

No. 624,459.

Patented May 9, 1899.

J. C. CRAMP.
PORTABLE RAMMER.

(Application filed July 9, 1898.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

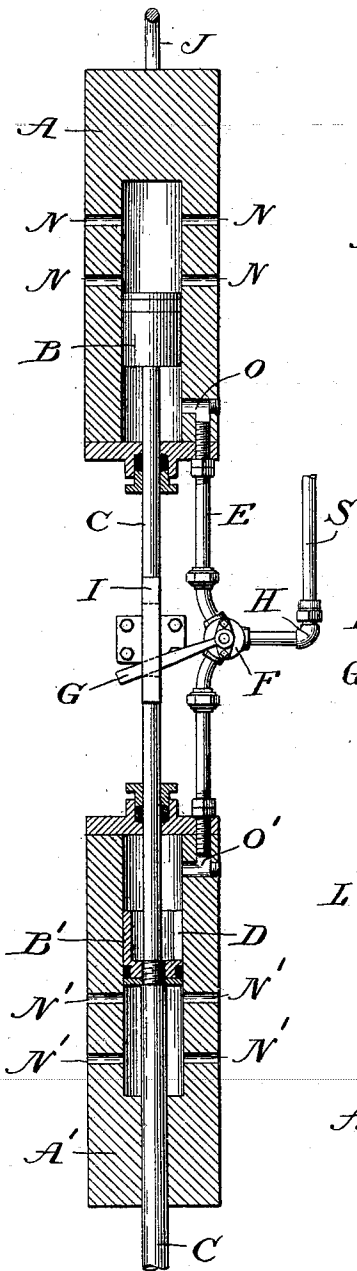


Fig. 2.

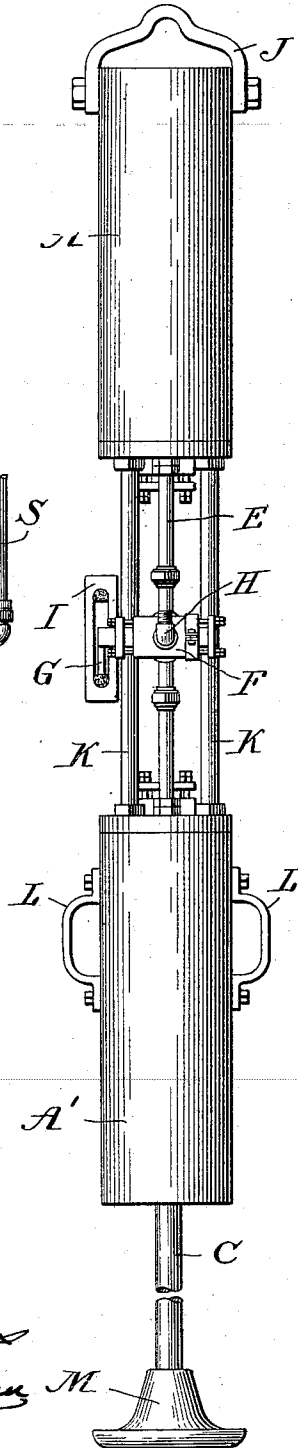
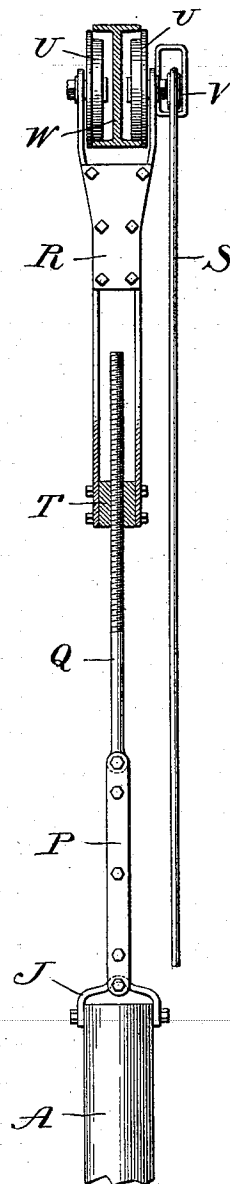


Fig. 3.



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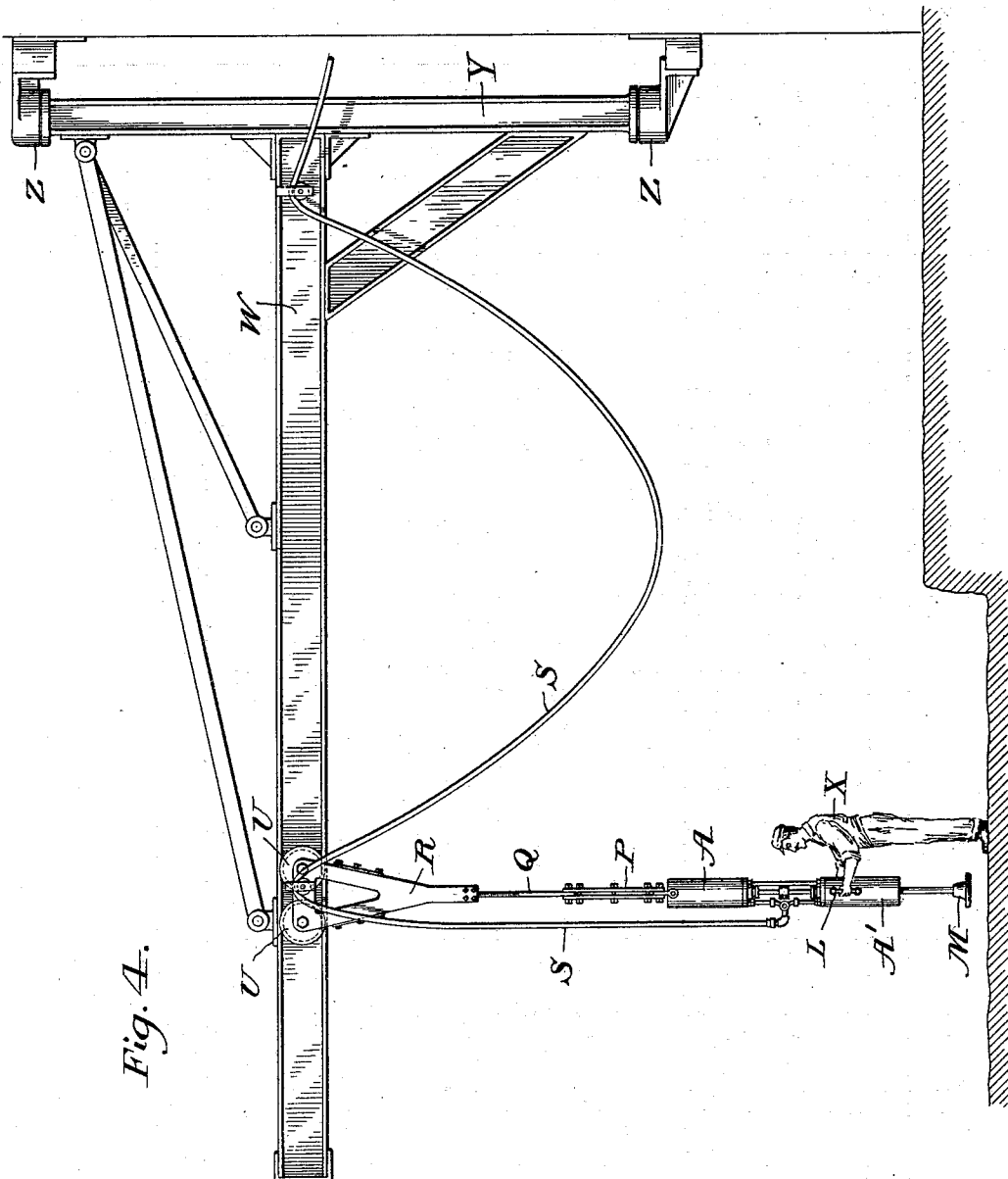


Fig. A.

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PORTABLE RAMMER.

SPECIFICATION forming part of Letters Patent No. 624,459, dated May 9, 1899.

Application filed July 9, 1898. Serial No. 685,569. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH C. CRAMP, a citizen of the United States, residing at No. 1344 Eyre street, in the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented a new and useful Machine which I term a Portable Rammer, of which the following is a specification.

Under the existing process of preparing molds for castings in foundry-work the sand or earth of which the mold is composed is packed or "rammed up," as the operation is called, by hand labor. The workmen stand in the molding-pit and ram up the loose sand or earth with hand-rammers as it is thrown into the pit a quantity at a time. The mold is thus rammed in successive layers from the bottom upward. The number of men required for this work varies, of course, with the size and character of the casting to be made. To prevent the molten metal from spreading beyond the desired limits of the mold or "straining" when it is poured into the mold, it is essential that the mold should be both closely and uniformly rammed. In ramming by hand there is found in practice to be a wide variation in the force of the blows delivered by the workmen, and in consequence some layers or portions of the mold will be closely and some loosely rammed. When the molten metal is poured into a mold thus unevenly rammed, the loosely-rammed portions yield under the pressure and the casting alters its proper shape or "strains." This necessitates the subsequent turning off of the superfluous metal at a loss of time, labor, and material. It is found in practice that these successive layers of the mold are not and cannot be hand-rammed to a uniform firmness and that in consequence almost all castings the molds for which have been rammed up by the existing hand process hereinabove described strain to some extent, the amount of this strain being dependent upon the size, weight, and shape of the casting and also upon the degree of care with which the hand-ramming has been done.

The object of my invention is to prevent the straining above described by performing the operation of ramming up molds for castings and similar work by means of a portable rammer, operated by any suitable power, suit-

ably suspended over the molding-pit and directed by hand.

To accomplish this object, my invention involves the features of construction and combination or arrangement of devices herein-after described and claimed, reference being made to the accompanying drawings, in which—

Figure 1 is a view of the rammer, partly in vertical section, exclusive of the rammer-head and of the rods connecting the two cylinders. Fig. 2 is a view of the rammer in side elevation. Fig. 3 is a view in front elevation of a part of the means for adjustably suspending and for moving the rammer. Fig. 4 is a complete view, in side elevation, of the rammer and the means for adjustably suspending, moving, and operating the same.

In Fig. 1, A A' are inverted cylinders disposed vertically one above the other, in which the piston-rod C operates by means of the trunk-pistons B B'. N N' are exhaust-ports in the sides of the cylinders A A'. D is a steam-port in the side of the trunk-piston B'. The trunk-piston B contains a corresponding steam-port. E is a branch pipe communicating with the cylinders A A' through the ports O O'. F is a three-way or Corliss valve communicating with the branch pipe E. H is a pipe communicating with the valve F. The trip I, attached to the piston-rod C, engages the lever G of the valve F, and thereby operates automatically the valve F. This trip and the manner in which it engages the lever G are shown in side elevation in Fig. 2.

In Fig. 2, J is a strap or ring forming part of the means whereby the rammer is flexibly suspended. K K are rods rigidly connecting the cylinders A A'. L L are handles attached to the sides of the cylinder A'. M is a rammer-head of any suitable size and shape.

In Fig. 3, P is a turnbuckle which supports the rammer by means of the strap or ring J. The shank Q of the turnbuckle screws into the block T of the traveler R. The traveler R is supported by and runs upon the wheels U U. The wheels U U travel upon the lower flange of the horizontal crane-arm W. (Shown in vertical section in Fig. 3.) S is a flexible pipe or hose for supplying steam or compressed air to the rammer. V is a pulley-wheel over which the pipe or hose passes.

In Fig. 4 is shown the rammer, with its flexible suspension, the means whereby it is moved and directed, and the method of its operation. W Y is a crane pivoted at Z Z to swing horizontally.

The operation of the portable rammer is as follows: Steam or compressed air being supplied through the flexible hose or pipe S, Fig. 4, is alternately admitted by the valve F, Fig. 1, to the cylinders A and A'. At the instant that the trunk-piston rises and the steam or air exhausts through the steam-ports N N the valve F cuts off from the cylinder A and opens to the cylinder A'. The trunk-piston B' then descends and exhausts in a similar manner through the steam-ports N' N'. The trip I, rising and falling with the stroke of the piston-rod C, engages the end of the lever G, which in turn automatically opens and closes the valve F, thus admitting steam or air alternately to the cylinders A and A'. The piston-rod C, with its rammer-head M, Fig. 2, thus rises and falls with a stroke uniform in rapidity and force. A workman stands in the molding-pit, as shown at X, Fig. 4, and directs the blows of the rammer by means of the handles L L, Fig. 2, which are attached to the sides of the cylinder A' at a convenient height.

I have described and shown the rammer in the form which I consider best adapted to the purposes for which it is designed; but I do not herein limit myself to this specific form, since the rammer above described and shown, exclusive of the supporting and suspending means, forms the basis of a separate application by me for Letters Patent.

In order that the rammer may be effectively used, it is essential that it shall be suspended in such manner that it may be freely moved over every part of the molding-pit. It is likewise essential that the rammer shall be so suspended as to admit of its being raised, lowered, and adjusted at any desired height in order to conform to the varying heights or shapes of the molds and also in order that the force of the blow delivered by the rammer may be regulated in the manner hereinafter described. In Fig. 4, W is a crane-arm pivoted at one end and swinging horizontally; but I do not confine myself to this precise form of support, as any arm having a horizontal and lateral movement would serve the same purpose. For example, both ends of the arm W might be mounted upon wheels or rollers running upon rails laid at right angles with the arm W. The horizontal movement of the arm W, Fig. 4, combined with the movement of the traveler R, mounted thereon, allows the free movement of the rammer to any point covered by the movement of the supporting-arm W. The force of the blow

delivered by the rammer-head M, Fig. 4, can be regulated by giving the rammer a few turns, disconnecting the flexible hose, if necessary. The rotation of the rammer screws or unscrews the shank Q, Fig. 3, in the block T, thus raising or lowering the rammer and regulating the force with which the rammer-head M, Fig. 4, strikes the loose material forming the mold. It is apparent that any degree of increase or decrease in the force of the blow delivered can thus be secured, depending on the number of rotations given to the rammer, or, in other words, upon the extent to which the rammer is raised or lowered by the screwing up or unscrewing of the shank Q in the block T.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with an automatic ramming device adapted to be suspended, of a supporting and suspending device therefor, capable of three independent motions, namely, a horizontal motion in the arc of a circle, by means of a swinging arm such as W, a horizontal motion in a straight line by means of a traveler, such as R, and a vertical motion in a straight line by means of a turnbuckle, such as a screw-threaded rod Q engaging with a screw-threaded head T, substantially as described.

2. In combination with an automatic ramming device adapted to be suspended, of a flexible supporting and suspending device therefor, consisting of a traveler R with pulley V mounted thereon, said traveler having a screw-threaded head T, and a screw-threaded rod or shank Q entering said head, and a turnbuckle-strap P attached to the lower end of the rod or shank Q, substantially as described.

3. In combination, a supporting means consisting of a crane-arm swinging horizontally, a traveler mounted and moving thereon and a turnbuckle adjustably attached to said traveler and raising and lowering therein; and a power-operated ramming device suspended from said turnbuckle, and means such as the handles L L for moving and directing said ramming device, substantially as described.

4. In combination, a supporting means having a horizontal movement, a traveler mounted and moving upon said supporting means, an automatic ramming device suspended from said traveler, means such as the turnbuckle Q and block T for raising and lowering said ramming device, and means such as the handles L L for moving and directing said ramming device, substantially as described.

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Witnesses:

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