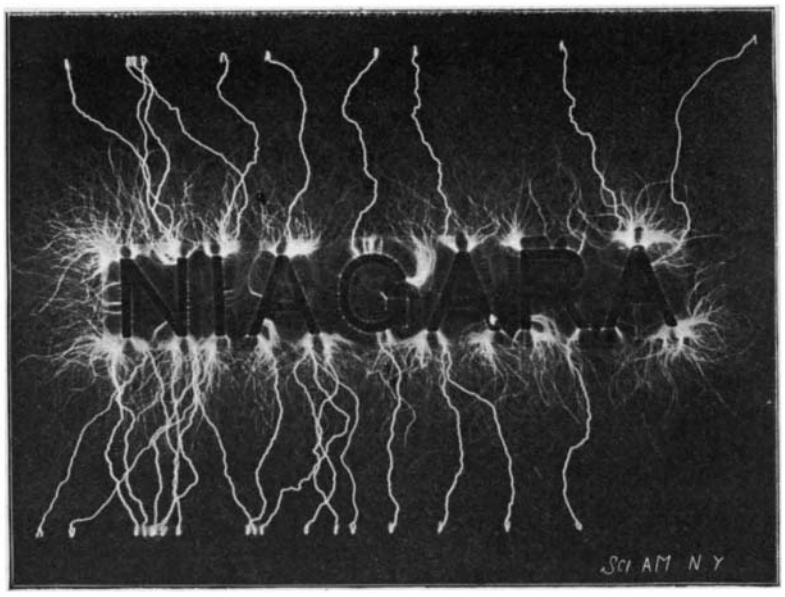
ARTIFICIAL LIGHTNING.

The electrically illuminated sign herewith shown is the work of Mr. P. M. Lincoln, chief engineer of the Niagara Falls Power Company, to whom we are indebted for our illustration and particulars. The sign may truthfully be called a miniature artificial thunder storm, the term "artificial" being used advisedly for the reason that the storm is strictly artificial and in no sense a mere imitation. The flashes of lightning and the thunder claps of a midsummer storm are repeated in the flashing illumination and the accompanying succession of sharp reports of this really magnificent electrical display. The sign consists of a large glass condenser charged with alternating currents of high potential. The partial and complete discharges of the condenser are the cause of the electrical display around the letters and over the surface of the glass. At low potentials each letter is surrounded by a beautiful violet fringe of brush discharge. As the potential is raised streamers begin to shoot out from the sharp corners of the letters and extend at first for a distance of about one inch over the plate. The length of these streamers increases with the rising voltage, until they form a brilliant and shifting halo, reaching out for a distance of 12 inches or more from the letters. Up to this point the electric discharges are only partial, but upon raising the voltage still higher, complete discharges occur, each being accompanied by a loud report. The white crooked lines of the illustration show some of the paths of these complete discharges. When the voltage is sufficiently high, each illumination is accompanied by one of these complete discharges, and when the frequency of 125 periods per second is reached, the discharge is extraordinarily brilliant, and the accompanying reports are strongly suggestive of a regiment of soldiers at rifle practice. Although the device is somewhat expensive, its effect when used as an advertising device is remarkably successful.



ARTIFICIAL LIGHTNING.

FIGHTING FIRE WITH WINE.

BY CHARLES FREDERICK HOLDER.

California has for four or five years been visited by a short rain supply, which has caused no little annoyance, trouble and expense to almost every industry in the southern part of the State, though certain regions have had their normal rainfall. In some localities water has almost entirely given out, and small ranchers have deserted their places and driven their stock to more favored sections. One of the most serious results of the lack of rain has been the forest fires, which in the past few years have raged with unprecedented violence and devastated hundreds of square miles of forest, which will not reproduce themselves in a century.

In many parts of California these fires have occurred owing to the dry conditions which have prevailed. Perhaps the most remarkable fire occurred near the town of Wrights, in the Santa Cruz Mountains, south of San Francisco. Here the fire was started, as in many other instances, by an irresponsible rancher who was burning brush. The wind sprang up suddenly, swept the flames into the forest, and in a very short time a fierce wall of flame was rushing up the west slopes of the Coast Range, carrying destruction before it. The mountains here were covered with a fine growth of old oaks, mazanits and madrones—landmarks in the country—which fell like straw before the destroyer. The wall of flame swept to the summit and descended into the cañons, following these rivers of verdure in and out, rushing on in an ever-increasing volume.

In the pathway of the fire was the ranch and Mare Vista winery of E. E. Meyer, one of the largest wine-making establishments and vineyards in Santa Clara County. To protect it and the homes in the vicinity, the people of the surrounding country assembled en masse, organized themselves into an efficient body of fire fighters and began a campaign in which striking acts of valor were performed. It was impossible to stay the flames, and as they went rushing down the cañon toward the winery, destruction of the valuable property seemed inevitable, and the result demonstrated the necessity of having in this and other States men who will make a study of fighting fire as a science. Trees in advance were cut down; ditches of earth dug, and every expedient known to fire fighting of today was tried; but so fierce were the flames that they seemed to leap hundreds of feet into the air, bounding in lurid sheets over the breaks, and in an incredible short time swept down to the winery, as shown in the accompanying illustration, and surrounded it. Under ordinary circumstances it would have seemed impossible to save the building, but the band of workers rallied under the intelligent lead of the Meyers, and men were posted on the roof who poured streams of water upon every portion. Young Mr. Meyer was held by ropes from a window while he used the hose upon the flames which were licking up the timbers at the base of the building, the heat being so intense that a stream had to be played upon his body.

LARGE WINE VATS WHICH WERE USED TO SUPPLY THE FIRE PUMP.

A FIRE EXTINGUISHED BY THE USE OF WINE.

It was believed that the winery could be saved, when, without warning, the water gave out. Some large trees, which were dropping in every direction, had fallen upon the supply pipes, crushing them in and clogging the reservoir. This was an unexpected catastrophe, but the resources of the fire fighters were by no means exhausted, though a desperate expedient was resorted to. The owner of the winery gave the order to attach the hose to the great vats of Zinfandel wine which were stored in the cellar (see illustration), and man the wine pumps. This was promptly done, and an exact picture of the situation at this time is here shown. Wine had been used in this way before, but the owner was not aware, in all probability, of the precedent. In a few moments valuable wine was being pumped upon the flames with remarkable effect. In the words of a witness, "it acted like some chemical prepared for the purpose." Wherever it struck, the flame was smothered at once, peculiar clouds of smoke rising, telling that the chemical combination was a success; so successful, indeed, so apparent, that the exhausted men, who had been working for hours, and whose clothing and hair were charred, raised a cheer and began the fight with renewed vigor. In a letter to the writer, Mr. Meyer says: "My cellar is surrounded by large pine trees, and these were burning furiously, throwing the flames toward the building which caught fire in several places. The wine I found to be a far better extinguisher than water. The wine I used was young, hardly through fermentation. It contained about one per cent of sugar, and was still quite warm. I had two pumps going, each throwing a one-inch stream."

Four thousand gallons of this wine was thrown upon the flames in this way before the building was safe, probably one of the most remarkable and successful methods of fighting fire known. The method was somewhat expensive, as the wine retailed at 50 cents per quart when bottled, and $8,000 in wine was used, yet it saved buildings and machinery worth many thousand dollars and demonstrated that a winery has a protective against fire in its vats if the owner has the courage and temerity to use it.

Photographic Telegraph Receivers.

Messrs. Siemens & Co., of London, have patented an invention regarding telegraph receivers of the photographic description. In this invention the photographic impression is produced by the deflection of the cathode rays relatively to the recording surface through the agency of the electromagnetic effect of the signaling current. The cathode rays act directly through the medium of a fluorescent screen, which has a portion of its light transmitted through a lens to the recording sensitized surface. It is stated that this process is specially applicable for the purpose of recording Morse signals. The inventors have somewhat modified the original method by using a different current strength to signal each sign, and by the special arrangement of the cathode ray apparatus the variations of the current strength causes differences in the deflection of the rays in relation to a fluorescent screen. These variations in the light are transmitted to the recording surface by a lens and mirror, or a lens, diaphragm and mirror, which are so shaped that an image of the signal is recorded upon the sensitized strip. If necessary, the straight line deflections by currents of widely varying strengths may be substituted by a rotary deflection by means of a series of magnets variously energized through a corresponding number of conductors.

THE first sleeping cars built in Japan have just been completed.