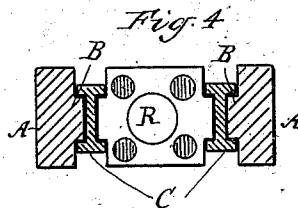
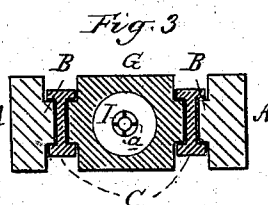
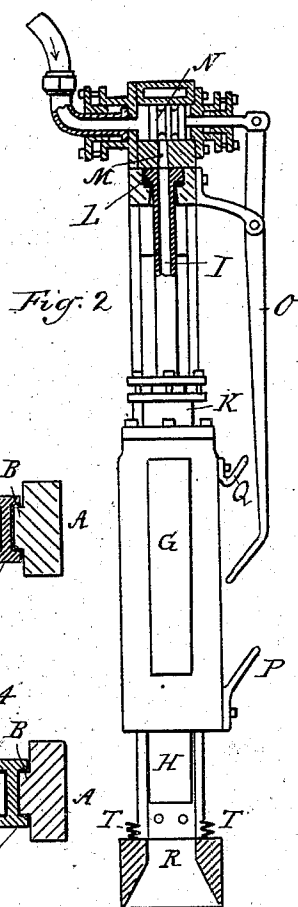
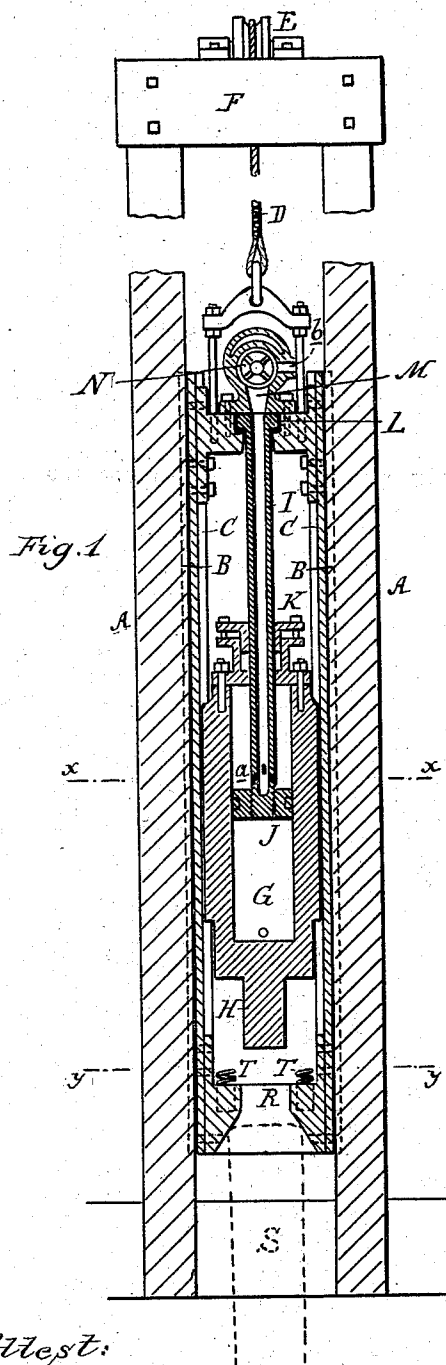


(No Model.)

R. J. CRAM.
PILE DRIVER.

No. 284,282.

Patented Sept. 4, 1883.



Attest:
A. Barthel
W. S. Sprague

Inventor:
Roy J. Cram
by his Atty W. S. Sprague

UNITED STATES PATENT OFFICE.

ROY S J. CRAM, OF DETROIT, MICHIGAN.

PILE-DRIVER.

SPECIFICATION forming part of Letters Patent No. 284,282, dated September 4, 1883.

Application filed March 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, ROYS J. CRAM, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Pile-Drivers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

10 This invention relates to improvements in pile-drivers; and it consists in the peculiar construction, combination, and operation of the various parts, as more fully hereinafter described.

15 Figure 1 is a front elevation, partially in section, showing the derrick and device as ready for use. Fig. 2 is a side elevation, also partially in section, detached from the derrick. Fig. 3 is a cross-section on the line *xx* in Fig. 1. Fig. 4 is a cross-section on the line *yy* in Fig. 1.

20 In the accompanying drawings, which form a part of this specification, A A represent the side timbers of the derrick, the inner faces of which are provided with the guides B, between which the frame C has a reciprocating motion, so that it may be elevated or lowered by means of the rope or chain D, passing over the sheave E in the top F of the derrick.

25 G is a steam-cylinder, adapted to have a free reciprocating motion between the two sides of the frame C, and with its lower end terminating in a ram, H. A hollow piston-rod, I, provided with a piston, J, and extending through the stuffing-box K of the cylinder, furnishes steam through its interior to such cylinder. 35 The upper end of this hollow piston-rod is provided with a collar, L, which is seated in the upper cross-bar of the frame C; but such seating is somewhat loose to allow for the vibrations of the machine when in use and prevent such vibrations from binding the piston-rod injuriously. The bore of the piston at its upper end connects with the steam-chest M, which is provided with a valve, N, and is actuated 40 by the tappet O, one end of which is pivotally secured to the projecting valve-stem, while its opposite end is in the reciprocating motions of the cylinder brought alternately in contact with the stops P Q, by which arrangement the steam is admitted or cut off and the exhaust 45 opened or closed at each stroke. The lower end of the frame C is provided with an aper-

ture, R, of sufficient size to allow the ram H to pass through it, while the lower end of said aperture is funnel-shaped, as shown, to rest 55 upon the top of the pile S. (Shown in dotted lines in Fig. 1.)

T are springs secured in the bottom of the frame C, to act as cushions to the lower end of the cylinder, and to prevent a too violent 60 impact at that point, which would sometimes occur when the pile was being driven into a soft bottom, which would allow the ram to descend lower than under other circumstances. Near the lower end of the piston-rod there are 65 one or more small openings, *a*, to admit the steam into the cylinder. In the drawings the ram is just striking its blow. The lower end of the tappet-lever O will be brought into contact with the stop Q, by means of which the 70 slide-valve N closes the exhaust *b* and moves said valve to disclose the steam-inlet to the hollow piston, and admits steam, which raises the cylinder until the lower end of the tappet-rod is brought into contact with the stop P, 75 which again moves the valve, cutting off the inlet and disclosing the outlet, when the cylinder, being relieved from the steam-pressure, falls by its gravity.

What I claim as my invention is—

80 1. The frame C, having flaring aperture R, and adapted to work in guides B in the frame A, and means, D, for operating it, combined with the ram H and cushioning means, as T, substantially as set forth. 85

2. In a pile-driving machine constructed substantially as described, a hollow piston-rod provided with a collar, which is seated in the top of the frame and adapted to suspend such piston-rod in place, and at the same time to 90 allow for the ordinary vibration of the machine without binding the parts, substantially as set forth.

3. In combination with the cylinder-ram G H, having the stops P Q, and the steam-chest 95 M, having inlet and exhaust ports, the stationary piston and its hollow rod I, having steam-ports *a* and collar L, loosely seated in the frame C, the valve N, and the tappet O, as and for the purposes set forth. 100

4. In a pile-driving machine constructed substantially as described, the frame within which the ram reciprocates, provided with a cushion in the bottom of said frame, to prevent

injurious impact of the ram, substantially as specified.

5 In a pile-driving machine, and in combination with the frame C, having flaring aperture R, and the cylinder G, having ram H, springs T, adapted to cushion the concussion between the frame and cylinder after the ram

has been projected through said aperture R, as set forth.

ROYS J. CRAM.

Witnesses:

H. S. SPRAGUE,
E. W. ANDREWS.