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D. E. MORAN & A. E. CARROLL.

PIN OR BOLT DRIVING HAMMER.

(Application filed Sept. 12, 1899.)

(No Model.)

Fig. 3.

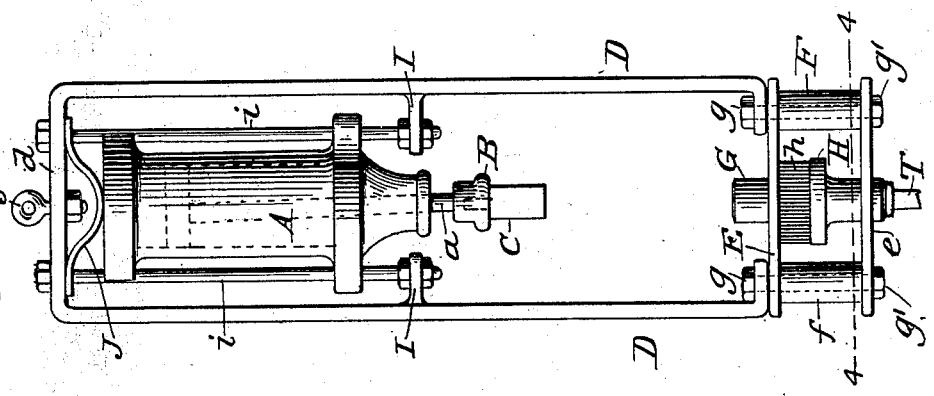

Fig. 2.

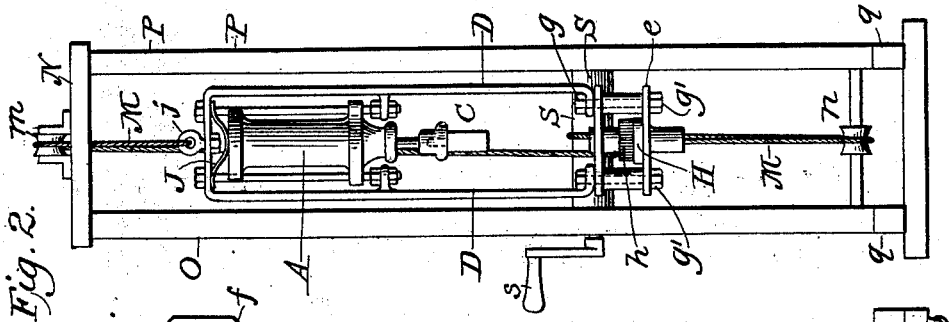

Fig. 4.

Fig. 1.

WITNESSES

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PIN OR BOLT DRIVING HAMMER.

SPECIFICATION forming part of Letters Patent No. 647,274, dated April 10, 1900.

Application filed September 12, 1899. Serial No. 730,237. (No model.)

To all whom it may concern:

Be it known that we, DANIEL E. MORAN, a resident of New York, county of New York, and State of New York, and ANDREW E. CARROLL, a resident of Cincinnati, county of Hamilton, State of Ohio, citizens of the United States of America, have invented certain new and useful Improvements in Pin or Bolt Driving Hammers, of which the following is a specification.

Our invention relates to a new and useful apparatus for driving bolts or pins, such as the heavy drift-pins employed to secure large masses of timber together.

We employ a reciprocating engine, preferably one of the standard drills of The Ingersoll-Sergeant Drill Company, which machine is supplied with compressed air or with steam by a flexible connection in the well-known way. The piston-rod of the engine is provided with a hammer in the place where the drill-steel would otherwise be, and the engine is secured within a frame carrying an anvil-block adapted to engage the bolt to be driven, and which frame is vertically adjustable and sustained upon a support or carriage which is moved as a whole from place to place where the pins are to be driven.

The details of construction and arrangement will be hereinafter more fully described, and referred to in the appended claims, in connection with the accompanying drawings, in which—

Figure 1 is a side elevation of the carriage, showing the driving-hammer and its frame in dotted lines. Fig. 2 is a front elevation of the organized arrangement of Fig. 1. Fig. 3 is an enlarged view in elevation showing the engine and the frame in which it is directly secured. Fig. 4 is a detail on the line 4 4 of Fig. 3.

In the drawings, A is a reciprocating engine, and by preference a standard rock-drill, of which *a* is the piston-rod.

B is the chuck, which when a rock-drilling engine is used ordinarily holds the drill-steel, and C is a hammer which is formed with a shank of the size of an ordinary drill-steel, which is fitted into and removably held in chuck B.

D D are the side bars of a frame, which may be integral across the top or connected by a third bar *d*. The lower end of this frame is completed by cross-pieces in the form of end plates E *e*, which are separated by a space of a few inches by distance-pieces F *f*, of tubing, through which pass bolts *g g*. The bolts *g g* also pass through the inwardly-turned ends of the side pieces D D, through the cross-pieces E *e*, and the tubes F *f* and are secured by nuts *g' g'* or otherwise locked at their other ends. Concentric openings are formed in the plates E *e* to receive a cylindrical anvil-block G, which has a free but limited vertical movement of about two inches. The anvil-block G is retained between the said pieces E *e* by a central collar H, formed about midway of its length, which while permitting free reciprocation under the blows of the hammer C prevents its displacement. A rubber gasket *h* is placed about the anvil-block above its central collar H in order to limit and cushion the stroke and also to absorb shock.

In Fig. 2 the anvil-block appears in its lowest position, with its collar resting upon the bottom plate *e*. In Fig. 3 the anvil-block is in its raised position, ready to receive the blow of the hammer C, the lower end of said block resting upon the head or upper end of a pin T to be driven.

About midway of the side bars D D are provided two strong metallic lugs I I, projecting inwardly, one on each side, and the drill is held in position in the frame by its side rods *i i*, which are passed through the end piece *d* of the frame and have their lower ends secured in the lugs I I, thus forming a sub-frame, in which the drill-engine is held, together with its buffer-spring J. The length of the lower part of the frame D between the lugs I and anvil G is such that the engine will always have its proper stroke. Should, however, the piston of the engine A make a downward stroke when there was no work to resist its progress—as, for instance, if the anvil-block was off the pin to be driven—the collar

H of the anvil-block would strike against and be arrested by the lower cross-piece *e*, and thereby prevent injury to the lower cylinder-head of the engine. The under side of the anvil-block G is slightly concave to retain the head of the drift-pin, and the upper end of the frame D D is provided with an eyebolt *j*.

The frame carrying the engine and anvil-block, referred to as frame D D, is suspended from eyebolt *j* by a rope M, which runs over a pulley *m* located upon the cross-piece N, which is secured on top of two parallel side pieces O P, which form the vertical uprights of a carriage Q, upon which the apparatus is sustained, and which carriage is moved so as to bring the hammer over each pin or bolt to be driven.

The carriage Q is a triangular structure, having the horizontal pieces *q* sustained upon suitable carrying-wheels *r*. The horizontal pieces *q q* carry at their front ends the parallel uprights O P, referred to, and the diagonal uprights R R, by which they are securely held and braced in position. A hand-winch S is secured at any convenient point upon the diagonal uprights R R, and an additional pulley *n* is secured preferably in the angle between the lower ends of the uprights O P and the horizontal pieces *p q*.

The rope M, which is secured to the eyebolt *j* at the upper end of the frame D D, carrying the engine A, and the anvil-block, is carried up over pulley *m* at the top of the carriage, is then carried downward and around the drum of the winch S, from which point it is carried diagonally forward, downward, and under the second pulley *n*, and from there up to and secured to the inner edge of the lower cross-plate *e*.

During the operation the anvil-block rests upon the pin to be driven and takes the weight of the engine and its inclosing frame, and the feed is by gravity. The winch is operated to lower the frame D D and the engine as the bolt or pin T is driven. The effectiveness of the apparatus can, however, be very much increased by turning the winch in the opposite direction, so as to pull upon the lower end of the engine-frame D D to the point of raising the front of the carriage, and thereby adding to the descending force the weight of the front portion of the supporting-carriage Q, since by turning the winch S to pull downward upon the engine D D the forward part of the said carriage Q will be raised up, so as to be supported upon the pin to be driven through the engine-frame, rope, and winch, and in that manner will add the resistance of its weight also to the driving force of the engine.

Numerous minor modifications and changes may be made in the apparatus which is here described for the purpose of illustrating the invention without departing therefrom. We therefore do not limit ourselves to the exact details of construction and arrangement shown and set forth.

Having described our invention, what we claim is—

1. The combination with a metallic inclosing frame, of an engine secured in the upper part thereof and provided with a reciprocating piston and piston-rod and a hammer attached to the piston-rod and operated by a power-stroke of the engine, an anvil-block at the other end of the frame having a limited free movement therein and arranged with its upper part within the power-stroke of the hammer and its lower part resting upon the work to be driven, a working support for the engine-carrying frame and means connected with the support for raising or lowering the frame and attached parts for operation.

2. The combination with an engine having a reciprocating piston and a hammer attached to the piston-rod thereof, of a frame sustaining said engine at its upper end and carrying an anvil-block at its lower end, said block being within the limit of the power-stroke of the hammer, and having a free, limited, movement under the blows thereof, and a cushion arranged between the upper part of the anvil-block and the frame and adapted to absorb jar when the hammer is raised for the succeeding stroke, and means for raising and lowering the frame engine and anvil as a unit.

3. The combination with a reciprocating engine having a hammer attached to its reciprocating part, a frame sustaining the engine and a movable anvil-block connected with the frame and adapted to rest with one end upon a pin to be driven and to receive the blows of the hammer upon the other end, a supporting-carriage, means for raising and lowering the engine-carrying frame upon the carriage and for raising the carriage upon the engine-frame to press the same downward upon the work.

4. The combination with a metallic frame, a reciprocating engine secured in the upper part thereof and provided with a hammer attached to the piston-rod, an anvil-block at the other end of the frame and having a limited movement within the stroke of the hammer, a working support for the engine-carrying frame and means connected with the support and with the frame for raising or lowering the frame and attached parts for operation, a rope attached to the top of the frame and passing over the upper part of the support and at its other end secured to the lower part of the frame and passing under the support at the lower end of the carriage, and a winch connected with said rope for raising or lowering the engine and its frame or for pulling downward upon said frame to reinforce the downward driving effect of the engine upon the anvil-block and work in contact therewith.

5. The combination with a cylinder and reciprocated piston-rod and a hammer attached

to the outer end thereof, of an elongated frame, side rods secured in said frame, and sustaining the cylinder, of a pair of spaced guide-plates at the lower end of the frame and a cylindrical block having a central flange and movably held between said guide-plates, the upper end of said anvil-block being within the stroke of the hammer, and the lower end thereof being cupped to engage the head of a bolt to be driven, and means for raising and lowering the frame, engine and anvil-block as a unit.

Signed by us this 21st day of August, 1899.

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Witnesses:
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