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A LOCOMOTIVE MAGNETO-ELECTRIC INDUCTION ENGINE.

We recently published Professor G. F. Barker's excellent lecture on magneto-electric machines, in the course of which a description was given of the Siemens armature. One of the most recent applications of this important apparatus for converting magnetism into electricity is represented in the accompanying engraving, which we take from the *Practical Magazine*. The machine is a locomotive magneto-electric induction engine, in other words a very powerful electrical battery, mounted on a carriage, to which horses may be harnessed in order to transport it from place to place. The fore part of the vehicle is occupied by the magneto-electric apparatus, which is driven by a small vertical steam engine located in the rear. The machine was built at the Siemens-Halske telegraph works, in Berlin, and is mainly intended for the production of the electric light.

Currents of electricity are induced in coils of insulated

The engine works up to 200 revolutions per minute, producing 450 revolutions per minute of the drum of the induction apparatus. The latter is of thin German silver plate, covered with eight separate coils of copper wire of 0.28 inch gage, and rotates between two very powerful horseshoe magnets. At full speed, the current induced is sufficiently intense to heat a copper wire, 0.04 inch in diameter and 38 feet long, to redness, and, photometrically, is equal to 14,000 wax candles. The draft of the apparatus is about 2½ tons.

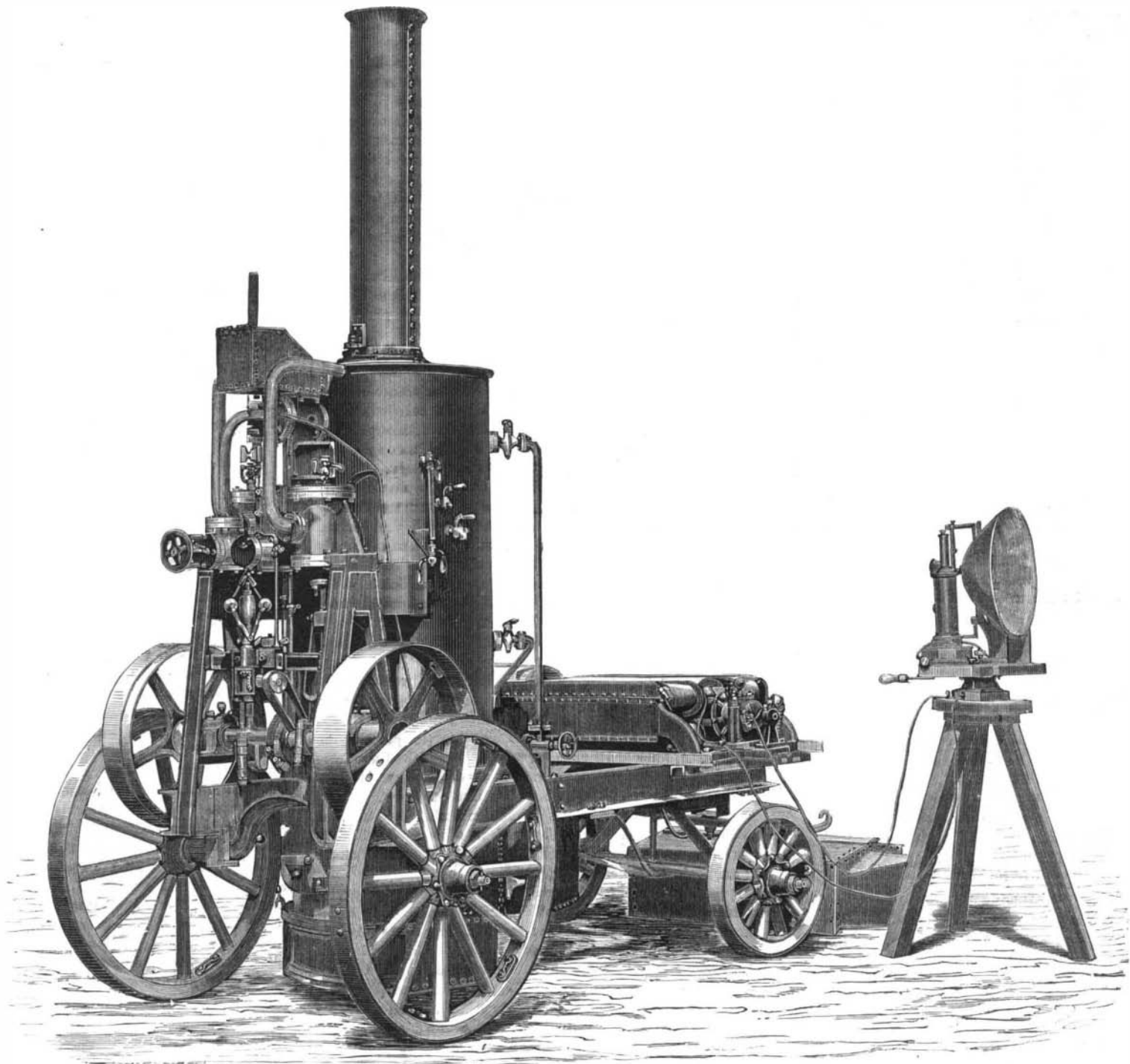
The Use of Well Water in the Cities.

The State Geologist of New Jersey, in his recent report, calls attention to the habit, still in use in some of the older cities of New Jersey, of people drawing their supplies of water from old wells. In an analysis of the water coming from some nine wells in Princeton, five of them were found to contain free ammonia, albuminous matter, and chlorides

always attend the use of water contaminated with putrefying organic matter

An Incendiary Machine.

The Hartford Phoenix Insurance Company lately unearthed the latest incendiary device in connection with an \$1,800 barn loss in Schoharie county, New York. It is to be hoped that the machine will form a part of the underwriters' Centennial exhibit. The apparatus consists of a board covered with sand paper that faces another board filled with matches, set so that the sulphur of the matches can rub against the sand. These were set against a hay mow, and with the match-filled board attached to a ten foot lever with its bearing in the middle. At the end of the lever is a tin milk pail, and set above the pail was an ordinary funnel supplying the bottom to a bushel box filled with fine sand. This sand was allowed to run into the pan; and when the pres-



PORTABLE MAGNETO-ELECTRIC MACHINE.

wire wound upon a metal drum, by causing the latter to rotate rapidly around an iron core placed between powerful magnets. The electric current can be conducted, either continuously or intermittently, to any desired point, by means of conductors connected with the magnetic poles. When used for illuminating and signaling purposes, the conductors are led to an electric lamp, which is provided with a special arrangement for regulating the intensity of the current. The steam boiler is vertical, made of steel plate, with a fire box suspended below; there are twin cylinders, which set in motion a couple of driving wheels, connected, by means of belting (omitted in the figure), with the drum of the induction apparatus

in excess. In tracing the effects of these waters, it was found in almost all cases that diarrhoea and typhoidal fevers accompanied their use. It is almost impossible to be sure of the good quality of any well which is surrounded by houses, where drains and sinks empty into the surrounding soil. It would be well if the proprietors of large country hotels and summer resorts would not only look more closely to their sources of water, but eschew well water entirely. For the health of their guests, it is better, in all cases where running water does not exist, to seek their source of water from cisterns which are fed from the rainfall on the roofs. Wherever such rain water is used, it may be safely stated that there is an entire exemption from the diseases which

sure was sufficient to move the lever, a string unloosed the funnel, and the balance of the sand, dropping suddenly into the pan, moved the lever, and so the board ignited the matches, thus firing the barn. A belated traveler passing discovered the thing in working order, rushed in, and saved it, and presented it to the insurance adjuster as an evidence of the ingenuity of man.

An excellent varnish for photographic negatives is made of 3 ozs. bleached shellac dissolved in 24 ozs. alcohol. Filter when dissolved, which will be in 1 or 2 days, then add gum sandarac 1 oz., essential oil of lavender 1½ ozs. Filter again and bottle for use