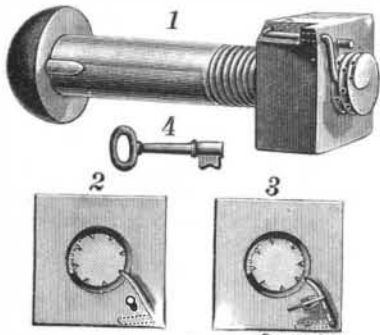


**AN IMPROVED NUT LOCK.**

This nut lock is especially adapted for securing the fish plates upon railroad rails and other similar uses. It has been patented by Messrs. Joseph Harmon and George W. Faber, of Fergus Falls, Minn. Fig. 1 shows the application of the device, Fig. 2 being an end view representing the nut engaging the bolt, and Fig. 3 showing it disengaged, while Fig. 4 is a key used to release the lock. In one corner of the nut is secured one end of a piece of spring wire, as shown in Fig. 1, the other end of the wire being bent at a right angle to lie against the outer side of the nut and form a locking limb, pointed and slightly curved near its end. In the bottom of the spiral track of the bolt thread are a number of cupped indentations, adapted to be readily engaged by the pointed end of the locking limb, the latter springing sufficiently to permit the nut to move freely as it is screwed upon the bolt body, but preventing backward movement of the nut by its engagement with one of the indentations. To disengage the spring locking limb from the bolt, the key is placed on an adjacent post in the end wall of the nut, and the turning of the key springs the locking limb away from the bolt, one key serving for use with any number of similar nut locks.



**HARMON & FABER'S NUT LOCK.**

**A Successful Storage Battery Electric Car.**

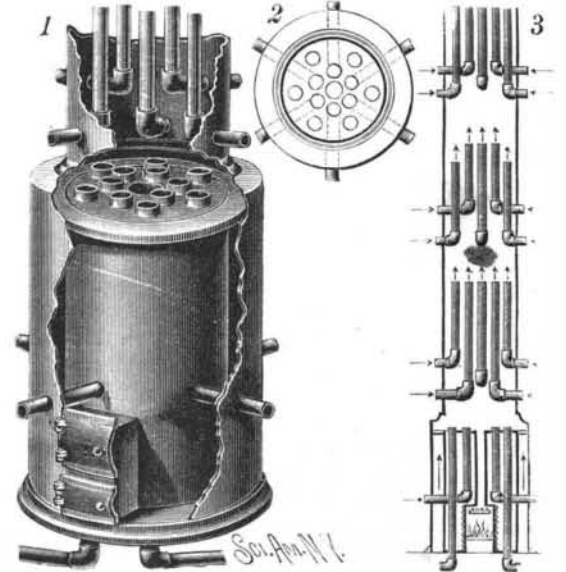
At Oneida, N. Y., they have a street car propelled by storage batteries made by the Syracuse Storage Battery Company. The total run on one charge of the batteries was 125 miles. The car makes daily from 64 to 90 miles without a break in the service. The 125 mile run was made on a seven hour charge. There are 96 cells used in the car. The motor is a single 30 horse power Rae type, with truck made by the McGuire Company, of Chicago. The motor and truck were purchased of the Detroit Electrical Company. The motor is wound for 190 volts. The voltage of the 96 cells at the start of the 117 mile trip was 204; at the end, 192 volts, a loss of only 12 volts in a day's trip. The car is lighted from a bank of 24 cells with 48 volt incandescent lamps.

**A PNEUMATIC VENTILATOR.**

This improvement, patented by Mr. William R. Macdonald, of Allegheny, Pa., comprises a main ventilating flue containing within itself auxiliary vertical tubes, having elbows at right angle connections at various levels, forming inlets for the tubes at the sides of the main flue, there being a heater within or contiguous to the main flue. Fig. 1 shows the lower part of such a main flue, provided with a heater and fire-box, Fig. 2 being a plain view, and Fig. 3 a sectional side elevation representing the air inlets as the apparatus would be arranged for the different floors of a building. The lower tubes, from the hot air generator, discharge a powerful upward blast of heated air against and around the tubes projecting into the main flue next above it, the second set of tubes in like manner discharging just below the tubes entering the main flue at a higher level, as shown in Fig. 3, the arrows indicating the direction of the air currents. With this arrangement all air entering the main flue is heated before its discharge into the flue, thus adding to the velocity of the upward current, and creating a draught which forms a most efficient means of ventilation, the inlets for the exhausts being placed where it may be most convenient, or in proximity to any particular location, where it may be most necessary to insure a constant circulation of air.

ceiving and purifying at present 5,280,000 cubic feet of water a day, that is to say, a little more than a third of the production of the city of Paris, which is about 14,784,000 cubic feet a day. The 9,504,000 cubic feet excess are thrown into the Seine, and this figure can only increase. It, therefore, became necessary to seek new absorbing grounds in the vicinity of the capital. After a profound geological and agricultural inquiry, they were found at Acheres, at Mery-sur-Oise and at Meulon.

The absorbing grounds of Acheres have a surface of



**MACDONALD'S PNEUMATIC VENTILATOR.**

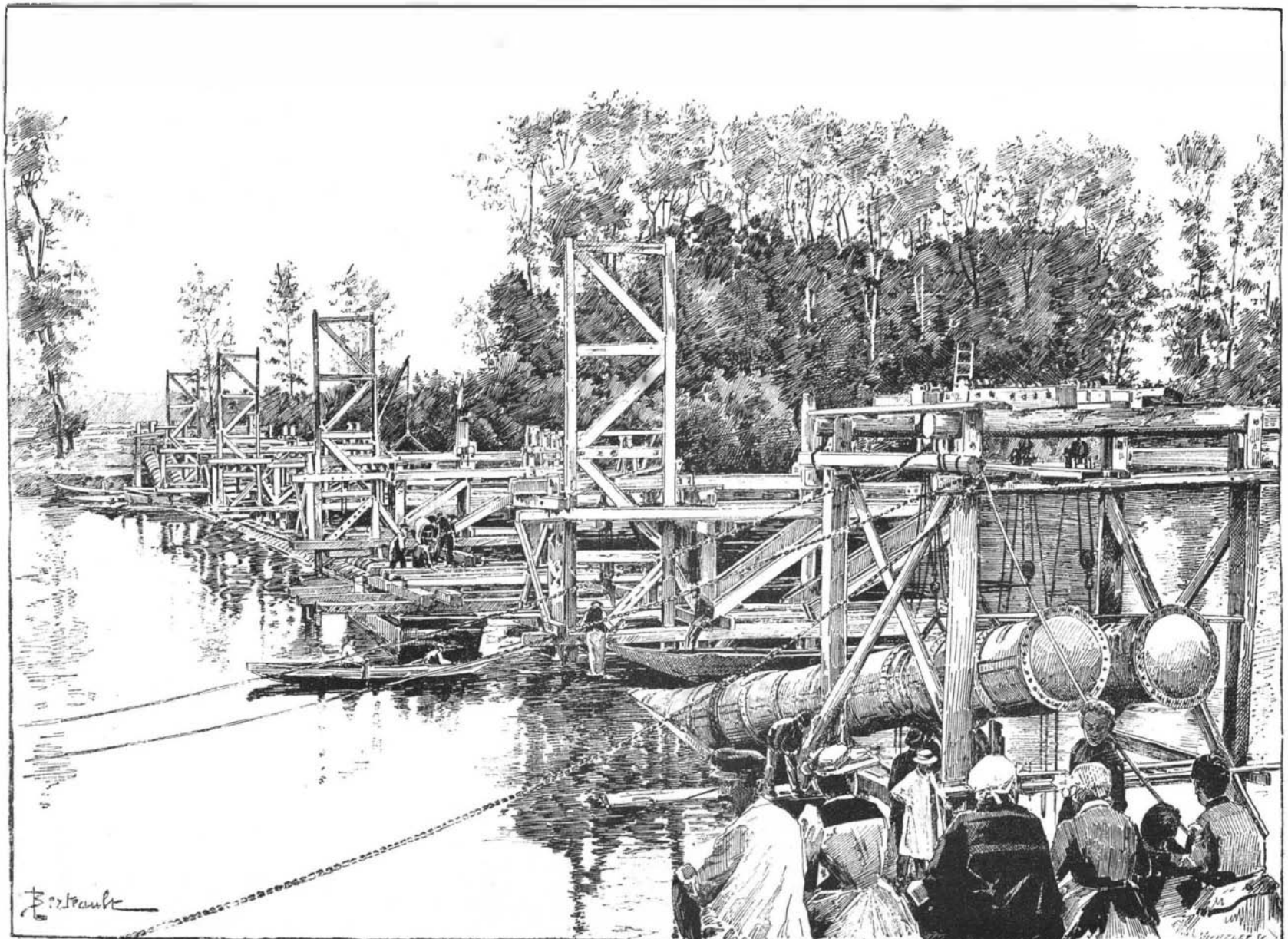
**WORK ON THE SEWERS OF PARIS.**

The administration is at this moment putting in execution with great activity the realization of the programme of the cleansing of the city of Paris through the application of the *tout a l'égout*. After long studies of various systems, it is, as well known, the one recommended by the late Mr. Durand-Claye that finally triumphed. It consists in purifying the sewage water by the action of a permeable soil combined with the vegetation. The sewage water begins by filtering completely in traversing the superficial strata of the soil. Then the dissolved organic matter descends through the strata of the subsoil, where it comes into intimate contact with the oxygen of the air, which fills the interstices between the solid molecules.

about 1,600 acres. It was a question in the first place of forcing to them the 9,504,000 cubic feet of sewage water that the Gennevilliers peninsula cannot absorb. To this effect there is under construction at the present moment a lifting plant, comprising four engines of 1,000 horse power as a whole, which will be doubled in the future when it becomes a question of the irrigation of Mery-sur-Oise and Meulon.

It was at Gennevilliers, near Paris, that the first experiments were made, and pursued upon quite a vast scale. It was found therein that 15 grains of sewage water contain 20,000 microgerms, while the same 15 grains of water making its exit from the drains of the irrigation grounds contain no more than 12. This encouraging result served as a base for the generalization of the system that is operating at this moment. The grounds of the peninsula of Gennevilliers comprise 1,600 acres of irrigatable and absorbent superficies. They are re-

The sewage water, lifted to a height of 16 feet, will be forced into a siphon passing to Asnières under the bed of the Seine, at the issue of which an aqueduct will lead it to the relay works of Colombes, near Paris. There a large plant comprising four engines and developing 6,000 horse power will lift the water to the summit of the hill of Argenteuil. Here they will empty into two conduits six feet in diameter crossing the Seine at Argenteuil upon an aqueduct bridge. Starting from Argenteuil, the sewage water will de-



**PARIS SEWERAGE—SUBMERSION OF A SIPHON AT HERBLAY.**