Protecting Your Factory From Fire

By CHIEF GUERIN

Price $1.00

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Protecting Your Factory From Fire

A Manual of

Fire Prevention

for

Industrial Plants

Third
Edition

By CHIEF GUERIN

Chairman, Fire Prevention Committee, of the Safety First Federation of America

Organizer and for three years head of the New York City Fire Prevention Bureau

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Acknowledgment

The author takes pleasure in acknowledging his indebtedness to "Field Practice," published by the National Fire Protection Association, for details and facts contained in this manual.

Illustrations

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How to Use This Volume

THIS is not a book to be read "for pleasure," but for information. It is a TOOL to be used in YOUR business.

It is a modest volume—but it has been strongly built to stand hard usage. It will find a useful place in your desk—it will fit your pocket.

The author has kept the size down, but not at the expense of utility. It is full of information that may mean dollars—many dollars—to you.

There are many books on "Fire Prevention"—many good books—but most of them are either highly technical or they approach the subject from a theoretical, rather than a practical viewpoint.

There has been real need of a small, compact volume, written FOR the factory man, not AT him—a volume which epitomizes the subject and tells *what* is needed in a few, plain words.

A slight amount of repetition will be noted. This is due only to the author's desire to drive the lesson home—to make others see, as clearly as he does, the crying need for something to put a stop to the frightful fire waste in the United States—now more than $250,000,000 a year, plus $250,000,000 more for Fire Departments, to say nothing of the 3,000 lives that are lost annually in *preventable* fires.

Fire prevention is a big subject. It is only just becoming known. We have much to learn—all of us. Therefore if this book can show you that to prevent fires starting is the best and cheapest form of insurance—if it leads you to think and act—it will not have been written in vain.

Notable Career of Chief Guerin

CHIEF GUERIN spent most of his boyhood at sea in the merchant service and United States Navy. He was in the navy three years and three months, obtaining the Bailey Medal for the year 1887.

When his enlistment expired, Chief Guerin entered the New York Fire Department and strictly on his own merit, without political help or favor, was promoted to the rank of Chief of Battalion in less time than any man in the New York Fire Department before or since. His remarkable ability as an organizer was recognized by the tasks assigned to him, the most notable being his organization of the paid Fire Department to supplant the volunteer system in Richmond Borough, New York City.

The organization of the Bureau of Repairs and Supplies in the New York Fire Department under his direction resulted in saving more than $500,000 in two years, while the organization and operation of the Bureau of Fire Prevention of the New York Fire Department, reduced the number of fires in New York City for the first time in its history by nearly 2,700 in one year, cutting down the fire loss $8,000,000 in two years.

While in the Fire Department, Chief Guerin studied law, and has been admitted to the New York Bar. He was retired from the New York Fire Department in December, 1913, after 25 years service, and began the practise of law.

Chief Guerin's latest triumph was on June 15, 1917, when he extinguished the biggest gas well fire the world has ever known. This was at Monroe, Louisiana, where a giant well of the Ouachita Natural Gas & Oil Company had taken fire.

For six days the flames had defied fire and gas experts of three states. The well was flowing 40,000,000 cubic feet a day under a pressure of 1,500 pounds, and the hopelessness of the situation is shown by the fact that much smaller gas well fires had frequently burned for years.

The loss faced by the company was tremendous. They were at their wit's end. At last in desperation, they wired to New York

CHIEF GUERIN

and Chief Guerin rushed to Monroe on a special train. When he arrived he found the flames soaring and roaring skyward in a column an eighth of a mile high.

The company was considering the use of dynamite, hoping to cause a tremendous blast of air that would "blow" the fire out. This plan, however, would have been attended by great danger and the chance of success was small.

It was a case of one man against the unpent furies of nature—and man won. Attacking the fire on opposite sides from behind metal heat screens, Chief Guerin caused two streams of water to meet in the column of gas where it left the ground. The meeting point of the lines was then raised slowly so that the water and steam acted like a brush wiping the fire from the column of gas.

In five minutes the fire was out and Chief Guerin was acclaimed a hero.

Chief Guerin is Chairman of the Fire Prevention Committee of the Safety First Federation of America, which has done much to help reduce the fire loss of the country. He was chosen in 1915 by the Pyrene Manufacturing Company to organize and head its Engineering Bureau.

The institution of National Fire Prevention Day on October 9, anniversary of the Chicago Fire, is due largely to the efforts of Chief Guerin.

As a result of his efforts to reduce the Fire Waste, Chief Guerin is affectionately known the country over as the "Father of Fire Prevention."

EDITOR.

INTRODUCTORY

Dollars and Sense

WHICH IS CHEAPEST—to shut your eyes to your many fire hazards and have your plant burn down, scattering your workmen among your rival plants, losing profits on unfilled orders, losing customers to competitors, losing good will and the many advantages you have already gained, plus the uninsured value of your property—

OR—

to take the steps necessary for proper fire prevention and fire protection and thus to feel the confidence that comes of knowledge that your plant is safe from fire?

That's just the situation. It's a matter of dollars and sense—a few dollars and a little common sense.

Fire Prevention—Mr. Factory Owner, or Superintendent,—means dollars in your pocket. Just that. For when the fire comes—and remember, every minute of the day *somebody's* factory is burning and *yours* is not immune—when it becomes *your turn* to suffer—your competitor will be called upon by *your* customers to fill the contracts that you can't.

Fire loss, you see, is not limited to fire damage. A little thing like a burned out dynamo or a switchboard put out of business—may tie up your whole plant for days—or weeks. Ten dollars might repair the *damage,* but $10,000 could not repay the *loss.* One dollar for prevention might have remedied the cause. One dollar for $10,000 protection is cheap insurance. The loss due to one small fire may far outweigh the slight cost of taking *every* modern precaution.

What precautions you should take depend upon your individual problems. In no two cases are they just the same. They are all simple—basic. They depend on conditions—not theories. *You* know the conditions in your plant but you are too close to them to recognize them. That, or familiarity has bred contempt for them.

When you are ill you call a doctor. When you want a contract drawn you consult a lawyer. In like measure you need the services of a Fire Prevention Engineer to deal with the fire hazards in your factory.

The Pyrene Manufacturing Company is prepared to render this service *free*. We will send one of our trained inspectors to your plant. He will submit a typewritten report on what is needed to render your factory more nearly fire safe. *There is no charge for this service.*

Whether you act on the expert disinterested advice is for you to say. If you *do,* the credit which may be granted or the penalties which may be removed by your local Rating Bureau, may materially reduce your insurance premium. The saving may more than pay the cost of installing appliances or making the improvements recommended.

After all—as I said before, it's all a question of dollars and sense

William Guerin

Protecting Your Factory From Fire

HOW TO SAFEGUARD YOUR PLANT AND LIVES OF EMPLOYES

1—Organize a Fire Drill.

2—Form a Fire Brigade.

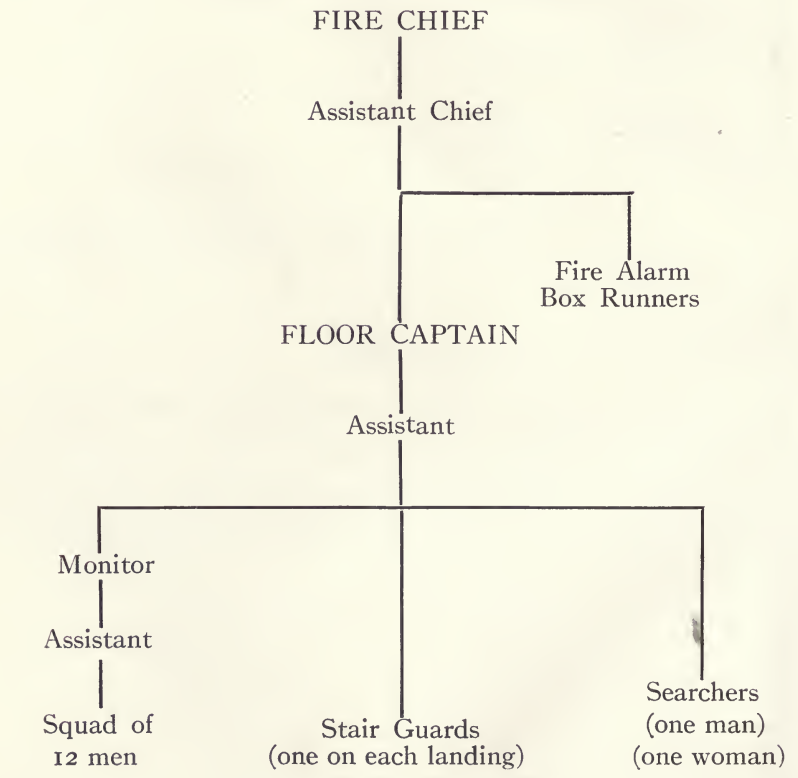
3—Equip your plant with means of Fire Prevention.

4—Install Fire Extinguishers and other Fire Protection Appliances.

5—Reduce or remove Fire Hazards.

These steps are outlined on the following pages. Take them and you can feel more than reasonably sure that your factory will be immune from fire, that your business will not suffer the loss of customers, of good will, of cash, that always attends such industrial disasters.

Plan of Organization



CHAPTER I

How to Organize a Fire Drill in Your Factory

FIRE AND PANIC go hand in hand and close behind lurks death—unless your workers know what to do if emergency arises. But *you* have to teach them.

The object of a fire drill is, first, to train employes how to use fire apparatus provided by the company and second, to prevent panic by teaching the employes to keep their heads and use exits in an orderly way. More lives are lost in panics at fires than in any other way.

It makes no difference if you employ a dozen workers, or a thousand; whether your factory is a one story frame shed, or a massive structure of steel and concrete, in the frenzied rush for the doors one or more—may be hurt, if not killed. And the courts lately are holding employers liable for such injuries or deaths.

The easiest way to organize a fire drill in large cities is to invite the assistance of the Fire Chief. Put your problem up to him. Tell him what you want. He will assign an officer to undertake the work, and it will be done *right*. This officer will come into your plant and instruct your men in the way to take care of themselves.

The sole expense to which you will be put is to put in a signal bell—preferably a gong—on each floor with an annunciator in the office which will show the location of the station from which the alarm is sent and signal stations from which to transmit the alarm.

It may be that the factory is in a small town or village, or that the services of a local Fire Department expert cannot be had. It is for such cases that the following directions are given.

The first step in organizing a fire drill is to number each exit on each floor. Stairs, fire escapes, bridges to other buildings, or doors leading to the surface, should be indicated by red lights and by a sign "EXIT" in red. The numbers should be plainly indicated in red. Passageways to all exits *always* should be kept clear.

FLOOR CAPTAIN—Appoint one man—preferably the foreman of each floor—to be floor captain. It is the floor captain's duty to give the signal to the employes to leave their work and to direct which exit to use, should one or another be cut off by fire or smoke. Each floor captain should have an assistant to act for him in case of his absence. The floor captain's orders are final on his floor.

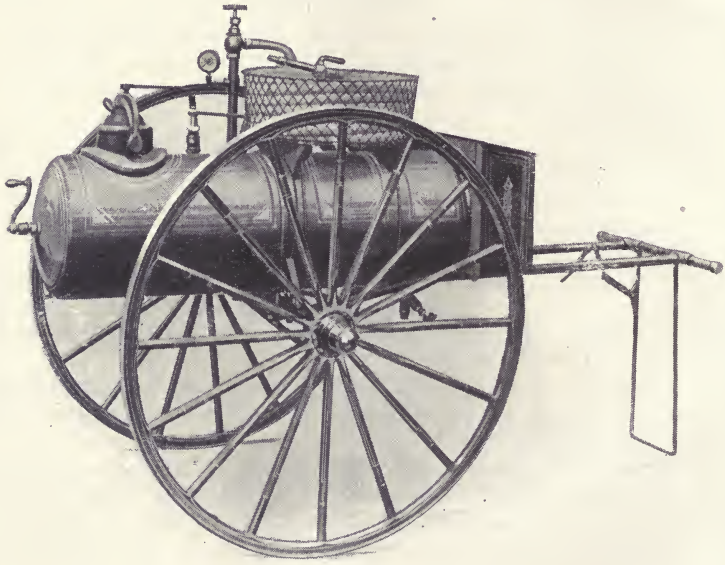
SQUADS—Divide the employes into squads of twelve to twenty individuals, depending upon the number on the floor.

MONITORS—Each squad should have a leader, or monitor, whose duty is to see they leave the building safely and march out of the way of the firemen.

STAIR GUARDS should be appointed to maintain order on the stairway and to give any assistance necessary while the employes are marching out. Not until all are out should they leave their position.

There should be as many stair guards on each floor as there are landings on the various stairways and fire escapes between the floor in question and the one below.

SEARCHERS—Beside the floor captain, monitors, and stair guards two or more employes (of both sexes if necessary) should be appointed as Searchers,



40 Gallon Chemical Engine for Factory Protection

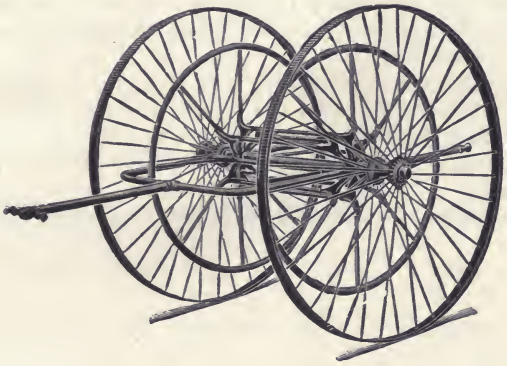
to go through wash-rooms, lavatories, cloak rooms, etc., to see no one is left behind. It is their duty also, to help any who may have fainted or who may be otherwise unable to save themselves. The Searchers should be the last to leave. When they go they must see that doors to all exists are closed. If the fire is in an adjoining building they should also see that all windows are shut.

EXITS—After the employes are divided into squads, a particular exit should be assigned for each to use in case of an emergency. The exits assigned should be the ones most convenient to that part of the floor where the members of the squad are employed. In case of fire one or more exits may be cut off by flames or smoke. Hence there should be a second and third

choice of exits for each squad. To accustom the workers to all exits it is well during drills to close one exit or another—a different one each time.

The floor captain should choose which exit to close. When the alarm sounds it should be for him to announce which exit is not to be used.

In short, effort should be made to reproduce conditions of a fire as nearly as possible, and to have each employe know what to do under any and all circumstances.



Hose Cart for Factory Use.

ALARMS for fire drills should be under the direction of the Fire Chief of the plant or his assistant (see Chapter II). They are the only ones who should order an alarm to be sounded and none, aside from them, should know that the alarm is for a drill and not for a real fire.

When the fire alarm is sounded every employe should rise and place his chair or stool on a table or a machine. The power should be shut off all machines, by the engineer if necessary.

The floor captain then gives the order, "Exit No. 2 (for instance) not in use. Squads A, B, and C, use exit No. 5.

The monitors then lead the employes out. The Stair Guards should precede the first squad to the doors and take their places on the landings. If exit No. 2 is temporarily closed, for instance, all No. 2 Stair Guards should depart with the squad to which they are nominally attached.

It is far safer, while marching out, if employes link arms. In this way the actual physical touch will tend to calm excitable ones.

When the alarm sounds, the Searchers start at once on their tour through

the cloak rooms, etc. Time should not be allowed for employes to get cloaks, hats or other property. Such delays cause many lost lives in factory fires.

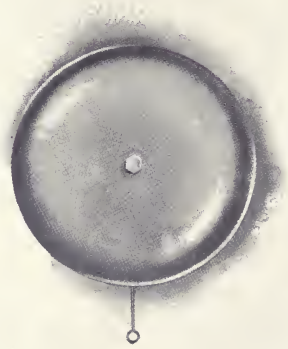
While the squads are leaving, members of the city Fire Department or the company's Fire Brigade may be at work laying hose or otherwise preparing to fight the fire. Employes should take care not to interfere with this work just the same as the firemen must put nothing in the way of their leaving.

Always include the office force in the fire drill. Even the officers of the company should not ignore the alarm.

All books and valuable papers should be put in the safe and vault which should be closed and made ready for locking. Where there are time locks on the safe, it is better, however, to await a second order before the bolts are shot and doors made fast.

FIRE ALARM BOX RUNNERS—One or more employes should go at once to the nearest City Fire Box aud turn in an alarm, while another should telephone the alarm to headquarters. By putting this duty on two men a little rivalry will be caused which will lead to far greater speed in calling the fire department.

NOTE—Of course, no city fire alarm should be turned in for a fire drill.



HOW TO BE READY IF FIRE SHOULD COME

1—Equip and maintain a Fire Brigade in your Plant.

2—Provide Brigade with Modern Means of Fighting Fire.

3—Keep Fire Appliances Clean and Accessible.

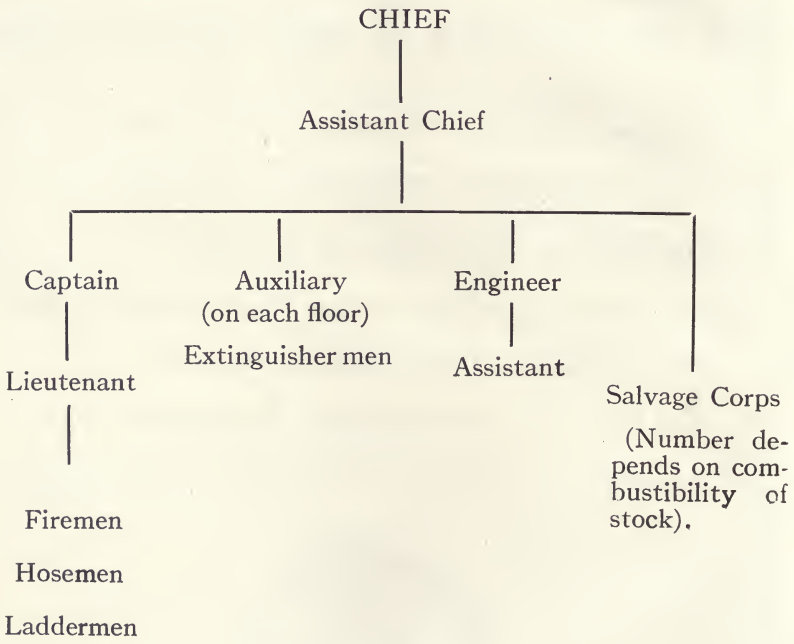
4—See that Standpipes and Hose are Always Ready for Use.

5—Hold Brigade Fire Drills at irregular intervals.

6—Offer Prizes for Good Records by Fire Brigade.

7—Have written reports made of all Brigade Drills and Fires.

Organization of Fire Brigade



CHAPTER II

The Fire Brigade

IN THE FIRST few minutes after fire starts in your factory, one small extinguisher can do more to stop it than the whole fire department can ten minutes later. Your chances of immunity from fire loss increase in geometrical ratio with the precautions you take.

"All fires are small fires first." Remember that. Remember the ounce of prevention. It's still worth the pound of cure. The measure of the loss you suffer depends on what is done in those vital five minutes. Be ready. Have your employes trained to protect your property. Their jobs are at stake. If your factory burns, they'll be idle. It is worth money to both, therefore, to be prepared. If *you* do *your* part, you may be sure they'll do theirs.

When a blaze is discovered in your factory, no matter how small it is, there's just one thing to do—put it out.

Firemen hate a false alarm. But if there be a real fire, they'll be tickled to death to find someone else has put it out before they got there. They have been saved a lot of hard work—and if the fire is in your plant—you have been saved a big loss.

It is up to *you* therefore, to organize a Fire Brigade among your own employes. It will take a little time and trouble and the cost will be an investment that will pay you a mighty dividend in the hour of danger.

To organize a Fire Brigade the Fire Chief in your own city is the best advisor you can have. He knows your plant. He knows the hazards—better than you do probably. He'll be glad to help you if he can possibly find time—for the Fire Chief is a mighty busy man.

However if his help is impossible, or if your plant is isolated, you can do the work yourself. Don't let it be left undone. You will find it interesting and profitable.

CHIEF—The first step in forming a Fire Brigade is to appoint a Fire Chief. For many reasons the Fire Chief should be someone of authority in the plant—the superintendent, maintenance engineer, or similar official with real authority. This official, however, is busy, so he should have an assistant to do the hard work, and take as much responsibility as possible. This assistant should be a young, active man, such as a foreman, knowing all the employes and able to call them by name. The Chief's duties are mostly executive while the Assistant Chief carries out his orders.

SIZE—The size of your Brigade should depend on the size of the factory or number of buildings. It is affected by the number of workers, the location

of the plant, its accessibility and extent of protection given by the public, character of the building itself, and the nature of the work being done. Also it may be affected by the exposure—that is the extent to which it is exposed to fire from outside sources.

The size of the Fire Brigade should depend on the factory construction, the number men available and the nature of the contents of the factory. It may consist of one company, trained to use a limited equipment of fire extinguishing apparatus, or, in the case of big plants, of several companies, equipped with a full line of fire apparatus, including pumping engines, hook and ladder trucks, chemical engines, etc.

BADGES for members of the Fire Brigade will cost little but will repay the expense many times over in the increased appreciation shown by the men of being chosen to serve.

The organization of the Brigade should be along the lines of a city fire company. Each company might include about 12 men, enough to man any piece of apparatus, or to operate hose lines, ladders, handle life nets, etc. Each company should have a captain and lieutenant appointed from the foremen or assistant foremen of the factory, whenever possible.

In large plants each company should have its own apparatus or at least its own duties or tasks. In case of an alarm, each company should assemble at a prearranged point. If chemical engines, trucks, hose wagons, or other apparatus is provided the houses where these are kept should be the rendezvous.

AUXILIARY—In large plants the Fire Brigade may be divided into two squads, one an Auxiliary Force of Emergency Men, and the other a body of trained fire fighters, to use the heavier apparatus.

The Auxiliary should make use of fire extinguishers, pails, axes and other small apparatus. They should attack the fire at once and attempt to put it out or at least to hold it in check until the Fire Brigade can get a hose line working.

The members of the Auxiliary should be at benches scattered about the floor so that one will be able to get to the fire without loss of time.

While the Auxiliary force is at work, and the employes are marching out, members of the regular Fire Brigade should hasten to their stations and take over the fight if the Auxiliary is unable to cope with the flames.

All members of the Fire Brigade should be young, active, strong and vigorous—men of intelligence. Men who do not thoroughly understand the English language are almost useless no matter how willing they may be. You need men who can understand and be understood instantly.

SUBSTITUTES—It is well to have a substitute for each member of the Brigade. Men frequently are absent from work and there should always be others to take their places.

Most factories have many small fires. A bit of oily waste starts to smoulder; a scrap basket is found smoking; or a tongue of flame is found in a rubbish heap. Frequently these fires are not reported to the office, but they

should be. Their number is an indication of the "housekeeping" standard of the factory.

To meet these emergencies any one of which might develop into a serious fire, provide each member of the Fire Brigade and Auxiliary with a pyrene fire extinguisher. This should be attached to his bench or machine, to the wall or to a post near by, ready for instant use.

Factories which have followed this plan find that it means much in stopping fires while they are small.

Upon the discovery of a fire, however, always sound the alarm, no matter how small it is. It is better to have what amount to a dozen fire drills than to take the chance of having a fatal fire. *Delay always means danger.*

Besides the regular fire drill there should be more frequent drills by the ladder and hose men, especially the latter. Hose is heavy and when the water is turned on, it is very difficult to manage. Hose under high pressure, if allowed to "get loose" will thrash about and has been known to cause fatal injuries.

It is not necessary always to turn on the water. The men must learn how to couple the hose, how to attach it to hydrants, and how to prevent kinking, which may cause it to burst.

Records of all drills should be kept, showing the time that elapses before the men are ready for the fire, the time taken to couple hose, to get water, etc. By pitting one company against another much greater efficiency will be obtained. Prizes may be given for speedy action.

In many large plants members of the Fire Brigade are paid a small sum in addition to their regular wages. A bonus is paid for each fire drill, and if they are called upon to fight a real fire a larger sum is paid.

ALARMS for Fire Brigade drills should be ordered only by the Chief or his assistant. It is a good plan for the Chief and his assistant to take turns giving the alarm so that only one person will know it is for a drill and not for a real fire.

As soon as the alarm sounds the engineer should blow the fire whistle and start the fire pumps. For the alarm a special whistle is best. Better yet, let it be a siren so it cannot be mistaken for the regular factory whistle.

All power—except to supply the pumps, and to run the lights and elevators—should be shut off instantly. All working machinery should be stopped.

Care should be taken by all members of the Fire Brigade not to interfere with employes leaving the building. Stairs and fire escapes must not be blocked with hose or other apparatus. No attempt must be made to lay hose until all are out, unless it is obvious that the safety of the employes demands instant action. That is for the officers to decide, and the firemen therefore should await orders before stretching hose up stairs or through exits.

SALVAGE CORPS—Besides the Fire Brigade and Auxiliary, plants with

big stock of exposed merchandise should have a salvage corps whose duty it is to prevent loss by fire and water.

For this purpose, the factory should have sufficient tarpaulins, stacked on hand trucks, ready for instant use.

These tarpaulins should be 12 by 18 feet and if they are properly folded they can be opened and spread by two men with great ease.

The first fold should be the long way of the sheet, reducing it to 6 by 18 feet. Another fold the same way will reduce it to 3 by 18 feet. Now, make a fold across reducing it to 3 by 9 feet and another in the same direction reducing it to 3 by 4½ feet.

When the tarpaulin is lifted off the truck one man should take either end and pull it out straight. It will require only two motions to spread it.

The salvage men should always take part in the fire drill. Contests in tarpaulin spreading, with prizes for speedy, efficient work, will go far to stimulate the men and in case of fire to reduce your loss.

HOW YOU CAN PREVENT FIRE STARTING IN YOUR FACTORY

1—Have regular inspections made.

2—Install the following appliances:

a—Waste cans.

b—Safety cans.

c—Metal ash cans.

d—Fireproof lockers for employes.

e—Wire guards on all gas and electric lights.

f—Other Fire Prevention Appliances.

3—Forbid the use of "Strike-anywhere" matches.

4—Provide a fireproof room where men may smoke. Forbid smoking elsewhere.

5—See that electric wiring is kept in repair and not abused.

6—Guard against spontaneous combustion in stock.

7—Get coöperation of employes.

CHAPTER III

Fire Prevention

IF JOHN SMITH, driving his automobile recklessly down the street, runs over you and breaks your leg, you expect John Smith to pay you damages for your pain and for your lost time.

If fire, starting from an avoidable cause, spreads from your factory to John Smith's factory next door, why should you not pay John Smith for the loss he suffers?

In both cases the injury could have been avoided by proper foresight. There is no difference whatever between the two cases. They are absolutely parallel.

Moreover, why should you not pay the city for the cost of saving your plant? Why should you not pay the firemen's salaries, for the water that was used, and a rental for the use of the fire apparatus? If you were hiring a typewriter you would expect to pay for it. Why not a fire engine?

That is the basis of that principle of law known as Personal Responsibility for Fires. Already several states have passed laws making the careless property owner responsible. The New York Courts have held that existing laws cover the case. Ohio has declared the principle is basic in the common law. Other states are quickly falling in line.

It is only necessary to show that a fire was preventable. And it is a fact that all fires except those due to arson, lightning, and explosion—are preventable in the last analysis.

It is cheaper to pay money to prevent fire than to collect insurance afterward. Constant watchfulness is the price of immunity. If, despite all you do, fire comes—it is proof that you have not done enough. Your meed of security is in exact ratio to your fire prevention equipment.

The trouble is that most property owners start with the idea of fire *protection* rather than fire *prevention.* They take precautions for fighting the fire *after* it starts but practically none to *prevent* its starting.

APPROVED APPLIANCES—The National Fire Protection Association was formed in 1897, as a Stock Fire Insurance Company. Since then it has broadened and now it includes in its membership many organizations interested in the Prevention of Fire.

Among the most important work of this Association, was the preparation of standards for fire fighting and fire prevention appliances. The preparation of these standards developed the need for extensive investigative work, so in 1901 the Underwriters' Laboratories was established in Chicago to examine and test all devices and appliances.

To establish means whereby purchasers might be assured of their acceptability by insurance companies, a label service was established.

Manufacturers of articles which have been tested and found satisfactory are privileged to attach a label to their product, the standard of which is maintained by regular inspections by representatives of the Underwriters' Laboratories.

The presence of the label on fire and other appliances may therefore be taken as evidence that they measure up to the highest standard and that they will be recognized by Insurance Rating Bureaus.

In equipping your plant with fire prevention appliances therefore be sure to get those approved by the Underwriters' Laboratories, Inc. These appliances are standard and where used will generally earn credits which may result in substantial saving in your insurance premium.

INSPECTION—The most important feature in fire prevention is a system of regular and rigid inspection. In plants where hazards are many, inspections should be made daily. There should be one at least every week in every plant, no matter what business it is engaged in.

These inspections should be very thorough and should be reported daily in writing to the office of the factory. Hence the inspector should be a man of intelligence and good judgment. His duties are:

1. To make regular inspections and to report his findings in writing daily.
2. To study the fire prevention and protection equipment; to understand their operation; and to keep the Fire Chief of the plant informed as to their condition.
3. To report on the work done by the cleaners.
4. To see that all rubbish, sweepings, refuse, contents of waste baskets, bins, waste cans, etc., are removed daily from the factory or stored in a fire-proof vault or enclosure protected by automatic wet sprinklers if practicable.
5. To see that waste bins, cans, safety cans, etc., are used by employes.
6. To see that ashes are removed daily and that they are not kept in wooden receptacles. If it is impossible to remove them, they should be stored in fire-proof cans.
7. To see that all company rules are obeyed, especially that forbidding smoking. To report violations of rules.
8. To check watchmen's reports and to instruct watchmen in the handling of the fire appliances, the starting of the pump, turning in fire alarms, etc.
9. To see that fire pails are kept filled.
10. To see that all soda and acid extinguishers are recharged at least once a year.
11. To test all fire doors, shutters, etc., and to see they are in good working order and to see they are not obstructed.
12. To keep sprinkler systems, hydrants, stand-pipes, valves, ladders, lanterns, etc., ready for instant service.
13. To report instantly wherever fire appliances are found to be missing or defective.

If it is impossible to employ an inspector exclusively for the purpose, this work should be done by the superintendent or manager. Department heads should be held responsible for the condition of their departments.

WASTE CANS[2]—Greasy or oily waste is liable to spontaneous ignition. If it cannot be burned at once approved waste cans should be installed. Cans should be kept in good condition. The self-closing lid should be in perfect working order and fit tightly. The cans should be raised at least 4 inches off the floor.

Waste Can

A sufficient number of cans should be provided, and their use should be insisted upon. They should be emptied each evening and the contents disposed of outside the building or burned.

SAFETY CANS[3]—Naphtha, gasoline, benzine or other volatile oils or liquids should be used in the smallest possible quantity and then only in approved safety cans. These liquids give off explosive vapors and should never be handled in open vessels. If necessary to do this, a separate fire-proof room with self-closing doors and automatic roof ventilators should be provided.

Safety cans should not be stored or filled in rooms where there are fire or open flames.

If workmen need something to cleanse their hands provide crude oil or kerosene—never allow naphtha, benzine or gasoline to be used for this purpose.

ASH CANS—A prolific cause for fire is the use of wooden boxes or barrels for holding ashes, cuttings, clippings, rubbish and other useless material. Refuse of this kind should be removed every day from the building. If this is not possible they should be stored in fire-proof vaults or enclosures protected by an automatic sprinkler if practicable. Most cities require the use of metal receptacles for ashes.

Safety Can

Ash cans should be of the approved standard type and they should be kept in good condition. They should be provided with two handles and the cover should fit tightly. They should never be over-loaded.

After ashes are removed from furnaces, stoves, boilers, etc., they should be allowed to cool and then placed in cans. Never should they be piled against combustible partitions.

The floors on which ash cans stand should be of fire-proof material. They should never stand on a wood floor.

2—See Fig. 32, Pyrene Fire Appliance Catalog. 3—See Fig. 31, Pyrene Fire Appliance Catalog.

LOCKERS—For employes' clothing provide strong, well ventilated metal lockers. The old fashioned closet of wood is a veritable invitation to fire. They should be discarded for sanitary reasons, if for no other.

Lockers should be provided for each employe and it should be insisted upon that they use them, and keep them clean and free from dust, or useless material.

Lockers should stand away from combustible partitions and it is better to provide special rooms with fire-proof floor for them.

Never permit employes to dry wet garments on steam radiators. This has started many a fire. Wet garments should be hung up to dry by circulation of air.

Never permit employes to leave matches of any kind in clothing while in the lockers.

The clothing of men employed in paint, varnish or dipping plants should be kept in lockers in a well ventilated room entirely of non-combustible construction, cut off by a standard fire-proof door.

MATCHES—The only kind of matches which should be permitted inside of a plant are the kind that strike only on the box. Employes found carrying any others should be suspended.

Wire Gas Jet Guard.

Metal receptacles should be provided for all matches.

SMOKING ROOM—You may forbid smoking, but there will be always found persons who will "take a chance." Therefore it is well to provide a room where the men can smoke. This room should be cut off from the rest of the factory by fire-proof doors. The floors should be of fire-proof material and safety matches should be provided.

For the rest of the plant, smoking should be absolutely barred. Large, conspicuous signs should be posted everywhere, calling attention to the "No Smoking" rule.

Too much cannot be said on the question of prohibiting smoking. The matter should be called frequently to the attention of employes. Small cards calling attention to the fact that fire will mean the loss of employment, can be placed in the pay envelope. At the same time, large signs, carrying out the same idea should be posted.

GAS JETS—All open flame gas jets should be provided with a wire guard[4] which will prevent the light coming in contact with inflammable material. If the jet is within 36 inches of the ceiling, a metal shield should be hung directly above the light.

All gas brackets should be of the rigid or non-hinged variety. No gas jet should be permitted to remain without a tip. Tips are cheap and fire is costly. Tipless gas jets have started many a fire.

Gas mantles always should be protected underneath with wire gauze. Car-

4—See Fig. 46 Pyrene Fire Appliance Catalog.

bon is frequently deposited on the mantle and this is liable to drop to the floor and start a fire. A globe closed at the bottom is far safer.

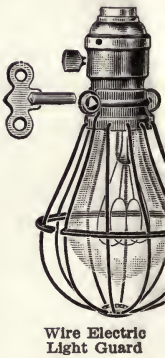
Never permit the use of paper shades on lamps, gas jets or electric light bulbs.

ELECTRIC WIRING—Electric light wires should never be used to hang anything on. Electric wires should never be hung on nails. This is liable to wear off the insulation and start a fire by short circuting.

Defective switches, fuses, sockets, etc., should be repaired immediately or replaced.

Employees should never be permitted to hang their hats or coats on electric bulbs. The heat generated by a light is ample to start a fire.

Wire guards [5] should be provided for all incandescent bulbs, particularly over or around machinery.



Wire Electric Light Guard

Pyrene extinguishers are the only kind which will kill electrical fires without danger to the operator.

SPONTANEOUS COMBUSTION—There are so many ways in which fire may be generated that it would be impossible to list them all in one small book. But there are certain rules which should be observed to prevent fires starting in this way.

Broadly speaking, remember that all oil is dangerous, and that moisture will increase the danger.

Great care should be taken in the storage of raw materials liable to start chemical action when combined with others.

The more tightly material is packed the more easily will it start to burn. If the outside is damp the danger is increased as the moisture will prevent the escape of the heat.

A piece of oily waste compressed in a corner and allowed to lie unmolested will burst into flames in a comparatively few hours.

In view of this, great care should be taken in the disposal of material of this kind. Waste material should be thrown out of the plant or burned every day. Under no condition should it be kept in other than covered metal receptacles of approved type.

It should be remembered that electricity is a potent force of destruction, and it should be kept always under control by the most up-to-date methods. Electric installations of all kinds, repairs, etc., should never be made except by a competent electrician and in every respect they should conform to the requirements of the National Board of Fire Underwriters.

The question has been asked whether fire prevention prevents. It can best be answered by a recent report by Fire Commissioner Adamson of New York which shows that in return for $1,000,000 spent on fire prevention in the last five years the city has reduced its fire loss $23,000,000. *Isn't it worth while to spend one dollar to save $23?*

5—See Fig. 46, Pyrene Fire Appliance Catalog

WHAT YOU NEED TO FIGHT FIRE IN YOUR FACTORY

1—Pyrene extinguishers.

2—Soda and acid extinguishers.

3—Water pails and casks.

4—Bucket tanks.

5—Chemical engines.

6—Axes and hooks.

7—Stand pipes and hose.

8—Sprinkler system.

9—Fire alarm.

CHAPTER IV
Fire Protection

IN SPITE of all your care and precautions fire will break out. Hence you must be prepared to extinguish it if you can, or to control it until the fire department arrives.

Most fires are discovered soon after they start. At that time they are small and can usually be extinguished easily. What is needed is something to nip the incipient blaze in the bud; something that will kill any kind of fire. This is found in the greatest degree in the one-quart pyrene extinguisher.[6]

For general use there is nothing in the same class with this extinguisher. Pyrene is efficient on all kinds of fire. It will kill burning gasoline as easily as a blazing waste basket. An acetylene gas fire yields instantly. Water makes such fires worse. Water will spread a fire in gasoline, benzine, kerosene or other volatile oil.

On electrical fires pyrene works like magic. The liquid is a non-conductor. It has been used to quench an arc of 110,000 volts without injury to the operator, and is the ONLY one which is safe and efficient.

Pyrene

There is no mystery about it either. Fire needs oxygen. When pyrene is heated to 200 degrees Fahrenheit, it is transformed into a heavy gas. This wraps itself around the fire like a blanket. Without air, the fire goes out *instantly*.

Pyrene has the additional advantage that it will injure nothing but fire. The finest fabrics, the most delicate colors, are unaffected by it. It will not harm electrical installations of any kind or corrode metal. Water will do both.

Pyrene is not affected by age. It is good until used,—ready when needed. There is no expense for upkeep as in the case of the soda and acid extinguisher, which must be recharged at least once a year to give reasonable certainty of operation. The efficiency of pyrene is never in doubt by reason of deterioration of contents, as in other extinguishers. Furthermore pyrene will not freeze at 50 below zero so that it is safe to use in exposed or unheated places.

These features make pyrene pre-eminent as a first line of attack on fire. Its small size—it is only 14 inches long and weighs less than 6 lbs.—and its simple, yet powerful double-acting pump, make is as efficient in the hands of a woman—even a ten year old boy—as in the hands of a man.

6—See Fig. 1, Pyrene Fire Appliance Catalog.

Equip your factory with pyrene and you can feel a measurable sense of security from fire. Its simplicity and the ease with which it is operated makes everyone of your employes a fireman—even if most of the workers are women.

Pyrene should be placed in the special brackets which come with it on the wall or on posts about five feet from the floor. Special wall boxes[7] of wood or metal also may be obtained. These boxes prevent tampering and meddling with the extinguisher, to obtain which you must break the glass front of the box.

To identify the location of pyrene, as well as other fire protective devices, it is well to paint the back ground red or to make it striped, like a barber's pole. This will enable anyone to locate the article at once even at a distance.

Pyrene is especially recommended for varnish, paint and oil risks, and for plants in which gasoline, benzine, kerosene, naphtha or other volatiles are made or used.

Install pyrenes for each dip tank, japanning oven or similar hazards. These extinguishers should be placed close at hand for use in sudden emergency.

Sectional View of Pyrene

There should be an extinguisher at the head and foot of each stairway. In the oil room, one should be placed just inside the door. The switchboard particularly needs protection. A stoppage of the power would mean a big loss. Where individual dynamos are used there should be an extinguisher close to each.

Other places especially needing pyrene protection are the office, stock room, shipping and receiving departments.

No instruction whatever is needed in the operation of pyrene. Any one of your workmen can use it at first sight. It requires nothing except to turn the handle slightly to the left and then pump.

The liquid should always be directed at the BASE of the flames. This is the way to get quick action.

Should the fire be in an open vessel, such as a pail, it is best to direct the stream against the inside wall of the pail, NEVER into the blazing fluid. It will simply sink to the bottom before the fire gets a chance to heat it and turn it into gas.

CHEMICAL EXTINGUISHERS[8]—In free burning fires—that is, wood fires,—where there is much draught, the soda and acid—or 2½ gallon Guardene extinguisher—finds its principal sphere of usefulness.

Soda and acid extinguishers kill fire by "wetting down"—cooling the burning material below the point of ignition. Where a volume of liquid is required they are most useful.

7—See Fig. 2, Pyrene Fire Appliance Catalog. 8—See Fig. 4, Pyrene Fire Appliance Catalog.

Soda and acid extinguishers bearing the Underwriters' label should be conspicuously placed on the walls or hung on posts five feet from the floor. These should be placed systematically about the building convenient to all parts of each floor.

There are several drawbacks, however, about all soda and acid extinguishers. The principal one is that they must be periodically recharged. Once a year at least they should be tested, the contents emptied through the hose as if on a fire by inverting the machine.

Guardene Soda and Acid Extinguisher.

While soda and acid extinguishers must be installed in many cases to meet underwriter's requirements, they require regular attention. Unless they are recharged once a year they cannot be depended upon. Where there are many of these extinguishers in use the upkeep cost is a not insignificant item of expense.

Great care must be taken not to get the mixture on one's clothing or anything else of value. The materials used to charge the extinguisher are four ounces of sulphuric acid and a pound and a half of bi-carbonate of soda. The acid will discolor or eat holes in anything it touches except metal, which it corrodes. These extinguishers will put out the fire but they may cause much damage.

Soda and acid extinguishers will freeze. In that case they are likely to burst or to be so strained as to render them useless. Hence they should never be placed in an exposed location or left in an unheated building.

After these extinguishers are tested, they should be thoroughly washed out, especially the hose which may be rotted if the acid mixture is allowed to remain in it. The soda solution also has a habit of "creeping." Crystals form on the inside wall of the extinguisher and spread through the hose. This is very dangerous, as, if the hose becomes clogged, the tank may burst under the terrific gas pressure generated by the mixture of the soda and acid.

"DRY POWDER" USELESS—So-called "Dry Powder" extinguishers are worse than useless as they give a false sense of security. They consist of nothing but bi-carbonate of soda,—the saleratus of the kitchen,—worth a few cents a pound, in a tin tube. They are little more use than sand, flour, or plaster of paris in putting out fire.

CHEMICAL ENGINES[9]—These are simply larger editions of the 2½ gallon extinguisher. They are furnished in 21, 25, 40, 45, 60 and double 35 gallon sizes. Their operation and care are the same as in the smaller type.

Chemical engines are generally mounted on two wheels with handles so that they can be dragged about a plant. These machines should be so placed that they are accessible at all times and goods should never be piled in front of them. An open aisle should always be left wide enough for them to be taken easily around the floor. And they can be shipped from floor to floor in case of need by means of elevators.

21 Gallon Guardene Chemical Engine

FIRE PAILS[10]—Twelve fire pails are required to each 5,000 ft. of floor space. Pails should be of galvanized iron and they should be hung from wall brackets or set on shelves not less than three nor more than five feet from the floor.

Pails must be painted a bright red and be marked "FOR FIRE ONLY." Their use for other purposes should be forbidden and penalized.

Fire pails never should be placed on the floor, on stock shelves, radiators, window sills, desks, boxes, or work tables or anywhere that they may be knocked over or hidden.

Pails should be arranged in sets of two to six according to the number in service, well distributed over the floor.

CASKS—Where water casks are provided, pails should be close by. The casks also should be painted red and be marked "FOR FIRE ONLY" in letters large enough to be read easily.

If the building is not heated or if the pails and casks are exposed to low

9—See Figs. 8 to 13, Pyrene Fire Appliance Catalog.
10—See Figs. 21, 24, 25, 29 and 30, Pyrene Fire Appliance Catalog.

temperatures freezing may be prevented by mixing with each gallon of water one and one-half pounds of salt or calcium chloride.

NON-FREEZING SOLUTIONS—If water casks, pails, bucket tanks, etc., are exposed to low temperatures means should be taken to prevent freezing. This can be accomplished by adding calcium chloride to the water. The following table shows the amount of calcium chloride to use to lower the freezing point of water to any given degree:

Acid or Water Bucket.

Freezing Point Desired	Calcium Chloride to Gallon
29 degrees	½ Pound
27 "	1 "
25 "	1¼ "
23 "	1½ "
21 "	1¾ "
18 "	2 "
14 "	2¼ "
10 "	2½ "
Zero	3 "
8 below	3½ "
17 "	4 "
27 "	4½ "
39 "	5 "
45 "	5½ "

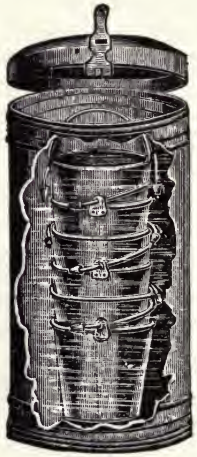
BUCKET TANKS[11]—Bucket tanks are a combination of the cask and pail. In this case the pails are immersed in water. The handles rise up automatically when the lid is lifted and as each pail is taken out the handle of the next pail comes up.

The same rules which apply to the cask and pails should be followed as regards the bucket tank.

Particular care should be taken to see that all pails, tanks, and casks are refilled at frequent intervals with clean, fresh water or solution. They also must be watched carefully to detect evidences of decay or corrosion. Papier mache pails are inclined to get soft after a while and they are easily punctured.

The flat bottom pail also will be found preferable to the round bottom pail. In the latter case the employe who carries two pails to a fire will find that he will spill one when he sets it down to empty the other.

There are many drawbacks, however, to the use of pails as it will be found practically impossible to throw water accurately from a pail. Extinguishers are far better.



Sectional View of Bucket Tank.

YARD HYDRANTS[12] should be standard and have two or more 2½ inch outlets with separate valves.

11—See Fig. 28, Pyrene Fire Appliance Catalog.

12—See Fig. 149, Pyrene F. A. Catalog.

See that the threads on the outlets correspond exactly to those on the public fire department hose. If there is no public department, the threads always should correspond to the hose couplings of the nearest factory to yours. Of course the hose in your own plant should be equipped to fit these hydrants.

Fire Pail.

Hydrants found leaking should be repaired immediately. Hydrant stems and caps should be kept well oiled and not allowed to get jammed. Should the arrow indicating the direction to turn the valve for opening become obliterated see that a new arrow is painted or chiseled on the hydrant at once.

Every hydrant should be flushed once a year, but this should not be done in winter as there is too much danger of freezing up after the test.

YARD EQUIPMENT—In large factories a hose house should be built over the hydrant to hold the fire fighting equipment. The equipment for a small hose house should include:

150 to 250 ft. of hose.[13]
2 Play Pipes with 1⅛-inch opening.[14]
2 Fire Axes.[15]
2 Crow Bars.
2 Ladder Straps.[17]
Lantern (see that it is kept filled).[18]
6 Spanners.[19]
Extra Hydrant Wrench.
Extra Hose Coupling Washers.[20]

Hose should be coupled and attached to hydrant, with play pipe ready for immediate use.


Ladder Strap for Hose

Hydrants should be provided with a wrench and an extra wrench should be hung in the hose house.

Hose should be folded so it can be drawn out without twisting or kinking. Extra hose should be on shelf rolled up.

All cotton rubber lined hose should be tested once a year, the pressure being 100 to 125 lbs.

All cotton rubber-lined hose should have water run through it twice each year to give life to the lining. Before replacing the hose in the house see it is drained properly and that the jacket is dry to prevent mildew.

Never test unlined linen hose with water. This hose rots easily and should be kept dry.

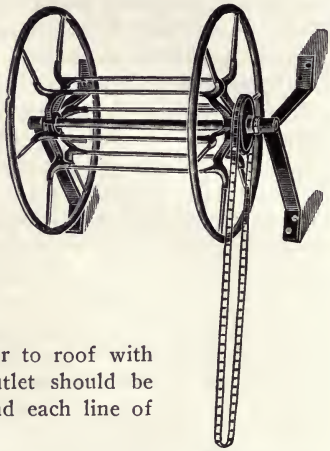
Hose houses should be clean and airy and free from insects, rubbish, etc. The roof and doors should be weather-tight and the door should be far enough above the ground so that it cannot become frozen in winter.

INTERIOR WATER SUPPLY—Every factory should be equipped with a stand-pipe with sufficient water pressure to fight fire. Frequent inspections are necessary to detect deterioration of hose or clogging of pipe.

13—See Figs. 95 to 100, Pyrene F. A. Catalog.
14—See Figs. 137 to 146, Pyrene F. A. Catalogue.
15—See Figs. 183 and 184, Pyrene F. A. Catalog.
17—See Fig. 180, Pyrene F. A. Catalog.
18—See Figs. 201 to 204, Pyrene F. A. Catalog.
19—See Figs. 119 to 124, Pyrene F. A. Catalog.
20—See Fig. 109, Pyrene F. A. Catalog.

Hose for interior use should be unlined linen. The couplings should have the same thread as the fire department hose, or the hose of the nearest neighboring factory.

The hose should be kept on a swinging rack or reel[21] about five feet from the floor. It should be kept free from all obstructions and should be so wound that it can be stretched without twisting or kinking. Each rack should be provided with sufficient unlined linen hose so that all parts of each floor may be reached by a stream.



Wall Bracket Hose Reel

Every hose station should be indicated by a metal sign bearing the words in red, "FIRE HOSE."

All stand-pipes should extend from cellar to roof with a hose connection on the roof. Each outlet should be controlled by a valve operated by hand and each line of hose should be equipped with a play pipe.

The shut off[22] nozzle is superior to an open nozzle as it will enable the user to shut off the water when the fire is out.

Shut-off Nozzle

Should hose become uncoupled, wire should never be used to reattach the couplings. No matter how tightly the wire may be twisted the coupling will blow off under normal water pressure, even if the wire does not cut the hose. Iron wire will rust and quickly rot the jacket.

If it is necessary to recouple hose, get it done by the local fire department with expansion rings. If there is much of this to be done, it will pay to equip your machine shop with a set of expanding tools.

Provide your local fire department with a plan of your factory, showing all fire fighting equipment, location of extinguishers, axes, hose, fire pails, stand-pipes, etc. This may save you a large sum of money in case of a night fire.

See that all employes are familiar with fire fighting equipment even if not members of the Fire Brigade.

Stand-pipes should have a Siamese connection[23] on the sidewalk so water can be supplied from the city fire apparatus. These outside connections should be plainly marked with the words "STAND-PIPE."

Keep close watch on all stand-pipe valves. If a leak is discovered see it is repaired immediately.

21—See Figs. 82-94, Pyrene F A. Catalog. 22—See Figs. 129 to 131, Pyrene F. A. Catalog.
23—See Figs. 150 to 153 and 155, Pyrene Fire Appliance Catalog.

If there is any question as to the serviceability of the hose a length should be submitted to the local fire department for a pressure test. *If defective it should be replaced at once.*

Each hose station should be provided with an axe, a lantern, a saw, two spanners, and a supply of rubber gaskets.

Siamese Connection

SPRINKLER SYSTEMS—The question of sprinkler systems is such a big one and so important to the factory owner that it is impossible to cover it in a manual of this kind.

Certainly the modern sprinkler system is an excellent basic protection for a factory. Several reputable companies will install a system in your plant. The reduction in insurance rates will soon pay for the equipment.

While the sprinkler system has saved many buildings from destruction and may save yours, should occasion arise, it is far better to be able to stop an incipient fire *before* the sprinkler heads begin operating by using an extinguisher.

Once the sprinkler system begins to operate it must be turned off by hand or it will continue to run until the tank runs dry if that is the source of its supply.

Thus, it can be seen that a small night fire might open a sprinkler head, be extinguished, and the water continue to run until the next day. In that case, much damage might be done by water to stock, machinery, fixtures, building, etc.

By far the best way is to employ a watchman and install a signal system which will compel him to make frequent rounds of the factory. In this way much loss may be prevented. The opening of a sprinkler head through accident might cause more damage than the wages of a watchman for a year.

SPRINKLER ALARM—An automatic alarm, which will be sounded the instant a "head" opens, should be attached to the sprinkler system.

This alarm will give instant warning all through the plant, and in the office will show the exact location of the trouble. These alarms also can be attached to the city fire signal system so that headquarters can send apparatus to the building without delay.

It the "head" should be knocked off, or open accidentally, the warning will enable the flow of water to be stopped before great damage is done.

WATCHMAN—The watchman should be instructed in the operation of

all means of fire protection and prevention. He should be a strong, able bodied man, trustworthy and honest. It is very laudable to give an aged or infirm employe a position as watchman, but it is far better to pension him than to give him a position, in which when put to the test he might be found wanting. It is unwise to trust a valuable building to the care of irresponsible watchmen.

A watchman should not be given so many other duties that he cannot perform his task properly. He should not be called upon to fire boilers, do janitor's work, act as messenger, or do other work which will require his being present in any one part of the plant for any length of time.

A watchman should never be permitted to smoke while on duty, and he should be a total abstainer.

A watchman should be familiar with the exact location of all fire apparatus on the premises and understand the manner of its use. He should give frequent tests to this apparatus and if found defective, should make an immediate report.

The watchman should be familiar with all fire alarm stations on the premises. He should know the telephone number of the fire department, and location of the nearest street fire alarm box.

It may seem unnecessary to suggest it, but the watchman should always be familiar with the name and address of the firm for which he is working. There have been many cases where watchmen have telephoned an alarm to Fire Headquarters and been unable to tell just where the plant was located.

The watchman also should be provided with the telephone numbers of the factory owner, superintendent, and other officials.

Never permit the watchman to carry other than safety matches. A safety lantern, or better yet, an electric lamp should be provided for his use.

The superintendent of the plant should frequently check up the watchman's report, and where a time clock is used, should see that the stations are covered regularly. Where irregularities are noted the watchman should be called upon for an explanation.

Every part of the plant should be visited at least once every hour. If this is impossible for one man to accomplish then put two or more on duty.

The watchman should be provided with, and made to carry a pyrene extinguisher in a holster, that he may be ready to fight fire the moment he finds it.

COMMON HAZARDS THAT IMPERIL MANY PLANTS

1—Boilers, radiators and furnaces.

2—Electric light, heat and power.

3—Gas light, heat and power.

4—Oil lamps.

5—Candles.

6—Torches.

7—Dirty chimneys and flues.

8—Static electricity.

9—Spontaneous combustion.

CHAPTER V

Common Hazards

IN EVERY BUILDING of every kind, there are danger spots or hazards, as they are technically called. Hazards attendant upon light, heat and power are known as Common Hazards, while Special Hazards are those which arise as a consequence of a particular business or occupancy.

ELECTRIC LIGHTING—See that all wiring is protected from accident which may result in short circuit. Telephone, telegraph, messenger and other special wires should be prevented from getting in contact with electric light wires. Wires should never be allowed to sag.

If wires run close to easily inflammable material, all switches, cut outs, etc., should be enclosed in metal or metal lined cases. The catch and hinges on such cases should be kept in good working order.

Volatile gases and vapors are likely to be ignited by electric sparks. Hence, switches, fuses, etc., should never be installed in rooms where such gases may be generated.

See that fuses are made of proper material. Wire, nails, etc., are very dangerous, and should never be permitted.

Motors should be kept clean and well oiled. There is great danger where the commutator becomes clogged with dirt.

Hanging lamps should always depend from approved wire cord. which must not be allowed to touch or swing against anything.

Portable lamps should be protected by heavy wire guards[25]. Never use shades made of paper or other inflammable material on electric light bulbs.

Electric heaters, ovens, furnaces, welding machines, etc., should be guarded with metal shields and should be set a safe distance from the floor and wall. It is better, however, to consult the National Board of Fire Underwriters as to these points.

The *only* means of killing an electric fire *instantly* is the pyrene extinguisher. Other extinguishers are dangerous to the operator.

GAS LIGHTS—Pressure at the tip should not exceed four ounces, nor be less than one ounce. This is for light jets. Where gas is used for power, a higher pressure may be allowed.

Valves should be installed outside the building so the supply can be shut off. This valve should be marked so it can be identified instantly.

Meters should be far removed from any open flame. It is better if they are in a fire-proof room, well ventilated from the outside.

25—See Fig. 45, Pyrene Fire Appliance Catalog.

Gas brackets should all be of the rigid type, or so safeguarded with wire guards[24] that they cannot be pushed against walls, curtains, etc.

Open flames or mantles, less than 36 inches from the ceiling, should be guarded above with a metal sheet having an open air space above it, or by a hanging bell.

If a gas jet is not in use, see that the tip is sealed and the valve locked. Have this done by a gas fitter. Never plug it with wood, paper, chewing gum, etc. Jets should never be permitted to remain without tips. This is a frequent cause of fire.

Gas mantles should be protected underneath with a wire screen to catch particles of heated carbon. Closed bottom globes are better.

Frozen gas pipes should never be thawed out with an open flame.

Never allow paper shades of any kind to be used on gas lights, nor allow paper to be pasted on glass or metal shades.

Electric wires should never be attached to gas pipes.

Furnaces, ranges, ovens, etc., which have more than one burner, should have a single valve by which the entire supply can be cut off.

Flexible tubing is highly dangerous. It should be watched closely for leaks, and new tubing provided the instant it is found to be defective.

ACETYLENE GAS—Tanks should be of approved type. Only generating machines approved by the National Board of Fire Underwriters should be permitted. Generators should always be in a special building. If this is impossible, see that no open flame is allowed within 15 feet.

The generator room should be absolutely dry. Generators should be recharged and cleaned only in the day time—never by artificial light.

Never throw used material into sewers, drains or waste pipes.

Always put in fresh water when the carbide is renewed. The stock of calcium carbide must be kept in an air and water-tight can, which must be kept away from the main building, under lock and key and not exposed to weather.

Tests should be made frequently to locate leaks by the sense of smell. Never hunt a leak with an open flame.

Never throw water on an acetylene gas fire. It will only make things worse. A pyrene extinguisher is the *only* kind of any use whatever.

OIL—All oil lamps should be of metal. Glass lamps are exceedingly dangerous and should never be used.

Lamps should never be filled " to the brim " nor should they be allowed to burn out entirely dry.

Lamps should be made with broad bases to prevent upsetting.

Lamps in fixed or swinging fixtures should never be in contact with anything.

Ceilings above lamps should be protected by metal with an air space above

24—See Fig. 46, Pyrene Fire Appliance Catalog.

it or by a suspended metal sheet if the lamps are within 24 inches of the ceiling.

Never allow wicks to burn so short they do not reach the bottom of the oil chamber. They should be trimmed daily and by daylight. Wicks never should be permitted to become charred and hard.

Paper or pasteboard shades are exceedingly dangerous and should not be permitted. Never allow paper to be attached to glass or metal shades on any lamps.

Inflammable decorations should never be allowed on chandeliers.

Cracked chimneys should be replaced at once, or the lamp should not be used.

Remember that water will scatter blazing oil or gasoline.

Pyrene kills such fires by cutting off the air supply. It kills the fire instantly.

CANDLES, LANTERNS, TORCHES—None of these devices should be allowed to burn when no one is present. Their use should not be permitted at any time, but if it is absolutely necessary, the greatest care should be taken.

For candles, provide a metal holder with a cup to catch melted wax.

Never allow the use of gasoline torches with a gravity supply. If they are necessary, see that they are as far removed as possible from inflammable material.

When visiting dark cellars, closets, etc., use an electric flashlight, never an open flame light.

Always store these lighting devices in a fire-proof enclosure and outside the main building, where practicable.

Heating Hazards

All boilers, furnaces, radiators, heaters, steam pipes, ovens, and similar devices should be protected by metal shields with space to allow the circulation of air between the shield and the wall. They should be set on brick, concrete or earth spaces and never on wood.

To fix the distance of heating devices from the wall or ceiling, test with your hand. If the wall or floor feels hot a screen is needed.

If there is the slightest doubt regarding the proper protection for these things you had better consult a representative of the National Board of Fire Underwriters.

CHIMNEYS AND FLUES—Metal stacks passing through a building should be surrounded by a brick wall with a four-inch space between the stack and the brick. This wall should extend through all floors and out above the roof. Chimneys supported on floors or on wooden beams are exceedingly dangerous.

Smoke pipes should not be permitted to pass through plaster or wooden

partitions. If unavoidable they should be protected by sheet iron guards, permitting a 6 inch space between the pipe and the partition.

Open fire places always should have wire screen spark guards.

Safeguards are needed around electric radiators and other devices. They should never be placed against inflammable material.

A one inch air space should be allowed between all hot-air pipes and metal flues and partitions or floors through which they pass. The partition or floor should be protected with a metal sheet.

Hot-air pipes from furnaces should never be less than six inches from any woodwork unless the woodwork is protected with metal or unless the pipe is covered with a fire-proof packing. In that case the pipe may be run within three inches of woodwork with safety. Hot-air pipes of this character should never be permitted to run through a wooden partition within eight feet from the furnace.

Where hot-air pipes run through combustible partitions they should be protected by an outside pipe with a half-inch space between the two, or they should be covered with at least one-half inch of asbestos. Wooden laths should not be used on partitions through which hot-air pipes are run.

Hot-air pipes in closets should be protected by an outside pipe, with at least one inch space between them.

Steam pipes should never be in contact with combustible material of any kind. They should rest on metal hangers, and where they pass through partitions there should be at least one-half inch air space between the pipe and the combustible material. The latter should be protected with a metal sleeve.

Pipes used for the principal supply of steam should be protected with an asbestos covering. Where they pass through a wooden partition there should be at least one inch space between pipe and partition.

Power Hazards

The question of the power hazards of your plant is so basic that it is better that you call in an expert before attempting to make any radical changes.

Only general directions can be given regarding the installation and location of such things as steam boilers, electric motors, gas engines, etc.

Wherever possible a separate building of fire-proof construction should be provided for all power and heating equipment. If this is impossible a fire-proof compartment should be constructed to house the power equipment. If this is properly cut off from the building by fire-proof, self-closing doors the danger can be minimized.

Fuel should never be stored against a boiler wall or in wooden enclosures. Many kinds of fuel are liable to spontaneous ignition and it is far better to have them stored in fire-proof vaults.

Never permit ashes to be stored or dumped upon a wooden floor. If impossible to remove them at once from the building they should be placed in metal containers and removed from the boiler-room each day.

Never store combustibles, refuse, oils or anything else in the boiler or engine-room. It is exceedingly dangerous. Only sufficient oil for one day's use should be permitted in the engine-room.

The tops of boilers are no place for workmen to dry their clothing. Many a fire has been started in this way.

See that motors are installed in dry and airy locations. Free access should be had to the motors at all times. Always provide metal drip pans under motors to catch oil. You may save a fire by doing this simple thing.

All motors should be inspected regularly by a competent man, whose duty it is to see that they are kept in perfect working order.

All power plants should be protected by pyrene extinguishers. They should be placed in brackets beside the main entrance to the room.

Gasoline Engines

Gasoline engines are one of the most dangerous of hazards. The use of gasoline is always attended with danger.

Gasoline engines particularly should be installed in separate buildings, or at least in thoroughly fire-proof rooms, with brick, stone, concrete or earthen floors and fire proofed walls and ceilings.

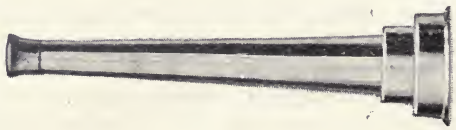
Under no circumstances permit gasoline engines to be located in rooms where there is dust or inflammable particles in the air, or where material of any kind is stored. Oily and greasy waste and rags should be burned as soon as they are used. If this is impossible, they should be placed in oily-waste cans.

The engine-room should be lighted by electricity and not from any open flame. Pyrene extinguishers should be placed on the wall close to the engine, ready for instant use.

Pyrene is the ONLY type of extinguisher that is 100 per cent. efficient on all gasoline or oil fires. Water makes such fires worse by spreading them.

All exhaust pipes from gasoline engines should be carried out over the roof of the building and never should be permitted to exhaust within ten feet of any wall opening. These pipes get exceedingly hot and should never be allowed within nine inches of any woodwork.

The gasoline supply tank should invariably be under ground. It should never be attached to the walls. Gravity feed is highly dangerous.



HOW TO ELIMINATE SPECIAL HAZARDS THAT THREATEN YOUR FACTORY

1—Isolate All Rooms where Oils, Paints, Varnish, and Other Chemicals are Stored.

2—If Rooms Are in Factory, Have All Doors of Approved Self-Closing Fire-Proof Type.

3—Protect All Oil, Gasoline, Acetylene Gas and Electrical Risks with Pyrene.

4—Have Extinguishers Close to All Japanning Ovens, Dip Tanks, Mixing Kettles, etc.

5—Keep All Combustible Material Away from Acids.

6—Provide Drip Pans for All Machines.

7—Have Your Plant Inspected by a Fire Prevention Engineer.

8—Act on His Advice.

CHAPTER VI

Special Hazards

ASIDE FROM the common hazards, incidental to light, heat and power, every factory has special hazards that always attend the work being done or the manner of doing it.

Special hazards are numerous. The unfortunate point is that the factory owner being used to conditions fails to recognize the danger spots. It requires an outside viewpoint to see them.

This is where the inspector can help most. His eye is trained to recognize conditions which are hazardous. He may never have been inside a similar plant before yet his trained senses take in every detail. The raw material, the method of handling, and the various steps taken to complete all products are much the same, and the inspector goes about knowing where to look for danger spots.

It is natural to find shavings and sawdust on the floor of a woodworking plant, yet in well managed factories these fire-nests are kept down to a minimum. The owner probably never thought of it in that light, but the inspector sees at once and points out what is needed.

Owing to the diversity of special hazards it is impossible to cover them except in the most superficial way. However, there are certain hazards found in many plants which might be mentioned.

FURNACES—Many factories and workshops contain a range or small furnace of some sort. These require a special setting and arrangement and ducts are needed for carrying off heat and vapors. All hot-air ducts need automatic dampers. In passing through partitions, walls or floors, air space should be left between the ducts and the combustible wall or partition. The same is true of all stove pipes.

Ranges, forges, furnaces and ovens are especially dangerous in rooms where woodworking, varnishing, painting or upholstering is going on, as well as places where inflammable liquids are stored or used.

DUCTLESS HEATING SYSTEMS—These are found in old buildings and are exceedingly dangerous. This antiquated plan makes use of the air spaces, of walls, floors, partitions, etc., to circulate hot air from the furnace. It has started many fires and should never be allowed to exist in a factory buildings.

WELDING—Where acetylene gas is used for welding only approved apparatus should be used. Great care should be taken with generating machines. (See Common Hazards—Acetylene Gas.)

FORGES—Forge flues should be of metal and the floor under the forge should be of metal, brick, concrete or other fire-proof material.

Portable forges should have ash pans at least 8 inches above the floor.

The flooring under all anvils, drop hammers, etc., should be of metal, concrete or brick.

DIP TANKS AND MIXING KETTLES—Oil stills, bleachers, varnish and japan boilers and similar receptacles should be operated in isolated fire-proof buildings, and so installed that if the contents of one take fire the flames cannot spread to another.

If not in a separate building, the room where such work is done should be sheathed in metal and have self-closing fire-proof doors with sills raised several inches above the floor.

See that pyrene extinguishers are always at hand as they are the *only* kind which will instantly quench such fires in their earlier stages.

Kettles should be as small as possible. They should be provided with close-fitting, self-closing lids and should be kept covered when not in use.

The direct application of fire to heat such kettles or tanks is exceedingly dangerous. Kettles should be heated by steam, but if this is not possible use water-jacketed containers. Small kettles may be set in pans large enough to catch any over-flow of boiling contents.

INCUBATORS, BROODERS—The use of gasoline or kerosene for heating should be absolutely prohibited. Use only electricity, hot water, or coal—and then watch them very closely.

PLATING—Great care must be taken in the handling of acids, particularly nitric. Electric wiring particularly should be protected from acid. Drying boxes should be made only of metal.

PICKERS—Cotton, moss, hair, excelsior and other pickers and shredders should be in isolated fire-proof buildings or in fire-proof rooms, with self-closing fire-proof doors. The rooms should be protected with sprinklers. Pyrene should be kept just outside the doors.

The rooms should be cleaned every day and no combustible material stored in them at any time.

See that all machine bearings are free from dust.

BUFFS—Dust from buffs is highly inflammable. Buffing rooms should be metal sheathed. Blowers should draw all dust from the wheels and convey it outside the building or deposit it in a fire-proof vault, ***never into a furnace.*** Rooms should be well ventilated and walls should be kept free from dust.

Provide chemical or one-quart extinguisher plentifully for such rooms.

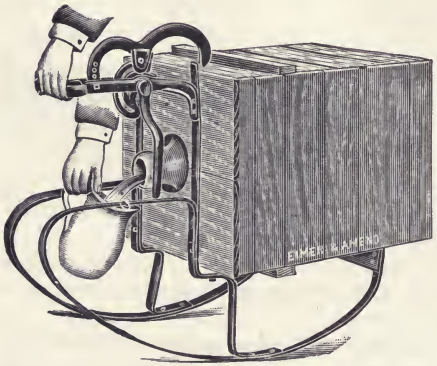
DRIP PANS—All machines, machine bearings, etc., should be provided with drip cups or pans which should be emptied each night. Also see that metal borings or shavings which are oily do not fall to the floor. They should be deposited in metal receptacles.

CHEMICALS—The mixing of chemicals may be highly dangerous and should always be done with great care, in isolated buildings. If this is impossible, the mixing room should be fireproof throughout with good outside ventilation, free from open flames, and lighted by electricity. Use only vapor-proof lamps in keyless sockets. All switches should be outside the room.

Always equip the room with pyrene extinguishers.

Acid containers should be stored outdoors, wherever possible. If kept inside, the room should be well drained and ventilated. The fumes of some chemicals, especially nitric acid, may interfere with fighting a fire, if they do not prove fatal. Many chemicals develop intense heat upon the application of water.

Hay, excelsior, paper, shavings, sawdust, etc., should never be stored close to carboys of acid. A broken carboy might mean a serious fire.



Carboy Inclinator

To prevent accidents carboy inclinators[26] or syphons[27] should always be used in pouring out contents. This will serve the double purpose of protecting the plant against fire and employes against injury. Each carboy in use should stand in a lead-lined pan, deep enough to hold the entire contents of the carboy.

Calcium carbide will generate acetylene gas if mixed with water. Great care should be taken to see it is kept dry. (See Common Hazards—Acetylene Gas).

Sulphur is dangerous because of the low temperature at which it takes fire—about 480 degrees of Fahrenheit.

Nitrate bags should be burned or thoroughly washed when emptied. Partial washing may make the bag even more combustible.

The foregoing are only a few of the well recognized chemical hazards. The mixing of any chemicals *may be very hazardous.* Experiments by other than experienced chemists, and then only with minimum quantities and in perfectly fire-proof rooms—should be absolutely forbidden.

GASOLINE TESTING ROOMS should be located in isolated buildings. If this is impossible, rooms should be protected as for chemicals.

Always equip gasoline testing rooms with pyrene entinguishers. They are the only kind that can deal with volatile oil and all chemical fires.

26—See Fig. 27, Pyrene Fire Appliance Catalog.

27—See Fig. 26, Fire Appliance Pyrene Catalog

REFRIGERATION PLANTS are dangerous hazards and should be installed in isolated buildings. If this is impossible, the plant should be located in a cut-off section of the main building. No light other than electric lamps should he allowed to be used in the operating room. Open flames should never be permitted in the room. Ammonia containers should be stored in cool places where they are not likely to be exposed to fire.

Factories containing refrigeration plants should be equipped with respirators[28] or smoke helmets[29] for use in emergency.

PAINT, VARNISH, LACQUER, OILS, ETC., are dangerous. They are especially liable to spontaneous ignition. Another hazard is carelessness in failing to destroy at once all rags, paper, excelsior, waste, sawdust or other packing which may have become saturated with oil or paint.

The danger of ignition of vapors is also serious as the flash points of some are as low as 32 degrees. Consequently great care should be taken to protect them from open flame.

Pneumatic Acid Syphon

Only minimum quantities of these materials should be allowed outside the vault or stock room.

PRECAUTIONS—Vaults or stock rooms should always be fire-proof and well ventilated from the outside. The floors should be of cement, brick, concrete, or other non-combustible material.

Drip pans should be provided for all oil faucets. These pans should be cleaned daily.

Oils should be kept only in closed metal tanks or cans.

Never use sawdust to absorb oil that has been spilled. If you must use something, use sand or Fuller's earth—then dispose of it at once, *outside* the plant.

Paint-covered or oily clothing, belonging to employes, should be kept at night in airy lockers, as far from the stock room as possible.

Benches and seats used by employes should be covered with metal.

Allow no open light in the stock room. Use only vapor-proof bulbs with keyless sockets. All switches should be outside the room.

BELTING—Rapidly moving belting generates static electricity, especially in cold weather. All machinery therefore should be well grounded.

28—See Fig. 62, Pyrene Fire Appliance Catalog. 29—See Fig. 64, Pyrene Fire Appliance Catalog.

Where belting is run through the floor or wall, special means should be taken to protect such opening.

MATCHES—Never permit the use of "strike-anywhere" matches around a factory. A penalty should be attached to the carrying of such matches by employes.

"No Smoking" signs should be distributed plentifully throughout the plant.

Respirator in Use.

BEFORE YOUR NEIGHBOR'S PLANT SETS FIRE TO YOURS

1—Close Every Wall Opening Not Absolutely Needed for Exits. Light, Ventilation, Power, etc.

2—Openings You Can't Close, Have Equipped with Metal Doors, Sashes, Frames, etc.

3—Protect All Windows with Fire Shutters.

4—See that All Shutters Are Closed Each Night.

5—Equip All Windows with Wired Glass.

6—Divide Large Floor Areas by Fire Walls.

7—Doors in Fire Walls Should All be Automatic Closing, Fireproof.

8—Sheathe Outdoor Woodwork with Metal if Exposed to Sparks.

9—Bar Shingle Roofs Absolutely.

CHAPTER VII

Exposures

THE EXPOSURE of a factory to fire from outside sources may be greatly reduced by properly safeguarding roofs, walls, and wall openings,

The best protection from outside fire is a solid wall so that the vulnerability of your factory depends on the number of wall openings and how well they are protected.

WINDOWS AND DOORS within four floors above adjoining buildings or chimneys or where there are buildings within 50 feet, should be protected by approved self-closing shutters of fire-resisting material.

Shutters should operate easily and quickly and should close the opening tight. They should be closed every night.

Hinges on windows and doors should be oiled frequently and all exposed metal should be kept protected with paint.

Doors and windows and frames, sills, lintels, etc., should be of metal, or at least sheathed in metal, and should be kept well painted.

All glass should be wired. If windows become cracked they should be replaced at once.

The joints between door and window frames and the wall should be air-tight. Fire can enter the tiniest crevice.

All other wall openings, such as drain pipes, blower, conveyer and ventilation holes, etc., should be protected by the most approved means, if they cannot be closed entirely.

ROOFS should be of tin, slate or other fire-resisting material. Shingles should be absolutely barred, even on wooden buildings.

Grille Model Watch Clock

RAILROAD SIDINGS—Should a railroad track run close to or into your building, all wood surfaces exposed to sparks from locomotives should be sheathed with metal.

Windows exposed to such sparks should be protected with a fine mesh copper screen, where it is necessary to keep them open.

SKYLIGHTS (except over elevator or ventilation shafts) should be of

A HOLE THAT WRECKED A WAREHOUSE.

Fire in adjoining property gained entrance to this concrete building through a six-inch hole. The building was gutted. Every window was protected by iron shutters. Arrow points to hole

wired glass, protected above and below by a sturdy wire screen. Screens should be well protected by paint from corrosion.

BRIDGES to adjoining buildings, roofs or stair towers should be fitted with automatic self-closing fire-proof doors at either end.

Easily burning material should never be stored close to wall openings of any kind.

The safest way is to brick up as many of the wall openings as possible. The greater the number of openings the greater the danger.

LOWER YOUR FIRE RISK BY KEEPING PLANT CLEAN

1--Make Rules for Elimination of Rubbish.

2—Provide Receptacles for Rubbish.

3—Insist that Receptacles be Used by Employes.

4—Provide Fire-Proof Lockers for Employes' Clothes.

5—See that Lockers are Kept Clean and in Good Order.

6—Have Building Thoroughly Cleaned Every Day.

7—Get Daily Report on Work of Cleaners.

CHAPTER VIII

Housekeeping

"A CLEAN FACTORY seldom burns" is an axiom that is trite but true, for the condition of a factory is the measure of its risk.

A well run factory is like a well run home—and is just as clean, no matter what work may be going on. To keep it so requires constant watchfulness and incessant work, yet it pays in the long run—pays big dividends.

And by clean, does not mean simply that the office floor is scrubbed every day. That is only an outward and visible sign. It means that rubbish is not permitted to accumulate; that cellars are not clogged with useless material; that there are no dark closets to gather fire food. In fact, light is the guiding star of a well run plant.

The war on fire begins with the construction of the building and it never ends.

First of all, a properly run plant is painted regularly. Outside and inside the paint brush should be kept just in advance of the scrubbing brush and broom. When paint begins to peel or crack or show signs of wear, renew at once. It is far better to do it a day too soon than a day too late. If for any reason, the use of paint is unpractical, use whitewash.

All rough wood surfaces should be treated in this way. The following is the standard United States Government mixture:

> Slack one-half bushel of unslacked lime in boiling water, keeping it covered during the process. Then strain and add one peck of salt dissolved in warm water; three pounds of ground rice, boiled to a thin paste. one-half pound of Spanish whiting; one pound of clear glue dissolved in hot water. Mix well, and let stand for several days before using. Apply as hot as possible.

ASHES from boilers, stoves, heaters, ovens, etc., should be removed daily from the factory. Never should they be stored in wooden receptacles—but in metal cans of approved design. And these cans should never be filled nearer than 4 inches from the top. Cans should be provided with tight-fitting lids and the lids should be kept on.

The floor on which cans stand should be of fire-proof material. *Never on wooden floors.*

If ashes cannot be removed every day, store them in a fire-proof vault or enclosure. Never pile them in wooden bins or against wooden partitions.

Rubbish, waste material, packing of all kinds, shavings, developed in the

process of manufacture should be placed either in metal-lined bins with self-closing lids, in waste cans, or they should be burned at once. Never let such containers go over night without being emptied. Remove all waste material from the plant as fast as possible, or see that it is placed temporarily in fire-proof vaults.

If waste material is oil soaked, particular care should be given as there is great danger of auto ignition.

Packing cases, barrels, old lumber, etc., must not be piled in the yard against or near the factory. This is a frequent cause of fire, and provides a medium by which fire can jump from a neighboring factory.

All waste baskets should be of metal, or other fire proof material.

Waste baskets should be emptied daily and spaces under desks, back of cabinets, closets, lockers, etc., should be free from accumulation of old papers and other rubbish.

Employes' clothing must not be left over night on hat racks, desks, chairs or elsewhere than in metal lockers, which in turn must be kept free from rubbish.

See that all rat, mouse and knot holes in floors, walls, partitions etc., are cemented up. The fondness of rats and mice for matches has started many a fire, consequently it is well to keep a battery of traps or a half a dozen cats about the building to keep these pests away.

All open fire-places should be equipped with spark screens. Never throw waste paper on an open fire. Blazing paper is frequently carried up a chimney and sets fire to the roof.

Offices, as well as manufacturing rooms, should be equipped with pyrene extinguishers as well as other fire-fighting devices.

Always keep the telephone number of fire headquarters or the nearest fire house on a card, close to every telephone.

See that all office as well as other employes, know how to send in a fire alarm and that they know enough to stay at the fire-box until the firemen arrive to direct the firemen to the fire.

Ask the Fire Chief to inspect your plant occasionally and ***then act on the advice he gives.*** It is given to you in the interest of safety.

See that the rule against smoking is obeyed by every one—even the "boss."

See that "NO SMOKING" signs are put up and that they are not moved or defaced.

Allow none other than approved safety matches to be used in the building. Covered metal receptacles should be provided for burned matches where it is necessary to use them.

Absolutely forbid the use of paper shades on gas or electric lights. Paper should never be pasted on metal or glass shades.

All electric switches should be protected by wire nets to prevent their being tampered with.

Vapor proof lamps with keyless sockets, and switches outside the room should be provided where volatile oils are used.

Drip pans should be provided under all machinery to catch excess oil. These should be emptied each evening.

Oil pumps should be installed on lathes where oil is used in cutting metal. Use sand or Fuller's earth to absorb spilled oil. Never use sawdust.

Watchmen should be equipped with clocks and electric lamps. They should carry pyrene in a holster on their rounds, to be ready for fire at any minute.

HOW TO MAKE ESCAPE EASIER IF FIRE SHOULD COME

1—Number all exits and indicate with red lights and signs.

2—Keep all aisles clear.

3—See that all doors open outward.

4—Light fire escapes at night if building is occupied.

5—Keep all fire escapes, stairs, etc., free from obstructions.

6—Protect all stairways with self-closing, fire-proof doors.

CHAPTER IX

Exits and Fire Escapes

BESIDES means of Fire Prevention and Fire Protection, deep consideration should be given by every factory owner and superintendent to the protection of the lives of his employes.

It is only within the last few years that the responsibility of the employer for the safety of his employes has been recognized by the law makers, for not until then was it recognized that there was no economic pressure to compel employers to give consideration to workers.

The degree of safety with which employes leave the building depends upon the number of exits, their size, location, width, fire resisting qualities, angle of descent, etc.

Metal Sign

EXITS should always be indicated by red lights and should be numbered and marked with the word "EXIT" in red letters.

The aisles to all exits must be kept clear of obstructions at all times.

Doors to all exits should open outward—in the direction of safety—or they should be of the sliding variety.

Doors should be self-closing, and of approved fire-proof construction. All windows in doors should be of wired glass.

Where it is necessary to prevent such doors being opened from the outside they should be equipped with Panic Bolts, which yield to the slightest pressure from the inside but prevent their being opened from the outside.

Pivot or revolving doors should never be used on fire exits.

Where exits may be used in either direction—as for instance on a bridge between buildings—doors should swing both ways so that they can be opened by pushing from either side.

Doors at the foot of stairways, etc., should be as wide as the stairway.

The safest exits are the horizontal kind—those leading to the surface; to another section of the same building or by way of a bridge to another building.

Exits from one section of the building to another through fire-proof walls should always be protected by a standard approved fire-door of automatic construction held open by fusible links.

Where the floor is divided up in this manner each section should be provided with a separate stairway and fire-escapes so that employes will not find themselves trapped in any part of the building without means of exit.

Bridges between buildings should have fire-proof self-closing doors at either end. They should be roofed to prevent accumulation of ice or snow in winter but open at the sides. There should be no steps at either end of the bridge, which should be on the same level as the floor.

Door Equipped with Panic Bolt

STAIRS—Many modern factories now have smoke-proof stair towers. These consist of isolated buildings containing fire-proof stairs connected with the main structure by roofed bridges.

The enclosed stairway is a modification of the smoke-proof stair tower. In these the stairs are in a section of the main building cut off by brick walls equipped with fire-proof self-closing doors. In both cases the stairs should be entirely fire-proof.

All wooden stairways should be enclosed with non-combustible material and have fire-proof self-closing doors on each floor.

The angle of the stairway should not be more than 35 degrees. Where they are steeper than this they are exceedingly dangerous.

All stairs should have hand rails and if they are more than six feet wide they should have a center rail as well.

FIRE ESCAPES—Iron stairways attached to the exterior of the building should always be roofed to minimize the danger of ice and snow accumulation in winter. Where the factory is run at night they should be well lighted.

Fire escapes and fire balconies should never be allowed to cross a window or door opening, flames from which may render their use impossible. Where it is necessary to install them in this way, doors, windows and frames should be of non-combustible material, and fitted with wired glass. All doors opening on fire escapes should be self-closing.

Perpendicular ladders are obsolete. No women and few men can use them.

Bridges, fire balconies, stairs, halls, etc., should never be used for the storage of anything. A broom on the stairway may cause someone to trip and result in a great loss of life.

Every interior stairway should be equipped with a pyrene extinguisher on each landing. The floor landing should also be used for hose stations.

Besides the exits mentioned, factories should have extension ladders to reach at least the fifth-story window. These ladders should be kept in the yard and should never be used except for the purpose for which they were installed.

SHAFTS—While elevators frequently may be used to assist employes in leaving a building, they are not usually considered as fire escapes. The elevator shaft provides a rapid means for the spread of fire and too frequently it is impossible to use the elevator owing to smoke or fire.

Elevator shafts should be lined with concrete, brick or other fire-resisting material. The entire shaft enclosure should be of cement on metal laths at least 2½ inches thick, extending the full length of the shaft.

Where the building is fire-proof the shaft enclosure should be of brick, tile or concrete at least 8 inches thick.

Doors to all elevator shafts should be so arranged to open only from the inside of the shaft. It is preferable that they be so equipped that the elevator cannot be run until the door is closed.

All windows in stairways, elevator shafts, etc., should be of wired glass. The only exception to this is that skylights at the top of all shafts should be of plain glass so that when broken by the heat the flames can escape through the roof and not mushroom out into the various floors.

If the building has a gable, cleats should be attached to the roof enabling firemen to reach the ridge-pole easily and safely.

TO INSURE FIRE APPLIANCES BEING READY WHEN NEEDED

1—Be sure to see all water and stand pipes are protected from freezing.

2—Guard chemical extinguishers, pails, casks, etc., from exposure.

3—Have extra charges for extinguishers always on hand.

4—See that all employes understand use of appliances.

5—Test fire pump regularly.

6—Replace defective appliances at once.

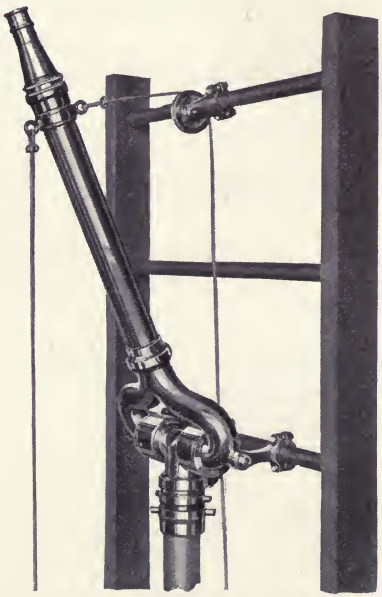
7—See that fire appliances are in their proper places at all times.

CHAPTER X

Care of Fire Appliances

WINTER is the worst time of all for fires. At that time roads frequently are blocked and the fire department delayed in reaching the scene. Extra precautions to protect fire appliances should be taken at that time, also, because cold is especially severe on them. When winter is approaching everything should be thoroughly overhauled and put in first-class condition.

The factory inspector and fire chief should go over the plant inch by inch and make certain that nothing is overlooked that can be injured by frost. This is the time you should take extra precautions to prevent fire starting and to handle it if it does.



Aerial Ladder Nozzle for Factories.

All water and steam pipes of every kind exposed to the elements should be well protected from cold by wrapping with fire-proof material. A frozen standpipe is worse than none at all. It gives a false sense of security, and fails when you need it.

Hose should be tested under pressure of 100 to 125 pounds. Be sure it is well drained before it is replaced on the racks. However, never test unlined linen hose with water. This hose rots easily and should be kept dry.

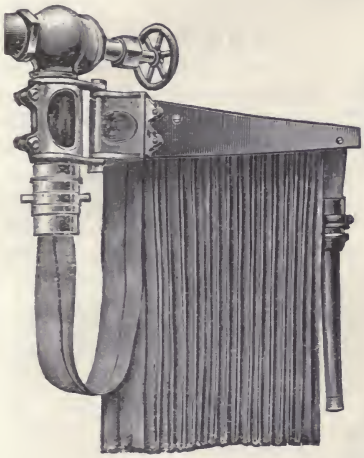
All hydrants, standpipes and connections should be tested to be sure that valves work properly.

See that the equipment of each hose house is complete. If anything is missing see it is supplied at once.

To prevent the freezing of water in bucket tanks, pails, casks and gravity tanks add chemicals to the water to reduce the freezing point.

Formulae for chemical mixtures that will reduce the freezing point of water to any desired degree, will be found on page 26.

This is the time also to recharge chemical extinguishers. Extinguishers should be discharged in the usual manner by inverting them but care should be taken to see that the mixture does not come in contact with clothing or anything else that can be harmed. Extinguishers should then be thoroughly washed out and fresh charges put in.



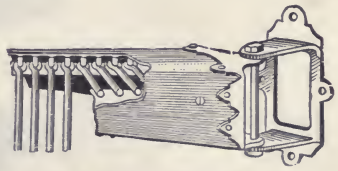
Ideal Type of Pin Rack

In cleaning out soda and acid extinguishers, great care should be taken to run water through the hose and to remove all traces of soda crystals. If the nozzle is found to be clogged, run wire through it to be sure that there is a free and open passage.

Should you have occasion to use a soda and acid extinguisher, the hose of which is clogged, the terrific gas pressure generated by the mixture of soda and sulphuric acid might cause the machine to explode.

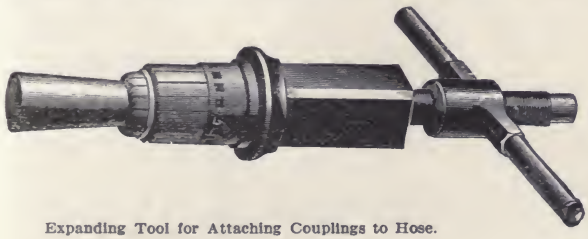
If the hose racks in your factory are not covered on top as those shown in the illustrations on this page, it would be well to have your machinist make tin covers to fit over the tops. This will keep dust and dirt from settling on the folds, rotting the linen, and causing the hose to burst when it is needed.

It is well also to have an expanding tool in your machine shop, so that hose can be recoupled. In this way you will be able to save many a dollar. It will be necessary only to cut out the weak or bad spots in the hose, and by adding new couplings, keep the short lengths in service.



Sectional View of Rack, Showing Construction

Extra charges for soda and acid extinguishers as well as extra liquid for pyrene extinguishers also are needed. Pyrene extinguishers should be kept entirely filled. Then they will always be at one hundred per cent efficiency. Should you have occasion to use them the liquid used should be immediately replaced.

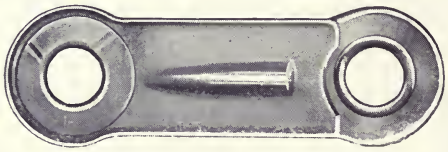


Expanding Tool for Attaching Couplings to Hose.

This also is a good time to assure yourself that the engineer and firemen thoroughly understand what each pipe and valve is for and how it is operated.

See that you have on hand, ready for emergency, extra sprinkler heads and extra fusible links. These little things are hard to obtain quickly. It is far better to have a few extra ones on hand.

Give the fire pumps a thorough test.



Fusible Link (Natura Size)

See that all waste cans are in good condition. If any are found defective—if the lids do not close properly or if they are badly bent or dented—provide new ones. It is easier to do this all at once than to wait until the time of need comes.

Be sure to have on hand enough safety cans to last for the winter months.

Have special tests made of all automatic closing doors and shutters.

Have an electrician go over all wiring and replace anything found defective.

WHEN YOU PLAN A NEW PLANT

1—Consult Fire Prevention Engineer So the New One Will be Safer.

2—Don't Discount Future Safety by Accepting Flimsy Construction.

3—Be Sure to Install a Sprinkler System and Stand Pipes.

4—Break Up Big Floor Areas with Fire Walls.

5—Shun Wooden Shingles as You Would the Plague,

and

6—Remember Your OLD Plant Can Be Made Safer at Slight Cost. Ask a Fire Prevention Engineer to Show You How.

CHAPTER XI

Construction

THE proper construction for factory buildings is too big a subject to be treated adequately in any manual, but a few points of advice to indicate what is needed to make a plant as nearly as possible immune from fire may not be amiss.

Fire is a manifestation of a disease, and that disease, like most of those to which mortal flesh is heir, is due either to uncleanly conditions or to a body—or building—unsuited to the work it is called on to perform, or house.

A business man who neglects to take precautions against fire on the ground that he may call the City Fire Department to put it out if it starts, and that if the worst comes to the worst he is insured, is in the same boat with the man who refused to buy a pair of rubbers because he had the sick benefit policy and that if he died he was insured anyway.

By studying the causes of fires, science is now prepared to prevent most of them. The few that do start in modern plants are discovered at once and put out with a minimum of expense and loss.

Money spent to prevent fire should be looked on firstly as an investment which guarantees uninterrupted production and, secondly pays actual cash dividends in the saving effected on insurance premiums.

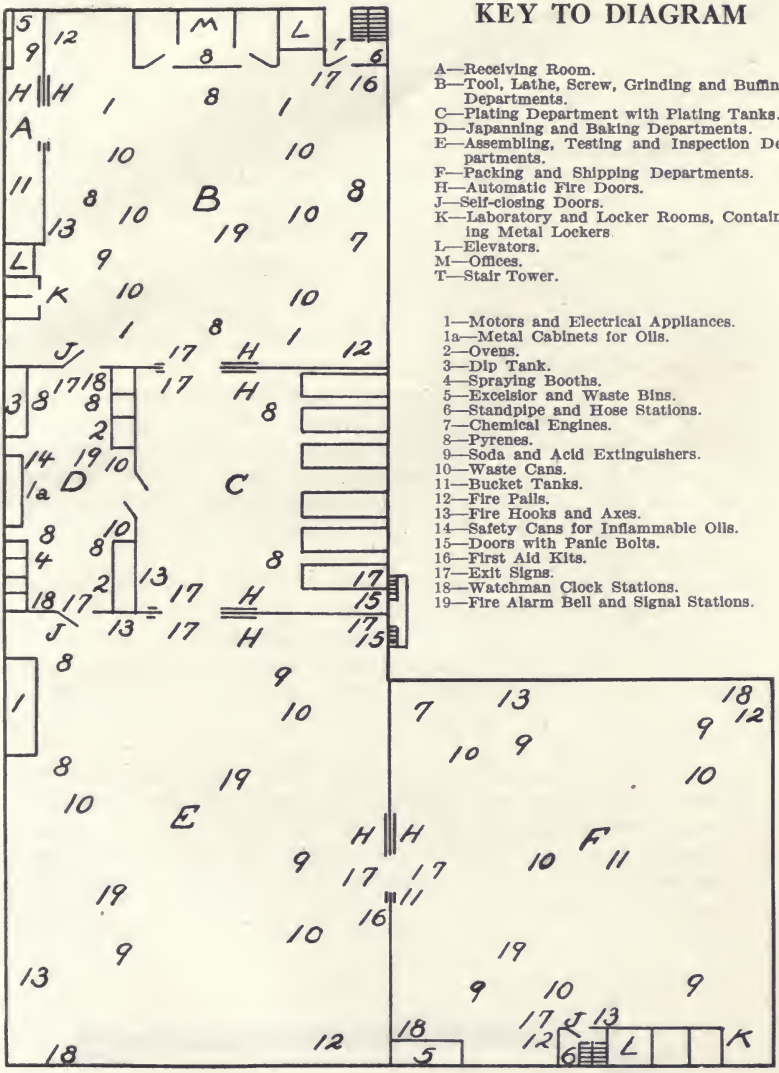
So when a new building is contemplated the services of a Fire Prevention Engineer should be obtained. He should sit at the right hand of your architect and his advice should be acted upon in every step that is taken.

FIREPROOF BUILDINGS—It is not a question of one type of building being better than another, but of the type which is best suited to the work that is to be done. Fireproof buildings not otherwise protected are like stoves. They do not themselves burn, but they can hold a mighty hot fire.

Fire in the Triangle building in New York destroyed 145 lives. Yet it was a fireproof building. The fire caused little damage to the building but ruined the firm in whose plant it started.

In other words it is not the *kind* of materials you use but the *way* you use them. We know wood will burn, but heavy planks and timber burn so slowly that there are few better forms of construction for many purposes.

When you want to bank a fire in the stove for the night you close the flue drafts. In your factory the windows, doors, stair wells, elevator shafts, etc., are the flues. If there were no windows, doors or shafts fire could not last any length of time or do much damage, therefore, see that the



KEY TO DIAGRAM

A—Receiving Room.
B—Tool, Lathe, Screw, Grinding and Buffing Departments.
C—Plating Department with Plating Tanks.
D—Japanning and Baking Departments.
E—Assembling, Testing and Inspection Departments.
F—Packing and Shipping Departments.
H—Automatic Fire Doors.
J—Self-closing Doors.
K—Laboratory and Locker Rooms, Containing Metal Lockers.
L—Elevators.
M—Offices.
T—Stair Tower.

1—Motors and Electrical Appliances.
1a—Metal Cabinets for Oils.
2—Ovens.
3—Dip Tank.
4—Spraying Booths.
5—Excelsior and Waste Bins.
6—Standpipe and Hose Stations.
7—Chemical Engines.
8—Pyrenes.
9—Soda and Acid Extinguishers.
10—Waste Cans.
11—Bucket Tanks.
12—Fire Pails.
13—Fire Hooks and Axes.
14—Safety Cans for Inflammable Oils.
15—Doors with Panic Bolts.
16—First Aid Kits.
17—Exit Signs.
18—Watchman Clock Stations.
19—Fire Alarm Bell and Signal Stations.

Plan of Loft occupied as Electrical Novelty Factory, showing Fire Appliances required to cover risks indicated and means necessary to protect employes.

"flues"—the doors, windows, stair wells, skylights, etc.—are closed, and that shafts are so constructed that flames and smoke will pass up and out into the air and not spread to upper floors.

FIRE WALLS—Large floor areas are bad. They should be broken up with brick fire walls that will confine fire to a small section of the building. Approved automatic fire doors should protect all communicating passageways through these walls.

Remember that fire can pass through the tiniest crevice. The cut on page 45 shows a case where fire in an adjoining building entered through a six inch hole in a concrete wall left by the removal of a water pipe. A great warehouse was thereby cleaned out, everything inside destroyed just as the coal is destroyed in the range.

WALL OPENINGS—Windows should never be opposite those in another building if walls are less than 10 feet apart. Even then they should have wired glass and approved automatic fire shutters.

Wired glass was invented to prevent breakage but as a means of fire prevention it has performed far greater service. Ordinary glass will crack under slight heat but wired glass is made to resist very high temperature. The melting point is 1800 degrees. A lesser degree of heat may crack it but the wire will hold the pieces in place and act as a bar to the flames.

Window and door sashes and frames should be of metal so as to be able to resist fire as long as the window.

Fire walls should extend from cellar to roof and then three feet above the roof. Cornices should be cut off in the same way so that flames cannot work their way through into adjoining property.

SHINGLES—The most dangerous single item of construction is the wooden shingle. Millions of dollars loss is caused each year by it. Even if your building is wood the roof should be covered with metal or other fire resisting material.

A new building may not be necessary. Your present building may be vastly improved without great expense. It is not necessary to rebuild, only to close useless openings in walls, floors, etc., which invite the spread of fire. Then if you install adequate means of fire prevention and protection you can feel reasonably sure that you will never be called upon to collect on your fire insurance policy.

KEEP IN TOUCH WITH THE CONDITION OF YOUR FACTORY

1—Have Written Reports Made by

A—The Watchman.

a—On History of His Tours.

B—The Fire Inspector.

a—On "Housekeeping" Standards.

C—The Assistant Fire Chief.

a—On All Fires.

b—On Work of Fire Brigade.

c—On Results of Fire Drill.

d—On Condition of Fire Appliances.

2—Study All Reports Carefully, and Be Guided by Them.

3—Keep Reports on File.

CHAPTER XII

Inspection Forms

ON the following pages will be found examples of blank forms and bulletins which are used in many large plants.

Form No. 1 is that usually adopted where written reports on daily inspections are required. Special hazards may require special blanks but these may be added to this.

Form No. 2 for Fire Drills should always be filled out and kept for reference. Comparisons of these reports will quickly show any falling off in drill efficiency.

A report on the work of the Fire Brigade (Form No. 3) should always be made after every drill. Absence from drill without cause should lead the offender to be dropped temporarily at least from the force.

Reports should be made on all actual fires (Form No. 4) and each fire no matter how trivial should be investigated and its cause ascertained if possible so that steps may be taken to prevent a recurrence.

Watchmen's reports (Form No. 5) should be studied carefully by the superintendent of the plant for they will show how well orders are being obeyed and will indicate the housekeeping standard of the plant. Where there has been an actual fire, a copy of the watchman's report on the fire should be attached to his daily report and another copy turned in to the fire chief.

In large plants with many employes it is well to keep a close check on the fire appliances. For this purpose Form No. 6 should be used. This inventory should be made each month and where appliances are missing the foreman of the department should be called on for an explanation. Any appliances found missing or defective should be replaced at once.

A similar inventory of the fire brigade equipment is necessary in order to keep the service at one hundred per cent. efficiency. For this report Form No. 7 is suggested.

The bulletins, samples of which are given, should be printed in red and black and should be distributed generously about the plant. They should be posted in locker rooms, at foremen's desks and on stair landings particularly.

Fire Inspector's Report

(Name of Company)

Date .....
Time of Inspection.....

General Cleanliness — Good — Indifferent — Bad.
If unsatisfactory — in what way ?.....
.....
.....
.....

Violations of Fire Department Rules.....
.....
.....

Give Department, Foreman and Employes.

Violations of Company Rules.....
.....
.....

Give Department, Foreman and Employes.

Condition of Fire Appliances .....
.....
Appliances Missing.....
Appliances Defective.....
Fire Alarm O.K.....

Are Fire Doors in proper working order and unobstructed?
.....
.....

Are Exits clear ?.....
Water Pressure on Sprinkler System and Standpipe as shown by gauge .....
Steam Pressure on Fire Pump.....lbs.
Engineer on duty.....
Watchman's tour O. K. ..... Delay at .....
Reason for delay.....
Name of Watchman.....
Suggestions for reducing risk and increasing protection.....
.....
.....

(Signed) .....
Inspector.

Every line must be filled in or checked.

Form No. 1.

Fire Drill Report

JOHN DOE, Chief Fire Brigade
(Name of Company)

Date ....., 19

Weather Conditions.....

Time of Alarm.....

Time building empty.....

Elapsed time .....

Time employes back at work.....

Time lost in drill .....

No. stairways used..... No. stairways closed.....

No. fire escapes used..... No. fire escapes closed.....

Horizontal exits used..... Horizontal exits closed.....

Condition of fire gongs.....

Suggestions for improving fire drill.....

.....

.....

.....

(Signed) .....

Asst. Chief.

Form No. 2.

Fire Brigade Drill

JOHN DOE, Fire Chief
(Name of Company)

Date 19
Weather Conditions.....

Time of Alarm.....
Location of "Fire".....
Time elapsed from alarm to "starting water".....
Number of hose lines stretched.....
Length of hose lines stretched.....
Number of ladders raised.....
Condition of hydrants.....
Condition of hose.....
Apparatus needing repair or replacement.....
.....
.....

ABSENTEES

Name ..... Why absent .....
Name ..... Why absent .....
Name ..... Why absent .....
Name ..... Why absent .....
Name ..... Why absent .....
Name ..... Why absent .....

Additional Equipment needed.....
.....
.....
Suggestions for increasing efficiency of Brigade.....
.....
.....
.....
.....

(Signed) .....
Asst. Chief.

Form No. 3.

Fire Report

JOHN DOE, Fire Chief

(Name of Company)

Date.....

Time of Fire.....

Location, Floor.....Department.....
Foreman in Charge.....
Discovered by.....
Fire in.....
Cause.....
How long burning before discovered (about).....
How extinguished and by whom.....
.....
.....
Was fire confined to point of origin.....
If not, by what means did it spread.....
.....
Time to extinguish.....
Appliances used.....
Appliances missing.....
Appliances defective.....
Did sprinkler heads open.....How many.....
Sprinkler heads replaced. Number.....By.....
Extinguishers recharged. Number.....By.....
Pyrene.....Soda and Acid.....
Damage by fire.....
Damage by water.....
Damage by Soda and Acid Extinguishers.....
Employes or others injured (Names).....Injuries.....
.....
Remarks.....
.....

(Signed).....
Ass't Chief,
Foreman or Watchman.

Fire Brigade and Drill Reports to be attached.

Form No. 4.

Watchman's Report

(Name of Company)

Date.....

On duty.....P.M. to....A.M.

WORK OF CLEANERS

Waste baskets or cans not emptied.....Dept.
Floor sweepings not removed.....Dept.
Refuse bins not emptied.....Dept.
Doors found open in.....Dept.
Windows found open in.....Dept.
Skylights open.....Dept.
Combustible material not removed from.....Dept.

FIRE APPLIANCES

Fire discovered in.....Dept.
Appliances missing.....Dept.
Appliances damaged.....Dept.
Appliances obstructed.....Dept.
Aisles obstructed.....Dept.
Fire Escapes obstructed.....Dept.
Fire doors out of order.....Dept.
Light at sprinkler valve out of order.....Dept.
Pressure on fire pump shown by gauge..... lbs.

POWER AND WATER

Power not shut off.....Dept.
Lights burning in.....Dept.
Water left running in.....Dept.

GENERAL

Matches, cigars and cigarette stumps in.....Dept.
.....Dept. operating until.....A.M..... P.M.
Employes found in.....Dept. with (out) permission.
Names.....Dept.
Explanation given.....
Clothing not in lockers.....Dept.
Conditions or occurrences during tour which should be reported.....
.....
Cause of delay in registering at Station No.....

(Signed).....
Watchman.

Watchman's report should be turned in each day before watchman leaves factory.

Form No. 5.

Monthly Fire Appliance Inventory

JOHN DOE, Fire Chief

(Name of Company)

	1st Floor Depts.			2nd Floor Depts.			Total
	A	B	C	A	B	C	
Pyrene	6	4	9	3	2	7	31
Soda and Acid	2	1	2	1	2	1	9
Chemical Engines	1	0	1	1	1	0	4
Bucket Tanks or Casks	3	2	2	1	2	2	12
Pails	6	8	6	6	10	6	42
Hose	100ft.	..	100ft.	100ft.	..	100ft.	400 ft.
Playpipes	1	..	1	1	..	1	4
Hose Racks	..	..	1	1	..	1	3
Hose Reels	1	..	..	..	..	..	1
Hooks	3	2	2	1	2	3	13
Axes	1	1	..	..	1	1	4
Waste Cans	8	7	10	8	14	3	50
Safety Cans	2	..	..	4	1	..	7
Tarpaulins	22	28	14	12	6	..	2

(Signed).....

Asst. Chief.

Date.....19....

Form No. 6

Monthly Fire Brigade Inventory

JOHN DOE, Fire Chief

(Name of Company)

	Company No. 1	Company No. 2	Total
Hose Carts	1	1	2
Hose	250 ft.	250 ft.	500 ft.
Playpipes	2	2	4
Pyrene	4	4	8
Hooks	6	6	12
Axes	2	1	3
Crow Bars	2	2	4
Lanterns	2	2	4
Ladders	1	..	1
Pails	4	4	8
Gaskets	12	11	23
Hydrant Wrenches	2	2	4
Spanners	3	2	5
Hose Jackets	1	1	2
Siamese Connections	1	2	3
Hose Hoists	1	1	2
Fire Hats	8	7	15
Rubber Coats	8	7	15
Rubber Boots	8	7	15

(Signed).....
Asst. Chief.

Date.....19....

TO ALL EMPLOYES

If OUR Plant Burns YOUR Job Is Gone

To protect this factory from destruction by fire it is necessary that everything possible be done by every individual to prevent fires starting.

To this end these rules have been made. Violations may be followed by instant dismissal.

RULES

1—Smoking is absolutely forbidden (except in room provided for that purpose.)

2—Carrying or using other than Safety Matches is forbidden.

3—Burned matches must be deposited in metal receptacles provided for that purpose.

4—Oily Waste Cans are provided for use. Waste material must be placed in them.

5—Wet clothing must not be placed on radiators or boilers or hung on wires to dry.

6—The use of paper lamp shades is forbidden. Paper must not be attached to lamps in any way.

7—Fire Appliances must not be moved or used except for the purpose for which they are intended.

8—Lockers must be kept clean and free from paper or waste material of any kind.

9—Space around waste bins must be kept clean. Bins must be kept clean when not in use.

10—Floors must be kept clear of waste, refuse and little of all kinds.

This Bulletin should be posted in locker rooms, and in other conspicuous places in the factory.

NOTICE TO ALL EMPLOYES

FIRE DRILL

For the greater safety of all employes a fire drill has been instituted in this factory. Floor captains, Monitors, Stair Guards and other drill officials must be obeyed INSTANTLY. (Signed.)_____
(Superintendent)

The following employes have been appointed drill officials on this floor:

FLOOR CAPTAIN: Mr._____ (Name)
STAIR GUARDS: Mr._____ (Name)
Mr._____ (Name)
MONITORS: Squad No. 1 Mr._____ (Name)
" No. 2 Mr._____ (Name)
" No. 3 Mr._____ (Name)
(Number of Monitors depends on number of Squads)
SEACHERS: Mr._____ (Name)
Miss (or) Mrs._____ (Name)
ALARM BOX RUNNERS: Mr._____ (Name)
Mr._____ (Name)

SUBSTITUTES

In case of the absence of any of the foregoing the following will act in their places:

FLOOR CAPTAIN: Mr._____ (Name)
STAIR GUARDS: Mr._____ (Name)
Mr._____ (Name)
MONITORS: Squad No. 1 Mr._____ (Name)
" No. 2 Mr._____ (Name)
" No. 3 Mr._____ (Name)
(Number of Substitutes depends on size of force)
SEARCHERS: Mr._____ (Name)
Miss or Mrs._____ (Name)
ALARM BOX RUNNERS: Mr._____ (Name)
Mr._____ (Name)

This Bulletin should be posted in locker rooms, and in other conspicuous places in the factory

FIRE BRIGADE

CHIEF—Mr..... Position.....

ASS'T CHIEF—Mr..... ... Position.....

COMPANY No. 1

CAPTAIN—Mr..... Dep't.....

LIEUTENANT—Mr..... Dep't.....

COMPANY No. 2

CAPTAIN—Mr. ..... Dep't.....

LIEUTENANT—Mr. ..... Dep't..... ...

(Number of Companies Depends upon the Size of Plant).

Bulletin to be posted in all Locker Rooms and in other prominent places in factory

WHAT A FIRE MEANS TO YOU

1—Loss of Difference Between Damage and Insurance.

2—Loss of Money for Work Done on Material in Course of Manu facture.

3—Loss of Orders Already Taken to Competitors Through Your Inability to Deliver the Goods.

4—Loss of Good Will from Same Cause.

5—Loss of Customers Who Are Satisfied with Competitor's Service.

6—Loss of Records, Lists, Accounts, Trade, etc.

7—Disruption of Your Organization Built Up by Years of Work.

8—Loss of Profits During Period of Rebuilding.

9—Increased Selling Cost to Regain Lost Trade.

CONCLUSION

Every Fire Due to Carelessness is a Crime

Fire controlled is your best friend. Fire rampant is your worst enemy. Is YOUR building equipped to fight it? Is YOUR building safe?

Every year we "efficient" Americans burn up $250,000,000 of our wealth. Every second—every tick of your watch $8 goes up in flames. Is *that* efficiency?

The President has urged industrial preparedness. He says "The Victories of Peace are greater than those of War." But how can Industry win Victory when we allow Fire, its worst enemy, to run riot?

To prevent fire you must think Red and be prepared. Are *you* doing *your* part to prevent such a catastrophe? Have you equipped your building for the fight?

"*All* fires are small fires first." Then, when they are *small, all* fires may be easily put out.

In the first vital few minutes one little pyrene can save more property than a whole fire department can save later, when lurid tongues are licking the entire structure.

Every fire due to carelessness is a crime, and most fires *are* crimes; 90% *are* preventable, in the last analysis.

Property destroyeed by fire is wealth irrevocably lost. Insurance will repay you for your burned property, but no insurance can recall your scattered employes. No insurance can restore your lost business—customers—orders—rent—tenants—good will. No insurance on earth can possibly pay for the 3,000 lives sacrificed every year on the fiery altar.

Walk through your building and look around. Every waste basket—rubbish bin—oily rag—every furnace—flue—coal bin; every match—all hold potential destruction. At any moment carelessness may rouse the sleeping enemy.

The owners of your plant look to YOU to keep it safe—running at maximum efficiency. Your position and reputation depend on your doing this.

If—through your neglect to take proper precautions or to recommend that they be taken—the property is swept away, who will be to blame?

YOU will.

Then what explanation can you make for not being prepared?

In protecting the property you are protecting yourself.

Act NOW, before fire comes.