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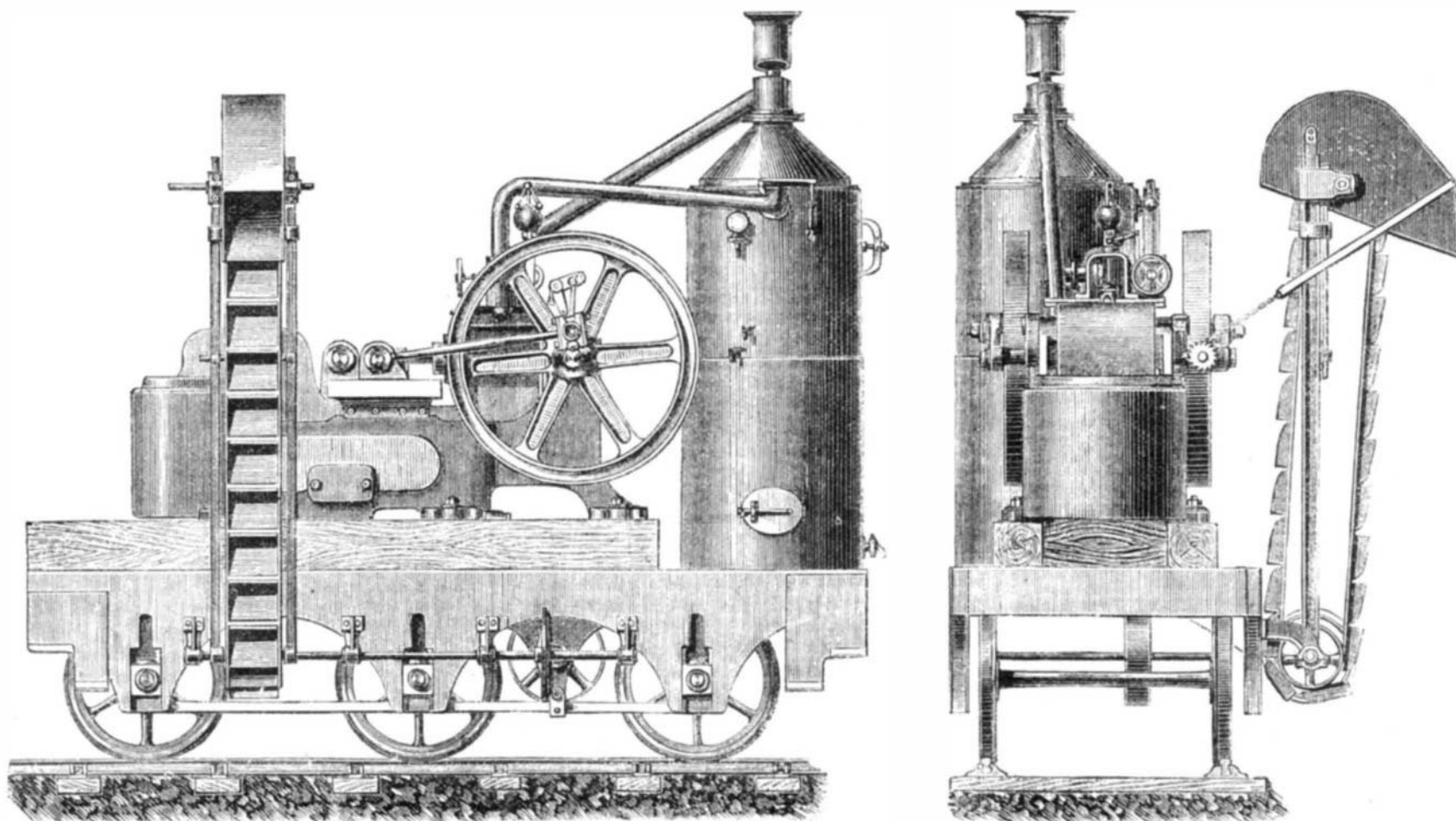
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BALLASTING MACHINERY.

Our illustration shows a very useful form of machine for breaking stone and ballasting railroads, and for macadam.

buckets are of wrought iron, and mounted on 4-ply india rubber belting 13 inches wide. A hood is placed over the top to shade the delivery from the wind. The ladder deliv-

the illustration. It was exhibited at the recent exhibition of the Society for the Promotion of Scientific Industry at Manchester. This machine is remarkable for the high speed



RAILWAY BALLASTING AND STONE BREAKING MACHINE.

izing common roads. It is the design of Mr. Marsden, of Leeds, England, and the stone-breaking arrangement is the familiar American machine known as Blake's stone crusher. The machine is designed especially for ballasting railroads; 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, while the material is left in the best possible form for binding together. The machine is used on the London and Northwestern Railway, and is capable of breaking down for ballasting about 120 tons of slag per day. The total weight of the apparatus is about 26 tons.

The working jaw is operated by a vertical rocking bar, having a front and back toggle plate 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 angular position, one up, the other down; and as the rocking bar passes its vertical center twice for each revolution of the crank, two distinct vibrations of the jaw are made. A horizontal cylinder, 14 inches in diameter by 14 inches 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.

The boiler is of the vertical type. 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

ers the material into trucks on the opposite rails. The boiler is fed by an injector

WOOD-BORING MACHINERY.

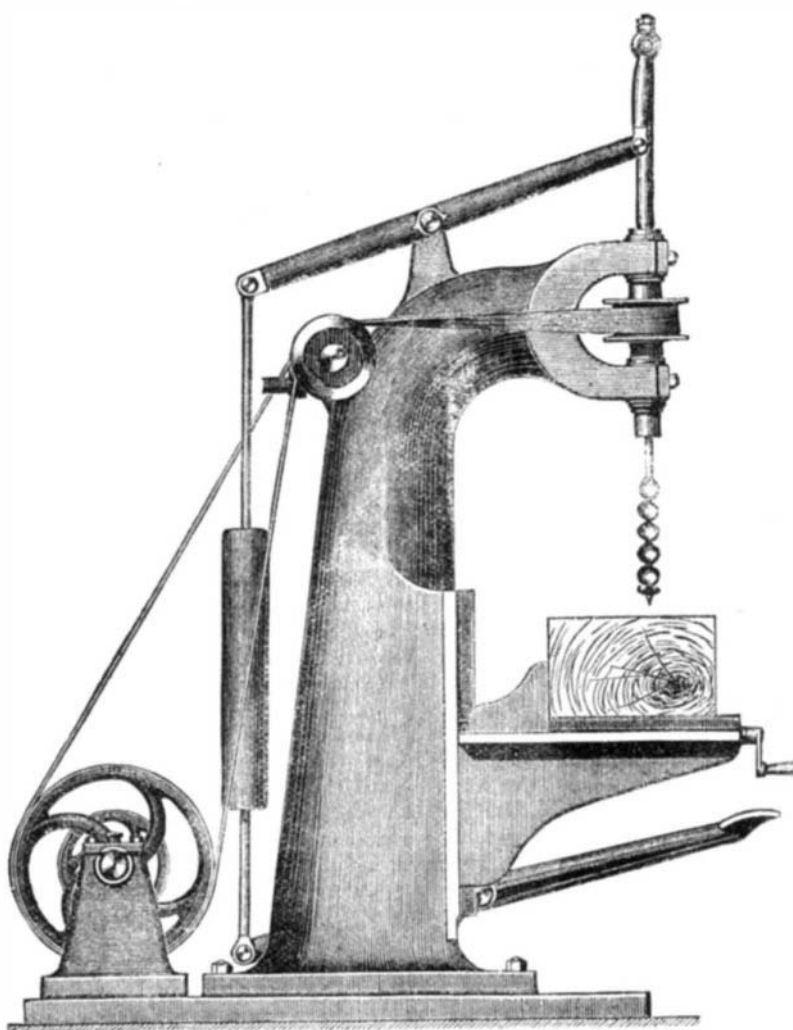
We publish herewith an engraving of a very simple boring machine, the whole construction of which is obvious from

at which it can be driven without noise, bevel wheels being entirely dispensed with, motion being imparted by straps. The upright frame is in one casting, the table moving up and down in slides, and worked by a rack and pinion, worm and wheel. It will bore holes from $\frac{1}{4}$ inch to 3 inches diameter, and 12 inches deep, and can be fitted with plug cutters and recess cutters.

The machine illustrated herewith does not necessarily possess advantages over the same class of machines made in this country, but it may interest our mechanics to see an engraving of one of the best of its kind used in England.

The Monopolies of Inventors.

A large fortune made from valuable patents was that of the late I. M. Singer, who left property valued at \$9,000,000 in the United States and \$4,000,000 in Europe. It has often been observed that inventors are not apt to amass wealth. This statement, however, is wide of the truth if it means that inventors are more apt to die poor men than those who engage in other branches of business. We are very confident, says the *Artisan*, that, if a comparison were instituted between inventors and all those in this country who have engaged in mercantile business, stock speculation, or banking, it would be found that as many inventors have acquired wealth in proportion to their whole number as those engaged in any other branch of business. We might enumerate instance after instance where very large fortunes have been made, as in the case of Mr. Singer. Should we do this, however, we might supply an argument to those who believe that patents create oppressive monopolies. We are willing to grant that, when wealthy rings and cliques are enabled to control legislation, so as to obtain the renewal of patents, through the aid of bribes, which they could not obtain under the regular working of the patent laws, oppressive monopolies may be created and fostered, but this is to be attributed to the general corruption of officials, and it is not peculiar to the working of the patent system. Designing individuals who combine to control legislation require monopolies of privileges in other departments of business more oppressive than any monopoly which has for its basis a patented invention



FURNESS & CO'S VERTICAL BORING MACHINE.