 10 by 10 inches and larger.
Racine duplex band saw machines for tool room and pattern shop, general cutting in wood, soft metals, steel, composition materials.
Racine portable rail cutting machines for railroads.
Racine hydraulic pumps: Rotary type, high pressure, oil, variable volume.
Racine hydraulic valves and controls, balanced piston type.

Reed-Prentice Corporation, 677 Cambridge Street, Worcester, Mass.:
Engine lathes: Sliding gear head only, sizes 14–20 inches.
Toolroom lathes: Sliding gear head, sizes 14–16 inches.
Production lathes: Sliding gear head, sizes 14–20 inches.
Vertical milling machines.
Die sinking machines.
Jig boring machines.
Die casting machines.
Plastic injection molding machines.
Brake drum turning lathes.
Portable timber sawing machines, electric A. C. and D. C., pneumatic and gasoline engine driven.
Whitcomb portable shapers for forge hammer repair and maintenance.
Engine lathe attachments.
Production lathe attachments.
Toolroom lathe attachments.
Milling cutters for vertical millers.
Vertical miller attachments.
Die sinking machine attachments.
Cherrying and profiling attachments for vertical millers and die sinking machines.

Reid Bros. Co., Inc., 138–140 Elliott Street, Beverly, Mass.:
No. 2–1 automatic feed surface grinder.
No. 2–2 automatic feed surface grinding machine with hydraulic reverse.
No. 2–3 hand feed surface grinding machine.
Rickert-Shafer Co., Erie, Pa.:
Automatic threading and second operation machines.
Hand threading machines.
Tapping machines.
Chaser grinders.
Self-opening die heads.
Collapsible taps.
Chasers for die heads and collapsible taps.
Offset boring heads.
Rivett Lathe & Grinder, Inc., 18 Riverview Road, Brighton, Boston, Mass.
1020 precision back geared screw cutting cabinet lathe, 10-inch swing, 20-inch center distance, 1-inch collet capacity, ball-bearing sprindle.
608 precision back geared screw cutting bench lathe, 8½-inch swing, 18-inch-center distance, ⅝- or 1- inch collet capacity, bronze bearing spindle.
918 enclosed head precision ball bearing bench lathe and hand screw machine, 9-inch swing, 18-inch center distance, 1-inch collet capacity, ball bearing spindle.
715 enclosed head precision ball bearing bench lathe, 7-inch swing, 15-inch center distance, ⅝-inch collet capacity, ball bearing spindle.
505 open head precision bench lathe and hand screw machine, 8-inch swing, 18-inch center distance, ⅝- or 1-inch collet capacity, bronze bearing spindle.
Draw-in collets for standard bench and toolroom lathes, milling machines, and grinders.
104 internal-external precision grinder, 8-inch swing, ⅞-inch collet capacity.
112 universal precision grinder, 14-inch swing, 1-inch collet capacity, power feed.
Rivett improved thread tool and cutters.
Blanchard Pulsolator automatic lubrication systems.
Forkup controlled feed oilers.
Rockford Machine Tool Co., 2400 Kishwaukee Street, Rockford, Ill.:
Hy-Draulic planers.
Hy-Draulic shaper-planer.
Hy-Draulic shaper.
Hy-Draulic slotters.
W. J. Savage Co., Knoxville, Tenn.:
Nibbling machines:
Nibbler type for line and template cutting in capacities to ½ inch thick-thickness in mild steel and ½ inch in stainless and other hard alloys.
Roller die mechanical feed type for line cutting in capacities to ⅞ inch thickness in mild steel and ½ inch in stainless and other hard alloys.
Throat depths 8 to 36 inches.
Circle cutting attachments.
Tripod cutting tables.
Tools and dies.
Material support plate.
Tube cutting attachments.
William Sellers & Co., Inc., 1600 Hamilton Street, Philadelphia, Pa.:
Grinders:
Drill grinding machines (four sizes).
Tool grinding machines (two sizes).
Horizontal boring, drilling, and milling machines.
Vertical boring and turning mills.
Planers, double housing, openside, and plate.
Car wheel lathes.
Driving wheel lathes.
Car wheel borers.
Driving box boring and facing machine.
Locomotive frame slotters.
Locomotive cylinder boring and facing machine.
Seneca Falls Machine Co., Seneca Falls, N. Y.;
Lo-swing lathes:
With tailstock and hand return 4- and 8-inch swing. Bed lengths to take up to 132 inches between centers.

Seneca Falls Machine Co.—Continued.
Lo-swing lathes—Continued.
With tailstock, full automatic:
Model R, 6⅝-inch swing. Bed lengths to take 15, 36, and 60 inches between centers.
Model U, 6-inch swing. Bed lengths to take 15, 36, 45, and 60 inches between centers.
Model LR, 5-inch swing. Bed lengths 10, 16, 22, 34, and 46 inches between centers.
Lo-swing imp., small, high speed turning lathe.
Short-cut production lathe.
Engine lathes:
Seneca Falls speedcut lathe for high-speed turning with carbide tools.
Star screw-cutting engine lathes; 10-, 12-, and 14-inch swing.
Centering machines, automatic. Single or double end.
Seneca Falls automatic drivers.
Automatic work-handling devices.
Special production machinery.
Shell-turning equipment.
Sheldon Machine Co., Inc., 4240–4258 North Knox Avenue, Chicago, Ill.: Engine Lathes.
Sibley Machine & Foundry Corporation, 206 East Tutt Street, South Bend, Ind.:
Upright drilling machines.
Special machinery.
Castings.
The Sidney Machine Tool Co., Sidney, Ohio:
Engine lathes, sizes 14- to 36-inch, inclusive, having either 8-, 12-, or 16-speed headstock.
Toolroom lathes, sizes 14- to 20-inch, inclusive.
Milling machines, knee type, plain universal and vertical sizes No. 2 to No. 5, inclusive.
South Bend Lathe Works, 425 East Madison Avenue, South Bend, Ind.:
Lathes: Metal working, 9- to 16-inch swing sizes:
Screw cutting precision.
Back geared.
Cone head, belted drive.
Tool room.
Quick-change gear.
Standard change gear
Production.
Precision bench.
Countershaft driven.
Underneath belt motor driven.
Brake drum.
V-belt driven.
Lathe attachments.
The Springfield Machine Tool Co., Southern Avenue and P. C. C. & St. L. Ry., Springfield, Ohio:
Engine lathes, 14- to 42-inch swing.
Spindle and axle boring machines, 7, 11, and 15 holes in spindles.
Bench straightening presses, three sizes.
Special machinery.
Gray iron castings.
Sunderstrand Machine Tool Co., 2531 Eleventh Street, Rockford, Ill.:
Rigidmils in the following sizes: No. 00, No. 0, No. 1.
Hydro-screw Rigidmils.
No. 2 Electromil.
Special milling machines.
Lathes: Stub, automatic, models 8, 10, and 12; brake drum boring.
Centering and drilling machines, single and double head.
Bench centers.
Index bases.
Tool grinders, two wheel and three wheel.
Link grinder.
Balancing tools.
Pneumatic rubbing machines for flat furniture tops, pianos, automobile bodies, etc.
Hydraulic pumps, valves, and controls.
Hydraulic transmissions.
Fluid motors.

The Taft-Peirce Mfg. Co., Woonsocket, R. I.:
- Surface grinders.
- Gages.
- Magnetic chucks.
- Reamers.
- Production and inspection tools.
- Miscellaneous small tool items.
- Special machinery and tools.
- Engineering design.

The Taylor & Fenn Co., 54 Arch Street, Hartford, Conn.:
- Milling machines:
  - Spline, duplex.
  - Vertical.
- Ball-bearing and plain-bearing sensitive drilling machines.
- Spring-actuated foot- and power-operated presses.
- Wet tool grinders.

The Thompson Grinder Co., Springfield, Ohio:
- Thompson 12- by 36-inch universal grinding machines.
- Thompson hydraulic surface grinding machines (all sizes).
- Thompson broach grinding machines.

The United States Electrical Tool Co., Sixth Street and Mount Hope Road, Cincinnati, Ohio:
- Portable electric drills and attachments.
- Portable electric sanders.
- Portable electric surfacers.
- Portable electric polishers.
- Portable electric grinders.
- Bench and floor type grinders to accommodate wheels 6 to 30 inches in diameter:
  - Single speed.
  - Adjustable speed.
- Bench and floor type polishers, from ¼ horsepower up to and including 20 horsepower:
  - Single speed.
  - Multispeed gear driven.
  - Belt-driven machines.
  - Motor in base.
- High-speed swing-frame grinders.
- Electric valve refinishing machines.
- Flexible shaft machines and attachments, ⅛ horsepower to and including 2 horsepower.
- Portable electric saws.
- Electric screwdrivers and nut runners.
- Portable electric tappers.
- Rotary hacksaws for use with electric drills.
- Valve seat grinder sets.
- Tool post grinders, angle plate grinders, ¼ to 7½ horsepower, inclusive.
- Reamer drives.
- High-speed tool-bit grinders.
- High-frequency electric sanders.
- High-frequency electric portable grinders.

U. S. Tool Co., Inc., Ampere (East Orange), N. J.:
- U. S. multimillers.
- U. S. multislide machines.
- U. S. compound wheel-truing attachment.
- U. S. slide feeds.
- U. S. roll feeds.
- U. S. stock oilers.
- U. S. stock straighteners, plain and power driven.
- U. S. wire straighteners.
- U. S. stock reels, plain and automatic.
- U. S. coil cradles.
- Die sets and accessories.

Universal Boring Machine Co., 312 Main Street, Hudson, Mass.:
- Table-type horizontal boring, drilling, and milling machines with 3-, 4-, and 5-inch diameter spindles.
- Horizontal boring-machine accessories.
- Precision machine aligning levels.

Van Norman Machine Tool Co.: 160 Wilbraham Avenue, Springfield, Mass.:
Horizontal knee-type plain milling machines.
Horizontal knee-type universal milling machines.
Ram-type universal milling machines.
Hand milling machines.
Contour milling machines.
Oscillating radius grinders.
Reaming machines.
Special boring machines.
O. S. Walker Co., Inc., Worcester, Mass.:
Magnetic chucks:
Rectangular.
Swiveling.
Rotary.
Special types.
Demagnetizers, A. C. and D. C.
Planer parallels.
Grinding machines, surface, vertical spindle type, 8-inch wheel, 12-inch rotary chuck, two styles, model DA and DB.
Grinding machines, tool.
The Warner & Swasey Co., 5701 Carnegie Avenue, Cleveland, Ohio:
Turret lathes.
Turret-lathe tools.
Astronomical instruments.
Wesson Co., 1220 Woodward Heights Boulevard, Ferndale, Mich.:
Diamond wheel grinders.
High speed steel and cemented carbide tools.
Vises.
Special equipment.
Whitney Metal Tool Co., 110 Forbes Street, Rockford, Ill.:
Angle iron notcher and bending brakes.
Foot press punches.
Punches and shears.
Special power punches.
Cornice and box brakes.
Power punch presses.
Roll. for Pittsburgh locks and drive cleats.
Wickes Bros., Saginaw, Mich.:
Crankshaft turning lathes.
Engine lathes, 26 to 60 inches, inclusive.
Manufacturing lathes.
Shell turning lathes.
Blueprinting machines.
Sheet reclaiming rolls.

EXHIBIT C. OTHER BUILDERS OF MACHINE TOOLS AS FAR AS THE ASSOCIATION HAS RECORD OF THEM

1. Albany Hardware Specialty Mfg. Co., Albany, Wis.: Sensitive drilling machines.
2. American Machine & Tool Co., Inc., of Pennsylvania, Royersford, Pa.: Bench Lathes, 12-inch swing.
3. B. C. Ames Co., Waltham, Mass.:
   Bench lathes.
   Lathe attachments.
   Bench milling machines.
   Die filing machines.
4. Atlas Press Co., 153 North Pitcher Street, Kalamazoo, Mich.:
   Lathes.
   Drilling machines.
   Arbor presses.
   Shapers.
   Tools and attachments.
   Bench drilling machines.
   Horizontal milling machines.

5. Automatic Machinery Manufacturing Corporation, 113 East Washington Avenue, Bridgeport, Conn.:
   - Boring machines, diamond tool.
   - Wire-crimping machines.
   - Cutting-off machines.
   - Frog and switch grinders.
   - Hob milling machines.
   - Profile milling machines.
   - Shaper planers.
   - Presses.
   - Shell-trimming machines.
6. Autometric Machine Tool Co., Ninth and Dwightway Avenue, Berkeley, Calif.:
   - Jig borers.
   - Vertical milling machines (bench).
7. Automotive Maintenance Machinery Co., 2100 Commonwealth Avenue, North Chicago, Ill.:
   - Honing machines:
     - 20- to 72-inch stroke.
     - 10- to 24-inch bore cylinder.
   - Shaper, 6 inches.
8. The Baird Machine Co., Stratford Avenue, Bridgeport, Conn.:
   - Chucking machines.
   - Internal grinders.
   - Automatic and semiautomatic lathes.
   - Multiple spindle or gang drills.
9. Baker Perkins, Inc., Fraser & Young Streets, Saginaw, Mich.: Horizontal boring machines.
10. Bakewell Manufacturing Co., 2427 East Fourteenth Street, Los Angeles, Calif.: Precision tapping and threading.
11. Barney Machinery Co., Inc., Union Trust Building, Pittsburgh, Pa.:
    - Shell lathes.
    - Special-purpose lathes.
    - Roughing lathes.
    - Thread milling lathes.
12. Barrett Machine Tool Co., Pine Street, Meadville, Pa.:
    - Facing machine.
    - Metal boring machines.
    - Cylinder boring machines.
    - Pipe-flanging machines.
    - Pipe-facing machines.
13. Bicknell & Thomas, Greenfield, Mass.: Turret lathes.
14. Bignall & Keeler Machine Works, Edwardsville, Ill.:
    - Pipe-threading machines.
    - Pipe-cutting machines.
15. Bilgram Gear & Machine Works, 1217–35 Spring Garden Street, Philadelphia, Pa.:
    - Chamfering machines.
    - Bevel gear generators.
16. The Billing & Spencer Co., Hartford, Conn.:
    - Presses.
    - Multispindle bar machines.
    - Die sinking machines.
17. The Edward Blake Co., Newton Center, Mass.:
    - Tap grinders.
18. J. G. Blount Co., Woodland Street, Everett, Mass.:
    - Speed lathes.
    - Grinding and polishing machinery.
    - Lathes.
    - Motor headstock lathes.
19. Henry P. Boggis & Co., 210 West Saint Clair Avenue, Cleveland, Ohio: Tap grinding machinery.
20. Boice Crane Co., Toledo, Ohio: Bench drills.
21. Boyar-Schultz Corporation, 2124 Walnut Street, Chicago, Ill.: Profile grinding machines.
22. Boye & Emmes Machine Tool Co., Caldwell Drive, Hartwell, Cincinnati, Ohio: Engine and toolroom lathes.

23. The Bradford Machine Tool Co., 8th and Evans Streets, Cincinnati, Ohio:
    Automatic and semiautomatic drills.
    Horizontal drills.
    Multiple spindle or gang drills.
    Bench lathes.
    Engine and toolroom lathes.
    Lathe attachments.
24. C. C. Bradley & Sons, 432 Franklin Street, Syracuse, N. Y.: Power hammers.
25. Bridgeport Machines, Inc., 52 Remer Street, Bridgeport, Conn.: Milling machines (with turret attachment).
26. The Bridgeport Safety Emery Wheel Co., P. O. Box E, Stratford Station, Bridgeport, Conn.:
    Face grinding machines.
    Knife grinding machines.
    Shear blade grinding machines.
    Swing frame grinding machines.
    Slotter and disc grinding machines.
    Grinding wheels.
    Buffing lathes.
    Abrasive cut-off machines.
27. The Brown-Brockmeyer Co., Inc., Dayton, Ohio:
    Pedestal type double end grinder.
    Heavy duty bench grinder.
    Electric motors.
    Buffing machines.
28. Brown Machinery Co., 1416 North May Street, Chicago, Ill.: Turret lathes.
29. Builders' Iron Foundry, Providence, R. I.: Rifling machines, deep-hole drills.
30. Burke Machine Tool Co., Conneaut, Ohio:
    Milling machines.
    Precision bench tools.
31. John T. Burr & Sons, 429–431 Kent Avenue, Brooklyn, N. Y.:
    Keyseaters.
    Cold sawing machines.
32. Canedy-Otto Manufacturing Co., Chicago Height, Ill.:
    Automatic and semiautomatic drills.
    Multiple spindle or gang drills.
    Sensitive drills.
    Presses.
33. The Carroll & Jamieson Machine Tool Co., Batavia, Ohio: Engine lathes.
34. Catskill Metal Works, Inc., Catskill, N. Y.:
    Abrasive cut-off machines.
    Bench reaming machines.
    Abrasive bench cut-off.
35. Champion Blower & Forge Co., Lancaster, Pa.:
    Drills—upright, post, sensitive, high speed, production, floor, bench.
    Lathes—13- to 16-inch engine, bench.
    Grinders.
    Saw machines.
    Power hammers. Arbor presses.
36. Chattanooga Machinery Co., 1000–1016 Watkins Street, Chattanooga, Tenn.: Keyseaters.
37. Chisholm-Ryder Co., Niagara Falls, N. Y.: Horizontal boring mills (Lambert).
38. City Engineering Co., Dayton, Ohio: Automatic screw machines.
39. James Clark, Jr., Electric Co., 600 East Bergman Street, Louisville, Ky.: Pedestal grinders.
40. Clausing Manufacturing Co., Lillian and Keota Streets, Ottumwa, Iowa: Bench lathes.
41. Cleveland Tapping Machine Co., 1725 Superior Avenue, Cleveland, Ohio: Vertical tapping machines.
42. The Cleveland Tool Engineering Co., 9205 Detroit Avenue, Cleveland, Ohio: Tool and cutter grinders.
43. Frederick Colman & Sons, Inc., 7250 Central Avenue, Detroit, Mich.: Shell machines.

44. Continental Machines, Inc., 1301 Washington Avenue, South, Minneapolis, Minn.:
    Sawing machines (contour).
    Band filing.
    Precision grinders—surface.
45. Asa S. Cook Co., Chestnut Street, New Haven, Conn.:
    Sawdust shaking machines.
    Slotting machines.
    Pointing machines (cap screw).
    Shaving machines (cap screw).
    Bolt and nut assembling machines.
    Wood screw machinery.
    Heading machine (open die).
    Threading machine.
46. C. B. Cottrell & Sons Co., Westerly, R. I.:
    Horizontal boring machines.
    Chambering and profiling machines.
47. James Coulter Machine Co., 386–404 Mountain Grove Street, Bridgeport, Conn.: Special automatic machinery.
48. The Cox & Sons Co., Bridgeton, N. J.:
    Pipe threading machines.
    Tube threading machines.
    Cutting-off machines.
49. Crystal Lake Grinders, Crystal Lake, Ill.: Internal grinders.
50. The Curtis & Curtis Co., 188 Garden Street, Bridgeport, Conn.:
    Pipe cutting machinery.
    Pipe threading machinery.
51. D & M Machine Works, Torrance, Calif.: Engine lathes, 12, 14, and 16 inches.
52. Dalzen Tool & Manufacturing Co., 12255 East Eight Mile Road, Detroit, Mich.:
    Thread grinders.
53. The Dauber Co., Oshkosh, Wis.:
    Sensitive drills—up to ¾ inch.
    Upright drills, swinging type, up to 1½-inch drill.
    Toolroom grinders.
54. Davis Keyseater Co., 399–407 Exchange Street, Rochester, N. Y.: Keyseaters.
55. Delta Manufacturing Co., 635 East Vienna Avenue, Milwaukee, Wis.: Bench drills.
56. Denison Engineering Co., Columbus, Ohio:
    Hydraulic presses.
    Automatic screw machines.
57. F. W. Derbyshire, Inc., 157 High Street., Waltham, Mass.:
    Bench lathes.
    Bench milling machines.
58. A. P. DeSanno & Son, Phoenixville, Pa.: Cut-off machines.
59. Detroit Universal Duplicator Co., 253 St. Aubin Street, Detroit, Mich.: Duplicating machinery.
60. DeVlieg Milling Machine Co., 450 Fair Avenue, Ferndale, Mich.:
    Milling Machines.
    Horizontal boring mills.
61. Diamond Machine Co., 2447 Aramingo, Philadelphia, Pa.:
    Face grinding machines.
    "40" hydraulic presses.
62. Divine Bros. Co., Utica, N. Y.:
    Polishing machines.
    Wheel dressing machines.
    Buffing machines.
63. The Economy Engineering Co., 108 Vine Street, Willoughby, Ohio:
    Bolt and cap screw finishing machinery.
    Special drilling machines.
64. Economy Pumps, Inc., Hamilton, Ohio: "Liberty" planers.
65. Ekstrom, Carlson & Co., Rockford, Ill.:
    Die sinking, drilling, and tapping machinery.
    Milling machines.

66. The Elgin Tool Works, Inc., 1770 West Berteau Street, Chicago, Ill.:
Bench lathes.
Screw machines (hand).
Bench milling machines.
Sensitive drilling machines.
Turret lathes—optical.
Lens grinding and polishing machines.
67. Engineering & Research Corporation, Riverdale, Md.:
Milling machines for airplane propeller.
Machines for bending and stretching.
68. Enterprise Machine Parts Corporation, 2731 Jerome Avenue, Detroit, Mich.:
Honing machines.
Automatic drill units.
Special machines.
69. The Espen-Lucas Machine Works, Front and Girard Avenue, Philadelphia, Pa.:
Metal sawing machines.
Horizontal boring machines.
Milling machines—planer and horizontal type.
Rotary planers.
Centering machines.
70. Farnham Manufacturing Co., 1646–54 Seneca Street, Buffalo, N. Y.:
Milling machines—duplicating type for aluminum alloy wing spars.
Fitting mills.
Countersinking machines.
Drilling machines (stack drills).
Forming rolls.
Draw benches.
Routers.
71. Federal Machine & Welder Co., Warren, Ohio:
Shell turning lathe.
Band grooving lathes (knurl and shell).
Copper band turning lathes.
Shell boring lathes—for shell 3½ by 6¼-inch diameter.
72. Fitchburg Grinding Machine Corporation, Fitchburg, Mass.:
Spline shaft and gear grinders.
Plain cylindrical grinders.
Universal grinders.
Chucking grinders.
Special purpose brinders.
73. Foley Manufacturing Co., Inc., 11 NE. Main Street, Minneapolis, Minn.:
Sawing machines.
74. The Foote-Burt Machine Co., 3089 East 80th Street, Cleveland, Ohio:
Drilling machines—radial.
Tapping machines.
75. Fox Grinders, Inc., 1710 Oliver Building, Pittsburgh, Pa.:
Heavy duty grinding machines.
Swing frame grinding machines.
76. Fray Machine Tool Co., Glendale, Calif.: All angle milling machines.
77. General Engineering & Manufacturing Co., 1519–1529 South Tenth Street, St. Louis, Mo.: Shapers.
78. General Machine Tool Co., Maynard Street at Seneca, Seneca Falls, N. Y.:
Thread grinders.
Grinding machines.
Special machinery.
79. Thomas B. Gibbs & Co., Delavan, Wis.: Automatic screw machines.
80. Giern & Anholtt, 1312 Mt. Elliott, Detroit, Mich.: Horizontal boring machines.
81. The Gordon R. Co., Detroit, Mich.: Plan-O-Mill precision thread miller.
82. Grand Rapids Stamping Division, General Motors Corporation, Grand Rapids, Mich.: Planers.
83. Granite State Machine Co., Inc., 448 Silver Street, Manchester, N. H.:
Vertical milling machines.
Jig borers.
84. Grant Manufacturing & Machine Co., 85 Silliman Avenue, Bridgeport, Conn.:
Rivet spacing and hammer type rivet machinery.

85. Grenby Manufacturing Co., Whiting Street, Plainfield, Conn.:
    Internal grinders.
    Vertical bench millers.
86. Grob Bros., Grafton, Wis.: Die filing machines.
87. Hack Machine Co., Des Plaines, Ill.:
    Multiversal machines.
    Horizontal boring machines.
88. Hamilton Tool Co., Hamilton, Ohio:
    "Varimatic" drilling machines.
    Bench drilling machines.
    Supersensitive drills.
89. Harris-Seybold-Potter, 4510 East Seventy-first Street, Cleveland, Ohio: Vertical boring machines.
90. Harvey Manufacturing Corporation, 210 Center Street, New York, N. Y.: Die filing machines.
91. High Speed Hammer Co., Rochester, N. Y.:
    Multiple spindle or gang drills.
    Sensitive drills.
    Electric riveter.
92. The Hill-Acme Co., 6400 Breakwater, Cleveland, Ohio: Surface grinding machines.
93. The Hisey-Wolf Machine Co., Colerain and Marshall Avenues, Cincinnati, Ohio:
    Buffing and polishing machines.
    Hand and breast drills.
    Tool post grinders.
    Angle plate grinders.
    Pedestal grinders.
    Internal and external grinding heads.
94. Hjorth Lathe & Tool Co., 12 Beacon Street, Woburn, Mass.:
    Lathes.
    Lathe attachments.
    Bench lathes.
95. Honing Equipment Corporation, 7207 McNichols Road, Detroit, Mich.:
    Honing machines.
    Honing tools.
    Work holding fixtures.
    Honing abrasives.
96. Illinois Machine & Manufacturing Co., LaSalle, Ill.:
    Surface grinding machines.
    Disc grinders.
    Slitting machines.
    Dies, jogs, tools.
97. The Index Machine & Tool Co., 543 North Mechanic Street, Jackson, Mich.: Vertical milling machines.
98. Jackson Machine & Tool Co., Jackson, Mich.: Vertical millers—bench.
99. Jarecki Manufacturing Co., Twelfth and Weschler Avenue, Erie, Pa.:
    Threading machines.
    Pipe threading machines.
100. Jones Machine Tool Works, Inc., 300 Lansdowne Avenue, Philadelphia, Pa.:
    Vertical shapers.
    Slotters.
    Boring Mills—vertical, horizontal.
    Special machinery.
101. Jones Superior Machine Co., 1258–1270 West North Avenue, Chicago, Ill.: Metal cutting band sawing machines.
102. Kalamazoo Tank & Silo Co., Machine Tool Division, 500–508 Harrison Street, Kalamazoo, Mich.: Metal cutting band saws.
103. L. J. Kaufman Manufacturing Co., Twenty-ninth and Meadow Lane, Manitowoc, Wis.: Tapping machines.
104. Kempsmith Manufacturing Co., Milwaukee, Wis.: Milling machines, bench and horizontal.
105. Kennedy Van Saun Manufacturing and Engineering Corporation, Danville, Pa.: Curtis shell lathe.
106. Kent Machine Co., Cuyahoga Falls, Ohio: Duplex milling machine.

107. H. S. Krueger & Co., 1469 East Grand Boulevard, Detroit, Mich.:
Special machinery.
Multiple heads and fixtures.
Chamfering machines.
Reaming machines.
Broaching machines.
108. William Laidlaw, Inc., Belmont, N. Y.: Metal cutting band saws.
109. Langelier Manufacturing Co., 51 Washington Avenue, Providence, R. I.:
Swaging machines.
Sensitive drills.
Hammering machines.
Automatic cam feed units.
Drilling and tapping machines.
Bench drilling machines.
110. Laporte Machine & Tool Co., Inc., Laporte, Ind.: J. & B. filing and saw machines.
111. K. O. Lee Co., Aberdeen, S. Dak.:
Utility hand grinder.
Reamer drives.
Expanding mandrels.
Drill chucks.
Carbide tool grinder.
Chip breaker grinder.
112. Lees Bradner Co., 12120 Elmwood Avenue, Cleveland, Ohio.:
Thread milling machines.
Gear grinding machines.
Hobbing machines.
Gear testers.
113. LeMaire Tool & Mfg. Co., 2657 South Telegraph Road, Dearborn, Mich.:
Hydraulic units.
Precision dies.
Jigs and fixtures.
Special machinery.
Gear chucks.
Gear checking instruments.
Shapers.
114. Lewis Foundry & Machine Division of Blaw-Knox Co., Pittsburgh, Pa.:
Heavy duty roughing lathe.
115. Liberty Planers, Inc., Hamilton, Ohio; Planers.
116. Linley Brothers Co., Bridgeport, Conn.: vertical millers, bench.
117. Lippman Engineering Works, 4603 West Mitchell Street, Milwaukee, Wis.:
Grinding machines.
118. Lobdell Car Wheel Co., Wilmington, Del.:
Slotting machines (Pill).
Hammers (Naxel).
119. Locomotive Finished Material Co., Atchison, Kans.: Horizontal boring machines.
120. Logan Engineering Co., Lawrence and Lamon Avenues, Chicago, Ill.:
Engine lathes.
Small tools and accessories.
121. Long Reach Machine Co., Houston, Tex.: Curtis shell lathe.
122. J. L. Lucas & Son, Inc., Bridgeport, Conn.: Milling machines.
123. Machinery Manufacturing Co., 3636 Irving Street, Vernon, Los Angeles, Calif.:
Vernon Number 0 horizontal milling machine.
Vernon 11-inch stroke shaper.
Vernon combination vertical milling machine and jig borer.
Profilers.
124. MacIntosh-Hemphill Co., 901 Bingham Street, Pittsburgh, Pa.: Heavy duty engine lathes.
125. Majestic Tool & Manufacturing Co., 2950 East Woodbridge Avenue, Detroit, Mich.:
Parker grinding spindles.
Ball bearing grinding spindles.
Special machines.
Tools, dies, fixtures.
126. McDonough Manufacturing Co., Eau Claire, Wis.: Tool and cutter grinders.

127. The Medart Co., Potomac and DeKalb Streets, St. Louis, Mo.:
Roll grinding machines.
Bar pointing machines.
Bar facing machines.
Special cutter tool grinders.
Bar turning machines.
Bar straightening machines.
128. Merritt Engineering & Sales Co., Inc., Lockport, N. Y.:
Turret lathes.
Hydraulic presses.
129. Mesta Machine Co., P. O. Box 1466, Pittsburgh, Pa.:
Heavy-duty machine tools.
Table-type planers.
Pit-type planers.
Post-type planers.
Roll grinders.
Turning lathes.
Boring lathes.
Combination boring and turning lathes.
Trepanning lathes.
Roll lathes.
Boring mills.
Draw-cut shapers.
Saws.
Gear planers.
Gear-hobbing machines.
Combination shaping, boring, and milling machines.
Gun tubes.
130. Micro Westco, Inc., Bettendorf, Iowa: internal grinders.
131. Midway Machine Co., 2324 University Avenue, St. Paul, Minn.:
Horizontal milling machines.
Vertical bench milling machines.
132. Miller & Crowningshield, Greenfield, Mass.:
Hand- and power-feed milling machines.
Horizontal milling machines.
133. Mitts & Merrill, 1009 South Water Street, Saginaw, Mich.: Key seaters.
134. Modern Machine Tool Co., 601 Water Street, Jackson, Mich.:
Cutting-off machines.
Combination drill tables.
135. Moore Special Tool Co., Inc., 358 John Street, Bridgeport, Conn.:
Jig-boring machines.
Jig-grinding machines.
Special machinery.
136. Morey Machinery Co., 410 Broome Street, New York, N. Y.:
Thread millers.
Turret lathes.
Vertical profilers.
Vertical shapers.
Manufacturing lathes.
Shell lathes.
Slotting machines.
137. Motch & Merryweather Machinery Co., 715 Penton Building, Cleveland, Ohio:
Hydraulic cold sawing machines.
Automatic saw-grinding machines.
138. Mummert-Dixon Co., Hanover, Pa.:
Swing frame grinders.
Tool grinders.
Radial grinders.
Facing heads, boring heads.
139. Murray Co., Atlanta, Ga.: Curtis shell lathe.
140. Musgrave Manufacturing Co., Shuey Building, Springfield, Ohio: Brake-shoe grinders.
141. National Machine Tool Co., 2270–2272 Spring Grove Avenue, Cincinnati, Ohio:
Key seaters.
Milling machines.

142. The Nebel Machine Tool Co., 3401 Central Parkway, Cincinnati, Ohio:
Engine lathes.
Extension bed cap lathes.
143. New York Tool Co., New York, N. Y.: Profilers.
144. W. H. Nichols & Sons, 48 Woerd Avenue, Waltham, Mass.: Hand millers.
145. Ohio Units, 515 Hunter Avenue, Dayton, Ohio:
General purpose superfinisher.
Cam-grinding machines.
146. Onsrud Machine Works, Inc., Chicago, Ill.:
Grinding machines.
Drilling machines.
Woodworking lathes.
147. Pedrick Machine Co., 3641 North Lawrence, Philadelphia, Pa.: Horizontal boring machines.
148. Pfiffer Machine Co., 7515 Tennessee Avenue, St. Louis, Mo.: Drillmaster.
149. Pope Machinery Corporation, 261 River Street, Haverhill, Mass.: Vertical milling machines, high-speed universal.
150. The Portage Machine Co., Miami and Cross Streets, Akron, Ohio:
Horizontal boring, drilling, and milling machines.
Table-type 3- and 4-inch bar.
Special machinery and tools.
Rotary tables—36 by 36 inches and 48 by 48 inches.
151. Pottstown Machine Co., Rowland Street, Pottstown, Pa.:
Centering lathe.
Tapping machines.
Pipe-threading machines.
Bushing machines.
6-inch shell lathe.
Drilling and reaming machine.
6-spindle reaming and threading machine.
3-inch shell lathe.
152. Poulsen & Narden, 1251 East Olympic Boulevard, Los Angeles, Calif.:
Turret lathes.
153. Prescott Co., Menominee, Mich.: Yeoman's shell lathe.
154. Procunier Safety Chuck Co., 18 South Clinton Street, Chicago, Ill.:
Tapping machines.
Tapping heads and attachments.
155. Production Machine Co., Greenfield, Mass.:
Sensitive drills (bench).
Abrasive belt surface and polishing machine.
Disc grinders (15-inch disc).
Set-up wheel polishing machines.
Polishing machines.
Turret lathes (W. & S. old-style No. 1).
156. Production Machinery Development Co., 4845 St. Aubin Avenue, Detroit, Mich.: Single spindle automatic chucking machine.
157. Providence Engineering Works, Inc., 521 South Main Street, Providence, R. I.: Sensitive drilling machines.
158. Rane Tool Co., Inc., 17 Ross Street, Jamestown, N. Y.: Slotter and shapers.
159. Rasmussen Machine Co., Inc., Racine, Wis.: Metal sawing machines.
160. Rehnberg-Jacobson Manufacturing Co., 2135 Kishwaukee Street, Rockford, Ill.: Drilling machines, way-type.
161. Reliance Machine & Tool Co., 21–17 Forty-fourth Road, Long Island City, N. Y.:
Special hydraulic lathes.
Profiling machines.
162. Rhodes Machine Co., 316 Union Street, Lynn, Mass.: Profiling machines.
163. Rice Barton Corporation, Worcester, Mass.: Spline milling machines.
164. Roan Manufacturing Co., Racine, Wis.: Tool and cutter grinders.
165. Robaczynski Machine Corporation, 326–349 Ten Eyck Street, Brooklyn, N. Y.: Horizontal spindle surface grinders.
166. W. Robertson Machine & Foundry Co., 56–58 Rano Street, Buffalo, N. Y.:
Sawing machines.
Hydraulic presses and pumps.
167. Rogers Machine Works, Alfred, N. Y.: Vertical boring mill, 36 inches.

168. Samuel C. Rogers & Co., 191–205 Dutton Avenue, Buffalo, N. Y.:
Knife grinding machines.
Saw grinding machines.
Armor plate grinders.
169. E. J. Rooksby Co., 1070 Hamilton Avenue, Philadelphia, Pa.:
Crank pin turning machines.
Boring bars (for reboring gas and steam engine cylinders).
Portable tools (locomotive repair).
170. B. M. Root Co., York, Pa.:
Multiple drilling machines.
Multispindle drill heads.
171. The Rowbottom Machine Co., Sheffield Street, Waterville, Waterbury, Conn.:
Cam milling machines.
172. Royersford Foundry & Machine Co., Royersford, Pa.:
Upright drills.
Grinders.
Hack sawing machines.
Punches and shears.
Grey iron castings.
Screw machine parts.
173. Saunders Machine & Tool Corporation, 25 Atherton Street, Yonkers, N. Y.:
Sawing machines.
Pipe threading machines.
Cutting machines.
174. Sebastian Lathe Co., Third and Philadelphia, Covington, Ky.:
Automatic and semiautomatic lathes.
Bench lathes.
Engine and toolroom lathes.
Extension and bed gap lathes.
175. Shields Manufacturing Co., Inc., 38–09 Twenty-fourth Street, Long Island City, N. Y.: Variangle milling machines.
176. The Sigourney Tool Co., Hartford, Conn.:
Sensitive drills.
Multiple spindle or gang drills.
177. Simmons Machine Tool Corporation, North Broadway, Albany, N. Y.:
Turret screw machine, 1¼ capacity.
Micro-milling machine.
Engine lathes, 16-to-20-inch swing.
Gap lathes, 16/25 to 26/50-inch swing.
48-inch heavy duty engine lathes.
178. Smalley General Manufacturing Co., Bay City, Mich.: Tread milling machines.
179. Smith & Mills Co., 2889 Spring Grove Avenue, Cincinnati, Ohio: Shapers, crank type.
180. Snyder Tool & Engineering Co., 3400 East Lafayette Boulevard, Detroit, Mich.:
Drilling machines (multi-sta).
Reaming machines.
Tapping and milling machines.
Profilers.
181. Sommer & Adams Co., 1811 Euclid Avenue, Cleveland, Ohio:
Special machinery:
Polishing machines.
Continuous milling machines.
Continuous drilling machines.
Continuous drilling and tapping machinery.
Vertical milling machines.
Automatic assembling machines.
182. Sparks Simplex, 35 Park Hill Avenue, Norwalk, Conn.: Shell lathes.
183. William K. Stamets, 4026 Jenkins Arcade, Pittsburgh, Pa.:
Shell turning machine (Breckenridge).
Pipe threader (automatic).
184. The Standard Engineering Works, Pawtucket, R. I.:
Hand millers, horizontal.
Horizontal milling machines.
Vertical spline milling attachment.
Vises, arbors, collets, etc.

185. Stark Tool Co., Waltham, Mass.:
Lathe attachments.
Turret lathes.
Bench lathes.
Vertical milling machines.
Milling machine attachments.
Sensitive drills.
Bench and Pedestal grinders.
Screw machines, plain and hand.
186. Stearns-Rogers Manufacturing Co., Denver, Colo.: Denver Acme shell lathe.
187. The Charles Stecher Co., Inc., 2452 North Greenview Avenue, Chicago, Ill.:
Deep hole drilling machines.
Turret lathes.
Automatic turning, drilling, and threading machines.
188. John B. Stevens, Inc., 304 Hudson Street, New York, N. Y.:
Power milling machines.
Milling machine attachments.
Milling machine vises.
Screw machines.
Cutter and reamer grinders.
Surface grinders.
Double end horizontal drills.
Vertical slotters.
Dividing heads.
Index centers.
Rotary tables.
189. Stokerunit Corporation, 4548 West Mitchell Street, Milwaukee, Wis.:
Planer type milling machines.
Boring machines.
190. The Tannewitz Works, 301–325 Front Avenue, NW., Grand Rapids, Mich.:
Metal cutting band saws.
191. Taylor Manufacturing Corporation, 3056 West Weinecke Avenue, Milwaukee, Wis.:
Sensitive drilling machines.
Static balancing machines.
Hydraulic dynamometers.
192. Toledo General Manufacturing Co., 3620 Summit Avenue, Toledo, Ohio:
Sensitive drills.
193. The Toledo Pipe Threading Machine Co., Toledo, Ohio:
Bolt and nut machines.
Pipe-cutting machines.
Pipe-threading machines.
194. Unit Machinery Co., Rockford, Ill.: Automatic screw machines.
195. U. S. Drill Head Co., 1950 Riverside Drive, Cincinnati, Ohio: Drill heads.
196. United States Machine Tool Co., 950 West Sixth Street, Cincinnati, Ohio:
Grinding machines.
197. Univertical Machine Co., 533 Beaufait Avenue, Detroit, Mich.: Bench-type milling machines.
198. Vonnegut Moulder Corporation, 1819 Madison Avenue, Indianapolis, Ind.:
Grinding machines.
Swing-frame grinding machines.
Polishing machines.
199. The Wade Tool Co., 49–59 River Street, Waltham, Mass.:
Precision bench lathes.
Bench profiling machines.
Pinion and wheel cutting machines.
200. Walker Turner Co., Plainfield, N. J.: Bench drills.
201. Waltham Machine Works, Waltham, Mass.:
Thread milling machines.
Pinion and gear cutting machines.
Cylindrical sub-presses.
202. Wardwell Manufacturing Co., 3167 Fulton Road, Cleveland, Ohio: Sawing machines.

203. The Waterbury Farrel Foundry & Machine Co., Wilcox and Daniel Streets, Waterbury, Conn.:
Lathes, automatic and semiautomatic.
Forming presses and mill machinery.
204. Wellman Engineering Co., 700 Central Avenue, Cleveland, Ohio: Horizontal boring mills (Lambert).
205. Western Machine Tool Works, Holland, Mich.:
Radial drills.
Shapers (Steptoe).
Lathes (Chard).
206. The Yoder Co., West 55th and Walworth Avenue, Cleveland, Ohio:
Slitters.
Automatic cut-off saws.
Rotary shears.
Power hammers.
Bending machines.
Roll-forming machines.
Edge-conditioning machines.
Brake-shoe machines.
Horizontal-boring machines.
Special machinery.
Electric weld tube mills.

EXHIBIT D

Estimated output of machine tools from 1937 to date

Year:	
1937	$189, 000, 000. 00
1938	140, 500, 000. 00
1939	200, 000, 000. 00
1940	440, 000, 000. 00
1941 (preliminary)	760, 000, 000. 00
1941 by months:	
January	50, 700, 000. 00
February	54, 700, 000. 00
March	57, 400, 000. 00
April	60, 300, 000. 00
May	60, 800, 000. 00
June	63, 400, 000. 00
July	57, 900, 000. 00
August	64, 300, 000. 00
September	68, 700, 000. 00
October	77, 200, 000. 00
November	74, 600, 000. 00
December	

EXHIBIT E

TABLE I.—*Total employment machine tool industry*

[Estimated from a U. S. Department of Labor Chart—highest month each year]

1935, December	32, 681
1936, December	41, 149
1937, October	50, 912
1938, January	44, 349
1939, December	54, 430
1940, December	78, 163
1941, December:	
Estimated, Department of Labor	102, 800
Estimated, N. M. T. B. A	110, 000

TABLE II.—*Total employment 129 machine tool companies as of end of November 1941*

129[1] Companies report total employment		97,598
In training (13.3 percent)		12,955
42 companies operate 3 shifts:		
Number on first shift	32,020	
Number on second shift	12,428	
Number on third shift	5,545	
		49,993
81 companies operate 2 shifts:		
Number on first shift	37,065	
Number on second shift	10,081	
		47,146
6 companies operate 1 shift		459
Total		97,598
Total number employees working first shift		69,544
Total number employees working second shift		22,509
Total number of employees working third shift		5,545
Total		97,598

[1] Only those companies whose major product is machine tools are included in this tabulation.

TABLE III.—*Machine operators—129 machine tool companies as of end of November 1941*

Total number of machine operators		38,959
Percent of total employment		40
40 companies report 3 shifts of machine operators:		
First shift	9,032	
Second shift	6,171	
Third shift	3,447	
		18,650
83 companies report 2 shifts:		
First shift	13,326	
Second shift	6,754	
		20,080
6 companies report 1 shift		229
Total		38,959
Total number of machine operators:		
First shift (58 percent)		22,587
Second shift (33 percent)		12,925
Third shift (9 percent)		3,447
Total (100 percent)		38,959

Exhibit 8.—Facilities Converted to Ordnance Manufacture

(Note by committee staff: The list below, submitted by the Under Secretary of War, shows the extensive possibilities of conversion on the basis of a number of particular instances but of course does not show that any large segment of American industry has been converted from peacetime production to armament manufacture. In the case of the automobile industry the data submitted to the committee show that despite the fact that a variety of armament items are being produced in the plants which under peacetime were devoted to automotive facilities, nevertheless only 5 to 10 percent of total automotive facilities were converted to armament production by the end of 1941.)

Normal products	*Ordnance items*
Textile trimmings	Ammunition belts
Outboard motors	37 m/m gun carr. & pts.
Deep-hole drills	B. M. G. Cal. .50 M2
Saw mill machinery	81 m/m machine mts.
Business machines	Shell, Q. F. H. E., 40 m/m
Washing and ironing machinery	Anti-tank mine H. E., M1
Thermostats for ovens	Boosters, M21
Dial indicators and gauges	Gauges
Electric cleaners	Mounts, tripod, M. G. Cal. .50
Washing machines	Tripod mts.
Linoleum	Shell, 3″ M42B2
Foundry products	Shell, H. E., 20 m/m, Hispano G.
Auto body hardware	Parts for light tanks
Magneto couplings	Fuze, anti-tank mine
Hair-clipping machines	Projectiles, Ball, 20 m/m
Laundry machinery	Adapter booster, M102
Men's shoes	Helmet linings
Box toes	Scabbards
Bottlers' machinery	Shell, chem. 105 m/m (M)
Cars and trucks	Carr. pack how. 75 m/m
Locomotive boilers	Track shoe links on tanks
Watch bracelets	Booster, M22
Textile machinery	Mounts, tripod
Screw-machine products	Primers, percussion
Automotive specialties	Bullet cores
Agricultural implements	Projectiles, 155 m/m H. E.
Silk ribbons (also silk goods)	Silk, parachute, pyrotechnics
Undertakers' sundries	Shell, Q. F. H. E. Mk II T/L
Shoe and harness machinery	Shot, A. P. 20 m/m
Enameled steel stamping, specialties, and signs	Anti-tank mine
Screw machine products, stampings, ball bearings, piston pins, etc.	Fuze, P. D., M56
Insecticides	Signal, ground
Auto lamps	Primers, percussion, M23A1
Electric shavers	Fuze, percussion, #253
Roller skates	Metal pts. for boosters
Canners' machinery	Ammunition boxes
Cranks, ball	Casing, burster M6
Display fireworks	Signal ground
Time recorders	Buster M3
Special machinery	Gages, mfg. 37 m/m guns
Grave vaults	Shell, 105 m/m (M)
Automobile accessories	Shell, 37 m/m
Aluminum foil	Shot, S. A. P., 37 m/m
Jewelry	Fuze, B. D. M58
Gasoline stoves	Shot, A. P., 20 m/m
Metal novelties	Links, for 20 m/m gun M1
Machinery designing	75 m/m guns
Bottle caps	Mounts, tripod, cal. .50
Automotive equipment	Carriage assemblies for B. M. G.
Valves	Shell, H. E., 105 m/m
Screw machines	Shell, 20 m/m

Normal products—Continued	*Ordnance items*—Continued
Mimeograph products	Fuse, B. D., M58
Die casting (nonferrous)	Booster, M22
Valves, cocks	Shell, 20 m/m, H. E., (met. pts.)
Die castings	Booster cups
Cotton mill machinery	Shot, 105 A. P., 37 m/m M74
Pipe couplings	Shell, 105 m/m (forg.)
Sash doors and blinds	Cart. cases, 37 m/m, M17
Household specialties	Antitank mines, H. E.
Sanding machinery	Shell, H. E., 37 m/m, M63
Electric ironers	Mts. tripod, B. M. G.
Vacuum cleaners	Fuze, P. D., M57 (met. pts.)
Toys	Signals, A. C.
Auto-loading devices	M. C. mounts
Machine products	Projectiles, ball, 20 m/m
Furniture hardware	Fuze, P. D., M56, metal pts.
Automotive radiators	Belt links, M. G.
Steel barrels	Links, metallic, M. G.
Wire springs	Components for rifles
Screw machine products	Shell, 20 m/m, H. E.
Hardware	Cartridge cases, 37 m/m
Shock absorbers	Body only, Shell, H. E., 60 m/m, M49A2
Castings, cars, etc.	Shell, H. E., 90 m/m, met. pts.
Bathroom fixtures	Shot, A. P., 20 m/m
Electric fans	Flares, A. C., para., M26
Razors	Primers, perc., M23A1
Bottle coolers	Mine antitank, metal parts
Sprinklers	Cart. Case, 20 m/m
Roller skates	Fuze, B. D., M58
Thermometers	Shell, 37 m/m, M 54
Gas stoves	Primer, Percussion, M31 (Metal parts)
Oil field tools	Shell 8" (M)
Stoves	Metallic Belt links
Auto cranks	Fuze, P. D., M52
Sucker rods	Shot, A. P., 37 m/m
Metal specialties	Projectile Ball, 20 m/m (Metal parts)
Conveyor systems	M. G. Mounts, Cal. .30
Household appliances	Fuze, T. S. R., M54
Construction power tools	Shell, Mach., 155 m/m
Pressure lubricating equipment	Shell, 20 m/m, H. E.
Electric signs	Shell, 75 m/m, M48 (M)
Stokers	Mounts, T2, 90 m/m
Brewery machinery	Shot, S. A. P., 37 m/m
Mouse traps	Mounts, Tripod, Cal. .30, M2
Cooling systems	Helmets
Oil field equipment	Mts., Tripod, Cal. .30
Heating systems	Sighting Devices, Cal. .30 Rfles
Dies, punches, etc.	Shot, 37 m/m
Calculating machines	Fuze, B. D., M58
Sanitary equipment	Shot, S. A. P., 75 m/m
Screw machines products	Shot, S. A. P., 37 m/m
Textile machinery	Fin Assembly, Shell, 81 m/m
Fire extinguishers	Panoramic Telescopes
Screens, steel	Fuze, P. D., M52
Printing presses	37 m/m Gun Mounts
Ice cream freezers	Shell, R. F., H. E., 40 m/m
Cigar lighters	Fuze, T. S. Q.
Flour mill machinery	Projectile, Vall, 20 m/m
Shotguns	Rifles, Cal. .22
Auto wheels	Shell 3" A. A., M42B2
Metal fabricators	Shell, 105 m/m (M)
Same as above	Case Cart., 105 How.
Cotton mill machinery	Shell, 75 m/m, (M)
Hardware	Primer, Percussion, Q. F., 40 m/m
Cash registers	Fuze, P. D., M48
Enameled ware, etc.	Fin assembly for bomb (500#)

Normal products—Continued	*Ordnance items*—Continued
Canning apparatus	Fuze, P. D., M51, (Met. Pts.)
Pumps	Fuze, Percussion, #253, 20 m/m
Aircraft flares	Flare, emergency landing, M8A1
Clothes washers	Mounts, Tripod, M. G., Cal. .50
Automobile parts	Bomb, Chem. 100#
Oil well supplies	Shell, H. E., 81 m/m
Sheet metal stampings	75 m/m Cart. Cases
Name plates	Cartridge cases, 20 m/m
Locks	Shot, A. P., 37 m/m
Fishing reels	Primers, Percussion, M23A1
Valves	Primers, Percussion, M23A1
Oil well equipment	Shell, 37 m/m, M54
Gas ranges	Fin assembly for bomb
Agricultural implements	Shell, 37 m/m, H. E., M54
Elevators	Recoil Mach., 90 m/m Guns
Glass moulds	Burster, M7 for Bomb
Auto loaders	Mine Anti-Tank, H. E., M1
Engine cooling radiators	Fuze, Mine Anti-Tank
Screw machine products	Primer, Percussion (Met. Pts.)
Streetcars	Carriages, 155 m/m, Gun M1
Storage batteries	Fuze, P. D., M48 (Met. Pts.)
Gas water heaters	Fuze, Bomb (Metal Parts) Tail
Electric push buttons	Fuze, P. D., M52 (Metal Pts.)
Locomotive equipment	Shell 8", H. E., M103 (Mach.)
Die castings	Booster, M22 (Metal Parts)
Screw machine products	Shot, A. P., 20 m/m (Met. Pts.)
Railroad and rolling stock	Shell, 105 m/m (F)
Brushes	Fuze, Bomb, Nose, M103
Radio vibrators	Fuze, Bomb, M103
Electrical transmission equipment	Mounts, Tripod, Cal. .30

FACILITIES CONVERTED TO MEDICAL MANUFACTURE

Normal Products	*Medical Items*
Tableware	Surgical instruments
Silverware	Field chests
Cutlery	Surgical instruments
Beautician supplies	Surgical instruments (Scissors)
Jewelry	Surgical instruments
Bicycle spokes	Surgical needles

FACILITIES CONVERTED TO QUARTERMASTER MANUFACTURE

Normal Products	*Quartermaster Item*
Auto felt	Cotton comforters
Carpets	Blankets
Radiators	Liners, helmet
Auto upholstry	Uniform cloth

INDEX