

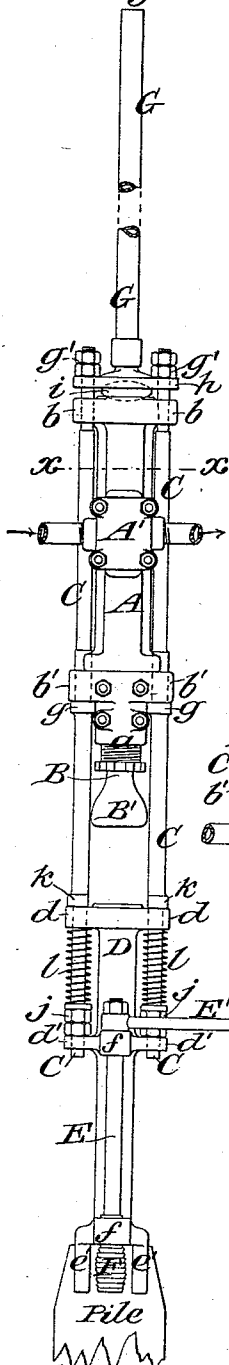
(No Model.)

H. C. SERGEANT.
PILE DRIVER.

No. 498,493.

Patented May 30, 1893.

Fig. 1.



Witnesses:
O. Sundgren
George Barry.

Fig. 3.

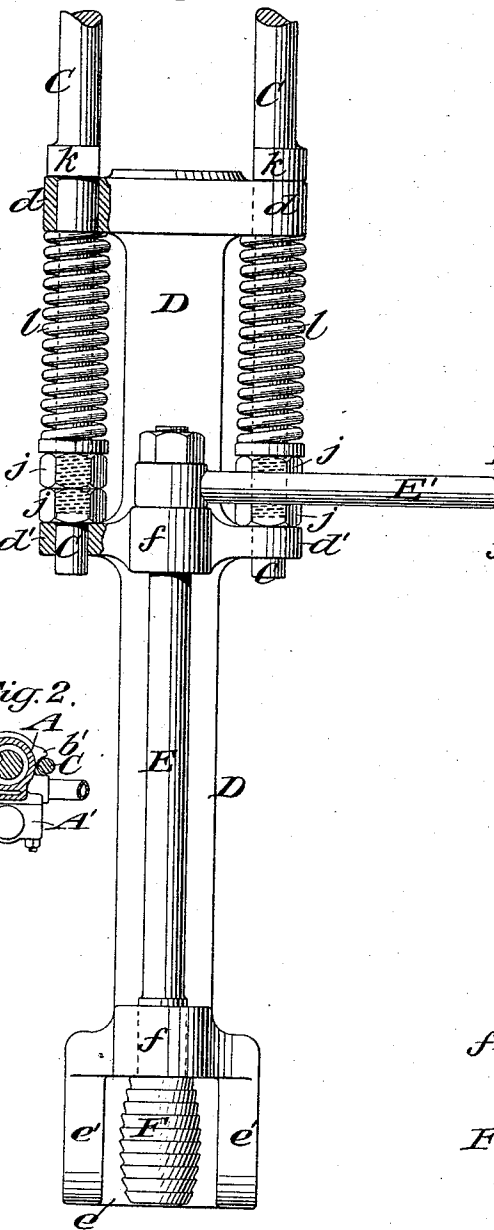


Fig. 2.

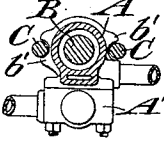


Fig. 4.

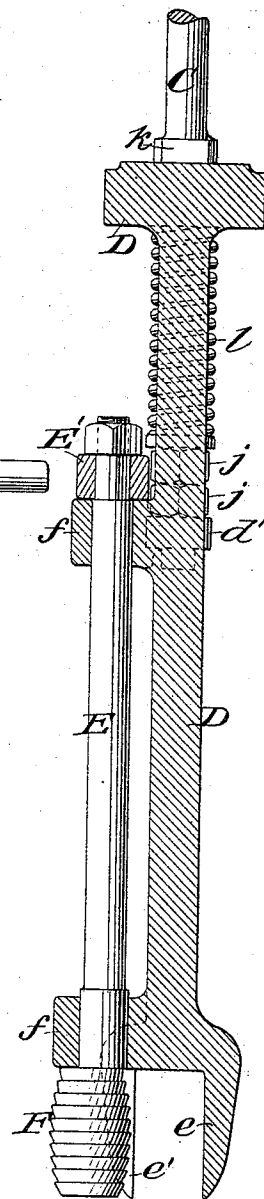
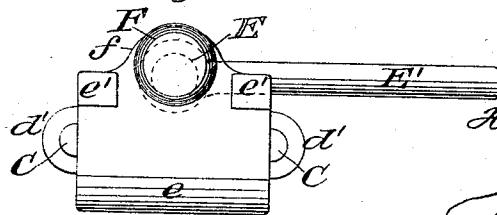


Fig. 5.



Inventor:
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UNITED STATES PATENT OFFICE.

HENRY C. SERGEANT, OF WESTFIELD, NEW JERSEY.

PILE-DRIVER.

SPECIFICATION forming part of Letters Patent No. 498,493, dated May 30, 1893.

Application filed March 6, 1893. Serial No. 464,800. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. SERGEANT, of Westfield, in the county of Union and State of New Jersey, have invented a new and useful Improvement in Pile-Drivers, of which the following is a specification.

This invention relates to a pile driver in which the ram is directly actuated by steam, compressed air or other fluid under pressure and it is more especially designed for a pile driver light enough to be lifted by hand by a man or men from one pile to another and easily carried from place to place for the driving of sheet piles such as are used in excavations for sewers and other purposes.

The nature of the improvement will be explained with reference to the accompanying drawings and its novelty pointed out in the claims.

Figure 1 is a front view of a portable pile driver embodying my invention. Fig. 2 represents a transverse section in the line *xx* of Fig. 1. Fig. 3 is a front view on a larger scale than Fig. 1, of a bolster which is interposed between the ram and the pile. Fig. 4 represents a vertical section of the bolster at right angles to Fig. 1. Fig. 5 represents an inverted plan of the bolster.

Similar letters of reference designate corresponding parts in all the figures.

A is an engine cylinder containing a piston (not shown) the rod B of which passes through a stuffing-box *a* at the lower end of the cylinder and is furnished with a head B' to constitute a steam-actuated ram. The said cylinder is closed at its upper end and has on it a valve chest A' in which there is a valve for the induction and eduction of steam, compressed air or other fluid under pressure to and from opposite ends of the cylinder alternately for the purpose of producing the reciprocating motion of the piston and ram. As the said cylinder with its piston, piston-rod and valve may be such as are common to direct-action engines for operating rock drills and other purposes and are well known, I have not thought it necessary to describe them in detail but I will mention that they may be such as are fully described in my United States Patent No. 202,060, dated April 2, 1878, except that the cylinder is provided at its

ends on opposite sides with lugs *b b* and *b' b'* through which pass two parallel rods C which combine with the cylinder to constitute the framing of the machine and which are prolonged beyond the lower end of the cylinder to serve as guides for the bolster D upon which the ram strikes in its descent and through which the force of the blow of the latter is transmitted to the head of the pile.

The bolster D consists of a forging or casting having lugs *d d* on its head and lugs *d' d'* lower down, which lugs are all bored to fit the rods C C in such manner as to permit the bolster to slide thereon. The foot of the bolster is represented in Fig. 2 at *e e'* as forked to fit over the head of a pile and keep the machine in place thereon and is also represented as furnished with a clamp E F to fasten the machine on the pile. The clamp consists of a spindle E fitted to turn in lugs *f f* on the front of the bolster and provided with an eccentric dog F which is so grooved as to present a series of sharp edged annular projections to bite upon the head of a pile which is placed in the fork *e e'* of the foot of the bolster, the prong *e'* having in it an opening for the entrance of said dog. The said clamp is operated by turning a handle E' provided on the upper end of its spindle E. The dog is represented (see Figs. 3 and 4) as having a rounded profile the better to adapt itself to the pile.

The rods C C have provided on them collars or shoulders *g g* upon which the cylinder is firmly held down by nuts *g' g'* fitted to screw threads on the upper ends of the said rods. The said rods are represented as pressing directly on a head plate *h* between which and the cylinder head is arranged a cushion *i* of india rubber and at the same time holding the cylinder head in place. The said rods C C have also provided on them some distance, below the cylinder, collars or shoulders *k k* against which the bolster is held up, when not acted upon by the ram, by means of coil springs *l l* arranged on the said rods below the lugs *d d* of the bolster and held up by nuts *j j* on screw threads on the lower parts of the said rods. The lower ends of the said rods C below the said screw-threads project through the lower lugs *d' d'* of the bolster in which

they fit loosely as guides. The head plate *h* of the cylinder has secured in it a rod or bar *G* which may be made of tubing for the sake of lightness and which serves as a handle to the machine by which it is placed upon the piles and held upright or in suitable position thereon.

In the operation of the machine the pile having been placed in position for driving and the foot of the bolster having been placed upon its head and, if necessary, clamped thereto by the clamp *E F*, the steam or air is turned on to the valve chest *A'* and a rapid reciprocating motion of the piston and ram takes place, the ram striking the bolster at every downstroke and carrying down the bolster with it and the force of the blow of the ram being transmitted to the pile through the bolster. As the pile is driven the whole machine follows it but at the moment of the ram striking a sudden tendency to recoil is produced upon the cylinder. This recoil is gradually taken up by the springs *ll* which, after permitting the cylinder to rise a short distance relatively to the bolster, return it to its normal position in which it rests upon the shoulders *g g* of the rods *C C*. By the interposition of the bolster between the pile and the ram and the provision afforded by the springs for permitting and taking up the recoil of the cylinder violent concussions on the working parts of the machine are obviated and the machine is made to work easily and rendered durable.

It may not be always necessary to clamp the

machine on to the piles and therefore in some machines I might omit the clamp.

By the term "steam-actuated ram" as used in this specification I mean a ram actuated by steam or any other fluid under pressure.

The steam or other fluid employed for actuating the ram must be supplied to the valve chest *A'* through a flexible pipe in order to permit the necessary movements of the machine.

What I claim as my invention is—

1. The combination in a pile driver, of a steam-actuated ram and a spring-controlled bolster arranged below said ram, substantially as herein set forth.

2. The combination in a pile driver, of a reciprocating steam engine, a ram actuated directly by the piston of said engine, a bolster arranged below said engine, guides for said bolster attached to the cylinder of said engine and springs on said guides for pressing the bolster toward the cylinder, substantially as and for the purpose herein set forth.

3. The combination in a pile driver, of a steam-actuated ram, a spring-controlled bolster arranged below said ram and a clamp attached to said bolster and consisting of a spindle arranged lengthwise of the bolster and an eccentric dog thereon for holding a pile, substantially as herein set forth.

HENRY C. SERGEANT.

Witnesses:

FREDK. HAYNES,
L. M. EGBERT.