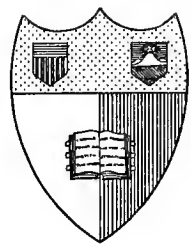
THE SEAL OF SAFETY



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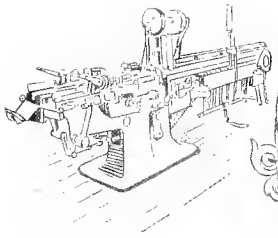

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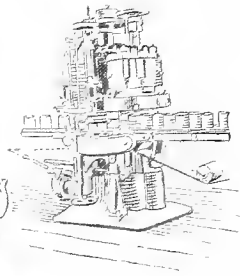

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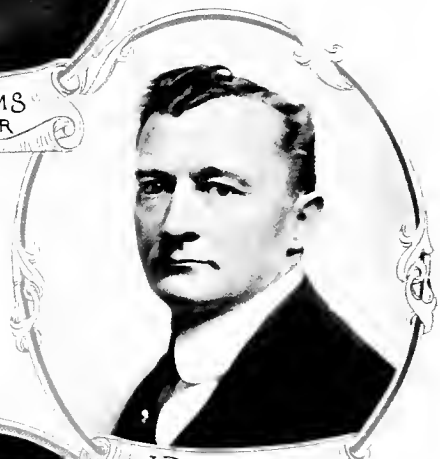

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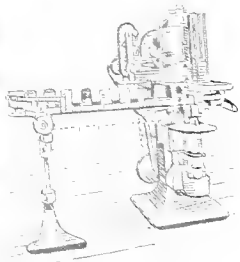


The Seal of Safety

YEAR BOOK

Volume II.

OF THE

MAX AMS MACHINE CO.

MOUNT VERNON NEW YORK

CHAS. M. AMS, President

1915

Issued by the Publicity Department

C. H. STECKER

FOREWORD

For the information of those who failed to procure a copy of the first volume of "The Seal of Safety" Year Book for 1914, a brief summary of the contents of the volume is here presented.

The Photogravures on India tint paper consisted of the portraits of Mr. Max Ams, founder of the company; Mr. Charles M. Ams, president; Mr. Julius Brenzinger, vice-president and superintendent; and Mr. Emil Ams, secretary and export manager. In addition to these full page photos, there were several plates of illustrations of the early types of machines used when the sanitary can first bid for recognition.

The final sixty pages of the volume, on India tint paper, also full page illustrations, were devoted to a line of can-making machinery manufactured by The Max Ams Machine Company.

The opening chapters contained a condensed history of canning and preserving from the beginning of the experimental stages in 1782 up to and including the present sanitary methods, with brief notes on the early canners in this country; the primitive can and machinery up to and including the sanitary can and improved automatic machinery in use to-day.

An elaborate article on "The Canning of Vegetables and Fruits," by Dr. Bitting, was followed by "A New Method of Canning," by Dr. Koch of Germany; "Salmon," by Secretary Crawford, and "Sulphuring Dried Fruits," by J. K. Armsby. Then followed a brief synopsis of the National Canners' Association and research laboratory, a list of associations, local, state and national, with officers of the canning and packing industries, jobbers, dry fruit brokers, wholesale grocers, etc., etc., bureau of adjustment, arbitration and agreement for cities and states, with names of the members for each place.

Legal matters pertaining to the canning and packing industries included the Sherman Anti-Trust Law, U. S. Patent Law, and laws, rules and regulations of interest to the trade, such as labeling, misbranding, guarantees, sale, delivery and acceptance of canned foods, owners' responsibility, adulterated food, Canadian regulations, trade-marks, reference tables, range of can sizes handled by Ams machines, and valuable "Don'ts" used in the care and operations of machines, besides other valuable and useful information, such as tables of references, weights, measures, coins, etc., etc.

THE CANNING INDUSTRY


AMS
Sanitary
Solderless
Sealed

THE CANNING INDUSTRY

It is a well-known fact that one of the progressive policies to gain the greatest prominence during the past few years is *pure food.* It is one that has taken hold upon the imagination of the public as none other has taken hold. The National Canners' Association has taken most significant action in promoting the pure food cause. This association unanimously declared that the national food laws shall be strictly enforced, and that efforts be made to obtain drastic regulations uniformly throughout the states. Sanitary code for canneries to be urged by all legislatures, guarantees for the use of good materials, enforcement of healthful conditions in operations of factories, and among employees, cleanliness of utensils, machinery, etc., etc., and the elimination of any feature that would interfere with purity of the product.

This action and attitude is of the greatest importance to the health and well-being of the public.

Canned foods are to-day the nation's staff of life, three billion cans of food products were consumed last year, having a retail value of more than six hundred million dollars. Without canned foods, our great cities would always be on the edge of a famine. One-half of the vegetables and fruits produced would go to waste if it were not for the canneries. The greatest force for better foods is the sound progressive policy adopted by the canners, who maintain standards higher even than those demanded by the laws.

As the pioneers of the Ams sanitary system, we enjoy this distinction in a peculiar way. We have brought the machinery used in hermetically sealing tin cans to a high plane of efficiency, and are striving for still better results, realizing, that there is a broad field for progressive development, and where formerly, under the old obsolete way, food containers contributed more leaks than did healthy cans, to-day under the "AMS" system, there is not one per cent of leakage in the packing of food products. This conveys only a vague idea of the immense saving that has taken place over what would otherwise prove to be a waste under the old conditions.

In presenting this second volume of "The Seal of Safety" for the year 1915, The Max Ams Machine Co. gratefully acknowledges the generous response received from all those who share with us an interest in the greatest of all industries—the canning of food products—in fact, all kinds of products in containers produced under sanitary systems, conditions and environments. And while the canning of food products is practically one hundred years old, the sanitary system now employed in many factories is scarcely more than a dozen years old; still in its infancy, yet progressing and developing with enormous strides.

The bringing out this past year of new Double Seamers, called the No. 98-AT Automatics, with a capacity of upward of fifty can tops sealed per minute, created quite a sensation in the trade, and proved to be the forerunner of a second machine called the No. 498 with a capacity of upward of one hundred per minute.

These new creations are from our vice-president and superintendent, Mr. Julius Brenzinger, whose genius as a creator of new machinery for the canning industry, has proved to be the greatest boon to the trade, in that it enables the producing of enormous outputs of food products, which a few years ago were considered impossibilities, and as a result of these enormous outputs, the price of canned foods has been within the reach of everyone. In addition to these Double Seamers which are illustrated in the machinery section, will also be found new Gang Slitter, Body Former, Lining Machine, Crimping Machine, Flanger, Power Presses and other can-making machines, catalogue and full description of which will be sent upon application.

With greatly increased facilities Ams Power Press department handles the most intricate and scientific problems of press users, including all variety of feeds, dies and special devices. Our extensive line of standard presses is an appealing force to all who are seeking the maximum output at the minimum outlay, and, as every press is subject to a thorough try out, a most liberal guarantee accompanies each machine. A generously illustrated press catalog has recently been issued, a copy of which every press user should have. We build complete lines of Sanitary Can making machinery.

All of these machines are mediums which contribute in the

greatest measure to the successful production of pure food containers.

Inside of another twelve months the Max Ams Machine Company will occupy its new and commodious plant in Bridgeport, Conn.

The art of enclosing and preserving, within durable and impervious containers, is now providing a perennial supply of wholesome delicacies. The canned vegetables are better than the average of the same kinds found, in natural condition, in the markets. One can readily prove this statement by making a test in the market. For both fresh and canned vegetables are sold side by side, and we venture to say that if your dealer is particular in the selection of fresh vegetables he is likewise as careful to purchase the best of canned vegetables.

Take the methods of the ordinary farmers, for instance, in contrast with the certain position which must be taken by the special class of agriculturalists, called "canned food gardeners." To gain the largest returns, in season of plentiful supply, the farmer naturally allows his vegetables to reach the utmost stage of development in bulk. For his returns are usually in ratio to crop yield. Economy in labor is also effected by a thorough stripping, at time of gathering, rather than by careful selecting just that which is most sightly and palatable at a particular stage of growth. Hence beans, for example, are allowed to grow until there are seeds developed within the pods and coarse strings on their backs, and corn will have advanced to a stage of solidity and toughness that makes chewing consciously laborious and food a hard-earned nutriment, instead of a delightful repast.

The canned food gardener, on the other hand must direct his efforts to secure highest quality, in accordance with the stipulated requirements of the canner's contract. The careful attention of the grower to the conditions affecting the production of quality is not only stimulated by the penalties attaching to failure in results, but also by the supervision of the canner's inspectors.

Charles M. Ams, president of the Max Ams Machine Co., who already has been written in recorded annals as a strong and devoted advocate of sanitary systems, not only in the line of canning food products but in every department of economic

welfare, is placing many of his theories into practical operation on his 2,500-acre "Royal Farms" in Amston, Conn., where the latest appliances and scientific experiments are in progress in developing and producing certified food products.

In fact, some of the larger and most reputable of canners are controlling and guiding the production of the crops which are to furnish the raw material for their canning industry.

The canner's art has proved such a boon to humanity that it would be a shame to discredit it altogether merely because of an occasional failure. Not every fresh egg is really fresh. Most of us have met with a bad one some time or other. Not every apple in the basket is really good, some may have a soft spot or a grub within. Just in the same way not every tin of food reaches the consumer in absolute perfection, but the proportion of bad tins is so small that it is safe to say the risk with canned foods (and common sense) is less than the risk with fresh foods. The canned food is prepared in a country of abundance, is taken just at the most favorable moment for preservation, is picked over and packed with special care and skill. The methods in vogue dealing with fresh foods are very often primitive, unscientific, and haphazard in the highest degree. Had it not been for the canner's art thousands of our population would never have known the taste of dozens of choice and delicious foods. The canning industry has done far more than any other industry to conserve the food products of the world and thus reduce the cost of living. If it were not for the canning of fruits and vegetables they would indeed be luxuries for the rich during a great portion of the year. If the canners cannot afford, during the periods of abundance to pack more than they can reasonably hope to dispose of during that season, because there is no demand for goods packed during a previous season, then much of the practical benefit from such food conservation would be lost. The producer or grower will also be a heavy loser.

Only a few years ago, as everyone knows, considerable doubt and skepticism were evinced by many consumers toward canned food, but this feeling has been entirely overcome and perfect confidence is now reposed by the consuming public in canned foods, with the result that the canning industry has grown by leaps and bounds. Under the present improved methods of put-

ting up canned foods, they can be held indefinitely in perfect condition.

The very first consideration under all food laws is wholesomeness. Every canner knows that even with the most approved machinery and methods of canning an occasional "slow leaker" will develop through defective tin or an improperly constructed can. As a practical matter the real protection of the consumer of canned food lies in the examination of the appearance or the condition of the can and not in the knowledge of the date when packed. A can of food when "collapsed"—that is, not showing any bulging or swelling, but furnishing evidence of a good vacuum—will in nine hundred and ninety-nine times out of a thousand be in good condition and safe for human food. This, taken together with a good appearance of the contents when the can is opened, furnishes a practical guarantee of wholesomeness regardless of the age. It is along this line that the consumers of canned foods should be educated.

The primary object of the pure food laws is the protection of the consumer by the prevention of adulteration and misbranding. The consumer is unquestionably entitled to foods that are sound and wholesome and which are truthfully labeled; that is, labeled to show exactly what they are, without any false representation as to the ingredients, methods or place of manufacture. A perfectly sterilized, processed and sealed can of food carried under favorable conditions will remain absolutely sweet and sound indefinitely, while on the other hand a can imperfectly processed, sterilized and sealed will deteriorate rapidly.

It is to be regretted that there is still a disposition on the part of a few graduate enthusiasts to distort the truth and revel in sensations.

Contrary to the opinion the reformers try to force upon the public, the canners as a whole are not in favor of child labor; are not seeking child labor, and, if the fact were known, actually do not want the children around the factories. Where children are found in the factories it is through force of necessity, because the parents will not come to work unless the children are allowed, and the most serious problem the canner has to solve is to get sufficient labor. Better factories, improved working conditions and higher wages have not solved the question of a sufficient supply, and when the crops come on and must be handled the

canners are compelled to take the children to get the adult workers. When we speak of children, we mean the little tots, not the boys and girls of 15, 16 or 17 years of age, who of their own accord choose to earn some vacation money doing light work preparing fruits or vegetables for canning, much as they most certainly have to do in their own home for their meals, and who have a right to work if they care to, and upon whom such work is a blessing as compared to some occupations they might otherwise fall into.

The greater part of the work of the modern cannery is done by machinery, beans are stripped from vines and sliced, peas are vined, podded and assorted according to size. Sweet corn is husked and cut from the cob at the rate of over one hundred per minute. Hand work is reduced to a minimum. Fresh running water is constantly flowing in every part of the factory, and machines, conveyors, knives and parts that come in contact with fresh food are washed with running water, and at night when the day's work is done, the cleaning down of the machines, walls and floors is accomplished by scalding steam.

The canner knows the importance of cleanliness and he has the facilities for keeping his factory clean.

The people of the United States are a peculiarly self-sufficient sort. They move along in an irresponsible manner from day to day, regardless of any thought or consideration for their future welfare, simply enjoying the contentment that comes to a people who revel in prosperity, and who say, let us live to-day for we are not sure what the morrow will bring forth. The economic problems do not seem to disturb their equilibrium and complacency. They require a jolt, and a good, hard one to awaken them to any danger of threatening gathering of the storm.

A warning is sent broadcast over the land against the policy of indifference to the growing difficulty of the nation conserving and developing its food supply in proportion to the demand created by a population which increased farther than the production of those things needed for its maintenance at reasonable cost.

Take for instance the period from 1900 to 1910. While the population increased twenty-one per cent or 16,000,000 people, the increase in our farm lands was only four per cent, or in

plain figures and facts, to-day one-fourth or twenty-five per cent of our people are producing or trying to produce what seventy-five per cent of the population are consuming. It does not take a very wise man to appreciate the seriousness of this inverse ratio. These things cannot continue. Food cannot be cheaper until these conditions are reversed and seventy-five per cent, or a more equal ratio, will produce what the one hundred per cent require.

The question has been asked, "Are we not in the same position as the Roman Empire was in?" The fall of the Roman Empire was due to the constant depletion of her farms, the non-production of her soil, decreased yield per acre, and the congestion of her cities and attendant immoralities. In the first volume of "The Seal of Safety," a brief outline of the canning industry was presented from the time that Nicholas Appert, the Frenchman, in 1810 issued his monograph on preserving foods in hermetically sealed containers. The pioneers in the United States who labored against tremendous difficulties in their efforts to produce wholesome food products and also to find a market for the same, found it very trying owing to the unwarranted prejudice existing. However these pioneers, like all path-finders, continued, and after many years of hard work finally received recognition. There has come to our notice additional names of men prominent in this field in their day and generation, through whose untiring zeal and devotion have left an honorable record and are entitled to be placed on the honor roll.

These men were not all confined to one state or one section of the United States. In every state, from Maine to Florida, from New York to California, may be found a name prominent in his day as having performed his part in promoting and extending the canning of food products.

The secret of canning in those early days was very zealously guarded, and on every building could be found a sign reading "Keep Out," "No Admittance," "Beware of the Dog." How time and conditions change the affairs of business as well as industries to-day! Everywhere you will find signs "Visitors Always Welcome," "Come in and Inspect Our Premises."

In the early history of the canning of food products, the containers were glass or porcelain jars. William Underwood,

who was the pioneer canner in this country, made use of this style from 1820 to 1839 when he began to substitute tin for glass.

The methods of can-making were very slow, sixty cans a day being a master workman's output. The body of each can had to be measured, marked and cut out from the tin plate by hand shears, and to make the seam of lap secure and air-tight it was thought necessary to pile on the solder until a ridge of an eighth of an inch thick was built up from end to end. It was also a slow and difficult operation to make the covers and bottoms. Each one had first to be drawn on the tin with a compass and then cut out with shears and, finally, with a mallet the edge struck up or bent over on an upright piece of iron called a "heading stake." The tops and bottoms, like the seams, were soldered on with a heavy beading of metal and enough solder was used on one can to make a dozen to-day.

So was born the tin can, which in its younger days was called a "tin canister."

For the next fifteen years canned foods were never mentioned. They were always spoken of as hermetically sealed foods in canisters or tin cases.

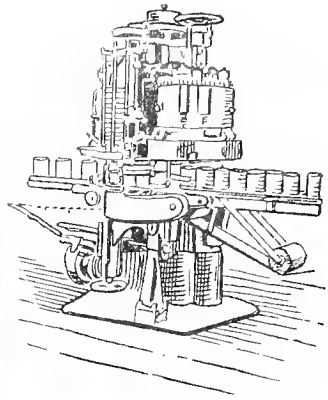
In the sales books canisters were abbreviated thus, "cans," and by such abbreviation tin packages for food came ultimately to be known as cans.

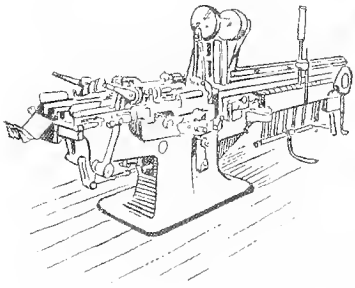
A letter written regarding a can-opening device by William Underwood in 1844 reveals an interesting fact in connection with this subject.

> Your samples of canisters reached me yesterday, and I find the oval cases just such as I have been selling for the past two years. Indeed, I have a new method. The cases are made in two pieces and are joined by a band of tin running around the canister which may be easily detached and is the best way of opening them.

Many unaccountable losses were sustained by packers in those days, when in certain years their foods would not keep at all. Numerous theories were presented in their vain efforts to learn the cause of these mysterious spoilages, the year 1850 was especially vexatious as one writer put it:

> The season ending last year has been a very strange one, our hermetically sealed foods spoiled although they were put up with the greatest care and of the best quality, and we can only add that the whole air was pregnated with cholera that acted upon animal matter as it did upon vegetables. We wish you to be very particular and not suffer any of our hermetically sealed foods to leave your hands until you have opened a few cans from each case.





C. W. Carter, vice-president of Berger & Carter Co., San Francisco, Cal., Coast Selling Agents for Max Ams Mach. Co.

James T. Connor, Assistant General Manager and Director of Sales. Max Ams Mach. Co.

At another time a new theory was advanced that certain cans spoiled because of freezing. This was accepted and held good for some time. And again others were advanced, but the real cause was not suspected. In 1830 Dr. Jacob Bigelow wrote a treatise on "The Elements of Technology," and in a chapter on the Preservation of Organic Substances, he makes the following reference to the Appert process:

> The remarkable effect of this process has been explained by attributing the preservation of the article to the total exclusion of atmospheric air. But as air, in common cases, is always present in sufficient quantities to excite fermentation, it is supposed that the application of heat serves to fix the small portion of atmospheric oxygen which is present by combining it with some principle in the other substances so that it is no longer capable of producing the fermentative action which in parallel cases leads to decomposition.

It is only within the last fifteen years that the theory of the "vacuum" has been abandoned, as formerly it was believed by many of the packers that without it canned foods would not keep. And it is not strange that this idea should have prevailed so persistently, for the science of bacteriology has only within two decades been applied to the canning industry. The researches in bacteriology, which in 1895 were begun at the Massachusetts Institute of Technology, showing conclusively that the seemingly mysterious spoiling of canned food which was so often experienced by the packers was due to imperfect sterilization or processing, through lack of sufficient heat to destroy the bacteria which, under ordinary conditions are ever present upon the food which is to be preserved.

Stimulated by these early researches, much interest in scientific sterilization was awakened. Other laboratories began to investigate, including that of the Department of Agriculture at Washington. That department has devoted much time to investigation of this subject and has maintained for several years at least one experimental cannery, while special investigations have been carried on in various other parts of the country.

The latest phase of this scientific control of this important food industry is due to the business sagacity and foresight of the canners themselves. Appreciating the dependence of their industry upon the scientific and efficient management of its processes, the National Canners' Association has established in Washington a laboratory supported chiefly by the can manufacturers and the canners. Here the problems of the industry

—mechanical, chemical and biological—are worked out under the direction of Dr. Bigelow and Dr. Bitting who for years were in charge of this kind of investigation in the Department of Agriculture.

It seems fitting that this should be known as the National Canners' Laboratory, for the industry long since ceased to be of sectional character and exists in all quarters of the country. The problems are not all solved yet, however, nor has that one laboratory a monopoly in this line of work. Even in New England, where aside from the canning of fish and a few vegetables the industry is relatively small, researches have been going on more or less continuously at the Massachusetts Institute of Technology and its closely allied laboratories, and inquiries come to its staff from all parts of America.

The canned foods industry of the United States began in New England, and here also at the Massachusetts Institute of Technology, began the practical application of science to it. Thus in less than a century there has developed an industry supplying canned foods to the value of approximately $200,000,000 yearly, and showing an increased growth in the last ten years, of nearly 60 per cent. From a small beginning in 1821, the canned foods business has grown to be economically one of the most important industries of the country and American canned foods are now to be found in every quarter of the globe. The Ams sanitary system and machinery have followed the foods, and there is scarcely a country on the globe where Ams machinery is not found.

THE CARE OF CANNED FOODS

There are many who seem to think that if care has been used in packing of food product, further precautions in its handling are unnecessary. This is a most unfortunate viewpoint and needs prompt correction. Damage may result from improper handling to both the container and the contents. Both must be attractive to the eye in order to command sale.

First the cans may become rusted, due to having been stacked in a factory, where steam reaches them during the day and cooling at night causing condensation upon the surface; also to storing in damp warehouses or in cellars. The presence

of rust upon a can gives an appearance of age or suggests a cheap article hardly worth ordinary care. Wherever rust has once started it is an easy point of attack in the future and the process may continue until there is penetration of the can and consequent spoilage. The presence of rust upon the cans before they are labeled will show through the label after a time, thus detracting from their appearance. Rust can be prevented in a large measure by lacquering, and while cans so treated at one time were looked upon with suspicion, lacquering is now regarded as an excellent preventive of damage from the outside, and is certain to come into more general use as its object becomes better understood. Rusting should be prevented as far as may be possible by storing in dry quarters, by avoiding sudden changes in temperature, which will cause precipitation of moisture upon the surface, and by the use of dry packing cases. The use of green wood and water-soaked lumber for boxes is no economy, simply because they cost one or two cents less.

A very common mistake is shipping in dirty cars. It is very little work to sweep a car clean, and if this is not done the presence of dirt, sand, traces of lime, etc., will be distributed by the motion of the car, soiling the boxes and a greater or less number of the labels. The condition of the boxes appeal to the retailer, the same as does the label to the consumer, and the cleaner they are the better. There is no easier way of "hammering" the price of a canned article than to have it handled in a soiled package.

It is an almost universal custom to stencil all cases in making shipment, but in small orders the shipping tag is sometimes used. Such tag should always be attached to the end, as the tacks used may puncture a can if used upon the side or top. This may seem to be such a small matter as to be scarcely worthy of attention, but there have been many hundreds of goods spoiled in this way.

Canned foods should not be stored where they will freeze, for while slight freezing does not seriously injure the quality, in no case does it make an improvement. If cans are once frozen it is better that they should remain in this condition than to permit a recurrence. Several short freezings are much more injurious than one continuous freeze. The effect of freezing in general is to soften fruit more or less and to destroy its char-

acteristic flavor. The effect of a hard freeze is to break some of the cans.

Canned foods should not be stored where there is excessive heat, as against radiators or close to steam pipes. The quality is injured more rapidly by heat than by cold, though the ultimate effect is much the same—softening of contents and loss of flavor. In this case color may also be affected, pears and peaches may be made more or less pink and fruits with high color may assume a gray tint.

Upon receiving a shipment of canned foods, the cases should be opened and examined for can leaks. One broken can, no matter what may be the cause, can stain a remarkable number if the case be allowed to stand at the top of a stack. Cans which have been dented or mashed in shipment or handling should be sorted out and disposed of early. A hard dent on the edge of a can tends to become a leaker, and one mashed on the side may have the ends bulged out presenting the appearance of a swell. The exercise of a little judgment under such circumstances will be the means of keeping a clean stock to the end.

In packing in sanitary cans and in the attempt to give full weight as demanded by the pure food laws, many canners are overfilling. When cans are overfilled, there will be more or less puffing of the ends when they are stored in a warm place, and there will be the usual collapse, or the ends can be pushed in when they are kept in a cool temperature. The test of the true swell and an overfill is to place the cans in a cool cellar or in a refrigerator. A swelled or spoiled can will not collapse at the ends, while an overfilled can will do so.

There are some lines of canned foods which should be disposed of early and not carried from one year to another. As a general proposition, fruits containing pits, as cherries and plums, acid fruits like strawberries and loganberries, apples, apple cider, blueberries and rhubarb, should be sold as early as possible.

Marked improvement has been made in canning foods in the past few years and it becomes necessary that similar conditions follow in their handling from the factory to the consumer.

While The Max Ams Machine Co. enjoys the keenest interest in everything pertaining to the canning industry in all its branches, and studies its varied evolutions with each succeeding

year, meeting new requirements with new and improved machinery, it cannot overlook the fact that too little attention is given to the very tools that the canner depends upon for the successful output of his products. He would devote more attention and care to a dollar watch than to a $500 piece of machinery; this is a strange phenomenon in human nature, but nevertheless a fact.

The necessary wrenches and tools are always sent out with every machine; and instructions as to when and how to use them, but operators are so careless and indifferent to the use of these adjuncts that many machines are damaged and some hopelessly ruined.

On another page of this volume, there is a series of "Don'ts" that every canner should study and be governed by, and yet, it may be very appropriate here and at this time to call attention to the extensive experience and knowledge attained by those who have made a careful study of efficiency in machinery, and methods for attaining the best results.

The things that we can lay down and say we must have are:

Productibility.—It seems reasonable that we should ask for productibility, the ability to produce. It is of prime importance, for it is what we buy the machine for, and if we cannot get productibility we have not spent our money wisely.

Durability.—Is it unreasonable to suppose that, having paid coin of the realm for a machine, we are not entitled to durability? Productibility, of course, is qualified by durability. If it is not a durable machine its ability to produce ceases. So it is reasonable to ask that a machine be durable, that it will do the amount required in a given time and do it easily and comfortably, and have a sufficient factor of safety in the design of its parts to provide for a continuous performance of the work for which it was installed.

Adaptability.—The ability of the machine to meet conditions. A machine has been purchased for a given purpose. The machine should meet these conditions. It is of little interest that it may be able to produce work for somebody else; that it may meet Jones's conditions. What you purchased it for was that it should meet your conditions.

We have, then, three essentials in machine tool design: Productibility, which means the ability to produce; durability, or

the ability to stand up and do the work and adaptability, or the ability to meet our conditions.

There are several factors which enter into the question of productibility, each of which is, in a way, related to the others. If, for any reason, the machine is not in service it is not producing and is, therefore, inefficient.

Continuous operation is an essential factor which is dependent not only on durability but on adaptability as well. If minor details of construction are constantly giving trouble it is not a durable machine, and if long delays are frequently occasioned by the necessity of changing or providing complicated and expensive tool equipments the machine is not adaptable, and the expenditure, therefore, has not been wisely made.

Then comes the matter of bearings and lubrication and it is lubrication of bearings on machinery. Generally, bearings are either flooded with oil, the surplus running over the machine or dropping on the floor, or they are dry and continually causing trouble on account of burning or sticking.

Our draftsmen give particular attention to the design of bearings. It is safe to say that the bearings of a machine are as important as any other part and receive their full share of attention when the machine is planned. To allow the bearings on an expensive machine to run dry and burn out is gross negligence and should not be tolerated under any conditions.

It is better to use a surplus of lubricant than too little, but either system is costly and should not be followed. The waste of lubricant may be as expensive as the damage done by allowing bearings to run dry.

Power plant operating engineers have set an example that is worthy of emulation. Instead of being proud of the large amount of lubricants they use, they are bragging about the smallness of their requirements in order to keep machinery under their charge running successfully. Instead of flooding bearings, the bearings are carefully watched, and just the amount of lubricant required is fed to each bearing. Instead of allowing bearings to run dry and thus demand costly repairs, the lubrication is given close attention, and if from any cause there is not sufficient lubrication to maintain proper conditions, immediate attention is given and lubrication is provided.

Conditions in most shops are exactly opposite. One grade of lubricant is purchased and used for all purposes and under all conditions. Men go to the source of supply as they please and either fill, or have filled, their oil cans, and then they begin to lubricate. Bearings that are doing little work are oiled as frequently as those bearing heavy burdens, or are neglected altogether. The results are wasted lubricant or ruined bearings. In these days, when efficiency and economy are the watchwords, the question of proper lubrication might receive more attention to good advantage. One hundred per cent oiling efficiency means that every drop of oil supplied to a bearing must perform its functions to the very best advantage, and it is right here that Ams machinery has made its splendid record.

One word regarding belting, on which a great deal may be said. Belting is an expensive item that the canner has to contend with, so it naturally comes in for considerable thought. The following points may be worth while:

Don't use anything but an endless belt if possible. It runs better, is easier on machine and saves a great deal of time over the laced belt. A good cabinet glue is as good to use on the joint as almost any belt cement, and is easier to pry open when the belt needs tightening.

Don't run the flesh side of belt next to pulley. If the flesh side gave as good service as the tanned side, the tanner would have no need of devoting so much time and care to getting a good face on the belt.

Don't use old varnish, or some belt dressings that are now on the market, to get your belt to pull. After a few applications the belt will become hard and slick on the face, then there is nothing you can do but dope it up again, and before long it will commence to crock. An occasional application either of neatsfoot oil or a cheap grade of castor oil will make the belt pull better and keep more life in the leather, which, of course, will make the belt last longer. Always be sure and remove any dust from face of belt before using the oil.

REPORT OF THE GERMAN CANNERS' LABORATORY

A report covering activities in the laboratory of Serger and Hempel in Germany, reviews the factors which tend to defeat the canners' efforts to put up sterile goods. These factors are:

(1) Incorrect reading of temperature and time by factory operatives.

(2) False indications of pressure through defective pressure gauges.

(3) False indications of the pressure gauge by reason of improper manipulation of the retort (failure to expel air, cold pressure).

(4) Improper choice of temperature and time of sterilization.

(5) Presence of especially resistant micro-organisms.

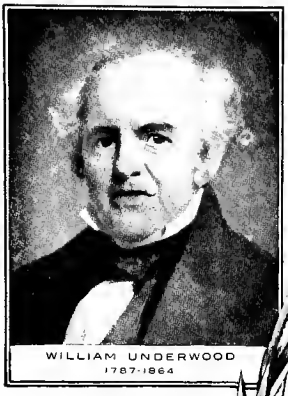
Any one of these factors alone is capable of resulting in unsterile goods, but it is not uncommon for several to come into play at the same time. Attention is called to what every up-to-date canner should not only know, but constantly bear in mind, namely, that a prompt investigation of each day's pack will reveal insufficient sterilization in time to permit the canner to avoid loss by reprocessing goods, which are otherwise sure to spoil.

In the German laboratory it is customary to incubate the various sized cans at 37°C. for the following lengths of time:

Small cans (below ¼ lb.)	40 hours
½ to 1 lb. cans	60 hours
2 to 4 lb. cans	75 hours
6 to 10 lb. cans	100 hours

In the case of goods destined for shipment to tropical countries the cans are further kept for an equal length of time at 45°C. and if they remain sterile are closely examined for any change in the physical appearance and character of the contents. This is important in the case of goods containing meat products, especially those containing gelatine (souse, scrapple) which unless properly prepared often deteriorate when subjected for some time to tropical heat. Tests of this character were carried out on goose liver paste, boiled sausage, fish sausage, and others, and a test shipment was made to Brazil and back. The

THE PIONEERS



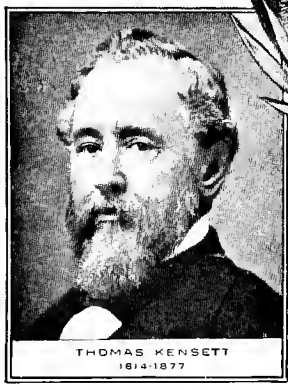
WILLIAM UNDERWOOD
1787-1864

GEORGE BURNHAM
1831-1909

NICOLAS APPERT
1750-1841

Nicolas Appert gave to the world in 1804 the process of preserving food products, which has been fully described in the "Seal of Safety 1914," Volume No. 1.

From a photograph of a miniature in possession of his grandson, Chevalier Appert, Paris.



THOMAS KENSETT
1814-1877

LOUIS McMURRAY
1823-1886

William Underwood came to this country from England in 1820, was one of our pioneer canners, and packed many food products. In 1830 he packed large quantities of pie fruit in bottles, in 1835 imported tomato seed in order to grow tomatoes for ketchup.

Thomas Kensett was a gentleman of the old school. He packed lobsters and oysters in New York in 1819, and obtained a patent in 1825 in the art of preserving. Later in 1848 he engaged in business in Baltimore.

George Burnham, of the firm of Burnham & Morrill Co., was born in Portland, Me. He entered the canning business in 1845. In the year of 1846 he packed green corn in Portland on Burnham's wharf until 1867. He went to France in 1866 to learn the process of packing sardines.

Louis McMurray, one of the most distinguished and successful pioneers of canned food, was born in Maryland. He was one of the first to export, shipping large quantities to California and Europe.

Courtesy of F. N. Barrett,
Amer. Grocer.

appearance of the goods at the end of their long round-trip indicated that German packers were capable of putting up goods which would stand severe requirements.

It was observed during the year that the time of sterilization was often prolonged at a cost of deteriorated quality, especially in the case of asparagus. The contents were sterile but the goods had been cooked to pieces and were unsalable. As asparagus is peculiarly sensitive to over-cooking, experiments were undertaken in the experimental factory connected with the laboratory to determine the minimum time of sterilization which would give absolute quality goods. These experiments indicated the following times:

For 1-lb. cans.. 7 min. at 116°C. (240°F.)
For 2-lb. cans.. 8½ min. at 116°C. (240°F.)
For 4-lb. cans..13 min. at 116°C. (240°F.)

In investigating the cause of springers numerous samples of the following kinds of foods were examined—asparagus, peas, mixed vegetables, Zeltower beets, cauliflower, beans, kohlrabi, cherries, spinach, eels in jelly, canned sausage, turtle soup, turtle meat in jelly, etc. All cases of springers were found to be due to bacteria, chiefly of the following varieties—bacillus subtillus (hay bacillus), proteus vulgaris, proteus mirabilis, bacillus megathrium, bacterium aceti, and cocci, diplococci, and streptococci of not further characterized species.

In determining the cause of spoilage Dr. Serger lays stress on the determination of the particular kind of organism which is responsible. If only one bacterium is found then it is very probable that spoilage is due to a leaky can and that the trouble does not necessarily affect the whole pack.

The reason why we generally find only one organism where spoilage has been due to a leaky can is explained as follows: Usually the leak is very small and a single spore finds entrance. Before other spores enter, the first comer, finding itself in a favorable medium, begins to grow and multiply and so possesses the field by reason of its numbers, thus preventing the development of other varieties which may subsequently succeed in entering. It is a well-known fact that each species of micro-organism gives off substances which are poisonous to many other varieties, and for this reason various processes of fermentation may be

kept "pure" after they have once become well started. If, however, the contents of the can are not sterile, all the germs present start with an equal chance and different colonies start simultaneously at different points, giving rise to a heterogeneous population.

An abnormal case of infection of a canned product is described as follows: A canning factory put out a line of canned ham which was packed by the vacuum process. No trouble had been experienced with this product for years, but during the past year there occurred many cases of explosions of ten-pound cans. A bacteriological investigation showed a profuse infection with hay bacillus (bacillus subtillus), which is extremely resistant to heat so that it survived the ordinary sterilization process. As the hay bacillus is only rarely to be found in food products a long search was made for the source of infection, which was finally located in the presence of a hay loft which had been recently installed near the cannery. With the removal of the hay loft from the vicinity the trouble disappeared.

That canners sometimes have to count on the possibility of an accidental contamination of their water is shown by the following incident: The cannery was troubled by very hard water which often showed a bitter taste. Analysis showed the presence of an abnormally high chlorid content and investigation proved that the source of supply was contaminated by the refuse water of salt works, and this knowledge permitted steps to be taken to remedy the matter.

A number of cases of unsatisfactory canned milk were brought to the attention of the laboratory. In a sample of homogenized whole milk the walls of one can were found to be covered with innumerable specks of milk albuminoids, while another showed clumps of coagulated casein. Both cases were traced to an unsatisfactory condition of the original milk as to freshness. It is pointed out that a simple test to determine whether a milk is suitable for canning is to boil a sample. If the milk coagulates it is unsuitable for the purpose, even though it may otherwise appear all right. Coagulation will take place when the acidity is between 9 and 15 Soxhlet degrees (1 Soxhlet degree equals number of ccm. of fourth annual caustic soda solution required to neutralize 100 ccm. of milk). For safety's sake, however, it is better never to try to can milk which has a

higher acidity than 5 degrees, since a tolerably acid milk which will withstand the boiling test at 212°F. without coagulating will do so when processed at 220°F.

A common fault in canned milk was found to be the use of too high temperatures for sterilization whereby the taste and flavors were impaired, and the milk was sometimes found to be off color. Experiments conducted in the experimental factory showed the following temperatures to be the most suitable:

10-lb. can	60 min.	at 220°	to 223°F.
8-lb. can	60 min.	at 220°	to 223°F.
4-lb. can	40 min.	at 216°	to 220°F.
2-lb. can	40 min.	at 216°	to 220°F.
1-lb. can	40 min.	at 216°	to 220°F.

The process is to be followed by thorough cooling with flowing water, the cooling to be finished in the following times:

10-lb. can	2 hours
2-lb. can	1½ hours
1-lb. can	1 hour

The laboratory encountered a new product during the year in the shape of a yeast extract, which, when mixed with boiling water, gave a very good bouillon, and proved to be an excellent addition to canned vegetable soups in giving them an agreeable meat flavor, being in fact scarcely distinguishable in taste from good beef extract. This opens up to soup canners an important new material, as brewery yeast is produced in enormous quantities in every beer consuming country. No satisfactory use has heretofore been found for it, so brewers have been accustomed to throw away the excess not needed for the actual brewing process.

The care exercised by the German patent office in issuing patents on new food preparations is exemplified by a case in which an inventor proposed to take out a patent on a new flavoring substance from the hulls of legumes. The laboratory was requested to test the inventor's claims, and as the test resulted satisfactorily the patent was issued. The fact that yeast extract closely resembles beef extract in flavor, however, should not fraudulently be taken advantage of.

German packers of mushrooms have been accustomed to using sodium sulphite for bleaching these goods. Experience proved

that the subsequent washing out of the bleaching agent was not always a success, with the result that the sulphite was reduced in the can to sulphide, producing blackening of the metal and leading to difficulties with the pure food authorities, on account of the presence of still undecomposed sulphite. It is therefore pointed out that care must be taken to thoroughly wash out the sulphite. Mushroom packers who feel that they must use a bleaching material are recommended to use hydrosulphite, the excess of which can be completely oxidized in inert sulphates. Hydrosulphite for this purpose is sold under the name of "Geblitol."

German cans for food-preserving purposes are made differently from those used in the United States. In making the cans the Germans first make the body, the seam being held by solder applied in such a way that the contents cannot possibly come in contact with the solder. Next the bottom is crimped on, a tight joint being secured by a thin rubber ring. After the can is filled the cover is crimped on, a tight joint being secured between cover and joint by another rubber ring. German canned goods therefore necessarily come in contact with a larger or smaller area of rubber, and hence a series of troubles due to reaction between the constituents of the rubber and the preserved goods. This necessarily brings up the subject of the composition of rubber rings most suitable for canning factory purposes. This subject has been treated at length in previous reports from the laboratory, and may be resumed here as follows:

(1) If the rings contain sulphur, this substance must be so firmly combined that no hydrogen sulphide will be evolved when the ring is gently warmed with 4 per cent tartaric acid or a similar strength of acetic acid.

(2) When the ring is heated to 177°C. (260°F.) in the presence of water, 4 per cent tartaric acid solution or 2 per cent salt solution, it must fully retain its desirable physical properties and give off no taste or odor.

(3) Lead and zinc must not be present in any form.

(4) The rings must not contain more than 77 per cent of incombustible substance. This requirement indicates that the rubber rings used in Germany are composed of only one-quarter combustible substance, and probably not all of this is rubber.

1 Prune Orchard, San Jose.
2 Peach Orchard, San Joaquin Valley.
3 E. C. Dee, of Berger & Carter Co. Author of Canning Industry, California.
4 Peach Orchard, Santa Clara Valley.
5 Apricots in Bloom, Saratoga, Cal.

CANNING INDUSTRY IN CALIFORNIA.

From a humble beginning under the primitive conditions of early days to the present high state of development, the evolution and growth of the canning industry in California has been rapid and continuous and the value of canned foods packed annually in the Golden State now exceeds twenty millions of dollars.

California is the second state in the Union in point of size, and, between the low-lying coast valleys and the foothill and mountain slopes, may be found every conceivable climatic variation. Three great advantages of the California climate—abundant heat, continuous sunshine, and absence of excessive humidity, considered in connection with the fertility of the soil and the unusual length of the growing season—insure the characteristic excellence of California fruits; while the relative geographical location of the different fruit-growing districts practically precludes the possibility of a total crop failure. The texture, color and ripening season of various fruits are materially affected by modification of climatic conditions, hence fruit produced in certain sections of the state is often more suitable for canning purposes than the same variety grown elsewhere.

About six years after the discovery of gold in 1849, the first experiments were made in planting fruit-trees commercially and the first canning establishment commenced operations some three years later.

D. Provost, who in 1858 operated a small packing-house at Market and Valencia Streets, San Francisco, is generally accredited with the distinction of undertaking the first commercial canning on the Pacific Coast. Provost acted as agent for his brother, Stephen H. Provost, who was a member of the firm of Wells, Provost & Co., of Yonkers, N.Y. This concern packed pickles, jams, etc., in bulk and shipped around the Horn in sailing vessels to San Francisco where the goods were repacked in suitable containers for the California market. In 1860 Provost enlarged the field of his activities and began to pack jams and jellies made from California fruits in addition to repacking bulk goods from the East. A small concern, known as Erzgarber & Goetzen, was established in 1859 which packed jams and jellies

in a small way. This business was taken over by Sol. Wangenheim & Co. in 1875 and carried on until 1887 when it was discontinued.

During 1859 the late Francis Cutting, who may be considered the real pioneer of the canning industry on the Pacific Coast, started a cannery on Main Street in San Francisco where he packed fruits, jams and jellies in glass and tin, although the supply of California fruit then available was very limited. Cutting also packed tomatoes as well as soups and other specialties and it has been authoritatively stated that a considerable portion of his pack found its way to the front during the Civil War. The earliest record of packing California apricots, peaches and plums is found in Cutting's inventory of 1863 in which year his total pack, including tomatoes, jellies and jams, was 7,000 cases.

Until 1866 the Cutting Packing Co. was the only concern handling fruit to any extent as Provost operated on a very small scale. In 1867 Provost discontinued business, and P. D. Code, who had been employed by him, founded the firm of P. D. Code & Co. This concern is still in existence under another name, having operated successively as the Code-Elfelt Co., the Code-Portwood Canning Co., and, at the present time, as H. G. Prince & Co. The first cherries canned in California were packed by P. D. Code & Co. in 1867.

In the spring of 1864, G. W. Hume, who for several years had been fishing in the waters of the Sacramento River, and Andrew Hapgood, a tinsmith, started a Salmon cannery on a barge at Sacramento. During their first season 1,000 cases of fish were packed in 2½-pound cans and, although unfortunately half of the pack swelled and was a total loss, the remainder was sold by William T. Coleman & Co. for $5.00 per dozen. In 1866 Hume operated, at Oak Point, Washington, the first salmon cannery in the Columbia River region; and as the G. W. Hume Co. still operates one fish cannery and two fruit canneries (one under the name of the Carquinez Packing Co.), this concern must be conceded the distinction of being the oldest canning establishment on the Pacific Coast *operating under the original designation.*

Josiah Lusk, in 1867, packed berries in 5-gallon cans but was unable to market them for several years. The J. Lusk

Canning Co., of Oakland, was the result of the development of Josiah Lusk's original venture.

The brokerage firm of A. Lusk & Co., composed of William Jacobs and Albert Lusk, was formed in 1860. In 1867 this concern began handling canned foods for the Cutting Packing Co., and in 1881 merged with the J. Lusk Canning Co. In 1893 A. Lusk & Co. reorganized and became the California Canneries Co., Ltd., which concern is still in existence.

The most prominent individuals and companies engaged in packing food products in California prior to 1890 were: 1858, D. Provost; 1859, Francis Cutting; 1864, G. W. Hume; 1867, P. D. Code & Co.; 1867, Josiah Lusk; 1871, J. M. Dawson Co.; 1871, C. James King of William; 1876, Golden Gate Packing Co.; 1880, Fontana & Co.; 1881, A. Lusk & Co.; 1882, G. W. Hume Co.; 1882, Sacramento River Packers' Assn.; 1893, California Canneries Co., Ltd.

Several of these concerns are still in existence. The G. W. Hume Co., the Golden Gate Packing Co., and the California Canneries Co., Ltd., still operate under their original names, while P. D. Code & Co. operates as H. G. Prince & Co. The Cutting Packing Co., the J. M. Dawson Co. (later the San Jose Fruit Packing Co.), C. James King of William (later the King, Morse Co.), and Fontana & Co. were absorbed by the California Fruit Canners' Association.

In 1881 the principal canners placed their goods under control of a corporation known as the Union Packing Co. William T. Coleman & Co. of San Francisco, who at that time controlled the stock of the J. Lusk Canning Co., were appointed sole agents for distribution of products, and the late Frank S. Johnson, then president of the Johnson-Locke Mercantile Co.; was in charge of this department. Another corporation known as the Packers' Exchange, was formed at the same time, and Wm. Jacobs of A. Lusk & Co., was in charge of the purchasing. These two corporations did business for one season only and until the business of that season was finally wound up.

In 1885, a corporation known as the California Canned Goods Association was formed for the purpose of advancing the interests of the fruit-canning industry. Isidor Jacobs of A. Lusk & Co., was president of this association, P. D. Code of the Code-Elfelt Co., was vice-president, and I. H. Morse was

secretary. The association lasted but two years, yet during this time accomplished much toward arousing interest in the necessity for establishing grades and maintaining the superiority of goods packed under a label bearing the name "California"; and it was through this organization that agitation was first begun to prevent the fraudulent use of this name on eastern packed goods. Individual canners, after some years, finally secured Federal court injunctions which put a stop to this practice.

In 1887 the eastern peach crop was a total failure, and canned fruit prices advanced 80%.

The California Fruit Canners' Association, which has for years been the dominant factor in the canning business on the Pacific Coast, was organized on June 15, 1899; and the efforts toward consolidation of the California packers were crowned with partial success. The association included originally the following plants: Cutting Packing Co., San Jose Fruit Packing Co., King, Morse Co., Oakland Preserving Co., Fontana & Co., Sacramento Packing Co., California Fruit Preserving Co., and Marysville Packing Co. In 1900, nine more plants were taken over, including: Hunt Bros. Fruit Packing Co., Rose City Packing Co., A. F. Tenney Canning Co., Courtland Canning Co., Whittier Cannery, Chico Canning Co., Lincoln Fruit Packing Co., Sutter Canning & Packing Co., and Southern California Packing Co. Thus, at the end of the second season, the California Fruit Canners' Association controlled twenty-seven plants in twenty-two cities. During the season of 1914, seventeen canning factories were operated by the association.

Until 1878 only two grades were packed—extras and extra standards. In 1878 standards, in 1880 seconds, and in 1892 water goods were added to the grades, and each packer designated his grades according to his fancy.

The pioneer canners contended with many difficulties, as they were practically cut off and isolated from the outside world, and not the least of these difficulties was the manufacture of cans, which were all made by hand. In 1862 Francis Cutting imported tinplate which cost $16.00 gold per box, $20.00 per box was frequently paid even in later years, and the price of solder and other material was proportionate. G. W. Hume obtained tinplate in 1864 from the hardware house of Holbrook, Merrill

& Stetson, then located in Sacramento, but many of the canners imported direct from England.

The first company organized for the purpose of making cans and selling them in the open market was the Pacific Can Co. in 1883. Prior to this time every packer made his own cans. In 1896 the Pacific Can Co. absorbed their only active competitor, the Eagle Automatic Can Co., and reorganized the Pacific Sheet Metal Works. In 1901 the American Can Company was organized. The Los Angeles Can Company is an active competitor in California.

The history of the sanitary can in California is very obscure. The earliest authentic record belongs to J. C. Ainsley Packing Company of Campbell, who purchased a No. 2 Max Ams double seamer in February, 1902. An invoice of the Hickmott Asparagus Canning Company, covering sanitary cans sold the Ainsley people in September, 1900, is conclusive proof that both companies used this type of can at a very early date.

The Sanitary can finally became recognized among the California canners in 1910 and was quite generally used in 1911, thus conclusively proving that the California packers were the first to use the sanitary can extensively. At present this type of can is used altogether throughout the state, and the old style packers' can is now somewhat of an oddity.

Fruits and vegetables, especially fruits, constitute the major portion of the food products canned in California, although the amount and variety of fish packed annually is constantly increasing and the output of condensed milk is by no means negligible. California leads the world in the production of canned fruits.

APPLES.

California is the ninth state in the Union in the production of apples. In 1912 the total acreage devoted to apples was 51,684 acres, containing 2,352,811 bearing and 1,523,598 non-bearing trees.

The limitations of the apple-growing regions are not clearly defined, as there are flourishing orchards on the slopes of the Sierra Nevada mountains at an elevation of 4,500 feet, and the region between 2,000 to 3,500 feet above sea level is commonly supposed to be best adapted to this fruit. The earliest canning

date for apples is July eighteenth. Although approximately fifty-eight varieties are grown in California, but few of them are of interest to the canning trade, and by far the greater portion of the fruit is shipped green to eastern points and Europe.

APRICOTS.

California leads the world in the production of apricots and enjoys a practical monopoly of commercial apricot growing and packing. In 1912 the total acreage devoted to apricots was 44,944 acres, containing 2,877,593 bearing and 493,141 non-bearing trees.

Although the occurrence of even light frost during the period of blooming and setting may strip the trees of fruit without damaging tender leaves and twigs, apricot orchards are to be found in nearly all fruit-growing sections of the state, thus unquestionably proving the universal mildness of the climate. The trees grow rapidly and in some localities yield paying crops during the third summer in the orchard. Individual trees frequently produce a ton or more of fruit annually and it is recorded that an old orchard of Royals in Alameda County yielded crops varying from eight to fourteen tons to the acre, for several successive years.

The earliest canning date for apricots is about June fifth and the later varieties are available until about August twenty-fifth. Although approximately eighteen varieties of apricots are grown in California, all of them are not desirable for canning and the most favored, in their order of popularity, are Royal, Blenheim, Moorpark, Hemskirke and Tilton.

CHERRIES.

California is the first state in the Union in the production of cherries, although Washington and Oregon are rapidly coming to the front. In 1912 the total acreage devoted to cherries was 8,180 acres, containing 505,123 bearing and 231,087 non-bearing trees.

The earliest canning date for cherries is about May fifteenth, and Royal Anne's are usually available until about July eighteenth. Approximately twenty-six varieties of cherries are grown in California, but the Royal Anne, Black Tartarian and Black

Republican, in order of their popularity, are most favored by canners.

PEACHES.

California is the first state in the Union in the production of peaches and is the only section of the country where clingstones are produced to any extent. In 1902 the total acreage devoted to peaches (both frees and clings) was 104,459 acres, containing 8,341,036 bearing and 2,104,707 non-bearing trees. The peach was the first fruit to ripen on the improved trees brought to California by the early American settlers, and the magnificence of the fruit is proverbial. Nearly every county in the state reports possession of peach-trees and in all districts, from the great interior valleys to the Sierra Nevada foothills, size, beauty, firmness and delicacy of flavor are characteristic of the fruit. The San Joaquin valley is the greatest peach district in the state, and nearly all of the San Joaquin canneries operate on peaches exclusively.

Nearly all varieties of the peach have been tried in California, but, as is the case with other fruits, certain varieties are especially suitable for canning purposes. Color is an important item and canners invariably demand fruit that is free from color around the pit. Approximately sixty varieties of peaches are grown in California, clingstones predominating, and the pack of clings amounts to 75% of the total peach pack of the state. Owing to the tremendous quantities of peaches handled annually it is only natural that the lye-peeling process should attain its highest development in this state, and so much care and effort has been expended in perfecting this process that peaches properly peeled with caustic soda are beyond criticism. The earliest canning date for peaches is July second, and the later varieties are frequently available until the first week in November. The favored varieties of clingstones produced for canning purposes in California are Phillips, Tuscan and Levy. The popular freestones are the Lovell, Muir, Crawford and Elberta varieties.

PEARS.

California is the first state in the Union in the production of pears, and pear-trees are the oldest deciduous fruit-trees in the

state. In some instances pear-trees planted by the pioneers in the old mining districts resemble adjacent oaks, and a tree, over half a century old with a trunk more than seven feet in circumference, is still in existence near San Jose, yielding annually about fifteen hundred pounds of fruit. The pear is grown extensively throughout the state, having a wider range than the apple, and the fruit frequently attains great size. It is reported that a pear grown near Marysville in 1904 was nine inches high, sixteen inches in circumference at the base and weighed five pounds.

The earliest canning date for pears is July sixteenth, and Winter Bartletts are often available until November eighteenth. It is noteworthy that the Vaca valley, which is famous for early fruits, also markets very late pears, and Bartletts have been picked in this district as late as November nineteenth. Approximately twenty-four varieties of pears are grown in California, but the Bartlett is the favorite for all purposes.

PLUMS.

California leads the world in the production of plums (considering prunes as plums) but the value of this fruit to the canning industry is immaterial in comparison with the vast quantities of dried product. In 1912 the acreage devoted to prunes was 90,441 acres, containing 7,920,799 bearing and 1,123,854 non-bearing trees, while the acreage devoted to plums (other than prunes) was 14,964 acres, containing 1,178,436 bearing and 317,960 non-bearing trees, thus making a total of 105,405 acres devoted to the production of plums of all kinds. It may be here remarked that all prunes are plums, but all plums are *not* prunes. A prune is a plum which can be dried without fermentation without removing the pit, and plums which cannot be so treated are not prunes—common names to the contrary notwithstanding.

The earliest canning date for plums is June twenty-fifth, while Damson plums may usually be obtained as late as October twenty-third. Approximately thirty-nine varieties of plums (including prunes) are grown in California, of which several varieties are favored for canning. A small quantity of stewed dried prunes is packed annually, but this end of the business has not attained appreciable proportions.

MISCELLANEOUS FRUITS.

California produces great quantities of grapes, figs, nectarines, etc., but these fruits pertain more particularly to the wine and dried fruit industries and their importance to the canning industry is comparatively insignificant.

BERRIES.

California produces enormous quantities of berries of all kinds and the expression "strawberries the year 'round" is frequently used to astonish eastern visitors and impress upon them the mildness and salubrity of the California climate. Blackberries, Strawberries, Loganberries, Raspberries and Gooseberries, named in order of their value to the canning industry, are the principal berry crops and of these the Loganberry alone is peculiar to the Pacific Coast. This variety was originated by Judge J. H. Logan of Santa Cruz, and is a cross between the California wild blackberry and a red raspberry—probably the Red Antwerp. The first plant, which was a chance hybrid, was multiplied by its originator and fruited for more than ten years. Since this variety was first given to the public by the University of California in 1893, it has been propagated by nursery men and sold in large quantities.

VEGETABLES.

California vegetables, so far as the canning industry is concerned, are confined to tomatoes, asparagus, peas, string beans and chili peppers. Corn, which is one of the staples in the east, cannot be grown successfully and has never been canned to any extent in California, although attempts have been made at various times.

Tomatoes are grown extensively throughout the state and a majority of the canners pack not only the regular tomato grades, but pulp and chili sauce as well. The earliest date for tomatoes is August twentieth, and the season frequently extends through the middle of November.

Asparagus is indigenous to the islands and delta of the Sacramento River, and several exclusive asparagus plants are operated in this district. Although the season is short, the asparagus

pack is of considerable importance, as California is the principal producer. The earliest canning date for asparagus is March twelfth and the season continues until July seventh.

Peas are packed to a limited extent only; in fact there are but five canneries in the state handling any appreciable quantity. The earliest canning date for peas is April twentieth, and they have been packed in some seasons as late as July thirty-first, but the heavy packing is confined to one month between the middle of May and the middle of June.

Chili peppers, as canned food, are rapidly becoming popular in the East, and are now used extensively for soups, sandwiches and salads and for garnishing egg dishes, etc. Peppers thrive in Orange County, near Los Angeles, and are prolific in growth. A full grown bush is about thirty inches in height and resembles a tomato plant. The fruit matures in August and bears until frost.

SALMON.

Fish canning is one of the oldest branches of the canning industry in California; in fact, one of the first canneries established in the state, that of G. W. Hume at Sacramento, operated exclusively on salmon caught in the Sacramento River. Although in 1866 Hume transferred his field of operations to the Columbia River region in which he was the pioneer canner, he returned to California in 1882 and established a cannery at Benicia which is still in operation. During the interim a number of small plants started up along the lower Sacramento River, but none of them were of any importance. In 1879 the Sacramento River Packers' Association started a plant on Chipps Island opposite Antioch which operated for a number of years, but the salmon canning business gradually declined and in 1901 operations ceased altogether. Although fishing has always been carried on to some extent as in former times, the catch has been mild—cured instead of canned—and until the outbreak of the war in Europe, 70% of this pack was exported to Germany. Prevailing conditions, however, have closed this market indefinitely and as the past season witnessed a revival of interest in salmon canning, it is possible that it may again become an important branch of the industry in this state.

The Chinook salmon is the principal variety frequenting California waters and other species are rarely found. The banner season for the California salmon packers was in 1882 when 242,000 cases were packed, and from this time on the quantity steadily decreased until the canneries discontinued operations in 1901. The salmon pack during the 1914 season was approximately 18,000 cases.

SARDINES.

California is the only part of the United States in which sardines are canned, as the true sardine is not obtainable outside of California waters. The center of this industry is Monterey Bay, where two plants are operated, midway between Monterey and Pacific Grove. The fish were formerly marketed as mackerel but later investigation proved that they are true sardines (sardinia caeruleus) and they are now labeled accordingly.

California sardines, which are enormous compared with the variety found in the Mediterranean waters, are packed in No. 1 flat oval sanitary cans. The cans are subjected to approximately an eight-minute exhaust at 212° F. and after sealing are cooked for sixty minutes at 240° F.

TUNA.

Tuna canning is the real infant branch of the industry in California, as the first commercial canning of this fish began in 1907 when approximately 500 cases were packed, and since the first successful season the demand for the temptingly delicate tuna fish has increased to such an extent that eleven plants, excluding a small Japanese factory on Magdalena Bay, Lower California, are now in operation during the season, while extensive enlargements are contemplated.

Although commonly known as tuna or tunny, the true name of this fish is albicore, a near relation of the tuna. Practically nothing is known of the natural habitat or characteristics of the albicore as it does not spawn in rivers after the manner of the salmon, but, except at certain brief seasons, disappears toward the open sea. As the commercial importance of this fish became recognized, the vital necessity for accurate information regarding its characteristics was impressed upon the Federal Govern-

ment by interested parties and investigations are now being conducted in conjunction with the University of California.

For the purposes of this article it may be stated that the albicore or tuna is found along the west coast of Central America and Lower California and comparatively small numbers go as far north along the coast of California as the Santa Barbara Islands. The seat of the tuna canning industry, however, is in San Diego and San Pedro (the sea port of Los Angeles), from which points the fishing boats put to sea. The fishing, and consequently the canning season, is usually about two weeks earlier in San Diego than in San Pedro, but the length of the season is approximately equal.

The tuna travels in large schools and the fish are extremely active and voracious. Fishing is carried on with open sail-boats and gasoline launches which cruise in the Santa Barbara Channel and in the open ocean. The fish are caught with short lines attached to stout bamboo poles and are beheaded and cleaned immediately, for if the blood is not drained from the body, the flavor of the meat is tainted and the fish rendered unfit for canning.

On arrival at the cannery, the fish are placed in perforated bottom steel baskets and subjected to a pre-cook in large rectangular cook boxes or retorts. The pre-cook or first process is for the purpose of softening the flesh and trying out the oil and is carried on for approximately two hours at a temperature of from 212° to 220° F. After the first process the fish is given a final cleaning, and the black meat is separated from the white. The latter is packed in sanitary cans containing 2 ounces of olive or cottonseed oil (preferably the latter) and one-half ounce of salt per No. 1 flat can; the cans are sealed and are then subjected to the final process in a closed retort for sixty minutes at 242° F. After the final cook the cans are washed, either in boiling lye or in a sawdust drum to remove the film of oil and after cooling they are ready for the warehouse.

The sanitary standard set by the tuna packers is unusually high. The white meat of the fish, which is not unlike breast of chicken, is the only part used for canning and the work of oiling and salting, in fact, all operations except the cleaning and packing are performed by continuous automatic machinery. The packing is done by lace capped, white uniformed girls, and in

general the tuna canneries are remarkable for their cleanliness and sanitary condition.

The annual pack of tuna has either doubled or tripled each year as shown in the following table and, as by-products are rapidly being developed, the prospect of a large increase in the tuna business is anticipated:

1907.....	500	cases (approximately)
1908.....	1500	"
1909.....	6000	"
1910.....	12000	"
1911.....	20000	"
1912.....	60000	"
1913.....	112000	"
1914.....	300000	"

MISCELLANEOUS.

In addition to the three varieties of fish referred to above, several specialties are packed in California to a limited extent. Experiments in canning shad-roe are being conducted on the lower Sacramento River, and a small plant near Pebble Beach in Monterey County has packed Abalone for several years.

In conclusion, it may be stated that the canning industry in California, is, as a whole, still in its infancy and every future indication points to a tremendous increase in the preservation of food products in this State.

CALIFORNIA GRAPE INDUSTRY.

Grape growing in California has reached a high state of efficiency. An official report of this industry for 1913 has recently been made public. There are 330,000 acres of growing vines in the State, this total includes 170,000 acres of wine grapes, 110,000 acres of raisin grapes and 50,000 acres of table grapes. Some of these vineyards would command $200 per acre, while some are considered to be worth a great deal more. At the conservative average of $200 per acre, these vineyards show a value of $66,000,000. There are 700 wineries, big and little, in the State, and their estimated value is $84,000,000.

CALIFORNIA'S RECORD.

The following statistics show the different articles shipped from the State in 1913 and to what extent:

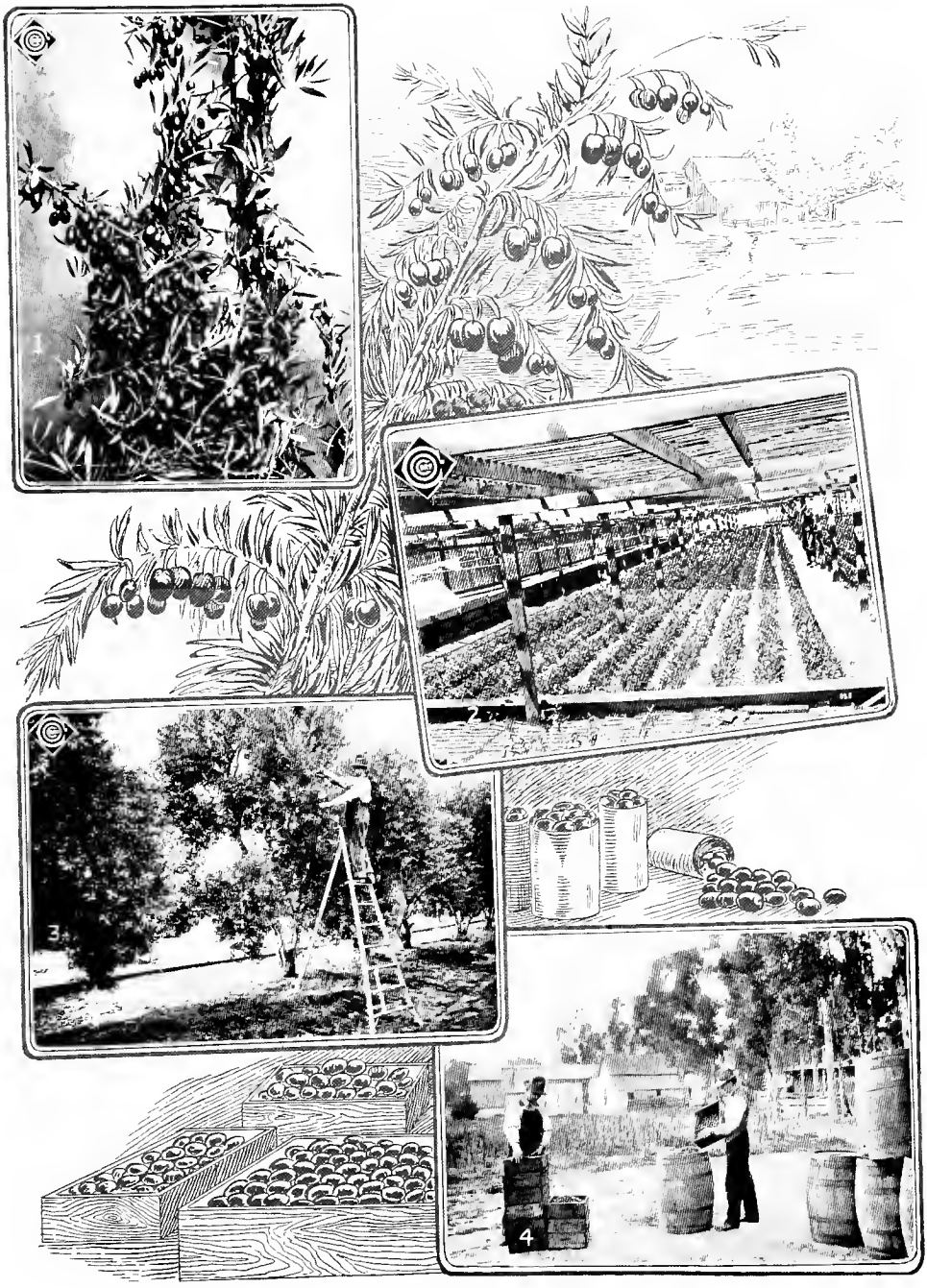
15,000 cars lumber, 10,000 cars wine, 4,000 cars codfish, 5,000 cars beans, 2,000 cars wool, 231 cars green cherries, 6,363 cars green grapes, 2,485 cars green pears, 470 cars green apricots, 1,000 cars green peaches, 3,250 cars raisins, 35,000 cars oranges, 800 cars almonds and English walnuts, 9,000 cars canned fruits, 1,000 cars green apples, 169 cars green apricots, 100 cars dried apples, 100 cars honey, 2,395 cars green peaches, 1,668 cars green plums, 200 cars green figs, 2,250 cars dried prunes, 4,000 cars green vegetables.

PRUNE CONSUMPTION.

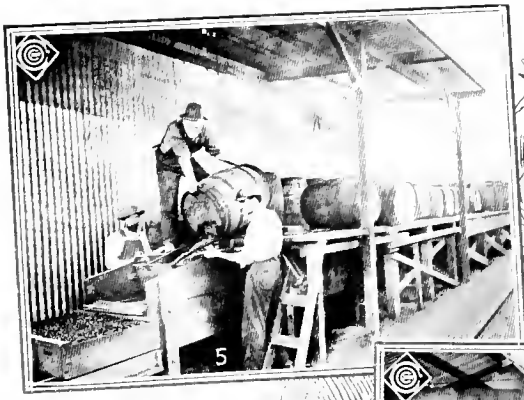
Prune consumption in the United States is estimated at an annual average of 112,000,000 pounds; annual exports for three years, 127,316 tons, an average of 42,438 tons per year. This year's crop has been seriously injured and present indications point to a very heavy shortage; some claim barely sufficient to meet home requirements. California leads the world.

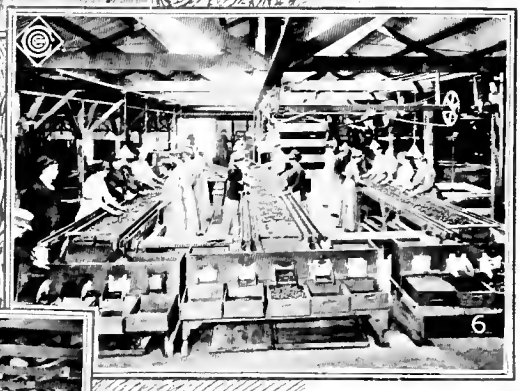
THE CALIFORNIA OLIVE INDUSTRY.

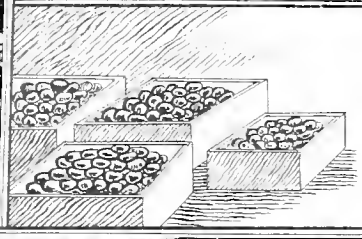
The olive-tree reproduces itself from the seed and from cuttings. The seedlings, however, do not come true to the parent tree

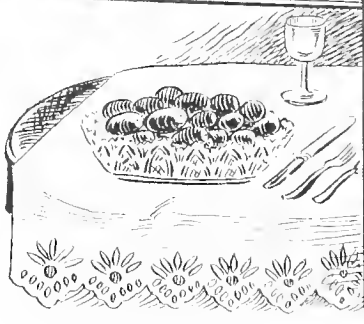


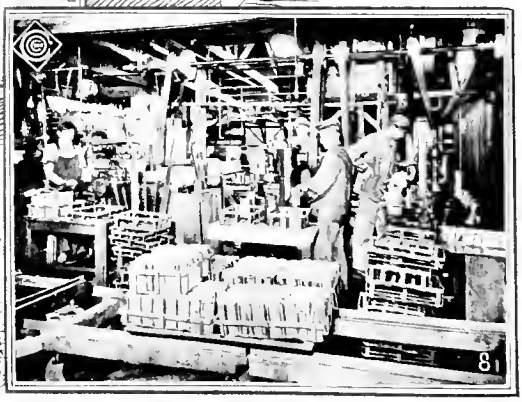
1 Olive Branches.
2 Olive Plants in Greenhouse.
3 Pruning Trees.
4 Filling Barrels for Shipping.











5 Emptying Filled Barrels.

6 Assorting Olives.

7 Olives Curing in Brine.

8 Ams Double Seamers in Curtis Olive Cannery.

—reverting to the wild or primitive type. These seedling trees must be budded or grafted to the desired variety. There are some eighty different varieties—five being used for Curtis ripe olives and the balance for olive oil.

The method of reproduction by cutting insures a tree of true variety. Three-inch cuttings are placed in hot sand beds, being heated underground by hot water pipes. This greatly aids quick and sure rooting. When well rooted they are transferred to the nursery and when two years or more old are set out. The lath roof on nursery is used in order to prevent scorching of tender shoots in the Summer, and as a support for canvas coverings in time of frosty weather, which would kill and curl the young growth. The olive is an evergreen tree and grows in North America only on the west coast between latitudes thirty and forty.

Nurseries are started about March first.

Olive orchards are started in April. The trees are set about thirty-five feet apart and are very often intersected with other crops to produce an income until the olive comes into bearing—six years after planting.

A modern California irrigating system is used. The water is lifted in the pump-house and through underground concrete pipes goes to several large reservoirs or standpipes. The water is then conducted through a system of underground pipes to outlets at the end of each row of trees. The water overflows into furrows and irrigates the trees. All California citrus groves are irrigated by the same method which greatly simplifies ploughing and harrowing inasmuch as there are no ditches or overground pipes to contend with.

Concerning the pruning of the olive, there has been less known in the past and more learned within the last few years than with any other branch of its culture. The olive by means of pruning, in California, is made to bear a good average crop of well-sized fruit each year, whereas in foreign countries the usual occurrence is a "bumper" crop of small fruit one year and a lighter crop of large-sized olives the succeeding season.

The olive is borne only on the two-year portion of the branches, which parts never again produce fruit. Pruning must therefore consist of the cutting away of a portion of the wood during a season of heavy new growth, and in stimulating the

growth of new wood (suckers) during a Spring that would otherwise produce little or no new wood. It is readily seen that pruning can regulate the annual growth of new wood on the branches which in turn two years later regulates the production of the fruit.

Expert pruning is an art. All dead wood is regularly removed and large branches at a time cut out to admit light and Summer heat, which will effectually remove from groves situated inland from the coast all black scale, the only pest affecting the olive in California. The twigs and small branches pruned off may be used as nursery stock. Pruning is done in the late Winter and early Spring. The closed season is from early March to October. During this period the trees are carefully cared for by cultivation, irrigation and fertilization; the plant is thoroughly overhauled, improved and repaired, the coming pack is sold on "futures."

The olive tree flower is star-shaped, creamish white with yellow center. It is very small—one-eighth to three-sixteenths inch in diameter—with a faint and pleasing odor. The leaves of the trees are long and slender, of a slightly glazed but somber green top, while the under side is covered with a velvety and silvery sheen. Different varieties of trees are known by the various leaves, some being wider and of different shades.

The first irrigating of the season is done just prior to the breaking of the buds. The water, of course, gives vitality and assists setting. The blossoms pollen profusely, and it has been noticed that a mixed variety grove will often produce better than one of a single species. Without doubt cross pollenation is a material agent. Little data is at this time available concerning this matter, yet numerous experiments are now being carried on, and it is hoped that the next few years will make possible a thorough understanding of this feature.

The fruit is now set and in a few of the earlier districts the trees appear with branches ladened. No mere photograph can do justice to the majestic beauty of a stately Mission olive-tree in the full grandeur of its bearing period. The fruit at first appearance from the blossom is of course green. In Europe, as it attains size, it is harvested in this immature condition and pickled. California, however, uses only thoroughly ripe and mature fruit in which the oil cells have fully developed.

Olive oil is a food supreme and is made solely from ripe olives. It would therefore appear quixotic to consider a green olive other than as an indigestible relish. In September and October the olive turns from its brighter emerald green to a straw green cast. Flakes of red soon appear, first on the side getting the most sunlight, until the whole olive has this red appearance. From this a purple shade is developed which eventually evolves into the deep purplish black of the thoroughly ripened fruit. The appearance of the tree may be imagined when it is considered that it holds fruit of all degrees of ripeness and naturally presents a color scheme bewildering yet at the same time harmonious.

The olive was introduced into California by the Franciscan Padres during the eighteenth century. The trees, brought either from Spain or Mexico, were planted around their early Mission, and have through the environment of favorable soil and climatic condition of California, evolved a variety called the "Mission." This olive has slightly different characteristics from any foreign variety and is particularly adapted to curing in its ripe state. Without doubt, were it to be transplanted to its native soil, it would revert to its original type.

Starting with its harvesting, the olive moves with machine-like rapidity. Care in picking is demanded of the grower. Men on the ladders must pick—not strip—a branch, they must place —not throw—the fruit into the picking bag. The slogan, "there is reason," is well known.

Three separate pickings are made in order to get fruit of the same degree of ripeness. An expert picker will harvest only about three hundred pounds of fruit in a day.

The best method is to deliver all fruit in water. Some packers handle olives over hundreds of miles, however, solely in boxes, on trucks, in wagons, on trains, etc. Every drop, jolt, or jar that an olive receives before its cure, leaves a bruise which will, after processing, develop fruit with soft spots.

Immediately after picking the grower transports the olives to a central portion of the grove where water is available. He fills a fifty-gallon barrel two-fifths full, and then proceeds to pour the fruit therein through the five-inch bung hole in the end. The fruit falls on a water cushion. Olives are filled to within two

inches of the top of the barrel. The remaining space is filled with liquid.

Usually sixty barrels of olives compose a car shipment. The barrels are stood on end in the car with the large five-inch bung end up. Also in this end of the barrel is a one-eighth-inch gimlet hole which is provided with a plug. At time of shipment this plug is removed, so that any changes in temperature or slight fermentation of the shipping solution will in no way affect the olive.

Even though ripe olives are delivered from an orchard not a mile distant from the plant "quality" demands that they be transported in solution by the barrel method. Dry fruit in boxes is accepted only for the purpose of expressing olive oil.

The barrels received are rolled to the edge of the unloading platform. The bung end is set immediately over a hopper filled with water. The end of the barrel is struck sharply with a bung starter, and the fruit, together with the shipping solution, quickly flows into the hopper. By sliding the hopper the olives and solution are poured into boxes. Fruit is allowed to drain in the boxes and is then weighed. It will be seen that everything possible is done to prevent a bruise—the water acts in every way as a cushion. A long fall and hard drop means soft olives.

One of the simpler operations is the weighing of the fruit. This is done on a platform-scale by the usual method of deducting tare from gross. For each delivery the grower is furnished with a ticket receipt showing number of barrels received and gross, tare, and net weight of the olives. A duplicate of this ticket is placed in the tin clip which follows each lot of fruit through all the remaining processes of the factory. This ticket also contains spaces for listing the entire chronology of the particular batch of olives. In the event of an unsatisfactory finished article the trouble can always be located by referring to the slip, as all information, even back to the grower, is obtainable.

Quality demands that no stems shall be found in the can. The first step within the factory is the stemming table and grader. The finding of several stems on opening a can of ripe olives is not a pleasant introduction to the consumer. Women are continuously employed in stemming. Nimble and skilled fingers rapidly pick the stems from the olives as they are slowly

carried by on the wide belt of the stemming table. A belt elevator takes the stemmed olives to the top of the grader.

The grader is built in several sections, each of which takes out a certain grade. This is accomplished by allowing all of the olives other than the largest size to fall through an accurately calipered aperture, and being then run over the next section (really another entire grader), which relieves the next smaller grade, and so on by this means the largest, heaviest and most likely to bruise is handled the least.

Each section of the grader is composed of highly-polished and accurately-turned steel shafting rolls which are set at the proper calipered space on either side of a small round belt which runs in a milled steel groove between the rolls. The rolls revolve away from the belt which give the olive a twisting or turning motion. The belt pulls the olive along the length of the rolls, giving it every opportunity in its twisting movement to fall through between the belt and rolls. Provided it is not of sufficient size to fulfil the requirements of the particular grade being taken out in that section, it is carried to the next.

Although through numerous experiments it has been able to develop a mechanical contrivance to accurately grade and select the olive as far as size is concerned, still no genius has ever yet in the least been successful in evolving a mechanical selection for color, degree of ripeness and culls. Each size and variety of olive requires a varying treatment in its cure. For instance a black, thoroughly ripe olive and one inclined to be soft cannot take the same heavy treatment in the curing that will be given a red to purple olive of crisp texture. This means a large addition to the costs, as separating the different kinds is made necessary.

The three principal sizes of olives are delivered by the grader to each of the three wide belts. From these moving belts the women pick the variously colored olives and place them on the small side belts. Some are selecting black fruit and others cull out flawed olives. A harmonious and uniform result, both with respect to size and color, is being delivered to the boxes. Here each size and kind is reweighed, the total being checked against the weight of the entire lot, as first listed on the batch ticket. Any error is therefore impossible.

After sorting, olives of one particular size and kind are placed in the concrete curing vats. A new tag for each assortment of the original lot contains as usual the grower's name, lot number, date of delivery, number of pounds, and spaces for its entire processing record. The raw ripe fruit is full of tannic acid and is consequently bitter—much like quinine. The standing joke at an olive cannery is to induce the visitor to sample the uncured fruit.

The olives are cured in various brine solutions which eventually relieve them of the acid and develop that delicious and zestful piquancy known only to the patron of the California ripe olive.

Quality is produced by scientific and experienced men. The best salt dissolved in the purest of water, brought from nearby mountains, is used. The curing process consumes from eighteen to thirty-five days, according to the varying condition of the fruit.

Every batch is inspected and treated twice daily. The curing department is composed of vats which are used several times each season. After passing through these channels the olives finally reach the packing room, where they are filled in bottles, small cans and up to five-gallon cans. Ams double seamers are used in sealing hermetically a perfect and tight double seam. No solder, acid or heat is required in the sealing operation.

THE TUNA FAMILY.

The California leaping tuna is famous the world over. There is scarcely a fisherman of note anywhere who has not at one time or other journeyed to the little island city of Avalon, Catalina Island, California, to engage in the wonderful sport provided by this gamest of fish. It will battle for hours before it can be brought to gaff, and great skill and care is required in playing the big fellow.

But this fighting, leaping tuna is not plentiful and is not particularly good eating. It is his cousin, the long fin tuna, that is so good to eat and is found in such large quantities off the southern coast of California. While the long fin tuna will put up a good fight for a short time, little difficulty is found in catching them in large quantities. They travel in big schools and take the bait as fast as you can throw it overboard. They live in deep water and come to the surface only when the weather is mild.

FISHING FOR TUNA.

In the early summer, fleets of small power-boats start out from various points along the Southern California sea-coast and are busy well into the fall supplying the canneries of the California Tuna Packers' Association. There are fully one hundred of these sturdy little fishing boats engaged in the tuna industry. The boats are all operated under their own power and carry from three to five fishermen. They are well built and seaworthy crafts and journey from five to fifty miles offcoast in search of the schools of tuna. When the fishing is good they will bring in as much as five tons in one boat; at other times they will scour the ocean for days and return without a fish.

The fish are all caught with hook and line—no seines are used as the long fin tuna is much too large and powerful. They weigh as much as seventy-five pounds, though the average is about twenty-five pounds, and they are extremely active and rush through the water at a terrific speed.

PREPARING TUNA MEAT.

The fish are cleaned as soon as caught and are brought in each night fresh and sweet. On their arrival at the cannery they

are thoroughly washed with salt water. They are then packed in clean trays and loaded on iron racks which are rolled into big steel cookers. These cookers are equipped with temperature gauges and the heat is kept at just the right point until the fish have been thoroughly and properly cooked.

After the fish are taken from the cookers, the process of elimination begins. When the skin, bones and dark meat have been separated from the white, delicately flavored tenderloin, 53% has been discarded. It is only this white tenderloin that is packed by the California Tuna Packers' Association. The dark meat, skin, bones, and other waste material is disposed of as various by-products. By this elimination of all waste matter, California tuna becomes the most economical as well as the choicest canned fish on the market.

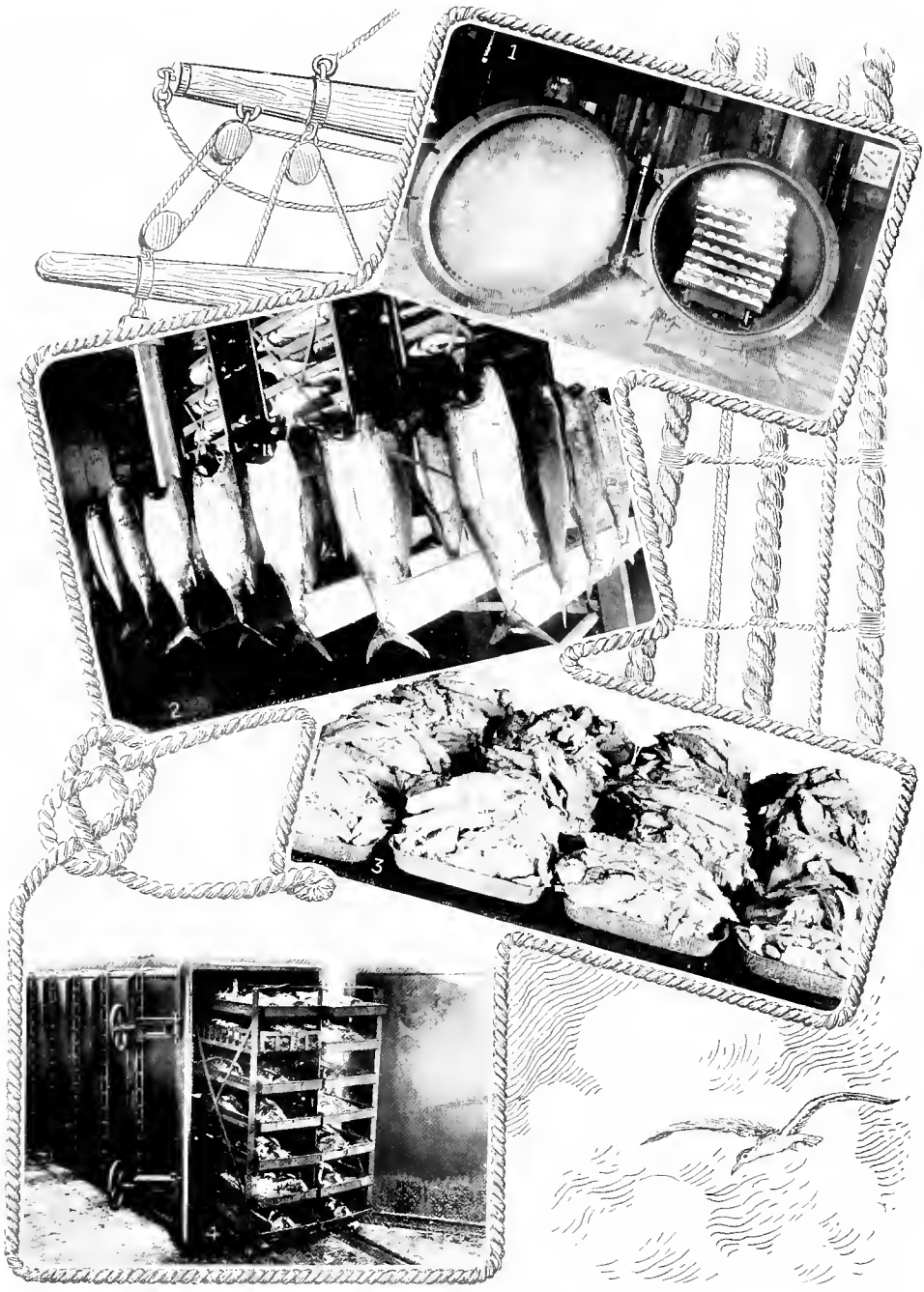
PACKING THE COOKED MEAT.

The white tuna meat resembles breast of chicken or turkey more than anything else—both in flavor and appearance. It is carefully packed with oil in sanitary tins. After the tins are sealed they are placed in a large steel retort and again cooked with steam to insure thorough sterilization. After passing through this process, the perfect tins are stacked and held from two to six weeks before being given a final test and inspection which will make it certain that, whenever the can is opened, the tuna meat will be found sweet and wholesome.

The surroundings under which tuna packing is carried on by members of the California Tuna Packers' Association are absolutely sanitary. Tables and floors are constantly washed and scoured and kept spotlessly clean.

HOW TO SERVE TUNA.

When the tuna has passed through all the various processes of preparation and has been finally delivered to the ultimate consumer, it is ready to serve. All that need be done is to empty it from the can into a clean platter, garnish with lettuce leaves and slices of lemon and you have prepared a tempting, nourishing dish at a minimum of cost and effort. Made up as a salad it rivals chicken and is such an excellent substitute that very few people can tell the difference.



1 Retorts.
2 The Tuna.
3 Tuna Tenderloins.
4 The Cooker.

5 Los Angeles Tuna Co. employees.

6 Canning Tuna.

7 Pacific Tuna Canning Co.

8 The Pride of California.

Tuna is delicious served cold in salads, sandwiches, etc., it is ideal for lunches, picnics, suppers and teas where you want something very good but very easily and quickly served. Yet it will be enjoyed most as a regular dinner dish. With very little effort it can be prepared in a great variety of appetizing dishes such as tuna loaf, creamed-on-toast, escalloped, fish cutlets, fish cakes, croquettes, etc., etc.

THE ECONOMY OF TUNA.

Canned tuna has no equal. All the bone and waste is eliminated. It requires much less fuel and labor to prepare, even in the most elaborate dishes.

Its exceptional merit and many unusual qualities already mentioned have made it immediately popular wherever it has been introduced. Tuna is a real California treat with merit that appeals to everyone—those who eat to live as well as those who live to eat.

THE TUNA INDUSTRY.

The packing of California tuna has become an industry of national importance in a very few years. In less than six years its seasonal output has grown to more than 200,000 cases. One of the chief markets lies across the continent in the North Atlantic States, where they have been brought up on fish and know good sea-food when they taste it.

The California Tuna Packers' Association has been formed only to regulate the standard of quality of the tuna sent out by California to the markets of the world. Its aim is to enforce a rigid inspection of all tuna put up by members of the association and to label all tuna that has successfully passed this inspection with the association seal, so the jobber, dealer and consumer will know it is safe to handle and buy this tuna because the association seal guarantees its purity and high quality.

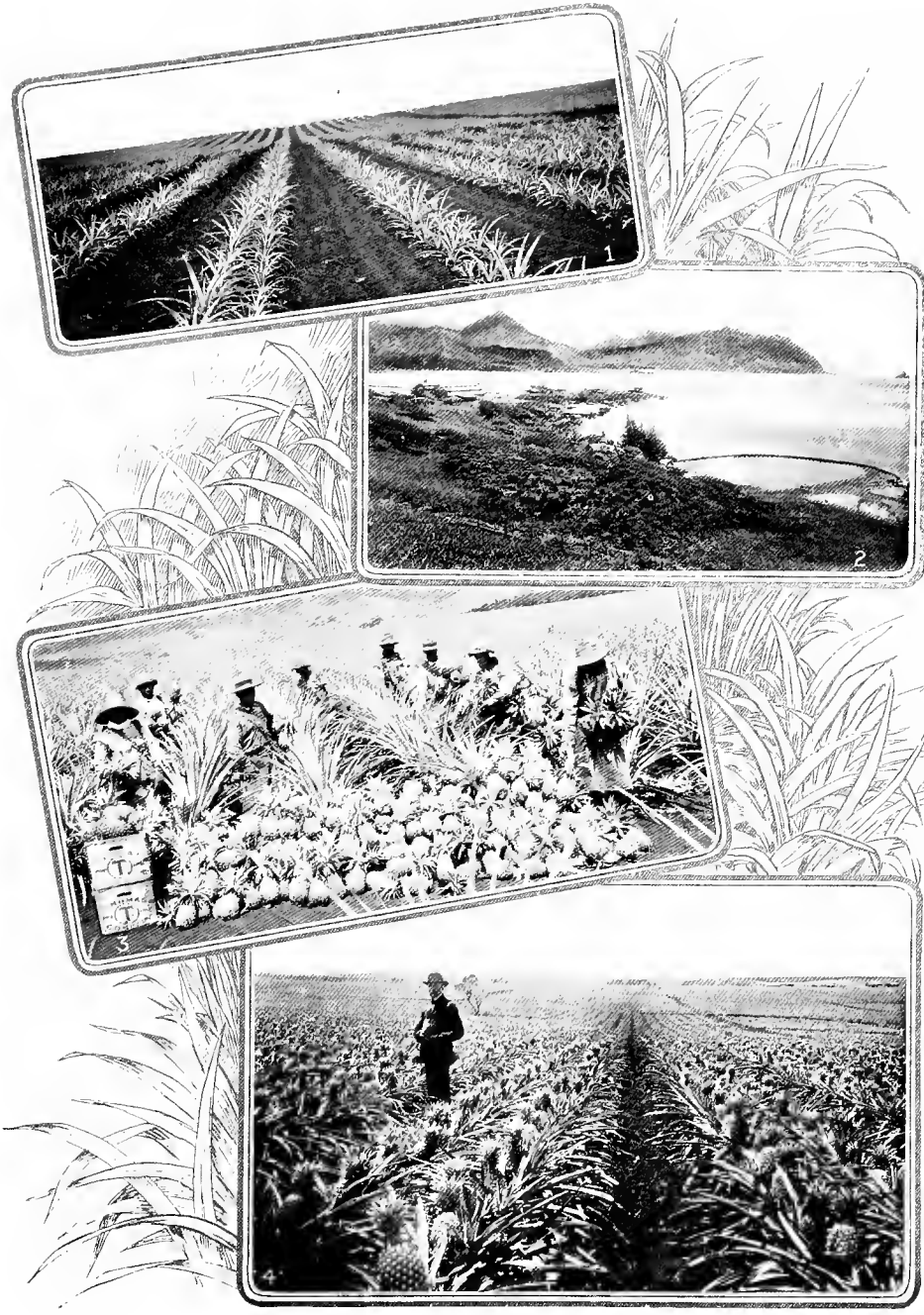
THE HAWAIIAN PINEAPPLE INDUSTRY.

The pineapple is supposed to be a native of Brazil, whence it passed to other parts of tropical America, including the West Indies, and more lately to parts of Africa and Asia.

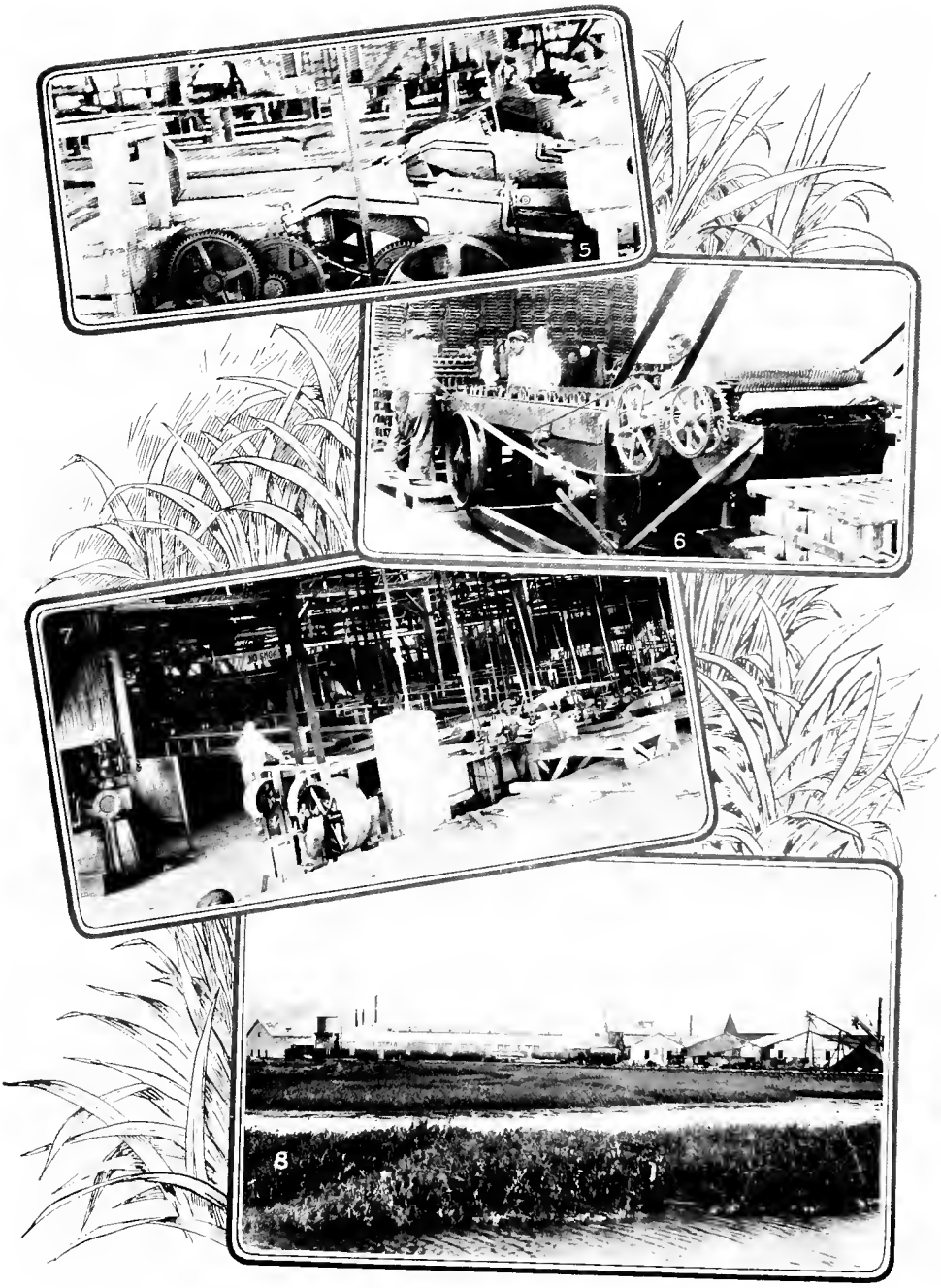
It became known to Europeans about the middle of the sixteenth century. We hear of it in England a hundred years later, some having been sent as a present to Cromwell, and in 1661 it was served at a banquet given by Charles II. In 1718 the cultivation of pineapples was first successfully established in England, in the garden of Sir M. Decker, of Richmond, Surrey. The plants were grown in pits heated with bark, and watered with tepid water.

The development of the pineapple industry is one of the most remarkable in the history of the Hawaiian Islands. In 1906 the value of canned pineapple shipped to the mainland of the United States from Hawaii was $250,990. This has grown in eight years to an estimated value of over $6,000,000 for a pack of 2,250,000 cases.

In planting pineapples the land is first plowed two or three times, harrowed and disced until the soil is in perfect tilth, then the fields are laid out in blocks 200 to 300 feet wide and of varying lengths, with a wagon road and drain ditch around each block. These blocks of land are then furrowed with small plows. Some planters make rows four feet apart and set plants two feet apart in the row. Others plant two rows with twelve to sixteen inches between, then a space of six to seven feet, two more rows, and so on. By the latter method there is always room to run a horse cultivator without injuring the plants, and about the same number of plants can be set to the acre—about 5,000. For eighteen months after planting the only attention the pineapple plant requires is frequent hoeing and cultivating to keep the land free from weeds and the soil loose and moist. The lands devoted to pineapple culture in the Hawaiian Islands have an annual rainfall of from fifty to eighty inches, well distributed throughout the year.



1 Pineapple 6 weeks old.
2 Pineapple Cannery, Libby McNeil & Libby.
3 Pineapple pickers.
4 Field ready for picking.



5, 6, 7 Machinery for preparing and labeling pineapples.
8 Hawaiian Pine Apple Cannery.

The pineapple harvest begins the latter part of June and ends about the first of October, though the bulk of the crop ripens in July and August. A few pineapples for table purposes may be found any month in the year. There are about 24,000 acres of land used in the cultivation of pineapples in the Hawaiian Islands, 20,000 of which are on the Island of Oahu. As there is never any frost in the Hawaiian Islands, and no serious insect pests, the crop is a very sure one.

The fruit is received at the canneries the same day it is picked, having been left on the plant until fully ripe, since the pineapple receives its sugar from starch in the stock of the plant which is converted to sugar and drawn into the fruit during the last days of ripening. The operation of canning is simple, quick and sanitary. The crown of the fruit is cut off in the field and when the fruit arrives at the cannery it passes into a machine which first cuts off both ends, then takes out the core and removes the rind, leaving the pineapple a perfect cylinder, slightly smaller in diameter than the tin in which it is to be packed. The fruit is then conveyed to a slicing machine which slices the whole pineapple at one operation, making every slice the same thickness. From the slicer the fruit passes on to a moving belt which carries it past a line of packers who select the perfect slices for the first grade, slices which are not perfect going into the second grade and the broken slices are made into grated.

The sanitary can is very necessary for the successful canning of the pineapple, and is the only kind used in Hawaii, as a can with a full open top is required to pack the slices to the best advantage.

From the packing table the tins are conveyed to syrup machines where a syrup of clear water and granulated cane-sugar is put over the fruit, thence to the exhaust box and double seamer. After the cover is on the tin the fruit is given a cook varying from fifteen to thirty minutes.

There are nine canneries in the Hawaiian Islands. They can nothing but pineapples and are modern in every particular, using all the latest devices for economy and efficiency.

The pineapple pack in Hawaii this season is expected to reach 2,250,000 cases. Canning pineapples was begun there only

in 1900, and the rapid progress since that year is shown in the following records of cases packed:

1901	2,000
1902	6,000
1903	9,800
1904	25,500
1905	51,300
1906	84,300
1907	186,300
1908	410,000
1909	498,000
1910	625,000
1911	751,000
1912	1,200,000
1913	1,500,000
1914 (estimated)	2,250,000

This rapidly increasing output has been readily absorbed in the United States until the past season.

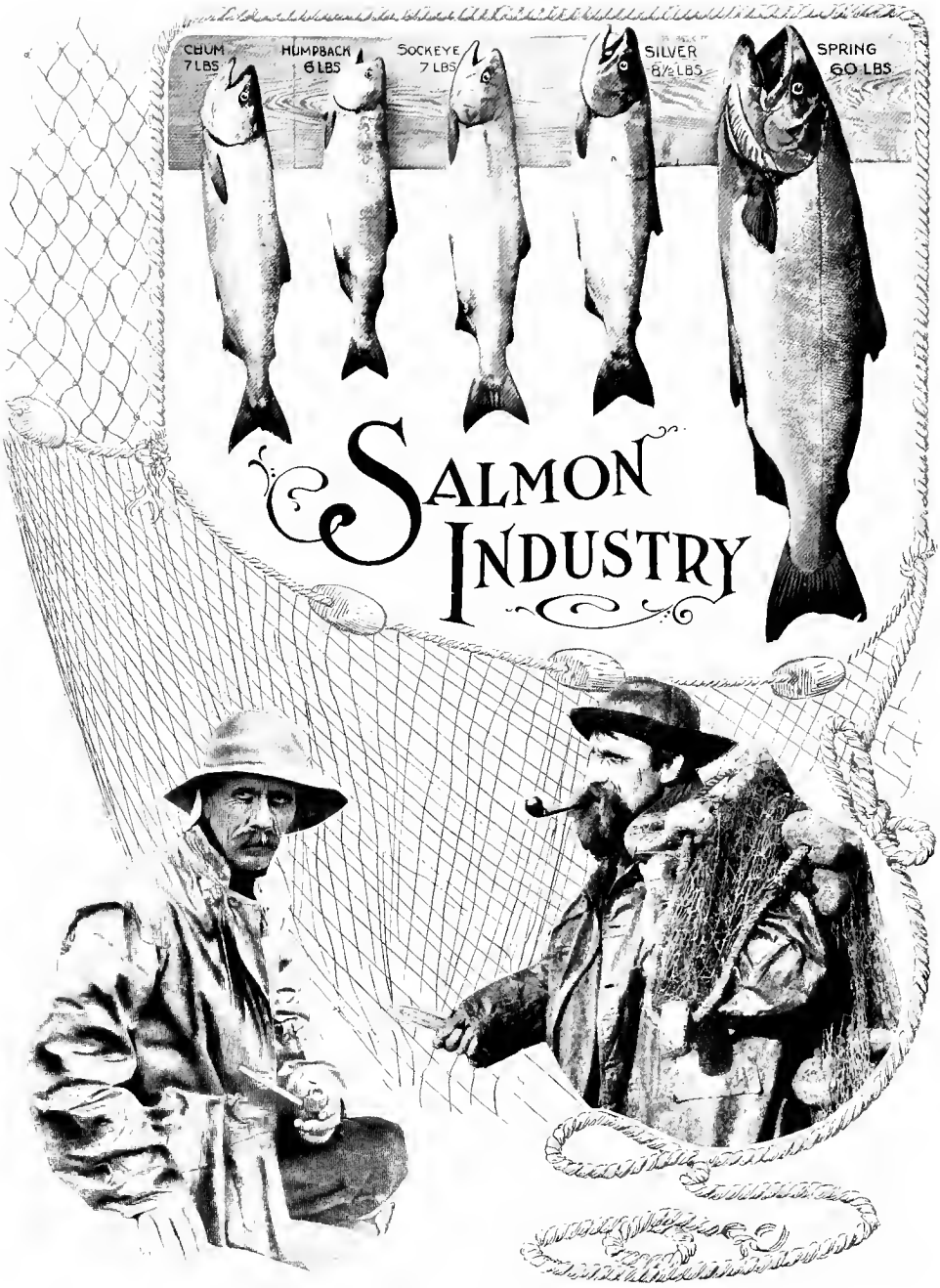
SALMON CANNING—AN INDUSTRIAL ROMANCE

by

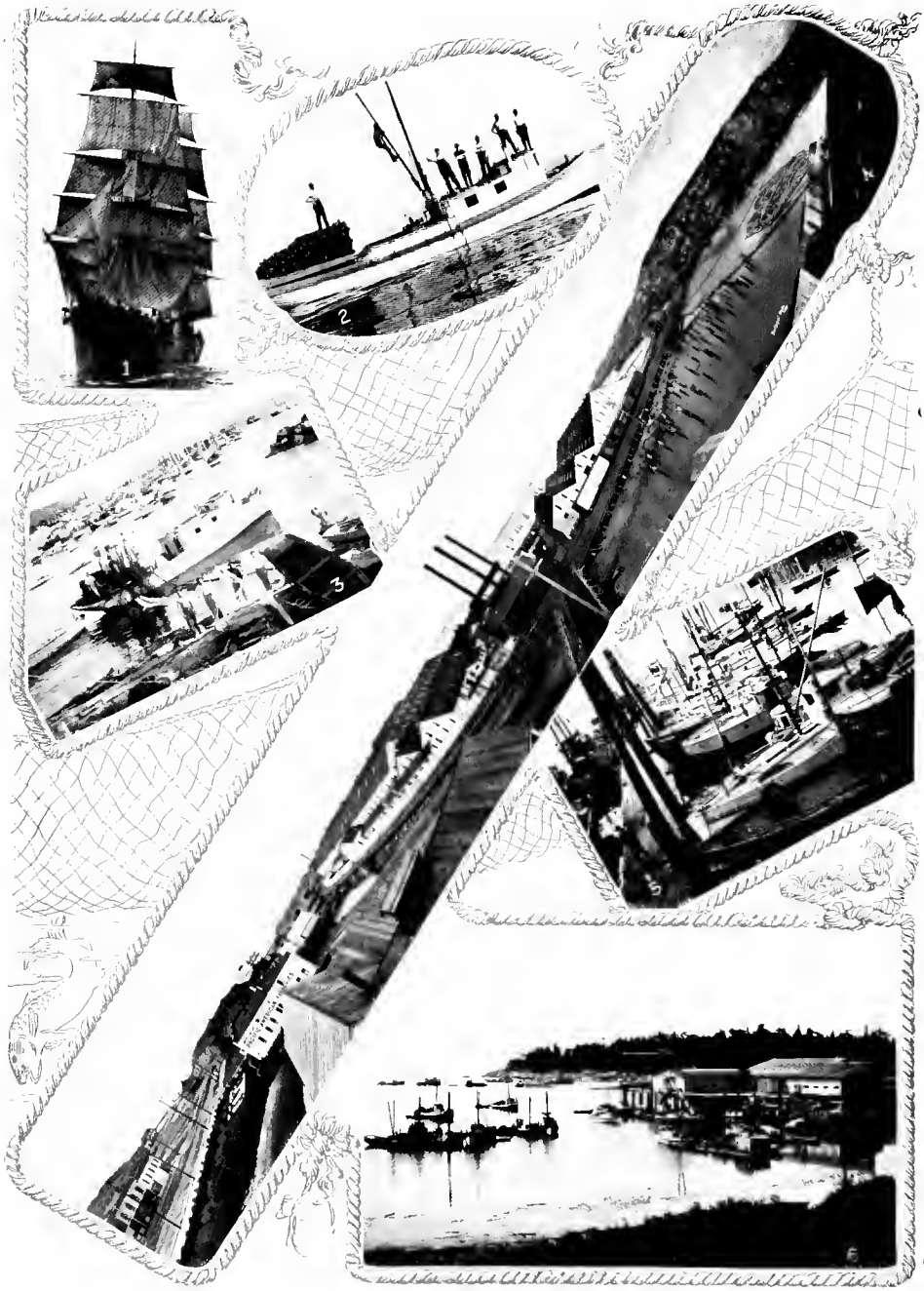
Miller Freeman, Publisher *Pacific Fisherman.*

"No, don't give me beef. Some of that salmon. You've no idea how I've thirsted and hungered for some nice tinned salmon. To my mind there's nothing so tasty."

—The Adventures of Captain Kettle.



Simply Types



1 Cannery ship "St. Paul" Northwestern Fisheries Co.

2 Typical Puget Sound Purse Seine Boat.

3 One Division of Puget Sound Purse Seine Fleet at anchor, Kanaka Bay, Wash.

4 Largest Salmon Cannery in World-Pacific American Fisheries, Bellingham, Wash.

5 Fishing Vessel at Public Landing.

6 Hodgson & Grahame Cannery, Richardson, Wash.

THE SALMON CANNING INDUSTRY

The life history of the Pacific salmon and the story of the conception and growth of the gigantic manufacturing business founded upon its great periodic runs, make up a narrative whose cold facts ring like fiction, and through which runs the bright thread of human interest.

Salmon are unique among the creatures which swim the sea. Born in the sandy upper reaches of streams which flow to the Pacific, they migrate oceanward in early youth, disappearing from all haunts of fish as known to man. At the expiration of a definite life cycle, ranging from two to six or seven years according to the species, the mature fish leave their mysterious abode in the bosom of the ocean. Returning to the streams, they fight their way through rapids and over waterfalls responding at any cost to the inexorable call of the creative instinct until they have reached the spawning grounds miles from tidewater. With the execution of the procreative act, the salmon dies, stern nature having decreed that when the seeds of a new generation have been sown, the old shall cease to be.

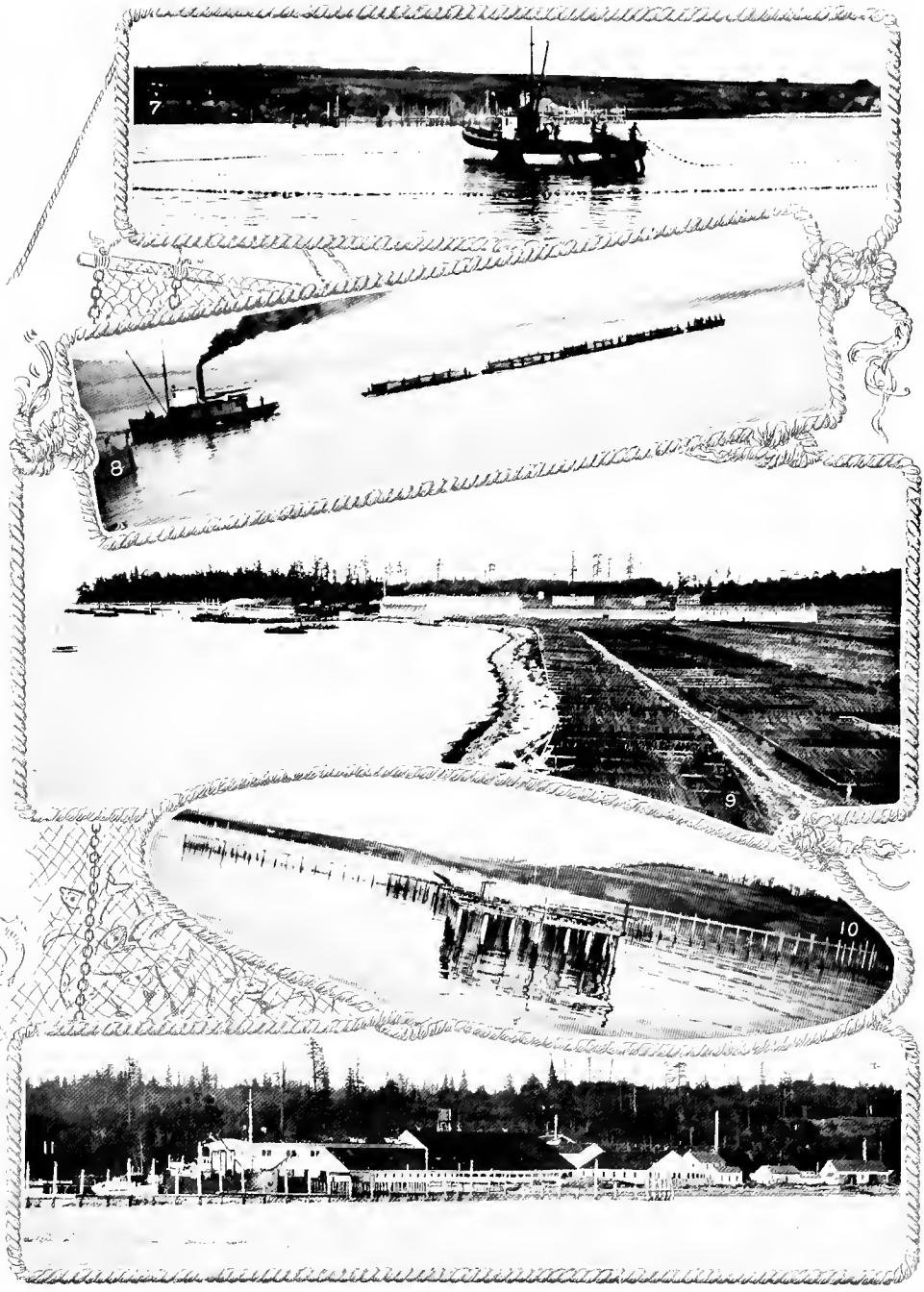
There are five distinct species of Pacific salmon, members of the same scientific family, but varying greatly in size, general appearance and texture and color of the flesh. These species are according to accepted nomenclature: the Chinook, known also as the King in Alaska, the Spring on Puget Sound, and the Quinnat in California; the Red, known on Puget Sound as the Sockeye and in the Columbia River as the Blueback; the Coho or Silver, better known under the trade name as medium red; the Pink and the Keta. Although approximately the same in food value, differences in color and appearance have caused some of the species to be prized above the others by consumers. The order in which they appear above represents approximately their relative market value.

Strange to say, California, now the least important canned salmon producer of the coast states, was the cradle of the industry. That the decline of the industry there was not due to the fact that fishing operations have been carried on their longest time will be seen later.

The founders of the business were G. W. and William Hume and Andrew S. Hapgood, Maine men who had settled on the western coast early in the sixties. Under the firm name Hapgood, Hume & Co., the first cannery was established and operated in 1864 at Washington, Yolo County, California. The idea of canning the fish, which then swarmed the Sacramento, seems to have first occurred to the Humes who were fishermen. Hapgood had previously been engaged in lobster canning on the Atlantic coast and was taken in because of his practical experience as a canner. The plant was built upon a scow moored near the river bank.

The first pack of 2,000 cases was made laboriously by hand, employing only the crudest methods. The late R. D. Hume, of the original firm, describes in detail the first operations. A comparison of salmon canning as described by Mr. Hume with the present day operations as outlined later in this article will show more clearly than words the forward strides which have been made. Mr. Hume says:

> Before the arrival of Mr. Hapgood (from Maine) the Hume brothers had purchased a large scow, on which they proposed to do the canning of salmon, and had added an extension to the cabin 18 by 24 feet in area, to be used as a can-making shop. This had a shed on the side next to the river for holding any cans that might be made in advance of the packing season. A few days after the arrival of Mr. Hapgood (March 23, 1864), the tools and machinery were packed and put in position. Mr. Hapgood made some stovepiping and two or three sheet-iron fire-pots, and in a short time was ready for can-making. The following list of tools and machinery will show how primitive our facilities were as compared with present methods. One screw hand-press, one set cast-iron top dies, one set cast-iron bottom dies, one pair squaring shears, one pair rotary shears, one pair bench shears, one pair hand shears or snips, one pair 24-inch rolls, one anvil (weight 50 pounds) one forging hammer, one tinner's hammer, one set punches for making stovepipe, one rivet set, one grooving set, two iron slabs grooved on one side to mold strips of solder, one iron clamp to hold bodies of cans while soldering the seams, one triangular piece of cast-iron about three-eighths of an inch in thickness and six inches in length, with a wooden handle attached to the apex, also used for holding can bodies in place while being seamed.
>
> The process of canning was as follows: The bodies of the cans were first cut to proper size by the squaring shears, a line was then scribed with a gauge three-sixteenths of an inch from one edge, and they were next formed into cylindrical shape by the rolls. They were then taken to the soldering bench, and one edge lapped by the other until the edge met the line that had been scribed and fastened there by being soldered a small part of the length to hold them in place for the further purpose of seaming. They were then placed either in the iron clamp, which



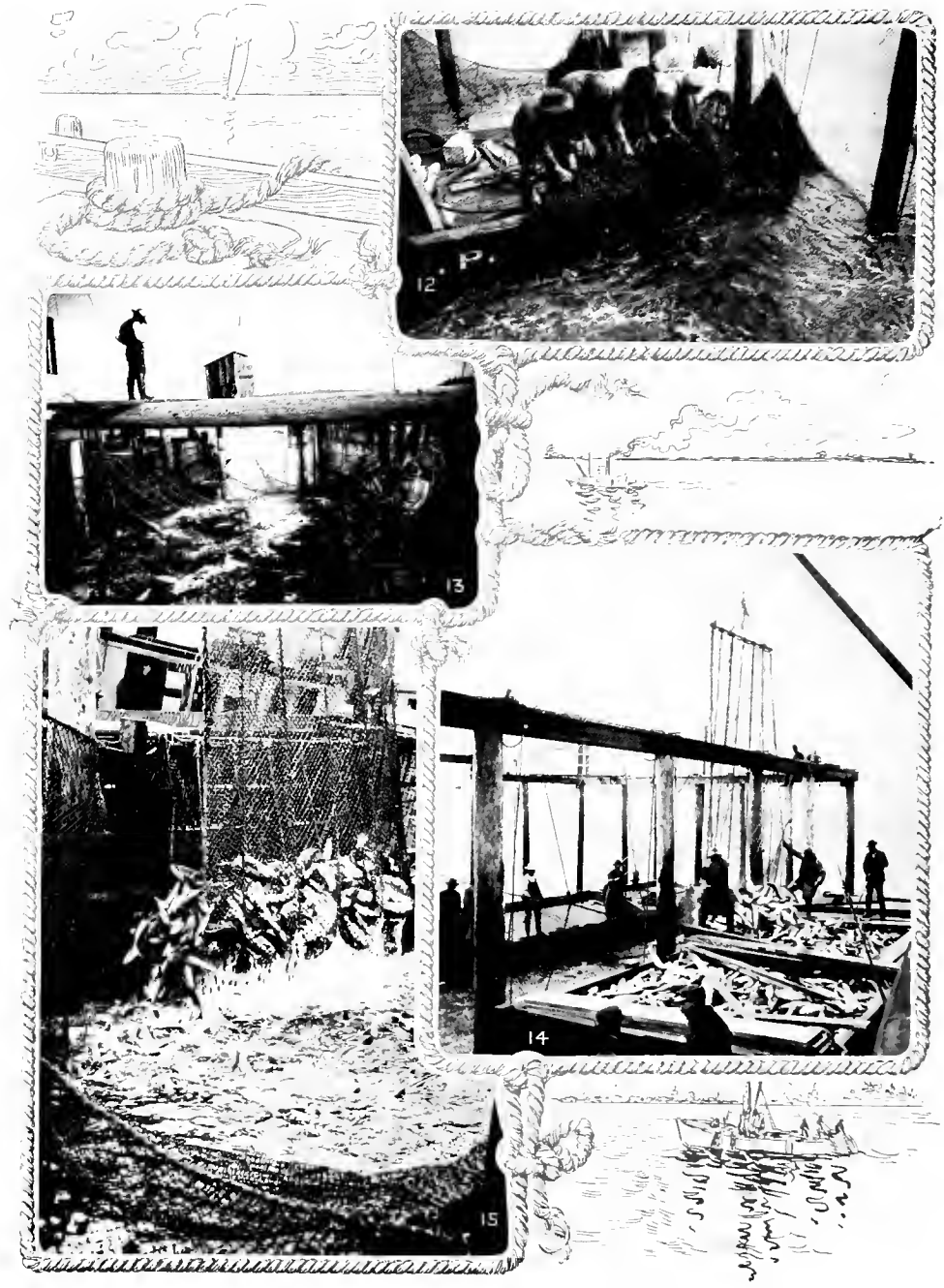
7 A purse seiner in operation.

8 Towing 30,000 sockeye salmon to the cannery.

9 Net drying yards of a P. S. cannery.

10 A typical salmon trap.

11 Carlisle Packing Co., Village Point, Wash.

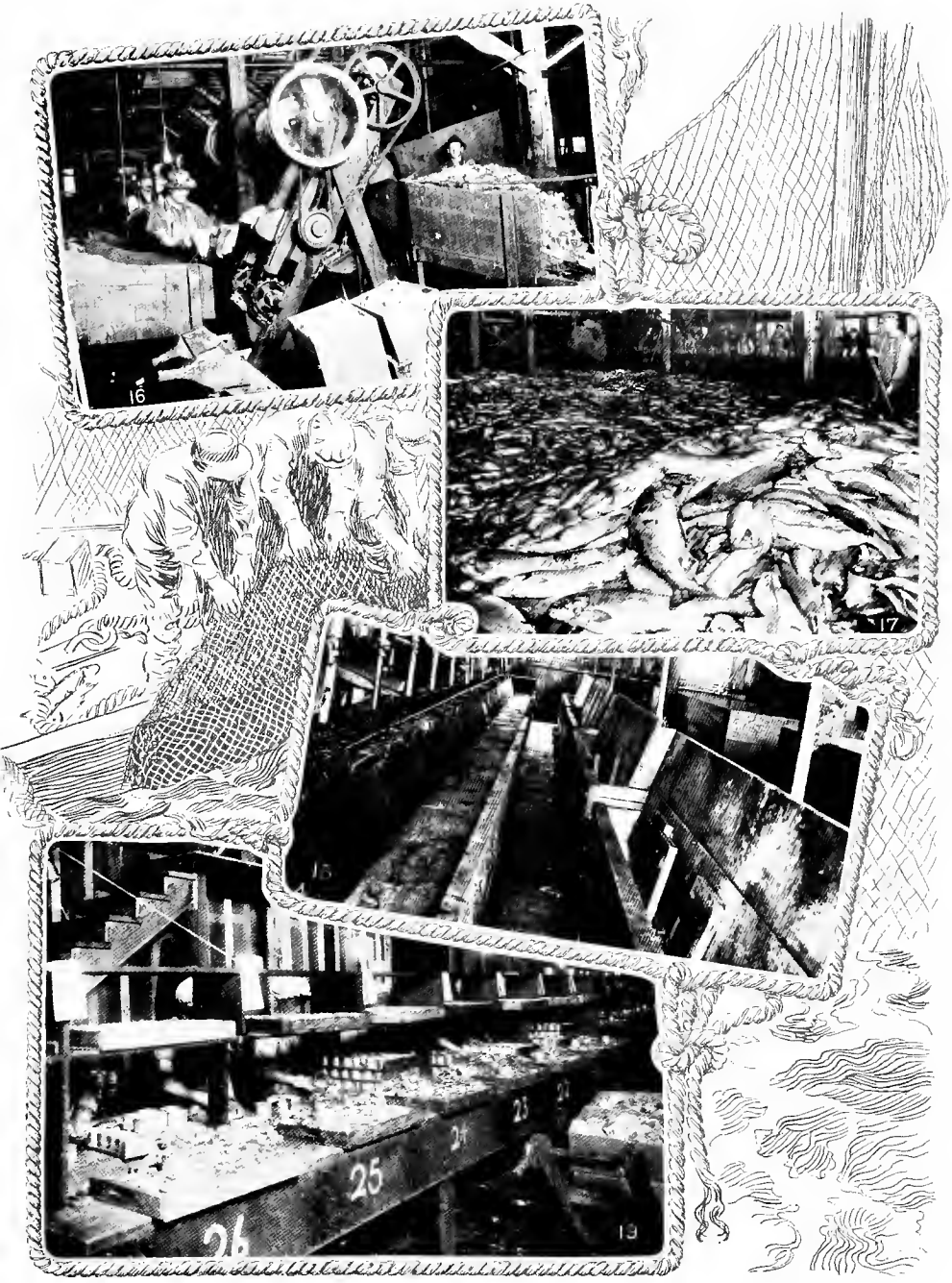


12 Brailing a salmon trap.

13 Hoisting the trap.

14 Emptying trap into boat.

15 Hoisting fish out of trap.

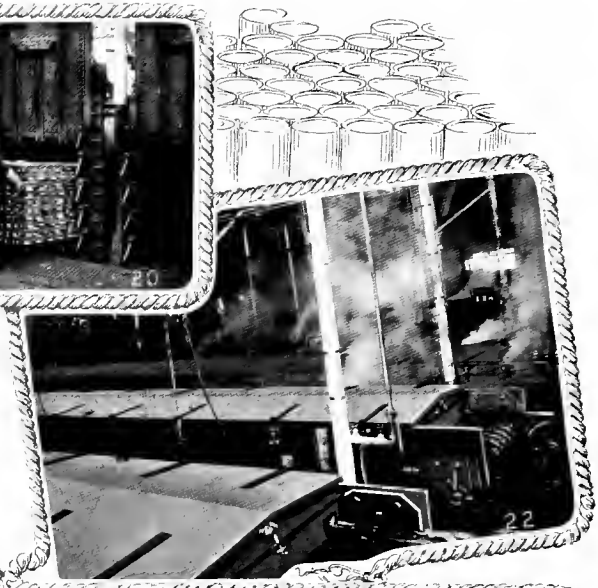


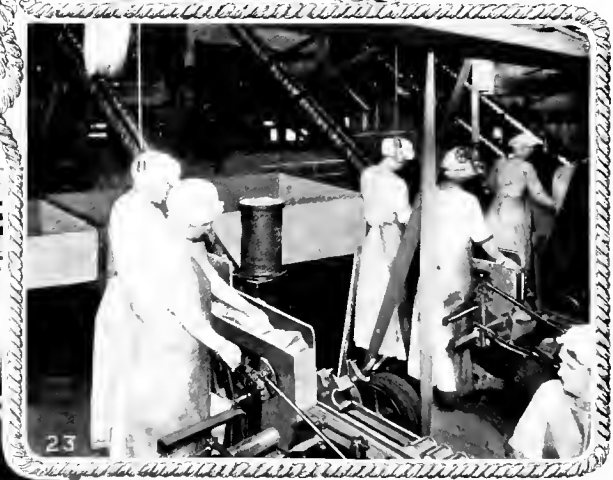
16 Gang knives cutting salmon to fit cans.

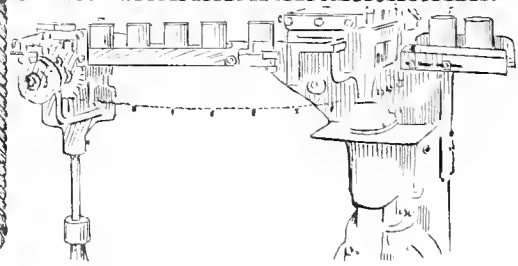
17 40,000 salmon ready for the Iron Chink.

18 Dressing stalls where fish are washed.

19 Filling cans.







20 Loading the retorts.
22 Exhaust boxes.
23 Machine fillers.
24 Gang knives.
21 The late Geo. T. Myers.

had a piece of wood attached to its under side, and held firmly, the clamp being closed by the operation of a treadle, or were slipped on a piece of wood, which was bolted to the bench, while being held in place by the triangular hand seamer, which was pressed down on the lap of the seam by the left hand of the operator. When this had been done a piece of solder, which had been prepared by shaking in a can together with rosin, was placed on the seam and melted and rubbed lengtbwise of the seam. After cooling the bodies were ready for the end or bottom, which operation was brought about by first cutting out circular blanks with the rotary shears, and then placing them in the cast-iron die, and bringing the handle of the screw press around with a swing with force enough to form up the end or bottom. In this operation there were many difficulties, as the ends or bottoms would many times stick to the upper part of the die and refuse to come off, and finger nails were pretty short in those days. To get the ends out of the lower part of the die was not so bad, as a wooden plunger operated by a treadle knocked them out, but sometimes they were in pretty bad shape. When the bottoms or ends were ready they were slipped on the bodies, and the edge of the bottom rolled about in a pan of powdered rosin until the seam was well dusted. A piece of solder similar in size and preparation as used for the side seam was placed in the can. They were then placed on the smooth side of the cast-iron slabs, and the operator, with a hot soldering copper shaped to fit the circle of the can, melted the solder and, by turning the can rapidly, soldered the full circumference. The output of this can factory was very imperfect, as at least one-half of the seams burst, owing to lack of experience of the manager or want of good judgment.

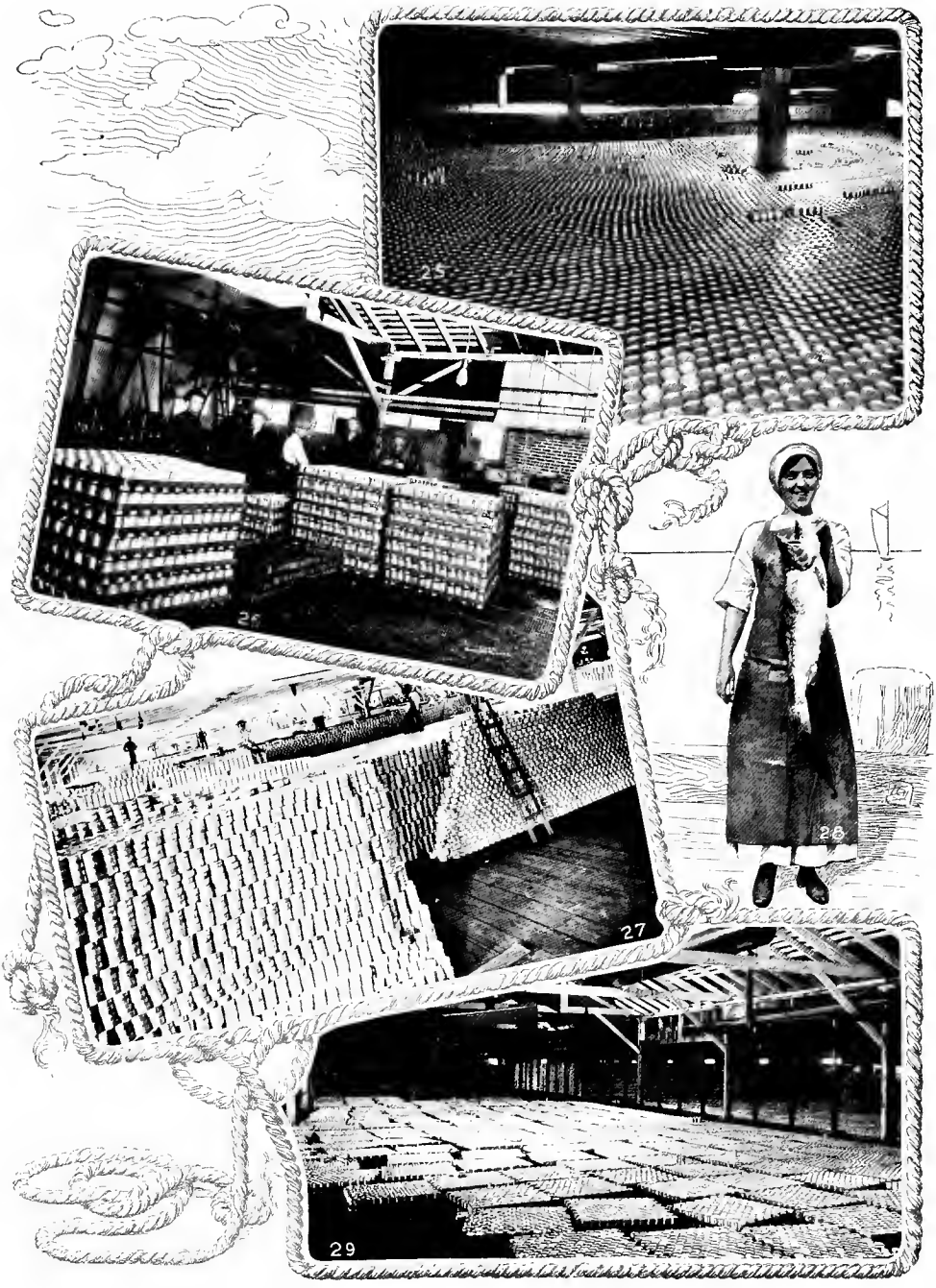
When the can-making was well under way Mr. Hapgood then turned his attention to getting the apparatus for canning on board the house-boat. This in the cooking department consisted of a kettle made of boiler iron about 36 inches in diameter and 5 feet in depth, set in a brick furnace and fired from underneath. Alongside was a round bottom, cast-iron pot holding about 60 gallons of water and heated in the same manner. These kettles with a dozen coolers or circular sheet-iron pans with ropes attached and with holes cut in the bottoms for drainage, a set of 5-inch blocks and tackle, with a sheet-iron fire-pot and a scratch awl, completed the bathroom outfit. The can filling and soldering room was furnished with a table through the center, where cutting the salmon in pieces to suit and the filling of the cans was done. On each side of the room there was a bench running the full length, on the end of one of which the cans were placed to receive the pickle, which was used at that time instead of the small quantity of salt that is placed in the cans during the operations of these later days. After the salmon had been cleaned by removing the entrails and washing them outside the covered portion of the scow, they were brought inside and placed on the table, and a man with a butcher knife in one hand and a stick in the other, which had a mark showing the length of the pieces desired, cut gashes in the side of the salmon as a guide, and then cut the fish into sections corresponding to the length of the mark on the stick. He then proceeded to cut the sections in pieces to suit the cans. Then three or four operators placed the salmons in the cans and shoved them along the table to where a boy wiped the top edge and passed them along to two others who placed tops which fitted inside of the rim. The cans were then taken in wooden trays to the bench opposite the starting point,

which was fitted with four sheet-iron pots, and at the one nearest the entrance to the house on the scow a man put a soldering flux on the top edge, which was made by adding zinc to muriatic acid, and then with a pointed soldering copper and a stick of solder melted the solder until a small portion could be drawn around the groove formed by the edge of the can and the bevel of the top. From there the cans were taken to the other parts of the bench, where two men finished soldering the head in, and then taken to the third man, who soldered, or, as it was called, buttoned the end of the seam lap. The cooking department or bathroom, as it was called, was separated from the filling and soldering room by a partition. The cans were shoved through a hole in the partition.

At this time the process was a secret. Mr. Hapgood did the cooking and all the work done inside, no one but a member of the firm being allowed to go in. This privacy was continued until the firm moved to the Columbia River, and, the labor becoming too arduous for Mr. Hapgood to perform alone, a boy by the name of Charlie Taylor was taken in as an assistant. * * *

But to return to the original proposition: When the filled cans had been soldered and entered the bathroom they were put in the coolers and lowered into the cast-iron pot, one cooler of cans being cooked at a time. The cooler was lowered into the boiling fresh water until the cans were submerged to within one inch of the top ends and left to cook for one hour; then they were hoisted out and the vent-holes in the center of the top soldered up, after which they were dumped into the boiler-iron kettle, which held a solution of salt and water of density sufficient to produce, when boiling, a heat of 228° to 230° F. They were cooked in this solution for one hour and then taken out of the kettle with an iron scoop shaped like a dip net, with a wooden handle about six feet in length. They were dumped into a tank of water on the other side of the partition which separated the bathroom from the packing room through an opening in the partition, receiving many a bump and bruise in the operation. Then they were washed with soap and rag to remove the dirt and grease, each can being handled separately. When this was done they were piled on the floor of the packing room and in a few days were painted with a mixture of red lead, turpentine, and linseed oil, for at that time buyers would have no canned salmon, no matter how good the quality, unless the cans were painted red.

It was George T. Myers who established the first salmon cannery on Puget Sound, who perceived the opportunity and was willing to venture the risk and stake what he had to find out whether he was right. The history of his career is a remarkable one in many ways and one which should be of great interest to those who are engaged in the salmon canning business. It cannot be taken up in detail here. If it could, it would make an attractive story, one that would have an episode as good and as strange as fiction at every turn, but it will have to suffice to give a brief outline, just the bare facts, in this chronicle.



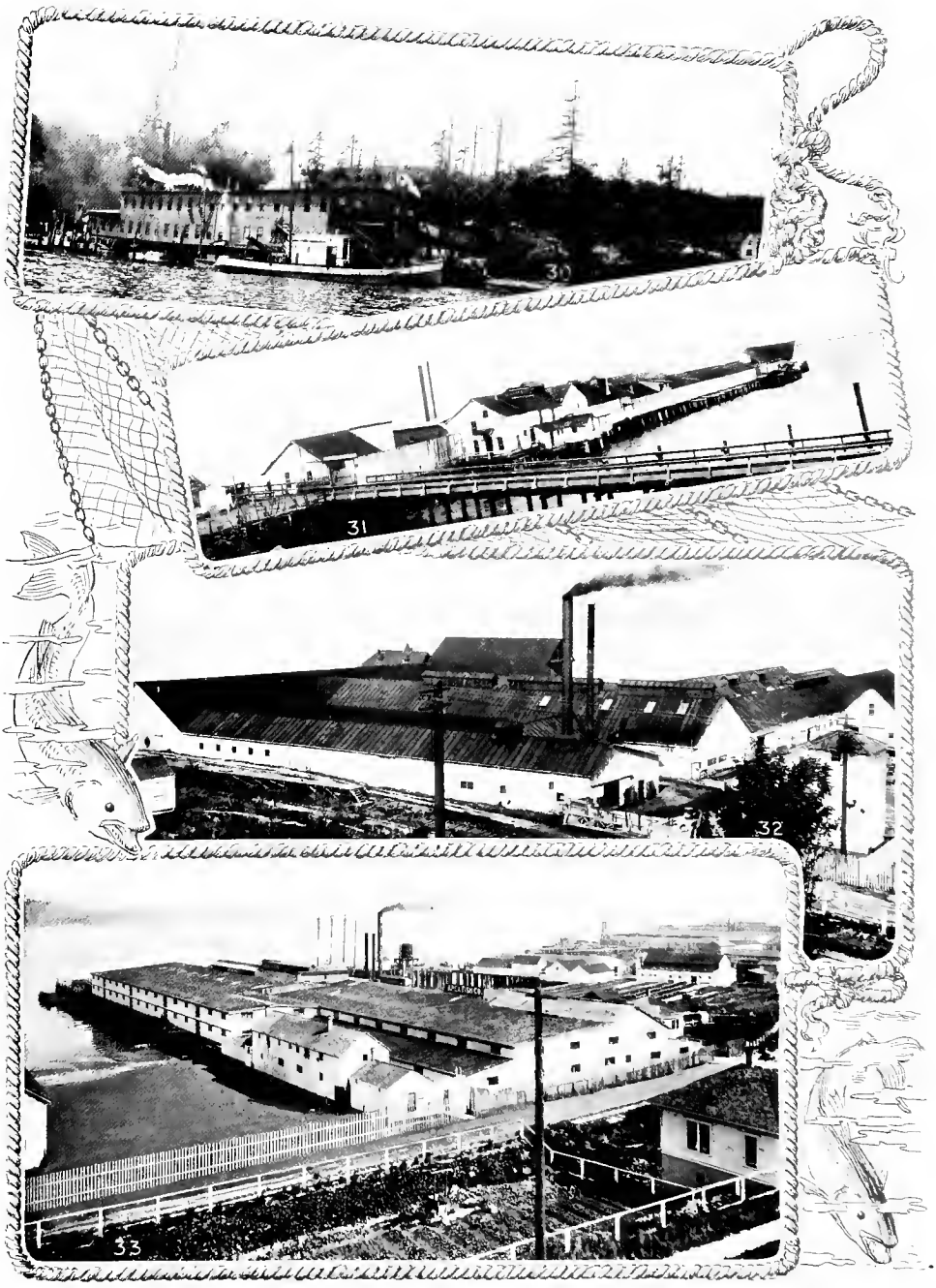
25 Showing 150,000 cases of salmon ready for labeling and boxing.

26 Ready for the retorts.

27 Millions of canned salmon in the warehouse.

29 Cooling room.

28 Two Pacific Coast Specialties.



30 Lummi Bay Packing Co.

31 Manhattan, Port Angeles.

32 Pacific American Fisheries, Anacortes.

33 Apex Fish Co., Anacortes.

Salmon for the canneries are caught after leaving salt water but some time prior to approaching the spawning grounds. The supply is derived chiefly from three forms of apparatus, or gear as the fishermen call it, namely, the trap, purse seine and gill net.

Traps are simply long arms of webbing stretched on piles and reaching channelward from shore to intercept a portion of the passing schools of fish. The tendency of the fish generally to follow always alongside something rather than to strike out across open water is employed to trap it. The fish follow the "lead" arriving finally at the "pot" on the outer extremity and from this they are unable to escape.

The purse seine in the last analysis is a sort of moving trap. It is a long net which is cast in a circle about a school of fish and then drawn together at the bottom like an old-fashioned purse, hence the name. The nets are mounted on fast motor boats which are able to follow the schools and are consequently very effective.

The general principle of gill netting is too well-known to require detailed description. The gill nets employed by salmon fishermen differ only in length and mesh size from those commonly used in other fisheries.

Since bait is so indelibly associated with fishing, it might be interesting to mention that no lure of any sort is employed in taking salmon for the canneries, as the fish do not feed after entering fresh water.

It has been estimated that there are approximately 12,000 boats employed in salmon fishing operations on the Pacific Coast, having a total valuation of $35,000,000 and carrying over 30,000 men.

Cannery tenders, a special type of motor tugs, having fish carrying holds, collect salmon from the traps and fishing vessels delivering them to the cannery. Here they are pitched into conveyors which land the fish on the floor of the fish room, where they are sorted according to species and fed to the "Iron Chink" or butchering machine.

This device, the only one of its sort in the world, severs the head, tail and fins and removes the entrails, passing the fish to a dress crew, which thoroughly washes them, removing all traces of blood, etc. The fish are then laid upon small slotted plat-

forms, carried to revolving gang knives and cut into proper lengths for cans of various capacity. The pieces of fish fall into bins from which they are fed to the magazine of machine fillers, where plungers operating at a high rate of speed place the desired amount in each can.

In the sanitary process, now rapidly coming into general favor, the cans pass on chain belts from the fillers to the toppers, which place a top lightly on each can. They then enter the exhaust box undergoing a lengthy path in live steam, the heat of which creates a partial vacuum in the can. On emerging from the exhaust box, cans are fed to Ams double seamers, which hermetically close the tops and the containers are then ready for the retort.

After being arranged in large trays piled six tiers deep on small cars, the cans are run into the retorts and cooked in steam. Following the cooking the trays are lowered into or carried automatically through a bath of lye-water to remove dirt and grease and are set out in the warehouse to cool.

The brisk popping noise of the collapsing can tops as cooling reduces the pressure with the can is probably the sweetest music that a salmon packer can hear for it indicates that his pack is being properly processed. From this point on, the treatment is the same as in all ordinary canned foods, labelling, boxing and shipping following in rapid succession.

In the beginning the operations described above were carried on by hand and even at a comparatively recent date it was still necessary to clean fish by the slow expensive method and fill the cans in the same fashion. Now with the introduction of modern machinery and the advent of the sanitary can, human hands touch the fish only during the washing received after the fish leave the "Iron Chink," and the enterprising manufacturers of that device recently announced that they would soon add an attachment which would retire the dress gang and make the process absolutely automatic from the ocean to the consumer.

Nothing better expresses the extent of the salmon canning industry than the plain unembellished statistical figures of which fortunately there is no lack. Starting a little over half a century ago in a humble way with a pack of only 2,000 cases, the trade reached its apex last year with a pack of 8,063,447 cases

of forty-eight pounds each. Its founders were not plungers and for the first two years did not increase the size of the pack. Three years from the inception of the industry the pack doubled. Three years later it had passed the 100,000-case mark and with a slow but steady increase reached the half million mark nine years later. Four years later, or in 1882, the first pack of a million cases was made and by 1895 it had doubled again. Eighteen ninety-five witnessed the first pack of 3,000,000 cases and four years later, in 1901, this had jumped to five million. Ten years afterward more than 6,000,000 cases were packed, and last year this record was eclipsed by 2,000,000 cases more.

There are nearly three hundred plants located in Alaska, British Columbia, Washington, Oregon and California, representing to-day a total investment of $100,000,000 and employing directly an army of 50,000 people.

It is estimated roundly that the coast salmon canners spent $50,000,000 in putting up the 1913 pack. Mere numerals convey but slight impression of their true significance and while manifestly large, the sum of $50,000,000 does not give the average reader an accurate idea of its immensity. It is perhaps more forcible when it is stated that this sum would pay the wages of a man working for $2.50 a day for some 4,000 centuries.

This money was divided among two great classes. First those employed directly in the industry and who are dependent on it for support, and secondly, those who are engaged in the preparation and distribution of the supplies which are required. The first class received the lion's share, $11,000,000 being paid to those employed in the canneries, while $10,000,000, nearly as much, went to the men who caught the fish which filled the cans.

The balance was distributed to those who furnished the equipment and materials necessary in the business. The manufacturers of tin-plate, cans and solder received $8,000,000. The upkeep of machinery, the canneries' fleet of vessels and gear cost the cannerymen another $5,500,000. Fully $3,000,000 alone to those who transported the supplies and pack between canneries and coast centers of distribution. The box-makers of the coast divided $1,500,000 among themselves, while those who insured and warehoused the pack took $1,000,000 as their toll.

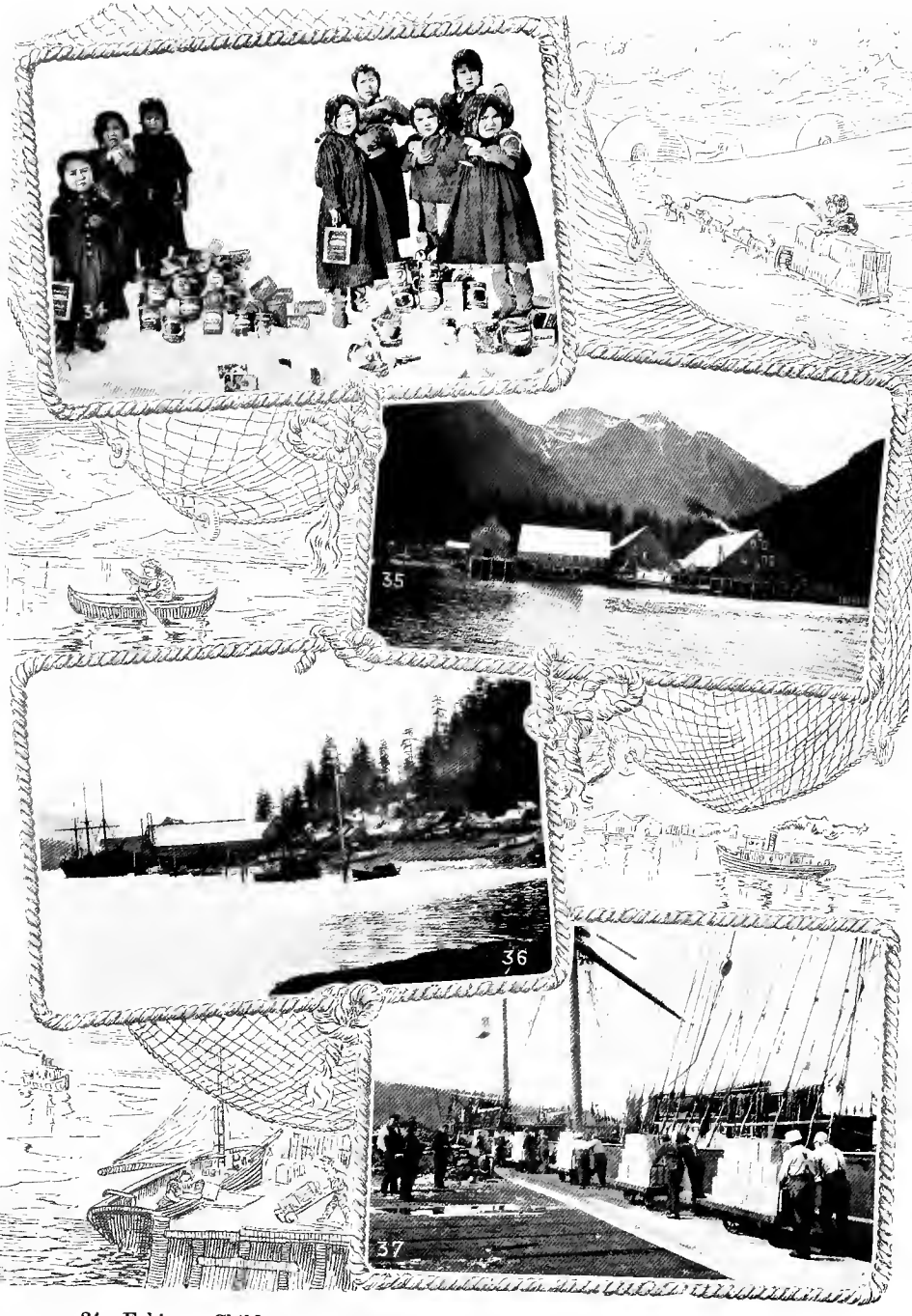
The printers of the labels in which the 387,000,000 cans were wrapped earned half a million, while a similar sum was paid for lacquer, varnishes and paints. Fuel, light and power consumed half a million, and the wholesale grocery trade took a like sum for the food served in the messhouses. The sum of $7,500,000 went to cover taxes and general overhead representing a multitude of expenditures for new machinery, the salaries of those engaged in the office and incidentals.

An adequate conception of the quantity of some of the supplies required by the business can be gained from the fact that 26,432,000 square inches of tin-plate went to make containers for last year's pack. Four hundred million labels were used to wrap the cans which were placed in 8,000,000 boxes fastened with 320,000,000 nails.

The growth of the world market for canned salmon has stimulated quite an interest in the product on the other shores of the Pacific, the only other place where our species of salmon occur. Within the past few years the business has been given quite an impetus in Siberia and Japan which are now coming rapidly to the front as salmon producers.

Naturally one of the first questions arising in the mind of the observer in this field is of the permanency of the business. How can hundreds of millions of salmon be taken from the waters each year and the supply be maintained? The answer lies in an instance in which man's ingenuity has supplemented the efforts of nature after her delicate balance has been disturbed. The reproductive power of salmon is remarkable, some female fish often carrying as many as 3,000 eggs. If it were not for this wise provision on nature's part the great salmon runs could not be maintained even in a primeval state, for natural enemies make fearful inroads on the eggs and young fish. In order to overcome the toll taken in this way, nature has provided a wide margin of productivity.

By increasing the efficiency of nature's original processes, it has been possible in many cases not only to maintain the run in streams which were being heavily fished, but to increase it. At various suitable points along the spawning streams the Federal Government, States, and salmon packing companies, have erected hatcheries. Here the eggs are collected, fertilized and

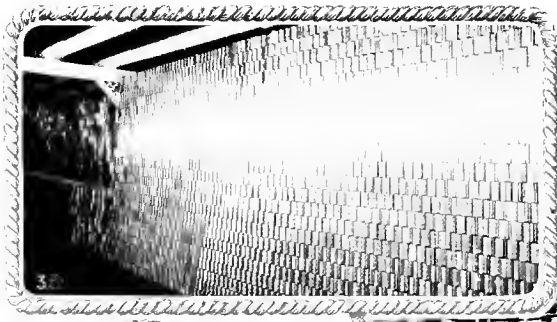


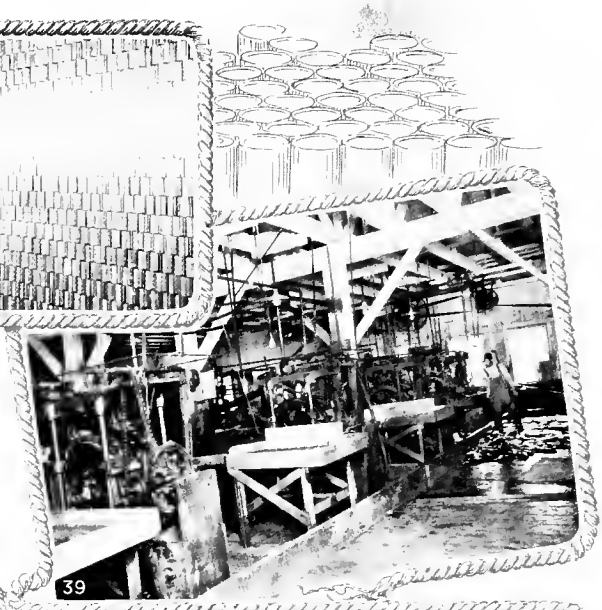
34 Eskimo Children eat canned foods.

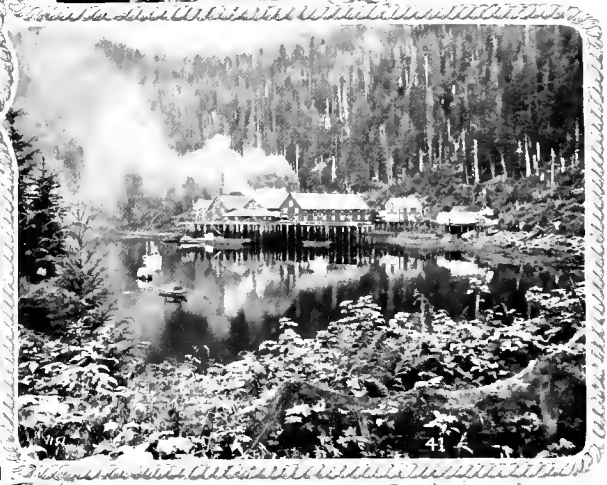
35 Pacific American Fisheries, Excursion Inlet, Alaska.

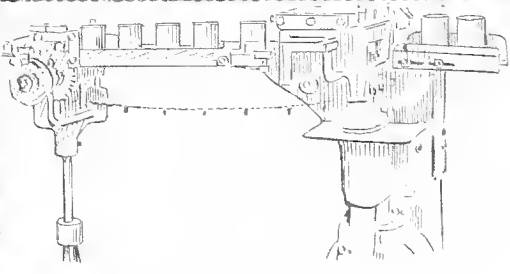
36 Geo. T. Myers & Co. Cannery, Sitkah Bay, Alaska.

37 Alaska Packers' Ass'n loading ship with salmon.









38 A stack of two million cans.

39 Machines clean 12,000 fish per hour.

40 G. G. Suddock. Northwest representative Berger & Carter Co.

41 Northwestern Fish Co. Santa Ann Cannery, Alaska.

42 Ams No. 58 double seamer in G. W. Hume, cannery.

developed, resulting in the saving of many eggs which would otherwise never have hatched.

The efficiency of this operation has been further increased in recent years by introducing nursery ponds in which the young salmon are retained and reared until able to avoid to a large degree their natural enemies. In this way it is practical to replace year after year, by artificial propagation, the fish which have been taken for food owing to the superior results obtained by that method.

The real menace to the salmon fisheries lies not in fishing operations as long as they are properly conducted, but in industrial developments along the streams in which the fish spawn. It was in this way that California's salmon fisheries were destroyed. Extensive mining operations, principally hydraulic, filled the Sacramento and its tributaries with waste products which killed the fish. Under regulations preventing the introduction into salmon streams of industrial waste products which might injure the fish, the enforcement of the commercial fishing laws, and reasonable attention to propagation, there is no reason why the business should not continue on its present scale for generations.

SWELLS AND SPRINGERS

BY

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The subject I have been asked to discuss this morning is one that would require a volume for its adequate consideration. It will be necessary, therefore, to confine ourselves to broad, fundamental principles. It would be much easier to occupy the time alloted by a detailed discussion of one of the phases of the subject. I realize, however, that the questions you have asked me indicate difficulties that frequently present themselves, and I shall cover as well as I can the outline suggested in your invitation to me to present this paper. This outline is as follows:

(1) What constitutes a "swell" or "springer"?
(2) What are the conditions of the product or of the process which might be a causative agent in producing swells or springers?
(3) Where should the line be drawn as to what class of foods coming into this category might be safely and properly used as food products?
(a) Should canned fruits or vegetables belonging to the class of "swells" be permitted to be processed, or to be sold to be worked up into other products, such as the making of pie stock, or working up into butters, jams or marmalades?
(b) How may such class of fruits that have been worked up into various by-products be detected by commissioners?
(c) Does the presence of tin in excessive quantities denote that such products are made from swelled canned goods?

In considering this problem it is necessary to bear in mind the two general types of cans which are now used for the preservation of food. These are known respectively as the "hole and cap" can and the "open top" or "sanitary" can.

The hole and cap can is the one whose ends are soldered and which is closed after the introduction of the food by soldering in place a cap with a vent hole, which is then tipped with solder.

In the case of the open top can, one end is left entirely off until the can is filled, and then the entire end is crimped on to the can by rollers, tightness being assured by means of a gasket of some elastic or compressible material, such as rubber composition.

A "swell" in canned foods is a can which has undergone decomposition by micro-organisms, accompanied by the generation

of gas, which first releases the vacuum and then causes pressure in the can. This decomposition is often of putrefactive nature and may be rapid or slow, according to the organism and temperature.

Swells are due either to defective sterilization, or to leaky cans. It is sometimes difficult to measure the heat conductivity of a given product. Fruit which is thoroughly ripe has a tendency to cook up more than fruit that is greener, and thus lessen the heat conductivity of the liquid in the can. In the case of many products, such as corn, the heat required to penetrate to the center of the can increases with the consistency of the product. If the processor underestimates the ripeness of a batch of fruit, therefore, or the consistency of a homogeneous product, or the amount of sugar added, swells may result.

Owing to defects in the manufacture of the can, or in the plate from which the can is made, there are occasional leaks, sometimes so small that even when filled with air under a pressure of 20 or 30 pounds the air that bubbles through them when placed under water is in such fine particles that it is difficult to see. When such cans are filled with food the bacteria that pass through these openings cause decomposition, and when pressure results the openings are sometimes closed by particles of food and are difficult to find.

A "springer" is a can whose ends are more or less bulged, owing to pressure from hydrogen generated as a result of the chemical action of the contents on the metal of the container, or because the can was overfilled or insufficiently exhausted.

In springers where the pressure is caused by overfilling the can, or by insufficient exhaust, this pressure does not increase with time, but remains constant except as it is influenced by temperature of storage. The ends of the cans are somewhat distended and may be easily pressed into place with the fingers. When the fingers are removed the ends may resume a convex position, or may remain concave or flat (according to the pressure within the can) until the can is jarred, and sometimes until the temperature to which it is subjected is increased. A number of packers have put up products in the fall which appeared normal till the following summer, when springers developed, and when these were held till the cool weather of the following fall the ends resumed their normal concave position. Thus it has

frequently happened that foods packed, for instance, in New York, Maryland or Alaska, have been sold by packers who had no suspicion that they were abnormal in any way, and yet those that remained on the retailers' shelves the following summer, especially in the southern states, developed springers as a result of increased temperature.

Springers of this nature are found chiefly in open top cans, and only rarely in hole and cap cans. With the latter there is always sufficient head space, otherwise the soldering iron would heat the air space to so great an extent that it would be impossible to seal. It so happened that the use of the open top can was enormously increased at just the time when there was an effort on the part of the Federal government, and also of the best canners, to secure a full can. It was immediately seen that it was possible to fill the open top can full. As a result a large amount of food was packed in the open top cans with very little head space, sometimes practically none. Now if such food were not heated to a pretty high temperature before it was capped, expansion naturally occurred after the product was shipped to a warmer climate and springers resulted. Many of the best firms found that a large proportion of their pack of some products consisted of springers immediately after canning; that is, the ends of the cans did not collapse on cooling, but remained somewhat distended. As packers become more familiar with the open top can and learn the amount of head space requisite and the necessity of a thorough exhaust, this difficulty is disappearing and springers of this nature will probably not be found to a large extent in the future.

The case is somewhat different when pressure is due to hydrogen generated by the action of acid fruits on the metal of the can. It is ordinarily taken for granted that the hydrogen thus generated is due to the action of the acid of the fruit on the tin. I think this is a mistake. I think it results, in large part, at least, from the action of the acid on the iron and that the amount of hydrogen liberated in the can is usually a measure rather of the iron that has been dissolved than of the tin. The metallic taste in a product of this nature is certainly due to dissolved iron. Of course, where any great amount of iron is dissolved in the product, the tin is also dissolved, but passes largely into an insoluble form.

This question has been studied for several years and in several laboratories. Exhaustive investigations, devoted to this point and to the kindred question of the action of the foods on the container, have been conducted (involving the expenditure of over $25,000), and the work is now being broadened and increased. Considerable progress has been made, but the solution is not yet in sight.

In this connection I wish to point out the relation of springers to certain other difficulties of the canner. The natural acids of the fruits attack the container, dissolving the iron and carrying tin into the food and into the liquor, where it is largely, often chiefly precipitated in insoluble form. This liberates hydrogen, which directly causes springers. While in the nascent state this hydrogen bleaches many of the colored fruits. When lacquer is used in an attempt to prevent this action pinholes often result, leading to the spoilage of a considerable percentage of the pack, and with some products an undesirable flavor is imparted by the lacquer. These difficulties all come from a common cause and will only be overcome by understanding and removing the cause. This statement, however, does not include the solvent action on the metals of the can of amino bodies in certain foods, such as shrimp, pumpkin and asparagus. (U. S. Dept. Agr. Bureau of Chem. Cir. 79.)

According to the amount and character of the fruit acid present, the tin and especially the iron of the container are more or less attacked, the latter causing the astringency which is often called the "tin" taste of some canned food, and yielding springers of the class we are now discussing. Since the action is chemical it is influenced by time and temperature of storage. It progresses more rapidly in summer than in winter; more rapidly in a hot warehouse than in one that is cold. The amount of hydrogen generated depends first on the temperature and time of sterilization; second, on the promptness and efficiency of cooling after sterilization; third, on the time of storage (the age of the canned product); fourth, on the temperature of storage. The relative importance of these four factors cannot be stated. In some cases the amount of tin and iron dissolved and the amount of hydrogen generated are greater within a week after canning than after two or three years, if cooled promptly and handled reasonably well.

The time that elapses before springers of the type now under consideration are formed depends on the four conditions mentioned above, and also on the fill of the can, i. e., the amount of air space left, and on the vacuum in the can, or, in other words, the temperature of the product when the cans are sealed.

Since the amount of hydrogen increases with time and temperature of storage, the pressure on the tin gradually increases until it cannot be distinguished by pressing with the hand from swells. Finally the pressure becomes so great that a seam is sprung, causing leaks and leading to infection and decomposition.

In distinguishing between swells and springers it is important to bear in mind that the former usually progress rapidly and the latter slowly or not at all. Swells, therefore, usually become hard, or even burst, before they reach the retail trade. In fact, it is the custom of canners to store their goods and permit such swells to develop as far as practicable before they leave the factory. After this it is usually only an occasional can that develops a leak and becomes infected. When a large percentage of a lot of canned food shows convex ends which may be pressed into place with the fingers, they are usually springers and not swells. Moreover, when decomposition has progressed so far that the ends begin to bulge, the odor on cutting the can is unmistakable, and even before that the peculiar aroma characteristic of the food is destroyed. *In this connection I wish to disclaim the idea that food whose appearance, odor and taste are acceptable to the consumer is necessarily free from decomposition or suitable for consumption, whether it be fresh or preserved.* There is a great difference, however, between decomposition in the open and in a confined space like a sealed tin can. In the open, decomposition is more or less localized and its volatile products to which the characteristic odor of decomposition is due are largely dissipated, especially on cooking. In the can, decomposition when it occurs is much more general throughout the mass and these volatile products are confined and are evident when the can is opened. A striking illustration of this is found in peas and corn held in the market till quite stale. They may be quite acceptable when prepared for the table in an open kettle, according to kitchen practice, and yet when canned have an offensive odor.

I feel that I am very safe in the statement that when decomposition has proceeded within the can to a sufficient extent to cause a perceptible bulging of the ends, the odor of decomposition is evident on cutting the can, even though it may have been vented and resterilized. Many consumers would doubtless overlook this distinction in some cases just as they overlook staleness in market vegetables and incipient decomposition in fish and shell fish purchased as fresh. For the reasons given above, however, it is more evident than the same degree of decomposition in market fruits and vegetables. It should be evident to any careful observer and does not require the highly developed sense of taste and smell possessed by tasters of coffee and tea, and especially of wine.

It must be borne in mind that, as stated above, springers due to overfilling or insufficient exhaust will be found in the market less frequently as packers learn the proper fill and exhaust. Springers due to hydrogen are found in strongly acid foods and are largely confined to the more acid fruits. The non-acid foods that attack tin or iron rarely form springers of this class. The three great staples in canned foods, tomatoes, peas and corn, neither attack the metals of the container to an appreciable extent, nor form springers due to hydrogen.

The third topic assigned me is: "Where should the line be drawn as to what class of foods coming into this category might safely and properly be used as food products?" I will say without reservation that swells should not under any circumstances be used as foods. Sometimes, especially in the case of fruit, such swells are the result not of bacterial decomposition but of the action of yeasts, and the products are simply sour. With the exception of highly nitrogenous material, it is probable that toxins are not formed in such swelled goods. In my opinion, however, it is to meet such conditions that a clause has been included in the Federal law, and all state laws, forbidding the sale of products which in whole or in part are "filthy, decomposed or putrid." Certainly that clause should be held to cover all foods which it properly describes, whatever their form and manner of preservation, and all canned foods which are "swells" as a result of decomposition by micro-organisms are intended to be covered by this clause and should be covered by it. They should not be used as food or in the preparation of food.

With springers the case is widely different. Springers due to overfilling or insufficient exhaust are sound and edible in all respects. As I have already stated, however, this type of springer will soon be almost a matter of history. With springers of the second type, after the action of the acid on the metal has proceeded to such an extent that the product cannot be distinguished from a true swell, it is my opinion that they should be condemned and destroyed. The strong metallic taste due to dissolved iron is commonly so pronounced in such cases as to make the produce unpalatable. Moreover, as I have said before, it cannot by outward appearance be distinguished from a swell.

As just stated, in the case of springers due alone to overfilling the can or insufficient exhaust, the contents are sterile and sound in every way and their use as food, or for the manufacture of foods, should be permitted. It is obvious that their sale on the market in that form is impossible and in my opinion it should not be possible. The bulged end, even if it can be readily pushed in place with the fingers, is taken by the consumer as a warning sign, indicating decomposition. It is a safe and reasonable sign and one which the consumer should continue to use. If food products of this nature are to be sold, therefore, the cans must be heated, vented, resealed and again sterilized.

I realize that the work of food commissioners would be simplified if the venting of an open top can, for instance, were held to be *prima facie* evidence of decomposition. Such a practice, however, is not logical nor necessary in order to protect the consumer. It should not be possible, acting under the name of the law, to prevent or restrict the sale of food that is sound and wholesome, prepared under good conditions, and in every respect suitable for consumption. Such a decision is unjust to the manufacturer and prejudicial to the public good in so far as it is uneconomic.

It is a recognized principle of legislation that the public health must be protected even though hardship to many be worked thereby. This principle, however, does not apply to the question under discussion. Danger to the public health is not involved. As far as I can learn, there is no evidence and no reason to suppose that illness is ever caused by a product of this nature.

When a can of food has undergone decomposition by micro-organisms to such an extent as to cause the slightest bulging of the ends, it is practically impossible for it to be reprocessed in such a manner that the decomposition will not be betrayed to a careful observer by the odor. By reprocessing I refer, in this connection, merely to venting and resterilizing in the can, and not to cooking in an open kettle with or without added sugar and flavor in the preparation of other products.

Again, it may be found advisable to vent all cans used for certain products, such as meat, fish and shellfish. It has always been customary in packing salmon in hole and cap cans to close the vent in the middle of the cap immediately after sealing, heat in the process retort, revent to allow the air to escape, close the second vent and sterilize. Since the advent of the open top can without vent holes, I am told by my associate, Dr. Bitting, that the product may be somewhat inferior. It appears that by the second venting of the cap of the old can, there are expelled not only air but also gases caused by heating the fish and whose retention in the absence of vent holes gives the product a stale odor and flavor. By interrupting the process and venting the open top cans this can be avoided, as in the hole and cap can. Recent experiments conducted by Dr. Bitting with crabs gave the same results. It is believed that this difficulty has been practically overcome by using two sealing machines. With the first one the cover is loosely crimped on the can, which is then given a thorough exhaust and sealed while hot in the second machine. At the same time it is possible that with some products the highest degree of excellence cannot be secured even with the open top can without venting after a preliminary heating in the process retort.

I regret that the subject assigned me includes one question which I cannot answer:

"How may such class of fruits that have been worked up into various by-products be detected by commissioners?"

If this practice were extensive I would suggest that it might be handled by factory inspection, but conducted as I am informed it is, in a small way, irregularly and only by men who have no connection with any legitimate industry, the inspection of the factories where such by-products are made appears to be out of the question.

Of course, it is obvious that swells in an advanced state of decomposition cannot be used in the preparation of any food whatever. There is no doubt but the great majority of so-called swells which are used in the preparation of products of this nature are not really swells in the sense of having been caused by decomposition, but owe their distension to hydrogen gas formed by the action of the fruit acids on the metal of the container.

At the same time the situation is different from that found in reprocessing foods in the can. In the case of certain fruit products which have begun to swell, even as a result of decomposition, it is probably sometimes possible, by boiling the product in an open kettle, to eliminate the odor of decomposition to such an extent that it is masked to the ordinary taste and smell by the addition of the sugar and flavors. This practice is most reprehensible and all possible effort should be made to stop it. Its detection, however, in the finished product, is attended by considerable difficulty. Probably the best method is by means of the microscope. Even if the decomposition has not proceeded to an advanced degree, when it has occurred in enclosed space such as a sealed tin can it is found to be quite general and the histology of the product is changed. Unfortunately, this method can only be employed by analysts with long training and experience in structural botany and there are very few analysts in the country who are competent to undertake the study of the question. It is hoped that in the near future more attention will be given to this line of work. Chemical methods have not been thoroughly worked out and I do not know that they are possible, though undoubtedly progress can be made in this field. The determination of the character and amount of acid in fruit products is often of value. In this manner a clue to decomposition can sometimes be obtained by the fact that the normal acid of the fruit in question is not present in proper amount. Lactic acid, which usually accompanies decomposition in tomatoes, is not ordinarily found in the decomposition of fruits. It would be strange, however, if the application of bio-chemistry to the problem did not disclose some by-products of the life of micro-organisms that might be considered sufficient evidence of decomposition. The attention that has been paid to the detection of decomposition in food is not at all commensurate with our needs. The situation

calls for work of a different type from any that has been largely utilized in detecting food adulteration. Such methods are needed, however, not for the examination of products of the type mentioned, but, broadly speaking, for the detection of decomposition in food, whether fresh or preserved, and whatever the manner of its preservation.

Perhaps the most striking feature of the packing of foods in recent years is the progress that has been made in the cleanliness and sanitation of factories and in washing the raw products and hand-sorting and trimming to exclude from the finished product rot and decay, which, when we come to think of it, is decomposed matter and just as objectionable as that found in a swelled can. Notwithstanding this progress, however, the amount of such decomposed matter that reaches our tables in our foods, both fresh and manufactured, is still so great that the amount of decomposition introduced into pie filling, jams and fruit butters in the form of blown cans dwindles into insignificance. *I do not depreciate the gravity of the latter practice, but wish to emphasize the fact that to give it serious consideration before a more determined effort is made to insure a more satisfactory sanitary condition in food factories of all kinds is like "straining at a gnat and swallowing a camel."*

The final question asked me is:

"Does the presence of tin in excessive quantities denote that such products are made from swelled canned foods?"

Most emphatically it does not. Of course, the decomposition that causes the swelling of canned fruits increases their acid content and hence their action on the tin and iron. At the same time, some products which are badly decomposed, even though the pressure has become so great that the can has burst, are not as acid and do not attack the metals of the container as badly as other products which are entirely fresh and sterile. Probably an excessive amount of tin or iron in pie stock, butters, jams and similar materials, may indicate that the product has been made from canned material which has attacked the metal of the container to such an extent that it could not be sold as canned food, whether decomposed or not. In the absence of evidence of decomposition probably it may be held that in working over such products in this manner their inferiority is concealed and for that reason their sale is illegal.

The charge of selling food containing "filthy, decomposed or putrid" material is a very serious one and its full meaning should be preserved. This can only be done by limiting the application of that term to products whose decomposition can be demonstrated.

The presence of tin is obviously not an indication of decomposition and to hold it *prima facie* evidence of decomposition is unnecessary as a precaution and would weaken the law and lessen the sense of fairness and justice so necessary to its proper enforcement.

DISCUSSION*

COMMISSIONER CASPARI, of Maryland: I would like to ask Dr. Bigelow a question. We have had very recently a large lot of blueberries brought in which the packer claimed were springers; and they were apparently so, but upon opening them we found there was a continuous escapement of gas in small quantities near the center of the can and there was no disagreeable odor there, but we found that the amount of tin taken up by the fruit was quite excessive, decidedly above that laid down by the government as permissible, which is, I believe, 300 milligrams. These show between five and six hundred milligrams. The packer claimed these goods were in a sound condition and asked permission to work them over. It occurred to me that a condition of that kind, even if it comes under the head of a springer, is hardly permissible, and I would like to ask Dr. Bigelow what he thinks when springers show evidences of gas disengagement in the center of the can and where the amount of tin taken up by the fruit is quite considerable. Would Dr. Bigelow consider that fit for subsequent use?

DR. BIGELOW: As a rule bubbles of gas throughout the mass indicate bacteriological decomposition, and if so, the product should be condemned; but in such a case you can always get additional evidence. In swells the microscope will reveal bacteria or yeasts. You can determine whether the bacteria are there and alive and acting. If yeasts are present you can detect alcohol. In a product of that sort the proof of decomposition is not a difficult matter by the methods we have now at our dis-

*To accentuate important points some of the discussion, not germane, has been omitted.

posal. I would go farther and get this confirmatory evidence.

Now as to the amount of tin present, that is a subject I don't know as much about as I thought I did awhile ago. We find that the major part of tin is insoluble and I am more concerned now about the iron in a can of food than the tin.

DR. CASPARI: On the face of it, then, you would hardly consider the cans suitable for condemnation on account of the tin content?

DR. BIGELOW: I don't know. But in my mind it reaches that point when the amount of iron dissolved becomes such as to be evident to the taste and to impair the quality of the food—then I feel that it is certainly no longer suitable for sale.

DR. CASPARI: The claim has been made frequently with us by canners that under such conditions as I have named they should be allowed to retain the goods and use them over again for other purposes, and I have held that that was not proper, but I should be very glad to change my opinion on the basis of better knowledge on the subject from experts like yourself.

DR. BIGELOW: When decomposed, the food should be destroyed. I feel that very strongly; but I also think that a great many mistakes have been made in regard to decomposition. I regard that as a very serious charge and for that reason action should be taken all the more carefully. We should be very careful not to bring that charge when it is not true—is not justified by the facts.

DR. CASPARI: It was argued in my office some time ago that a springer was an incipient swell, that it was a baby form of the second condition. Do you hold that opinion?

DR. BIGELOW: No, that is not true. The reverse is true, that every swell has gone through the stage of being a springer. But swells develop very rapidly, and the most of them develop within two or three weeks after canning, so that if you find after the goods have been shipped that a considerable proportion of the shipment is springers you can know that if such a large percentage were going to be swells they would have developed already. I would examine those springers very carefully then. But where you find that goods have been shipped —have been manufactured long enough to have been shipped out—and contain a great many springers you will usually find them to be sterile.

Now, in a sweet-potato cannery in Dr. Caspari's state, last fall, I asked the manager if he had much trouble with springers. No, he said he had had trouble with only one shipment. He sold one shipment the spring before in Baltimore and instead of sending the goods into consumption there, the firm he sold them to had sent them to Texas and the consignee there had refused to accept them and sent them back, and they all came back springers. He said he would go and get some of them and show them to me. He was gone about half an hour. It was rather a cold day and there had been a frost the night before. I waited around and finally he came back and said, "I can't find a springer in the lot and they were all springers when they came back last summer." Here was a lot that was normal when shipped, became springers in the summer and was again normal when I saw it in October.

DR. CASPARI: Would you place any value at all upon the chemical examination of canned tomatoes?

DR. BIGELOW: In canned tomatoes I think a decrease in citric acid would indicate decomposition, but I have seen very few cases of canned tomatoes that show decomposition. Tomatoes do not act much on the metal. Consequently the only class of springers we have to deal with in tomatoes are those due to overfilling and I have not seen many of them.

DR. CASPARI: We have found in a few cases that the citric acid content has fallen to below that quantity which is normal where the lactic acid has gone to .6 per cent.

DR. BIGELOW: That indicates decomposition in tomato pulp.

COMMISSIONER CRUMBINE, of Kansas: Dr. Bigelow has said that the presence of excessive tin in products made from canned goods does not necessarily indicate decomposition. I would like to ask a question about that, and it is this: Is it commercially profitable or is it customary to make jams and marmalades and other related products of that kind from canned goods, and if it is customary or commercially profitable to make these articles from canned goods, when such products show excessive tin, and are put up in glass, isn't that evidence of something rotten in Denmark?

DR. BIGELOW: I think in such a case the presence of tin is probably an indication that canned food has been used for that

purpose which could not have been sold as canned food. It is not complete evidence of that fact, but is an indication of it. I would not say decomposed food had been used, because there is a great deal more fruit in bulged cans due to the generation of hydrogen because of the action of the fruit on the metal than is due to decomposition; but I think even such products used for jams, pie fillings, etc., should be condemned. I think they are largely springers, or if they appear to be swells because the top of the can is "hard" instead of being so "soft" you can push it back with the fingers, even that distension of the ends of the can is due to the action of the acid in the fruit on the container. I do not argue that they ought to be used as food. The consumer will refuse to buy such cans and they become unmerchantable in that form. The flavor would sometimes be ruined by the iron taste and it ought not to be possible for a manufacturer of by-products to take a product that is in such form that he can't sell it as such and conceal its inferiority and sell it in another form, such as jam.

DR. CASPARI: He oughtn't to work it up into another product.

DR. BIGELOW: And I think the clause of the law "which conceals damage or inferiority" is violated by that practice, provided the product is one which could not be sold in its normal form. I think it can be reached under that clause.

I would not say it would not be economical to make over any canned food. In the last year we have seen so much canned food sold below cost of manufacture that you can conceive of foods canned in a season of great plenty being sold at such a low price that, the season following, it might be economical to use them instead of fresh fruits. So I would not want to say that a canned food which was normal could not be used in the manufacture of the products mentioned. But I would regard the presence of tin as very suspicious, and when present in large amount, it would probably bring the product under the clause mentioned in the law. The use of decomposed food is a serious matter and we ought not to minimize its danger, but, more than that, the charge that a product is decomposed ought to be restricted to cases where we are sure that the product is decomposed.

MR. TAYLOR, of Louisiana: Do you find that when canned goods are punctured and give off a bad odor and taste, they are decomposed? Do you think any further examination would be necessary?

DR. BIGELOW: I don't think so, but we have to be careful how we judge.

MR. TAYLOR: We had a case in Louisiana just before I came away. We seized a case of canned goods and the odor was bad. We had the regular hearing, sent out notices and so on, and the attorney for the defense came in at the hearing and complained that the examination was entirely incompetent because we had not made a chemical and bacteriological examination. We are going to court on that very subject and the fact is, the attorney had his expert's report there which stated that the goods were apparently not injurious to health. It did not say they were not decomposed, however. We are going to court on that question, because we have all the authorities, including Dr. Bigelow, with us.

DR. BIGELOW: I would be very glad to see my paper used in such a case.

DR. CRUMBINE: What becomes of swells the retailer finds on his shelves and sends back to the wholesaler? Are they sent in to the factories to be worked over? Should they ever leave the state? The Commissioner might not know anything of this. Would the wholesaler favor a law to give jurisdiction to the Commissioner in the state in which those swells were found, so that the wholesaler would not be obliged to give credit for returns to the retailer for claims on these goods unless on the certification of the Commissioner? It is a plan for the purpose of having a food commissioner know what is going on, and to enable him to keep an eye on the disposition of such goods.

DR. BIGELOW: That is a thought that had not occurred to me. But this suggestion by Dr. Crumbine brings up one of the greatest difficulties the canners have to contend with. They protect their customers by a guaranty that they will reimburse them for all swells that occur within a certain time after the sale is made. Now it very often happens that the swells on older goods are returned to the canners, and they have to take them, too. Very often they do accept older goods than the guaranty covered. The retailers send them

back even after they have kept them on their shelves for a very long period of time.

Now the question comes, why do the canners want these goods back? Why do they pay freight on them clear back to the factory—a long distance sometimes. We immediately suspect that they want to make some illegal use of the product. But I have been in several canneries when such a shipment came back and I must admit that I was very much surprised at what I saw.

As a usual thing (I think I may safely say in the majority of cases) the shipment does not consist of swells, but of cans that are perfectly normal except that the label is soiled or discolored. Sometimes they are not the goods of the packer to whom they are sent at all. Sometimes they are a different product altogether from what he puts out. The dealer makes a claim for reimbursement on tomatoes, perhaps, but the cans returned are peas, sent back to a man who never packed peas, and the cans are labeled "Peas."

The reason for mistakes of this character is that this work of sorting out swells is put on the cheapest sort of labor they have. The result is, the packer is oftentimes called upon to reimburse a dealer for swells in a shipment of goods he never made at all, goods put out by somebody else, and it is even said that several canners are called upon to reimburse a dealer for the same goods and probably for goods that are not spoilt at all.

Now I anticipated that this question would probably be asked me and I put in my pocket the other day copies I had made of two letters that came into the office on this very point. They are from a firm in Maryland, well known by Dr. Caspari as one of the best firms of his state, and I would like to read one letter to show the character of the firm and the other letter to show their experience with matters of this very kind.

July 3, 1914.

National Canners Association, Washington, D.C.

GENTLEMEN: We are sending you to-day by Parcel Post four samples of goods. Will you not kindly make an examination of these four tins and advise us whether or not they are safe to be eaten? Of course we know this corn looks very badly

and we were going to throw it away, but if there is nothing deleterious to health in them we thought it might be a better plan to give them to some institution for the poor, but before doing so want to be sure that there would be no chance of their being hurt by the goods. We have had several samples examined once or twice before by chemists and they report them all right, but we want to again assure ourselves before giving them to the institution we have in mind.

Thanking you in advance for this courtesy, beg to remain,

Yours very truly,

.....

July 7, 1914.

Mr. Frank E. Gorrell, Secy., National Canners Asso., Washington, D.C.

DEAR MR. GORRELL: I do not know whether or not we are the only people troubled with the question of swells and the method of examining them, but I am free to admit that we have a good deal of trouble along these lines.

Our swell claims are, of course, not of any excessive cash value, as we pack only beans, peas and corn, none of which as far as I am informed run a very high amount of spoilage, but on the other hand we have all kinds of trouble with people returning us goods as swells, which are as good as the day we shipped them out except for needing a new label and a little cleaning up, which condition is usually produced by bad storage facilities.

I would like to know if the National Canners Asso. has ever taken any action along these lines and whether their Publicity Bureau has looked into the matter of trying to help the canners in making a demand for better conditions, a trade demand and not an individual complaint. I recall very clearly a splendid article written by a Baltimore canner and published in the Canners' Magazine which took in all of these points.

To show you the way these things are done, last year we had one lot of seven cases shipped back to us reported as swells. The commodity was corn. Out of the seven cases there were six cases perfectly good, needing a new label and a little care to put them into perfectly salable condition; 3 dented cans, and

21 tins swells or leaks. This percentage holds good in a number of claims which we have had a chance to examine and, as all other concerns, we ship goods to such distant points that sometimes it does not pay to have them returned. We know that the larger percentage of our so-called swell bills are illegitimate claims. Further than this, the merchants as a rule deduct the freight from all of their shipping points to the home house in case these goods are requested to be centralized.

Any assistance I could give you along these lines would certainly be gladly rendered and we would like to know the status or the canners' stand on this subject.

Sincerely yours,

.....

Now one thing more: The cans are often sold under contract, which permits two cans in every thousand of each size to be defective. If a larger number than this are defective, the contract requires the can manufacturer to reimburse the canner, not only for the value of the cans, but also for the value of the food they contain—that is, "factory cost." This sometimes amounts to a great deal, but the packer cannot make a claim unless he has the cans and can demonstrate that the trouble was due to defective cans. It becomes, therefore, a matter of great importance to the packer that swells be returned to him.

The canners would certainly welcome any plan that would save them this freight if it could be arranged and have the demands made for reimbursement handled properly. I am sure they would be very much interested in any plan that might be suggested for that.

If it is practicable to have all returns of that kind approved by the Food Commissioner in the State in which the swells are found, I don't see myself why it should not be done. I should think it might handicap the matter if inspections were slow—if the inspector was slow in coming around to attend to the matter—because in some cases decomposition proceeds very rapidly and then the grocer doesn't want to hold them long because they become annoying. But all details of that kind could be worked out, I suppose.

COMMISSIONER FRARY, of South Dakota: Concerning this same trouble I corresponded with some packers as to a plan of procedure, as to whether it would be satisfactory to take up swells and open the cans and destroy the goods and send the labels to the jobber. The jobbers were unanimously opposed to that plan of procedure. They said they had to have the goods intact shipped back. I went over that correspondence, and as a result of the opinions they seemed to hold in the matter, I did not adopt that plan. I had rubber stamps made, reading "Condemned" in large letters, and then, underneath, "This food must not be used after (giving the date) in South Dakota," and signed. We stamped that on every swell we came across, and it has worked out very satisfactorily. The retailer holds those goods and gets credit for them if he can—but I think the real benefit of this lesson is the education of the retailer against overloading his stock. It is a shame the way they do that. We get in enough stuff to last four years. The retailer likes to keep his shelves full; and he takes goods off the front layer as he sells them, and when he gets new goods just puts them in the front and shoves the old ones back, and as a consequence you always find the swells back against the walls. And that whole thing originates through the fault of the grocery salesman from the canner or jobber because he wants to send in large orders and get his commission, and I believe the solution of the whole difficulty lies largely in the education of the retailer to practice more care in buying and not to overload beyond what he knows he will need.

DR. BIGELOW: In regard to that rubber stamp, Dr. Frary, were your inspectors careful to put that only on goods which actually were swells, and not to put it on cans because they had discolored labels and looked old?

COMMISSIONER FRARY: Yes, they were careful what they put it on.

DR. BIGELOW: That would prevent the great difficulty complained of in this letter I just read.

COMMISSIONER FRARY: Yes, and your canner had this trouble from jobbers who sent back goods that did not come from that canner. This would be only human nature, though, I suppose. I would like to tell you about an instance of that

kind I happen to know about. I received several letters from one of the jobbers complaining to me that he had lost money because he had received returns of shoe-polish and plug tobacco, and I wrote back and told him that I had considerable difficulty in securing good inspectors and he must overlook a few mistakes caused probably by a desire on the part of the retailer to get a little out of it. But we don't condemn goods on account of a stained label. That doesn't harm the goods any, except perhaps in the eye of the purchaser.

Now in the case Dr. Caspari spoke of, is it not possible that some of that gas he spoke of finding is dissolved from the hydrogen under pressure?

DR. BIGELOW: Probably not if the mass has a foamy appearance throughout.

COMMISSIONER FRARY: The difficulty we have met with is to tell which is which from the outside. The question which occurs to me is why berries cause so much trouble—is it the acidity or the seeds or what?

DR. BIGELOW: I don't think the seeds have anything to do with it. Of course some fruits are more strongly acid than others. Blueberries grown in some sections of the country are very acid, and there are sour cherries, and some plums attack the metal a great deal more than others. Fruits are different in the same localities at different times. This is a matter you cannot determine entirely by the variety of the fruit. I know of one firm in New York that has two canneries fifteen or twenty miles apart. In one plant they have had a great deal of trouble from pinholing. At the other factory they have had no trouble at all. They don't know what causes it; there is no difference in the process. There is something there we don't understand about the action of the fruit on the metal. It may be that the acidity is higher in one place than the other. We don't know.

MR. FRICK, of Tennessee: I would like to ask if the inspector is justified in condemning all swells. Are you able to tell whether the stuff is fit for food or not?

DR. BIGELOW: I think that a swell caused by decomposition should always be condemned. Certainly a springer, where caused by the action of the contents on the metal, which has gone so

far it may be confused with a hard swell, should be condemned. I think there is no question of that. With regard to other springers, that have not gone that far, I should cut the cans and judge of them then. I think there is no difficulty in telling their condition by the odor, for trained men, that is. Even when such goods would be accepted by many consumers, they can be distinguished by an observant inspector. There is no difficulty in his telling whether it is decomposed or not.

MR. FRICK: I understand there is no difference.

DR. BIGELOW: Now in the case of jams, pie-filling, etc., manufactured from material that has begun to decompose on the market and is no longer salable as fresh food, if that food is worked up into a by-product in such a way that the decomposition is concealed I would take the same objection to it as if it were a swell.

MR. TOLMAN: Is it a wise matter to allow manufacturers to reprocess springers, then? Can you do it with any safety at all?

DR. BIGELOW: The idea of the question is that the manufacturer may be influenced by his interests and reprocess goods that are beginning to decompose? I would say there is just the same possibility of that as when he puts up his goods fresh. There is a difference in the degree of trimming and sorting at different factories when goods of that kind are prepared from fresh goods, and the manufacturer who will use rotten material in his fresh raw product will probably do the same thing if he is working over cans which were springers.

MR. TOLMAN: The point is, can you tell?

DR. BIGELOW: I think you can, yes. I think there is no difficulty in doing that. A man who has made a study of these goods, like a superintendent of the canning establishment or a buyer, is very competent to handle them—or an inspector who has had experience in this matter and given it attention.

THE PRESIDENT: It is getting late and we must be getting on with our program.

COMMISSIONER FRARY: Well, this is one of the most important questions we have before us, I believe. I would like to ask Dr. Bigelow if in the case of a vegetable or any food product, a swell should also be condemned.

DR. BIGELOW: Yes, I think a swell should always be condemned. I would condemn it on general principles.

COMMISSIONER FRARY: Anything that approaches a hard swell in the case of vegetables?

DR. BIGELOW: I should condemn them whether they were vegetables or fruits, but I would not call them decomposed unless I had positive evidence that they were decomposed. There is no question but that the odor is very pronounced if decomposition has occurred in the can.

LEGAL MATTERS FOR THE CANNERS

REORGANIZATION OF FOOD AND DRUG INSPECTION WORK, BUREAU OF CHEMISTRY.

The food and drug inspection work of the Bureau of Chemistry has been reorganized by dividing the country into three districts—Eastern, Central, and Western. The branch laboratories of the bureau have been divided among these districts as follows:

Eastern District	Central District	Western District
Washington Lab'r't'ry	Chicago Lab'r't'ry	San Francisco Lab'r't'ry
New York "		Seattle "
Boston "	St. Paul "	Denver "
Philadelphia "	St. Louis "	Honolulu "
Buffalo "	Cincinnati "	
Savannah "	New Orleans "	
San Juan "		

The dividing line between the Eastern and Central Districts runs along western boundaries of Pennsylvania and West Virginia and follows State lines south, including Georgia and Florida in the Eastern District. The dividing line between the Central and Western Districts runs south on the State lines, following the eastern boundary of Montana, including the whole of Colorado in the Western District and the whole of Texas in the Central District.

The laboratories at Pittsburgh, Kansas City, Nashville, Omaha and Portland, Ore., were closed about April first.

Mr. W. G. Campbell, formerly chief inpector of the bureau, has been appointed chief of the Eastern District, with headquarters at Washington, D.C.

Mr. L. M. Tolman, formerly chief of the Food Inspection Division of the bureau, has been appointed chief of the Central District, with headquarters in Chicago.

Mr. B. R. Hart, formerly chief of the Cincinnati laboratory, has been appointed chief of the Western District, with headquarters in San Francisco.

The district chiefs will have general supervision over all employees and all work in connection with the enforcement of the Food and Drugs Act in their respective territories, subject to the approval of the chief of the bureau.

The reorganization became effective on the first of March, 1914.

INSTRUCTIONS TO FOOD AND DRUG INSPECTORS REGARDING MEAT INSPECTION.

(Letter based on the report of a joint committee, representing the Bureau of Animal Industry and the Bureau of Chemistry, appointed to devise plans for cooperation in meat inspection. These instructions have been approved by the chiefs of the bureaus.)

Since the abrogation of Regulation 39, as announced in F.I.D. No. 151, it becomes the duty of food and drug inspectors to include meat and meat food products in those classes of foods and drugs over which they have been required heretofore to maintain supervision under the law.

The principal, if not the exclusive charge for prosecutions against the sale and shipment of meat, will be under paragraph 6 of section 7 of the act, which states that an article shall be deemed to be adulterated, "if it consists in whole or in part of a filthy, decomposed, or putrid animal vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter."

The application of this law to meat and meat food products will be effected by cooperation between the Bureau of Animal Industry and the Bureau of Chemistry. Such cooperative work may be classified under two general heads:

(1) Those cases where evidence of sale and interstate delivery is obtained by food and drug inspectors and examination of the product made by B. A. I. inspectors.

(2) Those cases where both the evidence of sale and shipment and the examination are made by officials of the Bureau of Animal Industry. It is anticipated that most of the prosecutions will be brought under the first classification, permitting thereby to employees of both bureaus the performance of those duties only with which they are now familiar.

Upon locating shipments which appear to be violative of the Food and Drugs Act, arrange at once for the delivery of samples to the nearest B. A. I. official in charge.

The character of the shipment and its location may frequently make it practicable and advisable to have the entire consignment rather than a sample inspected. The judgment of the B. A. I. officer will determine this. A written report of the examination will be submitted to you and it should specify in what particular the product is in violation of the above-quoted paragraph; that is, in what manner "filthy," to what extent "decomposed," and in what respect "unfit for food," or to use the terms of the Meat-Inspection Act, "unsound," "unhealthful," "unwholesome," or "otherwise unfit for food."

Should the examination indicate a violation of the law, reports should be made in the following manner:

(1) *Seizure action under section* 10: Transmit immediately, in accord with general instructions, all facts relative to quantity, shipment, etc., together with a verbatim report of the examination of the sample by the B. A. I. official.

(2) *Criminal action under section* 2: In this case the collection of a sample is imperative. It should be delivered direct to the official making examination or otherwise should be properly sealed and delivered to the officer in charge, who may then refer it to a subordinate. This sample after examination should be returned to you when the written report is submitted and should be properly sealed in glass jars or other suitable containers and delivered to the laboratory to which you are submitting samples at that time. All reports required under present instructions in such cases should be submitted by you and the report of the B. A. I. official in charge or a copy thereof should be in-

cluded with your collection report. The description of sample slip, which is delivered to the laboratory receiving the sample, should bear a notation setting forth the circumstances under which collection was made, the nature of examination and results thereof.

If the report of the B. A. I. official shows the product not to be adulterated it will be sufficient to transmit such report with the information and records required of unofficial samples only. In such instances delivery of samples to the laboratory may be omitted unless supplemental or additional examination be deemed necessary.

Subhead 2 of the general classification refers to those cases which are prepared exclusively by inspectors of the Bureau of Animal Industry. On account of the small number of food and drug inspectors it will not be possible always for officials of the Bureau of Animal Industry to communicate readily with them, looking to appropriate investigations of questionable shipments which may have been brought to the attention of the B. A. I. inspectors. The latter will be acquainted fully with the character of instructions issued to food and drug inspectors. If you receive at any time requests from employees of the Bureau of Animal Industry to assist in the completion of some investigation which they have undertaken with a view to bringing prosecutions independently under the Food and Drugs Act, cooperate with them in every way practicable, giving them the benefit of your knowledge and experience in such work.

A. STENGEL, *Acting Chief Inspector.*

FOOD INSPECTION DECISION NO. 153.

Amendment to Regulation 9, Relating to Guaranties by Wholesalers, Jobbers, Manufacturers, and Other Parties Residing in the United States to Protect Dealers from Prosecution.

Regulation 9 of the Rules and Regulations for the Enforcement of the Food and Drugs Act, June 30, 1906 (34 Statute, page 768) is hereby amended, effective May 1, 1915, so as to read as follows:

Regulation 9, Guaranty.
(Section 9.)

(a) It having been determined that the legends "Guaranteed under the Food and Drugs Act, June 30, 1906" and "Guaranteed by (name of guarantor), under the Food and Drugs Act, June 30, 1906," borne on the labels or packages of food and drugs, accompanied by serial numbers given by the Secretary of Agriculture, are each misleading and deceptive, in that the public is induced by such legends and serial numbers to believe that the articles to which they relate have been examined and approved by the Government and that the Government guarantees that they comply with the law, the use of either legend, or any similar legend, on labels or packages should be discontinued. Inas-

much as the acceptance by the Secretary of Agriculture for filing of the guaranties of manufacturers and dealers and the giving by him of serial numbers thereto contribute to the deceptive character of legends on labels and packages, no guaranty in any form shall hereafter be filed with and no serial number shall hereafter be given to any guaranty by the Secretary of Agriculture. All guaranties now on file with the Secretary of Agriculture shall be stricken from the files and the serial numbers assigned to such guaranties shall be canceled.

(b) The use on the label or package of any food or drug of any serial number required to be canceled by paragraph (a) of this regulation is prohibited.

(c) Any wholesaler, manufacturer, jobber, or other party residing in the United States may furnish to any dealer to whom he sells any article of food or drug a guaranty that such article is not adulterated or misbranded within the meaning of the Food and Drugs Act, June 30, 1906, as amended.

(d) Each guaranty to afford protection shall be signed by, and shall contain the name and address of, the wholesaler, manufacturer, jobber, dealer, or other party residing in the United States making the sale of the article or articles covered by it to the dealer, and shall be to the effect that such article or articles are not adulterated or misbranded within the meaning of the Federal Food and Drugs Act.

(e) Each guaranty in respect to any article or articles should be incorporated in or attached to the bill of sale, invoice, bill of lading, or other schedule, giving the names and quantities of the articles sold, and should not appear on the labels or packages.

(f) No dealer in food or drug products will be liable to prosecution if he can establish that the articles were sold under a guaranty given in compliance with this regulation.

W. G. MCADOO,
Secretary of the Treasury.
D. F. HOUSTON,
Secretary of Agriculture.
WM. C. REDFIELD,
Secretary of Commerce.

Washington, D.C., May 5, 1914.

FOOD INSPECTION DECISION NO. 154.

Regulation of marking the quantity of food in package form.

Under section 3 of the Food and Drugs Act of June 30, 1906 (34 United States Statutes at Large, pages 768 to 772), as amended by the act of March 3, 1913, entitled "An act to amend section eight of an act entitled 'An act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes, approved June thirtieth, nineteen hundred and six' " (37 United States Statutes at Large, Page 732), Regulation 29 of the Rules and Regulations for the Enforcement of the Food and Drugs Act is hereby amended so as to read as follows:

STATEMENT OF WEIGHT, MEASURE, OR COUNT.

(Section 8, paragraph third, under "Food," as amended by act March 3, 1913.)

(a) Except as otherwise provided by this regulation, the quantity of the contents, in all cases of food, if in package form, must be plainly and conspicuously marked, in terms of weight, measure, or numerical count, on the outside of the covering or container usually delivered to consumers.

(b) The quantity of the contents so marked shall be the amount of food in the package.

(c) The statement of the quantity of the contents shall be plain and conspicuous, shall not be a part of or obscured by any legend or design, and shall be so placed and in such characters as to be readily seen and clearly legible when the size of the package and the circumstances under which it is ordinarily examined by purchasers or consumers are taken into consideration.

(d) If the quantity of the contents be stated by weight or measure, it shall be marked in terms of the largest unit contained in the package; for example, if the package contain a pound, or pounds, and a fraction of a pound, the contents shall be expressed in terms of pounds and fractions thereof; or of pounds and ounces, and not merely in ounces.

(e) Statements of weight shall be in terms of avoirdupois pounds and ounces; statements of liquid measure shall be in terms of the United States gallon of 231 cubic inches and its customary

subdivisions, i.e., in gallons, quarts, pints, or fluid ounces, and shall express the volume of the liquid at 68°F. (20°C.); and statements of dry measure shall be in terms of the United States standard bushel of 2,150.42 cubic inches and its customary subdivisions, i.e., in bushels, half bushels, pecks, quarts, pints, or half pints: *Provided*, That, by like method, such statements may be in terms of metric weight or measure.

(f) The quantity of solids shall be stated in terms of weight and of liquids in terms of measure, except that in case of an article in respect to which there exists a definite trade custom otherwise, the statement may be in terms of weight or measure in accordance with such custom. The quantity of viscous or semi-solid foods, or of mixtures of solids and liquids, may be stated either by weight or measure, but the statement shall be definite and shall indicate whether the quantity is expressed in terms of weight of measure, as, for example, "Weight 12 oz." or "12 oz. avoirdupois," "Volume 12 ounces," or "12 fluid ounces."

(g) The quantity of the contents shall be stated in terms of weight or measure unless the package be marked by numerical count and such numerical count gives accurate information as to the quantity of the food in the package.

(h) The quantity of the contents may be stated in terms of minimum weight, minimum measure or minimum count, for example, "minimum weight 16 oz.," "minimum volume 1 gallon," or "not less than 4 oz"; but in such case the statement must approximate the actual quantity and there shall be no tolerance below the stated minimum.

(i) The following tolerances and variations from the quantity of the contents marked on the package shall be allowed:

(1) Discrepancies due exclusively to errors in weighing. measuring, or counting which occur in packing conducted in compliance with good commercial practice.

(2) Discrepancies due exclusively to differences in the capacity of bottles and similar containers resulting solely from unavoidable difficulties in manufacturing such bottles or containers so as to be of uniform capacity: *Provided*, That no greater tolerance shall be allowed in case of bottles of similar containers which, because of their design, can not be made of approximate uniform capacity than is allowed in case of bottles or

similar containers which can be manufactured so as to be approximate uniform capacity.

(3) Discrepancies in weight or measure, due exclusively to differences in atmospheric conditions in various places and which unavoidably result from the ordinary and customary exposure of the packages to evaporation or to the absorption of water.

Discrepancies under classes (1) and (2) of this paragraph shall be as often above as below the marked quantity. The reasonableness of discrepancies under class (3) of this paragraph will be determined on the facts in each case.

(j) A package containing 2 avoirdupois ounces of food, or less, is "small" and shall be exempt from marking in terms of weight.

(k) A package containing 1 fluid ounce of food, or less, is "small" and shall be exempt from marking in terms of measure.

(l) When a package is not required by paragraph (g) to be marked in terms of either weight or measure, and the units of food therein are six or less, it shall, for the purpose of this regulation, be deemed "small" and shall be exempt from marking in terms of numerical count.

W. G. McADOO,
Secretary of the Treasury.
D. F. HOUSTON,
Secretary of Agriculture.
WILLIAM C. REDFIELD,
Secretary of Commerce.

Washington, D.C., May 11, 1914.

FOOD INSPECTION DECISION 157.

Amending Regulation 29, which relates to marking the quantity of food in package form.

Paragraph (h) of Regulation 29 of the Rules and Regulations for the Enforcement of the Food and Drugs Act is hereby amended by striking out the words "minimum weight 16 oz." and inserting in lieu thereof the words "minimum weight 10 oz." so that paragraph (h) as amended shall read as follows:

The quantity of the contents may be stated in terms of minimum weight, minimum measure, or minimum count, for ex-

ample, "minimum weight 10 oz." "minimum volume 1 gallon," or "not less than 4 oz.;" but in such case the statement must approximate the actual quantity and there shall be no tolerance below the stated minimum.

W. G. McADOO,
Secretary of the Treasury.
D. F. HOUSTON,
Secretary of Agriculture.
WM. J. HARRIS,
Acting Secretary of Commerce.

Washington, D.C., July 25, 1914.

GENERAL INFORMATION.

7. Individual guaranties required by Food Inspection Decision No. 153.

Regulation 9 of the Rules and Regulations for the Enforcement of the Food and Drugs Act (Food Inspection Decision No. 153) requires that guaranties, filed with this department, shall be stricken from the files on May 1, 1915, and that serial numbers assigned thereto shall not be used on the label or package of any food or drug after that date.

This regulation contemplates that on and after May 1, 1915, guaranties, if given with respect to any article of food or to any drug, shall not appear on the label or package, but shall be incorporated in or attached to the bill of sale, bill of lading, or other schedule, giving the names and quantities of the articles. If the goods are properly described in the bill of sale or other document, they may be referred to in the guaranty as listed in the bill of sale or other document, without repetition of the detailed description. Guaranties may be written, printed, or stamped on the bill of sale or other document, and, in order to afford protection, must conform to paragraph (d) of the regulation.

8. Filing of guaranties and issuance of serial numbers prior to May 1, 1915.

Regulation 9 of the Rules and Regulations for the Enforcement of the Food and Drugs Act (Food Inspection Decision No. 153) provides that guaranties, filed with the department of ag-

riculture, shall be stricken from the files on May 1, 1915, and the serial numbers assigned thereto shall not be used on the label or package of any food or drug after that date. It is believed accordingly that manufacturers and dealers will prefer to guarantee their goods in accordance with paragraphs (d) and (e) of the regulation, rather than to submit general guaranties and request serial numbers, which can not be used after May 1, 1915.

9. "In package form."

Representations have been made to the department that certain articles of food are not "in package form" within the meaning of the Food and Drugs Act, as amended by the act of March 3, 1913 (37 Stat., 732). It is the view of the department that the meaning of the phrase "in package form" is so clear that manufacturers and dealers will have little difficulty in determining whether or not articles of food in which they deal are included within it. If doubt arises in administering the law whether individual articles of food or classes of foods are "in package form," the department will determine the question, for administrative purposes, upon the facts in each case.

10. Inquiries regarding cases pending in the courts to be addressed to the United States Attorney.

The Bureau of Chemistry receives frequent inquiries, both by letter and in person, concerning cases arising under the Food and Drugs Act in which court proceedings have been instituted. All inquiries of this nature should be addressed to the United States Attorney for the district in which the case is pending.

11. Establishment of Office of State Cooperative Food and Drug Control.

The need of close and cordial cooperation between State and Federal officials charged with the enforcement of food and drug laws has long been recognized. It is the desire of the department to promote such cooperation in every possible way, and with this end in view a new organization has been formed in the Bureau of Chemistry known as the Office of State Cooperative Food and Drug Control. J. S. Abbott, formerly dairy and food commissioner of the State of Texas, has been appointed chemist in charge of this office.

12. Decree by the Argentine Republic regarding the shipment of food products of animal origin.

Translation from the Official Bulletin of the Argentine Republic, March 9, 1914:

ARTICLE 1. It is decreed—That the following regulations proposed by the National Department of Hygiene for the shipment of food products of animal origin be herewith approved.

1. In virtue of those that determine the regulations at present in force, it is required of manufacturers or importers of products of animal origin to indicate henceforward clearly on the packages of each shipment the class of alimentary substance from which each canned product, be it fish, tunny fish, sardines, etc., or any other class of meat of domestic or other animals, has been made up; without which requirement such goods will not be permitted to enter the country.

2. In like manner it is required to announce on the shipment the name of the manufacturer and the source of origin, in accordance with the rules established in the article already cited.

3. There is allowed a period of six months from the date of official publication of this resolution for those thereby affected to arrange to carry out the conditions set by the preceding articles, with the understanding that in case they do not do so they shall incur the penalties which are set by the regulations now in force. This period of time should be understood, concerning shipments of merchandise in steamers which sail from foreign ports, as beginning with the date of the completion of the time granted, which will under no circumstances be prolonged.

ARTICLE 2. Let it be communicated, published, given to the National Register, and archived.

Plaza. MIGUEL S. ORTIZ.

Food Inspection Decisions Nos. 153 and 155, amending Regulation 9 of the Rules and Regulations for the Enforcement of the Federal Food and Drugs Act, Relating to Guaranties.

GUARANTY LEGENDS ON PACKAGES.

The purpose of Regulation 9, as amended by F. I. D. No. 153 and F. I. D. No. 155, is to prevent the use upon the label or package of any food or drug of a statement which, in any way, might be construed as implying that the article of food or drugs has been guaranteed or approved by the Government. The guaranty legend "Guaranteed by ———— under the Food and Drugs Act, June 30, 1906," or any similar guaranty legend, should not be used on products packed or labeled on or after May 1, 1916. On and after November 1, 1916, no such guaranty legend should appear on any article of food or drugs while in the channels of commerce described in the Federal Food and Drugs Act. In the opinion of this department, it would not constitute a sufficient compliance with the regulation if only

the serial number issued by this department should be blotted out from the guaranty legend heretofore in common use. The use of the words "under the Food and Drugs Act of June 30, 1916," should also be discontinued, and any statement to the effect that the article is guaranteed should contain no reference to the United States or to the Department of Agriculture.

No objection, however, would be made by this department to a statement, if true, that the guarantor himself guarantees the contents of the package to be pure, wholesome, or free from adulteration; nor, in the opinion of the department, would it constitute a violation of the regulation if it were stated, in substance, that the article is warranted by the manufacturer, or other designated person, to comply with the requirements of all State laws or of the laws of certain named States.

TIME OF TAKING EFFECT.

Food Inspection Decision No. 153 was supplemented, on May 29, 1914, by Food Inspection Decision No. 155. The last-mentioned decision postpones the effective date of the new regulation until May 1, 1916, except that, as the goods packed and labeled prior to May 1, 1916, in accordance with law and with the regulations in force prior to May 5, 1914, it further postpones the effective date of the regulation until November 1, 1916; provided, however, that compliance with the terms of Regulation 9 as amended will be permitted at any time hereafter.

Under Food Inspection Decision Nos. 153 and 155 it will not be necessary to wait until May 1, 1916, to remove the serial number and guaranty legend from packages of food or drugs, but the use of either the serial number or the guaranty legend may be discontinued at any time. In that event, however, in order for guaranties under the Federal Food and Drugs Act to afford the dealers protection from prosecution under the act, all the requirements prescribed in Regulation 9, as amended by Food Inspection Decision No. 153, should be complied with.

Effect of Amendment on Guaranties Filed Under Present Regulation 9.

It is not intended that the provision in paragraph (a) of Food Inspection Decision No. 153, which states that—

All guaranties now on file with the Secretary of Agriculture shall be stricken from the files, and the serial numbers assigned

to such guaranties shall be canceled, shall affect the validity of such guaranties in respect to the particular articles of food or drugs covered thereby which have been sold or delivered by the guarantor to his vendee prior to the date when such guaranties shall have been stricken from the records of the department.

FORM OF GUARANTY IN FUTURE.

The amended regulation contemplates that guaranties given under the Food and Drugs Act on and after May 1, 1916, shall be incorporated in or attached to the bill of sale, invoice, bill of lading, or other schedule, giving the names and quantities of the articles. If the goods are properly described in the bill of sale or such other document they may be referred to in the guaranty as listed in the bill of sale or other document, without repetition of the detailed description. Guaranties may be printed or stamped on the bill of sale or other document referred to in paragraph (e), and, in order to afford protection, must conform to paragraph (d) of the regulation. The signature of the guaranty may also be printed or stamped on the bill of sale, or on the invoice, or on the bill of lading, or other schedule, describing the goods sold, if transmitted by the guarantor direct to the dealer.

The department has no authority to prescribe the exact wording which must be used in making a guaranty, nor can it determine whether any particular guaranty submitted to it is legally sufficient to protect dealers from prosecution under the Food and Drugs Act. In the opinion of the department, however, a guaranty, if worded substantially according to the following form, will comply with all the requirements of the act:

> I (we), the undersigned, do hereby guarantee that the articles of food (and drugs) listed herein (or specifying the same) are not adulterated or misbranded within the meaning of the Federal Food and Drugs Act, June 30, 1906, as amended.
>
> (Signature and address of guarantor.)
>
> The signature of the party making the guaranty should be followed by his address.

Regulation 9 as amended describes a form for and a method of giving a guaranty, the legal sufficiency of which, under the Food and Drugs Act, is believed to be unquestionable. In the

event that guarantors desire to give general guaranties to their vendees, or desire to use any form of guaranty different from that described in Regulation 9, as amended, it will be necessary for them to consider and decide for themselves whether such form is legally sufficient to protect a dealer from prosecution.

In a decision reported in Notice of Judgment No. 2471 the court held invalid a general guaranty in the following form:

> The undersigned, ————, of Chicago, State of Illinois, United States of America, does hereby warrant and guarantee unto ———— that any and all articles of food and drugs, as defined by the act of Congress approved June 30, 1906, entitled "An act for preventing the manufacture, sale, or transportation of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines, and liquors, and for regulating traffic therein, and for other purposes, which the undersigned has sold since October 1, 1906, or shall at any time hereafter prepare, manufacture for, sell, or deliver to said————, will comply with all the provisions of said act of Congress, and are not and shall not be in any manner adulterated or misbranded within the meaning of said act.
>
> It is expressly understood that this shall be a continuing guaranty until notice of revocation be given in writing and notice of acceptance of the guaranty is hereby waived.
>
> Dated at Chicago this ————, 1906.
>
> (Signed)————————

In a later case the court sustained a prosecution based on a similar form.

OPINIONS REGARDING THE WEIGHT AND VOLUME REGULATIONS (F. I. D. NO. 154).

QUANTITY OF CONTENTS ON SHIPPING CASES.

"If two or more packages of food, each of which bears a statement of the quantity of the contents on the outside thereof, in conformity with the Food and Drugs Act as amended March 3, 1913, and the regulations thereunder, are placed in a box, bag, barrel, crate, or similar container for convenience in shipping only, it is not required that the quantity of the contents shall be stated also on such box, bag, barrel, or other container. If, however, the quantity of the contents be stated on any such box, bag, barrel, or container, the statement should be plain and correct."—C. L. ALSBERG.

"CULL" BEANS OR BEANS WHICH ARE MOLDY, MUSTY, ETC., TOMATO SAUCE FROM DECOMPOSED TOMATOES IN BAKED BEANS.

"The attention of the Board of Food and Drug Inspection has been called to the practice of using 'cull' or other beans which

are moldy, musty, or otherwise decomposed in various canned food products, such as baked beans or pork and beans. Products made from such material are manifestly contrary to section 7, paragraph 6, in case of foods, of the food and drugs act.

"The use of tomato sauce or pulp which is prepared from decomposed tomato or trimming stock, in the preparation of baked beans or other food products with tomato sauce, is also deemed to be in violation of the law."—C. L. ALSBERG.

WEIGHTS OF CLAM MEAT REQUIRED IN CANS.

"Food Inspection Decision No. 144 states that in canned food products the can serves not only as a container but also as an index of the quantity of food therein. It should be as full of food as is practicable for packing and processing without injuring the quality or appearance of the contents, and such products as require the addition of brine, water, etc., for proper preparation should contain only sufficient liquid to fill the interstices and cover the product.

"The board has received many inquiries from canners of clams regarding the weights of clams which cans should contain in order to comply with the requirements of the above decision. The subject has, therefore, been investigated by the Bureau of Chemistry. As a result of this investigation it is the opinion of the board that cans which contain the weights of drained clam meat shown below will satisfactorily fulfil the requirements of Food Inspection Decision No. 144. These weights are 'cut-out' weights; i.e., the weights of meat left in the can after all free liquor has been drained off.

Type of can.	Diam. Inches	Height. Inches	"Cut-out" Weights of clams
No. 1, Regular or oyster	2 11/16	4	5
No. 1, Maine style	3	4 7/16	8
No. 2, Short or picnic	3⅜	4	8½
No. 2, Regular	3⅜	4 9/16	10

"When cans of other sizes are used, they should contain proportional weights of meat.

"It should be remembered that a loss of weight almost invariably occurs when clams are processed, and due allowance should be made for this loss in weighing the clams into the can. It is believed that the experience of the packers is such that

there will be no difficulty in making the proper allowance for shrinkage in processing, thus avoiding shortage from this cause. It may be said that the investigations made in the bureau indicate that the loss in weight in processing varies from about 5 to 15 per cent, the average loss being about 10 per cent of the weight of clams placed in the cans. The weights of drained clam meat should not fall below those given above, or, if a variation occurs, it should be as often above as below the weights specified."—C. L. ALSBERG.

ADDITION OF CORNSTARCH TO CANNED CORN.

"The corn ripened very late, and, in spite of the fact that the corn is of the finest quality and flavor, it lacks sufficient starch to pack properly on account of the fact that the liquids will separate from the solids in the canning, and, therefore, in order to produce a satisfactory product it is necessary to add cornstarch to the extent of 1 to 1½ per cent.

"In the opinion of the board, on the facts as above stated, and, if no inferiority of the corn is concealed, this addition would be permitted, under Regulation 25, section 7 (a), which states that 'When a substance of a recognized quality commonly used in the preparation of a food or drug product is replaced by another substance not injurious or deleterious to health, the name of the substituting substance shall appear upon the label.' If a product prepared as indicated, were plainly labeled 'Sweet Corn with added Starch,' there would not appear to be any violation of the Food and Drugs Act.

"It is, however, plain to the board that starch may be added to sweet corn in a manner whereby inferiority is concealed, and whereby water is added, which addition of starch would clearly constitute a violation of the act. The canners are, however, familiar with the conditions under which they are working, and the board is not; the canners should, therefore, be able to decide the proper course from the above statement of facts."—A. S. MITCHELL.

LABELING OF "SOAKED PEAS."

The bureau has received a number of inquiries regarding the form of label which should be used on the product heretofore designated as "soaked peas." This question was fully answered

by the Board of Food and Drug Inspection in the letter quoted below:

> We have been endeavoring to secure as much information as possible, both from our experts and from the canning trade, as to proper labeling of this product. From the information thus gathered it appears that the proper designation for this product is "soaked dried peas" or "soaked ripe peas" as the case may be. The Board of Food and Drug Inspection is of the opinion that the terms "dried peas" and "ripe peas" are not proper designations for these products, inasmuch as they are the names of other definite substances. Our inquiry does not show that there is any particular objection in the trade to the term "soaked peas." It would appear that the term "soaked peas" is a shortened expression of the legend "soaked dried peas" or "soaked ripe peas" which has naturally grown up among the manufacturers and which from long usage has come to represent to both the consumer and the trade, a definite food product. The board is of the further opinion, however, that no objections could be raised to the designation of these products as "peas, prepared from dried peas," or "peas, prepared from ripe peas," as the case may be, provided the modifying phrase "prepared from dried (or ripe) peas" be plainly stated in immediate connection with the word "peas," the whole phrase thus forming the name of the product. We understand that the trade recognizes a difference between dried peas and ripe peas, the dried peas being the peas gathered in the succulent state and dried and the ripe peas being those which have ripened on the vine.
>
> R. E. DOOLITTLE,
> *Acting Chairman,*
> *Board of Food and Drug Inspection.*

THE TERM "STRINGLESS BEANS."

"Inquiry regarding the use of the expression 'stringless beans' has been taken up with the Bureau of Plant Industry.

"We are informed that the term 'stringless' applies more particularly to a condition of growth than to a variety of beans, although there is a great diversity among varieties in respect to stringiness. If the so-called stringless varieties are processed, while they are in the proper state of development, the term 'stringless' could be applied very properly to the stock so handled. There is bound to be, however, a greater or less percentage of the product of any variety which will carry more or less fibrous matter (strings). In other words, many of the better sorts of beans, if picked and processed when young enough, will give a brand of goods which could properly be designated 'stringless.' If the same varieties are allowed to come to a later stage of development and approach more nearly to maturity, they will become tough and fibrous.

"It is the opinion of the bureau that the term 'stringless' may properly be used for a high-grade brand of canned beans,

regardless of the name of the variety from which the stock was derived, provided they are canned at the proper stage of development, as indicated above."—C. L. ALSBERG.

"LEMON CLING" AND "YELLOW CLING" ON CANNED PEACHES.

"Regarding the use of the terms 'Lemon Cling' and 'Yellow Cling' on canned peaches, a declaration of the varietal name is not required upon the label. Where such a name is given, however, it must be the true name of the variety.

"The Lemon Cling is a well-known variety of peach which is somewhat widely grown in California and is highly esteemed for canning. If the peaches in question, which are labeled 'Lemon Cling' are not of that variety, it would be obviously improper to so label them. Should the words 'Yellow Cling' be substituted on the label for 'Lemon Cling' the product would be understood to belong to anyone of the yellow clingstone varieties. We are informed that practically all of the peaches which are commercially canned in California are yellow-fleshed clings." —C. L. ALSBERG.

THE TERM "CAVIAR."

"Labeling of caviar made from whitefish to which a harmless vegetable dye had been added.

"This question has been taken up at some length with the Commissioner of Fisheries. The bureau is informed that the term 'caviar' can properly be applied to any kind of fish eggs prepared after a special method. The eggs first prepared and most extensively used were those of the sturgeon and to many people the term 'caviar' is synonymous with 'sturgeon caviar.' In view of this fact and of other considerations, it is believed that the name of the particular fish from whose eggs caviar is made should appear on the label. In the case in point an appropriate label would be 'whitefish caviar.' This bureau will make no objection to the use of the term 'caviar' on a product prepared according to the usual method and made from the roe of whitefish, provided the name of the fish is given in conjunction with the word caviar.

"There is no objection to the use of a harmless coloring matter in a product of this kind, provided a clear declaration

of the presence of added color is made on the label. It should, of course, be understood that the product should not be labeled in such a way as to lead the purchaser to believe it to be an imported product."—C. L. ALSBERG.

LABELING OF BUTTER BEANS

"While undoubtedly the term butter beans is used in some localities in describing a variety of lima beans, it would seem that there is considerable evidence to show that in certain markets of the North the wax string bean is thus designated. It would seem, therefore, that in order to avoid confusion the term should be applied to lima beans only in those regions where this is the common name for that product."—C. L. ALSBERG.

BUYERS' LABELS

For their best protection packers should exercise great care in seeing that labels furnished by buyers fully comply with the law. Such labels may be furnished in entire good faith and with the guaranty on the part of the buyer to protect the packer in their use. This is good as far as it goes, but, if the goods should be labeled in transit, the packer under the law could be held liable for putting on the labels. Under these circumstances the buyer's guaranty of the buyer would not serve to relieve the packer from prosecution.

COVE OYSTERS

"This Board has issued no ruling against the use of the word 'Cove' on the labels of canned oysters and no such ruling is contemplated. It is the understanding of the Board that this is a trade term which has been established by long usage as a designation for canned oysters."—C. L. ALSBERG.

LABELING OVER-FILLED SWEET POTATOES

"If the appearance of swelling is actually due to the fact that the cans have been overfilled, there can be no objection to making some statement on the label which will notify the customer of this fact. The Board is not prepared to recommend any particular form of statement, but would not object to the

expression, 'Can Over-filled.' This statement will have no weight if the swelling be actually due to decomposition."—C. L. ALSBERG.

PLACE OF MANUFACTURE ON LABEL

Fully covered by Regulation 18, subdivision (b) of the Rules and Regulations for the enforcement of the Food and Drugs Act, which reads as follows:

> (b) When a person, firm or corporation actually manufactures or produces an article of food or drug in two or more places, the actual place of manufacture or production of each particular package need not be stated on the label except when in the opinion of the Secretary of Agriculture the mention of any such place, to the exclusion of the others, misleads the public.

USE OF COMBINATION VIGNETTE ON LABELS

There would appear to be no objection to the use of a combination vignette on the label of a can containing one of the fruits represented, provided the name of the fruit actually canned is clearly stated upon the label.

USE OF LABELS OF PREDECESSOR

This matter was submitted to the Bureau of Chemistry and reply received to the following effect: "Regulation 18 of the Rules and Regulations promulgated by the three secretaries under authority conferred upon them by the Food and Drugs Act, June 30, 1906, requires that if the name of the manufacturer is given on the label, it must be that of the true manufacturer. If the name of the company appearing on the labels is the true name of the manufacturer, there can be no objection to the use of the name of that company on the labels.

"If, however, the name of the company appearing on the labels is not that of the true manufacturer, but is a predecessor of the manufacturer, such fact should appear on the label, if the old labels are to be used."

The meaning of the above is that where the name of the company is changed the labels should be imprinted to show the fact.

REGARDING WEIGHT AND VOLUME REGULATIONS (F. I. D. NO. 154)

MISLEADING TRADE TERMS INDICATING SIZES OF CONTAINERS

Reply to a request for the criticism of a carton which contained 4 dozen cans of deviled ham and bore the following statements: In large type, "4 doz. ¼ cans"; in smaller type, "Contents of each can 3 oz."

"While the requirements for branding as given in the regulations for the enforcement of the amendment of March 3, 1913, to the Food and Drugs Act (Food Inspection Decision No. 154) apply particularly to the small cans or units in the package, and the branding of the quantity of the contents upon packing cases containing a number of units branded in conformance with the law and the regulations is not obligatory (see Service and Regulatory Announcements No. 5, Letter 34), nevertheless if the packing cases are branded the statements must be in accordance with the requirements of the act.

"The statement reading '4 doz. ¼ cans' upon a package of cans containing 3 ounces is considered false and misleading and not in conformance with the requirements of the act, notwithstanding the further statement, made in smaller type, 'Contents of each can 3 oz.' "—C. L. ALSBERG.

NET WEIGHT OF COMB HONEY.

The net weight of comb honey is considered to be the weight of the honey and comb, exclusive of the wooden section. It is believed that the tare weight of these sections is easily ascertained and that the filled sections can be readily sorted into approximately similar weights which may be marked in accordance with paragraph (h) of Food Inspection Decision No. 154.

The individual units must be marked, and the shipping case may be if desired. The marking should be done previous to their introduction into interstate commerce.

While the regulations do not prescribe the manner of marking, as to whether a rubber stamp may be used, the law requires that the statement shall be plain and conspicuous. Stamping by means of anilin ink is frequently illegible owing to fail-

ure to print or to the running of the ink. If such a stamp is used, care should be taken to make the statement plain and conspicuous, as required by the act.

OILS OF THE NATURE OF COTTONSEED OIL.

"Regarding the statement of the quantity of the contents upon cottonseed oil, the opinion of this department is that oils of the nature of cottonseed oil are not viscous substances under ordinary conditions within the meaning of the regulations. Cottonseed oil should, therefore, be considered as a liquid and marked in terms of volume, gallons, half gallons, quarts, pints and fractions thereof, or, if the quantity is less than 1 pint, in terms of fluid ounces."—C. L. ALSBERG.

CONTENTS MUST BE MARKED IN TERMS OF THE LARGEST UNIT.

"Labels reading 'C.M.A. Brand, Weight of Contents, 16 oz.,' is not in conformance with the requirements of the regulations as laid down in Food Inspection Decision No. 154. Note the requirements under paragraph (d) that the quantity of the contents shall be marked in terms of the largest unit contained in the package."—A. S. MITCHELL.

EXTENSION OF TIME FOR THE USE OF LARGEST UNIT LABELS.

"Regarding the use of the expression 'Contents 26 Fluid Ounces,' for the marking of the quantity of the contents upon liquids, the form of statement submitted does not comply with the requirements that the statement be made in terms of the largest unit contained in the package, which is in this case 1 pint.

"The following decision has been reached by the department concerning labels where there was evident intent to comply with the requirements of the law:

"In order to prevent unnecessary destruction of labels and cartons which were printed before the issuance of Food Inspection Decision No. 154, the department has decided that, prior to June 1, 1915, it will not recommend proceedings solely upon the charge that the statement of the quantity of the contents on a package, if otherwise satisfactory, is not in the terms of the largest unit in the package, provided that upon inves-

tigation it is found that the labels or cartons bearing such statements were printed prior to May 11, 1914, and plainly indicate an honest attempt to comply with the provisions of the law."—C. L. ALSBERG.

LABELS BEARING ALTERNATIVE STATEMENTS.

"The use of one label at the same time for large and small bottles of liquids, the label bearing a statement reading: 'Contents—Large bottles 28 oz., Small bottles 14 oz.'

"A statement of this character is not in compliance with the regulations and is not satisfactory. Each size of bottle should be labeled with a plain statement of the quantity of its contents in terms of the largest unit. The statement upon large bottles should read '1¾ pints' or '1 pt. 12 fl. oz.' and upon the small size '14 fluid ounces.' "—A. S. MITCHELL.

CONTENTS BLOWN IN BOTTLES MUST BE PLAIN AND CONSPICUOUS.

"The Food and Drugs Act as amended by the act of March 3, 1913, provides that the quantity of the contents in the case of food in package form must be plainly and conspicuously marked on the outside of the package. Subdivision (c) of Regulation 29 as amended (Food Inspection Decision No. 154) provides that 'the statement of the quantity of the contents shall be plain and conspicuous, shall not be a part of or obscured by any legend or design, and shall be so placed and in such characters as to be readily seen and clearly legible when the size of the package and the circumstances under which it is ordinarily examined by purchasers or consumers are taken into consideration.'

"It would appear that a statement blown in the bottle would be satisfactory if plain and conspicuous and in conformity in other respects with the regulations. Such a statement should, of course, apply to the quantity of the contents and not to the capacity of the bottle.

"I am of the opinion that the statement upon the crown cork would not be conspicuous within the meaning of the act and would not comply with the terms of the regulation quoted above."—C. L. ALSBERG.

CONTENTS MADE BY MEANS OF PERFORATIONS NOT PLAIN AND CONSPICUOUS.

"Food Inspection Decision No. 154, containing the regulations under the amendment to the Food and Drugs Act requiring a statement of the quantity of the contents upon food products in package form.

"Inasmuch as the statement is required to be plain and conspicuous, statements made by means of perforations in the label or wrapper are deemed not in compliance with this requirement."—C. L. ALSBERG.

TOMATOES WITH PUREE.

"It is the understanding of the Bureau that the term 'puree' implies a certain degree of concentration. A product consisting mainly of tomato pulp which has been put through a cyclone, or a cyclone and finishing machine, would hardly be entitled to the name 'puree.'

"There appears to be no objection to the sale of tomatoes with puree made from trimmings under the label 'Tomatoes with Puree,' provided the statement that the product is made from trimmings is printed in a conspicuous manner.

"One label has come to the attention of the Bureau which bears the legend 'Puree from Trimmings with Tomatoes' on one face, while the other face bears a picture of a whole tomato, above which is printed the name of the brand and below the name of the canning company. Such a label is not regarded as proper, but no objection will be made to it if the legend 'Puree from Trimmings with Tomatoes' is also printed across the face bearing the picture of the tomato."—C. L. ALSBERG.

MEANING OF THE TERM "ORANGEADE."

"Concerning the labeling of an orange beverage, it is noted that the product is made from orange peel, orange juice, citric acid, sugar, water, and color, and that the word 'orangeade' applied to this product.

"It is the opinion of the Bureau that the word 'orangeade' should be applied only to a product consisting of orange juice, sugar, and water, flavored with more or less orange peel. The

above product, which contains citric acid as a substitute for orange juice, would not, in the opinion of the Bureau, be properly described as orangeade. It should be plainly labeled to show that it is an imitation or compound. If the product is termed a compound, the ingredients used, including an artificial color, should be plainly stated on the label in connection with the term compound."—C. L. ALSBERG.

MEANING OF THE TERM "ORANGEADE POWDER."

"It would not be proper to apply the term 'orangeade powder' to a product made by mixing citric acid, oil of orange, and artificial color. Such a product might be sold under a label which clearly indicates it to be a compound or imitation, as provided for in section 8, paragraph 4, under foods, of the Food and Drugs Act. If labeled as a compound, the ingredients should be stated, including the presence of artificial color." —C. L. ALSBERG.

CALCULATION OF GLUTEN OR PROTEIN IN GLUTEN FLOUR, ETC.

"It is still the practice of many manufacturers and dealers in cereal products to calculate the percentage of protein or gluten in wheat flour and gluten flour by multiplying the percentage of total nitrogen in the product by the factor 6.25.

"At the time of the adoption of certain food standards by this department (see Circular No. 19, Office of the Secretary of Agriculture) this factor was generally used, but subsequent investigations have shown it to be incorrect, and in 1911 the Association of Official Agricultural Chemists adopted the factor 5.70. Regulation 4 for the enforcement of the Food and Drugs Act prescribes the methods of analysis adopted by that association for the examination of food products in connection with the enforcement of that act.

"It is, therefore, the opinion of this Bureau that all statements of protein or gluten content on labels of wheat flour, gluten flour, or other wheat products should be calculated by multiplying the percentage of nitrogen, as determined by the Kjeldahl or Gunning method, by the factor 5.70, and after June 30, 1915, this bureau will regard as misbranded such products in which an excessive amount of gluten or protein is declared on

the label owing to the use of the incorrect factor 6.25."—C. L. ALSBERG.

THE TERM "HOMINY FEED."

"We are of the opinion that hominy feed is a mixture of the bran coating, the germ, and part of the starchy portion of the corn kernel obtained in the manufacture of hominy grits for human consumption. We are further of the opinion that hominy feed is adulterated if it contains any or all of the materials which are cleaned from the corn before it is subjected to the actual milling process which finally results in hominy grits. In other words, it does not make any difference whether part of the cleanings from corn are obtained in the elevator and part in the mill; none of these cleanings from the corn is, in our opinion, a proper constituent of hominy feed.

"The case is analogous to mixtures of wheat bran and screenings. Some of the screenings may be obtained from the wheat in the elevator and some in the mill, yet they are nevertheless screenings. Wheat bran is the coarse, outer coating of the wheat berry obtained in the usual commercial milling process from wheat that has been cleaned and scoured, and is adulterated if it contains any of the cleanings or screenings obtained from the wheat before it goes to the break rolls."—C. L. ALSBERG.

"DRAM" OR "DRACHM" AS FLUID MEASURE.

"The letter quoted below is a reply to the following inquiry: We put in packages of food flavors holding 5 and 15 drachms and wish to know whether they can be labeled 'Contents five drachms' and 'Contents fifteen drachms,' respectively.

"The subject of this inquiry is covered by paragraph (d) of the regulations under the weight and volume amendment to the Food and Drugs Act (F. I. D. No. 154).

"There appears no objection to the statement of 5 drachms, provided fluid drams are intended. Expressions of weight, however, should be in avoirdupois pounds, ounces, and fractions thereof, inasmuch as drams are units of troy weight. A statement reading '15 drams' is not in strict conformance with paragraph (d), inasmuch as 8 drams constitute 1 fluid ounce.

"Also note the exemptions for small packages given in paragraphs (j) and (k)."—A. S. MITCHELL.

PACKAGES CONTAINING MORE THAN 1 PINT OF LIQUID.

"Inquiry whether a statement in fluid ounces is satisfactory where the contents of the package consists of more than 1 pint, the intention of the regulation was to require the statement in terms of the largest unit contained in the package, as '1 pint and 8 fluid ounces' or '1½.' "—A. S. MITCHELL.

LABELING OF CANNED SOAKED PEAS.

"In the opinion of the Bureau the use of a vignette showing peas in the pod would not be considered proper on a label for canned soaked peas, for the reason that it might lead the purchaser to believe the product to be canned fresh peas. There would be no objection, however, to the use of a pictorial design which would not mislead purchasers as to the nature or quality of the product, such, for example, as a vignette showing a dish containing shelled peas."—C. L. ALSBERG.

ADDITION OF TUMERIC TO PREPARED MUSTARD.

"The addition of tumeric to prepared mustard is not prohibited, provided the coloring added by means of tumeric does not conceal damage or inferiority. Such inferiority might arise from deficiency in mustard or the substitution of charlock, starch, or other cheap filler for mustard. The presence of tumeric should in all cases be declared upon the label."—C. L. ALSBERG.

LABELING OF ARTIFICIALLY TREATED WATERS.

"If salts are added to a natural water the quantity of salts need not be stated, but the facts regarding such treatment must appear on the label in such a manner and in type of such size as to make it clear and not misleading. Such words as 'fortified,' 'concentrated,' 'added salts,' etc., do not convey the proper information to the purchaser and are considered misleading and objectionable. It would be entirely satisfactory, however, to say: 'Contains added sodium chlorid,' 'Contains added sodium bicarbonate,' 'Artificially treated with sodium chlorid and sodium bicarbonate,' 'Fortified with magnesium sulphate,' or to use any truthful legend of a similar import which conveys the proper information to the consumer."—C. L. ALSBERG.

QUANTITY DISTINCT FROM QUESTIONS OF BRANDING CHARACTER OF CONTENTS.

"Regarding the interpretation of section (b) of Food Inspection Decision No. 154, this regulation was intended to exclude from the statement of the net weight of food products in package form all linings of packages, premiums which might be enclosed in the package of food, printed circulars and similar objects sometimes enclosed. It was not intended to exclude brine, syrup, oil, or the usual condiments which are a necessary part of canned foods; the statement of the quantity of the contents may include such substances.

"The regulations, Food Inspection Decision No. 154, apply only to the marking of the quantity of the contents, and are not intended to treat of questions of misbranding as to the nature of the contents, to questions of adulteration by mixing and packing water with the product, or of substitutions of cheaper and inferior substances for the product. Violations of this character are covered by different paragraphs of the act and are the subject of Food Inspection Decision No. 144."—A. S. MITCHELL.

THE EXPRESSION "NO. ½," REFERRING TO THE SIZE OF CANS.

"The statement 'No. ½' on a shipping box which contains two dozen cans, each of which bears a true declaration of the quantity of the contents, is in comformity with the Food and Drugs Act as amended March 3, 1913, and the regulations thereunder. You are informed that the use of the statement 'No. ½' will be permitted in the marking of outside shipping containers. This will not permit the use of the term '½ cans,' which is considered misleading as indicated in a previous letter."—C. L. ALSBERG.

"SUGAR PEAS," "SUGAR CORN," AND "CHAMPION PEAS."

"The terms 'sugar corn' and 'sugar peas,' as applied to varieties which are distinctly sweet, is not regarded as objectionable. The terms 'sweet corn' and 'sugar corn' are used interchangeably, and the term 'sugar peas' is used also for some of the higher grades of wrinkled peas which are used in canning. The term 'sweet peas' would not be regarded as a synonym for

'sugar peas,' since the formcr term is confined exclusively in horticultural literature to the types of peas grown for their flowers. Sugar is customarily used in connection with the canning of both corn and peas for the purpose of sweetening the liquor, and it should be understood that the use of sugar in canning corn or peas does not justify the use of the terms 'sweet corn' and 'sugar peas' for such products. As stated above, the use of these terms is only proper when the varieties are distinctly sweet. In this connection, the provisions of Food Inspection Decision No. 66 should be borne in mind.

"It is the opinion of the Bureau that the term 'Champion' is objectionable in connection with the labeling of peas, since the use of this word 'Champion' is often used as a contraction of the name 'Champion of England.' This is a recognized horticultural name for a standard variety of peas. The use of the word 'Champion' would only be regarded as proper in connection with peas belonging to the 'Champion of England' variety." —C. L. ALSBERG.

MARMALADES.

"Relative to standards for marmalade published in Circular No. 19, the Bureau is now making a study of this question, and pending further information no action will be brought against marmalade made from clean, sound, properly matured and prepared fresh fruit and sugar (sucrose), even though the proportions of fruit and sugar vary within reasonable limits from those laid down in Circular No. 19, namely, 45 pounds of fruit to 55 pounds of sugar. As the bureau has not yet completed its investigations on this subject, no more definite statement regarding the permitted variation can be made at this time. The product must, of course, conform in name to the fruit used.

"If new standards are drawn, a reasonable time will be allowed manufacturers in which to dispose of goods which they have on hand before action is taken against products not conforming to the new standards."—C. L. ALSBERG.

"JELLY" NOT PRODUCTS MADE FROM GELATIN.

"In the opinion of the Bureau, the term 'jelly' without modification is applicable only to a product prepared according to

definition 12 (Circular No. 19), under Fruit and Fruit Products, the gelatinous consistency of which is derived entirely from the fruit. A product which is thickened by means of gelatin could not properly be labeled as fruit jelly, but should be designated in such a way as to clearly indicate the nature of the product."

ALCOHOL IN FRUIT JUICES.

"An investigation by the Department of Agriculture shows that fruit juices such as peach and cherry juices, to which alcohol has been added, are imported or shipped in interstate commerce under the designations 'peach juice,' 'cherry juice,' etc.

"It is the opinion of this Department that such names as 'peach juice,' 'cherry juice,' etc., should be applied only to the unfermented juices of the corresponding fruits, containing no added sugar, alcohol, or other substances.

"Fruit juices to which alcohol has been added should be plainly labeled to show this, and cannot properly be designated 'peach juice,' 'cherry juice,' etc.

"After September 1, 1914, goods labeled contrary to the above ruling were denied entry, and, if found in interstate commerce, appropriate action will be taken."—C. L. ALSBERG.

ARSENIC AND LEAD IN FOOD AND FOOD PRODUCTS.

"For some time the Bureau of Chemistry has been investigating the presence of arsenic and lead in certain food products and has found that these metals are usually introduced into such products through the use of impure raw materials or from the apparatus or utensils employed in the processes of manufacture.

"The poisonous properties of arsenic and lead are well known, and this Bureau holds that food containing arsenic or lead, added in any manner, is adulterated, in that it contains an added poisonous or deleterious ingredient which may render the product injurious to health. Manufacturers of all food products or ingredients of foods are, therefore, warned to be on the lookout for the presence of arsenic or lead in such products and to take such precautions as are necessary to avoid its

presence in the finished product or to secure its elimination therefrom."—C. L. ALSBERG.

FOOD INSPECTION DECISION No. 156

WINE.

"As a result of investigations carried on by this Department and of the evidence submitted at a public hearing given on November 5, 1913, the Department of Agriculture has concluded that gross deceptions have been practiced under Food Inspection Decision No. 120. The Department has also concluded that the definition of wine in Food Inspection Decision No. 109 should be modified so as to permit correction of the natural defects in grape musts and wines due to climatic or seasonal conditions.

"Food Inspection Decisions Nos. 109 and 120 are, therefore, hereby abrogated and, as a guide for the officials of this Department in enforcing the Food and Drugs Act, wine is defined to be the product of the normal alcoholic fermentation of the juice of fresh, sound, ripe grapes, with the usual cellar treatment.

"To correct the natural defects above mentioned the following additions to musts or wines are permitted:

"In the case of excessive acidity, neutralizing agents which do not render wine injurious to health, such as neutral potassium tartarate or calcium carbonate;

"In the case of deficient acidity, tartaric acid;

"In the case of deficiency in saccharine matter, condensed grape must, or a pure dry sugar.

"The foregoing definition does not apply to sweet wines made in accordance with the Sweet Wine Fortification Act of June 7, 1906 (34 Stat., 215).

"A product made from pomace, by the addition of water, with or without sugar or any other material whatsoever, is not entitled to be called wine. It is not permissible to designate such a product as 'Pomace wine,' nor otherwise than as 'imitation wine.'"

D. F. HOUSTON, *Secretary of Agriculture.*

Washington, D.C., June 12, 1914.

WINES MANUFACTURED PRIOR TO JUNE 12, 1914.

Proceedings under the Food and Drugs Act, with respect to fermented beverages not prepared in conformity with this decision, but which, it is claimed, have been manufactured in good faith in compliance with either Food Inspection Decision No. 109 or Food Inspection Decision No. 120, will not be recommended by the Department of Agriculture, prior to June 12, 1916, if it shall appear, upon investigation, that the articles with respect to which the claim is made were actually manufactured prior to June 12, 1914, and are labeled in conformity with either Food Inspection Decision No. 109 or Food Inspection Decision No. 120, as the case may be.

WEIGHT NOT REQUIRED ON WRAPPED HAMS AND BACONS.

The question has been raised whether the act of March 3, 1913 (37 Stat., 732), known as the Net Weight Amendment to the Food and Drugs Act, requires that the weight of the meat be marked upon the paper, cloth, or gelatin covering with which single hams and single sides or strips of bacon are wrapped or coated.

In the opinion of the Department single hams and single sides or strips of bacon when so covered with paper, cloth, or gelatin are not "in package form" within the meaning of the Net Weight Amendment, and consequently it is not required that the quantity of the meat be stated on such coverings.

FOOD PRODUCTS SHIPPED IN INTERSTATE COMMERCE AFTER SEPTEMBER 3, 1914.

First.—That the penalties of the act of fine, imprisonment, or confiscation cannot be enforced for violation of the net-weight amendment in respect to domestic food products prepared, or foreign food products imported, prior to September 3, 1914.

Second.—That if, after September 3, 1914, packages of food products not marked as required by this amendment be shipped in interstate or foreign commerce, or otherwise brought within the jurisdiction of the Food and Drugs Act, the burden will be upon the person guilty of the violation to show that

the article, if domestic, was prepared, or, if foreign, was imported, prior to September 3, 1914.

Third.—Persons guilty of violations who cannot make proof that the preparation in the case of domestic, or importation in the case of foreign, food products was prior to September 3, 1914, will be subject to the penalties of the Food and Drugs Act.

SPECIFICATIONS FOR CANNED FOOD CASES.

Approved at Baltimore, Md., February 4, 1914, in joint conference by the following committees in attendance: Canners' Conference Committee, National Wholesale Grocers' Conference Committee, representatives of the Pennsylvania Railroad Co., acting for the railroads; committee from National Box Makers' Association.

The report of the conference with specifications was submitted to the convention on the same date and unanimously passed by the convention of canners.

Boxes must be made from sound grade of lumber, dry and well seasoned, with no loose knots in any part.

Thickness of lumber in any part of the finished box must not be less than required by these specifications:

BOXES HOLDING 2 DOZEN NO. 1, 4 DOZEN NO. 1, 2 DOZEN NO. 2, AND BOXES OF LESS CAPACITY.

ENDS.—⅝ in. Dis, 1 or 2 pieces, when made of 2 pieces to be fastened with two corrugated metal fasteners, at least 1⅛ in. long by ½ in. wide; or tongued, grooved and securely glued; or, cleated with two cleats on each end, ⅞ in. wide by ⅜ in. thick. Each cleat nailed with five nails sufficiently long to go through both thicknesses and clinch.

SIDES.—⅜ in. thick Dis, not more than 2 pieces to be nailed to the end with at least 5 5-d cement coated or barbed full length nails at each nailing end.

T. & B.—⅜ in. Dis, or bottoms only may be smoothly sawn, not more than 3 pieces to be nailed to the end with 5 5-d cement coated or barbed full length nails at each nailing edge.

24 NO. 2, NO. 3, 4⅞ IN., 5 IN., AND 5½ IN.

ENDS.—⅝ in. thick Dis, 1 or 2 pieces. When made of 2 pieces to be fastened with two corrugated metal fasteners, at least 1⅛ in. long by ½ in. wide; or tongued, grooved and securely glued; or, cleated with two cleats on each end, 1 in. wide by ⅜ in. thick. Each cleat nailed with five nails sufficiently long to go through both thicknesses and clinch.

SIDES.—⅜ in. thick Dis or bottoms only may be smoothly sawn, not more than 3 pieces to be nailed to end with 5 5-d cement coated or barbed full length nails at each nailing place.

T. & B.—⅜ in. Dis, or bottoms only may be smoothly sawn, not more than 3 pieces to be nailed to the end with 5 5-d cement coated or barbed full-length nails at each nailing edge.

CASES HOLDING 6 NO. 10 CANS.

Specifications for this case shall be the same as 24 No. 2½, except that sides are to be nailed to end with 4 5-d cement coated or barbed full length nails at each nailing edge.

12 NO. 10 CANS, WHEN PACKED TWO HIGH OR DOUBLE DECKER.

ENDS.—13/16 in. thick Dis, not over 3 pieces, each piece fastened together with two corrugated fasteners 1¼ in. long by ⅝ in. wide; or, 13/16 in. thick Dis not over 3 pieces, when cleated with two wooden cleats on each end; cleats not less than ⅜ in. thick by 1¼ in. wide. Each cleat nailed with not less than 6 nails sufficiently long enough to go through thicknesses and clinch.

SIDES.—⅜ in. thick Dis, not over 3 pieces, to be nailed to end with not less than 6 6-d cement coated or barbed full length nails at each nailing edge.

T. & B.—⅜ in. Dis, or bottoms only may be smoothly sawn, not more than 3 pieces, nailed to end with at least 6 6-d cement coated or barbed full length nails at each nailing edge.

Resolved, That the specifications of a standard case approved by the National Canners' Convention, become effective July 1, 1914, except in such cases where shooks or cases were purchased prior to this date, and on and after July 1, 1915. No goods will be accepted in cases that do not comply with these specifications.

Further Resolved, That these resolutions be sent to W. T. Carter, who will refer them to the Official Classifications Committees, for the purpose of making them effective.

CANNED GOODS FOOD GUARANTY

Approved by Joint Conference Committees of the National Wholesale Grocers' Association of the United States, and the National Canners' Association.

I (we), the undersigned, DO HEREBY WARRANT and GUARANTEE that the articles of foods and drugs which the undersigned has sold, or shall at any time hereafter prepare or manufacture for, or sell or deliver to.....do and will comply with the United States Food and Drugs Act, June 30, 1906, and all amendments thereto, and are not and shall not be adulterated or misbranded within the meaning of the said act and amendments, and that they conform also to the food laws of the states to which I (we) ship them.

However, if the guarantor shall use labels furnished by the buyer under specific labeling instructions, said guarantor shall not be responsible to the buyer for misbranding, but guarantees only that the contents comply with said food laws.

This shall be a continuing guaranty until notice of revocation be given in writing. Notice of acceptance of this guaranty is hereby waived.

Dated at this
day of 191

REMSEN BOARD SANCTIONS MODERATE USE OF ALUM IN FOODS

The United States Department of Agriculture has issued a bulletin announcement of the final decision by the Remsen Referee Board on the general subject of alum in foods.

The decision of the Remsen Board followed the submission of questions to that Board with reference to the use of aluminum compounds, and whether they contained added poisonous or deleterious ingredients, and whether they are injurious to the strength of food. These questions were submitted to the Board following experiments conducted under the direction of the Department, and individual expressions are given by individual in-

vestigators of the Remsen Board. The conclusions by the Board are summed up as follows:

In their report the Board first define their understanding of the terms "small quantity" and "large quantity," as applied to alum baking powders, as follows:

"By the term 'small quantity' we understand such an amount as may be ingested in the normal use of biscuits, pastry or other articles leavened with baking powder, as these foods are practically used in the ordinary American family. This amount will not average more than 25 to 75 milligrams (0.39 to 1.16 grains) of aluminum daily for the days of consumption of such articles.

"By the term 'large quantity' we understand such an amount of aluminum as would be ingested only under very unusual conditions, as, for example, where the flour consumption is mainly in the form of biscuits or other articles leavened with aluminum baking powders. This amount may reach 150 to 200 milligrams (2.31 to 3.09 grains) of aluminum per day. A person subsisting mainly on baking powder biscuits, as may happen in camp life, might ingest an amount in excess of 200 milligrams per day. With this possibility in mind, we have also studied the effects of amounts up to and exceeding 1,000 milligrams (15.4 grains) of aluminum per day."

With this understanding of the terms the Board give the following answers to the questions submitted to them:

"Aluminum compounds when used in the form of baking powders in foods have not been found to affect injuriously the nutritive value of such foods.

"Aluminum compounds when added to foods in the form of baking powders, in small quantities, have not been found to contribute any poisonous or other deleterious effect which may render the said food injurious to health. The same holds true for the amount of aluminum which may be included in the ordinary consumption of aluminum baking powders furnishing up to 150 milligrams (2.31 grains) of aluminum daily.

"Aluminum compounds when added to foods, in the form of baking powders, in large quantities, up to 200 milligrams (3.09 grains) or more per day, may provoke mild catharsis.

"Very large quantities of aluminum taken with foods in the form of baking powders usually provoke catharsis. This action

of aluminum baking powders is due to the sodium sulphate which results from the reaction.

"The aluminum itself has not been found to exert any deleterious action injurious to health, beyond the production of occasional colic when very large amounts have been ingested.

"When aluminum compounds are mixed or packed with a food, the quality or strength of said food has not been found to be thereby reduced, lowered or injuriously affected."

In short, the Board concluded that alum baking powders are no more harmful than any other baking powders, but that it is wise to be moderate in the use of foods that are leavened with baking powder.

CIRCULAR No. 68 OF THE BUREAU OF CHEMISTRY.

While it is believed to be possible for manufacturers of tomato products to keep within the limits given—25 million bacteria per cubic centimeter, 25 yeasts and spores per one-sixtieth cubic millimeter and molds in less than 25 per cent of the fields—and that these are the desirable maximum limits, they are in no case to be regarded as the final standard by which products of this nature are to be judged. Such products should be judged by no single factor but by all the factors involved, including the degree of concentration.

PACKAGES OF FISH IN BRINE.

It is the opinion of the Department that packages containing fish in brine should bear a plain and conspicuous statement showing the net weight of the fish exclusive of the brine.

PACKAGES OF OLIVES IN BRINE.

In the opinion of the Department packages of olives in brine should be marked with a statement of the net weight of the olives exclusive of the brine. This should be stated in terms of the largest unit contained in the package.

TOMATOES PACKED IN BRINE.

It is the opinion of the Bureau that canned tomatoes, when labeled as such, must comply strictly with the requirements of

Food Inspection Decision No. 144, and that the addition of water, brine, or juice in excess of that naturally present in the tomatoes canned would constitute an adulteration.

There would appear to be no objection, however, to packing whole tomatoes in brine if sold under a label which clearly distinguished them from canned tomatoes. In declaring the quantity of the contents of the food in such a package the statement should be based upon the weight of the tomatoes, exclusive of the brine.

BROOKS LAW IN NEW YORK STATE IN EFFECT.

The Brooks Law requiring the exact weight or measure to be plainly marked on all articles sold in the state of New York, became effective February eighth. Weight, measure, or numerical count of contents must be indicated on the outside of all goods. The Bureau of Weights and Measures has taken steps to enforce penalties for violations of the law, which provides a fine of from $25 to $100 for a first or second offense and from $100 to $500 for a third offense.

Canned foods must be marked by the weight of the total contents in terms of pounds or ounces, or by the weight of the fruit or vegetable and the weight of the immersing fluid separately, or by the total contents in terms of gallons, quarts, pints, half pints, gills or fluid ounces.

NEW YORK LAW REGARDING FRUIT PACKAGES.

The law that all boxes, half boxes, crates, baskets, etc., holding fruit shall have stamped on them the approximate net weights or number of fruits as follows:

Grapes, crates .....net weight 24-lbs.
" baskets .....net weight 6-lbs.
Plums, crates .....net weight 20-lbs.
" baskets .....net weight 5-lbs.
Pears, boxes .....net weight 46-lbs.
" half boxes .....net weight 23-lbs.
Peaches—Number of fruit per box or approximate net weight.
Apples —Number of fruit per box or approximate net weight.

This virtually means that there must be stamped somewhere on each of these packages these net weights, or the number of peaches or number of apples in each box, otherwise there may

be trouble as the Commissioner of Weights says that he intends to enforce this law. As other cities are also taking this matter up, it is urged that fruit be marked or stamped correctly.

STOPPING GOODS IN TRANSIT.

The rights of the packer of canned foods to withhold shipment or to stop the goods in transit, where the packer has reason to believe that the buyer is in a weak financial condition and will not be able to make payment for the goods on arrival, are summed up as follows:

"In the absence of insolvency on the part of the buyer, the packer has no *legal* right to withhold the shipment; that is, if he does withhold shipment in the absence of insolvency of the buyer, he does so at his own risk. He would be fully protected in this if insolvency on the part of the buyer should happen pending the arrival of the goods at their destination. By 'insolvency' it is not to be understood that the parties had actually taken the benefit of or had been forced into insolvency or bankruptcy, but a general inability to pay one just and admitted debt would probably be sufficient evidence.

"This is the situation as far as the law is concerned. The packer will therefore have to decide for himself whether he feels justified in taking the risk of withholding shipment or taking some steps whereby he may be protected in making the shipment."

It will thus be seen that the determination of a matter of this kind is left largely to the discretion of the seller, unless, of course, the buyer should become insolvent between the date of the sale and the date of delivery, in which case the packer would be fully justified in withholding shipment or in stopping the goods in transit.

OFFICIAL WEIGHTS FOR CANNED FOODS.

The following is a list of the official arbitrary weights of contents to be used on labels to comply with the various State and National Pure Food Laws, as agreed upon by the Cooperative Committee of the National Wholesale Grocers' Association and the National Canners' Association.

These weights allow for reasonable tolerances; in other words, cans reasonably well filled will weigh more than the weight expressed below. The following legend is recommended: "Contents" to be expressed....Pounds.....Ounces.

	No.	Lbs.	Ozs.
Apples	2½	1	10
4⅞-inch	2	1	13
5-inch	3	1	14
5½-inch	3	2	3
	8	5	6
	10	5	14
Apple Butter	1	0	11
	1	0	11
4⅞-inch	3	2	1
5-inch	3	2	1
Apple Sauce	2½	1	13
	10	6	11
Asparagus, Round			
Salmon	1	0	15
Square	1	0	15
Flat	2	1	2
	2	1	3
	2½	1	14
	3	2	0
Square	3	2	10
	8	6	2
	10	6	4
Beans (Wax and			
Refugee)	1	0	11
	1½	0	14
	2	1	3
4⅞-inch	3	1	15
5-inch	3	2	0
	8	6	2
	10	6	6
Beans (Red Kidney)	1	0	10
	2	1	4
4⅞-inch	3	2	0
	10	6	11
Beans (Lima)	1	0	11
	1½	0	14
	2	1	4
	10	6	11
Beans (Baked)	1	0	11
	2	1	5
4⅞-inch	3	2	2
	10	6	10
Beets	2	1	4
	3	2	1
	10	6	4
Blackberries, H. S.	2	1	5
Water	2	1	3
H. S.	2½	1	14
	3	1	13
	10	6	8
Blueberries, H. S.	2	1	4
Water	2	1	3
	10	6	12
Cabbage	3	2	0
California Fruits,			
Extra (Tall)	1	1	0
Extra Standards			
(Tall)	1	0	15
Seconds (Tall)	1	0	15
Extra (Flat)	1	0	15
Seconds (Flat)	1	0	14
Extra	1½	1	1
Seconds	1½	1	0
Extra	2½	1	14
Extra Standards.	2½	1	14
Standards	2½	1	14
Seconds	2½	1	12
Water	2½	1	12
Pie	2½	1	12
Extra 5-inch	3	2	4
Extra Standards.	8	6	8
Water	8	6	4
California Fruits,			
Pie	8	6	4
Extra	10	6	14
Water	10	6	6
Cherries, H. S.	2	1	5
Water	2	1	3
H. S.	2½	1	15
	10	6	9
Clams	1	0	5
	2	0	10
Corn	1	0	11
	2	1	4
	10	6	8
Gooseberries, H. S.	1	0	13
Water	1	0	11
H. S.	2	1	5
Water	2	1	3
H. S.	2½	2	0
	10	6	7
Hominy	2½	1	15
4⅞-inch	3	2	0
5½-inch	3	2	4
	10	6	11
Milk	Baby	0	6
	Family	0	11
	Tall	0	15
	Hotel	2	3
Okra	2	1	2
	3	2	0
	10	5	14

	No.	Lbs.	Ozs.
Okra and Tomatoes	2	1	2
.....	3	2	0
Oysters, 2-11/16x2¾		0	3
2-11/16x3-6/16 ..		0	4
2-11/16x4	1	0	5
3⅜x3-5/16		0	6
3⅜x3-15/16		0	8
3⅜x4-9/16	2	0	10
Peaches, H. S.....	1	0	10
H. S. (Flat)....	1½	1	3
H. S.....	2	1	4
Water	2	1	3
H. S.	2½	1	14
Water	2½	1	12
H. S. 4⅞-inch ..	3	2	0
.....	10	6	6
Peach Butter	2	1	4
Pears, H. S.....	2	1	4
Water	2	1	3
H. S.	2½	1	14
H. S. 4⅞-inch ..	3	2	0
.....	10	6	8
Peas	1	0	11
.....	1½	0	15
.....	2	1	4
.....	10	6	12
Pineapple (Buffet)	1	0	9
(Flat)	2	1	2
(Tall)	2	1	5
.....	2	1	4
.....	2½	1	15
4⅞-inch	3	1	15
Pineapple	8	6	0
Plums, H. S.....	2	1	6
H. S.	2½	1	14
Water	2½	1	12
H. S. 4⅞-inch ..	3	2	1
.....	10	6	6
Pork and Beans...	½	0	6
.....	0	0	9
.....	1	0	11
.....	2	1	5
.....	2½	2	0
4⅞-inch	3	2	2
.....	10	6	14
Pumpkin	2	1	3
.....	2½	1	14
4⅞-inch	3	2	1

	No.	Lbs.	Ozs.
5½-inch	3	2	5
.....	10	6	8
Raspberries, H. S..	2	1	5
Water	2	1	3
H. S.	2½	1	14
.....	10	6	10
Rhubarb	2½	1	15
.....	10	6	4
Salmon	¼	0	7¾
(Tall, Flat and Oval)	1	0	15½
Sardines	¼	0	3½
.....	¾	0	11
Sauerkraut	2	1	3
.....	2½	1	13
4⅞-inch	3	2	0
5½-inch	3	2	4
.....	10	6	4
Shrimp (Wet and Dry)	1	0	4
.....	1½	0	9
Spinach	2	1	2
.....	2½	1	9
4⅞-inch	3	1	14
5-inch	3	1	14
5½-inch	3	2	4
.....	10	6	4
Squash, 4⅞-inch ..	3	2	1
.....	10	6	9
Strawberries, H. S.	1	0	11
H. S.	2	1	4
H. S.	2½	1	12
.....	10	6	4
Succotash	1	0	11
.....	2	1	4
.....	10	6	9
Sweet Potatoes, 4⅞-inch.....	3	1	15
5-inch	2	2	0
.....	10	6	4
Tomatoes	1	0	11
.....	1½	0	13
.....	2	1	3
.....	2½	1	12
4⅞-inch	3	2	0
5-inch	3	2	1
5½-inch	3	2	5
.....	8	6	4
.....	10	6	7

ENFORCEMENT OF FEDERAL AND STATE FOOD LAWS AFFECTING CANNERS AND OTHER FOOD MANUFACTURERS.

GENERAL SYNOPSIS OF FOOD LEGISLATION AFFECTING THE MANUFACTURE AND SALE OF CANNED FOODS—NATIONAL CANNERS' ASSOCIATION BULLETIN NO. 28.

The purpose of the Federal Act, as set forth in its caption, is to prevent the manufacture, sale or transportation in interstate commerce of adulterated or misbranded or poisonous or deleterious foods, drugs, medicines or liquors, and for regulating traffic therein, and for other purposes.

ADULTERATION

under the National Law is defined as follows:

First. If any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength;

Second. If any substance has been sustituted wholly or in part for the article;

Third. If any valuable constituent of the article has been wholly or in part abstracted;

Fourth. If it be mixed, colored, powdered, coated or stained in a manner whereby damage or inferiority is concealed;

Fifth. If it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health; provided, that when in the preparation of food products for shipment they are preserved by an external application applied in such manner that the preservative is necessarily removed mechanically, or by maceration in water, or otherwise, and directions for the removal of said preservative shall be printed on the covering of the package, the provisions of this Act shall be construed as applying only when said products are ready for consumption.

Sixth. If it consists in whole or in part of a filthy, decomposed or putrid animal or vegetable substance, or any portion of an animal unfit for food, whether manufactured or not, or if it is the product of a diseased animal, or one that has died otherwise than by slaughter.

under the National Law is defined as follows:

First. If it be an imitation of or offered for sale under the distinctive name of another article;

Second. If it be labeled or branded so as to deceive or mislead the purchaser, or purport to be a foreign product when not so, or if the contents of the package as originally put up shall have been removed in whole or in part and other contents shall have been placed in such package, or if it fail to bear a statement on the label of the quantity or proportion of any morphine, opium, cocaine, heroin, alpha or beta eucaine, chloroform, cannabis indica, chloral hydrate or acetanilid, or any derivative or preparation of any of such substances contained therein;

Third. If in package form, the quantity of the contents be not plainly and conspicuously marked on the outside of the package in terms of weight, measure or numerical count; provided, however, that reasonable variations shall be permitted, and tolerances and also exemptions as to small packages shall be established by rules and regulations made in accordance with the provisions of section three of this Act;

Fourth. If the package containing it or its label shall bear any statement, design or device regarding the ingredients or the substances contained therein, which statement, design or device shall be false and misleading in any particular.

This Act of Congress and the rules and regulations made by the three Secretaries under its authority, are applicable to articles of food, drug or liquor being transported from one State, territory or district or insular possession to another for sale, or, having been transported, should remain unloaded, unsold, or in original unbroken packages, or to such articles sold or offered for sale in the District of Columbia or the territories or insular possessions of the United States, or imported from a foreign country for sale or intended for export to a foreign country.

The three Secretaries formulated forty rules and regulations for the enforcement of the above act.

The special provisions of the National Law, so far as the same relate to adulteration and misbranding and are applicable

to the manufacture, transportation and sale of canned foods, have been adopted by the following States:

Alabama,	Kentucky,	North Carolina,
Arizona,	Louisiana,	North Dakota,
Arkansas,	Maine,	Ohio,
California,	Maryland,	Oklahoma,
Colorado,	Massachusetts,	Oregon,
Connecticut,	Michigan,	Pennsylvania,
Delaware,	Minnesota,	Rhode Island,
District of Columbia,	Mississippi,	South Carolina,
Florida,	Missouri,	South Dakota,
Georgia,	Montana,	Texas,
Hawaiian Islands,	Nebraska,	Utah,
Idaho,	Nevada,	Vermont,
Illinois,	New Hampshire,	Virginia,
Indiana,	New Jersey,	Washington,†
Iowa,	New Mexico,	West Virginia,
Kansas,	New York,*	Wisconsin,
		Wyoming.

The amendment of the National Law, by the Act of Congress of March 3, 1913, requires all food in package form to be marked with

STATEMENT OF WEIGHT, MEASURE OR COUNT.

The regulation for the enforcement of this amendment specifies the manner in which the statement must be made, namely:

(a) It must appear on the outside of the covering or container usually delivered to consumers;

(b) It must be plain and conspicuous, not obscured by any legend or design, so placed and in such characters as to be readily seen and clearly legible when the size of the package and the circumstances under which it is originally examined by the purchaser or consumer are taken into consideration;

(c) The quantity of the contents must be stated in terms of the largest unit contained in the package and fractions thereof.

*Attention is called to Act of 1885 hereinafter quoted.
†Special statute covering labeling of canned Salmon, as hereinafter noted.

It therefore appears that compliance with the terms of the National Law, as now amended, will meet the requirements of all State laws except the following:

CALIFORNIA.

This State requires that the words "net contents," or the words "net weight," or the words "net measure," or the words "net count" shall appear with and as a part of the designation of the quantity of the commodity in the package.

CONNECTICUT.

Under the Connecticut law the term "package" has been construed to mean such things as cases of bottles and other enclosed packages. We have, therefore, heretofore advised the stenciling of cases to show the net contents of cans enclosed, where goods are intended for shipment into the State of Connecticut.

FLORIDA.

By the law of this State the word "net" is required to be placed after the statement of the weight or measure, as for instance, 8 oz. net, etc.

NEW YORK.

By the laws of this State canned foods must be marked in one of the following ways:

1. Weight of the total contents, including syrup or brine, in terms of pounds and ounces;

2. Weight of fruits or vegetables and the weight of syrup or brine separately, both being expressed in the same terms and one immediately under the other;

3. Total contents in terms of gallons, quarts, pints, half pints, gills and fluid ounces.

Where the weight of contents is expressed in one-quarter pounds, one-half pounds, pounds or multiples of the half-pound, or in terms of gallons, quarters, pints, half-pints or gills, the letters shall be bold-faced type at least one-ninth of an inch in height; otherwise, the letter shall be bold-faced type not less than three-sixteenths of an inch in height.

The average of twelve cans shall not vary more than three per cent from the amount stated on the can.

If the marking is placed on an uncovered part of the tin, the letters must be not less than three-eighths of an inch in height.

A New York statute enacted in 1885 requires that canned foods shall be branded with "the name, address and place of business" of the packer, or the name of the wholesaler and the name "of the State, county and city, town or village where packed, preceded by the words 'packed at.' "

This statute, so far as we are aware, has never been enforced, nor has any action been brought under it. Attention is now called to it because it is on the statute books, and especially because the recently appointed Superintendent of Weights and Measures has announced that he intends to enforce its provisions. This announcement was made several months ago, but so far we are not advised that any action looking to the enforcement of the act has been taken.

RHODE ISLAND.

The Rhode Island law as amended at the last session of the legislature, requires the quantity of contents to be plainly and conspicuously marked on the outside of the package in terms of weight, measure or numerical count; provided, however, that reasonable variations shall be permitted, in accordance with rules and regulations to be adopted.

This amendment is now in effect, but provides that no penalty shall be enforced thereunder prior to November 1, 1915. The regulations for its enforcement have not yet been promulgated.

WASHINGTON.

The laws of the State of Washington require that salmon packed on Puget Sound and prepared for sale and export by being hermetically sealed in cans made of tin or other metal, shall be labeled with the words "Puget Sound Salmon," together with the name of the person engaged in the business of such preparation for export and sale, and the name of their place of business; and that the cans shall likewise be packed in cases marked by label or otherwise in plain letters with the name of the place where said salmon were caught, and also the name of the State in full and the name of the party or parties putting up the same.

SUGGESTIONS.

1. The general purpose of food legislation, as shown by the text of the laws now being considered, are three-fold, namely:

(a) To protect the public health.

(b) To prevent fraud and deception.

(c) To prevent unfair competition.

Legislation designed for these purposes is a valid exercise of the police power of the State, and as such is constitutional.

2. These laws make the sale, etc., of adulterated or misbranded foods an offense, and fix a penalty for their violation.

3. All manufacturers of canned foods would do well to thoroughly familiarize themselves with the provisions of the National Food and Drugs Act and the regulations for its enforcement, as the same are now in effect. These are the fundamental principles underlying most of the food legislation of the country, and compliance with their provisions will meet the requirements of State laws, except as herein otherwise noted.

4. In making a statement of quantity of contents upon the label of food packages, we would suggest as follows:

(a) Every such statement should be plainly and conspicuously printed. It must be a correct statement.

(b) Where the quantity in a package will vary, it is advisable to state the minimum weight or measure the package will contain. Do not use the word "minimum" or any similar language; make a definite, unqualified statement. The variation must not be below the amount stated oftener that it is above the amount stated. If you attempt to state the average weight or measure, you must be sure it will be the average on every case of goods you put out. It is not sufficient to have one case of goods average above the stated weight or measure, and another case average below the weight or measure stated. Every case of goods should average correctly.

5. The terms "net weight" or "net measure" mean exclusive of all wrappers, containers, etc. They mean that the actual weight or measure of the commodity in the package must be stated.

We advise, therefore, that instead of saying "net weight" or "net measure," the terms "weight of contents," or "measure of contents" be employed. This applies to all goods except

those destined for States requiring the use of the term "net" in connection with the statement of the quantity of contents.

6. Weights should be stated in terms of pounds, ounces and grains avoirdupois. Measure should be stated in terms of gallons, quarts and fluid ounces.

7. The statement of contents should be printed in type proportionate in size to the other type on the label. It is not sufficient to make this statement in type equal in size to the smallest type employed for the expression of other matters on the label.

8. All canned foods must be honestly filled; that is, all cans must be as full of the material being packed as can be done without injuring its quality or appearance; and if the use of water, brine or syrup is necessary, no more of such water, brine or syrup shall be used than is required to fill the spaces between the material being packed.

9. Pulp from trimmings, cores and other waste material must not be added to canned tomatoes, nor must tomato juice in excess of the amount present in the tomatoes be used in canning. It is likewise unlawful to add any water to canned tomatoes. All of these matters constitute adulteration.

10. No fraud or deception may be practiced in the preparation of canned foods, nor may they be so labeled as to convey an impression in any way false or misleading.

11. All canned foods bearing a serial number guaranty must be labeled in accordance with law as it existed on the 5th of May, 1914. Such goods may be shipped interstate until May 1, 1916, and until November 1, 1916, provided they are labeled prior to May 1, 1916, in accordance with the law in force on the 5th of May, 1914.

12. Products shipped into a State before September 3, 1914, either to wholesaler or retailers, and not thereafter shipped out of the State nor within the State in original package, will not be subject to the weight or measure branding requirements of the National law, but only to the State requirement.

For the convenience of the members of the Association, we append herewith a list of the Food Officers of the various States of the Union.

STATE OFFICIALS.

ALABAMA.—C. H. Billingsley, Food, Drug and Feed Clerk, Montgomery.

ARIZONA.—Charles A. Merserve, Director State Laboratory, University of Arizona, Tucson.

ARKANSAS.—John H. Page, Commissioner of Agriculture, Little Rock.

CALIFORNIA.—M. E. Jaffa, M.D., Director, State Food and Drug Laboratory, University of California, Berkeley.

COLORADO.—John Lynch, Food and Drug Commissioner, Capitol Building, Denver.

CONNECTICUT.—Frank H. Stadtmueller, Dairy and Food Commissioner, Hartford.

DELAWARE.—A. E. Frantz, M.D., Secretary, State Board of Health, Wilmington.

DISTRICT OF COLUMBIA.—William C. Woodward, M.D., Health Officer, Health Department, Washington.

FLORIDA.—R. E. Rose, State Chemist, Tallahassee.

GEORGIA.—R. E. Stallings, State Chemist, Atlanta.

IDAHO.—John K. White, State Food Commissioner, Boise.

ILLINOIS.—W. Scott Matthews, State Food Commissioner, Chicago.

INDIANA.—H. E. Barnard, State Food and Drug Commissioner, Indianapolis.

IOWA.—W. B. Barney, State Dairy and Food Commissioner, Des Moines.

KANSAS.—S. J. Crumbine, Secretary, State Board of Health, Topeka.

KENTUCKY.—R. M. Allen, Chief, Food and Drug Department, Lexington.

LOUISIANA.—Oscar Dowling, President, State Board of Health, New Orleans.

MAINE.—A. M. G. Soule, Chief, Bureau of Inspection, Augusta.

MARYLAND.—Charles Caspari, Jr., State Food and Drug Commissioner, Baltimore.

MASSACHUSETTS.—Herman C. Lythgoe, Analyst, State Department of Health, Boston.

MICHIGAN.—James W. Helme, State Dairy and Food Commissioner, Lansing.

MINNESOTA.—Joel G. Winkjer, State Dairy and Food Commissioner, St. Paul.

MISSISSIPPI.—W. F. Hand, State Chemist, Agricultural College.

MISSOURI.—F. H. Fricke, State Food and Drug Commissioner, St. Louis.

MONTANA.—F. W. Cogswell, Secretary, State Board of Health, Helena.

NEBRASKA.—Charles E. Harmon, Deputy Food Commissioner, Lincoln.

NEVADA.—S. C. Dinsmore, State Food and Drug Commissioner, Reno.

NEW HAMPSHIRE.—Irving A. Watson, Secretary State Board of Health, Concord.

NEW JERSEY.—R. B. Fitz-Randolph, Chief Food and Drugs Division, Trenton.

NEW YORK.—Calvin J. Huson, Commissioner of Agriculture, Albany.

NORTH CAROLINA.—W. A. Graham, Commissioner of Agriculture, Raleigh.

NORTH DAKOTA.—E. F. Ladd, State Food Commissioner, Agricultural College.

OHIO.—S. E. Strode, Dairy and Food Commissioner, Columbus.

OKLAHOMA.—J. C. Mahr, Commissioner of Health, Oklahoma City.

OREGON.—J. D. Mickle, Dairy and Food Commissioner, Portland.

PENNSYLVANIA.—J. M. Foust, State Dairy and Food Commissioner, Harrisburg.

RHODE ISLAND.—Frank A. Jackson, Chairman, Board of Food and Drug Inspection, Providence.

SOUTH CAROLINA.—E. J. Watson, Commissioner of Agriculture, Columbia.

SOUTH DAKOTA.—Guy R. Frary, Food and Drug Commissioner, Vermilion.

TENNESSEE.—Lucius P. Brown, State Food and Drug Commissioner, Nashville.

TEXAS.—C. O. Yates, Food and Drug Commissioner, Austin.
UTAH.—Willard Hansen, Dairy and Food Commissioner, Salt Lake City.
VERMONT.—B. H. Stone, State Board of Health, Burlington.
VIRGINIA.—B. L. Purcell, State Dairy and Food Commissioner, Richmond.
WASHINGTON.—J. H. Perkins, Commissioner of Agriculture, Seattle.
WEST VIRGINIA.—John N. Millan, Secretary, State Board of Agriculture, Charleston.
WISCONSIN.—J. Q. Emery, State Dairy and Food Commissioner, Madison.
WYOMING.—Maurice Groshon, Dairy, Food and Oil Commissioner, Cheyenne.

FOOD STANDARDS FIXED BY THE CANADIAN GOVERNMENT

The Government has announced the adoption of a number of food standards for Canada, including canned peas, fruit and fruit products.

GREEN AND RIPE CANNED PEAS

The following standards of quality have been established for canned peas:

1. Canned peas, unless specially designated as below, shall be prepared from the harvest of the year in which they are canned, and shall be the unripe peas of the crop of that year.

2. Ripe peas may be canned, provided that the label shows quite clearly that they are such. This may be done either by labeling them as canned ripe peas, or by the use of the word soaked.

3. Mixtures of ripe and unripe (or green) peas shall be plainly labeled in such a way as to show that they are mixtures.

4. Peas which do not comply with the above regulations shall be deemed to be adulterated under the act.

FRUIT AND FRUIT PRODUCTS DEFINED

1. Fruits are the clean, sound, edible, fleshy, fructifications of plants, distinguished by their sweet, acid and ethereal flavors.

2. Dried fruit is the clean, sound product made by drying

matured properly prepared fresh fruit in such a way as to take up no harmful substances; and conforms in name to the fruit used in its preparation.

3. Evaporated fruit is dried fruit in whose preparation artificial heat has been employed.

4. Evaporated apples shall contain not more than 27 per cent of moisture.

5. Canned fruit is the sound product made by sterilizing clean, sound, properly matured and prepared fresh fruit, by heating with or without sugar, and keeping in suitable, clean, hermetically sealed containers; and conforms in name to the fruit used in its preparation.

6. Preserve is the sound product made from clean, sound, properly matured and prepared fresh fruit and sugar syrup, with or without spices and vinegar, and conforms in name to the fruit used in its preparation.

7. Jam, marmalade, is the sound product made from clean, sound, properly matured and prepared fresh fruit or fruit pulp and sugar, with or without spices or vinegar, by boiling to a semi-solid consistence; and conforms in name to the fruit used in its preparation.

8. Fruit butter is the sound product made from fruit juice, and clean, sound, properly matured and prepared fruit, boiled to a semi-solid mass of homogeneous consistence, with or without the addition of sugar and spices or vinegar, and conforms in name to the fruit used in its preparation.

9. Jelly, fruit jelly, is the sound, semi-solid gelatinous product made by boiling clean, sound, properly matured and prepared fresh fruit with water, concentrating the expressed and strained juice, to which sugar is added, and conforms in name to the fruit used in its preparation.

10. When jam, marmalade, fruit butter, or jelly contains other fruit or fruit juice than that which gives its special name to the article, the fact of the presence of such other fruit shall be stated upon the label, in lettering as large and as distinct as that used in naming the fruit principally present. This requirement does not, however, apply to the use of fruit juice, up to the amount of ten (10) per cent of weight of the jam, etc., used instead of water in the manufacture of the jam, etc.

11. When the sugar in preserve, jam, marmalade, fruit butter or jelly is wholly or partially replaced by glucose, or by any other substitute for sugar, the fact of such substitution shall be stated upon the label in plain lettering.

FOOD COLORING REGULATIONS IN CANADA

Regulations governing the use of coloring matter in food products have been made by order-in-council and announced. Pure whole milk cheese, confectionery, ice cream and ices and butter may hereafter be artificially colored, provided that only harmless coloring matter are used and no declaration of their presence will be necessary.

Spirits, vinegar, sauces, non-excisable fermented beverages and summer or so-called "temperance" beverages may be colored with caramel only without declaration of coloring. In all other cases the presence of artificial coloring matter must be declared on the label in legible type.

The coloring matters which are regarded as harmless to health are: Caramel, cochineal, saffron, chlorophyll and innocuous vegetable color extractives, also the following coal-tar dyes, which must be free from arsenic and heavy metal except iron, and must not be used in quantities exceeding two grains per pound; amaranth, poncean, erythrosin, orange, naphthol yellow, light green, indigo carmine di-sulphonic acid. Copper salts may be used to color peas provided that the amount of copper in the peas does not exceed eighty parts by weight per million in the drained peas, or ten parts per million in the imbedded liquid.

48,000 VARIETIES OF TIN CONTAINERS

At present the American Can Company is producing about 48,000 different kinds of containers, the largest sellers being fish, fruit and vegetable cans. Containers for coffee, milk, tea, biscuits, tobacco, phonograph needles, talcum and tooth powders, soap, etc., are also important products, running well into the hundreds of millions.

JAPANESE CRAB

The "Japanese Crab" is the best-known of specie. He measures ten feet between the claws, each of which is five feet

long, though the body, however, is comparatively small and is triangular in shape. These crabs are caught in nets out in the open sea, from three to five miles from shore, the net baited with fish being sunk to the bottom of the ocean. The fishermen, on becoming adept can tell on pulling the rope which holds the net, whether they have caught any crabs or not, without hauling it to the surface of the water. After feeling that they have a sufficient quantity in the net, they pull it into the boat, when the meat is extracted from the shell and placed, after salting it, in a receptacle where it remains until the day's work is ended, when it is taken to the factory, where it is prepared, canned and delivered to us as you see it on the tables.

REGISTRATION OF PATENTS IN THE PHILIPPINES

An act was passed at the last session of the Philippine Legislature providing for the registration and protection of patents and trade-marks in the Philippine Islands. Any patent or trade-mark registered in the United States Patent Office, upon being filed in the Executive Bureau of the Philippines, shall receive the same protection as is accorded in the United States, and persons infringing such patent or trade-mark shall be liable to the same penalties, provided the rights of property in patents and trade-marks secured in the Philippine Islands under the Spanish laws shall be respected as if such laws were in full force and effect. To file a patent for protection, a certified copy of the patent should be sent, with a fee of 2 pesos ($1) and a letter of transmittal, to the chief of the division of archives, patents, copyrights, and trade-marks, of the Executive Bureau of the Philippine Islands. A certified copy of a patent may be filed by another than the owner of the patent if such agent is given power of attorney. Assignments of patents may be filed in the same manner. Any questions arising under this act shall be determined by courts of first instance of the Supreme Court of the Philippines. This law became effective February 10, 1913.

ANNUAL LOSS BY INSECT PESTS

In 1904 the United States Department of Agriculture made a study of the annual losses to the people of this country by the ravages of destructive insects. So far as we know, the estimates

published in the Year-book for 1904 have not been disproven or disputed. Behold some of the figures:

OUR ANNUAL LOSSES BY INSECT PESTS

Product	Percentage of Loss	Amount of Loss
Cereals	10	$200,000,000
Hay	10	53,000,000
Cotton	10	60,000,000
Tobacco	10	5,300,000
Truck crops	20	53,000,000
Sugars	10	5,000,000
Fruits	20	27,000,000
Farm forests	10	11,000,000
Miscellaneous crops	10	5,800,000
Total		$420,100,000

The codlin moth and other apple pests cost us about $8,250,000 a year for spraying operations and $12,000,000 a year in shrinkage of value in the apple crop.

The chinch bug wheat pest sometimes costs us $20,000,000 a year.

The cotton boll weevil costs the cotton planters $20,000,000 a year.

The tree insect pests cost the nation $100,000,000 a year.

The grasshoppers, cut-worms, army-worms, wire-worms, leaf-hoppers and other insects cost the nation, annually, more millions than can be counted separately; but the total for all insect pests is $420,100,000. Now, have we not paid this price about long enough?

The American people do not realize that scores of species of the birds that sportsmen and pot hunters are regularly allowed to shoot for sport are of immense value to agriculture.

"PTOMAIN POISONING" NOT DUE TO PTOMAINS

Like many names given hastily or carelessly, this term is now known to be inexact as generally applied. Dr. H. J. Hutchens, Professor of Bacteriology in the University of Durham, brings out quite clearly that the symptoms of poisoning often attributed to some article of food are not due to ptomains, but to toxins

formed by bacteria; that sometimes these toxins are in the food before it is eaten, but more often only the bacteria themselves are there, and it is their activity in the digestive organs that causes the serious or even fatal symptoms usually described as ptomain poisoning. Dr. Hutchens writes:

"The term ptomain poisoning is inexact, because it leads by inference to the assumption that the symptoms are due to ptomains, while, in fact, as will be shown, these substances are not the cause of the disease. The word ptomain was introduced by the Italian toxicologist Selmi, to describe certain chemical substances more or less allied to the vegetable alkaloids which had been found in putrescent meat and decomposing albuminous matter. . . .

"They are found in only very small amounts in decomposing animal matter, and it is only when meat is in so advanced a stage of decomposition as to be totally unfit for human food that they are present at all. Moreover, many of the ptomains are non-poisonous, and the majority of those that act as poisons exert their influence on the nervous system rather than on the alimentary system. . . .

"Food poisoning is, therefore, the result of the action of the specific toxins of bacteria on persons who consume meat or other food infected with living organisms or their toxins, or both. The non-specific products should also, perhaps, be included; for though the evidence so far available is against the view that they take any part in the production of food-poisoning, it cannot be stated as a definitely ascertained fact that they never exert any influence. This definition at once excludes from the category of food-poisoning all cases of poisoning following the consumption of food containing arsenic, lead, strychnin, or other well-defined chemical substance, whether administered intentionally for criminal purposes or taken by accident. On the other hand, the generally accepted use of the term does not include such diseases as enteric fever, Malta fever, etc., though these are also the direct result of eating food specifically contaminated with the organisms of those diseases."

This is an excellent, and we may say, authoritative explanation of what ptomain poisoning really is. Reading it carefully we gain from it additional knowledge of a subject which, through the ignorance of the general public and, it would seem, a goodly

portion of the medical profession in the United States, has become a matter of great interest to canned food packers. We do not directly charge the American medical profession with ignorance of ptomains yet the average physician seems unable to disassociate ptomain poisoning from canned foods, and for this there is no warrant.

PARCEL POST RATE

FIFTY-POUND PARCEL POST LIMIT NOW IN EFFECT

Changes of importance in the parcel post regulations, effective January 1, 1914. In brief form, the amendments to the government's rules involving the shipment, rates and delivery of mail packages are as follows:

On and after January 1, 1914, the limit of weight of parcels for delivery in the first and second zones will be fifty pounds (instead of twenty pounds as at present), and the rate in the first zone will be as follows: Local rate, 6 cents for one pound, 7 cents for five pounds, 10 cents for ten pounds, 12 cents for fifteen pounds, 15 cents for twenty pounds, 17 cents for twenty-five pounds, 20 cents for thirty pounds, 22 cents for thirty-five pounds, 25 cents for forty pounds, 27 cents for forty-five pounds, and 30 cents for fifty pounds.

The zone rate in the first zone will be 5 cents for one pound, 9 cents for five pounds, 14 cents for ten pounds, 19 cents for fifteen pounds, 24 cents for twenty pounds, 29 cents for twenty-five pounds, 34 cents for thirty pounds, 39 cents for thirty-five pounds, 44 cents for forty pounds, 49 cents for forty-five pounds, and 54 cents for fifty pounds. In the second zone the rates on one pound or over will be the same as in the first zone.

The new regulations provide that in the third, fourth, fifth, sixth, seventh and eighth zones the limits of weight rise to twenty pounds (instead of eleven pounds as at present), and the rates of postage for parcels weighing over four ounces in these zones will be as follows:

Third zone: Six cents for the first pound and 2 cents for each additional pound or fraction. Fourth zone: Seven cents for the first pound and 4 cents for each additional pound or fraction. Fifth zone: Eight cents for the first pound and 6 cents for each additional pound or fraction. Sixth zone: Nine

cents for the first pound and 8 cents for each additional pound or fraction. Seventh zone: Eleven cents for the first pound and 10 cents for each additional pound or fraction. Eighth zone: Twelve cents for the first pound and 12 cents for each additional pound or fraction.

Approximately every place within fifty miles is embraced within the first zone. The second zone is the area within a radius of 150 miles; the third, all points within 300 miles; fourth, within a distance of 600 miles; fifth, within 1,000 miles; seventh, within 1,400 miles, and eighth zone, all places outside the seventh zone, including the Philippines, Canada, Mexico, Cuba, Porto Rico and Panama.

Parcels weighing four ounces or less were mailable on January 1, 1914, at 1 cent for each ounce or fraction thereof, regardless of the distance.

Books were admitted to the parcel post service on March 15, 1914.

TRADE-MARKS

List of trade-marks applied to canned foods and registered in the Patent Office since the middle of December, 1913, to November 11, 1914, as shown by publication in the *Official Gazette.* For further information on any subject relating to trade-marks, copyrights and patents, write the Trade-Mark Title Company, Fort Wayne, Ind.

REGISTERED TRADE-MARKS 1914.

OLD FAITHFUL. Trade-mark No. 95,554. Owner, Northern Pickle Co., Tacoma, Wash. Used on pickles, pork and beans, sauerkraut, prepared mustard and boiled cider.

EVER-WELL. Trade-mark No. 95,249. Owner, Everett & Treadwell Co., Kingston, N.Y. Used on their products.

SNOWFLAKE. Trade-mark No. 95,438. Owner, Kentucky Refining Co., Louisville, Ky. Used on cottonseed oil.

STAR OF ITALY and picture of queen and angels. Trade-mark No. 95,573. Owner, Achille Starace, New York, N.Y. Used on olive oil.

EN-BE-CO. Trade-mark No. 95,464. Owner, Nicholas Burke Co. Ltd., New Orleans, La. Used on canned vegetables, wheat flour, spices and syrup and flavoring extracts for foods.

HURRICANE. Trade-mark No. 95,403. Owner, Cross, Abbott Co., White River Junction, Vt. Used on canned vegetables, canned fruits, canned salmon, coffee and tea.

HUNEEMEL. Trade-mark No. 97,073. Owner, National Preserve Co., St. Louis, Mo. Used on table syrups and fruit preserves.

LETTER L WITH WINGS. Trade-mark No. 95,470. Owner, The Porto Rico Fruit Exchange, San Juan, Porto Rico. Used on oranges, lemons, limes, citron, shaddock (grape-fruit), and pineapples, either in their natural state or canned.

DR. SAYMAN'S and portrait of Dr. Sayman. Trade-mark No. 95,481. Owner, Thomas M. Sayman, St. Louis, Mo. Used on vanilla extract for foods.

DR. SAYMAN'S and portrait of Dr. Sayman. Trade-mark No. 95,482. Owner, Thomas M. Sayman, St. Louis, Mo. Used on vanilla extract for foods.

VELVET. Trade-mark No. 95,600. Owner, Central Fruit Co., South Lake Weir, Fla. Used on citrus fruits; namely, oranges, grape-fruit, tangerines, lemons and limes.

GREEN SEAL. Trade-mark No. 95,645. Owner, McCormick & Co., of Baltimore, Md. Used on table relishes and salad dressing.

SNOOKUM and picture of a totem pole. Trade-mark No. 95,650. Owner, Northwestern Fruit Exchange, Portland, Ore. Used on fresh fruits.

FORT CARROLL. Trade-mark No. 95,615. Owner, Fleming & Co., Baltimore, Md. Used on canned fruits and canned vegetables.

COURTESY. Trade-mark No. 95,654. Owner, Pacific Fisheries & Packing Co., Aberdeen, Wash. Used on canned salmon.

WHITE HEATHER. Trade-mark No. 95,683. Owner, Union Lard Corporation, New York, N.Y. Used on cooking oil.

SUN-KIST. Trade-mark No. 96,385. Owner, The J. K. Armsby Co., Chicago, Ill., and San Francisco, Cal. Used on canned vegetables.

FLAG OR PENNANT. Trade-mark No. 95,958. Owner, Stewart Fruit Co., Los Angeles, Cal., and San Francisco, Cal. Used on their fruits.

FROM THE LAND OF SUNSHINE. Trade-mark No. 95,974. Owner, The J. K. Armsby Co., Chicago, Ill., and San Francisco, Cal. Used on canned fruits and vegetables and dried fruits.

SPLENDOLA. Trade-mark No. 95,915. Owner, Fannie L. Ives, Meriden, Conn. Used on vegetable pickles, condiments and relishes.

BOY DRESSED AS A TRAMP. Trade-mark No. 96,066. Owner, Violante, Balbi & Co., New York, N.Y. Used on canned tomatoes and tomato paste.

DE-LUXE. Trade-mark No. 95,910. Owner, P. Hohenadel, Jr. Canning Co., Rochelle, Ill. Used on canned corn and canned peas.

EAGLE. Trade-mark No. 95,903. Owner, G. C. Francis, Florin, Cal. Used on fresh grapes.

CRAIG-Y-NOS. Trade-mark No. 95,943. Owner, James Nathaniel Reynolds, Lindsay, Cal. Used on citrus fruits.

INSPECTOA. Trade-mark No. 95,872. Owner, Best-Clymer Co., St. Louis, Mo. Used on mince pie filling, fruit preserves, apple-butter, and fruit jelly.

FRENCH-ISLAND. Trade-mark No. 95,937. Owner, Onalaska Pickle & Canning Co., Onalaska, Wis. Used on canned vegetables.

GOLD LACE. Trade-mark No. 95,950. Owner, Southern Citrus Corporation, Lynchburg, Va. Used on citrus fruits.

HARVEST MOON. Trade-mark No. 95,951. Owner, Southern Citrus Corporation, Lynchburg, Va. Used on citrus fruits.

GLEN ROSA. Trade-mark No. 95,934. Owner, North Ontario Packing Co., Los Angeles, Cal. Used on dried fruits and raisins.

FOREST KING. Trade-mark No. 95,935. Owner, North Ontario Packing Co., Los Angeles, Cal. Used on dried fruits and raisins.

CAPSTAN. Trade-mark No. 95,912. Owner, Hustisford Canning Co., Hustisford, Wis. Used on canned vegetables of all kinds.

G. SASSO & SONS with fanciful design. Trade-mark No. 95,946. Owner, G. Sasso & Sons, Brooklyn, N.Y. Used on olive oil.

BABY and photograph of George Theodore Richardson. Trade-mark No. 96,095. Owner, Borden's Condensed Milk Co., New York, N.Y. Used on condensed milk.

PAUL AND VIRGINIA. Trade-mark No. 96,185. Owner, James Nathaniel Reynolds, Lindsay, Cal. Used on citrus fruits.

PIEDIGAOTTA. Trade-mark No. 96,110. Owner, Crisafulli Bros., New York, N.Y. Used on tomato paste with basil.

OLGA. Trade-mark No. 96,153. Owner, J. S. McKenzie & Co. Inc., New York, N.Y. Used on canned sardines, canned herring, and canned salmon.

AMAZO. Trade-mark No. 96,381. Owner, American Maize-Products Co., Portland, Me., and New York, N.Y. Used on glucose, corn syrup and other articles.

COAN KING. Trade-mark No. 96,382. Owner, American Maize-Products Co., Portland, Me., and New York, N.Y. Used on glucose and other articles.

CREAM OF CORN. Trade-mark No. 96,383. Owner, American Maize-Products Co., Portland, Me., and New York, N.Y. Used on glucose, sugar and other articles.

SYBARITES. Trade-mark No. 96,457. Owner, Pellier Freres, Mans, France. Used on their products.

CHASSEUR. Trade-mark No. 96,458. Owner, Pellier Freres, Mans, France. Used on their products.

CROWN OF ARAGON, and picture of crown. Trade-mark No. 96,415. Owner, Fernando Palleres E'Hijos, Torosa, Spain. Used on olive oil.

FIDELIS. Trade-mark No. 96,409. Owner, Gordon, Sewall & Co., Houston, Tex. Used on canned fruits and canned cooked fish.

LITTLE JACK. Trade-mark No. 96,430. Owner, The H. D. Lee Mercantile Co., Salina, Kan. Used on their products.

SIBILLA. Trade-mark No. 96,464. Owner, Achille Starace, New York, N.Y. Used on macaroni, canned anchovies, and sardines, and the relish antipasto, composed of a combination of tunny, mushrooms, stuffed olives, sardines, miniature artichokes, truffles and pearl onion put up in cans.

CLADWATER FARMS and picture of cows near a stream of water. Trade-mark No. 96,585. Owner, James S. Harlan, Essex, N.Y. Used on milk, cream, butter, dressed poultry, eggs, fresh fruits and vegetables.

EUREKA. Trade-mark No. 96,434. Owner, Lofaro & Rossi, Utica, N.Y. Used on olive oil.

AMBROSI. Trade-mark No. 96,451. Owner, Carl L. Olsen & Kleppe, Stavanger, Norway. Used on fish packed in cans or other hermetically sealed receptacles.

PEOPLE IN A TWO-WHEELED CART DRAWN BY A HORSE. Trade-mark No. 96,575. Owner, A. Cusimano & Co., New Orleans, La. Used on tomato paste.

ODIVA. Trade-mark No. 96,413. Owner, Ernest L. Heebner, New York, N.Y. Used on canned sardines.

PICTURE OF AN INDIAN WOMAN. Trade-mark No. 96,572. Owner, Corn Products Refining Co., New York, N.Y. Used on table syrups, corn starch, edible corn oil, jams, jellies, and corn-syrup apple jelly.

BUCKEYE. Trade-mark No. 96,450. Owner, The Ohio Dairy Co., Toledo, Ohio. Used on evaporated milk and condensed milk.

TARGET and representation of same. Trade-mark No. 96,455. Owner, Palo Seco Fruit Co., South Easton, Mass. Used on fresh pineapples.

SNOW and picture of a house. Trade-mark No. 96,428. Owner, Lane & Hawkins Manufacturing Co., not Incorporated, Chicago, Ill. Used on horse radish.

MOJO. Trade-mark No. 96,158. Owner, The Mosel-Johnson Co., Steubenville, Ohio. Used on their products.

MICO. Trade-mark No. 96,155. Owner, Joseph Howard Mercian, New York, N.Y. Used on canned or preserved fish.

SUN-KIST. Trade-mark No. 96,083. Owner, The J. K. Armsby Co., San Francisco, Cal. Used on salmon.

MOONSTONE. Trade-mark No. 96,140. Owner, Melville E. Johnson, Palatka, Fla. Used on citrus fruits; viz, oranges and grape-fruit.

MARIGOLD. Trade-mark No. 96,092. Owner, Best-Clymer Manufacturing Co., St., Louis, Mo. Used on fruit jelly, mustard, fruit preserves, and mince pie filling.

PINK RABBIT. Trade-mark No. 96,093. Owner, Best-Clymer Manufacturing Co., St. Louis, Mo. Used on fruit preserves.

BULLION. Trade-mark No. 96,200. Owner, Southern Citrus Corporation, Lynchburg, Va. Used on citrus fruits.

STATE FAIR. Trade-mark No. 96,174. Owner, Oostburg Canning Co., Oostburg, Wis. Used on canned vegetables.

MAY-POLE. Trade-mark No. 96,151. Owner, Charles J. McDonald, Elyria, Ohio. Used on canned pork and beans with tomato sauce.

NATOMA. Trade-mark No. 96,152. Owner, Charles C. McDonald, Elyria, Ohio. Used on canned pork and beans with tomato sauce.

MANOLA. Trade-mark No. 96,207. Owner, Strohmeyer & Arpe Co., New York, N.Y. Used on preserved fish, canned fish, canned fruits, canned vegetables, olive oil, and peppers.

GOLD SEAL, the outer seal being in red and the inner seal and the picture of the animal seals being in gold. Trade-mark No. 96,622. Owner, Alart & McGuire, New York, N.Y., assignors to Alart & McGuire Co., New York, N.Y., a corporation of New York. Used on their products.

WORTH-WHILE and monogram of letters M. B. N Co. Trade-mark No. 96,596. Owner, Mullen-Blackledge-Nellis Co., Brazil, Ind. Used on their products.

TRIUMPH. Trade-mark No. 96,387. Owner, The Arthur Chemical Co., New Haven, Conn. Used on flavoring extracts for foods.

BEAR and picture of two bears. Trade-mark No. 96,398. Owner, California Associated Raisin Co., Fresno, Cal. Used on dried fruits.

TRE-VYN. Trade-mark No. 96,393. Owner, Best-Clymer Manufacturing Co., St. Louis, Mo. Used on fruit preserves.

SPEEDWAY. Trade-mark No. 96,595. Owner, Charles C. McDonald, Elyria, Ohio. Used on canned pork and beans with tomato sauce.

NEEDMORE. Trade-mark No. 96,567. Owner, Hustisford Canning Co., Hustisford, Wis. Used on canned vegetables of all kinds.

MONOGRAM OF LETTERS O D Co USED WITH SHIELD. Trade-mark No. 96,449. Owner, The Ohio Dairy Co., Toledo, Ohio. Used on evaporated milk and condensed milk.

FIGURE OF A FISH. Trade-mark No. 96,837. Owner, Tazaburo Suzuki, Sunamura, Japan. Used on their products.

H. G. PRINCE & Co. Trade-mark No. 96,827. Owner, H. G. Prince & Co., Fruitvale, Cal. Used on canned fruits and canned vegetables.

MISSION. Trade-mark No. 96,829. Owner, Redbanks Orchard Co., Visalia, Cal. Used on grapes.

MOUNTAIN SCENE. Trade-mark No. 97,026. Owner, Alpine Evaporated Cream Co., San Francisco, Cal. Used on evaporated and condensed milk.

OUR SEAL. Trade-mark No. 97,093. Owner, Vaughn-Crutchfield Co., Winston-Salem, N.C. Used on flavoring extracts for foods.

PA AND MA and picture of an old man and lady. Trade-mark No. 96,769. Owner, American Pickle & Canning Co., Des Moines, Iowa. Used on canned vegetables, pickles, tomato catsup and prepared table mustard.

BOB EVANS and picture of Admiral Robley D. Evans, deceased. Trade-mark No. 96,795. Owner, The Dolan Mercantile Co., Atchison, Kan. Used on canned salmon, canned oysters, canned fruits, canned vegetables, canned hominy, canned pork and beans, tea and blended coffee.

TEMPTOA. Trade-mark No. 97,588. Owner, Best-Clymer Manufacturing Co., St. Louis, Mo. Used on mince meat, fruit jelly, fruit preserves, apple-butter, honey, cane syrup, sorghum, corn syrup, molasses, mustard and maple syrup.

BLUE RIBBON and ribbon bow. Trade-mark No. 96,884. Owner, Richard Hellman, New York, N.Y. Used on mayonnaise dressing.

FIGURE OF A FISH ON A FORK HANDLE. Trade-mark No. 96,927. Owner, M. Amieux & Cie, Nantes, France.

CONSERVES ALIMENTAIRES MAISON FONDEE EN 1829 PELLIER FRERES LE MANS (FRANCE). Trade-mark No. 96,991. Owner, Pellier Freres, Mans, France. Used on all their products.

CITY OF LIGHTS AND LETTERS F-R-V, with picture of a fox. Trade-mark No. 96,958. Owner, Fox River Valley Co., Aurora, Ill. Used on cider vinegar, and distilled vinegar, whole cloves, whole allspice, ground white pepper, ground black pepper, mustard seed, leaf sage, leaf marjoram, and caraway seed, cane molasses, rice, evaported milk.

SUNKIST. Trade-mark No. 99,835. Owner, The J. K. Armsby Co., Chicago, Ill., and San Francisco, Cal. Used on catsup, pickles, olive oil, jams, jellies, olives, tea, coffee, dried beans for food.

ROYAL GEORGE. Trade-mark No. 97,016. Owner, Percival H. Troutman, Canon City, Colo. Used on jams, jellies, canned fruits, apple-butter, and fresh boxed apples.

NATURAL. Trade-mark No. 98,737. Owner, Arbuckle Brothers, New York, N.Y., and Chicago, Ill. Used on mustard, nutmeg, sage, mace, white pepper, red pepper, black pepper, Jamaica ginger, allspice, cloves, cinnamon and flavoring extracts.

GRAY GOOSE, picture of same. Trade-mark No. 97,009. Owner, Sprague, Warner & Co., Chicago, Ill. Used on canned fruits, canned vegetables, and canned fish—to wit, canned peaches, pears, tomatoes, corn, oysters and salmon.

NORMANNA. Trade-mark No. 96,467. Owner, Tokstad-Burger Co., New York, N.Y. Used on canned fish.

PICTURE OF A CUP, PLATE AND PATTY. Trade-mark No. 96,480. Owner, Workman Packing Co., San Francisco, Cal. Used on tamales and kerno (consisting of maize, chicken and a special sauce).

ATLAS and representation of Atlas. Trade-mark No. 96,396. Owner, John W. and Herbert W. Brown, Bayamon, Porto Rico and Philadelphia, Pa. Used on grape-fruit, oranges and pineapples.

BANKER'S and picture of man handing something to the cashier. Trade-mark No. 96,453. Owner, Pacific Fisheries and Packing Co., Aberdeen, Wash. Used on canned salmon.

MESSAGE and picture of a messenger boy. Trade-mark No. 96,454. Owner, Pacific Fisheries & Packing Co., Aberdeen, Wash. Used on canned salmon.

GEM and picture of little girl. Trade-mark No. 96,441. Owner, Joseph Howard Mercian, New York, N.Y. Used on canned or preserved fish.

RED MILL. Trade-mark No. 96,442. Owner, Joseph Howard Mercian, New York, N.Y. Used on canned or preserved fish.

FIRSKOT and picture of a small boy holding a fish in one hand. Trade-mark No. 96,443. Owner, Joseph Howard Mercian, New York, N.Y. Used on canned or preserved fish.

ZENO and picture of a sea horse. Trade-mark No. 96,444. Owner, Joseph Howard Mercian, New York, N.Y. Used on canned or preserved fish.

SWEET ALICE and head of woman. Trade-mark No. 96,395. Owner, M. Brawer & Son, New York, N.Y. Used on horse radish, olives, honey, syrup, olive oil, catsup, mustard, salad oil, vinegar, mustard oil, Worcestershire sauce and pickles.

VINTA and picture of dwarfs carrying a fish. Trade-mark No. 96,389. Owner, Raymond Barvier, New York, N.Y. Used on preserved fish products.

O. K. and fanciful design. Trade-mark No. 96,600. Owner, E. A. O'Kelly & Co., London, England. Used on dates (for use in food).

PICTURE OF AN ANGEL SEATED ON A GLOBE. Trade-mark No. 96,578. Owner, Fantini & Latorraca, New York, N.Y. Used on olive oil.

GUSTALF. Trade-mark No. 96,826. Owner, Pellier Freres, Mans, France. Used on their products.

WHITE FROST. Trade-mark No. 97,061. Owner, Kentucky Refining Co., Louisville, Ky. Used on cotton seed oil.

RECEPTION. Trade-mark No. 100,144. Owner, Norton & Curd Co., Louisville, Ky. Used on rice, seeded raisins, alimentary paste products, canned fruits and canned vegetables.

UNEED. Trade-mark No. 96,813. Owner, Lofaro & Rossi, Utica, N.Y. Used on olive oil.

BRIARDALE. Trade-mark No. 96,802. Owner, Grocers' Wholesale Co., Des Moines, Iowa. Used on canned vegetables, canned fruits, spices and canned fish.

GOLDEN GLORY. Trade-mark No. 97,624. Owner, Libby, McNeill & Libby, Chicago, Ill. Used on canned fruits and canned vegetables.

BLUE AND GOLD. Trade-mark No. 97,634. Owner, Minnesota Valley Canning Co., Le Sueur, Minn. Used on canned vegetables; viz., canned peas and corn.

DERBY WINNER and picture of man seated on a horse. Trade-mark No. 98,547. Owner, Menzol & Co., New York, N.Y. Used on sardines.

THOUSAND ACRES. Trade-mark No. 97,589. Owner, Bitter Root Valley Orchards, Inc., Ravalli County, Mont. Used on fresh apples, pears and cherries.

WHITE ROCK and pictures of a chicken. Trade-mark No. 97,594. Owner, Cereal Food Co., Peoria, Ill. Used on canned vegetables.

COLCOLOR and monogram of letters C C. Trade-mark No. 98,099. Owner, Ungemach A. G. Els. Conserven Fabrik & Import-Gesellschaft, of Strassburg, Germany. Used on coloring matters for use as ingredients in foods.

COLCO-DIFFUSER—no claim to word "diffuser." Trade-mark No. 98,220. Owner, Ungemach A. G. Els, Conserven-Fabrik & Import-Gesellschaft, Strassburg, Germany. Used on coloring matters for use as ingredients in foods.

LETTER A UPON A SHIELD used in connection with a basket of fruit. Trade-mark No. 97,932. Owner, Benjamin Lewis Aldridge, Maple Shade, N.J. Used on poultry, eggs, fresh fruits and vegetables, preserved fruits and vegetables, and nuts.

UN-GRO-CO. Trade-mark No. 98,018. Owner, C. C. Truax & Co., Toledo, Ohio, assignor to United Grocer Co., Toledo, Ohio, a corporation of Delaware. Used on all their products.

COL CARTER and head of man. Trade-mark No. 98,017. Owner, Sprague, Warner & Co., Chicago, Ill. Used on canned corn.

RITTER. Trade-mark No. 98,008. Owner, The Philip J. Ritter Conserve Co., Philadelphia, Pa. Used on catsup, pork and beans, apple butter, soups, pure fruit preserves, pure fruit jams, pure fruit jellies, mustard, olives, honey, and compound fruit jams.

CAPRICE. Trade-mark No. 97,988. Owner, George Lueders & Co., New York, N.Y. Used on olive oil.

RED RIBBON. Trade-mark No. 98,030. Owner, Yakima County Horticultural Union, North Yakima, Wash. Used on second quality of fresh deciduous fruits, apples and pears.

AUTOCRAT. Trade-mark No. 97,970. Owner, Harder & De Voss, Hamburg, Germany. Used on their products.

SEAKETCH. Trade-mark No. 97,931. Owner, Alaska Fish Co., Seattle, Wash. Used on canned salmon.

OUR HOBBY QUALITY. Trade-mark No. 97,995. Owner, Frank Mosca, New York, N.Y. Used on olive oil and macaroni.

PONCE DE LEON. Trade-mark No. 97,986. Owners, S. A. & W. H. Leonard, Blountstown, Fla. Used on table syrup made from pure sap of Florida sugar cane.

SUNNY-VALE and picture of an orchard. Trade-mark No. 96,974. Owner, Libby, McNeill & Libby, Chicago, Ill. Used on canned fruits and canned fish.

SAPSUCKER. Trade-mark No. 96,957. Owner, Fort Ogden Citrus Association, Fort Ogden, Fla. Used on citrus fruits.

BLACK HILLS. Trade-mark No. 96,933. Owner, Black Hills Wholesale Grocery Co., Rapid City, S.D. Used on canned fruits, canned vegetables, canned fish, coffee, spices and mince meat.

REPRESENTATION OF A QUADRILATERAL FIOURE. Trade-mark No. 96,929. Owner, The J. K. Armsby Co., San Francisco, Cal. Used on raisins, dried fruits, nuts, canned fruits, canned vegetables, canned chili, canned pimientoes, canned milk, canned salmon, olives, olive oil, catsup, pickles, dried beans, coffee, tea and butter.

MARIGOLD and picture of same. Trade-mark No. 96,945. Owner, Clossett & Devers, Portland, Ore. Used on tea, flavoring extracts for foods and spices.

VEGA. Trade-mark No. 96,983. Owner, Cora F. Moore, San Francisco, Cal. Used on canned soups.

PICKWICK. Trade-mark No. 97,058. Owner, Kansas City Wholesale Grocery Co., Kansas City, Mo. Used on their products.

FRONTIER. Trade-mark No. 97,167. Owner, Nave-McCord Mercantile Co., St. Joseph, Mo. Used on vinegar, tapioca, tea, sugar, rice, pepper, jelly powder, buckwheat flour, jellies, jams, preserves, pickles.

GREAT SEAL and figure of a seal. Trade-mark No. 97,086. Owner, The Styron-Beggs Co., Newark, Ohio. Used on flavoring foods.

LA FORMICA. Trade-mark No. 97,041. Owner, Angeli de C. Davini, Lucca, Italy. Used on olive oil.

EMPIRE. Trade-mark No. 97,156. Owner, John McCormick, New York, N.Y. Used on citrus fruits, such as oranges, grape-fruit and tangerines, mandarins and kumquats.

NAMCO. Trade-mark No. 97,074. Owner, North American Mercantile Co., San Francisco, Cal. Used on canned crab meat, tuna, clams, and shrimps, peanut butter and peanuts.

CHICKEN OF THE SEA. Trade-mark No. 97,192. Owner, White Star Canning Co., Los Angeles, Cal. Used on tuna fish and pure olive oil, and olive oil with cottonseed oil and salad oil.

WHITE BEAUTY. Trade-mark No. 97,609. Owner, Grayson Oil & Cotton Co., Sherman, Tex. Used on cooking oil made from cottonseed oil.

GRANADAISA and picture of woman. Trade-mark No. 97,639. Owner, Florence Netter Newfeld, New York, N.Y. Used on canned sardines.

COMMANDER. Trade-mark No. 97,640. Owner, North Ontario Packing Co., Los Angeles, Cal. Used on dried fruits and raisins.

CLOVER and picture of same. Trade-mark No. 97,716. Owner, Mohawk Condensed Milk Co., Rochester, N.Y. Used on condensed milk.

BOVININE and picture of cow. Trade-mark No. 97,590. Owner, The Bovinine Co., New York, N.Y. Used on beef juices and meat extracts.

BUST PICTURE OF AN INDIAN HOLDING A TOMAHAWK. Trade-mark No. 98,434. Owner, Stone-Ordean-Wells Co., Duluth, Minn. Used on their products.

COALADO. Trade-mark No. 98,320. Owner, H. Schlinck & Cie., A. G., Hamburg, Germany. Used on cocoanut fat, especially, substitute of cocoa butter, food greases, and food oils; namely, cocoanut oil, palm oil, earth nut oil, olive oil, sesame oils, beef fat, suet, margarin.

APEX. Trade-mark No. 98,306. Owner, Meyer & Carmody Import Co., Inc., New York, N.Y. Used on olives, sardines, peanut butter and salad dressing.

ROCHIDA. Trade-mark No. 98,289. Owner, Italian Importing Co., Des Moines, Iowa. Used on olive oil.

DASCO. Trade-mark No. 98,255. Owner, Davies & Sullivan Co., New York, N.Y. Used on coffee, tea and olive oil.

IMPERATOR. Trade-mark No. 98,305. Owner, Menzel & Co., New York, N.Y. Used on sardines.

OAKLAND. Trade-mark No. 98,313. Owner, Oakland Vinegar & Pickle Co., Saginaw, Mich. Used on cider vinegar.

BABY STUART and picture of a baby. Trade-mark No. 98,325. Owner, Sprague-Warner & Co., Chicago, Ill. Used on canned peas.

WEDGEWOOD, picture of a vase. Trade-mark No. 98,335. Owner, Downing-Taylor Co., Springfield, Mass. Used on mince meat, tomato catsup, cornstarch and table syrup.

ACCO, figure of Atlas. Trade-mark No. 98,237. Owner, Atlanta Canning Co., Atlanta, N.Y. Used on canned vegetables.

YOUR KIND. Trade-mark No. 98,292. Owner, W. H. J. Kavanaugh, Chicago, Ill. Used on fresh Colorado Rocky Ford gems, melons, and cantaloupes, and fresh Colorado pink meat gems, melons, and cantaloupes and fresh celery.

LETTEA Y. Trade-mark No. 99,412. Owner, Yakimi Valley Fruit Growers' Association, Yakima, Wash. Used on canned, dried and evaporated fruits and jellies.

PRIDE. Trade-mark No. 98,435. Owner, Sulzberger & Sons Co., New York, N.Y. Used on apple butter, fruit jellies, fruit jams and preserves.

COLONIAL. Trade-mark No. 98,436. Owner, Sulzberger & Sons Co., New York, N.Y. Used on fruit jellies and fruit jams.

RED CEDAR. Trade-mark No. 98392. Owner, Inderrieden Canning Co., Chicago, Ill. Used on canned vegetables.

ANGLER. Trade-mark No. 98,393. Owner, Inderrieden Canning Co., Chicago, Ill. Used on canned vegetables.

MARCELLA. Trade-mark No. 98,394. Owner, Inderrieden Canning Co., Chicago, Ill. Used on canned vegetables.

KING FISHER. Trade-mark No. 98,395. Owner, Inderrieden Canning Co., Chicago, Ill. Used on canned vegetables.

VICTORENE. Trade-mark No. 98,376. Owner, The N. K. Fairbanks Co., Chicago, Ill. Used on edible fats and oils.

REWARD. Trade-mark No. 97,991. Owner, J. S. McKenzie & Co., Inc., New York, N.Y. Used on canned salmon, canned corn and canned peaches.

VANITY FAIR. Trade-mark No. 97,992. Owner, J. S. McKenzie & Co., New York, N.Y. Used on canned salmon, canned corn and canned peaches.

LEMOLIVOIL. Trade-mark No. 97,953. Owner, Carlo Antonio Covina, New York, N.Y. Used on a specialty of olive oil flavored with essence of the outer rind of lemons.

BUCKEYE. Trade-mark No. 98,013. Owner, Ernest Schnitzler, Weirsdale, Fla. Used on oranges.

AMO. Trade-mark No. 98,010. Owner Roethlisberger & Co., New York, N.Y. Used on olive oil.

NOMAD. Trade-mark No. 97,958. Owner, U. H. Dudley & Co., New York, N.Y. Used on dates.

ROB-ROY and figure of man. Trade-mark No. 98,011. Owner, F. E. Royston & Co., Aurora, Ill. Used on canned vegetables, canned pork and beans, peanut butter, olives, tomato catsup, vinegar and blended coffee.

SEMINOLE. Trade-mark No. 97,949. Owner, Chase & Co., Jacksonville, Fla. Used on citrus fruits and tomatoes.

ADAS. Trade-mark No. 98,150. Owner, Frank J. Horton, Youngstown, Ohio. Used on tea, coffee, spices and flavoring extracts for foods.

SHEFFORD. Trade-mark No. 98,151. Owner, Alexander J. Howell, Syracuse, N.Y. Used on cheese, bacon, peanut butter, potato chips, horse radish, welsh rabbit, and dried beef.

GOLDEN GAGE, figure of same. Trade-mark No. 98,201. Owner, Fernando R. Sari, Washington, D.C. Used on olive oil.

ALMO, picture of a castle. Trade-mark No. 98,338. Owner, James Turnbull, Rosewell, N.M. Used on fresh apples, pears, peaches, plums, cherries, strawberries, raspberries, and cantaloupes.

ROMANA, picture of a woman. Trade-mark No. 98,276. Owner, Pasquale Giunta & Son, Philadelphia, Pa. Used on olive oil.

ROGUE. Trade-mark No. 98,170. Owner, The Macleay Estate Co., Portland, Ore. Used on canned salmon.

LUXURY. Trade-mark No. 98,111. Owner, The Arthur Chemical Co., New Haven, Conn. Used on flavoring extracts for foods.

SUMMORE. Trade-mark No. 98,229. Owner, Jarvis A. Wood, Philadelphia, Pa. Used on citrus fruits—viz., grape-fruit.

LOOKOUT. Trade-mark No. 98,213. Owner, The Sunset Packing Co., West Pembroke, Me., and New York, N.Y. Used on canned herring.

CYRILLA. Trade-mark No. 98,321. Owner, Leo E. Schoenfeld, Chicago, Ill. Used on their products.

HOMESPUN. Trade-mark No. 98,258. Owner, Thos. P. Dietrick, Richmond, Va. Used on their products.

SURF RIDER. Trade-mark No. 99,210. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

RED FLOWER. Trade-mark No. 99,211. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

PLANTATION. Trade-mark No. 99,212. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

PARADISE ISLAND. Trade-mark No. 99,213. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

RELY. Trade-mark No. 99,360. Owner, J. F. Pyle & Son, San Jose, Cal. Used on sauces and canned fruits and vegetables.

PANAMA PACIFIC. Trade-mark No. 99,304. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapples.

SCENE. Trade-mark No. 99,657. Owner, Freeman G. Davis, Lewiston, Me. Used on canned baked beans and tomatoes.

MONO AND MONOGRAM OF LETTERS. M I E U. Trade-mark No. 99,896. Owner, Monopol Import Export Union, Inc., New York, N.Y. Used on bullion cubes, chicken broth cubes, soup flavors, turtle extract, canned vegetables, vegetables soup powder, canned sardines, beef extract tablets.

WATCHMAN. Trade-mark No. 99,596. Owner, Kadiak Fisheries Co., Seattle, Wash. Used on canned salmon.

NEWERA. Trademark. No. 99,597. Owner, Kadiak Fisheries Co., Seattle, Wash. Used on canned salmon.

POINSETTA. Trade-mark No. 99,598. Kadiak Fisheries Co., Seattle, Wash. Used on canned salmon.

SNOW FLAKE. Trade-mark No. 99,911. Owner, Snow Flake Canning Co., Brunswick, Me. Used on canned corn.

TIOGA. Trade-mark No. 99,733. Owner, Griffith-Durney Co., San Francisco, Cal. Used on fresh and canned pineapples.

BEST VALUE. Trade-mark No. 99,825. Owner, The Weidman Co., Cleveland, Ohio. Used on their products.

GOLDEN ELK. Trade-mark No. 99,879. Griffith-Durney Co., San Francisco, Cal. Used on canned and fresh pineapples.

MAUNA LOA. Trade-mark No. 99,736. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

CRITERION. Trade-mark No. 99,752. Owner, Kadiak Fisheries Co., Seattle, Wash. Used on canned salmon.

MERITO. Trade-mark No. 99,818. Owner, Union Fisherman's Co-operative Packing Co., Astoria, Ore. Used on canned salmon.

PACIFIC GEMS. Trade-mark No. 99,981. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

HAWAIIAN CLUB. Trade-mark No. 99,982. Owner, Hawaiian Pineapple Co., Ltd., Honolulu, Territory of Hawaii. Used on canned pineapple.

ARTISTO. Trade-mark No. 98,515. Owner, Grossfeld & Roe Co., Chicago, Ill. Used on canned fruits, canned vegetables, canned fish, evaporated vegetables and coffee.

MOUNTAIN SCENE. Trade-mark No. 98,527. Owner, Hoquiam Packing Co., Hoquiam, Wash. Used on canned salmon and clams.

NECTARLENE. Trade-mark No. 98,492. Owner, Ryland W. Eames, Vale, Ore. Used on canned syrups.

CONDUCTOR and picture of conductor and passenger train. Trade-mark No. 98,539. Owner, The H. T. Lange Co., Eau Claire, Wis. Used on canned vegetables, sauerkraut and pork and beans.

VERIBEST and picture of girl. Trade-mark No. 99,034. Owner, Armour & Co., Chicago, Ill. Used on fish generally, including sardines, salmon and tuna.

TANGO and picture of man and woman dancing. Trade-mark No. 98,588. Owner, The Sunset Packing Co., West Pembrooke, Me. Used on sardines.

CLAREMONT. Trade-mark No. 98,691. Owner, H. G. Prince & Co., Fruitvale, Cal. Used on canned fruits and canned vegetables.

MONOGRAM OF LETTERS P P P P Co enclosed in a hexagon. Trade-mark No. 98,690. Owner, Premier Packing Co., San Diego, Cal. Used on canned tuna.

BOSTON. Trade-mark No. 98,625. Owner, Boston Food Products Co., Boston, Mass. Used on canned cod fish balls, canned brown bread and canned baked beans.

LAWNDALE and picture of house. Trade-mark No. 98,610. Owner, West Side Wholesale Grocery Co., Chicago, Ill. Used on canned fruits and vegetables and fish.

GOLDEN GATE. Trade-mark No. 98,866. Owner, Golden Gate Packing Co., San Jose, Cal. Used on canned and preserved fruits and vegetables.

CALUSA. Trade-mark No. 99,063. Owner, Premier Packing Co., San Diego, Cal. Used on canned fish.

BEACON. Trade-mark No. 99,058. Owner, McCready & Webster, Baltimore, Md. Used on canned fruits, canned vegetables and canned oysters.

PIGEON and picture of a bird on a branch of a tree. Trade-mark No. 99,046. Owner, E. M. Frye & Co., Harrington, Me. Used on canned blueberries.

STRONGHOLD and picture of a castle. Trade-mark No. 99,040. Owner, Diehm-Fansler Grocery Co., East St. Louis, Ill. Used on canned fruits, tomato catsup, canned vegetables and canned salmon.

CHAMPION STATE. Trade-mark No. 99,389. Owner, Grand River Canning Co., Markesan, Wis. Used on canned vegetables.

CROWN and picture of a crown. Trade-mark No. 99,229. Owner, The Macleay Estate Co., Portland, Ore. Used on canned salmon.

LANCO. Trade-mark No. 99,226. Owner, The H. T. Lange Co., Eau Claire, Wis. Used on canned vegetables and evaporated milk.

BIG F. Trade-mark No. 99,967. Owner, Frick Bros., New Iberia, La. Used on canned fruits and vegetables.

MAGNOLIA. Trade-mark No. 100,105. Owner, Dunbars, Lopez & Dukate Co., New Orleans, La. Used on canned shrimp.

BLUE BIRD and picture of bird. Trade-mark No. 100,177. Owner, Stone-Ordean-Wells Co., Duluth, Minn. Used on their products.

PICTURE OF THE DEVIL. Trade-mark No. 100,229. Owner, Wm. Underwood Co., Boston, Mass. Used on canned fish, ham, poultry and beef.

YE OLD WHITE HORSE CELLAR and picture of a white horse. Trade-mark No. 100,175. Owner, Percy Steet, New York, N.Y. Used on sauce put up in bottles.

THELCO. Trade-mark No. 100,713. Owner, The H. Lesinsky Co., El Paso, Tex. Used on canned fruits, canned vegetables, canned fish and canned oysters and shrimp.

VEE GEE and letters V G. Trade-mark No. 100,659. Owner, Henry von Glahn & Son, Brooklyn, N.Y. Used on canned vegetables, canned fruits and canned fish.

SILVEA BOY. Trade-mark No. 100,640. Owner, Spitalnik & Bushel, New York, N.Y. Used on salad oil made from cottonseed, tomato catsup, white vinegar, and cider vinegar.

WEDDING BREAKFAST. Trade-mark No. 100,700. Owner, Farrell & Co., Omaha, Neb. Used on table syrups, sorghum, and maple syrup molasses.

ALAFLAGA. Trade-mark No. 100,691. Owner, Alabama-Georgia Syrup Co., Montgomery, Ala. Used on table syrups.

MONOGRAM OF LETTERS D L & D Co, used in connection with other features. Trade-mark No. 100,296. Owner, Dunbars, Lopez & Dukate Co., New Orleans, La. Used on canned shrimp.

RED SEAL. Trade-mark No. 100,479. Owner, Armour & Co., Chicago, Ill. Used on sardines.

LA FAMOSA. Trade-mark No. 100,836. Owner, Henry F. C. Kilian, New York, N.Y. Used on canned vegetables, canned fruits, canned salmon and canned jam.

PRIDE OF NORWAY. Trade-mark No. 100,843. Owner, Otto L. Kuehn Co., Milwaukee, Wis. Used on canned sardines.

PENGUIN. Trade-mark No. 100,844. Owner, Otto L. Kuehn Co., Milwaukee, Wis. Used on canned sardines.

ZOO. Trade-mark No. 100,845. Owner, Otto L. Kuehn Co., Milwaukee, Wis. Used on canned sardines.

DOMINO. Trade-mark No. 100,846. Owner, Otto L. Kuehn Co., Milwaukee, Wis. Used on canned sardines.

KAYAK. Trade-mark No. 100,847. Owner, Otto L. Kuehn Co., Milwaukee, Wis. Used on canned sardines.

COB STYLE. Trade-mark No. 100,586. Owner, The Mollen Thompson & James Co., Cleveland, Ohio. Used on canned corn.

DIXIE. Trade-mark No. 100,814. Owner, B. A. Hancock, Atlanta, Ga. Used on vinegar, sauerkraut, pickles, mustard, jellies and preserves.

CARAVEL. Trade-mark No. 100,848. Owner, La Manna, Azema & Farnan, New York, N.Y. Used on canned sardines and olive oil.

ROSEBERRY. Trade-mark No. 100,818. Owner, Hawks, Inc., Bloomington, Ill. Used on their products.

MONTROSE. Trade-mark No. 100,748. Owner, Augusta Canning Co., Brunswick, Me. Used on canned corn, succotash and lima beans.

ROMOLO-MONTI. Trade-mark No. 100,739. Owner, Michele Ajello, Brooklyn, N.Y. Used on canned olive oil, fruits and vegetables.

CHIC-I-NUNA. Trade-mark No. 100,885. Owner, Premier Packing Co., Chicago, Ill. Used on canned albicore.

RELY. Trade-mark No. 100,886. Owner, J. F. Pyle & Son, San Jose, Cal. Used on sauces and canned fruits and vegetables.

MONOGRAM OF LETTERS S B. Trade-mark No. 100,900. Owner, Seggerman Bros., Inc., New York, N.Y. Used on green, dried and evaporated apples.

ASSOCIATIONS

IN THE

CANNING AND PACKING INDUSTRIES

WHEN AND WHERE PAST NATIONAL CONVENTIONS WERE HELD, AND NAMES OF THE PRESIDENTS.

DETROIT—1899

Atlantic States Packers' Association.....R. Tynes Smith, *President*
Western Packers' Canned Goods Association.....Peter Whitmer, *President*
Canning Machinery and Supplies Association.....F. O. Conant, *President*

DETROIT—1900

Atlantic States Packers' Association.....J. C. Winters, *President*
Western Packers' Canned Goods Association.....A. H. Trego, *President*
Canning Machinery and Supplies Association.....I. V. McCagg, *President*

ROCHESTER—1901

Atlantic States Packers' Association.....F. F. Hubbard, *President*
Western Packers' Canned Goods Association....J. W. Cuykendall, *President*
Canning Machinery and Supplies Association.....J. A. Chisholm, *President*

MILWAUKEE—1902

Atlantic States Packers' Association.....F. F. Hubbard, *President*
Western Packers' Canned Goods Association....J. W. Cuykendall, *President*
Canning Machinery and Supplies Association.....J. A. Chisholm, *President*

WASHINGTON, D. C.—1903

Atlantic States Packers' Association.....Willard G. Rouse, *President*
Western Packers' Canned Goods Association.....A. C. Fraser, *President*
Canning Machinery and Supplies Association.....Fred H. Knapp, *President*

COLUMBUS, O.—1904

Atlantic States Packers' Association.....Willard G. Rouse, *President*
Western Packers' Canned Goods Association.....A. C. Fraser, *President*
Canning Machinery and Supplies Association.....Fred H. Knapp, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Thomas J. Meehan, *President*

COLUMBUS, O.—1905

Atlantic States Packers' Association.....George G. Bailey, *President*
Western Packers' Canned Goods Association.....A. C. Fraser, *President*
Canning Machinery and Supplies Association....C. A. Suydam, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Walter A. Frost, *President*

ATANTIC CITY, N. J.—1906

Atlantic States Packers' Association.....George G. Bailey, *President*
Western Packers' Canned Goods Association.....Lon A. Sears, *President*
Canning Machinery and Supplies Association.....C. A. Suydam, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Walter A. Frost, *President*

BUFFALO, N. Y.—1907

*National Canners' Association.....George G. Bailey, *President*
Western Packers' Canned Goods Association.....Lon A. Sears, *President*
Atlantic States Packers' Association.....Hugh S. Orem, *President*
Canning Machinery and Supplies Association....E. M. Lang, Jr., *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Walter A. Frost, *President*

CINCINNATI, O.—1908

National Canners' Association.....Charles S. Crary, *President*
Canning Machinery and Supplies Association....E. M. Lang, Jr., *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Walter A. Frost, *President*

LOUISVILLE, KY.—1909

National Canners' Association.....Charles S. Crary, *President*
Canning Machinery and Supplies Association....George W. Cobb, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Frank L. Deming, *President*

ATLANTIC CITY, N. J.—1910

National Canners' Association.....Lon A. Sears, *President*
Canning Machinery and Supplies Association....George W. Cobb, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Charles S. Jones, *President*

MILWAUKEE, WIS.—1911

National Canners' Association.....W. R. Roach, *President*
Canning Machinery and Supplies Association....Thomas A. Scott, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Charles S. Jones, *President*

ROCHESTER, N. Y.—1912

National Canners' Association.....S. F. Haserot, *President*
Canning Machinery and Supplies Association....Thomas A. Scott, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Joseph H. Kline, *President*

LOUISVILLE, KY.—1913

National Canners' Association.....Bert M. Fernald, *President*
Canning Machinery and Supplies Association..W. C. Langbridge, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Richard Dallam, *President*

BALTIMORE, MD.—1914

National Canners' Association.....W. C. Leitch, *President*
Canning Machinery and Supplies Association..W. C. Langbridge, *President*
National Canned Goods and Dried Fruit Brokers' Association.....
.....Richard Dallam, *President*

* The National Canners' Association came into existence at this meeting, near the close of which it took hold.

PROGRAM OF THE SEVENTH ANNUAL CONVENTION OF THE NATIONAL CANNERS' ASSOCIATION AND ALLIED INDUSTRIES.

The seventh annual convention of the National Canners' Association and its allied industries will be held in Baltimore, Md., February 2-6, 1914, inclusive.

We cordially invite the entire canning industry and its friends, the members of the Canning Machinery and Supplies Association and the National Canned Foods and Dried Fruits Brokers' Association, and welcome them to participate in the events of what should prove for all a most resultful week.

B. M. FERNALD,
President National Canners' Association.

W. C. LANGBRIDGE,
President Canning Machinery and Supplies Association.

RICHARD DALLAM,
President National Canned Goods and Dried Fruits Brokers' Association.

The committees appointed by the Baltimore Canned Goods Exchange to prepare for the convention and care for the visitors on that occasion are made up of the following well-known gentlemen:

CONVENTION COMMITTEE

F. A. Torch, *Chairman*	Rufus M. Gibbs
D. H. Stevenson	H. W. Krebs
Ed. A. Kerr	Albert T. Myer
Geo. N. Numsen	J. Cecil Smith

SUB-COMMITTEES

HOTEL

D. H. Stevenson, *Chairman*	A. Hampton Steele
W. C. West	Thos. L. North, Jr.

PUBLICITY AND PRESS

Ed. A. Kerr, *Chairman*	John R. Baines
H. S. Orem	Arthur Judge

FINANCE

Geo. N. Numsen, *Chairman*	B. Hamburger
Wm. A. Wagner	L. Langrall

ATTENDANCE

Rufus M. Gibbs, *Chairman*	Robert A. Sindall
Wm. Silver	L. G. Kraft

ENTERTAINMENT

H. W. Krebs, *Chairman*	W. E. Wilson
John S. Gibbs, Jr.	Chas. G. Summers, Jr.
W. F. Assau	

MACHINERY HALL

Albert T. Myer, *Chairman*	Walter J. Phelps
H. P. Strasbaugh	Jas. B. Platt
Richard Dorsey	Frank A. Curry

RECEPTION

J. Cecil Smith, *Chairman*	C. J. Schenkel
E. C. White	A. J. Hubbar
Thos. J. Meehan	C. F. Butterfield

The sessions of the National Canners' Association will be held in the assembly rooms of the Hotel Belvedere.

PROGRAM

MONDAY, FEBRUARY 2.

Machinery Hall open all day. There will be no session of the convention this day. Everyone is urged immediately upon arrival to come to the secretary's office at the Belvedere Hotel and register.

It is exceedingly important that each person register immediately upon arrival, as the *official badge will be necessary to* obtain admission to the Machinery Hall and convention halls.

Monday Evening at 8 O'clock Meeting of the Directors of National Canners' Association, at the Hotel Belvedere. It is Important for all Directors to Attend This Meeting.

TUESDAY, FEBRUARY 3, 10 O'CLOCK A.M.

OPENING SESSION

Assembly Rooms, Hotel Belvedere.

Machinery Hall closed until 1 o'clock p.m.

F. A. Torsch, President, Baltimore Canned Goods Exchange, presiding.

Invocation—His Eminence James Cardinal Gibbons.

"Maryland, My Maryland!"—His Excellency Phillips Lee Goldsborough, Governor of Maryland.

"The Dignified Mission of Canned Foods"—His Excellency Charles R. Miller, Governor of Delaware.

Baltimore Greetings—Honorable James H. Preston, Mayor of Baltimore.

Response—William C. Leitsch, First Vice President, National Canners' Association, Columbus, Wis.

Addresses of Presidents—Hon. B. M. Fernald, President, National Canners' Association; W. C. Langbridge, President, Canning Machinery and Supplies Association; Richard Dallam, President, National Canned Goods and Dried Fruits Brokers' Association.

The recommendations of the president of the National Canners' Association will be furnished in printed form, together with the report of the secretary and treasurer.

Announcement of convention and special committees.

TUESDAY AFTERNOON

Machinery Hall open. No session of National Canners' Association, except special committee work.

Reception by the visiting ladies and the ladies of Baltimore to Mrs. M. V. Terhune (Marion Harland).

Music—Tea.

TUESDAY EVENING

A typical Maryland oyster roast, tendered by the host, the Baltimore Canned Goods Exchange.

Place: The cannery of the John Boyle Company, South Wolfe Street, corner Thames Street.

Hour: 7 o'clock.

Oysters in practically every known Maryland style—raw, roasted and steamed. Elaborate entertainment.

WEDNESDAY, FEBRUARY 4, 10 O'CLOCK A.M.

Assembly Rooms, Hotel Belvedere.

Machinery Hall closed until 1 o'clock p.m.

"Reciprocal Insurance"—John C. Bardwell, St. Louis, Mo.

"Important Factors Affecting Crop Production"—Dr. H. J. Wheeler, Manager Agricultural Service Bureau, American Agricultural Chemical Co., Boston, Mass.

Address—Hon. J. Harry Covington, Interstate and Foreign Commerce Committee, House of Representatives.

"Federal Government and Food Products"—O. B. McGlasson, President National Wholesale Grocers' Association, Chicago, Ill.

"Links in the Chain of Distribution"—Col. John A. Lee, Chicago, Ill.

"Retailer's Confidence"—John A. Green, Secretary National Retail Grocers' Association, Cleveland, Ohio.

Report of Committee on Nominations.

Election of officers of the National Canners' Association.

WEDNESDAY MORNING, 10 O'CLOCK

Meeting of Canning Machinery and Supplies Association, Hotel Belvedere. Nomination of officers and other association business.

WEDNESDAY AFTERNOON AND EVENING

Machinery Hall open.

National Canners' Association Committee meeting.

Ladies will visit the famous Walters Art Gallery, Mount Vernon Place.

WEDNESDAY EVENING

Session in Albaugh's Lyceum Theater, Charles Street, near Preston.

Address—Mrs. M. V. Terhune (Marion Harland).

"The Housewife's Debt to the Canned Food Industry"—Mrs. Winnifred Harper Cooley, National President of Associated Clubs of Domestic Science, New York.

"Solving a Great Problem"—Hugh S. Orem, former President of Baltimore Canned Goods Exchange.

Moving Pictures: Catching Salmon—Miller Freeman, Secretary Alaska and Puget Sound Packers' Association. Capt. J. J. Reynolds, Secretary Oregon-Washington-California Coast Salmon Packers' Association, Portland, Ore.

Canning Hawaiian pineapple.

THURSDAY, FEBRUARY 5, 10 O'CLOCK A.M.

Assembly Rooms, Hotel Belvedere.

Machinery Hall closed until 1 o'clock p.m.

"Fire Insurance Canners' Exchange, Chicago"—George G. Bailey, Treasurer Advisory Board, Rome, N.Y.

Address—Dr. C. L. Alsberg, Chief, Bureau of Chemistry, Washington, D.C.

"Export Trade in Canned Products; How to Get It and How to Keep It"—Hon. Wm. C. Redfield, Secretary of Commerce, Department of Commerce, Washington, D.C.

REPORTS OF ALL COMMITTEES

Cooperative Committee with Wholesale Grocers—L. A. Sears, *Chairman.*

Committee on Legislation—E. V. Stockham, *Chairman.*

Committee on Scientific Research—Henry Burden, *Chairman.*

Committee on Adjustment—E. V. Stockham, *Chairman.*

Committee on Sanitation—Wm. C. Leitsch, *Chairman.*

Committee on Publicity—F. L. Deming, *Chairman.*

Committee on Contracts and Terms, Weights and Measurements—L. A. Sears, *Chairman.*

THURSDAY AFTERNOON

Machinery Hall open.

Automobile ride for ladies into the famously beautiful countryside of Baltimore. Entertainment and refreshments at the Country Club.

THURSDAY EVENING

Theater Parties—American Can Company.
Ford's Opera House, Fayette Street, near Eutaw Street.
(Doris Keane in "Romance").
Auditorium Theater, Howard Street, near Franklin Street.
(Poli Players in "The Fortune Hunter").

FRIDAY, FEBRUARY 6

Visit to research laboratories of the National Canners' Association, Washington, D.C., at 1739 H Street, N.W. Visitors will be the special guests of the laboratories.

The laboratories will be open each day during the convention and full inspection is cordially invited.

RESUME OF SOCIAL FUNCTIONS

Tuesday Afternoon—Reception to Mrs. Terhune. Ladies.
Tuesday Evening—Oyster Roast, Cannery of John Boyle Company, Wolfe and Thomas Streets. Ladies and gentlemen.
Wednesday Afternoon—Visit to Walters Art Gallery. Ladies.
Wednesday Evening—Series of lectures on domestic science and kindred subjects, Lyceum Theatre.
Thursday Afternoon—Automobile ride into the country, and entertainment and refreshments at Country Club. Ladies.
Thursday Evening—Theatre parties tendered by the American Can Company, Ford's Opera House—Doris Keane in "Romance." Auditorium, Poli Players in "The Fortune Hunter."

PROGRAM OF THE ELEVENTH ANNUAL MEETING, NATIONAL CANNED FOODS AND DRIED FRUITS BROKERS' ASSOCIATION

Banquet Hall, Hotel Belvedere, Baltimore, Md., 1914.

TUESDAY, FEBRUARY 3, 10 A.M.

1. Joint meeting with National Canners' Association and Canning Machinery and Supplies' Association, in Convention Hall, Hotel Belvedere.

TUESDAY, FEBRUARY 3, 2 P.M.

2. Meeting of members of National Canned Goods and Dried Fruits Brokers' Association, in Banquet Hall, Hotel Belvedere.
3. Roll call.
4. Reading of minutes of previous meeting.
5. Greeting on behalf of Maryland Brokers, by Mr. Thomas J. Meehan, of T. J. Meehan & Co., Baltimore, Md.
6. Appointment of committee on nominations and committee on resolutions.
7. Report of president.
8. Report of secretary.
9. Report of treasurer.
10. Report of standing committees.

THURSDAY, FEBRUARY 5, 10 A.M.

11. Address, "The Broker from the Jobber's Point of View," by Mr. Walter B. Timms, of Austin, Nichols & Co., New York.
12. Address, "The Broker from the Packer's Point of View," by Mr. Samuel F. Haserot, of the Haserot Canneries Co., Cleveland, Ohio.
13. Address, "The Broker as Seen by Himself," by Willard G. Rouse, Easton Commission Co., Easton, Md.
14. Address, "Some Legal Aspects of the Brokerage Business," by Mr. S. A. Williams, Counsel for the National Canners' Association.

WEDNESDAY, FEBRUARY 4, 10 A.M.

15. Address, Hon. B. M. Fernald, President National Canners' Association.
16. Address, Mr. O. B. McGlasson, President National Wholesale Grocers' Association.
17. Address, Mr. W. C. Langbridge, President Canning Machinery and Supplies Association.

WEDNESDAY. FEBRUARY 4, 2 P.M.

18. Consideration of unfinished business.
19. New business.
20. Report of committee on resolutions.
21. Report of committee on nominations.
22. Election of officers.
23. Adjournment.

PRINCIPLES OF ORGANIZATION

Some reasons for becoming a member of the National Canners' Association are as follows:

1. To get acquainted with other business men.
2. To learn from other canners actual trade conditions.
3. To better trade credits and collections in general.
4. To learn that good conditions are not the result of individual effort.
5. To get better results by co-operation.
6. To learn to work together for the common good.
7. To help support the canning industry since the canning industry supports you.
8. To do your share in keeping factories and business methods clean and attractive.
9. To get for canned foods the endorsement of the best schools, churches and housewives.
10. To get away from self, find good in others and be one in the best association, composed of the best canners having the best factories, doing the best business, with the best buyers at the best terms and all to be made better as the membership increases.

NATIONAL CANNERS' ASSOCIATION MOVES TO LABORATORIES.

On June 27th, 1914, the office of the National Canners' Association moved from the Woodward Building, where it has been since it went to Washington, about a year ago, to the Laboratory Building at 1739 H Street N.W. This brings the whole business under the one roof, and makes it much more handy for all parties concerned. Those who have visited the Laboratories know that the building is a handsome one, and that the new arrangement permits an even better housing than before.

EXECUTIVE OFFICERS OF NATIONAL CANNERS' ASSOCIATION SINCE ITS ORGANIZATION

1907

GEORGE G. BAILEY, *President,* Rome, N.Y.
CHARLES S. CRARY, *Vice-President,* Waukesha, Wis.

EXECUTIVE COMMITTEE

George G. Bailey, Rome, N.Y.
Charles S. Crary, Waukesha, Wis.
W. R. Roach, Hart, Mich.
R. I. Bentley, San Francisco, Cal.
J. S. Hughes, St. Paul, Minn.

1908

CHARLES S. CRARY, *President,* Waukesha, Wis.
L. A. SEARS, *Vice-President,* Chillicothe, Ohio.

EXECUTIVE COMMITTEE

Charles S. Crary, Waukesha, Wis.
L. A. Sears, Chillicothe, Ohio.
W. R. Roach, Hart, Mich.
George G. Bailey, Rome, N.Y.
Hugh S. Orem, Baltimore, Md.

1909

CHARLES S. CRARY, *President,* Waukesha, Wis.
L. A. SEARS, *Vice-President,* Chillicothe, Ohio.

EXECUTIVE COMMITTEE

Charles S. Crary, Waukesha, Wis.
L. A. Sears, Chillicothe, Ohio.
W. R. Roach, Hart, Mich.
S. F. Haserot, Cleveland, Ohio.
Hugh S. Orem, Baltimore, Md.
George G. Bailey, Rome, N.Y.

1910

L. A. SEARS, *President,* Chillicothe, Ohio.
W. R. ROACH, *Vice-President,* Hart, Mich.

EXECUTIVE COMMITTEE

L. A. Sears, Chillicothe, Ohio.
W. R. Roach, Hart, Mich.
Crafton Johnson, Greenwood, Ind.
C. S. Crary, Waukesha, Wis.
George G. Bailey, Rome, N.Y.
Hugh S. Orem, Baltimore, Md.
S. F. Haserot, Cleveland, Ohio.
Gene Dickinson, Eureka, Ill.
W. O. Hoffecker, Smyrna, Del.

1911

W. R. ROACH, *President,* Hart, Mich.
S. F. HASEROT, *Vice-President,* Cleveland, Ohio.

EXECUTIVE COMMITTEE

W. R. Roach, Hart, Mich.
S. F. Haserot, Cleveland, Ohio.
Gene Dickinson, Eureka, Ill.
H. C. Hemingway, Syracuse, N.Y.
C. H. Bentley, San Francisco, Cal.
W. C. Leitsch, Columbus, Wis.
C. T. Lee, Chicago, Ill.
E. V. Stockham, Perryman, Md.
M. W. Jones, Vinton, Iowa.
F. F. Wiley, Edinburg, Ind.
L. A. Sears, Chillicothe, Ohio.
F. L. Deming, Chicago, Ill.
W. O. Hoffecker, Smyrna, Del.
B. M. Fernald, West Poland, Me.

1912

S. F. HASEROT, *President,* Clevcland, Ohio.
B. M. FERNALD, *Vice-President,* West Poland, Me.

EXECUTIVE COMMITTEE

S. F. Haserot, Cleveland, Ohio.
B. M. Fernald, West Poland, Me.
W. R. Roach, Hart, Mich.
L. A. Sears, Chillicothe, Ohio.
E. V. Stockham, Perryman, Md.
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1913

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THE ASSOCIATION OF PACIFIC FISHERIES

E. B. DEMING, *President*.....Pacific American Fisheries Co.
C. H. BUSCHMAN, *1st Vice-President*....Northwestern Fisheries Co.
F. B. PETERSON, *2nd Vice-President*.....Red Salmon Canning Co.
T. NELSON, *3rd Vice-President*.....
.....Union Fishermen's Co-operative Packing Co.
CAPT. J. J. REYNOLDS, *Secretary and Treasurer*.....

The executive committee consists of the above named gentlemen and E. E. Ainsworth, of Ainsworth & Dunn; J. T. Barron, of the Thlinket Packing Co.; W. T. Chutter, of the Booth Fisheries Co.; T. J. Gorman, of Gorman & Co.; G. P. Halferty, of the Pacific Fisheries and Packing Co.; W. F. Robinson, of the Robinson Fisheries Co.; C. A. Sutter, of the Fidalgo Island Packing Co.; W. Timson, of the Alaska Packers' Association; F. M. Warren, of the Alaska-Portland Packers' Association, and Frank Wright, of the Carlisle Packing Co.

HAWAIIAN PINEAPPLE PACKERS' ASSOCIATION

F. W. MACFARLANE, *President*.....
J. D. DOLE, *Vice-President*.....
W. P. THOMAS, *Secretary and Treasurer*.....
C. H. MEDCALF, *Assistant Secretary*.....

PACIFIC FISHERIES SOCIETY

CARL WESTERFELD, *President*.....San Francisco, Cal.
HENRY O'MALLEY, *1st Vice-President*.....Oregon City, Ore.
PROF. TREVOR KINCAID, *2nd Vice-President*.....Seattle, Wash.
JOHN N. COBB, *Secretary*.....Seattle, Wash.
RUSSELL PALMER, *Treasurer*.....Seattle, Wash.

The constitution also provides that the President of the United States, and the governors of the states of Washington, Oregon, California, Arizona, Nevada, Idaho and Montana, and the territories of Alaska and Hawaii, shall be honorary members of the Society.

PACIFIC COAST FISHERIES ASSOCIATION

CARL SUTTER, *President*.....Seattle, Wash.
JAMES T. BARRON, *1st Vice-President*.....Portland, Ore.
FRANK B. PETERSON, *2nd Vice-President*.....San Francisco, Cal.
THOMAS NELSON, *3rd Vice-President*.....Astoria, Ore.

These officers, together with the following men, will compose the executive board:

F. M. Warren, Portland, Ore.
T. J. Gorman, Seattle, Wash.
Frank Wright, Village Point, Wash.
Frank Berry, Tacoma, Wash.
E. A. Sims, Port Townsend, Wash.
Chris. Buschmann, Seattle, Wash.
W. F. Robinson, Anacortes, Wash.

ALASKA PACKERS' ASSOCIATION

H. F. FORTMANN.....*President*
LOUIS SCHLOSS.....*1st Vice-President*
WILLIAM TIMSON.....*2nd Vice-President*
I. LIEBES.....*Treasurer*
A. K. TICHENOR.....*Secretary*
G. E. GEARY.....*Cashier*

DIRECTORS:

Henry F. Fortmann
George L. Payne
Isaac Liebes
John Daniel
W. B. Bradford
Wm. Timson
Louis Sloss
Mark L. Gerstle
Henry E. Bothin
Jefferson F. Moser and
Wm. Haas

PENNSYLVANIA CANNERS' ASSOCIATION

C. H. MUSSELMAN, *President*.....Bigleville, Pa.
WM. E. MORRIS, *Vice-President*.....Lansdale, Pa.
D. E. WINEBRENNER, JR., *Secretary*.....Hanover, Pa.

BOARD OF DIRECTORS:

One Year:	*Two Years:*	*Three Years:*
C. C. Smith	J. T. Smith	J. H. Garrahan
A. I. Judge.....Honorary Life Member		

ASSOCIATION OF PACIFIC FISHERIES

The Association of Pacific Fisheries is a new organization, embracing the salmon fishing and canning industries and other fishing interests on the Pacific Coast. At a meeting of the Executive Committee, held at Seattle in June, permanent by-laws were adopted.

THE FOLLOWING OFFICERS WERE ELECTED:

E. B. DEMING, *President*..... Bellingham, Wash.
CHRIS. NUSCHMANN, *1st Vice-President*.....Seattle, Wash.
J. T. BARRON, *2nd Vice-President*.....Portland, Ore.
THOMAS NELSON, *3rd Vice-President*.....Astoria

REFERENCE TABLES

ADDITIONAL REFERENCE TABLES

WILL BE FOUND IN

VOLUME No. 1, 1914

REFERENCE TABLES

COMPARISON OF METRIC SYSTEM WITH THE UNITED STATES METHOD OF WEIGHTS AND MEASURES

(Arranged in Alphabetical Order.)

Are (100 square meters) = 119.6 square yards.
Bushel = 2150.42 cubic inches, 35.24 liters.
Centare (1 square meter) = 1550 square inches.
Centigram (1/100 gram) = 0.1543 grain.
Centiliter (1/100 liter) = 2.71 fluid drams, 0.338 fluid ounce.
Centimeter (1/100 meter) = 0.3937 inch.
1 Cubic centimeter = 16.23 minims (Apothecaries).
10 Cubic centimeters = 2.71 fluid drams (Apothecaries).
30 Cubic centimeters = 1.01 fluid ounces (Apothecaries).
100 Cubic centimeters = 3.38 fluid ounces (Apothecaries).
473 Cubic centimeters = 16.00 fluid ounces (Apothecaries).
500 Cubic centimeters = 16.90 fluid ounces (Apothecaries).
1000 Cubic centimeters = 33.81 fluid ounces (Apothecaries).
Decigram (1/10 gram) = 1.5432 grains.
Decimeter (1/10 meter) = 3.937 inches.
Deciliter (1/10 liter) = 0.845 gill.
Decagram (10 grams) = 0.3527 ounce.
Decaliter (10 liters) = 9.08 quarts (dry), 2.6418 gallons.
Decameter (10 meters) = 393.7 inches.
Dram (Apothecaries or Troy) = 3.9 grams.
Foot = 0.3048 meter, or 30.48 centimeters.
Gallon = 3.785 liters.
Gill = 0.118295 liter, or 142 cubic centimeters.
Grain (Troy) = 0.064804 gram.
Grain = 0.0648.
Gram = 15.432 grains.
Hectare (10,000 square meters) = 2.471 acres.
Hectogram = 3.5274 ounces.
Hectoliter (100 liters) = 2.838 bushels, or 26.418 gallons.
Hectometer (100 meters) = 328 feet 1 inch.
Hundredweight (112 pounds Avoirdupois) = 50.8 kilograms.
Inch = 0.0254 meter.
Inch = 2.54 centimeters.
Inch = 25.40 millimeters.
Kilogram = 2.2046 pounds, or 35.274 ounces.
Kiloliter (1000 liters) = 1.308 cubic yards, or 264.18 gallons.
Kilometer (1000 meters) = 0.62137 mile (3280 feet 10 inches).
Liter = 1.0567 quarts, 0.264 gallon (liquid), or 0.908 quart (dry)
Meter = 39.3700 inches, or 3.28083 feet.
Mile = 1.609 kilometers.
Mile = 5280 feet, or 1609.3 meters.
Millier or tonneau = 2204.6 pounds.
Milligram = 0.0154 grain.
Millimeter (1/1000 meter) = 0.0394 inch.
Myriagram = 22.046 pounds.
Myriameter (10,000 meters) = 6.2137 miles.
Ounce (Avoirdupois) = 28.350 grams.
Ounce (fluid) = 28.3966 cubic centimeters.
Ounce (Troy or Apothecaries) = 31.104 grams.
Peck = 9.08 liters.

Pint (liquid) = 0.47318 liter.
Pound (Avoirdupois) = 453.603 grams.
Pound (English) = 0.453 kilogram.
Pound (Troy) = 373.25 grams.
Quart (liquid) = 0.94636 liter.
Quintal = 220.46 pounds.
Scruple (Troy) = 1.296008 grams.
Ton = 20 hundredweight = 2240 pounds (Avoirdupois) 1016.070 kilograms.
Yard = 0.9144 meter.

TABLE OF MULTIPLES

Centimeters × 0.3937 = inches.
Centimeters × 0.0328 = feet.
Centimeters, cubic, × 0.0338 = apothecaries' fluid ounces.
Diameter of a circle × 3.1416 = circumference.
Gallons × 3.785 = liters.
Gallons × 0.833565 = imperial gallons.
Gallons, imperial, × 1.199666 = U. S. gallons.
Gallons × 8.33505 = pounds of water.
Gallons, imperial, × 10 = pounds of water.
Gallons, imperial, × 4.54102 = liters.
Grains × 0.0648 = grams.
Inches × 0.0254 = meters.
Inches × 25.4 = millimeters.
Miles × 1.609 = kilometers.
Ounces, Troy, × 1.097 = ounces of avoirdupois.
Ounces, avoirdupois, × 0.9115 = ounces Troy.
Pounds, avoirdupois, × 0.4536 = kilograms.
Pounds, avoirdupois, × 0.8228572 = pounds Troy.
Pounds, Troy, × 0.37286 = kilograms.
Pounds, Troy, × 1.21527 = pounds avoirdupois.
Radius of a circle = 6.283185 × circumference.
Square of the radius × 3.1416 = area.
Square of the circumference of a circle × 0.07958 = area.

MISCELLANEOUS MEASURES

Bale of cotton (in America) = 400 pounds.
Bale of cotton (in Egypt) = 90 pounds.
Bag of Sea Island cotton = 300 pounds.
Cable = 120 fathoms.
Can = 35 pounds.
Cask of lime = 240 pounds.
Hogshead = 63 gallons.
Keg (nails) = 100 pounds.
Noggin or Nog. = 5/16 of a pint.
Pipe = 2 hogsheads.
Stone = 14 pounds.
Tun = 2 pipes.
Cubic foot of water weighs 62.4 pounds.
Cubic foot of water is 7.48 gallons.
Gallon of water weighs 8 1/3 pounds.
Gallon of water is 231 cubic inches.

In England, wool is sold by the sack, or boll, of 22 stones, which, at 14 pounds to the stone, is 308 pounds.

A pack of wool is 17 stones and 2 pounds, which is rated as a pack load for a horse. It is 240 pounds.

Sack of flour = 280 pounds.

A tod of wool is 2 stones of 14 pounds.

A wey of wool is 6¼ tods. Two weys, a sack.

A clove of wool is half a stone.

CONVENIENT MULTIPLES FOR CONVERSION

To Convert	Multiply by	To Convert	Multiply by
Grains to grams,	.065	Inches to millimeters,	25.4
Ounces to grams,	28.35	Inches to centimeters,	2.54
Pounds to grams,	453.6	Feet to meters,	.3048
Pounds to kilograms,	.45	Yards to meters,	.9144
Hundredweights to kilograms,	50.8	Yards to kilometers,	.0009
Tons to kilograms,	1016.	Miles to kilometers,	1.6
Grams to grains,	15.4	Millimeters to inches,	.04
Grams to ounces,	0.35	Centimeters to inches,	.4
Kilograms to ounces,	35.3	Meters to feet,	3.3
Kilograms to pounds,	2.2	Meters to yards,	1.1
Kilograms to hundredweights,	.02	Kilometers to yards,	1093.6
Kilograms to tons,	.001	Kilometers to miles,	.62

1 Yard = 0.9144 meter. 1 square meter = 1.196 square yards. 1 liter = 1.760 pints or 0.22 gallons.

STANDARD WEIGHTS AND MEASURES

Square Measure

144	square inches (sq. in.)	= 1 square foot
9	square feet	= 1 square yard
30¼	square yards	= 1 square rod, or square pole
16	square rods or square poles	= 1 square chain
40	square rods or square poles	= 1 rood
4	roods	= 1 acre
160	square rods	= 1 acre = 43560 sq. ft.
640	acres	= 1 square mile
A township is 6 miles square		= 36 sections
A section is 1 mile square		= 640 acres
¼ section is ½ mile square		= 160 acres
1-16 section is ¼ mile square		= 40 acres

Cubic Measure

1728 cubic inches (cu. in.)	= 1 cubic foot
27 cubic feet	= 1 cubic yard
128 cubic feet	= 1 cord of wood
40 cubic feet	= 1 shipping ton, Mdse.
42 cubic feet	= 1 shipping ton, lumber

Geographical and Nautical Measure

6086.44	feet	= 1000 fathoms = 1 nautical mile
1	nautical mile	= 1.153 statute miles
1	nautical mile per hr.	= 1 knot
60	nautical miles	= 69.17 statute miles = 1 degree

Paper Measure

24 sheets	= 1 quire	2 reams	= 1 bundle
20 quires	= 1 ream	5 bundles	= 1 bale

Time Measure

60	seconds	= 1 minute
60	minutes	= 1 hour
24	hours	= 1 day
7	days	= 1 week
30	days	= 1 month
12	months, 365 days	= 1 year

Circular Measure

60	seconds	= 1 minute
60	minutes	= 1 degree
30	degrees	= 1 sign
90	degrees	= 1 quadrant
4	quadrants, 12 signs, or 365 degrees	= 1 circle

Cloth Measure

2¼	inches	= 1 nail
4	nails	= 1 quarter
4	quarters	= 1 yard

Mariners' Measure

6	feet	= 1 fathom
120	fathoms	= 1 cable length
7½	cable lengths	= 1 mile
5,280	feet	= 1 statute mile
6,085	feet	= 1 nautical mile

Miscellaneous

3	inches	= 1 palm
4	inches	= 1 hand
6	inches	= 1 span
18	inches	= 1 cubit
218	inches	= 1 Bible cubit
2.5	feet	= 1 military pace

WEIGHTS AND HOUSEHOLD MEASURES

45 drops of water make a teaspoonful.
1 teaspoonful equals 1 fluid dram.
1 dessertspoonful equals 2 teaspoonfuls, or 2 drams.
1 tablespoonful equals 2 dessertspoonfuls, or 4 teaspoonfuls.
2 tablespoonfuls equal 8 teaspoonfuls, or 1 fluid ounce.
1 common size wineglassful equals 2 ounces, or ½ gill.
1 common size tumbler holds ½ pint.
A Small teacup is estimated to hold 4 fluid ounces, or one gill.
1 pound of wheat is equal to about a pint.
1 pound and 2 ounces of Indian meal is equal to 1 quart.
1 pound of sugar is equal to about one pint.
1 pint of pure water is about one pound.

WEIGHTS OF EVERYDAY THINGS

A barrel of flour weighs	196 pounds
A barrel of salt weighs	280 "
A barrel of beef weighs	200 "
A barrel of pork weighs	200 "
A barrel of fish weighs	200 "
A keg of powder equals	25 "
A stone of lead or iron equals	14 "
A pig of lead or iron equals	21½ stone
Anthracite coal, broken—cubic foot averages	54 pounds
A ton, loose, occupies	40-43 cubic feet
Bituminous coal, broken—cubic foot averages	49 pounds
A ton, loose, occupies	40-48 cubic feet
Cement (hydraulic) Rosendale, weight per bushel	70 pounds
Cement (hydraulic) Louisville, weight per bushel	62 "
Cement (hydraulic) Portland, weight per bushel	96 "
Gypsum, ground, weight per bushel	70 "
Lime, loose, weight per bushel	70 "
Lime, well shaken, weight per bushel	80 "
Sand at 98 pounds per cubic foot, per bushel	122½ "
18.29 bushels equal	1 ton
1.181 tons equal	1 cubic yard

AMOUNT OF BARBED WIRE REQUIRED FOR FENCES

	1 line	2 lines	3 lines
1 square acre	50⅔ lbs.	101½ lbs.	152 lbs.
1 square mile	1,280 lbs.	2,564 lbs.	3,840 lbs.
1 side of square mile	320 lbs.	640 lbs.	960 lbs.
1 rod in length	1 lbs.	2 lbs.	3 lbs.
100 rods	100 lbs.	200 lbs.	300 lbs.
100 feet	6 1/16 lbs.	12½ lbs.	18 3/16 lbs.

GAUGE PRESSURE AND TEMPERATURE

According to "Kent," under ordinary conditions at the sea level the air pressure is 14.7 pounds per square inch, and steam is formed at a temperature of 212 degrees Fahrenheit; gauge pressure will give temperature as follows:

Gauge Pressure: pounds per sq. inch	Degrees Temperature F.	Gauge Pressure: pounds per sq. inch	Degrees Temperature F.
0.304	213.0	8.3	235.4
1.3	216.3	9.3	237.8
2.3	219.4	10.3	240.0
3.3	222.4	11.3	242.2
4.3	225.2	12.3	244.3
5.3	227.9	13.3	246.3
6.3	230.5	14.3	248.3
7.3	233.0	15.3	250.2

If your thermometers and gauges do not agree with this table, have them tested.

ALTITUDE STERILIZATION TABLE.

BASED ON TWENTY-NINE-INCH BAROMETER, WITH TEMPERATURE AT SEVENTY DEGREES FAHRENHEIT AT SEA LEVEL

If your factory is located above sea level to such an extent as to cause trouble in your process room, first determine just how high it is; then consult the following table, and it will undoubtedly help to solve some of your troubles. Add time in third column to the process time:

Altitude	Water Boils At	Additional Time
512 feet	211 degrees	2 minutes
1,025 feet	210 degrees	4 minutes
1,539 feet	209 degrees	6 minutes
2,063 feet	208 degrees	8 minutes
2,589 feet	207 degrees	10 minutes
3,115 feet	206 degrees	12 minutes
3,642 feet	205 degrees	14 minutes
4,169 feet	204 degrees	16 minutes
4,697 feet	203 degrees	18 minutes
5,225 feet	202 degrees	20 minutes
5,674 feet	201 degrees	22 minutes
6,304 feet	200 degrees	24 minutes

VALUE OF DIFFERENT STRAWS

The following table, as compiled by the United States Department of Agriculture, shows the relative value of different straws in their use as litter.

Kind of straw or litter	Nitrogen	Phosphoric acid	Potash	Value of each ton
Wheat	9.6%	4.4%	16.4%	$3.18
Rye	11.2%	5.1%	18.1%	3.54
Oat	14.4%	3.6%	23.0%	4.35
Barley	11.4%	5.0%	23.5%	3.87
Pea	20.8%	7.0%	19.5%	5.61
Soy-Bean	14.0%	5.0%	22.0%	4.31
Buckwheat	13.0%	7.1%	21.2%	4.35
Millet	14.0%	3.6%	34.0%	4.88
Rice	15.1%	5.2%	8.4%	3.79

COMPARATIVE TABLE OF BALLING, BEAUME AND SPECIFIC GRAVITY

In order to assist in clearing up the canners' confusion as to the various methods of testing sugar syrups the following table would be a good thing for every canner to keep on his desk for future reference. This table is so constructed that all readings are assumed to have been taken at a temperature of 60°F.

Specific Gravity	Degrees Beaume	Degrees Brix or Balling	Percent Sugar	Pounds Sugar per Gallon water.
1.0000	0.	0	0	0
1.0197	2.80	5	5	½
1.0401	5.56	10	10	1¼
1.0613	8.30	15	15	2
1.0833	11.07	20	20	2¼
1.1060	13.80	25	25	2½
1.1296	16.50	30	30	3
1.1541	19.20	35	35	3¼
1.1794	21.91	40	40	4
1.2056	24.56	45	45	4½
1.2328	27.19	50	50	5¼
1.2899	32.36	60	60	6½
1.3509	37.40	70	70	7½
1.4159	42.29	80	80	saturated
1.4849	47.02	90	90	saturated
1.5578	51.26	100	100	saturated

The last column, "pounds sugar per gallon of water," is only approximate, the figures given being the closest fraction of a pound which it is practicable to weigh in the average cannery.

OFFICIAL STANDARD SIZES OF CANS

	Diameter. Inches.	Height. Inches.
Hole and Cap Cans		
No. 1 size	2-11/16	4
No. 2	3-3/8	4-9/16
No. 2-½	4	4-3/4
No. 3-47/8"	4-3/16	4-7/8
No. 3-5"	4-1/4	5
No. 3-5½"	4-1/4	5-1/2
No. 10	6-1/4	6-3/4
Sanitary Cans		
No. 1 size	2-11/16	4
No. 2	3-7/16	4-9/16
No. 2-½	4-1/16	4-3/4
No. 3-47/8"	4-1/4	4-7/8
No. 3-5"	4-1/4	5
No. 3-5½"	4-1/4	5-1/2
No. 10	6-3/16	7

OYSTER CANS

3 ounce	2-11/16 inch diameter	2-3/4 inch high
4 "	2-11/16 " "	3-3/8 " "
6 "	3-3/8 " "	3-5/16 " "
8 "	3-3/8 " "	3-15/16 " "

PAINTING

One gallon of good paint (metallic brown, Venetian red, or red oxide, with pure linseed oil) will cover about 400 sq. ft. of surface, one coat. To keep tin roofs in perfect condition paint at intervals of three to five years, or longer as the roof ages and the paint skin thickens.

ROOFING WEIGHTS

Weights of Various Roofing Materials Per Square (100 sq. ft. on the roof). Sheathboards not included.

Tiles (shingle) 10½-inch by 6¼-inch by ⅝-inch—5¼-inch to weather	1800 lb.
Tiles (Spanish) 14½-inch by 10½-inch—7¼-inch to weather	850 lb.
Slate, 3/16-inch good grade	650 to 700 lb.
Five-ply gravel	600 to 650 lb.
Four-ply slag	525 to 575 lb.
Three-ply slag	350 to 450 lb.
Shingles, spruce and pine	400 lb.
Corrugated, galvanized iron, No. 20 gauge	225 lb.
Copper, 16-oz., standing seam	125 lb.
Tin, IC thickness, standing seam	65 lb.

WEIGHT OF SHEATHING-BOARDS

Yellow pine sheathing one inch thick, 400 lb. White pine, or spruce sheathing one inch thick, 250 lb. Hemlock sheathing one inch thick 200 lb.

COVERING CAPACITY OF SHINGLES

Average size of shingles—4 by 16 inches—is taken as a basis of calculation.

100 sq. ft. will require, laid 4 inches to the weather 900
100 sq. ft. will require, laid 4½ inches to the weather 800
100 sq. ft. will require, laid 5 inches to the weather 720

Three and one-half pounds of four-penny nails are required for laying 1,000 shingles.

5 to 10 per cent should be added to these figures for waste and shortage.

WOOD AND LUMBER

A cord of wood contains 128 cubic feet. To ascertain how many cords there are in a pile of wood, multiply the length by the height, and that by the width, and divide the product by 128.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching.

To measure round timber, take the girth in inches at both large and small ends, add them, divide by 2, which gives the mean girth; then multiply the length in feet by the square of one-fourth of the mean girth and the product will be the contents in cubic feet. This rule is commonly adopted, and gives four-fifths of the true contents, one-fifth being allowed to the purchaser for waste in sawing.

One thousand laths wil cover 70 yards of surface, and 11 pounds of lath nails will nail them on. Eight bushels of good lime, 16 bushels of sand and 1 bushel of hair will make enough good mortar to plaster 100 square yards.

BRICK WALLS

Common bricks are 7¼ to 8 inches long by 4¼ inches wide and 2½ inches thick. Front bricks are ¼ inch longer and wider.

It requires 20 common bricks to lay one cubic foot. In an 8-inch wall 15 common bricks make one foot of wall.

One and one-eighth barrels of lime and ⅝-yard of sand will lay 1,000 common brick.

TO CALCULATE THE DRIVING POWER OF BELTS

Divide the speed in feet per minute by 1,100; the quotient will be the horse-power per inch of the belt's width that is allowed in good practice to be transmitted by single thickness leather belting having laced joints. Although this is the best practice, the amount is often exceeded by as much as 25 per cent with satisfactory results, though the life of the belt is shortened.

Double thickness belts will transmit twice and triple thickness belts three times as much power as single thickness belts.

Spliced belts will transmit a third more power than those that are laced.

The adhesion of belts to pulleys and the consequent driving power vary so much under different conditions of use that some intelligent deviation is occasionally necessary from any simple rule. From the horse-power given by the above rule, therefore, some deduction should be made when the belt is vertical or inclined instead of horizontal; when the arc of contact on the pulley is much less than 180 degrees or a "half wrap"; when the speed of the belt is less than 900 feet per minute, and also when one or both of the pulleys are small in diameter.

Five per cent should be deducted for every 10 degrees less than a "half wrap."

Twenty-five per cent should be deducted for vertical belts when used without a tightening pulley.

In the case of small pulleys deduct as follows:

Deduct from 0 to 60% for

- single belts on pulleys from 12 inches to 2 inches diameter.
- double " " " " 24 " " 6 " "
- triple " " " " 36 " " 15 " "

When circumstances permit, the best speed for belts is about 5,000 feet per minute. The adhesion is then so good as to require less stretching of the belt, with less consequent loss of power by friction.

The smoother the surface of the pulleys and of the belt surface in contact with them the better the adhesion and the more driving power. It is therefore sometimes found of benefit in the case of low belt speeds or of pulleys of small diameter to cover the pulleys with leather or to make them of wood, polished, and to run the hair side of the belts in contact with the pulley faces.

THE APPROXIMATE MELTING POINT OF SOME COMMERCIAL COPPER ALLOYS

As very little information on the melting points of commercial brasses and bronzes can be found in either scientific or technical literature, tests of a few typical alloys were made by W. H. Gillet and A. B. Norton, of the U. S. Bureau of Mines. The results, summarized, are as follows:

Alloy	Approximate Composition				Melting Point	
	Copper	Zinc	Tin	Lead	Deg. C.	Deg. F.
Gun metal	88	2	10	..	995	1,825
Leaded gun metal	85½	2	9½	3	980	1,795
Red brass	85	5	5	5	970	1,780
Low-grade red brass	82	10	3	5	980	1,795
Leaded bronze	80	..	10	10	946	1,735
Bronze with zinc	85	5	10	..	980	1,795
Half-yellow-Half-red	75	20	2	3	920	1,690
Cast yellow bronze	67	31	....	2	895	1,645
Naval brass	61½	37	1½	..	855	1,570
Manganese bronze	....	..	....	..	870	1,600

The melting point given is the "liquidus," or point where the alloy is completely molten. The temperatures are thought to be accurate within plus or minus 10 degrees C., or plus or minus 20 degrees F.

HORSE POWER OF SHAFTS FOR GIVEN DIAMETER AND SPEED

This table is practically safe to use in general practice for the transmission of power where shafts are properly supported.

Diam. of Shaft Inches.	Revolutions per Minute									
	100	125	150	175	200	225	250	300	350	400
1 3/16	2.4	3	3.6	4.2	4.8	5.4	6	7.2	8.4	9.6
1 7/16	4.3	5.4	6.5	7.6	8.6	9.8	10.8	13	15.2	17.2
1 11/16	6.5	8	9.7	11.2	13	14.6	16	19.4	22.4	26
1 15/16	10	12.5	15	17.5	20	22.5	25	30	35	40
2 3/16	14	17.8	21	24.5	28	31.5	35.6	42	49	56
2 7/16	20	25	30	35	40	45	50	60	70	80
2 11/16	26.5	32.5	40	44.6	53	59	65	80	89	106
2 15/16	34	42.5	51	59.5	68	76.5	85	102	119	136
3 3/16	54	67.5	81	94.5	108	122	135	162	189	216
3 7/16	80	100	120	140	160	180	200	240	280	320
3 11/16	114	142.5	171	199.5	228	256.5	285	342	399	456
3 15/16	156	195	234	273	312	351	390	468	546	624
4 3/16	208	260	312	364	416	468	520	624	728	832
4 7/16	270	337.5	405	472.5	540	607.5	675	810	945	1,080
4 11/16	340	425	510	595	680	765	850	1,020	1,190	1,360
4 15/16	420	525	630	735	840	945	1,050	1,260	1,470	1,680
5	640	800	960	1,120	1,280	1,440	1,600	1,920	2,240	2,560

Rule for calculating horse-power transmitted by line shafting:
H. P. = Dia. shaft, cubed, × revolutions ÷ 75

HORSE-POWER OF BELT PULLEYS

100 revolutions per minute (single belt), half wrap.

Pulley Diam. in ins.	Width of Belt						
	2 ins.	2½ ins.	3 ins.	3½ ins.	4 ins.	5 ins.	6 ins.
2	.038	.048	.057	.066	.076	.095	.114
4	.095	.119	.143	.166	.190	.24	.29
6	.171	.22	.26	.30	.34	.43	.51
8	.31	.38	.46	.53	.61	.76	.91
10	.43	.54	.65	.75	.86	1.07	1.29
12	.57	.71	.86	1.00	1.14	1.43	1.71
14	.67	.84	1.02	1.18	1.35	1.69	2.02
16	.76	.95	1.14	1.33	1.52	1.90	2.28
18	.85	1.07	1.28	1.50	1.71	2.14	2.57
20	.95	1.09	1.43	1.67	1.90	2.38	2.86
22	1.04	1.31	1.57	1.83	2.09	2.62	3.14
24	1.14	1.43	1.71	2.00	2.28	2.86	3.43
26	1.23	1.55	1.86	2.17	2.48	3.10	3.72
28	1.33	1.66	2.00	2.34	2.67	3.44	4.00
30	1.42	1.79	2.14	2.50	2.86	3.58	4.28
32	1.52	1.90	2.28	2.76	3.05	3.82	4.57
34	1.61	2.02	2.43	2.84	3.24	4.05	4.87
36	1.71	2.14	2.56	3.00	3.42	4.29	5.44

CALCULATING SPEED OF PULLEYS

Example.—A main shaft running 110 revolutions and a countershaft with 8-inch tight and loose pulleys running 220 revolutions.

To Find Size of Pulley on Main Shaft.—Multiply diameter of pulley on countershaft by its number of revolutions, and divide the product by number of revolutions of main shaft. The quotient will be its diameter: $8 \times 220 = 1760$, $1760 \div 110 = 16$ inches diameter.

To Find Number of Revolutions of Countershaft.—Multiply diameter of pulley on main shaft by its number of revolutions, and divide product by diameter of pulley on countershaft: $16 \times 110 = 1760$, $1760 \div 8 = 220$ revolutions.

To Find Size of Pulley on Countershaft.—Multiply diameter of pulley on main shaft by its number of revolutions, and divide product by number of revolutions of countershaft: $16 \times 110 = 1760$, $1760 \div 220 = 8$ inches diameter.

STATUTORY WEIGHTS OF THE BUSHEL

STATE OR TERRITORY	Wheat	Rye	Oats	Barley	Buckwheat	Shelled corn	Corn on cob	Cornmeal unbolt	Bran	Malt	Potatoes, Irish	Potatoes, sweet	Carrots	Onions	Turnips, English	Beets	Beans	Peas	Apples	Dried apples	Dried peaches	Castor beans	Flaxseed	Hemp seed	Millet seed	Timothy seed	Blue grass seed	Hungarian grass sd.	Clover seed
United States	60	56	32	48	42	..	..	48	..	34	60	..	..	..	..	..	..	60	..	..	..	50	56	..	..	..	..	..	..
Alabama	60	56	32	47	..	56	70	48	..	..	60	55	..	..	55	..	60	60	..	24	33	..	..	..	..	..	..	..	..
Alaska	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Arizona	60	56	32	45	..	..	..	..	..	..	..	..	..	..	..	..	55	..	..	..	..	..	..	..	..	..	..	..	..
Arkansas	60	56	32	48	52	56	70	48	20	..	60	50	..	57	57	..	60	60	50	24	33	..	56	..	50	60	14	..	60
California	60	54	32	50	40	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Colorado	60	56	32	48	52	..	70	50	..	..	60	..	..	57	..	..	60	..	..	..	..	..	..	44	..	45	14	..	60
Connecticut	60	56	32	48	48	..	..	50	20	..	60	54	50	52	50	60	60	60	48	25	33	..	55	..	..	..	..	..	60
Delaware	60	..	..	..	..	..	..	48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Dist. Col	60	..	..	..	..	..	..	..	..	..	60	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Florida	60	56	32	48	..	56	70	48	20	..	60	60	..	56	54	..	60	..	48	24	..	48	..	..	50	..	..	..	..
Georgia	60	56	32	47	52	56	70	48	20	..	60	55	..	57	55	..	60	60	..	24	33	..	56	44	..	45	14	..	60
Hawaii	60	56	32	48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Idaho	60	56	36	48	42	..	..	..	..	..	60	..	..	..	..	..	..	..	45	28	28	..	56	..	..	..	..	..	60
Illinois	60	56	32	48	52	56	70	48	20	38	60	50	..	57	55	..	60	..	..	24	33	46	56	44	..	45	14	..	60
Indiana	60	56	32	48	50	56	68	50	..	35	60	55	..	48	55	..	60	..	..	25	33	46	..	44	50	45	14	..	60
Iowa	60	56	32	48	52	56	70	..	20	..	60	46	..	57	..	..	60	..	48	24	33	46	56	44	50	45	14	50	60
Kansas	60	56	32	48	50	..	70	50	20	32	60	50	..	57	55	..	60	..	48	24	33	46	56	44	50	45	14	50	60
Kentucky	60	56	32	47	56	56	70	50	20	..	60	55	..	57	60	..	60	60	..	24	..	45	56	44	50	45	14	50	60
Louisiana	60	56	32	48	48	..	70	48	20	34	60	55	..	57	55	..	60	60	..	..	..	..	..	..	..	..	..	..	..
Maine	60	56	32	48	48	..	..	50	..	..	60	..	50	52	50	60	60	60	44	..	..	..	..	..	..	..	..	..	..
Maryland	60	56	32	48	48	56	70	48	20	..	60	60	50	..	..	..	60	60	..	28	32	50	56	44	50	..	14	..	60
Massachusetts	60	56	32	48	48	50	..	50	20	..	60	54	50	52	..	..	60	60	48	25	..	..	55	..	..	45	..	..	60
Michigan	60	56	32	48	48	56	70	50	..	..	60	56	..	54	58	..	60	60	48	22	..	46	56	44	50	45	14	50	60
Minnesota	60	56	32	48	50	56	70	..	..	..	60	55	45	52	..	50	60	60	50	28	..	..	..	50	48	45	14	48	60
Mississippi	60	56	32	48	48	56	72	48	20	38	60	60	..	57	55	..	60	60	..	26	..	46	56	44	50	45	14	50	60
Missouri	60	56	32	48	52	56	70	50	20	38	60	56	50	57	42	..	60	60	48	24	..	46	56	44	50	45	14	48	60
Montana	60	56	32	48	52	56	70	50	20	30	60	..	50	57	..	50	60	60	45	..	..	..	56	44	..	45	14	50	60
Nebraska	60	56	32	48	52	56	70	50	20	30	60	50	..	57	55	..	60	60	..	24	..	46	56	44	50	45	14	50	60
Nevada	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New Hampshire	60	56	32	..	..	..	..	50	..	..	60	..	..	..	..	..	62	60	..	..	..	..	..	..	..	..	..	..	..
New Jersey	60	56	30	48	50	..	..	..	..	..	60	54	..	57	..	..	60	60	50	25	..	..	55	..	..	..	..	..	64
New Mexico	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
New York	60	56	32	48	48	..	..	50	20	..	60	54	50	57	..	..	60	60	48	25	..	..	55	..	..	45	..	..	60
North Carolina	60	56	32	48	50	..	..	48	..	..	..	..	..	..	..	..	60	..	..	..	..	..	55	..	..	..	..	..	60
North Dakota	60	56	32	48	42	56	70	..	20	..	60	46	..	52	60	60	60	60	50	..	..	..	56	..	50	45	..	..	60
Ohio	60	56	32	48	50	56	68	..	..	34	60	50	50	55	60	56	60	60	50	24	..	..	56	44	50	45	..	50	60
Oklahoma	60	56	32	48	42	56	70	..	20	..	60	46	..	52	60	60	60	60	..	..	..	..	56	..	..	42	..	..	60
Oregon	60	56	32	46	42	..	..	..	..	..	60	..	..	..	..	..	..	..	45	28	..	..	..	..	..	..	..	..	60
Pennsylvania	60	56	32	47	48	..	..	..	..	..	56	..	..	50	..	..	..	..	..	..	..	..	..	..	..	..	..	..	60
Rhode Island	60	56	32	48	48	56	70	50	20	38	60	54	50	50	50	50	60	60	48	25	..	46	56	44	50	45	..	50	60
South Carolina	..	..	..	..	..	..	..	48	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
South Dakota	60	56	32	48	42	56	70	..	20	..	60	46	..	52	60	60	60	60	..	..	..	..	56	..	..	42	..	..	60
Tennessee	60	56	32	48	50	56	70	48	20	..	60	50	50	56	50	50	60	60	50	24	..	46	56	44	50	45	14	48	60
Texas	60	56	32	48	42	56	70	..	20	..	60	55	..	57	55	..	60	..	45	28	..	..	56	44	50	45	..	48	60
Utah	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Vermont	60	56	32	48	48	56	..	..	..	..	60	..	50	52	60	60	62	60	46	..	..	..	..	..	..	45	..	..	60
Virginia	60	56	30	48	52	56	70	50	..	38	56	56	..	57	55	..	60	60	..	28	32	..	56	44	50	45	14	48	60
Washington	60	56	32	48	42	..	..	..	..	..	60	..	..	..	..	..	..	..	45	28	..	..	56	..	..	..	..	..	60
West Virginia	60	56	32	48	52	..	..	..	..	..	60	..	..	..	..	..	60	..	..	25	..	..	56	..	..	45	..	..	60
Wisconsin	60	56	32	48	50	..	..	50	20	34	60	54	50	57	42	50	60	60	50	25	..	..	56	44	50	45	..	48	60
Wyoming	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

Note.—Rye meal takes 48 lbs. to the bushel in the District of Columbia and 50 lbs. in Maine, Massachusetts, New York, Rhode Island, and Wisconsin. Peeled dried peaches take 38 lbs. to the bushel in Alabama, 40 lbs. in Maryland and 40 lbs. in Virginia. The metric system is used in the Philippines and Porto Rico.. Rice rough in Louisiana takes 45 lbs. to the bushel

Only a few States have fixed the legal weight of a bushel of tomatoes by statute; but the following are the legal weights in the States indicated, according to Bailey's Cyclopedia of Agriculture:

Ohio, 56 lbs; Missouri, 45 lbs; Rhode Island, 56 lbs; Tennessee, 56 lbs; Texas, 55 lbs; Maryland, 60 lbs.

STANDARDS OF SEED GERMINATION

The United States Department of Agriculture shows the average germinating power of different seeds. From the tests a purchaser may know if his seed is up to standard.

Per Cent of Germination of Seeds

Seed	Germination Per Cent	Seed	Germination Per Cent	Seed	Germination Per Cent
Asparagus	80–85	Cucumber	85–90	Pumpkin	85–90
Beans	90–95	Mustard	90–95	Spinach	80–85
Cabbage	90–95	Okra	80–85	Squash	85–90
Cauliflower	80–85	Onion	80–85	Tomato	85–90
Corn, sweet	85–90	Peas	93–98		

AVERAGE PERIODS OF INCUBATION

Chickens	20-22 days	Guinea fowls	28 days
Geese	28-34 days	Pheasants	25 days
Ducks	28 days	Ostriches	40-42 days
Turkeys	27-29 days	Pigeons	18 days
Canary Birds	14 days		

AVERAGE PERIODS OF GESTATION

The period of gestation in animals varies considerably, but the following is an average period based on a long series of observations:

Ass	12 months	Pig	3½ months
Mare	11 months	Bitch	9 weeks
Cow	9 months	Cat	8 weeks
Sheep	5 months	Rabbit	30 days
Goat	5 months	Guinea pig	65 days

GALVANIZED STORAGE TANKS

The construction of galvanized steel storage tanks. For tanks up to 6 feet in diameter and 5 feet high, No. 18 gauge metal should be used, the bottom and seams being riveted, and the top edge reinforced with an angle iron. For tanks up to 10 feet in diameter, No. 14 gauge metal should be used. The following table gives the capacity of round tanks from 2 to 6 feet in diameter and from 2 to 5 feet high:

Diameter Feet	Height Feet	Capacity Barrels	Diameter Feet	Height Feet	Capacity Barrels
2	2	1½	4	4	12
2½	2½	3	4	5	15
3	2	3¼	5	4	19
3	3	5	5	5	24½
3	4	7	6	4	27
4	3	9	6	5	34

TIN PLATE

TIN PLATE	Thickness, Stubs' Gauge	No. of Sheets in Box	Net Weight of Box, 14x20 Sheets
Taggers	38 (34)	225 (150)	112 lbs.
IC	30	112	107 lbs.
IX	28	112	135 lbs.
IXX	27	112	156 lbs.
IXXX	26	112	176 lbs.
IXXXX	25	112	196 lbs.

INTEREST AND STATUTE OF LIMITATIONS

State	Interest		Limitations			State	Interest		Limitations		
	Legal rate	By contract	Judgments	Notes	Accounts		Legal rate	By contract	Judgments	Notes	Accounts
	%	%	Yrs.	Yrs.	Yrs.		%	%	Yrs.	Yrs.	Yrs.
Alabama	8	8	20	*6	3	Montana	8	Any	10	8	3
Arkansas	6	10	10	5	3	Nebraska	7	10	5	5	4
Arizona	6	Any	5	4	3	Nevada	7	Any	6	6	4
California	7	Any	5	4	2	N. Hamp.	6	6	20	6	6
Colorado	8	Any	20	6	6	N. Jersey	6	6	20	6	6
Connecticut	6	6	†	†	6	N. Mexico	6	12	7	6	4
Delaware	6	6	–	6	3	New York	6	6	20	6	6
Dist. of Col.	6	10	12	3	3	N. Carolina	6	6	10	*3	3
Florida	8	10	20	5	2	N. Dakota	7	12	10	6	6
Georgia	7	8	7	6	4	Ohio	6	8	5	15	6
Idaho	7	12	6	5	4	Oklahoma	7	12	1	5	3
Illinois	5	7	20	10	5	Oregon	6	10	10	6	6
Indian Ter.	6	10	.....	.....	.....	Pennsylvania	6	6	5	6	6
Indiana	6	8	¶10	10	6	Rhode Island	6	Any	20	6	6
Iowa	6	8	20	10	5	S. Carolina	7	8	10	6	6
Kansas	6	10	5	5	3	S. Dakota	7	12	10	6	6
Kentucky	6	6	15	15	*5	Tennessee	6	6	10	6	6
Louisiana	5	8	10	5	3	Texas	6	10	10	4	2
Maine	6	Any	20	††6	6	Utah	8	Any	8	6	4
Maryland	6	6	12	3	3	Vermont	6	6	8	‡‡6	6
Mass.	6	Any	20	6	6	Virginia	6	6	20	5	2
Michigan	5	7	6	6	6	Washington	6	12	6	6	3
Minnesota	7	10	10	6	6	W. Virginia	6	6	10	10	3
Mississippi	6	10	7	6	3	Wisconsin	6	10	20	6	6
Missouri	6	8	10	10	5	Wyoming	8	12	5	5	8

*Under seal, 10%. †No law. ‡Negotiable notes, 6%; non-negotiable, 17%. –Varies by counties. ¶Real estate, 20%. ††Under seal, 12%. ‡‡Under seal, 14%.

Days of grace on notes and drafts are given in the following states and territories: Alabama, Arkansas, South Dakota, Georgia, Indian Territory, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri, Nebraska, Nevada, New Mexico, North Carolina, Oklahoma, South Carolina, Texas, and Wyoming.

PHYSICAL RATINGS

The maximum rating for physical ability, in any case, is 98. Ratings for physical ability for all groups are based upon the following table of heights and weights, but in order to get a rating of 98 per cent an applicant must weigh not less than 160 pounds, and must be of corresponding stature (at least 5 feet 6 inches), and must be able to lift, shoulder and easily carry a sack and contents weighing 125 pounds.

Height Ft. In.	Weight Lbs.	Per Cent	Height Ft. In.	Weight Lbs.	Per Cent	Height Ft. In.	Weight Lbs.	Per Cent
5 0	120–144		5 6	138–168		5 11	159–198	
5 1	122–147		5 7	142–174		6	165–204	
5 2	124–151		5 8	146–179		6 1	170–208	
5 3	127–154	95	5 9	150–185	98	6 2	176–215	98
5 4	131–158		5 10	154–191		6 3	181–224	
5 5	134–163							

A MEASUREMENT TABLE FOR LUMBER

Here is a simple and complete table for obtaining the number of feet in a bill of lumber.

The top line gives the length of the piece of lumber in feet. The first column to the left gives the dimensions in inches. The remaining columns show the number of board feet in the piece. For example: A piece of lumber 2x4x10=7 feet; 2x4x12=8 feet; 2x10x18—30 feet; 2x14x18—42 feet; 8x8x24=128 feet.

	10	12	14	16	18	20	22	24	26	28	30	32
2x 4	7	8	9	11	12	13	15	16	17	19	20	21
2x 6	10	12	14	16	18	20	22	24	26	28	30	32
2x 8	13	16	19	21	24	27	29	32	35	27	40	43
2x10	17	20	23	27	30	33	37	40	43	47	50	53
2x12	20	24	28	32	36	40	44	48	52	56	60	64
2x14	23	28	33	37	42	47	51	56	61	65	70	75
3x 4	10	12	14	16	18	20	22	24	26	28	30	21
3x 6	15	18	21	24	27	30	33	36	39	42	45	48
3x 8	20	24	28	32	36	40	44	48	52	56	60	64
3x10	25	30	35	40	45	50	55	60	65	70	75	80
3x12	30	36	42	48	54	60	69	72	78	84	90	96
3x14	35	42	49	56	63	70	77	84	91	98	105	112
4x 4	13	16	19	21	24	27	29	32	35	37	40	43
4x 6	20	24	28	32	36	40	44	48	52	56	60	64
6x 6	30	36	42	48	54	60	66	72	78	84	90	96
6x 8	40	48	56	64	72	80	88	96	104	112	120	128
8x 8	53	64	75	85	96	107	117	128	139	149	160	171
8x10	67	80	93	107	120	133	147	160	173	187	200	213
10x10	83	100	117	133	150	167	183	200	217	233	250	267
10x12	100	120	140	160	180	200	220	240	260	280	300	320
12x12	120	144	168	192	216	240	264	288	312	336	360	385

A FEW SIGNS REGARDING CLOUDS AND WINDS

After fine, clear weather, the first signs in the sky of a coming change are usually light streaks, curls, wisps, or mottled patches of white distant clouds, which increase and are followed by an overcasting of murky vapor that grows into cloudiness. Usually, the higher and more distant such clouds seem to be, the more gradual but general the coming change of wealther will prove.

If high clouds, or cirrus, disappear, fine weather is indicated, but if they increase and begin to change to lower cirrus stratus or alto stratus, unsettled weather is indicated.

When cloud streamers point upward, the clouds are falling or descending and rain is indicated; when cloud streamers point downward, the clouds are ascending and dry weather is indicated.

Lower clouds, moving at different heights and in opposite directions, indicate the approach of heavy rains within a short time, and in hot weather there will be thunder storms; general squalls are preceded, accompanied or followed by clouds. Clouds flying against the wind indicate the approach of rain.

Cumulus clouds, increasing after sunrise until noon and then decreasing toward evening, are an indication of fair weather; if they continue to increase after sunset, look out for rain.

Thunderstorms usually occur when the air is sultry and warm, with accompanying light, southerly winds. Ordinarily a thin veil of cirrus clouds gradually overspreads the sky in advance of the thunder clouds or cumulonimbus, the storms usually breaking with a squall.

Although the sky may be entirely covered with thin, high clouds, there will be little rain or snow if the wind is light.

If the wind sets in from the east to south, a storm is approaching from the west or northwest, and will usually pass near or to the northward of

the observer in from 24 to 36 hours (frequently sooner in winter), and the character of the clouds will usually indicate, at least 12 hours in advance, whether or not rain or snow may be expected. As the center of the storm passes the meridian of the observer, the wind will shift to west and probably northwest.

If the wind sets in from the east to north, a storm is approaching from the south or southwest and will usually pass the locality of the observer in from 24 to 36 hours (frequently sooner in winter), the wind shifting to northwest as the storm center passes the meridian of the observer.

During stormy conditions do not look for clearing weather until the clouds in the west begin to break and the wind shifts to westerly.

Frost is likely to occur on cool, clear nights when the air temperature on the previous day, after the passing of a storm, or rain period, has not been about 60°, with diminishing winds from a west to north direction. Radiation, or loss of heat, from plants takes place very rapidly under these conditions, especially if the air is dry. Clouds act as a blanket, greatly reducing the radiation, or loss of heat, and thereby prevent frost formation. The character of the vegetation as well as that of the soil has marked effect upon the formation of frost, notably in lowlands and moorlands, and temperatures as high as 70° may be followed in such places by severe frosts on the following morning.

Every one should, if possible, be provided with a barometer and a thermometer of good make, always remembering that a falling barometer indicates the approach of the unsettled weather and a rising barometer the approach or continuation of fair weather. The barometer at normal height and stationary indicates little or no change in weather conditions during the succeeding 24 hours.

PANAMA FACTS

The United States began the construction of the Panama Canal May 4, 1904.

The official opening was on August 1, 1914.

Estimated cost of the Panama Canal is $375,000,000.

A force of about 36,000 men were employed.

It is estimated that 5,000,000 cubic yards of concrete was used.

Excavations made by the French saved the United States about one year's work on the Panama Canal.

The total excavation amounts to 212,504,000 cubic yards—nearly double the estimate of the International Board of Consulting Engineers in 1906.

$10,000,000 were paid to the Republic of Panama for the Panama Canal Zone, the area of which is 436 square miles.

In going from New York to San Francisco, 7,873 miles are saved by passing through the Panama Canal.

It is no further to Honk Kong from New York by the Panama Canal than by the Suez Canal.

It's the same distance from Liverpool to the Japan Island of Yokohama by either the Suez or Panama Canal.

The direction of the Canal is from Northwest to Southeast.

The Pacific entrance is about 22½ miles east of the Atlantic entrance.

The length of the Canal from deep water in the Pacific to deep water in the Atlantic is 50 miles.

In passing through the Panama Canal, ships are elevated 85 feet to the level of Gatun Lake.

The depth of the channel varies from 45 to 85 feet.

300 feet is the minimum width.

There are six double locks in the Panama Canal, each lock being 1,000 feet long and 110 feet wide.

It requires about 30 minutes to fill and empty a lock.

Vessels may pass through the entire Canal in from 10 to 12 hours.

No ship may pass through a lock on its own power but will be towed by four electric locomotives operating on tracks along the lock walls, two on each side of the lock.

Ex-President Taft's proclamation of November 14, 1912, gives the following rates of toll:

1. On merchant vessels carrying passengers or cargo, $1.20 per net vessel ton—each 100 cubic feet of actual earning capacity.

2. On vessels in ballast without passengers or cargo, 40 per cent less than rate of tolls for vessels with passengers or cargo.

3. Upon naval vessels other than transports, colliers, hospital ships and supply ships, 50 cents per displacement ton.

4. Upon Army and Navy transports, colliers, hospital ships and supply ships, $1.20 per net ton, the vessels to be measured by the same rules as are employed in determining the net tonnage of merchant vessels.

A FEW USEFUL DON'TS FOR THOSE WHO USE AMS DOUBLE SEAMERS

Don't have your chuck too high, the seaming rollers will ruin the seaming chuck.

Don't have your chuck too low, the countersink in cover will be too deep after seamed and can will stick to chuck.

Don't put too much pressure on base-plate as it will force cover inside in can, making countersink too deep.

Don't have too little pressure on base-plate; the can will slip.

Don't set the first operation roller too tight as it will circle the metal too close making it necessary to roll it back by the finishing roller.

Don't set the first roller too loose as it will leave the seam too wide and not properly underhook.

Don't use a two-pound seaming ring with a three-pound chuck; they must correspond.

Don't put the first operation roller in the place where the second operation roller should be.

Don't forget to oil your machine well, it is better a little too much than not enough.

Don't let your machine run when not in use.

Don't run machine backwards.

Don't forget to regulate your oil cup so it will feed about three drops a minute.

Don't forget to close oil cup when machine is not running, the oil will feed as long as there is oil in the cup and is only wasted.

Don't use dirty oil or grease for lubricator, the least little dirt will spoil the bearings.

Don't keep the lubricating oil and grease in an open can; dirt and dust will blow in.

Don't use a poor grade of lubricating oil; a good grade is practically tasteless, and far cheaper in the end.

Don't forget to take out seaming ring when finished with day's work; clean well and oil.

Don't forget to clean your machine when finished.

Don't use a hammer when adjusting any part of machine, there are special tools for this purpose.

Don't fail to keep bolts and nuts tight.

Don't forget to make a can test once in a while to be sure that the can is tight; you may save a lot of money.

Don't forget to think before trying to adjust a machine.

Don't leave gear guard and chuck hood open while machine is running.

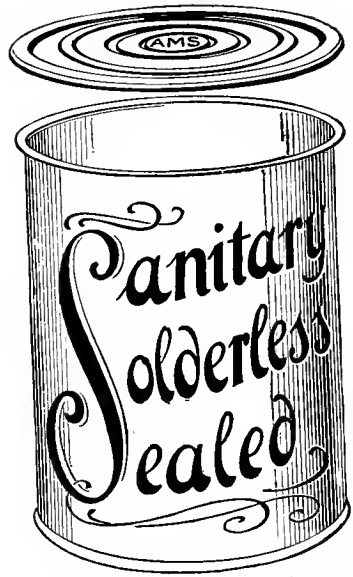
Don't leave wrenches lying on any part of the machine.

Don't try to seam cans that are bent out of shape; it is cheaper to first straighten them.

Don't forget to write and ask us if there is something you don't understand about the machine.

THERE'S A MACHINE IN THE AMS LINE THAT WILL EXACTLY MEET YOUR NEEDS

Additional machines will be found in Vol. I, S.O.S., 1914.



AMS SANITARY CAN

Introduction

The machines illustrated and described in this section, embody the best types that our extensive experience has evolved, in the field of machinery for making sanitary cans, for all kinds of products.

In placing these details into the hands of the packers of the world, we do so with the earnest request, that our methods be thoughtfully considered, and the many advantages, both sanitary and otherwise, be carefully compared with existing imperfect systems.

Our business relations with the largest canners in the trade enable us to thoroughly test every one of these machines during the period of development, and we are therefore in position to deliver them perfectly finished. We are not experimentors.

Only experienced and skilled workmen are employed in building them, and this enables us to fully guarantee our productions. Ams guarantee goes with each machine.

We are prepared to furnish machinery and tools adapted for the economical production of tin or sheet metalware in general, such as petroleum, paint or varnish cans, tin pails and canisters, as well as spice and tobacco boxes, in fact, packages of every description.

BUILDERS OF COMPLETE CAN-MAKING EQUIPMENTS

Exporters and Foreign Agencies

We desire especially to call the attention of exporters and foreign agencies to our machines and the sanitary Ams can, and to interest them in extending our *system* and *principles* to every country where canning of any kind is engaged in. We will guarantee that Ams machinery and Ams methods will do it.

We know the success our system maintains where it is in operation, and see no reason why it cannot be duplicated everywhere with the assistance of those who will become interested in our proposition.

The simplicity of our machines and system is such that a boy or girl can operate them in very short order. There is nothing complicated in the construction of our machines, and should any part get out of order, or even break, it can be adjusted by a local machinist. Where this is not possible, we always have on hand duplicate parts, which can be shipped immediately.

No effort will be spared to place Ams sanitary solderless seamless cans and can making machinery in every section of the globe. Write to us for whatever information you wish on this subject, and we will cheerfully supply it.

Agencies in all principal cities of the world.

Ams Method for Making and Sealing Tin Cans

Without Heat, Solder or Acid

The Ams system embodies an entirely new principle in canned food products, and successfully disposes of the present manner of drenching the interior and soiling the exterior of cans with objectionable solder and acids.

Heat is not required to fasten the tops and bottoms, and the old fashion holes for filling are unnecessary.

The cans are constructed on sound, sanitary principles eliminating all the objectionable features now prevailing in other methods.

Our method consists in applying to the curled flanges of the covers by means of a "Lining Machine," an odorless, tasteless and pure sealing fluid, in such a manner as to make an absolutely airtight seam, without the use of solder or acid; making the cans cheaper, more attractive in appearance and more durable than any on the market used for *processing food products.*

In offering this method to the canning trade we call attention to the following advantages:

1. A neat, perfect seam.

2. *A big saving in solder and labor.*

3. Skilled workman unnecessary. A girl or boy properly instructed may make and seam cans perfectly.

4. Cans for future use may be made ahead for years, and will remain in good condition.

5. Cans will not corrode when finished, no acid being used in the process.

6. Tin of any weight may be used for such cans, from Taggers to IX.

7. Any size can from 2 to 12 inches in diameter of the round or diagonally of the square may be made.

8. There will be no leaks if the bodies are properly made.

9. Any solid article as large as the interior of the can may be packed as readily as liquid.

10. The entire interior of the can ready for filling is exposed—like a tumbler—which may be filled more quickly with either solids or fluids, than the old style cans.

11. The contents may be packed more solid, and owing to the absence of the old style holes will not lacerate delicate fruits, of which detached pieces frequently cloud the syrup. Also the *absence of heat* in closing, prevents the objectionable black spots so frequently found in syrup goods.

12. The solid contents of the can may be packed tighter, as it will hold more, and therefore requires less liquor to fill up, a desirable feature when goods are to be shipped a great distance. For the same reason a considerable item of tin may be saved.

13. As the ends of the cans are double seamed, the edges will protect the labels and decorations from rubbing in the cases while in transit.

14. As no solder or acid for covers are used, such cans are the most perfect sanitary vessels for food products, and will comply with all the food laws of the world.

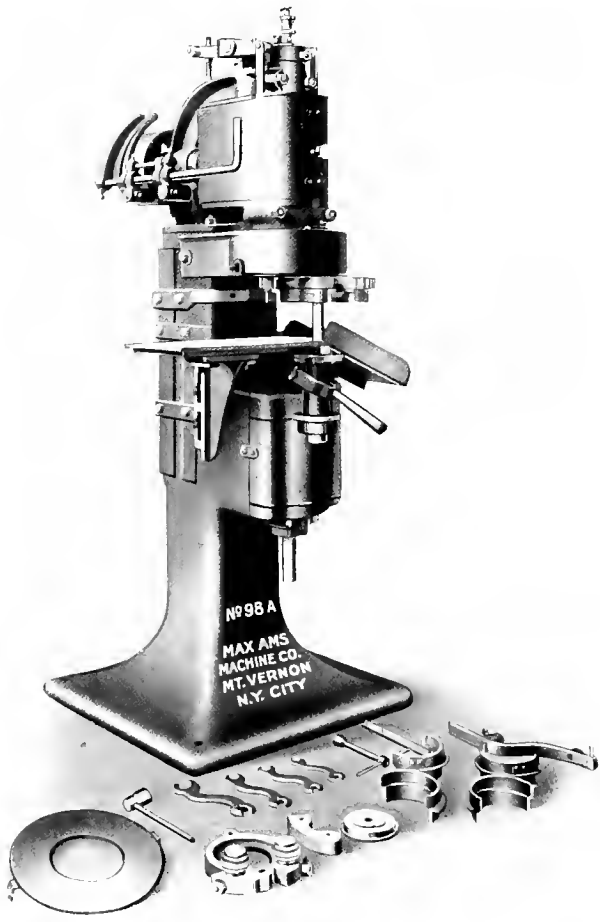
The bodies are made in the same way as for the old style cans, the covers are stamped in the same manner, special dies only being needed; while the quantity of tin required is about the same.

Ams machines are adjustable for all standard sizes.

Some of the purposes for which the new seam sanitary can is available.

All kinds of fruit both in syrup or water. All kinds of vegetables, all kinds of meat, smoked or otherwise. All kinds of fish and fish products, dried, in oil, vinegar or brine. Heavy syrups or molasses, honey, maple syrup, condensed milk, butter, etc. Also all purposes where processing is not essential and an hermetically tight can is required, such as drugs, salves, teas, coffees, spices, paints, dry or wet, pastes, etc.

Patented in the United States and Colonies, and in all countries where sanitary canning is engaged in.



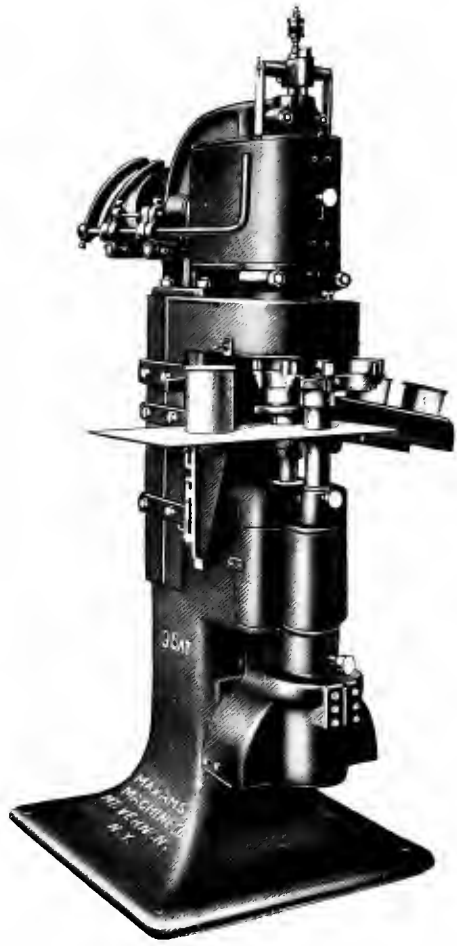
PATENTS PENDING

Ams No. 98A

Turret Hand Feed Double Seamer

The Can Stands Still

Codeword: Seamenolp



PATENTS PENDING

Ams No. 98AT

(Automatic Turret)

Hand Feed Double Seamer

The Can Stands Still

Codeword: Seamerete

Ams No. 98A Turret Hand Feed Double Seamer

This machine will double-seam all sizes and styles of standard round and sanitary cans, or any other round containers, such as oil squirt cans, baking powder, coffee, lye cans, etc., made of tin, cardboard, zinc or other like materials up to and including No. 3's.

CAPACITY:—In hand-fed machines the capacity naturally depends upon the operator's ability. We know of cases where the operator, becoming expert, has handled as high as 40 ends per minute for a limited time; however, the average operator should easily handle 1,500 to 1,800 per hour.

The principal features incorporated in this machine, and which cannot be claimed for those of other makes, are as follows:

For each size to be handled there is furnished a separate cast steel SEAMING RING. The seaming rollers are adjusted on these seaming rings before they leave the factory, so that when changing from one size to another it is unnecessary to adjust the rollers, it being only necessary to unbolt one ring and bolt on another.

Very liberal bearing surfaces given to the principal working parts which extend the life of the machine and reduce the repairs to a minimum.

Perfect and complete oiling system.

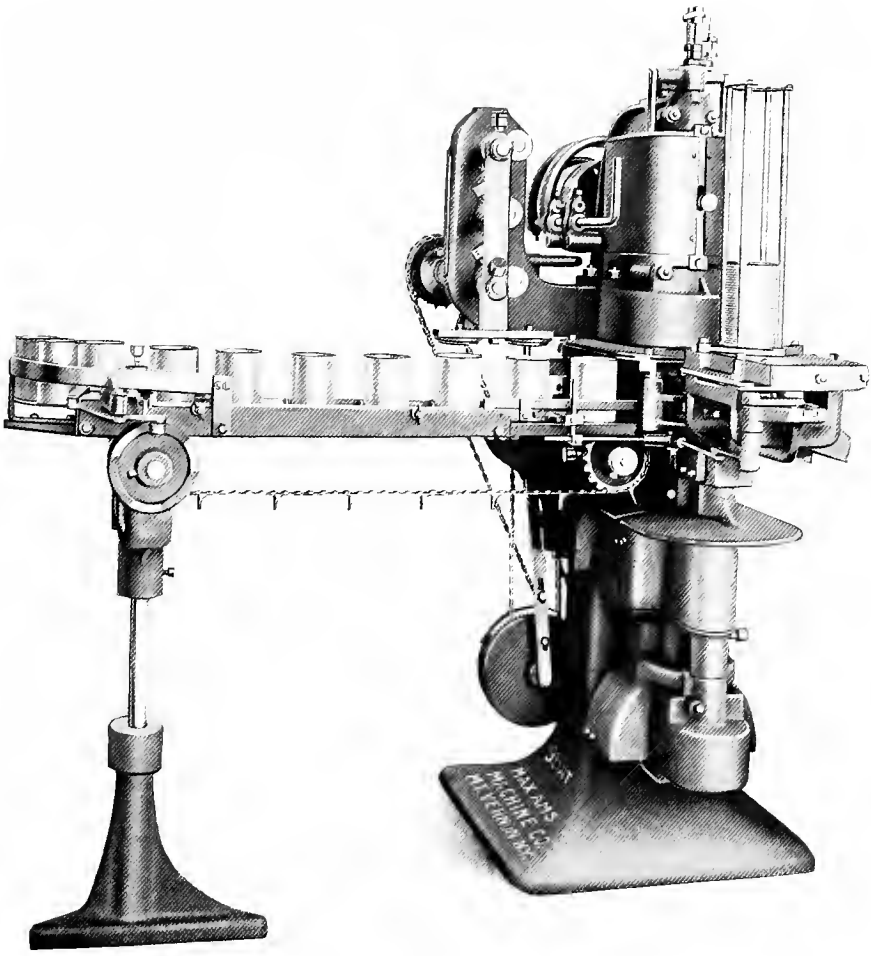
Seaming rollers reversible, that is, they are double-grooved. When one groove becomes too much worn for further use, the roller may be reversed and the second groove used.

SPEED:—The machine should be run at the speed of about 750 revolutions per minute.

It requires less than a 2 horse-power to operate the machine.

Specifications

Net Weight, 760 pounds (342 kgs.).
Gross Weight, 950 pounds (428 kgs.).
Length, 3 feet, 6 inches.
Width, 2 feet, 6 inches.
Height, 5 feet, 10 inches.
For individual drive we recommend a 2 horse-power motor.
Speed, 750 R.P.M.
Shipping crate 4 feet 2 inches long, 3 feet 4 inches wide, 6 feet 8 inches high.
Cubic Measure, 72 feet.



PATENTS PENDING

Ams No. 98AT
Automatic Double Seamer

Automatic Cover Feed, Disc Conveyor, Plunger, Can Straightener and Friction Clutch

Codeword: Seamabout

Ams No. 98AT Double Seamer
Auto Cover Feed

This machine is designed for service, and is rigid in construction, easily assembled, complete lubricating system, convenience in operating very simple and compact and takes up very little space.

There is no adjustment or timing necessary, the machine sets itself regardless of any fixed position. It is especially adapted for sealing the ends of filled cans, as the can stands still during this operation.

The seaming mechanism is entirely separate from the turret feed mechanism, both working independently. The always ready adjusted seaming ring, which constitutes an exclusive feature of Ams' Double Seamers will give entire satisfaction.

These machines are designed to meet the requirements of every canner as to cost, output, etc.

Will take all standard sizes up to and including No. 3. Capacity 50 per minute.

The always ready adjusted seaming ring is a special and exclusive feature on all of Ams Double Seamers.

Specifications

Gross Weight, 1,352 pounds (607 kgs.).

Net Weight, 1,052 pounds (472 kgs.).

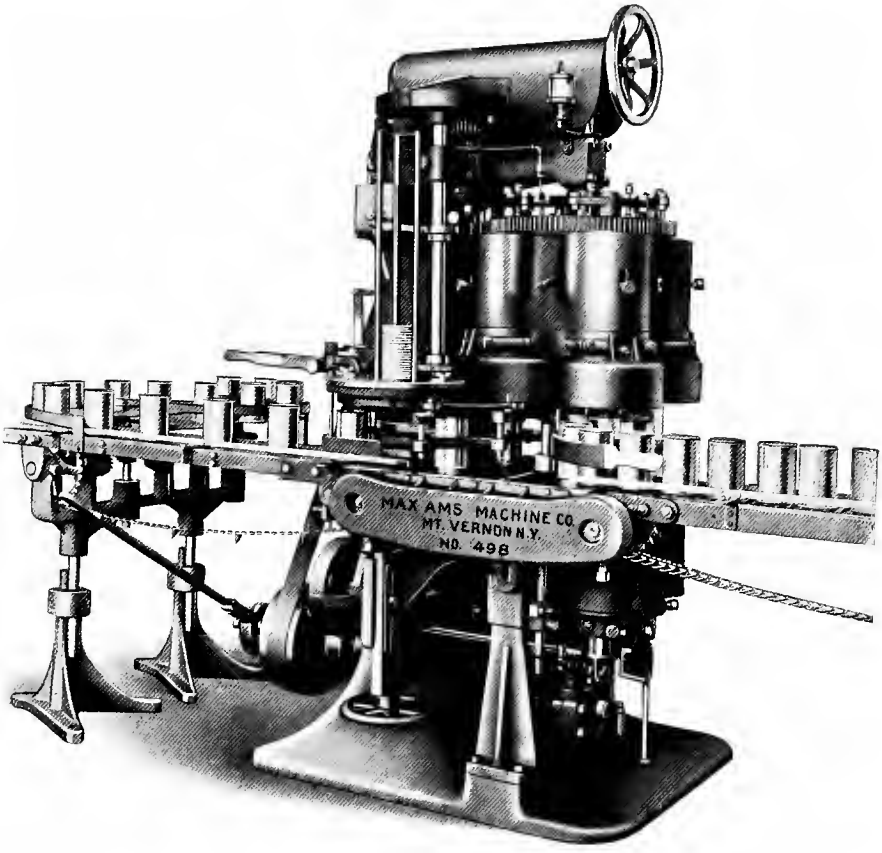
Length, 4 feet, 4 inches.

Width, 2 feet, 8½ inches.

Height, 6 feet, 2 inches.

Speed, 1,250 R.P.M.

Horse-power required, 1.



PATENTS PENDING

Ams No. 498 Double Seamer

Four Spindles, Automatic for Round Cans

Codeword: Seamepaht

Ams No. 498 Double Seamer

The No. 498 Double Seamer is a four-spindle double seamer, and has a capacity of more than 120 cans per minute. The cans are fed into the seamer by a chain conveyor, which carries the can under the automatic cover feed; a cover is released as the can passes into the seaming mechanism where a clean, tight double seam completes the operation. No can, no cover. The can stands still during the seaming operation.

This seamer possesses speed and strength, and is very compact. The lubricating system is complete.

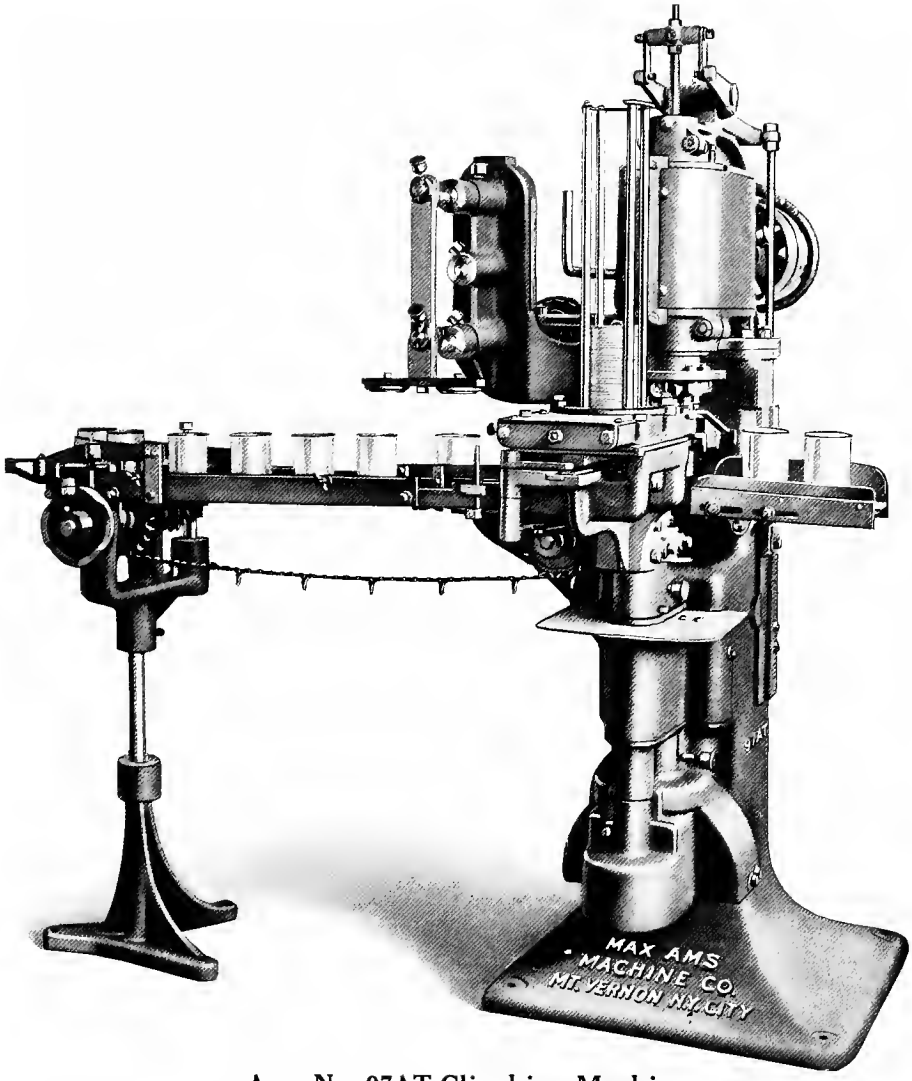
The always-ready adjusted seaming ring which constitutes an exclusive feature of Ams Double Seamers, will give entire satisfaction to every canner. No failure has yet been recorded against this seaming ring. Double-grooved rollers on every ring means double service; when one side is worn, reverse the roller.

The No. 498 will take all sizes up to and including one gallon.

This machine may be used in connection with the clincher, in which case no cover feed is used on this No. 498 machine. These machines are designed to meet the requirements of every canner, as to cost, output, etc.

Specifications

Net Weight, 2,530 pounds (1,138 kgs.).
Gross Weight, 3,512 pounds (1,580 kgs.).
Length, 5 feet, 4 inches.
Width, 4 feet, 5 inches.
Height, 6 feet, 10 inches.
Horse-power required, 3.
Speed, 875 R.P.M.
Cubic Measure, 108 feet (3 cbm.).



Ams No. 97AT Clinching Machine

Automatic Feed, Plunger, Can Straightener

Codeword: Clinchcot

Ams No. 97AT Clinching Machine
Automatic Feed, Plunger, Can Straightener

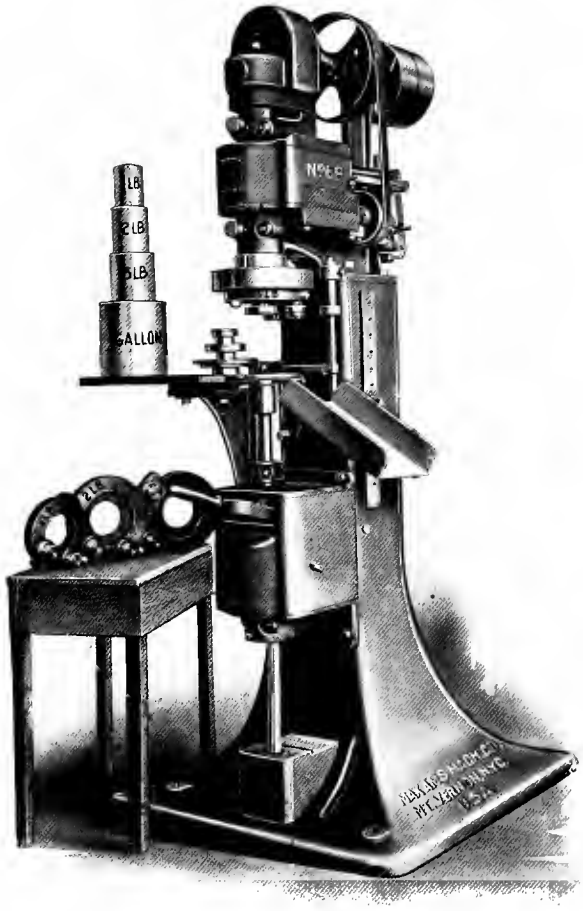
The No. 97AT Clinching or Crimping Machine, as it is sometimes called, is rigid in construction and has all the characteristics of the No. 98AT Double Seamer. It is especially adapted for crimping the filled can before it enters the exhaust box or the double seamer, as the case may be; in either case the speed is regulated according to the work to be done. This clinching machine, from actual operation has an output record of 70 perfect cans per minute.

These machines are designed to meet the requirements of every canner as to cost, output, etc. Every one has Ams guarantee.

Will take all standard sizes up to and including No. 3's.

Specifications

Gross Weight, 1,350 pounds (608 kgs.).
Net Weight, 1,050 pounds (472 kgs.).
Length, 4 feet, 4 inches.
Width, 2 feet, 8½ inches.
Height, 6 feet, 2 inches.
Speed about 1,500 R.P.M.
Horse-power required, 1
Cubic measure 108 ft. (3 cbm.).



PATENTS PENDING

Ams No. 68 Double Seamer

Round Cans Only. The Cans Revolve. Hand Feed

Codeword: Seamecoln

Ams No. 68 Double Seamer

This machine will double seam all sizes and styles of round sanitary cans, or any other round containers, such as oil squirt cans, baking powder, coffee, lye cans, etc., made of tin, cardboard, zinc or other like material, water pails, canisters, etc., etc.

The standard machine will handle all sizes from 1½ inches diameter up to 13 inches diameter, and from 1 inch to 9 inches high, although the machine is so constructed that at slight expense it can be arranged to handle any height.

CAPACITY:—In hand fed machines the capacity naturally depends upon the operator's ability and ingenuity in performing the work. We know of cases where the operator, becoming expert, has handled as high as 40 and 50 ends per minute.

For each size to be handled there is furnished a separate cast steel SEAMING RING. The seaming rollers are adjusted on these seaming rings before they leave the factory, so that when changing from one size to another it is unnecessary to adjust the rollers, unbolt one ring and bolt on another.

Very liberal bearing surfaces given to the principal working parts, which extends the life of the machine and reduces the repairs to a minimum.

Complete oiling system.

Seaming rollers reversible, that is, they are double grooved. When one groove becomes too much worn for further use, the roller may be reversed and the second groove used.

SPEED:—The machine should be run at a speed of about 750 revolutions per minute.

Note:—12-inch diameter tight and loose pulleys are furnished unless otherwise specified.

Under certain conditions when a machine is used for cans no larger than 3½ inches in diameter, smaller diameter tight and loose pulleys are desirable, and if specified at the time of placing the order the machine can be fitted with either 10-inch diameter or 8-inch diameter tight and loose pulleys, making it possible to use a smaller diameter driving pulley on the main shaft in the factory, which is sometimes necessary, where the space between the main shaft and the ceiling will not permit the use of a driving pulley large enough to run the machine at the proper speed with 12-inch tight and loose pulleys.

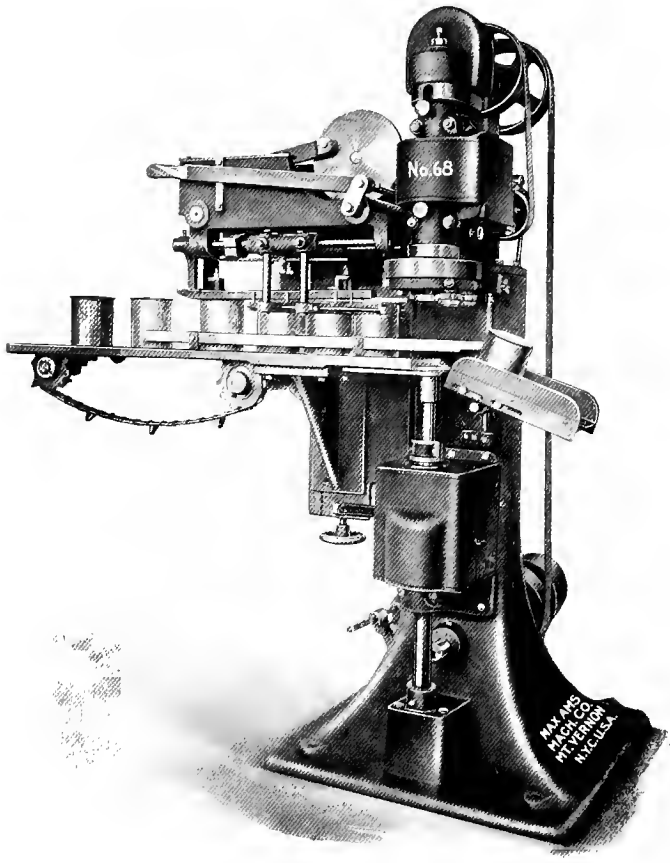
It requires less than a 2 horse-power to operate the machine.

Specifications

Floor Space, 2 feet, 10 inches by 2 feet, 11 inches.
Height, 6 feet, 4 inches.
Net Weight, about 1,130 pounds (kg. 508).
Gross Weight, about 1,500 pounds (kg. 675), cubic feet 96.

Shipping Crate

3 feet 8 inches long, 3 feet 9 inches wide, 6 feet 7 inches high.



PATENTS PENDING

Ams No. 68 Double Seamer

Round Cans. Automatic Feed

Codeword: Seamefult

Ams No. 68 Double Seamer, Automatic Feed

This machine will double seam all sizes and styles of standard round sanitary cans, or round containers, made of tin, cardboard, zinc, or any other like material, such as is used in baking powder boxes, lye cans, spice, paints, wet or dry.

The standard machine will handle all sizes from 2 inches diameter up to 6⅛ inches diameter, and from 1⅜ inches to 9 inches high, although the machine is so constructed that at slight expense it can be arranged to handle much larger work.

The principal features incorporated in this machine, and which are not found in any other makes, are as follows:

For each size to be handled there is furnished a separate cast steel SEAMING RING. The seaming rollers are adjusted on these seaming rings, so that when changing from one size to another it is only necessary to unbolt one ring and put on another. The feed table is likewise adjustable for the several changes.

Liberal bearing surfaces between all the principal moving parts.

The seaming mechanism consists of only 7 parts besides the seaming ring.

Complete oiling system.

Seaming rollers reversible, *i.e.*, double grooved. When one groove becomes too much worn for further use, the roller can be reversed and the second groove used.

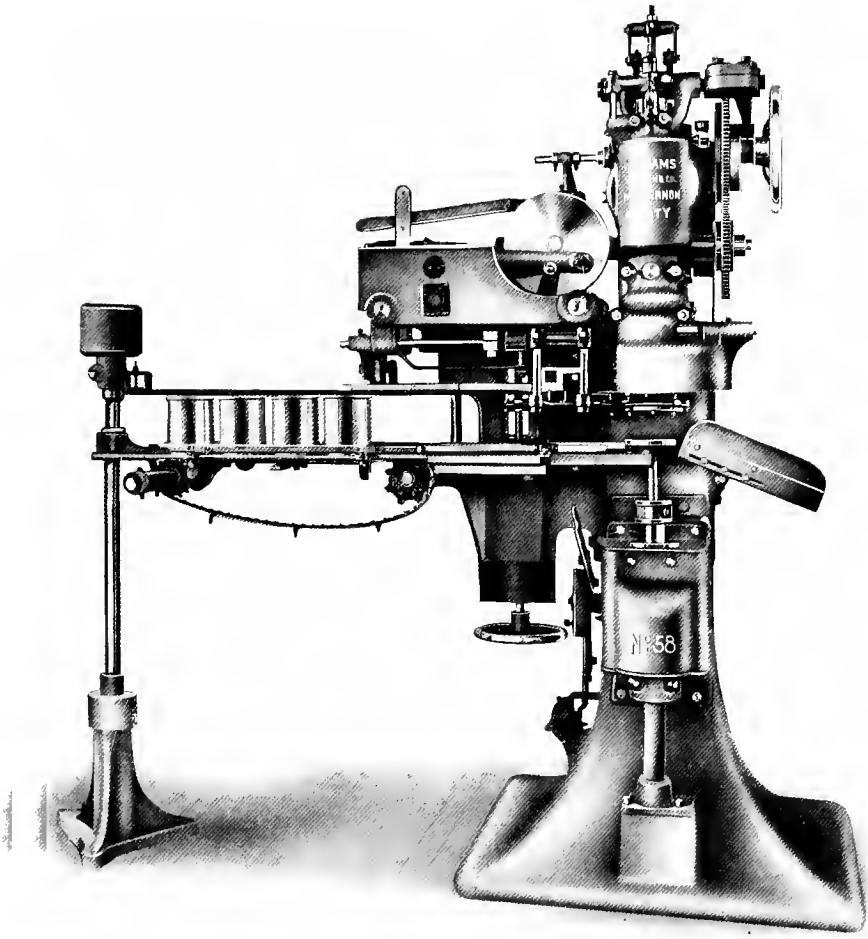
Note:—12-inch diameter tight and loose pulleys are furnished unless otherwise specified. Under some conditions when a machine is used for cans no larger than 3½ inches in diameter, smaller diameter tight and loose pulleys are desirable, and if specified at the time of placing the order, machine can be fitted with either 10-inch diameter or 8-inch diameter tight and loose pulleys, making it possible to use a smaller diameter driving pulley on the main shaft in the factory, which is sometimes necessary, where the space between the main shaft and the ceiling will not permit the use of a driving pulley large enough to run the machine at the proper speed with 12-inch tight and loose pulleys.

Specifications

Floor Space, 2 feet 10 inches by 5 feet 5 inches.
Height, 6 feet 4 inches.
Net Weight, about 1,900 pounds (kg. 855).
Gross Weight, about 2,300 pounds (kg. 1,035).
Driving Pulleys, tight and loose, 8 inches, 10 inches or 12 inches by 3 inches.
Horse-power required, approximately 2.
Speed, about 770 R.P.M.
Capacity, over 1,800 per hour.

Shipping Crate

7 feet long, 3 feet 9 inches wide, 6 feet 7 inches high.



PATENTS PENDING

Ams No. 58 Double Seamer, Automatic Feed

The Cans Stand Still

Codeword: Seamejump

Ams No. 58 Double Seamer, Automatic Feed

For Round Cans, the Cans Stand Still

The difference between the No. 58 and the No. 68 lies chiefly in the operation of the can, which in the No. 58 does not revolve. The automatic feed and the adjustable feed table are similar to those of the No. 68.

This seamer will handle cans from 1⅞ inches diameter by 1⅜ inches high, to 6⅛ inches diameter by 9 inches high. It has a capacity of over 26 gallon cans per minute.

It has all the advantages contained in the No. 68 and many others, according to the work to be done. The principal features which we have incorporated in this machine, and which are missing in machines of other makes, are the long bearing surface parts of the seaming head mechanism running in ball and roller bearings, with a good lubricating system. Also the seaming ring feature, which enables an inexperienced person to change the machine from one size to another without the necessity of adjusting the seaming rollers.

There is a separate seaming ring for each size of can. the seaming rollers are adjusted on these rings at the factory and there is no necessity for readjusting them. The rollers are also reversible, giving double service. If they become worn out when used one way, they can be reversed in a few moments. There are no lever movements.

Changes can readily be made for all sizes within the range specified.

Specifications

Weight, about 2,200 pounds (kg. 990).
Floor Space, 2 feet 10 inches by 5 feet 5 inches.
Height, 6 feet 4 inches.
Driving Pulleys, tight and loose, 8 inches, 10 inches or 12 inches by 3 inches.
Horse-power required, about 2.
Capacity, over 1800.
Speed, about 620 R.P.M.

Shipping Crate

Length, 6 feet 8 inches; width, 4 feet 2 inches; height, 6 feet 10 inches.
Gross Weight, 2,750 pounds. 156 cubic feet. 1,237 kgs.

Ams No. 58 Double Seamer

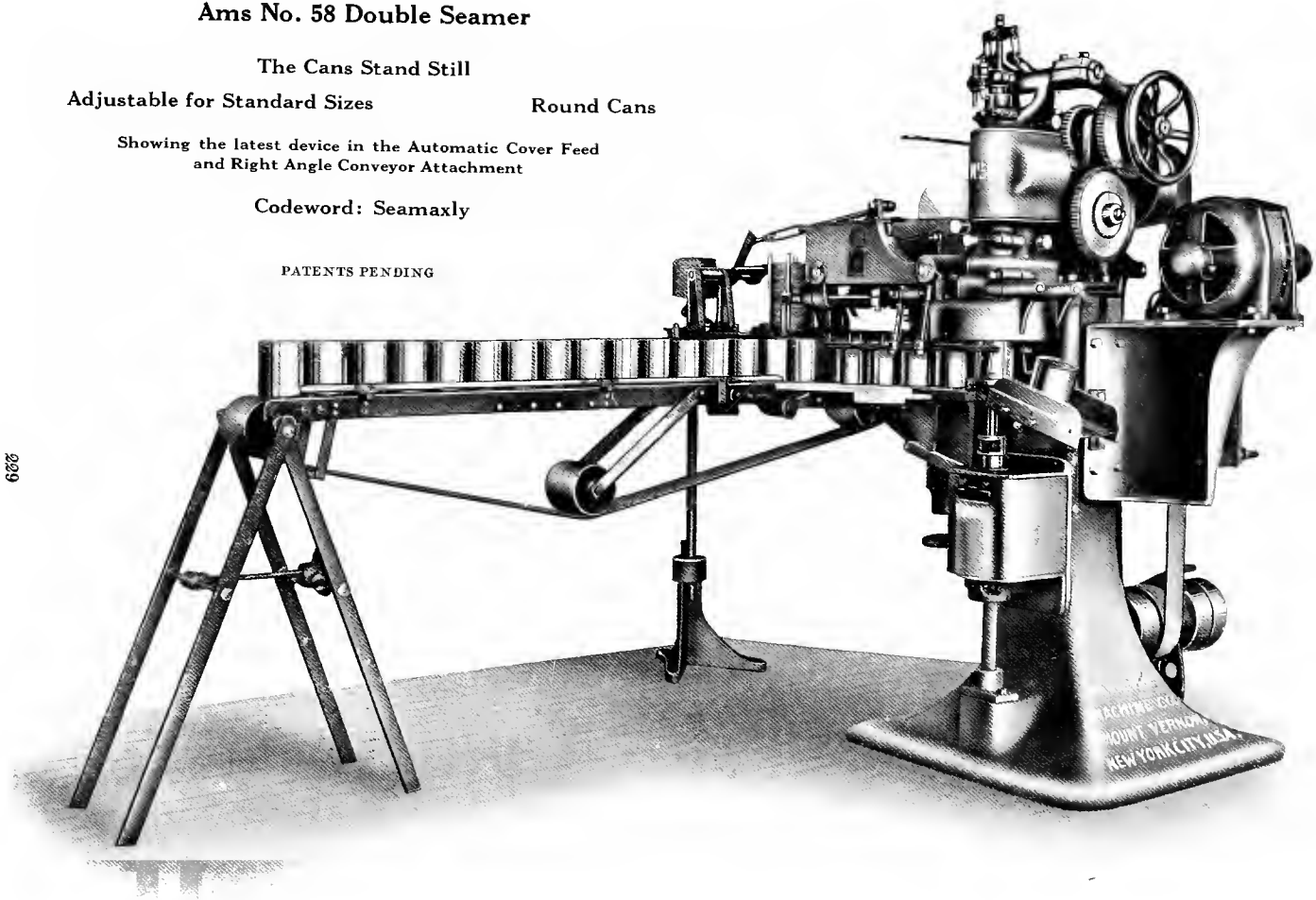
The Cans Stand Still

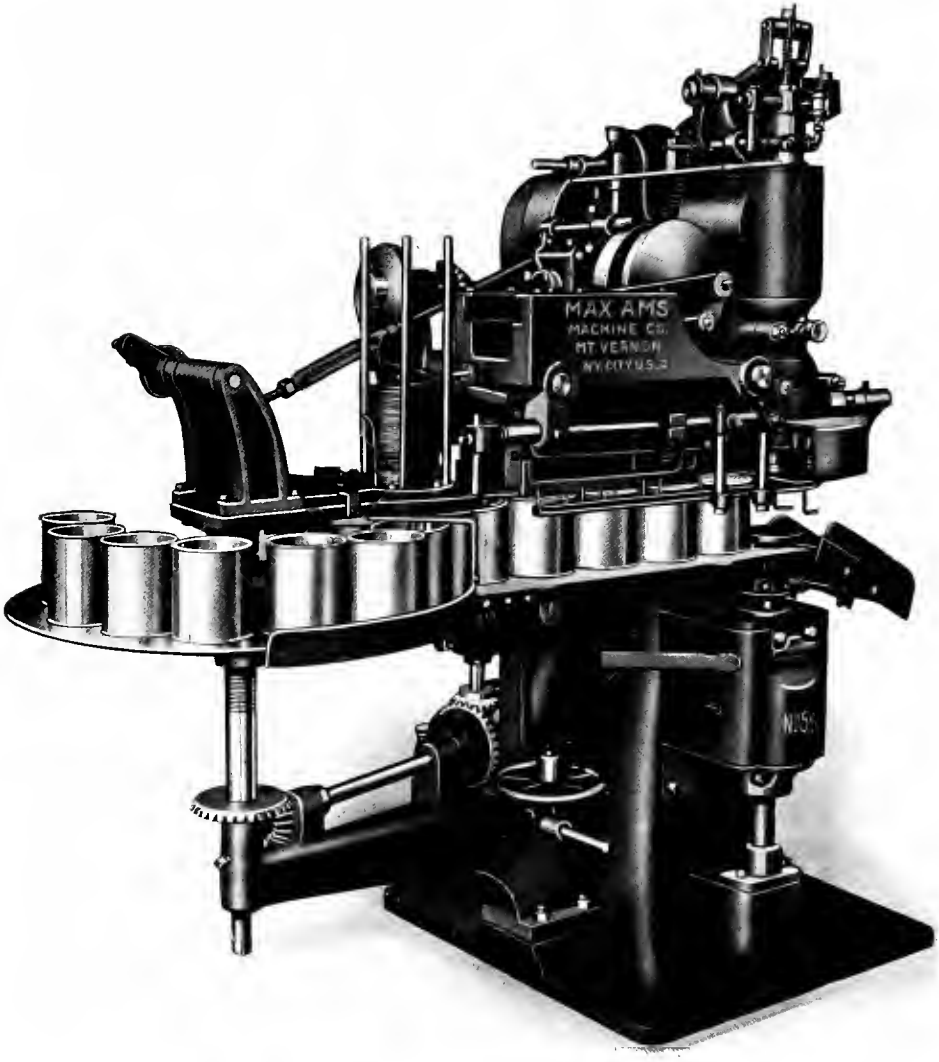
Adjustable for Standard Sizes — Round Cans

Showing the latest device in the Automatic Cover Feed and Right Angle Conveyor Attachment

Codeword: Seamaxly

PATENTS PENDING



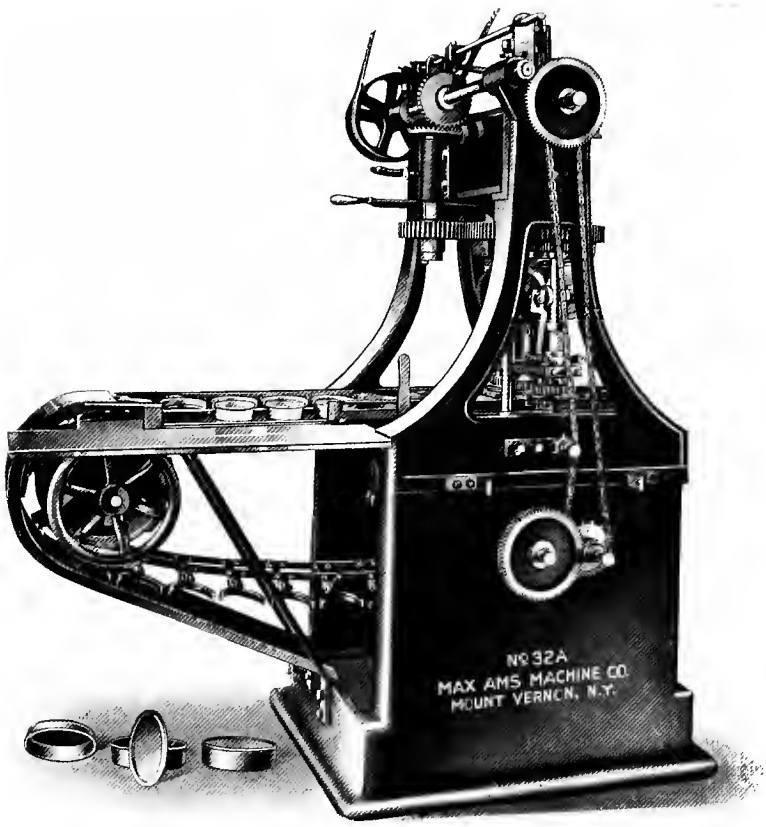


PATENTS PENDING

Ams No. 58D Double Seamer, Disc Conveyor and Cover Feed

Operation Same as No. 58

Codeword: Seamekily



PATENTED

Ams No. 32A Automatic Double Seamer

Codeword (Square Can): Soplona

Codeword (Oval Can): Soploni

No. 32A Automatic Double Seamer

For Sardine or Oval Cans

This Automatic Double Seamer is the latest machine for sardine or oval cans. It has a capacity of 40 per minute.

The feed table is ample to accommodate six or more cans at a time, and as they pass under the chuck, the can is engaged by the rollers, and a uniform, perfectly tight double seam is effected (as an equal amount of pressure is exercised on each can), after which the can is discharged from a chute into a suitable receptacle.

Any boy or girl can operate this machine.

No. 32A Double Seamer is the best machine made for this particular class of work.

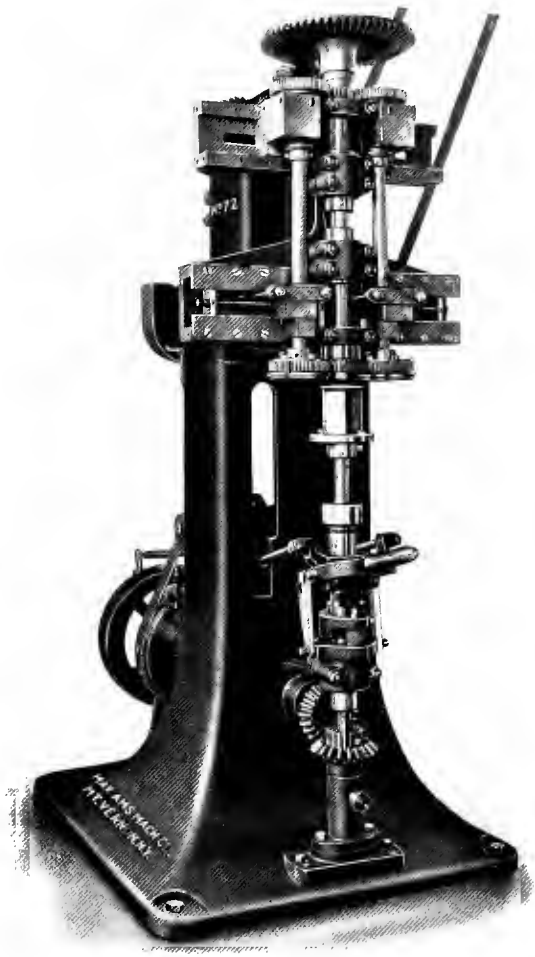
Built under special arrangements with the patentee.

Specifications

Driving Pulley, tight and loose, 10 inches.
Speed, 720 R.P.M.
Floor Space over all, F. & B. and R. & L., 7 feet by 4 feet.
Height over all, 6 feet 4 inches.
Net Weight, about 2,750 pounds (1,250 kgs.).

Shipping Crate

6 feet 8 inches long, 4 feet wide, 6 feet 8 inches high.
Cubic Measure, 177 feet (5 cbm.).
Gross Weight, 3,200 pounds (1,440 kgs.).



PATENTED

Ams No. 72 Double Seamer

Square or Irregular Shape Cans

Codeword: Soppunto

Ams No. 72 Double Seamer

The work of this seamer is automatic, and under all conditions the baseplate remains rigid in alignment with chuck, making it very easy to center all irregular shapes.

The body with cover attached is placed upon the baseplate the handle depressed, and instantly the can is engaged by the rollers, making a quick, clean and tight double seam.

It is also possible to change quickly from the tallest to the smallest can in height. The can revolves.

This machine is by no means confined to any particular class of work, as it will handle all average sizes and shapes, but may be easily altered in range when required, from 1½ inches upward.

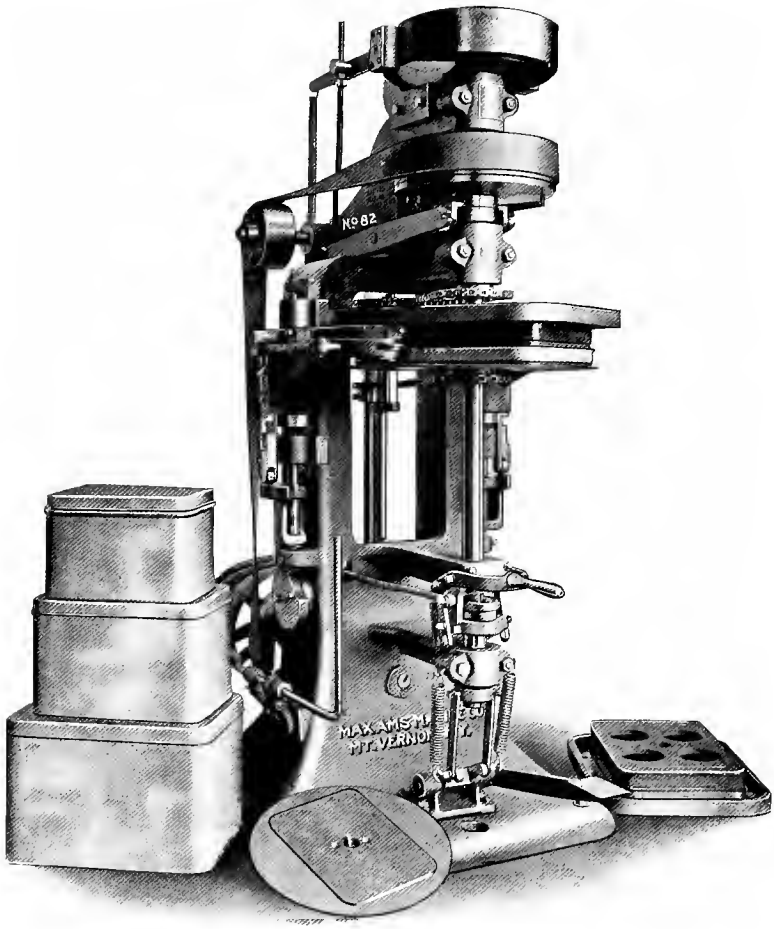
On square or oblong work, when a good speed is desired, it is preferable, particularly for hermetical sealing, to use a rounded corner not under ¾-inch radius. For false or blind double seaming, such as is used for cocoa, candy, tobacco or similar packages, or such as are subsequently soldered, smaller corners may be used.

Specifications

Capacity, according to size and style. Speed, according to nature of work.
Floor Space, 4 feet 4 inches by 1 foot 8 inches (132 x 52 cm.).
Height, 5 feet 4 inches.
Net Weight, 1,880 pounds (846 kgs.).
For individual drive we recommend a 2 horse-power motor.

Shipping Crate

5 feet long, 2 feet 4 inches wide, 6 feet high.
Cubic Measure, 70 feet (2 cbm.).
Gross Weight, including countershaft, about 2,200 pounds (998 kgs.).



Ams No. 82 Double Seamer

Round, Square, Oval or Irregular Shapes

Codeword: Sopradora

Ams No. 82 Double Seamer

For Round, Square, Oval or Irregular Shapes

The illustration shows the character of the work which this Double Seamer is capable of doing.

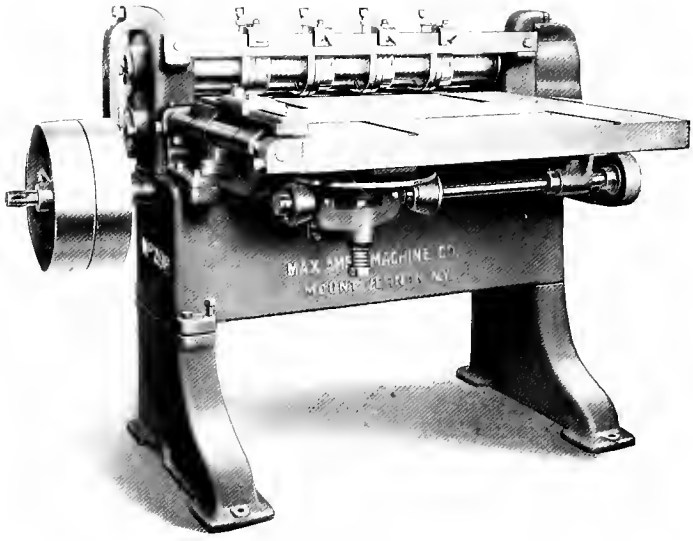
The three size bread boxes shown were double seamed by the No. 82, which has a capacity of turning out from 100 to 500 per hour according to size. The work is not confined to this particular canister, but round, oval and irregular shape large vessels may be double seamed.

Specifications

Weight, Net 1,848 pounds.
Driving Pulleys, T. & L., each 14 x 4 inches.
Speed, 100 revolutions per minute, according to work.
Floor Space, 5 x 3 feet (1½m. x 1m.).
Total Height, 6 feet 6 inches.
Horse-power, about 5.

Shipping Crate

5 feet 6 inches long, 3 feet wide, 6 feet 9 inches high.
Cubic Measure, 112 feet (3.17 cbm.).
Gross Weight, 2,080 pounds (936 kgs.).



Ams No. 29B Gang Slitter

Positively True

Codeword: Gangatepe

Ams No. 29B Gang Slitter

Positively True

This Gang Slitter is rigid in construction on account of the entire frame with housing being of one casting.

Cutter shaft made of the best hammered steel, 3 inches diameter, accurately ground the entire length through extra long bush bearings.

The side movements of the shafts are taken up by ball thrust bearings and set screws in center of shaft.

The automatic feed bar is controlled by friction drive, thus enabling the feed bar to be stopped at any point.

The construction of the legs is such, that by an adjustable pivoted leg, a perfect alignment of cutter shafts is maintained throughout the life of the machine, and insures absolutely true slitting of sheet-metal or cardboard.

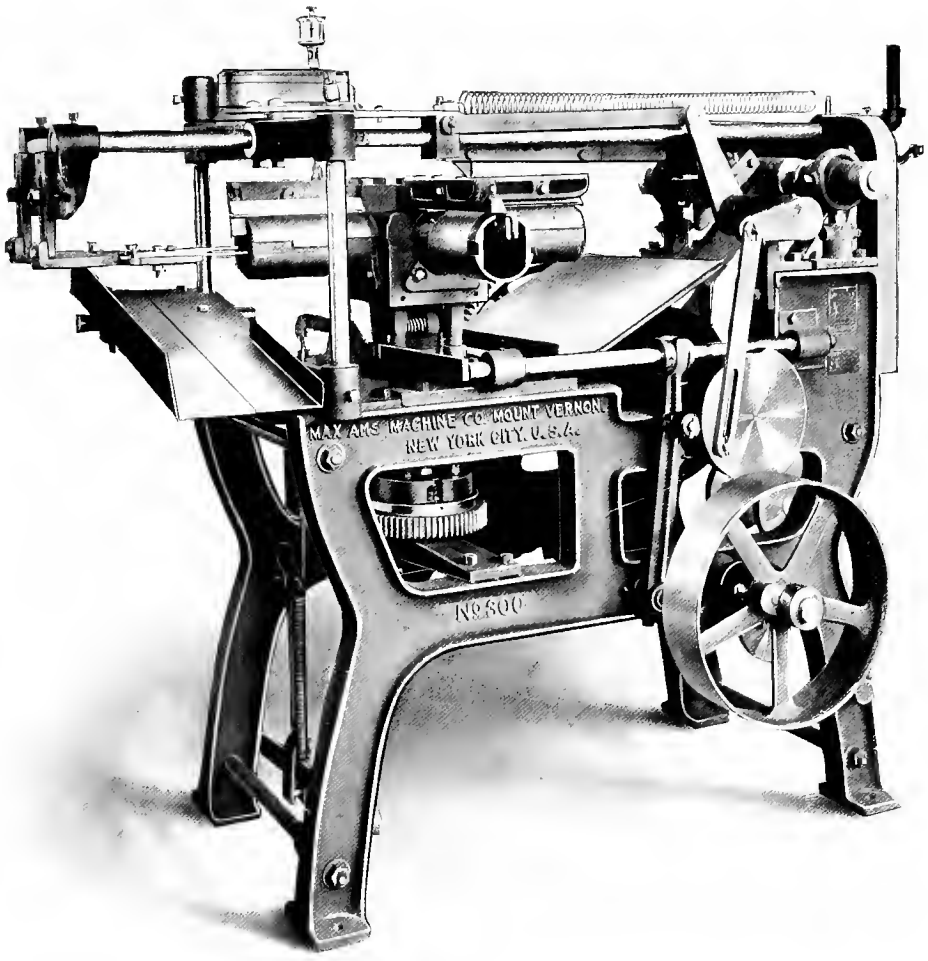
Always place on firm foundation as any vibration will interfere with the grinding of the cutters.

The grinding attachment is constructed and arranged so that the cutters may be ground without removing them or taking the shafts out of the machine.

By using Ams grinder the cutters never change in diameter, as the grinding is done on the side, in consequence of which, the sides always keep the same relation to the feed roller. The compartment underneath the table is arranged for tools.

Specifications

Weight, complete with countershaft, 2,000 pounds.
Diameter of cutters, 6 inches.
Diameter of cutter shafts, 3 inches.
Maximum width between bearings, 35 inches.
Will handle sheets in width up to 32 inches.
Length of table (front to centre of cutters), 33 inches.
Maximum number of cutters, 12.
Will slit sheet metal with 12 sets of cutters, thickness up to No. 26 B. W. G.
Will slit with 4 sets of cutters, thickness up to No. 24 B. W. G.
Diameter and face of driving pulley, 14 x 3 inches.
Speed of driving pulley, about 280 R.P.M.
Number of strokes of feed, per minute, 42.
Height from floor to feed table, 34 inches.
Floorspace base (F to B-R to L), 45 x 66 inches.
Cubic Measure, 84 feet (cbm. 2.4), 900 kgs.

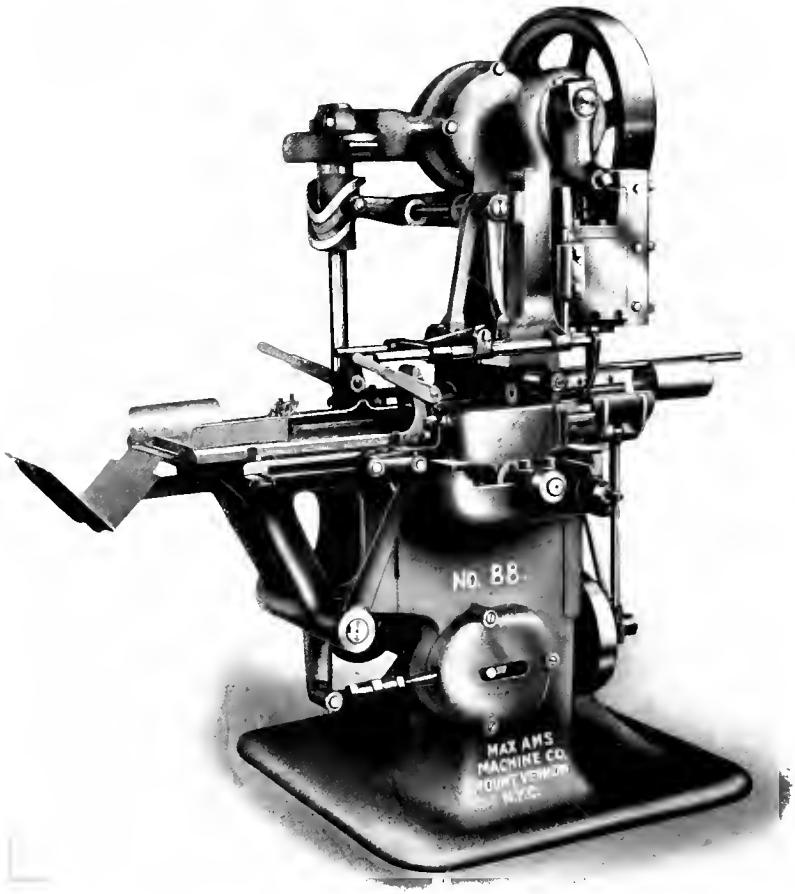


PATENTED

Ams No. 300 Automatic Side Seam Soldering Machine

Capacity: No. 3's, 8,000 to 10,000 Gallons, 5,000 to 6,000 per day

Codeword: Sopha



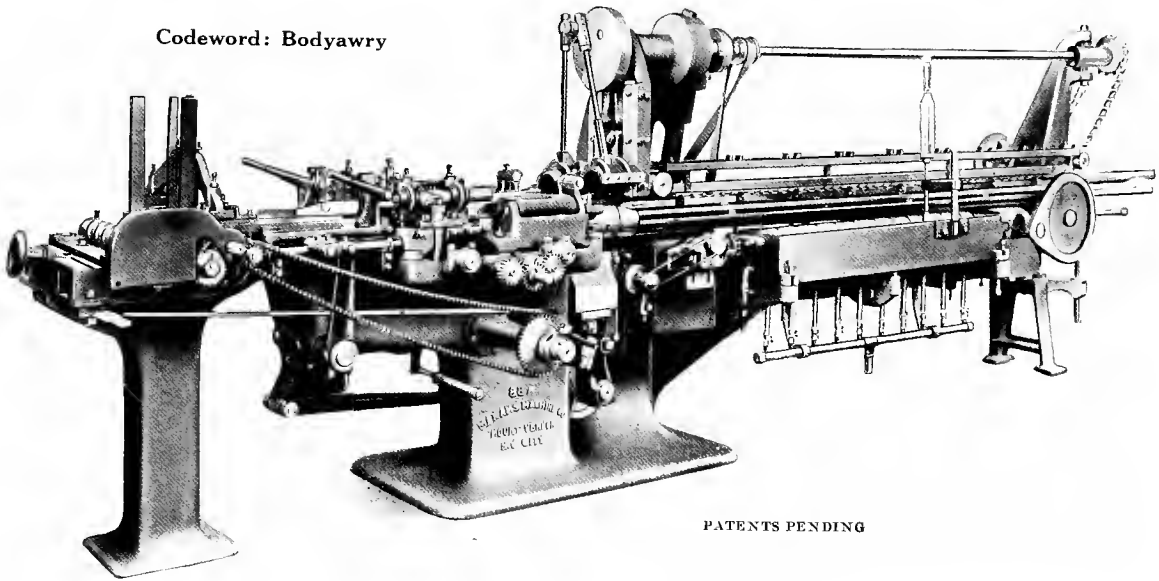
PATENTS PENDING

Ams No. 88 Can Body Maker

For Cocoa, Candy, Spice, Tobacco, Baking Powder and Similar Cans

Codeword: Bodyatepe

Codeword: Bodyawry



PATENTS PENDING

Ams No. 88A Automatic Body Maker

With Blank Feed, Notching and Soldering Attachments

Ams Automatic Can Body Makers

With Notching and Soldering Attachments

These machines are entirely new in design and have many original features. They are very compact and carefully designed, are easy running and work with great rapidity and accuracy. Vibration is entirely eliminated by properly timing and balancing the movements.

All working parts are open and easily accessible. A damaged blank can instantly be removed at every station, by simply lifting the friction bars. The feed delivers the blank positively square to the forming horn.

Notcher and Edger are very simple and work positive. Punches, Dies and Edging Plates have separate adjustments to take up the wear and can be quickly replaced when necessary.

The Forming Horn is supported on both sides, insuring a proper grooved lock seam. The expansion of the Horn can be varied either way to suit the size of the covers.

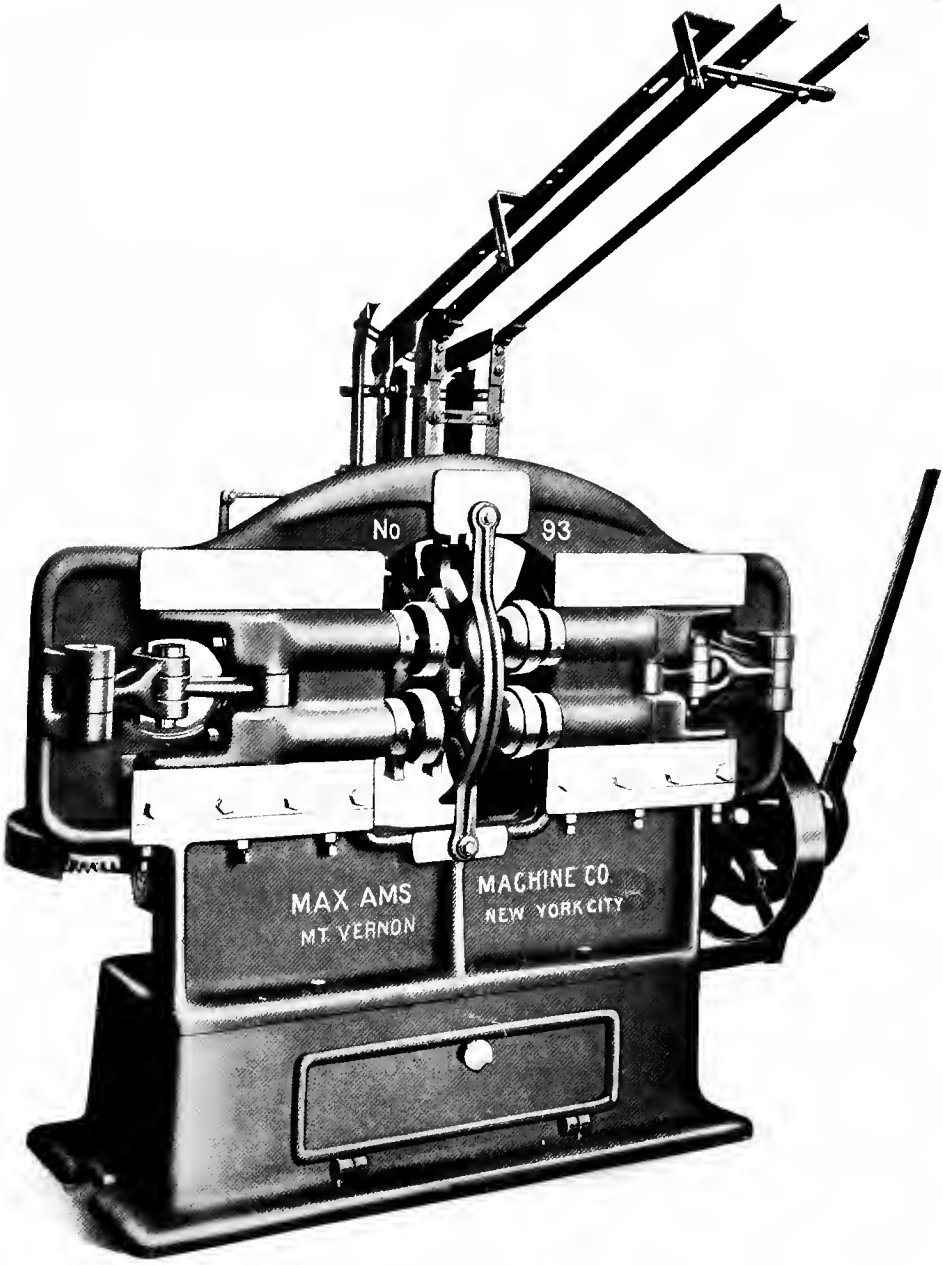
Adjustment of the Edger and Notcher is made simultaneously by turning a single crank. The forming parts (consisting of horn, wings, brackets, rods and cam) are furnished adjusted, and only require exchanging. This is done in very short time.

Soldering attachment is very efficient. The liquid solder is applied to the cans from underneath, by means of a roll in a positive manner. The can is then passed on to the wiper and over the cooling pipe. Adjustment from one size to the other is quickly made.

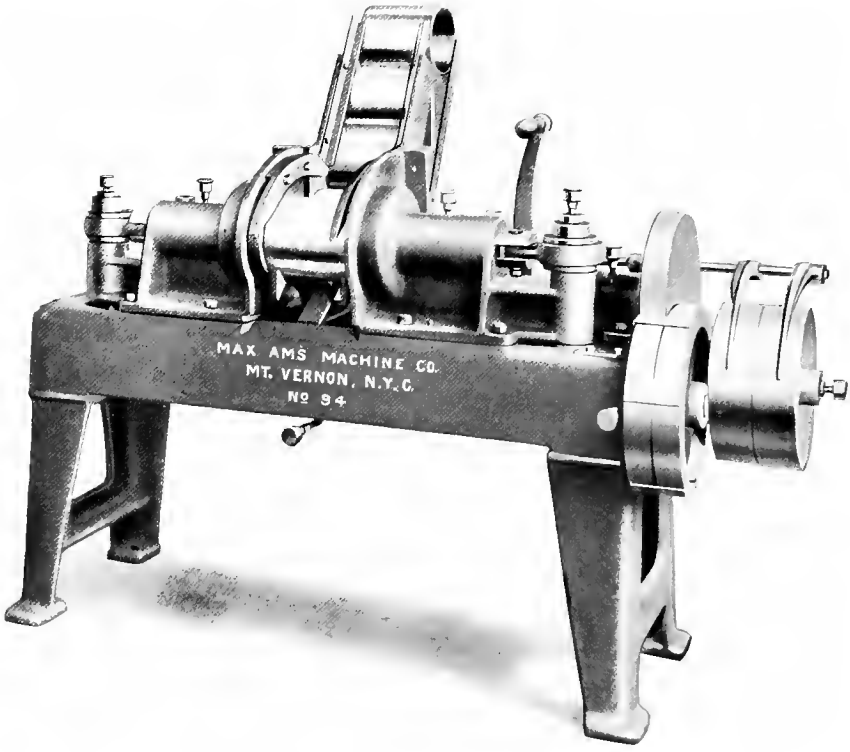
These machines will handle round and irregular shaped can bodies and are particularly adapted for the production of Sanitary Can Bodies (lap and lock seam). They are made in two sizes.

	No. 88A	No. 89
Will take work in diameter	2½ in. to 4¼ in.	2½ in. to 6½ in.
Will take up to (lengths)	6 in.	7¼ in.
Diameter and width of flywheel	21 in. x 3¼ in.	24 in. x 3½ in.
Revolutions per minute	150—250	150—300
Capacity per minute about	75—125	50—100

Net Weight No. 88A 2,972 lbs. No. 89, 3,845 lbs.
Cubic feet 178, 50 cbm., 2,106 kgs.



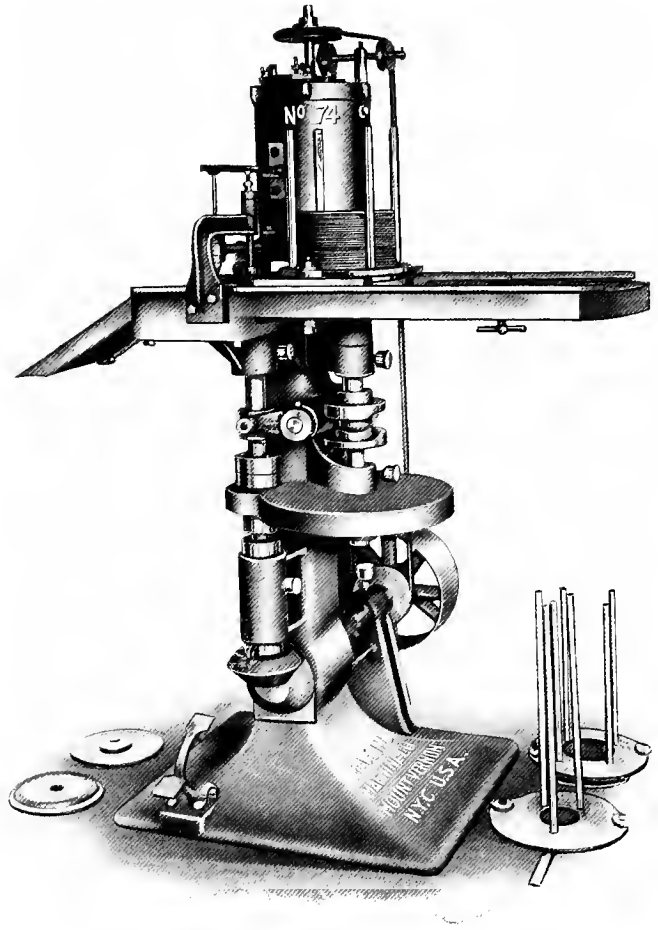
Ams No. 93 Automatic Flanger
Up to and including No. 3's, 120 per minute
Codeword Flangawry



Ams No. 94 Automatic Flanger

For gallons, 40 and upward per minute

Codeword: Flangaxly



PATENTS PENDING

Ams No. 74 Lining Machine

With Automatic Feed for Round Covers

Codeword: Sorbeamus

Ams No. 74 Lining Machine

Automatic Feed for Round Covers

The illustration on the other side shows a lining machine, used for the purpose of applying compound to the flange of the can covers.

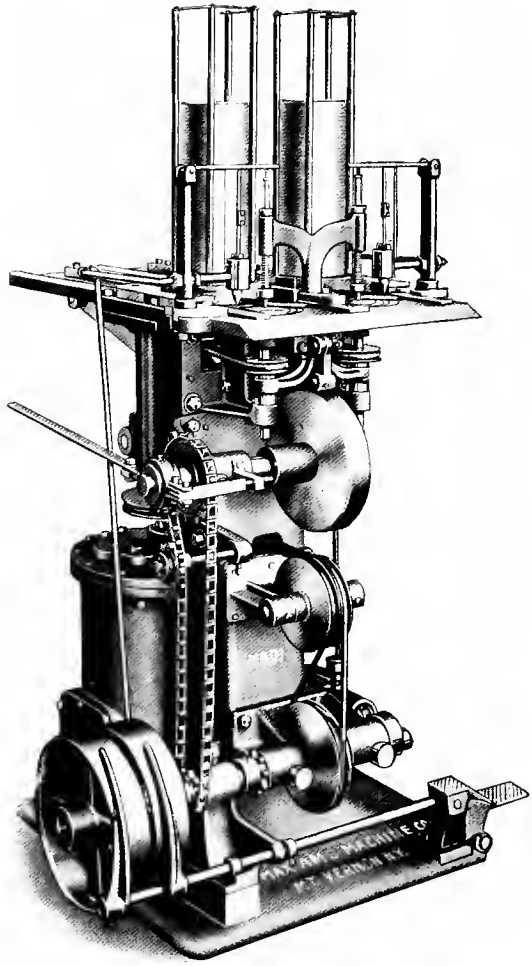
It also shows the can ends stacked in the magazine ready to be fed automatically under the compound feeding-nozzle from the bottom of the stack.

The capacity of this No. 74 Lining Machine is from 60 to 120 per minute, according to the size of the covers.

The machine is very compact, easily adjusted and changed from one size end to another and very simple in operation. It will line covers from 2 inches to 6½ inches outside diameter when curled.

Specifications

Net Weight, 575 pounds.
Height, 4 feet 9 inches.
Floor Space, 3 feet by 2 feet 6 inches.
Driving Pulley, 10 inches.
Speed, 220 R.P.M. for 60 large diameter ends per minute.
Speed, 370 R.P.M. for 100 small diameter ends per minute.
Cubic Measure, 75 feet (2 cbm.).
Gross Weight, 725 pounds (335 kgs.).



Ams No. 91 Double Lining Machine

Automatic Feed for Round Covers

Codeword: Linatop

Ams No. 91 Lining Machine

Automatic Feed for Round Covers

This self-contained lining machine will handle 240 ends and upwards per minute, up to and including No. 3's.

The tank has a capacity of 7½ gallons for sealing fluid, which is applied to the curled flange of the cover under pressure obtained from an air-pump at the end of the driving shaft.

This one machine will line ends sufficient to take care of any single line of sanitary can-making machinery, at whatever speed it may be run.

This liner is solid and compact, very simple in operation, easily adjusted and changed from one size end to another.

Specifications

Net Weight, 870 pounds (391 kg.).
Gross Weight, 1,000 pounds.
Height, 6 feet.
Floor Space, 3 feet by 4 feet.
Driving Pulley, 10 inches.
Speed, 120 R.P.M.
Cubic Measure, 90 feet (3 cbm.), 450 kgs.

Ams No. 83 Cover Curling Machine

Codeword: Sorbemos

Ams No. 83 Cover Curling Machine

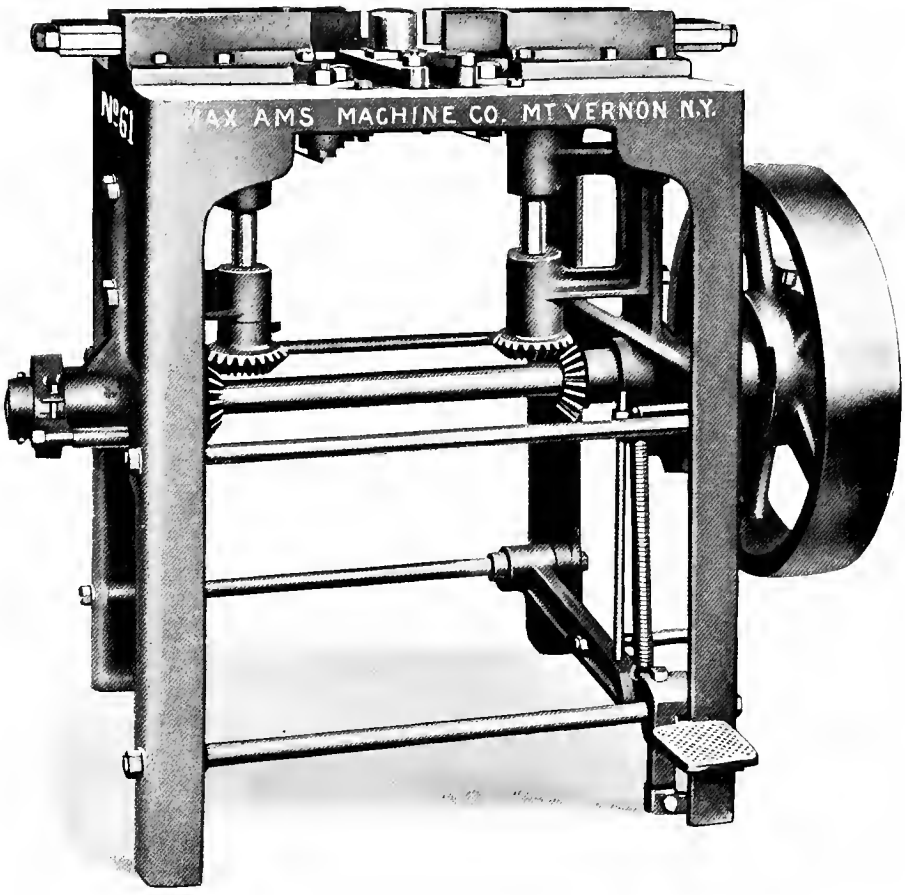
The No. 83 Cover Curling Machine is used for curling the turn-up flanges of tin can ends. This operation, as shown in the illustration, is performed without the necessity for extra labor. It can be adjusted to any power-press, and as fast as the tops are stamped they automatically feed into the curler, and from there into a receptacle. The large can-making companies have found this device desirable principally because it helps in the double-seaming operation. Beside helping in the double-seaming operation, it allows the covers to be stacked on top of one another in such a manner that they can be fed automatically into the lining machine to have the compound applied. The curling segment is removable, and there is a different one of these curved segments furnished for each size of can end to be handled. We build presses for stamping these covers.

Specifications

Net Weight, 210 pounds.
Measurements over all: Length, 2 feet, width, 20 inches, height, 20 inches.

Shipping Crate

3 feet 2 inches long, 2 feet 2 inches high.
Cubic Measure, 8 feet (3 cbm.).
Gross Weight, 300 pounds (135 kgs.).



PATENTED

Ams No. 61 Flanger

Oval, Square and Irregular Cans

Codeword: Flangatos

Ams No. 61 Flanger

Oval, Square and Irregular Cans

This type of No. 61 Flanger is the hand feed and adjustable for all sizes from 2 inches up to and including one gallon.

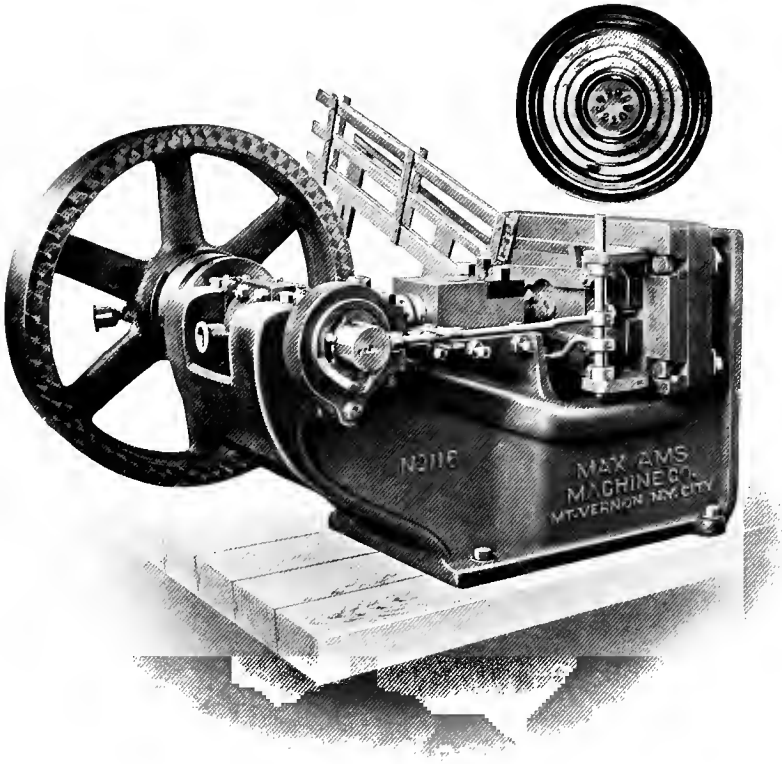
It flanges one end at a time and will take oval, oblong, square and irregular shapes, and is especially suitable for olive oil cans.

It is compact and does not require much more room than an ordinary sewing machine.

Built under special arrangement with the patentee.

Specifications

Gross Weight, 1,100 pounds.
Net Weight, 908 pounds.
2 feet 8 inches long, 2 feet wide, 2 feet 11 inches high.
Speed, 130 R. P. M.
Capacity depends on skill.
Requires one horse-power.
Cubic Measure, 29 feet (1 cbm.), 336 kgs.



No. 116 Dating Machine

For Marking Round, Square or Irregular Shapes
Sanitary Can Covers and Studhole Caps
Codeword: Sorvar

No. 116 Dating Machine

For Marking Round, Square or Irregular Shapes

Sanitary Can Covers and Studhole Caps

The Ams Dating Machine will register any desired combination of dates, weeks, years, serial numbers and other private marks so that a packer may identify his own product at any future time.

It is provided with chutes from which the covers are fed into the stamping device whence after the impression has been received, they drop by gravity into a suitable receptacle or to a conveyor belt, to be taken where wanted. Any boy or girl can operate it.

This machine is also furnished with an automatic cover feed for round cans only. Speed, 100 per minute.

The illustration, which is about one-eighth size of the actual machine, shows its character and purpose. It may also be used for making and dating metal tags.

Sample cover sent upon request.

Specifications

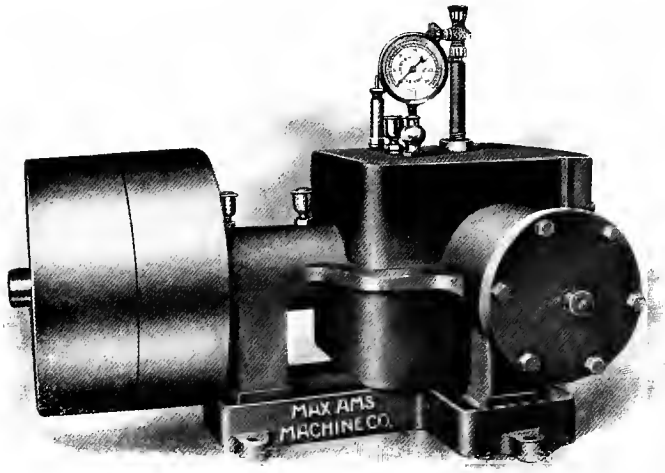
Height from center of shaft to bench, 10 inches.
Bench Space, F. to B. and R. to L., 1 foot 7 inches by 1 foot 7 inches (48 cm. x 48 cm.).
Net Weight, complete, 354 pounds.
Adjustable chute, 2 inches up to 6¼ inch covers.
Automatic feed can be detached and machine used as a bench press.

Shipping Crate

Cubic Measure, 13½ feet (.4 cbm.).
450 pounds (202 kgs.)

Ams No. 13 High Pressure Air Pump

Codeword: Sorosis



This cut represents a Double Cylinder High Pressure Air-Pump and Compressor. It was designed for use in connection with our lining machines and self-heating soldering irons. One of these pumps is equal in capacity to a group of lining machines and a number of self-heating soldering irons. Such a group may be arranged by the introduction of a compressed air tank.

It is not confined to this class of work, however, and may be used in many other ways, such as silver-smithing, blow-pipes and small forgings, tempering, etc., in fact, where a direct pressure up to 50 pounds per square inch is required.

Its construction is simple and compact, and it runs almost noiselessly and practically without vibration.

We build them also, with four cylinders, where a large volume of air pressure is required.

Floor space 23x23. Net weight, 200 lbs.

Dies

Round, Square, Oblong and Irregular Shapes

The above illustration shows a round combination die, with an ingenious stripper arrangement which prevents clinging of the sheet to the punch, thereby giving operator freedom of action, and increasing the stamping capacity.

Estimates on round, square, oblong and irregular dies.

We supply everything required in this line for sheet metal work.

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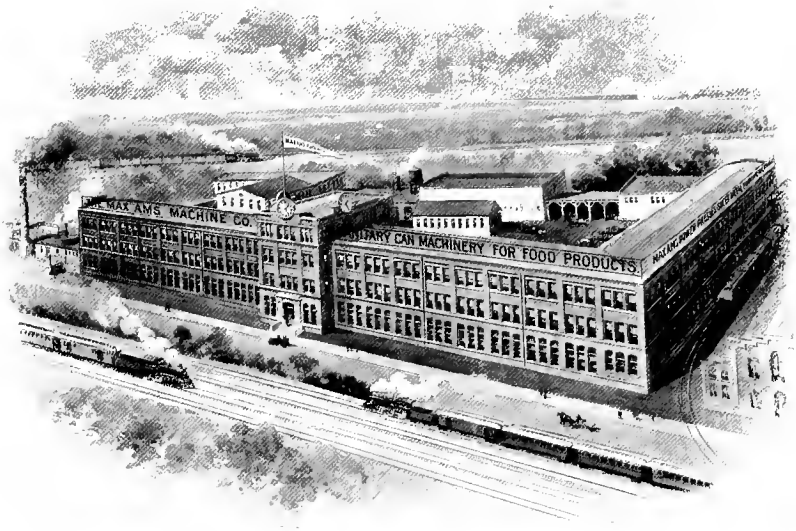

Plant of The Max Ams Machine Co.
Mount Vernon, New York, U. S. A.