

Lightning Protection on the Farm

Written for The Western Home Monthly by W. E. Clark



The enormous loss due to the destruction of buildings by fire and lightning each year is occasioning much comment, and strenuous efforts are being put forth to minimize this loss. It is estimated that the fire and lightning loss in the United States and Canada for the past year is \$254,000,000.00 which means an average loss of \$70,000.00 every day. In Canada alone the loss is \$26,000.00 annually.

In the cities restrictions are being adopted making it impossible to build the easily combustible structure which has flourished in the past; in all modern cities fire districts are laid out, and combustible structures are forbidden within the limits of these districts. In addition, outside these business districts, the tendency is to discourage by legislation the building of residences or any other structures unless same are largely protected against fire from outside influences.

There is a tendency to regard a fire loss lightly, due to the fact that insurance minimizes the individual loss. As a matter of fact every dollar's worth of property burned up is irretrievably and forever lost, and is a burden on the community at large just the same as a tax.

The fact that banding together and thus reducing the risk by transferring it to other and distant shoulders cuts down individual liabilities for large amounts, does not in any way alter the situation. Every individual in Canada loses \$3.50 per year on account of fire and lightning losses, whereas in Europe the per capita loss is only 48c; there they make every effort to prevent the fire, on this continent we try to extinguish it; there they figure that a fire is an absolute loss of money, here we consider it an exchange of our property for ready money. This, in general is the situation as pertaining to cities, towns and villages. It is indeed serious, and worthy of the best efforts of the Dominion and Provincial governments to minimize the loss.

Attention is called to a much more serious phase of the matter, via, unprotected condition of farm buildings as compared with those in the city where fire protection and fire extinguishing are receiving increasing consideration. The average building is an easy prey to the flames once they are started. It is almost impossible for the farmer to arrange for capable fire-fighting facilities so that he must look to prevention rather than means of extinguishing the fire. Fire once started in a farm building, either a residence or an out-building, rapidly gains headway and before the meagre fire-fighting facilities can be put into operation, has gone beyond the point where it can be extinguished. As a rule supply of water is very limited and is generally quite distant from the point of fire, and in addition the individuals capable of fighting the fire, are limited, comprising on an average not more than two persons. This makes it all the more important that the farmer should fight his fires before they occur.

It is unnecessary to dilate on the fact that a farm building covered with metal roofing and metal siding is protected against fire from outside influences; this fact should be self evident to everyone. The Canadian farmer is becoming



more in the habit of using metal coverings every year, and in this respect is considerably in advance of his fellow farmers in the United

States where wooden buildings are more common and where the fire loss is consequently even larger than Canada.

The danger from forest fires is rapidly diminishing as the forests decrease, but in many sections of Canada and during long dry spells in the summer and fall months there are still vast possibilities of damage from flying embers due to forest fires. All liability to loss or damage from this and many other causes is entirely nullified by the use of metal coverings on buildings, and in the case of residences by building brick walls and using metal shingles, which makes an artistic and pleasing combination, durable, economical and fireproof.

The loss to farm buildings by fire may be controlled to a large extent by exercising care, but in regard to the loss from lightning even the most careful family is as liable to suffer from the destructive effects as the most careless one, providing their buildings are not protected against lightning.

In considering this subject the farmer will usually have in mind lightning rods as a protection, and while lightning rods have a value, metal roofing properly applied gives better protection from lightning besides added protection against fire, sparks from the engine, etc., which might burn a wooden roof with a lightning rod on.

Lightning not only destroys property but destroys life; and anyone having experiences in the country, a heavy thunderstorm with its accompanying discharges of lightning, would certainly

than could be given by rods. Buildings that are completely covered with sheet metal and well connected with the earth are practically lightning-proof. Covered in this manner buildings have been known to be repeatedly struck by lightning without the least damage. The ground connections may be made of metallic rods that extend well into the earth, and are securely fastened to the metallic roofing, on the buildings. It must be remembered that the ground connection is a positive necessity and too much care cannot be exercised in its construction. The ground connection must be of considerable area and extend well into the moist earth; a piece of galvanized iron pipe driven into the ground 3 or 4 feet makes a good 'ground'; large buildings should have two or more such 'grounds.'

In view of the above the use of metal shingles or metal roofing when put together, makes practically a solid sheet of metal over the roof. In connection with these use metal eavetroughs and conductor pipes or down spouts and drive the galvanized iron pipe into the ground near the termination of the conductor pipe. It is well to fasten the conductor pipe to the upper end of the galvanized iron 'ground' by soldering or wiring them tightly together.

Quotations from Prof. Wm. H. Day, Dept. of Physics, Ontario Agricultural College, i.e., as follows:

"For eleven years this department has gathered reports regarding buildings

course to the earth, generally causing damages to the structure and frequently starting fire. In general, all-metal buildings need only to be 'grounded.' Iron used in any form for this purpose should be thoroughly galvanized to prevent corrosion. Conductors should have as few joints as possible, these to be mechanically secured and be protected from corrosion."

You will note from the above that the Fire Underwriters, which is another name for the National Fire Protective Association, recognize the value of the all-metal or "metal clad" buildings as a protection against the effects of lightning.

A quotation from a report of the Mutual Fire Prevention Bureau, Oxford, Michigan, looking after the interests of the Mutual Fire Insurance companies:

"Every elevator or mill in the country, even if only built this year, could afford to tear off their wood shingle roof and buy metal roof, and siding and thereby reduce their rate enough to pay for the entire charge in a few years. We will do everything we can to point out to the property owner that his interest demands the substitution of iron cladding and iron roof over wood construction."

It will be noted that the above is from a Mutual Bureau and it is to their interest to speak the truth, and to cut down the losses as much as possible because the cost of the insurance depends upon the total loss.

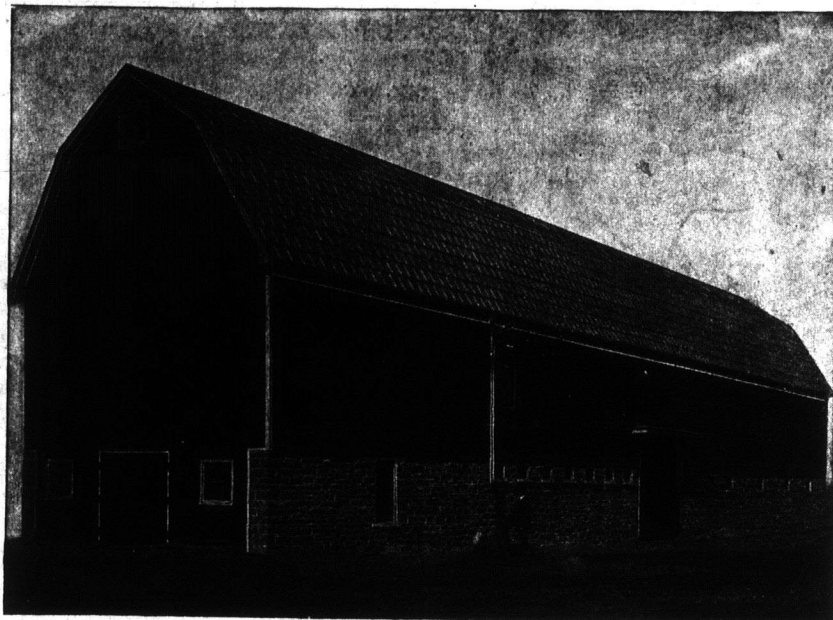
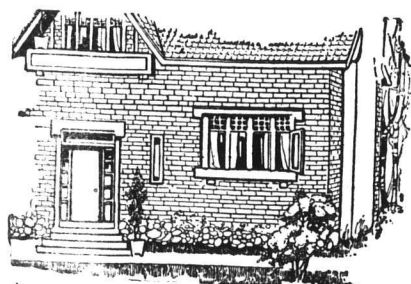
Quotation from Farmers' Bulletin No. 367, United States Department of Agriculture:

"The greater part of the annual loss of property by lightning is chargeable to farm buildings and their contents, and live stock in the field. A lightning conductor means a body of conductor that will lead away a lightning discharge. Metals are good examples of conductor bodies. The ordinary farm building is not difficult to protect from lightning flashes. A metallic roof properly connected to the earth affords ample protection to the buildings from lightning. It will not do to stop the conductor within a few inches of the ground. There should be an unbroken metallic path from the ridge of the roof into the ground.

The point to be emphasized is that buildings covered with metal and properly connected to the ground should not be attached to, or connected with buildings not protected, otherwise the unprotected building may be struck by lightning and be set afire and, of course, the flames will communicate to the contents of the other building. It is important that all connected buildings be similarly protected.

It is also well to note that all the authorities unite in stating that the sheet metal should be heavily and thoroughly protected by galvanized coating in order to be an efficient conductor as well as making it proof against corrosion.

With the above facts in mind there is no reason why every farmer should not protect his buildings and stock by the use of metal coverings, whenever a roof has to be replaced or new building erected; thus removing the fire menace, as prevention is better than cure, when adequate fire protection is not available.



A Proper Roofed Barn.

not regret a slight additional expenditure for the sake of immunity from the effects of lightning. The feeling of terror usually engendered in the minds of the family, conscious of their helpless and unprotected condition is more conducive to a high state of nervousness with its accompanying physical breakdown than almost any other cause. As the spring comes on, this subject recurs more frequently and in the hot summer days, with their heavy thunderstorms, lightning becomes a very constant source of dread and trouble.

Very careful observation has finally established a fairly good understanding as to the operations of electricity and the methods of minimizing the effects of same; lightning is a discharge of a large amount of electricity in a very short space of time, and whatever medium conducts it from the clouds to the earth suffers in the transmission, unless the medium is a first class conductor of electricity, and of sufficient size to take care of the full volume of the discharge. Trees, poles and buildings, on account of their height generally act as conductors. In the case of buildings, an electrical discharge is generally accompanied by fire, and a severe fire in the midst of a thunderstorm brings to light about the most helpless condition of humanity. Below is a quotation from an article by Prof. E. S. Keene, North Dakota Agricultural College:

"Buildings with metal roofs that are properly connected with the earth are far better protectors from lightning

that were struck by lightning; of some 600 cases we found that 53 per cent of the buildings struck were burned. Twenty insurance companies got reports for me last year and we found from their reports that out of every 200 buildings struck by lightning 42 were rodded and out of every 200 buildings struck by lightning only three were rodded showing 94½ per cent as the efficiency of lightning rods in preventing strokes. A building with a metal roof properly grounded is well protected; in case a stroke occurs to that building the roofing and the ground wires or other conductors will carry off the stroke as well as if there were rods on the buildings."

Quotations from a report of the National Board of Fire Underwriters, edition of 1913:

"Protection against lightning is advisable on country buildings, on isolated buildings and on all buildings, wherever located, having elevated features such as tall chimneys, high peaked or gable roofs, steeples, etc. The ordinary condition causing a lightning discharge is a cloud charged with electricity at a greatly different potential from that of the earth. The difference of potential is finally sufficient to break down the stratum of air between the earth and clouds, and as electrical discharge takes place. The high points take the discharge and unless some less resistive path is provided from this point to the ground than the structure to be protected, the lightning will follow the next best