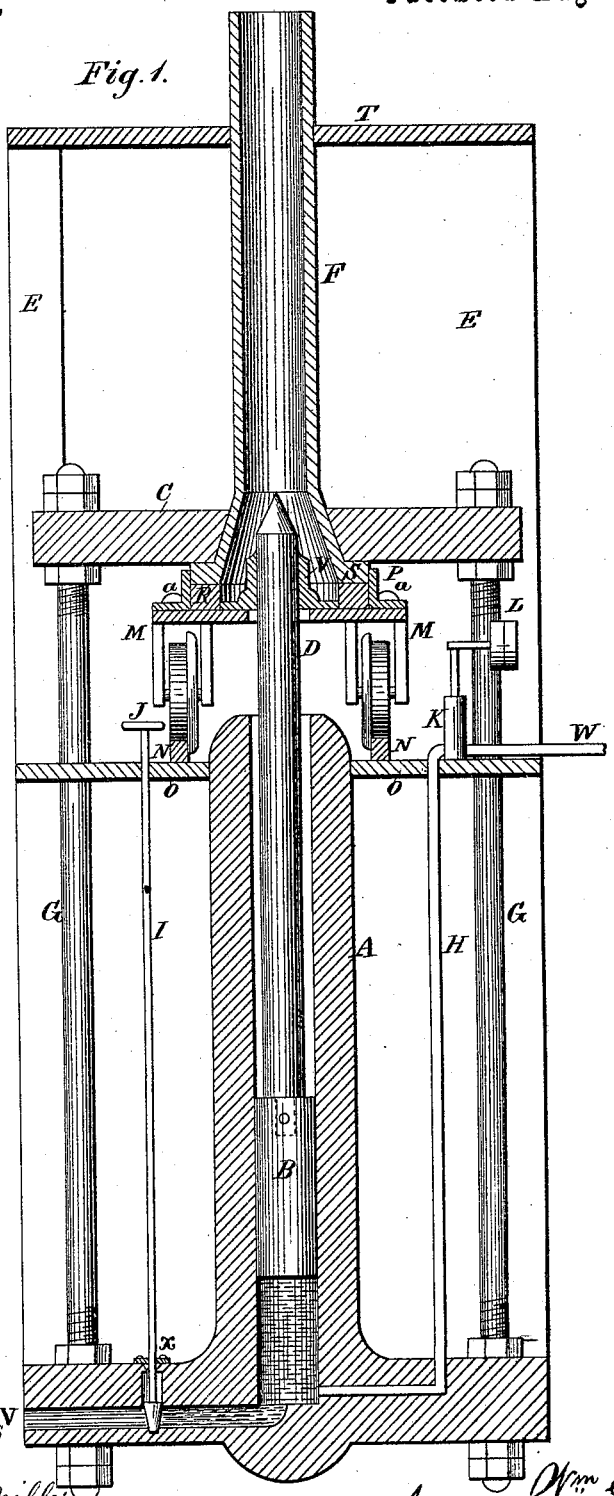
2 Sheets—Sheet 1.

W. SMITH.

MAKING PIPE-MOLDS.

No. 181,368. Patented Aug. 22, 1876.

Fig. 1.



WITNESSES

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2 Sheets—Sheet 2.

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Fig. 2.

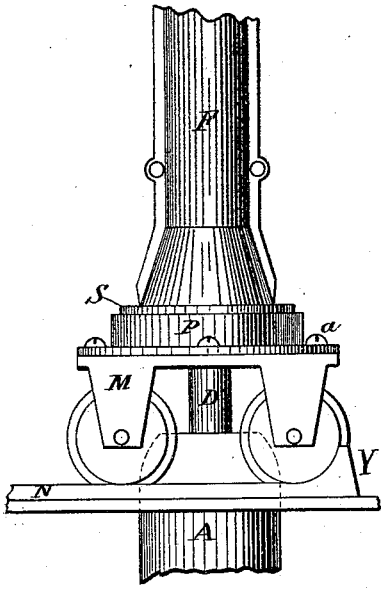
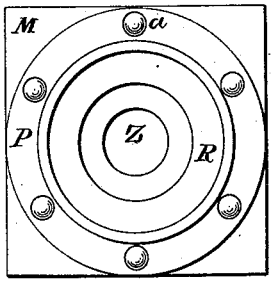


Fig. 3.



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM SMITH, OF PITTSBURG, PENNSYLVANIA.

IMPROVEMENT IN MAKING PIPE-MOLDS.

Specification forming part of Letters Patent No. **181,368**, dated August 22, 1876; application filed January 21, 1876.

To all whom it may concern:

Be it known that I, WILLIAM SMITH, of Pittsburg, in the county of Allegheny, and in the State of Pennsylvania, have invented certain new and useful Improvements in Forming Molds for Casting Pipe; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to the manufacture of pipe in sand-molds; and it consists in the construction and general arrangement of an apparatus for forming the mold, whereby time and labor are saved, and a more perfect impression of the pattern is produced therein by the equable packing of the sand, as will be hereinafter more fully set forth.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the annexed drawings, in which—

Figure 1 is a vertical section of my apparatus. Fig. 2 is a side elevation of the carriage and lower portion of the flask supported thereon. Fig. 3 is a plan view of the carriage.

A represents a hydraulic ram, the working portion of the cylinder of which must equal in length the mold it is designed to make, and a sufficient length of the piston B to retain it working therein. This piston B will, in a full-sized machine, be packed on its lower end, and the upper end is provided with a mortise or other suitable device to center and hold the pattern D. E E represent the walls of the pit, in which the whole machine is located, which pit is so deep that the upper end of the flask F will project about two or three feet above the platform T, which is supposed to be level with the floor of the foundry. G G are strong upright bolts, firmly fixed in the base of the ram A, and holding firmly on their upper ends the resisting cross-bar C. This bar is provided at its center with a recess for the reception of the flask, which it is intended to hold during the process of packing the sand. O is the lower platform within the pit E, on which the workman stands, who has control of the working of the machine. It, as well as the lower parts, is built in and sustained by the walls E E. On this platform O are rails N N, upon which the carriage M travels by means of suitable wheels. W is the water-supply pipe to the force-pump K, driven by the pulleys L, or other suitable means. H is the pipe connecting the force-pump K with the ram A, and provided with valves, &c. J is a hand-wheel, controlling, by means of the rod I, the waste-valve X in the waste-passage V. P is a circular guide-ring, fastened, by bolts *a*, to the carriage M. The inner diameter of this ring P is equal to the exterior diameter of the flanges S on the flask F, and acts as a retainer and centerer for the flask and the false flange R. This false flange has vertical parallel sides, and acts as a guide to the bowl-pattern V and its packing-flange, and by its depth below the point S it allows of a sufficient quantity of sand, so that when the pattern V is forced up to said point the sand will be solidly packed. To the rails N are attached stops Y, which are so placed that when the carriage reaches them the flask F and other parts shall be centered directly over the pattern D, and ready for work. Z is the central opening in the carriage, through which the pattern and plunger work.

In practice, the rails N are to lead from the pit E to a larger pit, where the molds are first blackwashed, then dried, and afterward cast.

The operation of my invention is as follows: The carriage M being in the large pit, the bowl-pattern V is first placed in position, resting on the top of the carriage M, and within the false flange R. The flask F, properly secured, is then placed, resting by its flange S on the false ring R, and within the guide-ring P. The carriage, with its load, is then rolled into the forming-pit until it strikes the stops Y, when the center of the bowl is directly above the body-pattern D, and the flanges S are under, and secured by, the brace C, which covers three-fourths of their surface. Power is then applied to the pump K, and water entering the ram the plunger B and pattern D are elevated to the point shown in Fig. 1. The pump is then stopped, and sand is thrown in from the top platform T until the conical end of the pattern D is covered, when power is again applied to the pump, and the pattern D rises,

and by means of its conical wedge-shaped head packs the sand firmly against the side of the flask F, the workman keeping the cone always covered with sand as it advances. When the cone reaches the top, the body of the mold has been completed, but the bowl remains to be compressed. This is done by the plunger B advancing upward through the opening Z until its projecting shoulder strikes the bowl V, which is also forced up, packing the sand above it until it reaches the line of the flange S, which can be ascertained by suitable marks on the plunger B. The pump is then stopped, and the work of forming the mold is completed.

The workman, by means of the wheel J, now opens the waste-valve X, and, the water in the cylinder A escaping by the outlet V, the plunger B and pattern D descend by their own weight, assisted by the atmospheric pressure, until the conical point of the pattern D is below the carriage M, which is now run into the large pit, the flask with the formed mold lifted off, the bowl portion of the pattern removed and replaced, and a new flask being arranged the process is repeated.

Although the hydraulic method of obtaining the required movement and pressure of the pattern D is, in all probability, the best, as herein described, still it is evident that a similar movement could be obtained by the use of other mechanical devices, or the employment of steam, gas, or compressed air in a cylinder.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The conical-pointed pattern D, operated by a hydraulic ram or other equivalent means, substantially in the manner and for the purposes herein set forth.

2. The hollow bowl-pattern V, with its packing-flange, in combination with the flask F, pattern D, and plunger B, as and for the purposes herein set forth.

3. The flask F, in combination with the bar C, for the purposes herein set forth.

4. The combination of the carriage M, guide-flange P, and false flange R, for supporting the bowl-pattern V and flask F, substantially as and for the purposes herein set forth.

In testimony that I claim the foregoing I have hereunto set my hand and seal this 24th day of December, 1875.

WILLIAM SMITH. [L. S.]

Witnesses:

JOHN B. GEYSER,

JOHN D. MORELAND.