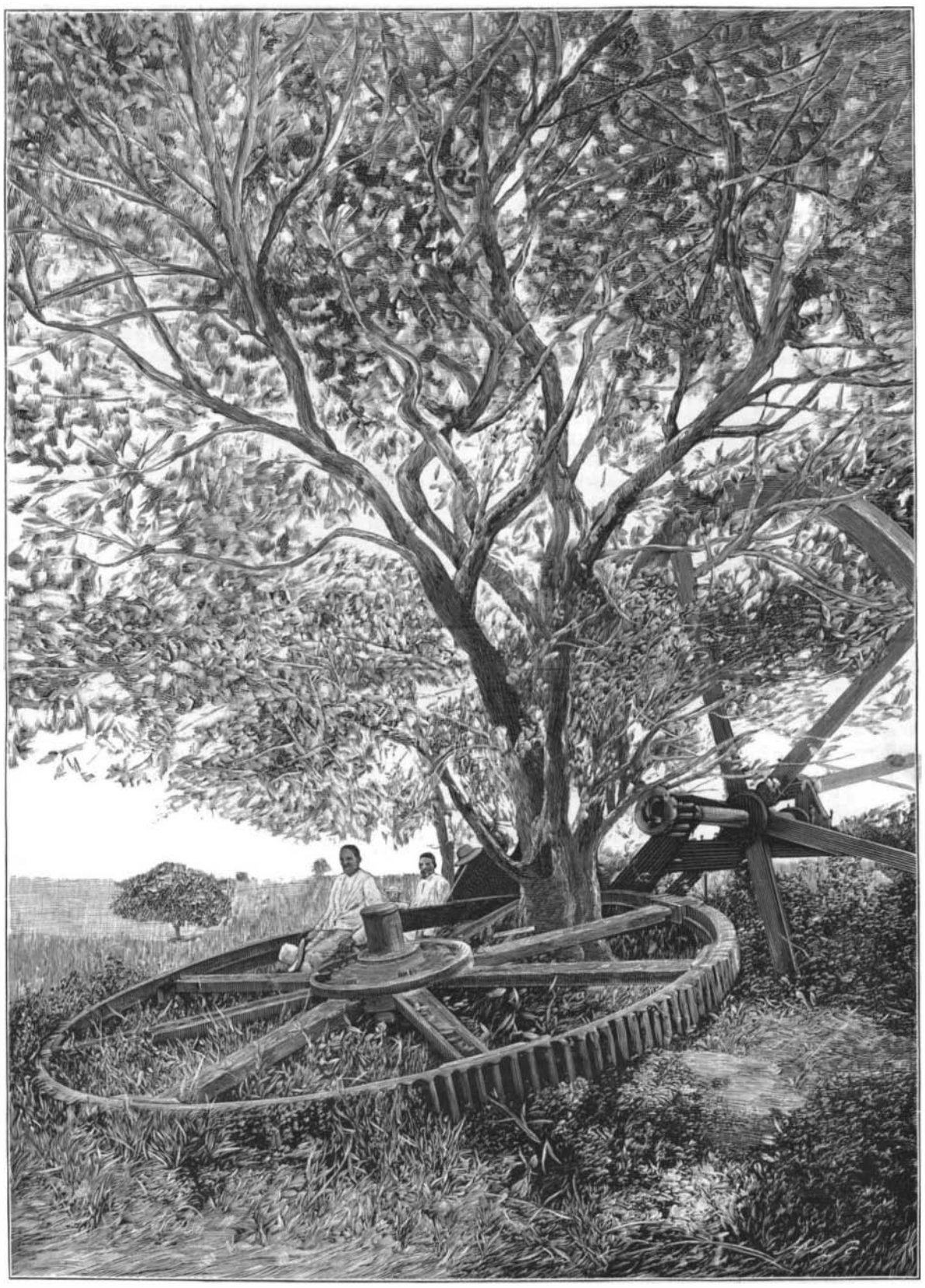
RELICS OF A CUBAN INSURRECTION.

A recent number of La Ilustracion Española y Americana contains a number of engravings of scenes in the vicinity of Manzanillo, which is in the eastern part of the island of Cuba, and the scene of the present hostilities. It was in this part of the island that the former revolution of 1868 took place. During the fighting which then occurred, the Spanish troops burned down the buildings pertaining to a large sugar estate known as the Ingenio de la Demajagua. Among the ruins left upon the ground was a large gear wheel and a fly wheel. These are shown in our engraving as they now appear after a lapse of twenty-five years, during which time a jaguey tree has sprung up between the spokes of the gear wheel and has assumed the large proportions represented in our engraving. The growth of this tree gives some idea of the Cuban flora and the rapidity with which it springs up and spreads over the ground. According to our contemporary, the present uprising of the Cubans is making extensive progress. A large portion of the eastern section of the island is already in the hands of the revolutionists, and it is doubtful whether the Spanish government will be able to bring in troops enough to overcome the patriots.



RELICS OF A CUBAN INSURRECTION.

Brine for Removing Snow and Ice from Rails.

The repeated demands by managers for a brine in place of salt resulted in President Fitch, of the Bay City, Mich., trolley road, making a series of experiments covering many months and which were at last successful in producing cheaply a method of compounding a highly concentrated clear salt liquor with specific gravity greatly in excess of water, and which is absolutely free from deposit or sediment, is no more expensive in first cost than salt, but can be applied with less trouble and expense, and is very much more economical in use, wastage being almost wholly saved. The basis of the triple chlorides, as President Fitch names the liquid, is natural salt water as pumped from his salt wells, with a mechanical and chemical treatment. It will not freeze even at 20° below zero and has an immediate action when applied, its penetrating effects being very much greater than dry salt or the brine formed from salt melting on track.

During the past winter the triple chlorides was used on several street railways with surprising and highly gratifying success, and these roads are so thoroughly convinced of its superior advantages they have abandoned salt and will use the brine exclusively in future. The method of its application will at once suggest itself to every manager. For curves, crossings and switches the brine is applied by the man whose duty it is to sweep these points, pouring the brine from a common sprinkling can with a small spout nose just as he uses water in summer.

If much is used at any special points a barrelful can be set out in any convenient basement or vacant place, as the brine will not evaporate in cold weather.

For main line tracks a small tank or keg can be set on the front platform and the brine fed to the rail by small iron pipes passing through the platform floor and reaching almost to the rails and discharging a stream from the size of a slate pencil up to any amount desirable, the flow being regulated by a cock. For very bad track and long distances, the sprinkling car used during the summer is pressed into service, the sprinkler being removed or changed so as to dischange only upon the rails. The brine has less corroding effect on iron and copper bonds than salt, and the method will readily commend itself to managers.

Electric Lighted Buoys in New York Bay.

Incandescent electric lamps on spar buoys have been experimentally used in New York Bay for several years, but an installation has now been completed which marks a considerable advance in maritime engineering and renders the entrance to New York Harbor possible for the largest vessels at any hour of the night. Gedney's Channel, which is the course taken by the transatlantic steamers, is only 1,000 feet wide, and while buoyed by day, became an impracticable course at night. It is now lighted by 10 incandescent lights of 100 candle power each, placed on the top of spar buoys on either side of the channel, forming a lighted avenue for the shipping. The lamps are mounted on 50 foot cedar buoys which are shackled to 5,000 pound mushroom anchors. The cable is constructed of a copper conductor, insulated with gutta-percha, then bedded with jute and sheathed with an armor of hard drawn copper wires. This cable carries successfully, according to the Engineering Record, a pressure of 1,000 volts alternating current under water for the distance of 6½ miles. The generating station is located about 2,000 feet back from the beach. The current for lighting the buoys is carried to the submarine cable through a lead-covered conductor laid in a creosoted subway 4 feet underground. The electric plant is in duplicate. The current is generated at 100 volts and is raised by a step-up transformer. All the high-tension lines are either underground or in cables at the bottom of the sea.

ALUMINUM felloes in bicycles are regarded by some makers as an improvement on wood.

A New Quadruple Expansion Engine.

Messrs. Hall and Treat announce, in the Sibley Journal of Engineering for April, "A New Quadruple Expansion Engine." This machine, built for regular working at 500 pounds pressure, and with its boiler tested to 1300 pounds, has now been in operation in Sibley College, at Cornell University, for many months. It was designed by the authors of the paper, built by them in the shops of the college, and has since been tested under a great variety of conditions. The design was entirely original, although, of course, embodying the principles taught them in their college course, the one being a graduate of '93 and the other of '94, and both now candidates for advanced degrees, the one for a doctor's, the other for the master's, degree in engineering. The valve gear is new and the invention of the builders of the engine. The proportions of the multiple cylinder system are those derived by application of their text book and lecture room work; and the engine as a whole is a success. The boiler has worked well and economically up to above 600 pounds per square inch, and its waste heat is utilized in the reheating apparatus of the engine and so thoroughly as to make the temperature of the chimney very low. The steel for "running parts" was obtained from the Bethlehem Iron Company and proves to be of very fine quality. Special devices have been required, in every direction, to make the operation of the machine with such high pressure steam satisfactory and safe. Even the injector was necessarily reconstructed, as no ordinary instrument would force water into the boiler against 600 pounds pressure. The figures reported for economy are something under 10 pounds of steam per horse power per hour, and the best conditions of operation are not yet fully identified, though unquestionably corresponding closely with the preliminary computations of the designers. This figure is the lowest yet reported, even for engines of many times the size of that here described. It will require authoritative revision and corroboration; but there seems no reason to doubt its substantial accuracy, as the result of many engine trials under a great variety of conditions. If thus corroborated, it will stand as the "record of the world" for the nineteenth century. The thermodynamic consumption of this engine should be about 7 pounds of steam per horse power per hour, exclusive of all thermal wastes, and this should be approximated much more closely in engines of similar type built on a large scale. The figure attained is extraordinary, and almost incredible, for a model engine such as is described; yet it indicates a waste, by conduction and radiation, after all, of no less than twenty-five per cent of all heat sent to the machine from its boiler.—Science.

Manufacture of Great Guns.

Seven 12 inch nickel steel tube army rifles have recently been completed at the Watervliet arsenal with a variation in weight between the lightest and the heaviest of only five pounds. The guns are forty feet long and weigh approximately 115,000 pounds apiece. Each has an inner tube over which a series of hoops are shrunk for nearly the entire length. Over these is a single jacket two-thirds the length of the gun, and over this again are shrunk more hoops. Aside from this large number of parts, the guns are turned on enormous lathes during certain stages of their manufacture, and the close agreement of theentire lot is considered a remarkable feat of accurate workmanship.