Dec. 8, 1925. 1,564,956

C. C. HANSEN

PILE DRIVER ATTACHMENT FOR ROCK DRILLS

Filed Aug. 7, 1925

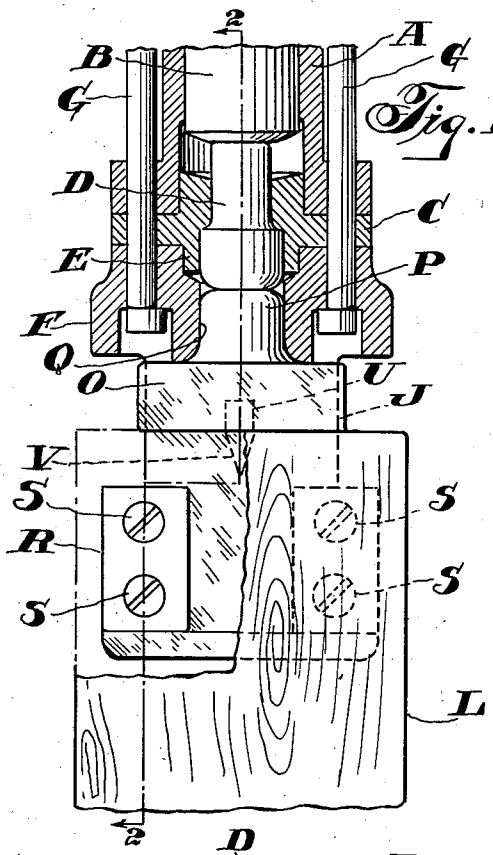


Fig. 1.

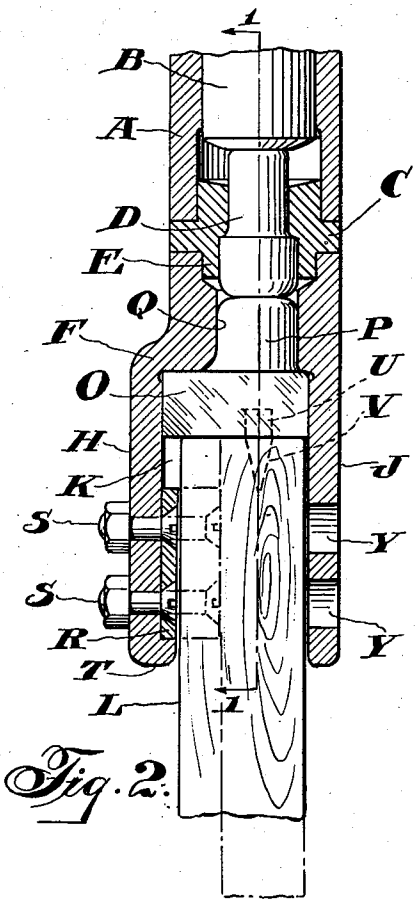


Fig. 2.

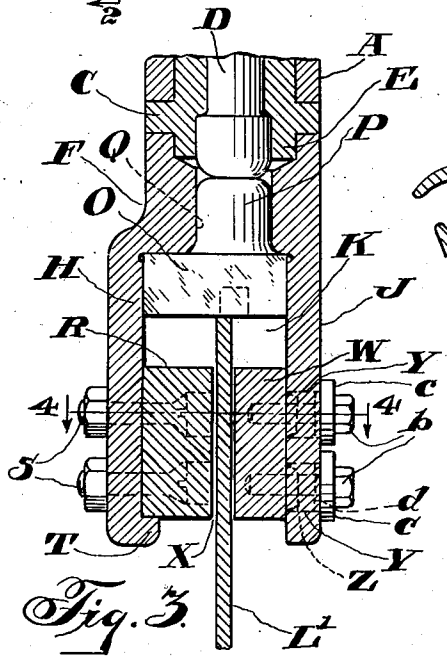


Fig. 3.

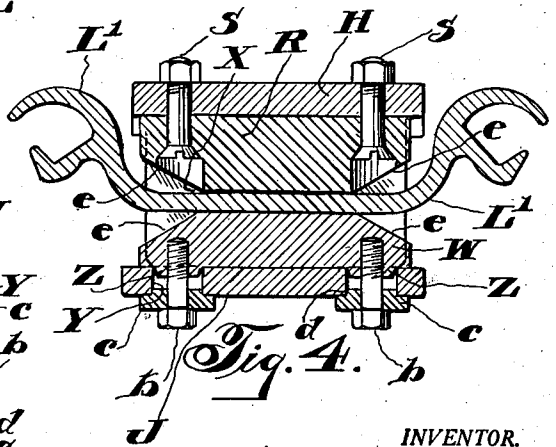


Fig. 4.

INVENTOR.
Charles C. Hansen.
BY Herbert Edgar
HIS ATTORNEY.

Patented Dec. 8, 1925. 1,564,956

UNITED STATES PATENT OFFICE.

CHARLES C. HANSEN, OF EASTON, PENNSYLVANIA, ASSIGNOR TO INGERSOLL-RAND COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

PILE-DRIVER ATTACHMENT FOR ROCK DRILLS.

Application filed August 7, 1925. Serial No. 48,760.

To all whom it may concern:

Be it known that I, CHARLES C. HANSEN, a citizen of the United States, and a resident of Easton, in the county of Northampton and State of Pennsylvania, have invented a certain Pile-Driver Attachment for Rock Drills, of which the following is a specification, accompanied by drawings.

This invention relates to pile drivers, but more particularly to a pile driver attachment for fluid actuated rock drills of the hammer type.

The objects of the invention are to expedite the sinking of a pile, to prevent injury to the pile during the driving thereof, and to construct a rugged and efficient pile driver attachment for rock drills of the hammer type which may be easily applied to a pile and operated by a minimum number of workmen.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention consists of the combinations of elements, features of construction and arrangement of parts having the general mode of operation substantially as hereinafter described and more particularly pointed out in the appended claims and illustrated in the accompanying drawings, in which—

Figure 1 is a view in elevation partly in section of the front end of a rock drill equipped with a pile driver attachment constructed in accordance with the practice of the invention,

Figure 2 is a view in elevation partly in section taken through Figure 1 on the line 2—2 looking in the direction of the arrows,

Figure 3 is a view similar to Figure 2 showing a pile driver attachment constructed to accommodate a metallic pile, and

Figure 4 is a transverse view in section taken through Figure 3 on the line 4—4 looking in the direction of the arrows.

Referring to the drawings, the invention is shown embodied in a fluid actuated hammer type rock drill in which a cylinder A is provided with a reciprocatory hammer piston B. A front cylinder washer C seals the front end of the cylinder A and is bored to receive slidably an anvil block D. In this instance, the front cylinder washer C is provided with a reduced forward extension E for centralizing an attachment or front head F secured to the cylinder by suitable side bolts G arranged on opposite sides of the drill and whereby the parts comprising the drill casing are firmly clamped in operative position.

In accordance with the practice of the invention, the attachment or front head F carries at its forward end a pair of parallel projections or walls H and J. The walls H and J are so constructed with respect to each other that a space or slot K exists therebetween to receive a pile L or other similar member adapted to be driven. A driving block O, preferably of rectangular formation, is arranged slidably between the walls H and J and carries on one face a projection P preferably of cylindrical cross sectional area which in this instance is off-set from the longitudinal axis of the driving block and projects into a bore Q in the inner portion of the front head F to receive the blows of the hammer piston B transmitted by the anvil block D. In addition to receiving the hammer blows of the piston, the projection P also serves to hold the driving block O against endwise movement. Although the drawings show an anvil block interposed between the hammer piston and the driving block, it will readily be seen that the projection P of the driving block O could be formed to extend into the cylinder A, in which case the blows of the hammer piston are delivered directly to said projection.

In order to prevent ejection of the driving block O from the front head F during the operation of the machine, a cheek plate or plates R may be secured on the inner face of the wall H in any suitable manner, as for instance, bolts S. The cheek plates R are preferably of a height to permit free reciprocation of the driving block O during the driving operation, but will prevent removal of the projection P from the bore Q when the machine is removed from the pile. As indicated by the dot and dash lines in Figure 2, the cheek plates R may be of convenient width to suit piles of different thickness.

To the end that the cheek plates R may at all times remain in placed position and that the bolts S or other securing means may be suitably protected against undue strain, a flange T is formed along the outer face of the wall H and extends inwardly to provide a bearing for said cheek plate. By this arrangement the bolts S serve only to prevent displacement of the cheek plates

R and any shock or blow delivered to the cheek plate will be transmitted to the flange T.

In order to prevent sidewise movement of the machine with respect to the pile due to vibration when the machine is in operation, a pin U is secured to the driving block O in any suitable manner and has a tapered point V which may be forced into the pile as shown in Figures 1 and 2 for holding the machine in position. The pin U like the projection P is also off-set from the longitudinal axis of the driving block to insure proper engagement of said pin with piles of small width.

To the end that the front head F may accommodate a metallic pile L', a second cheek plate W may be arranged on the inside of the wall J to form a space X between the cheek plates. The space X is of sufficient width to permit free insertion of the pile L', but is sufficiently narrow to prevent tilting of the machine on the pile. Holes Y are formed in the wall J to receive tapered lugs Z carried by the cheek plate W to protect bolts *b* used for holding the cheek plate W in position. In this instance, washers *c* are provided for the bolts *b* and have a reduced extension *d* to cooperate with the holes Y for centralizing said washers. The cheek plates R and W are preferably beveled as at *e* so that when the device is used for driving a metallic pile of the inter-locking type the machine may be readily placed on the pile without hindrance due to the curved portions usually present in piles of this type.

Whenever the machine is used for driving a metallic pile the pin U may be removed from the driving block O and the machine is prevented from sliding off the pile by one or the other of the cheek plates which cooperate with the inter-locking portion of the pile.

The advantages of the invention reside chiefly in the fact that by means of the attachment as herein described, a rock drill of the hammer type may be readily converted into a pile driver by merely replacing the ordinary front head of the rock drill with the front head or attachment described herein. Another advantage is that little head room is required for a machine of this type as compared with pile drivers of the trip hammer type. Another desirable advantage is that owing to the fact that a machine of this type will deliver light blows in rapid succession, so that piles of small cross sectional area may be driven or sunk without buckling or flexing the pile, and without shattering or injuring the end of the pile on which the blows are delivered.

I claim:

1. In a pile driver attachment for a fluid actuated rock drill of the hammer type, having a cylinder and a reciprocatory hammer piston in the cylinder, the combination of a front head adapted to be secured to the cylinder having a pair of parallel walls, a rectangular driving block in the front head slidable between the walls, a projection on the driving block to receive the blows of the hammer piston and for preventing endwise movement of the driving block, a cheek plate for preventing ejection of the driving block from the front head and for engaging a pile, and a flange on one of the walls for supporting the cheek plate.

2. In a pile driver attachment for a fluid actuated rock drill of the hammer type, having a cylinder and a reciprocatory hammer piston in the cylinder, the combination of a front head adapted to be secured to the cylinder having a pair of parallel walls, a rectangular driving block in the front head slidable between the walls, a projection on the driving block to receive the blows of the hammer piston and for preventing endwise movement of the driving block, a pin carried by the driving block for retaining the front head on a pile, an anvil block between the hammer piston and the projection for transmitting the blows of said hammer piston to the projection, a cheek plate for preventing ejection of the driving block from the front head, and an inwardly extending flange on one of the walls for supporting the cheek plate.

3. In a pile driver attachment for a fluid actuated rock drill of the hammer type, having a cylinder and a reciprocatory hammer piston in the cylinder, the combination of a front head adapted to be secured to the cylinder having a pair of parallel walls, a rectangular driving block in the front head slidable between the walls, a projection on the driving block to receive the blows of the hammer piston and for preventing endwise movement of the driving block, said projection being off-set from the longitudinal axis of the driving block, a pin carried by the driving block to prevent relative endwise movement between the front head and a pile, said pin being in the same longitudinal plane as the projection, an anvil block between the hammer piston and the projection for transmitting the blows of said hammer piston to said projection, a cheek plate for preventing ejection of the driving block from the front head, and an inwardly extending flange on one of the walls to serve as a bearing for the cheek plate.

In testimony whereof I have signed this specification.

CHARLES C. HANSEN.