

FIRE PREVENTION

on the

FARM

AND ELSEWHERE

Of Vital Interest to Men, Women and Children

"CARELESSNESS CAUSES FIRES"

"CLEANLINESS AND CAREFULNESS
WILL PREVENT FIRES"

The Ontario Fire Prevention League Aims :

"To co-operate with the Provincial Government and the Ontario Fire Marshal's Office for the purpose of promoting the science and improving the methods of Fire Prevention and Fire Protection; to obtain and circulate information on these subjects; to assist in securing proper safeguards against loss of life and property by fire; to keep the subject before the people, especially the young, and endeavour to inculcate the idea that *it is a patriotic duty to prevent fires.*"



Office of the Ontario Fire Marshal, Department of the Attorney General,
Parliament Buildings, Toronto

E. P. HEATON,
Fire Marshal

GEORGE F. LEWIS,
Deputy Fire Marshal

TORONTO

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FORE-WORD



Fires cause heavy losses every year to the farmers of Ontario. Carelessness is possibly the chief cause of fires. Every farmer, therefore, should give the subject careful thought and no one should rest content until he has availed himself of all the protection which science and intelligence have devised. Thinking and planning save thousands of dollars every year.

I am glad to commend the efforts of the Ontario Fire Prevention League in affiliation with the Ontario Fire Marshal's Office to arouse an interest in this subject in the Province, and I trust the information and suggestions contained in this publication will receive most thoughtful consideration and be followed by prompt action.

GEORGE S. HENRY,

Minister of Agriculture.



ONTARIO FIRE PREVENTION LEAGUE (INC.)

IN AFFILIATION WITH THE

ONTARIO FIRE MARSHAL'S OFFICE

Toronto, Ontario

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“To those who husbanded the Golden Grain,
And those who flung it to the winds like Rain,
With them the seed of wisdom did I sow,
And with mine own hand wrought to make it grow.”

GREETING:

The war has proved a “solvent” for many problems of a national character. Problems that only a short time ago would have seemed baffling and insurmountable have been overcome and their solution has redounded to the benefit and upbuilding of the nation.

Conditions were forced upon us as a young and peace-loving nation which we were compelled to face and which providentially emancipated us from the “feeding bottle” class—enabling the country to throw off its swaddling clothes for those of more sturdy attire. The war, with all its terrible suffering and sacrifices, has done even more than that, *it has made us think*; it has given us more confidence in ourselves, more reliance in our ability

to do things, and taught us to know the meaning of *thrift*; but alas, it has not changed our *habits*—those habits of *carelessness* for which we have established an unenviable reputation.

With the triumphant ending of the world war additional responsibilities are placed on our shoulders entailing greater demands on our food supplies and other products of our country.

The conservation of our resources, from destruction by fire, is now more imperative than ever. Not only must we supply the needs of our soldiers until they return to their homes and are again employed in peaceful, productive occupations; but we must also help feed the peoples whose lands have been devastated by the fiendish Hun, who has wrought death and destruction along his path and caused turmoil and suffering throughout the world.

The ability of our country to successfully compete with other nations of the world for the business that is available during the reconstruction period depends upon its financial strength—its potential power to further develop its industries and produce more foodstuffs.

After co-ordinating our efforts “to produce” it is of paramount importance to protect those products from destruction by fire if we would maintain our supremacy in the march of progress and prosperity.

We must not relax but rather redouble our efforts to reduce the fire waste of Canada.

Canadians have proved themselves “great fighters”—they have the heroic valor and resourceful intelligence necessary to overcome their enemies.

The next war, though a peaceful one, should be none the less strenuous against the strongly entrenched demon “Fire.”

Unfettered fire is one of our worst enemies—it kills, devastates, and destroys in a ruthless manner.

If we can make as good progress in our fight against fire as we have against the Hun we will have won a great battle.

Aggressive action is needed. Everyone should co-operate in the work of Fire Prevention and help to educate and bring people—young and old—to a realization that they must be more careful about their “habits.” Statistics regarding the cause of fires show that we are the most careless people on earth. We toil unceasingly to acquire comfortable and attractive homes, and yet *two* out of every *three* fires that occur are in the homes of the people; and worse still, is the amazing fact that *eight* out of every *ten* of all the fires that occur are preventable.

"Carelessness" in doing the ordinary things about the house is the chief cause of a great many fires; and for this unnecessary waste—men, women and children appear to be equally culpable.

While "Cleanliness is next to Carefulness in the Prevention of Fire" it is our habits that first need correction. The change in our mode of life is one of the serious problems that now confront us. We must change our thoughts and our actions so as to effectively change our *careless habits*. These habits appear to have become in-grown with our very nature. Witness, for instance, the way in which lighted matches and cigarette butts are thrown around. When we succeed in changing our careless habits, the tax for fire waste of the country will be greatly reduced.

As a matter of patriotism it is a duty that we owe to our country and humanity at large to prevent destruction of life and property by fire. There are more than four times as many people burned to death every year in Canada as are killed on steam and electric railways.

Besides amending one's habits of carelessness, much can be done by the individual to eradicate the terrible fire waste that is impoverishing our country. "Example is better than precept"—the removal of fire menaces and unnecessary hazards in one's home, barn, store or factory can be easily done; after being thus forearmed, one would feel fortified to suggest to others "to go and do likewise."

The power of suggestion is remarkable, and thus we may perhaps, often unconsciously, teach the doctrine of "Fire Prevention" and radiate an influence for good that is widespread and most effective.

It is desirable that every person should enlist in the army of "Fire Preventionists," especially women, who might well direct their efforts towards the education of the children on fire prevention lines.

When one member is injured all members of the human body suffer with it; so it is with the destruction of our homes, barns, factories, and resources by fire—we all suffer. Medical science teaches us that certain diseases are caused by certain bacteria and the only way to get rid of the disease is to attack the microbes by sterilization. We must pursue the same course if we are going to reduce the number of fires. We must eradicate the cause—by amending our careless habits and keeping our premises free from accumulations of combustible rubbish, etc.

The fire waste touches the pocket of every man, woman and child in the country. It is an indirect tax. It is paid in the cost of everything we eat, drink and wear. The fact that most of the money paid by insurance companies, out of the premiums they collect, is for losses caused through carelessness, is a serious indictment against an intelligent, progressive people—an indictment against our "habits."

You are most earnestly requested to join the great army of fire preventionists and help through your influence and hearty co-operation to reduce the fire waste and fire tax of the country.

There are great possibilities in co-operation. Drops of water are valuable only when they combine. Alone they dry up and vanish. The world war has furnished some striking examples of what may be accomplished through co-operation. Kipling has put it in a terse way:

"It ain't the guns nor armament, nor the funds that they can pay,

But the close co-operation that makes them win the day—

It ain't the individual, nor the army as a whole,

But the everlastin' teamwork of every bloomin' soul."

We must be inspired by this feeling of co-operation if we are going to win. If we only make up our minds to do it—we will win.

Taught by experience and the serious lessons of life, as a progressive people, let us strive to better our conditions.

Vast strides are being made in the preservation and improvement of the health of the nation by educating the children in hygiene; and let us hope that results of equal importance to the wealth and prosperity of the nation may be obtained by educating the children in fire prevention methods, so that their careless habits, as well as our own, may be changed.

Don't simply read but *study* every one of the following articles. They have been compiled with great care for your benefit. Learn what you ought to do to avoid fire, and *do it now*. Neglect may mean sorrow and suffering, even loss of life—loss of valuable stock that money cannot replace—loss of the savings of a life-time.

Yours for action,



Secretary Ontario Fire Prevention League.

IT IS A PATRIOTIC DUTY TO PREVENT FIRES

If we were to consider that EVERY FIRE IS A CRIME in our country, as it is in some countries of Europe; and if those in whose homes, barns or places of business where fires originate should be held responsible for their acts when those acts result in injury to their neighbours; or are the result of gross carelessness, culpable neglect or mischievous intent, there would be fewer fires. The Fire Tax would be less, and Canada would be richer to the extent of Millions of dollars every year.

The elementary principle of justice that an individual should be responsible to others for his acts when those acts result in injury to his neighbour is as old as the Mosaic Law. The liability for fire is recorded in Exodus xxii. 6:

"If fire break out, and catch in thorns, so that the stacks of corn, or the standing corn, . . . be consumed therewith; he that kindled the fire shall surely make restitution."

The fire waste in Ontario, not including forest fires, for the year:

1916 was \$16,520,206, caused by 10,279 fires.
1917 was \$10,365,539, caused by 9,681 fires.
1918 was \$14,856,329, caused by 9,588 fires.

This means a tax of \$6.00 per capita for every man, woman, and child in the Province; or \$30.00 a year for a family of five. It means that the fire waste of Ontario exceeds \$40,000 every day.

In normal times the fire waste in five of the principal countries of Europe averaged 33c. per capita.

Clean-up the Barn

It is an easy matter for you to put your farm barn in what might reasonably be called perfect physical condition as regards fire hazards if it is well built, on good foundations, metal or other non-inflammable roof, properly ventilated, painted, has no stoves or fire heat, electric wiring *approved by Hydro Inspector*, not used as a garage; no gasoline, coal oil or other volatile oil kept in it, proper hooks for lanterns, *is kept shut and locked at night*, and equipped with *properly installed lightning rods*; or if a metal roof is used see that it is properly grounded.



Make sure that the sparks are out.

NO SMOKING IN THE BARN

It is assumed that 50 per cent. of fires with "Cause unknown" in barns can be charged to the foolishness of smoking in them.

Loose Matches

Matches should not be carried loose in a man's pocket. A match may easily be dropped in the hay or other inflammable material and if stepped on cause a fire. Avoid the danger of burning up your buildings and stock by not carrying matches loose.

Sparks from Locomotive

If near a railroad the buildings should be covered with metal or other non-inflammable roofing, and no doors or windows should be left open where sparks might blow in.

A furrow or two of turned land next to the railway right-of-way will save pasturage, hay, and green crops from destruction by fire.

Burning Brush

Brush or rubbish should not be burned within 200 feet of the barn, and never when there is a high wind.

Ontario Barn Fires—\$91,000 a month

During 1918 there were 836 barns burned in Ontario, causing a loss of \$1,093,931. The buildings destroyed were valued at \$677,096 and their contents at \$416,835.

The farmers were reimbursed by the insurance companies to the extent of \$640,814, and were burdened with a direct loss of \$453,117 as a result of these barn fires, and this in addition to the fires which occurred in dwellings.

Many have the false idea that it is the insurance companies that pay this colossal tax. The insurance companies collect the premiums and distribute them as fire losses. The greater the fire loss the more they must collect. If they collected less than they pay out they would soon be bankrupt.

The greater the fire loss the more the people are assessed to pay for it, and the less they have to spend for other things.

In addition to having chemical fire extinguishers in the dwelling and farm buildings, it is well to have fire buckets filled with water located in convenient places. *Bi-carbonate of soda is a fire killer.* For effective work put $\frac{1}{2}$ to $\frac{3}{4}$ lb. of bi-carbonate of soda to the gallon of water in your fire pails.

GASOLINE

With the increasing use of gasoline and other fuels that are dangerous because of their ready inflammability, there is each year an increasing number of accidents, and fires that cause loss of life and great damage to property.

The following is clipped from one of the Toronto newspapers and shows what is happening from day to day throughout the country. We could give many other graphic illustrations, but space forbids:

BURNED IN EXPLOSION

"Guelph, Nov. 25.—As the result of a gasoline explosion a young man named Ivan Felker is laid up suffering from severe burns. Mr. Morris, who owns a grocery store on Perth Street, keeps his car in the barn, and he went out, accompanied by Felker and Harry Duffield, with a three-gallon can of gasoline to put in the car. Young Felker carried the lantern, and as soon as the cap was taken off the tank of the car the fumes of the two gallons of gasoline already in the car exploded and there was a sheet of flame, setting fire to the car and also the clothing of all three. Felker was terribly burned about the legs, arms and face, while both Mr. Morris and Duffield were also severely burned about the face and hands. The car was ruined and the barn damaged to the extent of \$500."

Lighting and Cooking

In gasoline lighting and cooking systems there are many hazards that can be introduced by faulty design and construction of apparatus. Among these are corrodible material, improperly made joints, and valves of poor design.

Cleaning

Many fires originate from the cleaning of silks with gasoline, the violent rubbing of the silk generating static electricity, which produces a spark that ignites the vapor.

Fires are caused by using gasoline in an open vessel and smoking a cigar or cigarette at the same time. *Don't take a chance.*

Automobiles

A dangerous practice is the cleaning of auto parts with gasoline from an open can. A spark may be caused by striking two pieces of metal together, by the ignition system on the automobile when the starting crank is turned, and in other ways. For instance, a nut that was stuck was struck with a wrench, causing a spark, and instantly the car was enveloped in flames.



Keep oily rags in metal cans.

Oily Waste

Oily waste should at all times be placed in a safe metal receptacle with automatic closing cover to avoid the danger of spontaneous combustion. Better still is to destroy the oily waste or rags and not leave them around the house or barn.

Oily waste will decay, smolder, and in time burst into flames.

Sawdust

Sawdust is just as dangerous as oily waste and is liable to cause spontaneous combustion when soaked with oil drippings. Its use around the building should be forbidden.

Sand

It is well to have some sand around the garage. It can be used for putting out a gasoline fire and is a safe material to use as an absorbant of oil.

Chemical Fire Extinguisher

Chemical fire extinguishers, of approved design, should be kept in convenient places, and one should always be kept in the automobile.

You cannot put the responsibility up to a well equipped fire department to protect your life and property. You must have your own fire fighting equipment — and it must be always ready and efficient. All fires are small when they start. Attack the seat of the fire at once. It is the first two or three minutes that count for most.

Open Lights

No open light or flame of any kind nor any machine or belt capable of producing a spark should be allowed in the room where gasoline is being used.

Shafting Should Be Grounded

All shafting and machines with belts that are liable to cause a static electric spark should be well grounded. The gearing of a wind-mill, if not properly in mesh or not taken care of, may cause a fire.

Danger Signs

Wherever gasoline is stored, danger signs should be posted on the doors, warning against the carrying of lights of any kind.

Why Take a Chance?

Gasoline vapor is heavier than air, consequently it will float along near the ground and may carry 30 feet, or more, and under favorable conditions ignite.

One gallon of gasoline has substantially the power equal to 83 to 88 2-3 pounds of dynamite. Gasoline will give off 130 times its bulk in vapor; and when vaporized will convert 1,560 times its volume of air into an explosive mixture, which will ignite from a flame or spark.

Five gallons of gasoline will generate 8,000 cubic feet of gas; or enough to fill a room 20 x 40 feet and 10 feet high. When ignited it immediately expands to four thousand times that space. This would cause a most destructive explosion with probable loss of life.

Store Underground

When large quantities of gasoline are used the main supply should be stored in a metal tank buried underground and a safe distance from buildings.

Don't Make a Garage of Your Barn

Automobiles, gas engines and tractors should be kept in isolated buildings as far from the barn as possible. The number of automobiles owned by the farmers is steadily increasing and the fire hazard on the farm is increased accordingly.

It is an extremely dangerous thing to keep an auto or run a gasoline engine in the barn. Why should you take the chance of losing your season's crops—cattle, horses, machinery and buildings from a back-fire or gasoline explosion.

"Safety First."

DUST DANGERS

Dust Explosions

A dust explosion is very similar to a gas explosion, except that particles of dust are a little bit larger than the gas particles.

As with gas—there must be a proper mixture of dust and air and a spark or flame present which has sufficient heat to ignite the dust before an explosion can occur.

The finer the dust the more easily it is ignited and the more disastrous the explosion.

A pile of dust in a room or a sack or barrel of flour, or any other finely pulverized carbonaceous material will not explode so long as it stays in the pile or sack. It must be in suspension as a cloud in the air and the cloud be sufficiently dense before it can be ignited and the flame propagate through the cloud with explosive force.

Dust Explosions in Threshing Machines

According to the records of the U. S. Department of Agriculture there was a severe epidemic of dust explosions in threshing machines in a large wheat growing section of the Pacific North-west during the threshing season of 1914. It has been estimated that there were over 300 explosions during the season.

During the 1915 threshing season 166 explosions were personally investigated by representatives of the department. During the 1916 and 1917 seasons there were about 150 dust explosions. The estimated loss from dust explosion in this section from 1914 to 1917 inclusive amounted to \$1,500,000.

Investigations developed the fact that the season of 1914 was unusually dry at the time of threshing—the humidity of the atmosphere was very low, and that there were large quantities of smut almost invariably present in the grain being threshed at the time of the explosions; together with the presence of very large amounts of static electricity in the machines at the time of operation.

No Explosions on Grounded Machines

It is of interest to note that during the past four years no explosions have occurred in threshing machines which have been properly grounded to remove the static electricity.

Automatic Chemical Fire Extinguisher

There may be other reasons for the ignition of the dust—such as sparks caused by stone and metal passing through the cylinder. Consequently an Automatic Chemical Fire Extinguisher has been developed for use on machines. This has proved to be very effective, and no machine has been destroyed which has been equipped with this device.

Suction Fan

To further prevent explosions the suction fan with dust collecting attachment has been devised for threshing machines which will pull the dust out of the machine just behind the cylinder where most of it is raised. The suction fan has also proved valuable in cleaning grain and in preventing the dissemination of smut.

Dust Explosions in Mills

Dust explosions have caused the destruction of millions of dollars' worth of property in grain and cereal plants, flour mills and sugar refineries.

Prevention

These three measures have been tried in the field and found very effective:—

(1) The installation of an effective fire extinguisher, designed for threshing machines, which, in the event of a fire, not only saves the machine, but prevents the spreading of flames to the nearby grain, straw and barn.

(2) The installation of an exhaust fan to collect and remove smut and dust from the separator, thus preventing the formation of an explosive mixture of dusts.

(3) The installation of an efficient grounding system for the removal of static electricity from the machine.

FIRES CAUSED BY STEAM THRESHERS

The *Harrison Review*, of October 17th, gives the following graphic description of a fire caused by sparks from a threshing machine:—

“A number of men were engaged filling a large cement silo. . . . A threshing engine placed contiguous to the barn furnished power. . . . A spark from the engine was blown through a crack into the barn. . . . In less time than it takes you to scan this description the whole interior was a mass of flames. Two men barely escaped with their lives; one was badly burned. . . . It was only by heroic efforts that the substantial residence was saved. Many barns are being burned by similar accidents, and the Provincial Fire Marshal might with propriety suggest some safeguards against their recurrence.”

Yes! many reports are received of somewhat similar instances of *gross carelessness*. Such occurrences are not “accidents.” Simple precautionary measures as provided by law would prevent fires of this character.

Rails, jack pine, soft coal, etc., are used for firing the engines, and every man who runs a threshing machine knows that they send out sparks. He also knows, or ought to know, that a screen placed on the smoke box, if kept in good order, will prevent the engine from emitting sparks and starting a fire.

The Law Provides the Safeguard

“Every manufacturer of steam threshing engines shall provide each engine with an efficient spark arrester before selling or disposing of the same; and no person shall use or run any steam threshing engine unless it is provided with such spark arrester, and every owner or other person using or running the engine, shall keep the spark arrester at all times when the engine is in use in proper working order.

“(1) Every manufacturer who sells or disposes of a steam threshing engine without an efficient spark arrester shall incur a penalty of not more than \$20 or less than \$5.

“(2) Every person using or running a steam threshing engine not provided with such spark arrester, or wilfully using or running a steam threshing engine not having the spark arrester in proper working order, shall incur a penalty of not more than \$20 or less than \$5 for every day he so uses such steam threshing engine.

“All penalties imposed by this Act shall be recoverable under the provisions of the Ontario Summary Convictions Act.

“One-half the fine when recovered shall belong to the informer and the other half to the treasurer of the municipality where the offence is tried.”

The law also requires the owners of threshing and other machines to guard against accidents, and stipulates what provision must be made to prevent injury to the operator or persons who may be near the machinery.



HOW THE HOUSEWIFE MAY PREVENT FIRES

Fireproofing Clothing and Decorations

It is a simple thing to make decorations fire-proof and especially is this necessary, and should be compulsory, in the case of public festivities, as, for instance, where a number of children are gathered together for the annual Christmas tree fête. The following is a simple and yet absolutely efficient means of making decorations, cotton, wool, etc., non-inflammable:—

Fireproofing Solution

Commercial ammonium phosphate, one pound.
Water, one gallon.

Fabrics immersed in this solution, slightly wrung, and dried will not ignite when touched with flame, and furthermore, when placed directly in flames, the material will only char, and upon removal there will be no smouldering fire. To obtain these results care must be exercised to see that the fabric is completely saturated with the fireproofing solution and that sufficient of the absorbed solution remains in the fabric, so that after wringing, and upon evaporation of the water, ample ammonium phosphate remains on the fibre to fireproof it. Ammonium phosphate in addition to its great fireproofing qualities has the power to render the dye fast.

The solution may be mixed in larger or smaller quantities so long as the same proportion of ingredients is used; that is, one pound of commercial ammonium phosphate to one gallon or ten pounds of water, *making it a ten per cent. solution*. The solution is harmless and is not injurious to the skin. It may be used for a variety of fire-proofing purposes where cotton, wool or silk materials are worn or used near fire, especially where persons are working near furnaces or open flames. Curtains, draperies, children's clothes and decorations of all kinds in houses as well as in stores and hotels should be fireproofed.

When a fabric that is fireproofed is immersed in this solution, do not wring it out any more than you would wool underwear when washing in the usual way.



They are homeless now.

Two Out of Three Fires Occur in Our Homes

The frequent occurrence of fires in dwellings is a matter that must receive more careful attention on the part of householders. Statistics show that sixty-four (64) per cent. of all our fires, or, practically *two out of every three*, occur in the homes of the people. This is a terrible indictment on our mode of life, and is the result of our *careless habits*.

It is also a fact that men, women and children are equally-guilty of causing this enormous fire waste. The careless manner in which coal oil lamps and candles are used; and lighted matches and cigarette butts are thrown around is sufficient evidence to show that our "habits" must be changed.

SUGGESTIONS

Keep attics and cellars, yards and outbuildings clear of rubbish and inflammable material.

Do not start a bonfire near the house, fence or outbuildings, and never when the wind is blowing.

Do not heap up the grate and then go away and leave the fire. All open fires should be screened.

Chimneys should rise at least three feet above the roof.

Be sure the chimney is safe and clean; and that all flue holes not in use are covered with tight metal caps. Should any be left open a sudden pressure of air from heavy winds will force sparks into the room.

Never place paper near or over a flue opening.

See that all stove pipes are clean and free from rust holes.

The floor underneath and surrounding the stove should be protected with a metal plate; and wooden partitions or other inflammable material near stoves or pipes should be covered with asbestos and with sheet metal guard. Leave an air space of at least two inches between the metal and the woodwork.



The floor covering must extend beyond the stove.

Where stove pipes run through floors, or walls they should be protected with metal ventilated thimble or collar, so as to leave an air space between the pipe and the wood or lath and plaster, through which the pipe passes.

Replace all cracked or broken mica windows in stoves.

Examine grates and firepot carefully to see that no parts are cracked, broken, or out of place.

It is well to have the fewest possible number of elbows, and these should be placed at an angle of forty-five degrees to avoid horizontal runs of pipe, which collect soot and shut off draft.

Bear in mind that soft coal ignites faster than hard coal.



Carry rubbish out of the attic.

To prevent overheated stoves it is necessary to watch the fire and drafts more carefully when burning soft coal or wood.



Watch careless smokers.

If you smell gas, open the window and turn off the gas at the meter. Don't go looking for a leak with an open light. . . . "Willoughby struck a match and there was a terrific explosion, throwing him with great violence against a stone wall. . . . Wm. Hoover was also killed in this cellar by a gas explosion."—St. Thomas despatch to a Toronto paper.

It is dangerous to leave jets or gas stoves burning over night.

Do away with swinging brackets and rubber gas tubes from the house.

All gas connections should be of metal pipe with air tight joints.

If you smell smoke, investigate until you find the cause.

If you are using an electric iron, etc., and are called away, turn off the current, as otherwise the iron may become overheated and start a fire. A fire in London on November 15 was caused by an electric iron, with loss amounting to more than \$8,500.

Never fill a lamp except in daylight. See that the burner is clean and that the wick fits properly. It is dangerous to leave a lamp burning all night, especially if it is dirty or made of glass.

Use nothing but—"Strike on the Box" safety matches. Keep matches in a metal receptacle out of the reach of children.

Caution children against playing with fire or lighted matches.

For lighting gas use a metal "friction lighter," it is both safe and cheap. An automatic push button in connection with a "pilot light" is a safe way to light gas stoves; or use an electric lighter.

Keep matches out of the pockets of clothes hung in closets. They may cause a fire by spontaneous combustion.

Use metal cans for ashes. Never put ashes in wooden receptacles or pile them up against wood.

Get rid of rats and mice. They are disease carriers and their nests are fire-traps.

Never use gasoline in the house.

Use an electric flash light rather than an open flame in looking for articles, especially in clothes closets.

Never light a fire with coal oil or throw coal oil on a fire to quicken it. It may cost you your life.

Never hang clothes to dry near the stove or grate.

Paper shades on electric globes invite fire.

Oily waste or rags used in polishing furniture or cleaning machinery, if left around the house, are liable to cause a fire from spontaneous combustion. An oily mop has been known to ignite from spontaneous combustion within one hour.



Don't let the baby play with matches.

It is dangerous to have incubators or brooders kept in use in the cellar or other rooms of the house.

Smoking in bed, putting a lighted pipe in coat pocket or leaving lighted pipe, cigar or cigarette stubs lying around the house are extremely dangerous habits and invite disaster.



Never put ashes in wooden barrels or boxes.

Provide a metal receptacle for cigar and pipe ashes, cigarette butts and matches. Make it a rule that they must not be thrown around the house but placed in the receptacle provided for them. Never throw a match, cigarette butt or cigar ashes in a waste paper basket.

These are simple precautionary measures and their observance would do much to change our careless habits. It would tend largely to reduce that terrible record of having two out of every three fires that occur originate in our homes.

COAL OIL

A common source of fire, often with attendant loss of life, is the use of coal oil in lighting fires in the ordinary cooking or heating stoves.

Don't Pour Coal Oil in the Stove

Coal oil should never be poured in a stove in which there is a spark of fire; neither should it be used in a stove in which the fire is out, but in which parts of the stove are still warm. The only safe way is not to use it for either starting or quickening a fire.

Filling Lamps and Stoves

Never fill a coal oil lamp, oil stove or heater while it is lighted. Don't fill it too full. Leave a little room for the air to expand.

Coal oil lamps made of metal with heavy bases are safer and more preferable to lamps made of glass.

Most fires from coal oil are due to the use of glass lamps.

Oil stoves left alone and with children have taken both property and life as toll.

Keep the Lamps Clean

Keep the burner of your lamp clean and the wick trimmed. The common cause of odour from lamps and overheating fonts are the clogging of the tiny air holes at the base of the burner under the cap and the crust which forms at the top of the wick tube.

Boil burners occasionally in a solution of sal soda and water, which will soften and aid in removing the crust.

Types of lamps.



Keep Oil in Safe Place

Keep your coal oil can in a safe place, preferably outside the house, and never allow the floor around the can to become saturated with oil.

Never use an oil can in an emergency for gasoline nor a gasoline can for oil. Paint the gasoline can "RED."

IN CASE OF FIRE

Don't get excited. Keep cool and *attack the seat of the fire at once*. Always have a bucket of water (containing bi-carbonate of soda in saturated solution) and a chemical fire extinguisher within easy reach.

The tubes of dry powder sold as fire extinguishers are practically useless. Don't buy them. They won't give you protection.

There are several liquid chemical fire extinguishers on the market that contain carbon tetrachloride as the extinguishing fluid. They are reliable and easily handled.

Care should be exercised in buying fire extinguishers to *see that the containers are made of copper*; as steel and iron will corrode and render the extinguisher useless inside of a year or two.

The standard types of fire extinguishers bear the labels of the Underwriters' Laboratories, which insure their efficiency, construction and material.

QUICK ACTION IS WHAT COUNTS

A fire may easily be quenched at its incipency by the vigorous use of a broom kept thoroughly wet; or by being smothered by the application of wet blankets, rugs, sacks, etc.

A lamp or oil-stove fire may be smothered by throwing a quantity of flour or sand on the blaze. Don't throw water on coal oil or gasoline.

A Chimney Fire

May be extinguished by pouring buckets of sand or earth down the chimney or by igniting a handful or two of common powdered sulphur in the chimney. Close all openings, and if there is an open grate hang a wet blanket in front of the fireplace so as the sulphur fumes will go up the chimney. The sulphur forms sulphurous acid with the oxygen of the air and thus renders the latter incapable of supporting combustion.

In Escaping from a Fire

put a wet handkerchief in your mouth, creep or crawl along the room with your face close to the ground. Children should be taught to press out a spark instantly if one catches in their clothing and also that running into the air will cause it to blaze immediately.



Smothering burning clothing with a rug.

FIRE PREVENTION DAY

October 9th has been adopted by general consent as Fire Prevention Day throughout North America.

An opportunity is thus afforded everyone to co-operate in the great Clean-up Campaign and help awaken in the public mind a universal watchfulness against careless habits that are causing the impoverishment of our country through the enormous waste caused by preventable fires.



It is important to have clean basements.

It was on October 9th, 1871, that Mrs. O'Leary's cow kicked over a lamp and started Chicago's great conflagration, which consumed 18,000 houses extending over an area of more than 2,000 acres. Two hundred persons perished and nearly 100,000 were rendered homeless. The property burned was estimated at two hundred million dollars.

Like other fires it was small when it started; and like the majority of fires, *it was the result of carelessness.*

Lanterns are safe only when clean, well trimmed, well filled, free from leaks and hung on hooks out of the wind, away from hay, cobwebs, other combustibles, and out of reach of horses and cattle.



Take no risks with lanterns.

LIGHTNING

The Great Annual Loss Caused by Lightning—Can and Should Be Prevented

Knowing that lightning strikes and that your dwelling or barn may be the next, the wise man will protect his property—stock and crops—from destruction, by equipping his buildings with properly installed lightning rods.

It's the unexpected that happens. *Do it now!*

Losses Caused by Lightning

During the year 1918 there were 1,151 fires caused by lightning in Ontario, with a total loss of \$513,145; of these 985 were in rural districts, entailing a loss of \$491,910.

The value of the farm buildings destroyed was \$319,715, and the value of farm produce and other contents included in this preventable waste was \$172,195.

Now, Mr. Farmer, you paid your share of this tax. The insurance companies, as collecting agencies, distributed out of the premiums paid by you and others, the sum of \$322,177.

In addition to this enormous sum the farmers whose property was destroyed by lightning suffered a direct loss of \$169,733.

Our records show that only three of the buildings were rodged and the loss or damage to two of these amounted to only \$28, and the third is under investigation.

Rods, properly installed, are more than 99 per cent. efficient.

Rodded Buildings Immune

In the year 1917 out of a total of over 1,600 lightning fires, causing a loss of \$660,164, in no case was the building which was struck equipped with properly installed lightning rods.

From the reports of losses by fire through known causes, sustained by Mutual Insurance Companies in Ontario for the year 1917 no less than 51 per cent., or more than half, of the total amount was lost through fires caused by lightning.

WHY ALL THIS UNNECESSARY WASTE WHEN IT CAN BE PREVENTED?

Surely it is not necessary to give any further facts or figures to show how essential it is to have all farm buildings properly rodded so as to protect life and property from destruction.

If the buildings that were struck in 1918 had been rodded the farmers of Ontario would be richer to the extent of nearly half a million dollars.

LIGHTNING RODS—THEIR EFFICIENCY AND INSTALLATION

W. H. DAY,

Professor of Physics, Ontario Agricultural College, Guelph

As a comprehensive conclusion from our investigations, which began in 1901, we have found that if all the buildings in rural Ontario were rodded from 95 to 100 per cent. of the annual damage to buildings by lightning would be prevented. The method by which this conclusion was arrived at was as follows: In 1912 eighteen insurance companies in Ontario kept special records for us. From their reports we learned that out of every 7,000 *unrodded* buildings insured by them 37 were struck by lightning, while in every 7,000 *rodded* ones only 2 were struck by lightning. The rods prevented damage in 35 cases out of an expectancy of 37, showing an efficiency of 94.7 per cent. In the rodding covered by these reports there was doubtless some that was improperly done. With proper rodding the percentage is considerably higher, frequently exceeding 99 per cent. Indeed, the efficiency in Ontario in 1914 was 99.8; and 99.9 in 1915, in spite of some improper rodding known to exist in the Province. These higher figures have been well borne out by more recent investigations in various quarters. Thus hundreds of thousands of dollars would be saved to the farmers of Ontario every year if all the rural buildings were rodded.

Lightning rods are a better investment than insurance. When they save a building, the farmer's only loss is the interest on the price of his rods. Under insurance in case of fire, he loses at least one-third of the value of his buildings together with his premiums. Rods do not eliminate the necessity for insurance—it is needed to protect against causes of fire other than lightning.

Kind of Rods

Copper rods are the most durable and therefore the best, although any metal will do the work as long as in proper condition; but iron rusts off at the ground and aluminum also corrodes under certain conditions. A rod composed of two metals, one wrapped around the other, is especially objectionable.

How to Rod

All rods should be grounded 8 feet deep. From the ground the cable should run up the corner of the building, over the eave, up the edge of the roof, to the peak, along the peak; down to the opposite eave and into the ground at the opposite corner diagonally opposite the first. Points should be placed every twenty or twenty-five feet along the peak, also on chimneys, dormers, etc. All parts of the system should be connected together, also metallic parts of the structure should be connected to the rods.

Silos should be rodded.

Metal roofed buildings with the metal properly grounded, and points on the peak are also well protected against lightning. A metal roofed building insures further protection from fire that might be caused by flying sparks.

Wire Fences

It is the nature of horses and cattle to drift with a storm until something stops them, and usually they line up with their heads close to the wire fence. These wires become live wires during an electric storm. Lightning may strike the fence some distance away, and the easiest way to the ground would be to follow along the fence to the stock and ground through their bodies, thus possibly killing many at a time.

A wire fence should be properly grounded at least every ten to twenty rods, and in barn yards or small yards where cattle are herded, at every corner. Where fences are connected with a building there should be a grounding at the first post from the building, and, moreover, the ground-rod from the building should be connected with the fence.

The fence grounding should consist of a rod or cable equal to three number twelve wires or one number nine wire stapled over or connected with each lateral wire of the fence and extending at least three feet into the ground. If the ground wires are allowed to project a few inches above the fence, strokes are prevented in the vicinity just as by points on a building. The fence groundings should be made of the same material as the fence wires.

Shade Trees

Where there are a few trees under which stock gather for protection it would be both wise and feasible to rod the trees. The same principles apply here as in general rodding.

Fuller directions for rodding, also the treatment of the entire subject of lightning rods will be found in Bulletin No. 220 of the Department of Agriculture. It will be sent free on application.

WHAT A MOTOR PUMP CAN DO IN THE COUNTRY

Fire Chief Phillips, of the Soo, in reporting a fire which occurred on January 6th, makes the following comment:

"The Reeve of Kerah Township called me by 'phone asking if I could come out and try and save a farmer's house about a mile from the city limits. I took our new Motor Pumper and went out and found a little stream of water near the house where we put the pumper to work and saved three parts of the house and all his barns and sheds. The snow was about eighteen inches deep but the truck made it fine, which demonstrates what these ——— Motor Pumpers can do."

ELECTRICITY ON THE FARM

H. F. STRICKLAND,

Chief Electrical Inspector, Hydro-Electric Power Commission of Ontario

The Electrical Inspection Department of the Hydro-Electric Power Commission receives many applications for the inspection of farm buildings. Since electrical inspection has been in operation considerable attention has been devoted to the proper wiring of these buildings.

Some barns were wired up before the Inspection Department became active, and the district inspectors in whose territory these barns are located are instructed to go over them now and make sure that the work has been maintained in a safe condition. Before long complete inspections will be made of each of these farm installations, and owners will be given written reports showing what is necessary to be done to remove any possible danger which has been introduced either through original faulty work or subsequent inherent defects which may have developed.

Safety in the Use of Electric Light

The Commission considers that the greatest care should be exercised in electrical installations in barns. It is generally conceded by authorities that electric light is infinitely safer around a barn than coal oil lamps, or any other form of artificial lighting. The Inspection Department has examined many very fine barn installations. In some cases where the expense is not seriously considered by the farmer the entire farm buildings have been wired throughout in the very best form of conduit wiring. There is nothing which can be adopted which will give more permanent and lasting satisfaction, both as to convenience and safety, than a first-class installation of rigid galvanized conduit.

The Commission's Regulations require that conduit be installed always in the upper portion of the barn, i.e., the hay mow, as it would be impossible to properly protect open wiring in such a place if any other form of construction were adopted.

Switch May Cause Fire or Explosion if Improperly Located

Care should always be exercised in locating switches and cutouts. The wires in an electrical installation are probably the least dangerous part of the installation. It is at the point of issue and control where the chief danger lies. In every-day language this means that the points where switches are located, where there is more or less arcing or sparking produced during the operation of the switch, are dangerous, and under no condition should these switches be located in the immediate vicinity of highly inflammable material, such as hay or in very dusty places, or where gasoline is used.

Switches in Iron-Clad Box

Around the barn all switches should be in iron-clad boxes, externally operated, and kept tightly closed at all times. This not only effectually encloses any sparking of the switch, but it lessens the danger from mechanical injury or short circuit which would, no doubt, be the inevitable result if the knife switch were placed in the open.

To the owners of farm buildings a warning is therefore issued not to permit open switches, and if any of them are in barns they should take prompt steps to have them replaced with the standard box switch.

Importance of the Ground Wire

Where conduit wiring is installed great care should be taken to see that the ground wire is kept in good order. This ground wire is one which, upon examination of the conduit installation, will be found securely strapped to the conduit pipe at some point with a copper clamp, and where there is underground water piping it should be run right down and securely attached to the water pipe. Where there are no water pipes a rod or length of pipe, about eight feet long, is generally driven down into the ground its full length, unless in a permanently moist location, where a lesser distance would do. The ground wire is then securely sweated to this pipe. The object of this ground wire is to render this conduit safe, or, in other words, prevent anyone from receiving a dangerous or fatal shock which might be caused under certain conditions if the pipe were grasped by the bare hand while standing on wet ground. This ground wire also possesses the function of automatically cutting off the circuit in case a ground, or what might be termed a leakage, should it occur on the system. Sometimes these ground wires appear to be of little or no use to those who do not understand their nature, and a person might thoughtlessly put this wire out of commission or permit it to continue loose until some danger had developed. An occasional examination of these ground wires is therefore recommended.

Proper Fusing of Cutouts

The fuse on an electric light or power circuit performs the function, and is the safety valve of your wiring. It is therefore of the utmost importance that this safety valve be not tied up or prevented from operating when the safety point has been passed.

In all wiring installations will be found what are known as Edison Plug Cutouts. These consist of a porcelain block with round brass plugs, which are familiar to everyone who has had electric light in their houses. Either on the brass face of these plugs or on the brass point will be found stamped in the metal the size or rating of the plug, for instance, 5, 10, or 15 amperes. Under no conditions existing or likely to exist is it ever necessary, *or permitted by law* to put larger than a 10 ampere plug in a branch electric light circuit. There is only one place in the whole system where a larger plug is necessary, and that is in the main service box.

If a 10 ampere fuse or plug continues to melt or "blow" on a branch circuit it is the surest evidence that the circuit is either overloaded or that there is something radically wrong. Do not under such conditions attempt to remedy the trouble by inserting pieces of copper wire, discarded pant buttons, mutilated coin or other metallic objects for the purpose of bridging this fuse or you will incur a serious danger.

The Rules and Regulations of the Hydro-Electric Power Commission, which govern all electrical installations in this Province, prohibit the filling of fuse holders with anything but proper fuses, so that in addition to incurring a danger, offenders in this respect are liable to be prosecuted. When fuses continue to blow and you are in doubt, send for a qualified electrical wireman.

Don't Overload a Circuit



Story of a fire in two acts.
Current not turned off.
Electric iron forgotten.

Farmers are warned against the attaching of heaters, washing machines, small portable motors, etc., indiscriminately to their lamp sockets. A law has been passed making it a punishable offence to offer for sale devices of this kind which are not approved by the Commission, and even if they are approved, to advertise that they may indiscriminately be used on any key socket. Until quite recently this sort of pernicious advertising has been carried to an alarming degree, not only in Ontario but all over the Continent. Convictions have been obtained in police courts for violations of these rules. No one is more likely to be imposed upon in the sale of devices of this kind than the farmer, who is generally more remote from the Inspection Department than the people in thickly populated districts or municipalities. Farmers can protect themselves by demanding a guarantee from the vendor that the electrical devices they are purchasing have been formally submitted to and approved by the Hydro-Electric Power Commission.

Where a complete conduit installation might be too expensive, it is permitted by the Commission's Regulations to adopt what is known as first-class weatherproof work in all places except the hay mow or upper portion of the barn. This consists of running open wiring on approved insulators with proper guardstrips or troughs and what is known as weatherproof pigtail sockets and rubber-covered wire. The details of this class of work are all familiar to first-class electrical contractors.

Employ a Qualified Electrician

In the letting of contracts for wiring, farmers are strongly urged to employ only contractors who are well-qualified and recognized as such, or properly trained electrical wiremen. There are many people around the country claiming to be electricians, and it is very distressing to find that after a job has been about completed that it will not pass inspection.

The Commission's Electrical Inspection Department now covers the entire Province of Ontario, with district offices in all chief centres, and if the farmer does not know the name of the inspector in the district, information regarding this or any other question concerning electrical inspection can be obtained by communicating with the Hydro-Electric Power Commission, 190 University Avenue, Toronto.

Don't Start Without a Permit

The inspection of all inside wiring in the Province of Ontario is administered by the Hydro-Electric Power Commission, regardless of whether the power is supplied by the Hydro, a private electric light company, or generated on the premises. It is illegal for electrical work to be commenced in any building without a permit, and all those about to undertake the installation of farm wiring should see to it that their wireman or contractor has complied with the law in this respect.

THE DESTRUCTION OF OUR FORESTS

A TWENTY-FIVE MILLION DOLLAR FIRE

Ten days before the great Minnesota underbrush fire, which did \$25,000,000 property damage in that State, began to burn, according to "Fire Protection," one of the State Forest Rangers wrote to his State Headquarters that fires were being started faster than he could get to them, and "if the present weather continues, the fire question will soon be beyond all control so far as we are concerned. In a few days there will be just one continuous fire through this district."



Take precautions with bonfires.

In the thirty days previous to the fire, five convictions were secured by one ranger in the forestry service for violation of the State order prohibiting starting of fires without permission of the Forestry Service.

The forest rangers' system in Minnesota was excellent as far as it went, but it was pitifully inadequate. Some rangers have been compelled to patrol as many as forty-five townships.

There is not the slightest foundation yet discovered for believing that the fire was caused by fire bugs.

Hundreds of lives were lost! Millions in property destroyed!

The people is the Government. The people have been indifferent. The people have been careless. *The people have paid.*

PREVENTION OF FOREST FIRES

E. J. ZAVITZ,

Provincial Forester of Ontario

Forest regions, in a new country, always present serious problems from the standpoint of fire prevention. The physical condition of the virgin forest with years of accumulated *debris* creates a serious fire hazard. Add to this natural condition the slash caused by timber, tie and pulp operators, and we find a fire hazard in some regions which is unsurpassed in magnitude.

Within the last decade enormous areas in northern Ontario have been opened up by new railway lines. These railways have passed through virgin forest regions opening them to settlers, prospectors, and timber men, all carrying in their wake serious problems of forest fire prevention.

The protection of forest areas has made considerable advance in Canada during the past decade. Ontario now employs over 1,000 rangers or patrol men during the maximum dry period.

The first and most important factor in prevention of fire is education. The settler, tourist, woodsman and others must be made to realise the vital importance of preventing the destruction of the forests by fire.



A hard method of making fire.

Education through press articles, pamphlets, moving pictures, and even by appeals from the clergy is resorted to in order to impress on the public its duty and responsibility in preventing forest fires.

The school children, especially in forest regions, are taught by suitable methods of the necessity of protecting the forests.

Ontario has legislation which requires that a person setting out fires during the dangerous season shall have a written permit before a fire can be started. Permits are issued by the forest ranger, and a staff of rangers is kept in new settlements to enforce the regulations. It is intended that the settler shall not be handicapped in clearing his land and the ranger must be in close touch with the settler so that he can obtain a permit with little trouble. The advantage of the "permit system" is that indiscriminate burning cannot take place, and the fire prevention service is responsible for all fires burning within a given district. During the summer of 1918 about 10,000 permits for burning were issued by the Forestry Branch officers.

During 1917 and 1918 about 50 per cent. of the fires occurring in forest regions were caused by sparks from locomotives.

To prevent railway fires, the Forestry Branch works in co-operation with the Board of Railway Commissioners for Canada. Locomotives are inspected to insure proper condition of screens and other fire preventive appliances. Right-of-way conditions in regard to grass burning, etc., are inspected, and patrols are placed along railway lines where special hazards exist.

Another matter which is receiving attention is the fire hazard about towns and settlements in forest regions.

The Forest Fires Prevention Act, 1917, empowers the Forestry Branch to remove hazards from these localities. Surrounding many new settlements there exists enormous quantities of slash and undergrowth which should be cleared away, otherwise the danger from fire is very great, especially during a dry period. The clearing and burning of such hazards should be done during favorable weather.

In addition to the patrol or ranger system and the various preventive measures outlined, new methods of detecting and reporting fires are now being developed. The common method of detection developed during the past decade has been through the erection of lookout towers, so placed that large areas are under observation from these points. Where possible these lookout towers are connected up with sources of assistance by telephone.

Some experiments at fire detection by aeroplane have been made, and it is possible that the air service will revolutionize the work of protection from forest fires. The great problem, however, is to reach and extinguish such fires before they get beyond control.

Mechanical appliances have been developed to assist in fire fighting, and the Ontario Forestry Branch has installed a number of outfits in connection with this branch of the work. On some of the larger lakes power boats with pumps and hose

are installed, which will control fires within 2,000 feet of the shores. Portable gasoline pumping units are also being used where water is available. In much of the territory, however, the only method of fighting fires that can be resorted to is the use of the shovel, grub hoe and axe.

Take All Possible Precautions

With extreme dry weather and hot winds, many localities contain conditions that make fire fighting very difficult. In such localities if fire occurs it is frequently a problem of escaping to shelter rather than fighting the fire.

Plans should be made in advance to meet all emergencies in case a fire gets beyond control, so that loss of life can be prevented. It is difficult to outline the precautions necessary to be taken, as local conditions control the methods to be adopted.

In general, the forest ranger should be in touch with every settler in his district and make sure that the settler knows what to do in case of emergency. Many lives were lost in the 1916 fire, owing to lack of information. Many took refuge in root cellars or wells and were suffocated. Few realized the value of covering the head with wet blankets, so that the hot, dry air would not enter the lungs, which in many cases was the chief cause of death.

The forest ranger in semi-settled districts carries a great responsibility and should have the hearty co-operation of everyone to PREVENT FOREST FIRES.

MAKING WOOD FIRE RETARDANT

A number of different chemicals have been used to make wood fire retardant or *non-inflammable*, but its *combustibility* is not thereby destroyed. The wood will smoulder slowly.

Probably the most efficient protection to wood—for interior use—is silicate of soda. If boards or planks of moderate thickness are brushed three or four times over on each side with a strong solution, they are rendered partially incombustible; they will, however, burn under intense heat. The silicate fuses and forms a glass which envelops the surface, and even the internal fibres of the wood, if it is sufficiently saturated, are thus sealed up from the oxygen of the air.

A treatment known as "Burnettizing" consists of immersing the timber in a solution of zinc chloride. This tends to harden the wood and renders it partially incombustible.

Asbestos paint is also used as a fire retardant.

PRIZES FOR ESSAYS

The writing of competitive essays in the various grades and forms of the schools and colleges for prizes offered by public-spirited citizens or organizations is a splendid means of educating the children and youth of our country in fire prevention measures. If the prize winning articles are published in your local newspaper the educative value of the competition is enhanced. The parents, as well as the children, are reached in this way.



SPONTANEOUS COMBUSTION

Hay

Sometimes in his anxiety to get his crop of hay into the mow, before it is properly cured, especially if it contains clover or alfalfa, or while it is in a wet condition, the farmer is willing to take a chance with the inviolable laws of nature—hoping that it will not heat.

The high prices of fodder and a bumper crop of hay are contributing factors to the increase in fire waste from spontaneous combustion. The former necessitating the placing of hay in the barn and other buildings, and the latter requiring the filling of all available space to the limit—resulting too often in lack of proper ventilation and sometimes storing hay in buildings with leaky roofs or with openings not protected from the weather.

Greater care should be exercised in the curing of hay and more attention should be given to the proper ventilation of the stack, barn or other building in which it is stored.

Horses and cattle do not like to eat hay that has heated or is mildewed.

Sweating Hay

It is an acknowledged fact that combustion will take place in hay not well cured, and is the cause of many barn fires.

Hay or straw when thoroughly dried but which later become wet, will, if densely packed, be liable to ignite spontaneously just the same as if it were densely packed without having been thoroughly dried.

What is Spontaneous Combustion?

Spontaneous combustion may be explained as the ignition of a body by the internal development of heat without the action of an external agent. It frequently takes place in oily waste or heaps of rags, wool or cotton soaked with oil; and in piles of coal, especially fine, soft coal. In the case of oily waste it is caused by the rapid spontaneous oxidation of oil, which raises the temperature sufficiently to make it burst into flame.

Why Hay Heats

In hay the cells continue to live and breathe for sometime after it is cut, and they alone in a close mow, heat the hay to a temperature of 132 deg. F. Added to this is the heat from the microscopic spores of fungi which continue to grow in the blades of hay during the period of fermentation. There is also the heat generated by the development of the hay seeds, the alfalfa, or the clover, together with the heat of the sun upon the roof and sides of the building.

These various causes acting together may heat closely packed hay stored where there is little or no ventilation to a temperature of 212 deg. F. As action sets in the hay begins to char. With the formation of charcoal, oxygen is absorbed and the mass grows still hotter until it reaches a temperature of about 265 deg. F., when it bursts into flame.

Prevention

A very good anti-spontaneous combustion remedy is to salt the hay when it is being stored away.

Ventilation

The proper construction of a barn should include the necessary ventilating of the hay mow, at the same time providing that no rain can enter.

A simple and yet practical way of ventilating the hay is by means of chimneys or air-ducts in different parts of the mow. These ventilating shafts can be made by means of empty barrels placed on the floor and drawn up through the hay as the mow is filled. The gases formed will thus have an opportunity to escape through the ventilator in the roof.

Stacks should be built on a foundation of stones or timber so as to raise the hay or straw from the moist ground. Stacks can be ventilated by "chimneys," in the same manner as hay mows, but they must be carried out on the sides of the stack by means of horizontal "A" board chutes under the eaves. Another plan for ventilating is to put a tripod, made of three timbers, (or more) tied together at the top, in the centre of the stack and then build around and over it. A current of air can be introduced from the bottom of the stack by means of "A" board chutes and carried out under the eaves.

Numerous barn fires caused by spontaneous combustion have been investigated by the Fire Marshal's Department. In some cases hay charred black but did not ignite because favorable conditions were not present, or the farmer, after noticing the heat in the mow, removed the hay before it reached the firing point.

Concrete Cases

In one instance where a large quantity of hay was stored in a barn the farmer noticed it heating and got his neighbors to help him fork it out, but before they could remove all the hay it blazed and burnt the premises.

A farmer in York County had a stack containing about 18 tons of oat, wheat, and barley straw, with a mixture of wild buckwheat, bluegrass and vetches.

About seven o'clock one morning the owner noticed steam coming from the top of the stack in two places. He opened up the stack, and as a result thought all danger had disappeared.

The following day, about 5.30 p.m., a neighbour who was ploughing in a near-by field noticed smoke about this farmer's yard and ran over to see what was the matter. He found the straw stack on fire. The fire from the stack subsequently communicated to some of the farm buildings, causing a loss of \$5,000.00.

Another case in the same locality may be cited: A farmer and his son opened up a straw stack that was steaming; the deeper they went, the hotter it got, and they removed all to about eight feet from the ground. The next morning it was still hot and the farmer's son and a nephew placed two hen eggs in the straw and

in twenty minutes the eggs were cooked. This stack contained barley, wheat and oat straw, and the greatest heat was in the barley straw at the bottom.

In connection with another fire caused by spontaneous combustion, in the course of the investigation one of the witnesses stated: "We noticed that as we worked at the stack trying to put it out with water that it seemed to have little or no effect, and almost immediately the red hot flames would come right out from inside the stack. When a forkful of straw would be pulled out, it would suddenly all go off in a puff of fire."

Build stacks so that there will be sufficient pitch to shed the rain.

Don't build hay or straw stacks near the farm buildings, so that in case they do catch fire, they will not endanger your other property.

Danger from Wet Grain

Bran, grain and silo material may ignite spontaneously if conditions similar to those already described should exist. Seeds stored in bins or pits and under water give off gases that are dangerous and highly explosive.

Danger from Manures

Stall manure should be kept damp on top when piled in quantities and away from all heat-generating substances, such as ashes and sawdust, and from the rays of the sun. Don't make the heap any larger than you can control in case of fire. The best plan is to put it on the land as soon as possible.

Artificial manures, containing potash salts, chloride of potash, magnesia salts and the like are safe and incombustible.

Phosphate of lime manures are not dangerous except when bagged damp and packed in large heaps. Here the lime slaking hazard enters and one must be careful not to stack damp.

The nitrates absorb a great deal of moisture and loosen the fibre of the bags so that it is possible for the smallest spark to enter; it might smoulder for a long time, and then suddenly burst into flame. When the bags become saturated with the nitrate they are highly inflammable.

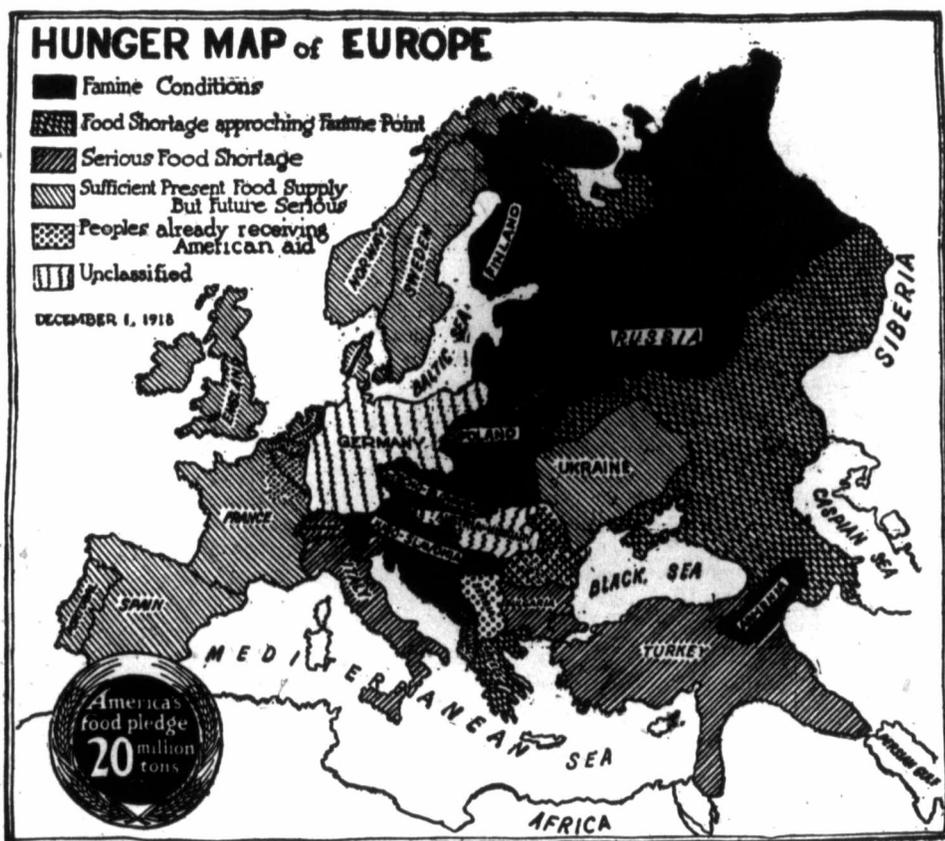
Lime in slaking generates a heat of 800 deg. F. Keep unslaked lime in a dry place, away from leaks in the shed or wherever stored.

Be Vigilant

Eternal vigilance is the price of safety on the farm, and every man and woman should preach and practice that doctrine. To see the fruits of months of toil and the profits of years go up in smoke in a few minutes is a serious matter. The way to prevent it is herein outlined, and it is up to you to carry out the suggestions. They are made for your benefit.



Fires must be put out while they are small.



A NATION'S STRENGTH IS IN ITS FOOD SUPPLY

This "Hunger Map of Europe," which appeared in a recent issue of "Fire Protection," portrays more vividly than words can describe the reason why fire must not be permitted to destroy Canada's food products. In order that the food shortage may be relieved the suffering peoples must get such commodities as they require, and these are chiefly products of the Canadian farm.

Fire prevention measures should be no less stringent and effective in the mills, elevators, warehouses, sugar refineries, canning factories, creameries, cheese factories, stockyards, meat-packing plants, grocery stores, and all other places where food is handled or stored, than on the farm.

The wail of suffering humanity has not touched the hearts of the people of Canada in vain; and the knowledge that millions of human beings are suffering the pangs of hunger should be sufficient reason for us to insist that food be conserved and every possible precaution taken against preventable fires.

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GOOD INTENTIONS



A \$200,000 FIRE IN N. W. ONTARIO

This photograph illustrates the terrible holocaust, suffering and loss that destroyed the business section of a prosperous, self-satisfied, growing town.

The fire appears to have been caused by a match in the hands of a careless smoker. If the town had been properly planned, kept reasonably clean and free from accumulations of rubbish, the conflagration would not have occurred.

The various Mayors, Councils of past years and the business men realized that the town needed fire protection. They talked about it, they passed resolutions, their intentions were good, *but they did not purchase* the pump, the hose and the chemical engine that they talked about. How many towns and villages are similarly situated?

The fire fiend's fangs are getting deeper and deeper into the vitals of the nation while those most interested calmly watch the destruction of their substance and the gradual sapping of the resources—the life-blood—of our country.

ONTARIO FIRE PREVENTION LEAGUE

(INC.)

IN AFFILIATION WITH THE

ONTARIO FIRE MARSHAL'S OFFICE

GEORGE F. LEWIS
Secretary

TORONTO