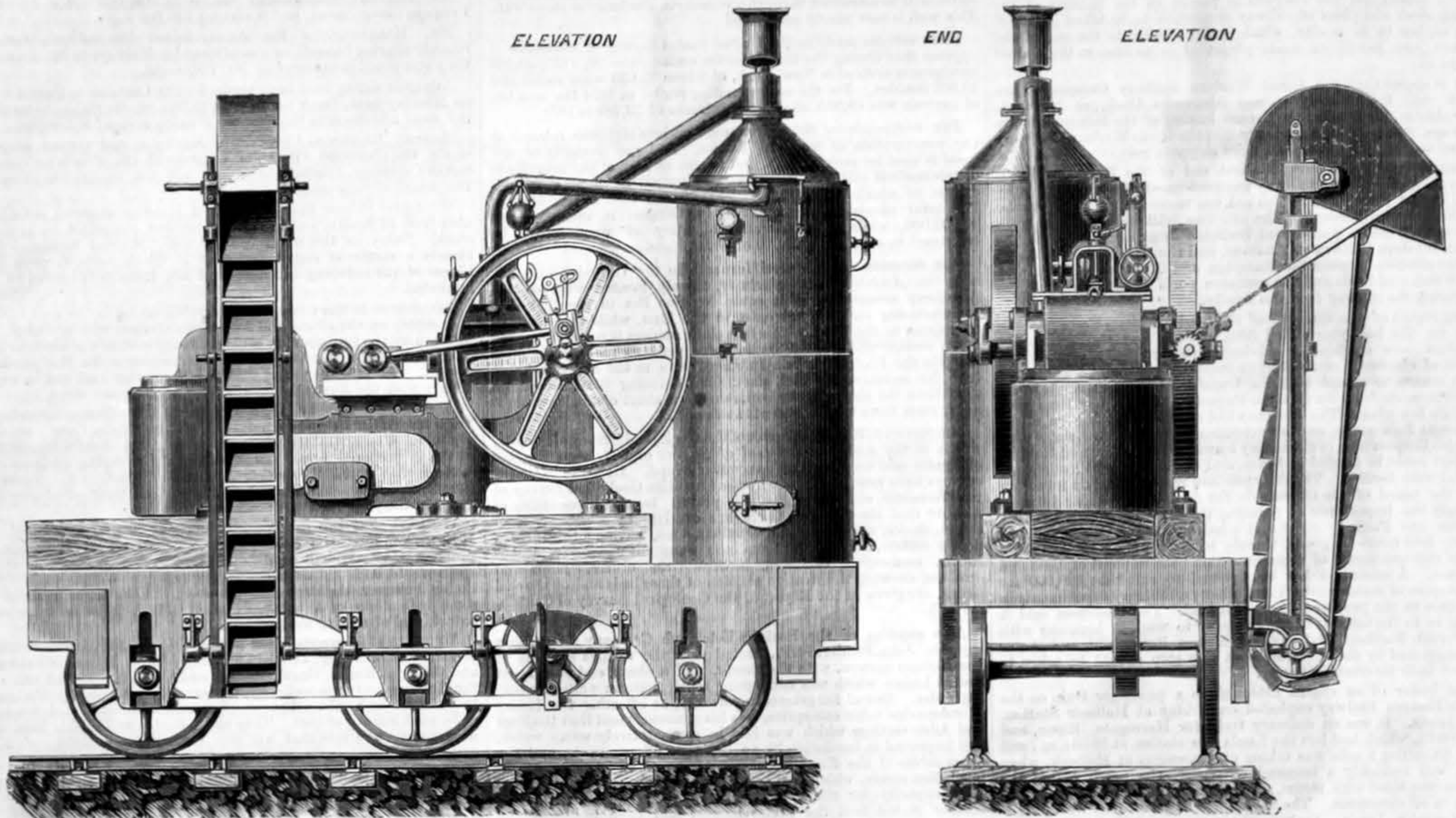


BALLASTING MACHINE—LONDON AND NORTH-WESTERN RAILWAY.

MR. H. R. MARSDEN, ENGINEER, LEEDS.



MR. MARSDEN, of Leeds, exhibited largely at Taunton, but the newest machines he showed were illustrated in our impression for July 2, and we shall, therefore, not refer further to his stand at Taunton. Instead, we illustrate a machine which possesses special interest for a large class of our readers. The machine is designed especially for ballasting railways, and it has long been known that stone or slag properly broken and screened is a most excellent material for such purpose, giving a close road free from dust, whilst the material is left in the best possible form for binding together. The illustrations show the most modern adaptation of the Blake stone breaker for this purpose. The machine was ordered by Mr. Webb, of the London and North-Western Railway Company, Crewe, and is capable of breaking down for ballasting about 120 tons of slag per day. The size of the machine is that known as 14in. by 12in., its total weight about 26 tons.

The working jaw is operated by a vertical rocking bar, having a front and back toggle taking into recesses on each side of the bar, the other end resting on the jaw and in the adjustable toggle block. When the jaw is forward these plates are placed in a straight line, when it is back they assume an angled position, one up the other down, and as the rocking bar passes its vertical centre twice for each revolution of the crank two distinct vibrations of the jaw are made. A horizontal cylinder, 14in. diameter by 14in. stroke, is placed between the arms at the rear of the machine. These arms carry plunger blocks, in which runs the crank shaft in adjustable gun-metal; two massive fly-wheels, each weighing one ton, are fitted at each end of the shaft. These carry crank pins, and two connecting rods pass to a stout crosshead bar. Slipper guides are bolted to each side of the frame, and the piston is coupled by a stout link direct on to the rocking bar. An efficient governor is supplied to regulate the speed of the engine to 125 revolutions per minute. There is a screw-down starting valve, and the motion of the slide valve is effected by an eccentric working on to a weigh bar or rocking shaft, which has an L lever link to the valve spindle. The cut-off is arranged at five-eighths of the stroke, but by a slot in the L lever the stroke can be lengthened or shortened to cut off sooner or later.

Mr. Webb constructed the framing and boiler, which last is of the vertical type, at Crewe. The elevators radiate round the bottom shaft, and the angle of delivery can be altered by the windlass attached to the side of the machine. The buckets are of wrought iron, and mounted on 4-ply india-rubber belting 13in. wide. A hood is placed over the top to shade the delivery from the wind. The ladder delivers the material into trucks on the opposite rails. The boiler is fed by an injector. We understand that the machine has answered its purpose perfectly.

CRICHTON AND CRAIG'S AUDIBLE SIGNALS FOR RAILWAYS.

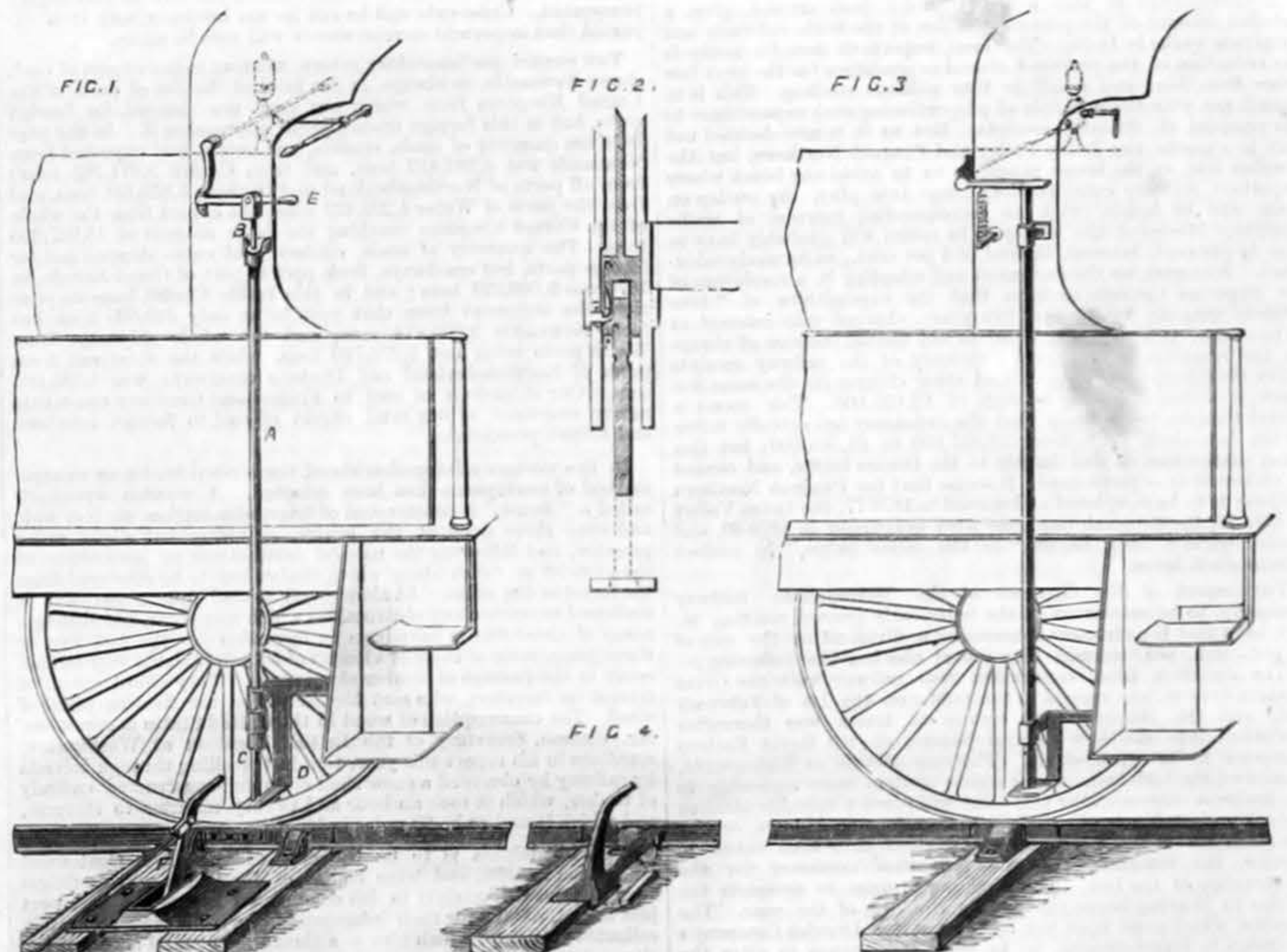
We have often advocated in these columns the use of audible signals on railways. There can be no question but that by these we could avert many accidents. We now illustrate what appears to us to be a very simple and satisfactory method of accomplishing the required purpose. In fact, nothing more simple or better suited for the ordinary exigencies of railway work has yet been devised.

The principle of the invention is as follows:—At each distant signal a counterweighted bell-crank, working in connection with the signal, is carried in position beside the line of rails. A staff or baton of wood is so placed on the engine that it must of necessity be broken by coming in contact with an arm of the bell-crank should the driver inadvertently pass the adjacent signal at such time as it indicates danger. When the baton is broken, a rod or lever is deprived of its support, falls, and causes the whistle to sound. But the apparatus is so designed that it admits of the baton being withdrawn from the position in which it would be destroyed; and whenever a driver requires to pass within a danger signal, it is his duty to prevent the destruction of the baton by changing its position accordingly. This action is also accompanied by a sounding of the whistle, the most important purpose of which is to prevent the driver from keeping the baton out of the normal position after passing the signal. It will thus be seen that if from any cause a driver fails to observe the signal, warning is given by the sounding of the whistle, and the fact recorded by the fracture of the baton.

The batons are to be considered as the property of the driver, and might be supplied at such a price as would insure the exercise of thorough vigilance in preserving them.

The following are a few of the advantages claimed for this system:—The apparatus is specially constructed to prevent the relaxation of vigilance which usually results from the employment of automatic machinery, and it cannot be kept out of action by accident or improper motive. It is solely auxiliary, and in no way a substitute for any appliance at present used in securing safety.

It is then impossible to withdraw the baton until it is broken, when the socket descends and the catch becomes accessible. It is proposed that the batons be marked in some simple way to prevent counterfeit, such as by placing a seal in the weakened part. Fig. 3 shows a modified form of the apparatus in which simplicity has been specially aimed at. By this method the baton—which is of deal about 1½in. square—extends from the supporting bracket to the lever that works the whistle. The continuous use of this baton may be secured by applying a padlock. Fig. 4 shows a portable



Its simplicity is a good guarantee that no unforeseen difficulties will be developed in working. It entails no expenditure beyond the first cost and gives no additional work to the officials. The whole apparatus is so designed as to be easily fixed and actuated, and it also admits of being modified to suit particular conditions. It provides against a class of contingencies of which the "block system" is not an efficient preventive. In Fig. 1 a vertical tube A is attached to the side of the engine. A rod B which is free to slide in the tube is connected at its upper end to a lever, which, by means of its cam-shaped attachment, acts on an arrangement for sounding the whistle, precisely the same as that now in extensive use for the passenger communication. The lower end of the rod is formed hollow, and receives one end of a staff or baton C which is held therein by means of a spring catch. The baton rests on a bracket D at a convenient height above the rails. There is a handle E forming part of the lever before mentioned, by which the baton is raised when it is necessary to pass a danger signal. The apparatus on the line consists simply of a counterweighted bell-crank F connected by a wire to the ordinary signal. Fig. 2 shows the position of rod, &c. when a new baton is being put in. When, by the default of the engine-driver, a baton is broken, he must at once introduce a new one. This is done by passing it from below through the rectangular hole in the supporting bracket, turning it a quarter round and then pushing it home, when the spring catch enters into a nick.

appliance to be carried on trains and fixed to the rail on any emergency, also for use by platelayers when required.

SOUTH KENSINGTON MUSEUM.—Visitors during the week ending July 24th:—On Monday, Tuesday, and Saturday, free, from 10 a.m. to 10 p.m., Museum, 13,585; mercantile marine and other collections, 2051. On Wednesday, Thursday, and Friday (admission 6d.) from 10 a.m. to 6 p.m., Museum, 2904; mercantile marine and other collections, 246. Total, 18,786. Average of corresponding week in former years, 13,569. Total from the opening of the Museum, 14,412,883.

WHITE BRASS.—Some years ago we had occasion to mention a white metal for bearings made by Mr. P. M. Parsons. This metal is now manufactured by the Parsons' White Brass Company, and from the reports we have of it, has been satisfactorily tried. It has been in use for some time on the Oude and Rohilkund Railway both for carriage and engine purposes, and in this country several locomotive superintendents have used it with good results. On the Metropolitan District it is now in use for eccentric strap liners, side rods, and other locomotive purposes, and it has recently been put under some new carriages. Probably the fact that it can be easily worked up for small jobs in a coppersmith's hearth encourages its use.