Electricians Start Fires to Learn How to Fight Them

FIRES in electrical transformers and oil-switches are not only spectacular, but exceedingly hard to put out.

To determine the best extinguishers for such blazes, which are frequent because of the low temperature at which the oil may be ignited, the Pennsylvania Water & Power Company recently conducted a series of tests of various methods, including the use of carbon tetrachloride, soda, water, sawdust, and sand.

In each test, a fire was started within the transformer or oil-switch, and allowed to burn unchecked for five minutes. Wood was added as fuel to increase the heat, for the purpose of making the test as severe as possible.

How Extinguishers Acted

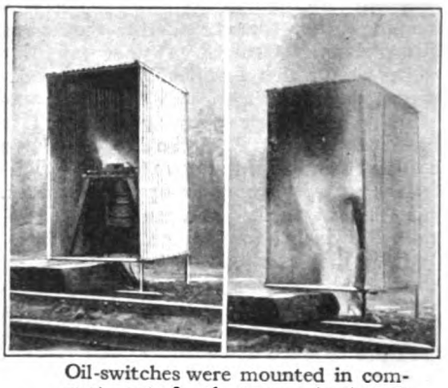
When applied at fifty pounds pressure, four gallons of carbon tetrachloride extinguished the fire in about ten seconds, but caused much smoke and flame.

Carbon dioxide from the ordinary soda tanks also gave excellent results. The stream was applied directly to the surface of the burning oil. Two two- and- one-half-gallon tanks extinguished the fire in eight seconds, while one tank required about twelve seconds.

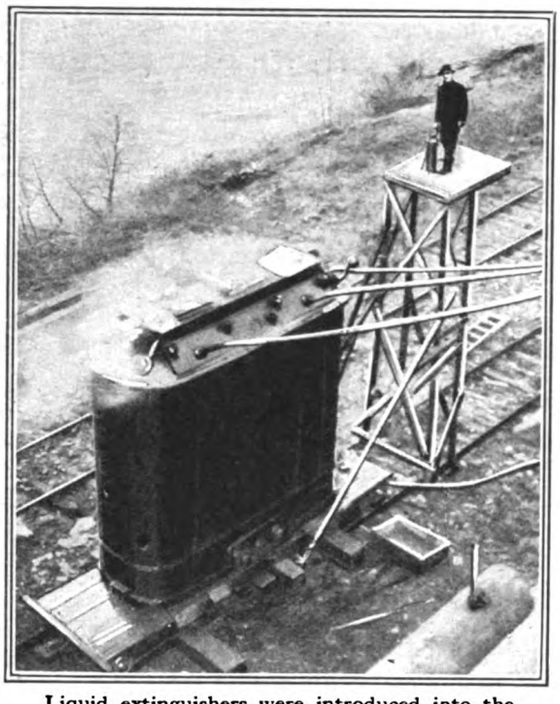
Water was effective, but when it was applied a flame twenty feet long, with clouds of smoke and steam, shot out of the transformer shell. Some oil was thrown out of the openings. A patent extinguisher similar in action to the soda apparatus in that it blankets the fire with carbon dioxide, put out the blaze in from fifteen to twenty seconds.

It was found that while damp sawdust would extinguish an oil-switch fire, a miniature explosion that threw blazing oil in all directions occurred whenever the smallest portion fell into the oil-pots. The use of sand was not accompanied by this danger, yet was just as effective in smothering the blaze.

As a result of the tests, certain precautions were formulated. Foam and soda are both electrical conductors, and if either liquid is permitted to run over an insulator, a "flash over" will follow. The transformer must be disconnected before they are used. If an operator moves too close to the fire, the jet may conduct the current to his body. A soda jet is an insulator after the stream is disintegrated into spray, but for a distance of forty-four inches from the nozzle the jet is solid and an excellent conductor. A short circuit will also result from the use of wet sawdust or sand unless the apparatus is disconnected.



Oil-switches were mounted in compartments for the tests. At the left is a fire on top of an oil-pot; at the right, a violent external blaze



Liquid extinguishers were introduced into the burning transformer through pipe connections, while external extinguishers were applied from an elevated platform

Danger of Poison Gases

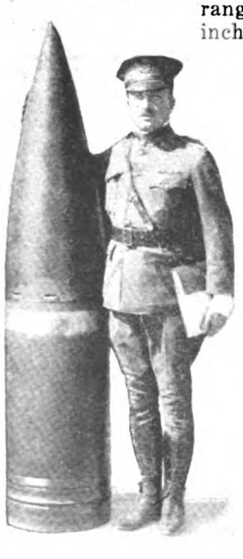
Carbon tetrachloride is a good insulator, and its use is recommended in high-tension fires. There is danger, however, in applying it in poorly ventilated locations. Tests made by the Bureau of Mines show that carbon tetrachloride will break down under certain conditions and generate the most deadly poison gases.

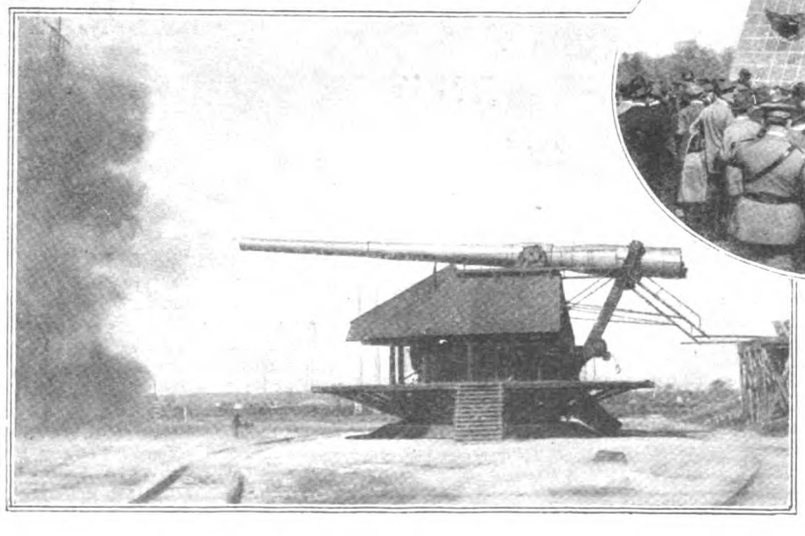
If large quantities are used on a very hot fire in a confined space, the operator should use a gas-mask.

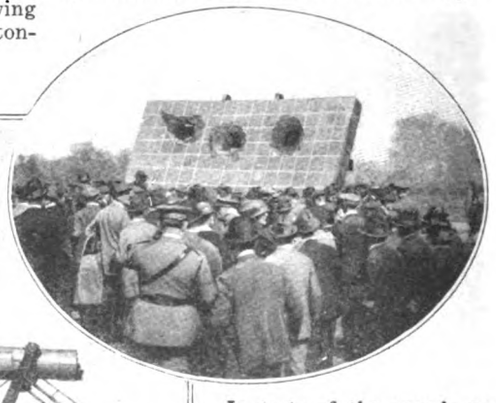
Shell from Army's New Gun Pierces Fourteen-Inch Plate

EIGHT million seven hundred thousand pounds of recoil energy, a force capable of tossing a two-thousand-ton freight locomotive two feet in the air, must be absorbed by the gun-carriage without a jar whenever the United States Army's newest disappearing coast defence gun is fired. While the shell cannot be stopped at short ranges by fourteen inches of steel armor, the gun, which travels to the rear with equal force, is checked in less than five feet with so little vibration that the gun-pointer is able to keep the sights continuously on the target.

The shock is absorbed by two closed cylinders partly filled with oil, flowing through narrow grooves in the piston-heads. The pistons move vertically, and are connected to the gun by a crosshead attached to the lower end of the gun-levers on which the piece is mounted. Some of the initial force of recoil is utilized to lift a counterweight of 315 tons, which in turn serves to lift the gun from loading position into battery.







In tests of the army's new sixteen-inch disappearing gun at the Aberdeen proving-grounds, the huge shell at the extreme left was fired through fourteen-inch steel armor plate. The roofed housing—called the "barbette"—protects the gunners and delicate mechanism from shell fragments and bombs

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