

(No Model.)

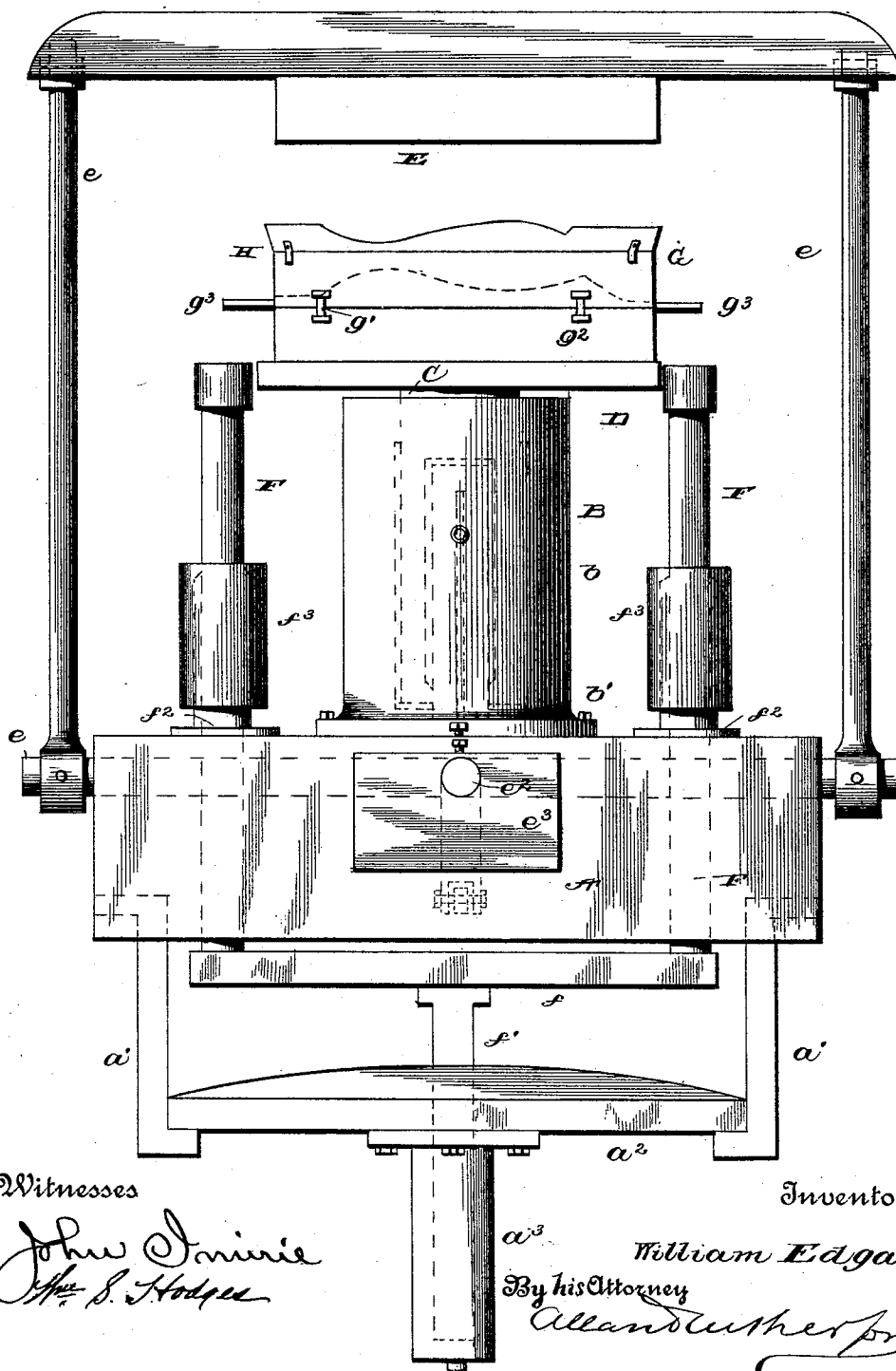
2 Sheets—Sheet 1.

W. EDGAR.
MOLDING MACHINE.

No. 480,566.

Patented Aug. 9, 1892.

Fig. 1.



W. EDGAR.
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Fig. 2.

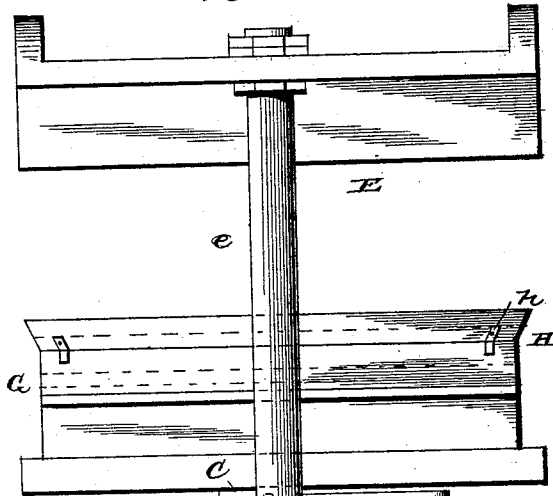


Fig. 3.

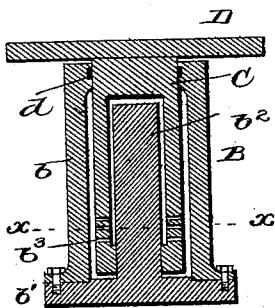
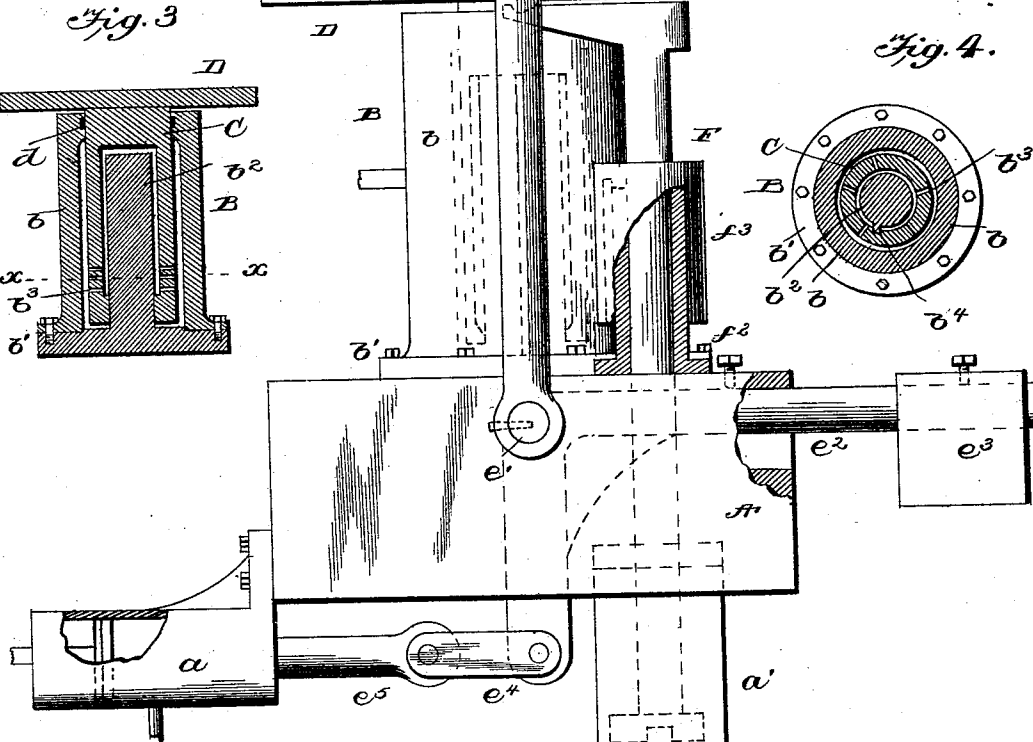
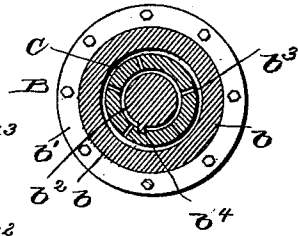


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

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FOUNDRY AND MACHINE WORKS, OF SAME PLACE.

MOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 480,566, dated August 9, 1892.

Application filed August 22, 1891. Serial No. 403,451. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM EDGAR, a citizen of the United States, residing at Sanford, in the county of Orange and State of Florida, have invented certain new and useful Improvements in Molding-Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain new and useful improvements in molding-machines, and has for its object the production of a simple and highly-efficient machine which shall be operated by hydraulic pressure and which will produce a mold-body of uniform density throughout its entire length and breadth.

A further object is to provide means for preventing sand from entering between the movable parts of the machine; and a still further object is to provide a new and improved hydraulic cylinder and piston which shall be positive in action and effective in results.

The invention consists, primarily, in providing a mold box or flask with a sand-box having a curved portion or general outline the opposite of the outline of the mold, whereby the relative proportion of sand will be left over every part of the mold after a straight-edge or rule has been passed over the edges of the sand-box.

The invention further consists in a hydraulic cylinder having a piston moving therein, a head-plate located above said piston and capable of being moved out of the way when the machine is not in use or when the mold box or flask is being adjusted in position.

The invention also comprises the detail construction, combination, and arrangement of parts, substantially as hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a view in side elevation of my improved molding-machine. Fig. 2 is an end view thereof. Fig. 3 is a vertical sectional view of the hydraulic cylinder. Fig. 4 is a horizontal sectional view thereof on the line $x x$, Fig. 3.

Referring to the drawings, A designates a base or platform suitably mounted in position, and a a cylinder connected thereto at one side. From this base or platform extend two arms or brackets a' , connected together by a cross-bar a^2 , to which is secured a second cylinder a^3 .

B designates the hydraulic cylinder, which is rigidly secured to base or platform A. This cylinder comprises an outer casing b , a base-plate b' , and a core b^2 , extending vertically therefrom. Into this casing b , and also into the cylinders a and a^3 , open the ends of water-pipes, which are connected to a suitable ram, (not shown,) any preferred form of ram being applicable for operation in connection with my molding-machine.

C designates a movable piston, hollowed out in its center so as to extend down over and inclose the core b^2 , the lower end of said piston being thickened so as to fit snug against the core. In this cylindrical piston, above the thickened portion thereof, is a series of laterally arranged holes or ports b^3 , through which the water under pressure will pass from cylinder B into the space between the cylindrical piston C and the core b^2 . The upper end of the cylinder B is thickened, so as to hug against the cylindrical piston C, packing d being secured in said thickened end, so as to make the cylindrical piston fit snugly. From the core b^2 projects a continuous flange or spline b^4 , which is designed to fit snugly within a corresponding groove or recess on the inner surface of the cylindrical piston C, so as to guide the latter in its movement. To the upper end of the cylindrical piston C is connected a base-plate or platform D, upon which the box or flask containing the mold is placed when the same is to be subjected to pressure.

E is a head-plate having a central thickened portion and designed to receive the blow of the mold box or flask in the upward movement thereof. To the ends of this head-plate E are connected the upper ends of arms e , the lower ends of which are rigidly secured to a rock-shaft e' , extended longitudinally through the base or platform A. To this rock-shaft e' is rigidly connected a right-angular arm or lever e^2 , which is provided with a weight e^3 at its outer end. The lower end of the normally-

vertical portion of arm or lever e^2 is connected by a link e^4 with a piston-rod e^5 , extending from piston-cylinder a . When the piston in this cylinder is at the outer limit of its movement, the weighted lever operating upon the rock-shaft will effect the tilting of the head-plate E on one side out of the way, so as to permit of convenient access to the mold box or flask. When pressure is first received against the piston in cylinder a , the head-plate E will at once assume its proper horizontal position. As soon as this is accomplished pressure will be admitted into the hydraulic cylinder B and effect the elevation of the piston-cylinder and its base-plate or platform.

F F designate two vertically-movable rods projected up through base or platform A and connected at their lower ends by a cross-bar f , to the central portion of which is secured the outer end of a piston f' , moving within the cylinder a^3 . These rods F are projected up through cylindrical boxes or casings f^2 , rigidly secured upon base or platform A, said boxes or casings serving as guides for said rods. To each rod is rigidly secured a sleeve f^3 , open at its lower end and designed to fit down over and inclose the boxes or casings f^2 . The upper ends of the sleeves, being preferably formed with or rigidly secured to the rods F, prevent sand from getting in between the boxes or casings and the rods, which, as is well known in this class of inventions, forms the greatest impediment to successful operation.

G designates a two-part box or flask having a horizontal partition g , upon which the mold-pattern is secured. The parts of this box or flask are secured together by any suitable means, that shown in the drawings consisting of pins g' , passed through corresponding ears g^2 , projecting from each part of the box or flask. From the ends of this box or flask or from the ends of the partition thereof project short rods g^3 , with which the upper angular ends of the vertically-movable rods F are designed to engage when it is desired to elevate the box or flask away from base-plate or platform D, said rods serving as pivots to enable the box or flask to be readily and easily inverted or turned over. To secure an equal pressure on all parts of the sand-mold, I have found that it is necessary that a relative proportion of sand should be left over every part of the mold-pattern, so that in the formation of the mold-body all curves and inclinations will have the same degree of pressure as that applied to straight lines. Hence I attach to the upper horizontal edge of the box or flask G what is termed a "sand-box" H, which consists of a skeleton frame having corresponding end and side boards and provided with lugs or plates h , which hug the sides of the box or flask. The edges of the side boards of this sand-box are cut or curved so as to be the converse or opposite of the outline of the mold-pattern. In the drawings I have shown the mold-pattern as being a brake-shoe,

and hence the edges of the sand-box H are curved accordingly. In practice after the mold-pattern is secured on the partition of the box or flask the same is well covered with sand, which will extend up to and above the edges of the sand-box H. The operator then takes a straight-edge or rule and passes the same over the upper horizontal edges of the sand-box H, making the sand conform thereto. Pressure being admitted from the hydraulic ram the head-plate E will, as before stated, be thrown into proper horizontal position directly above the mold box or flask, and upon pressure being admitted into the hydraulic cylinder B the piston C will be at once elevated and force the mold box or flask upward, causing the sand to strike with great force against the thickened portion of head-plate E. Owing to the curvature of certain portions, more sand is required at one point than another—that is, a greater quantity of sand is required over a concaved portion than is necessary over a convexed portion, and in this way I am enabled to secure the proper quantity over each and every part. After the mold has received its pressure the piston is gradually lowered into place until the platform D resumes its normal position, and at the same time head-plate E is tilted to one side, out of the way. The sand-box H is removed, and then pressure is admitted into cylinder a^3 , effecting the elevation or raising of the parallel rods F until the same engage rods g and elevate box or flask G away from its platform B. The operator then inverts the box or casing, the rods thereof serving as pivots therefor, and upon the lowering of rods F and the reseating of said box or flask on the platform the operator disengages the connections between the two parts of the box or flask, and said rods F are then again elevated, effecting the elevation of the then upper half of the box or flask, causing the removal of the pattern, and leaving the sand-mold on the platform intact.

The advantages of my invention will be apparent to those skilled in the art to which it appertains, and it will be especially observed that by means thereof I can readily and easily produce a mold which is of proper and proportionate density throughout its entire length and breadth. It will also be observed that by using hydraulic pressure the working or operation of the machine is greatly facilitated, and the results secured are of the highest order.

I claim as my invention—

1. As an improvement in molding-machines, a box or flask having a central horizontal partition carrying the mold-pattern and a sand-box removably secured to said box or flask, the edges of said sand-box having an outline the converse of that of the mold-pattern, substantially as set forth.

2. As an improvement in molding-machines, a two-part box or flask having a central horizontal partition carrying the mold-pattern

and a sand-box having lugs or plates hugging the sides of said box or flask, the edges of said sand-box having an outline the converse of that of the mold-pattern, substantially as set forth.

3. As an improvement in molding-machines, a box or flask, a mold-pattern, and a sand-box the upper edges of which have an outline the converse of that of such mold-pattern, substantially as set forth.

4. The herein-described improved molding-machine, comprising a hydraulic cylinder, a piston moving therein, having a base-plate or platform for the mold box or flask, the head-plate, the arms connected thereto, the rock-shaft to which said arms are attached, and the weighted arm or lever secured to said rock-shaft and also connected to and arranged to be operated by a hydraulic piston, substantially as set forth.

5. In a molding-machine, the combination, with a base or platform, of the hydraulic cylinder, the piston moving therein, the base-plate or platform connected to said piston, the box or flask designed to rest on said base-plate and having short rods projecting from its ends, the vertically-moving rods for en-

gaging said short rods and elevating the mold box or casing, the boxes or casings secured to said base or platform and inclosing said vertically-movable rods, the sleeves secured to or made with said rods and fitting down over and inclosing said boxes or casings, and means for operating said vertically-movable rods, substantially as set forth.

6. The combination, with a base or platform, of the hydraulic cylinder secured thereto, having a cylindrical piston moving therein, the base-plate or platform connected to said cylindrical piston, the rock-shaft mounted in said base or platform, the head-plate having arms connected to said rock-shaft, the weighted lever rigidly secured to said rock-shaft, the piston connected at one end to said weighted lever, the vertically-movable rods connected at their lower ends by a cross-bar, and the piston connected to said cross-bar, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM EDGAR.

Witnesses:

J. NOTA MCGILL,
WM. S. HODGES.