

POSTAL TELEGRAPH CARRIAGE.

We publish herewith an engraving of a traveling telegraph office, now in use in Great Britain for opening temporary communications. The idea is to have a movable office, carrying its own cable, apparatus and batteries, which can be transported from place to place, either by road or rail, at the shortest notice, and which can be taken to the wires when the wires cannot be taken to it. This, which is the only carriage of the kind in use for similar purposes, is constructed to carry one of each of the different forms of instrument (six in all) in use in the postal system, and can comfortably accommodate as many as eight clerks in full work. It carries, also, nearly 150 battery cells, and so skillfully is the accommodation designed that these are all stowed away out of sight in odd corners, so that not a single atom of space is lost. Half a mile of three-wire iron-sheathed cable is stowed away as snugly as possible in the "boot," and can be paid out and drawn in with the greatest ease in the world. The telegraph carriage has been used at agricultural shows and races, and similar occurrences, which sometimes take place away from cities.

New Method of Engraving.

At the recent meeting of the French Association for the Advancement of Science, M. Gourdon, of Lyon, described some novel facts which he had observed in the action of acids upon zinc covered with certain metals. Zinc plunged into dilute solutions of sulphuric, hydrochloric, and acetic acids is attacked only at the points where other metals are present. The metals which produce this phenomenon with most intensity are cobalt, platinum, nickel, and iron. Ammoniacal chloride of cobalt renders it possible to perforate zinc with water containing only one 10,000th part of sulphuric acid. M. Gourdon applies these results to various procedures for engraving. By writing directly upon zinc with different metallic inks, making use of the most active, containing salts of cobalt, for the blackest parts, and passing it then into acidulated water, an engraved plate is obtained. To reproduce leaves or plants, they are soaked in solutions of metallic salts, and applied to the zinc, which is then treated with weak acid. The author has discovered a new kind of heliographic engraving by transferring the silver from an ordinary photographic proof upon the zinc, which can be attacked by the acids in the parts where the silver has been deposited.

STEAM TRAVELING CRANES AT THE VIENNA EXPOSITION.

On page 95 of our current volume, we illustrated a large and powerful traveling crane employed in moving ma-

chinery and other heavy exhibits to their proper location within the buildings. We now produce a view of another and somewhat similar apparatus, by Messrs. J. H. Wilson & Co., of Liverpool, England, which has also been exhibited at Vienna. It is worked by a couple of 6 inch cylinders, and, in addition to the lifting gear, has gear for slewing, traveling, and raising the jib. The lifting gear is single only, the



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crankshaft pinion gearing direct into the wheel on the drum shaft. The brake is arranged so as to be applied by a hand wheel on a vertical spindle, the bottom end of this spindle being screwed, and turning in a nut on the end of a long lever. The spindle for the traveling motion is carried through the center of the crane post, a bevel pinion on its upper end being driven from the crankshaft. It is arranged to drive both the axles of the truck, instead of, as is so commonly the case, only one of them. A countershaft, lying across the top of the framing, is driven from the crankshaft, and carries a pair of bevel pinions, either one of which can be put in gear by means of friction cones, with a bevel wheel on the top of a vertical spindle, so that the latter can be driven in either direction. This spindle serves both for the slewing gear and for raising the jib. The former consists of simple spur gearing, with a pinion working into an internal circular rack on the top of the carriage. For raising the jib, a worm and worm wheel are used, working a deeply recessed pulley on a horizontal countershaft. It will be seen that the raising chain is fixed to the framing at one end, and carried round a pulley connected by a rod to the end of the jib.

The boiler (says *Engineering*, to which we are indebted for the illustration) is of the simplest possible construction, with one cross tube in the fire box. The jib is made of wrought

iron, and has a radius of 12 feet; and the carriage or truck is cast iron, as well as the framing of the crane. The whole of the bending stress due to the weight comes upon the crane post, there being no supporting rollers, and this seems to us a defect; but in other respects the design of the crane is very good; the different motions are compactly arranged, and the whole of the gearing is easily accessible.

The Boiler Tests at Sandy Hook.

The experimental tests as to the cause of boiler explosions, made under the supervision of a government commission, the members of which we specified in our last week's issue, were inaugurated at Sandy Hook during the past week. Two marine boilers were used, one a small tubular, and the other a large low pressure generator, ordinarily known among engineers as a "lobster back."

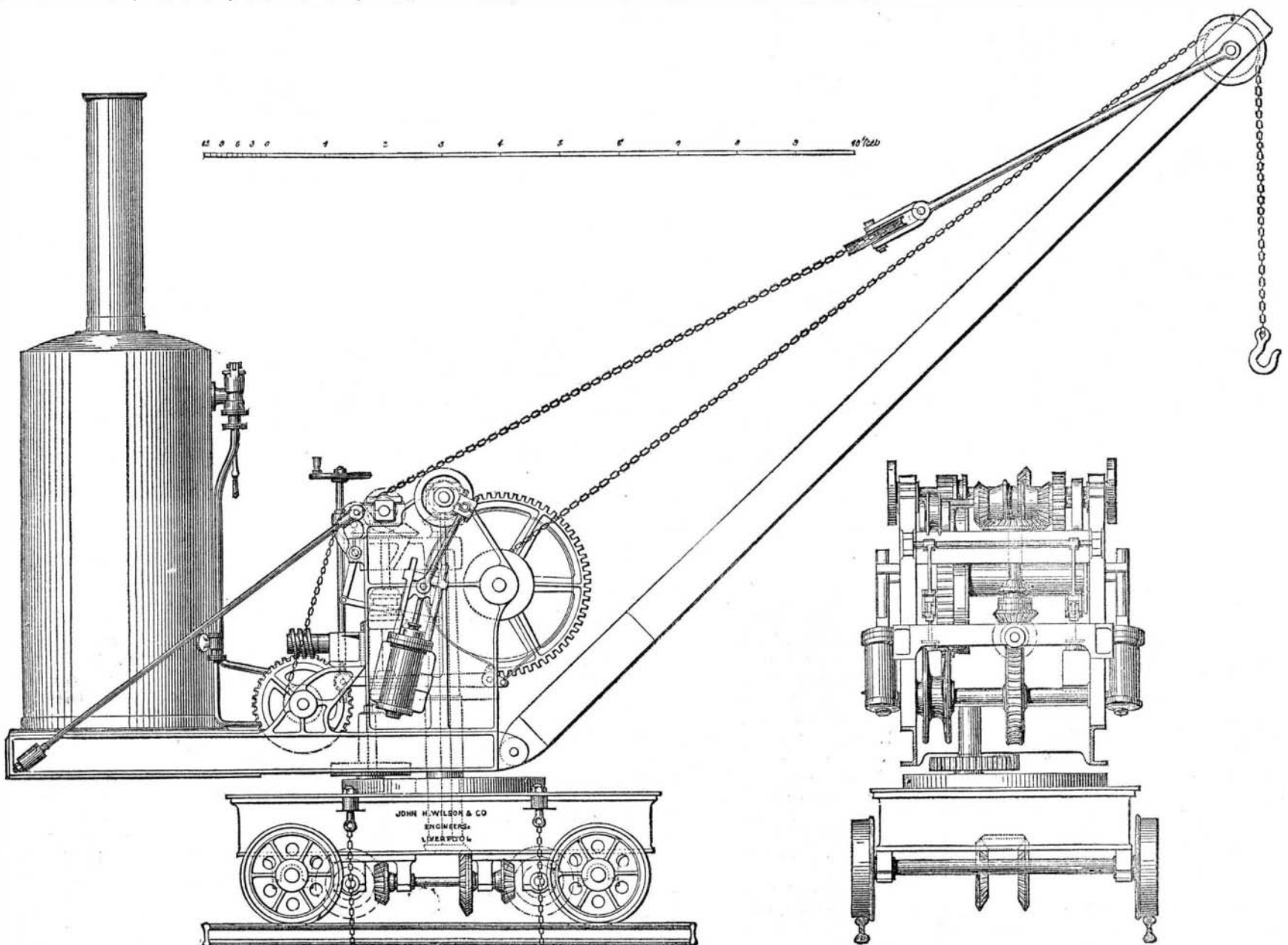
The small boiler was first tried, but, owing to leakage of the supply pump, there was a long delay which finally terminated in the collapsing of one of the tubes at a steam pressure of 54 pounds. The object of this experiment was to show that, with low water in the boilers, the plates become heated so that their strength of resistance is decreased. The pyrometer, placed below the boiler and near the fire box, showing that the steam in the upper portion of the vessel was superheated to 750° when the collapse occurred, it was considered that the truth of the theory was fully proved.

The "lobster back" boiler was next tested under a steam pressure of 70 pounds, at which point a seam on the upper side of the shell became ruptured, the split taking place in a soft patch and extending over a length of 18 inches. The gages showed that, even after this break, the steam pressure continued to ascend although the rupture did not enlarge. No further damage was done. The conclusion drawn was that over pressure of steam will rupture a boiler if there be a weak spot, whereas a violent and dangerous explosion may ensue if the boiler be uniformly strong at all points.

The weak places in the apparatus, we learn, will be strengthened; and during the coming week, operations on the same boilers will be renewed. The safety valves are also to be tested at the same time. The Pittsburgh experiments have been postponed until the 18th inst.

New Car Starter.

Amos Whittemore, of Cambridgeport, Mass., has obtained a patent for a device whereby the momentum of the car is made to lift one end of the car in stopping, and the weight so raised is made so to act as to help the car forward in starting.



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