No. 616,378. Patented Dec. 20, 1898.

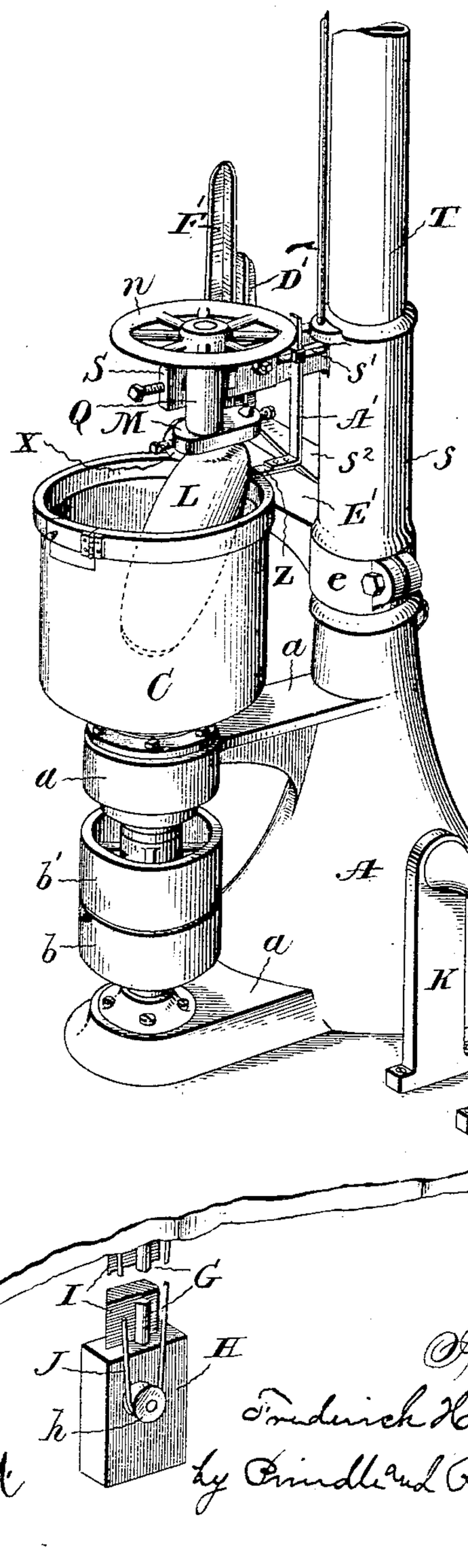
F. H. & C. D. WEEKS.

POTTERY MOLDING MACHINE.

(Application filed June 9, 1898.)

(No Model.) 4 Sheets—Sheet 1.

Fig. 1.



Witnesses:
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Henry C. Hazard.

Inventors
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by Prindle and Russell their attys

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(No Model.) 4 Sheets—Sheet 2.

Fig. 10.

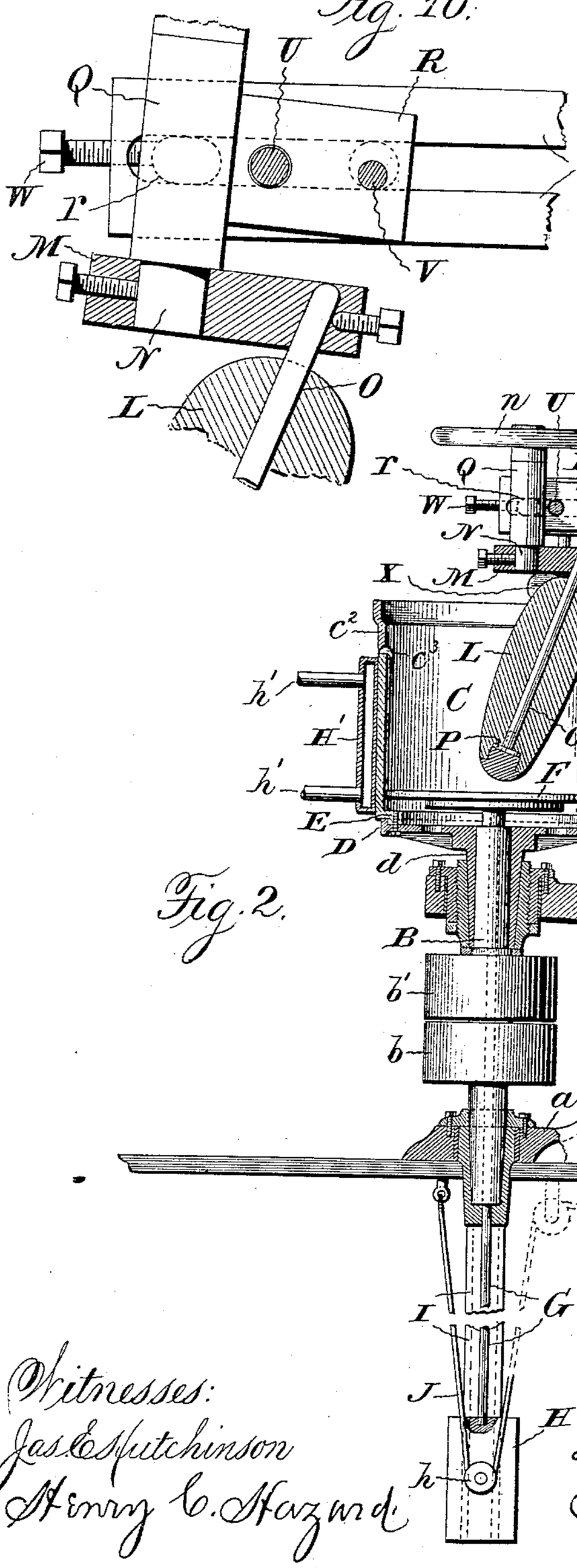

Fig. 2.

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Fig. 3.

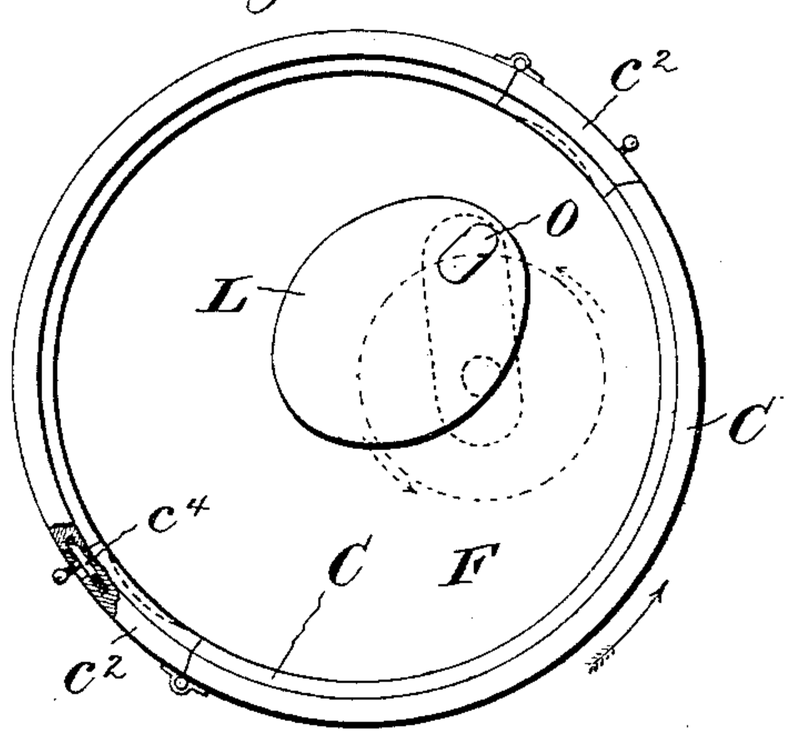

Fig. 4.

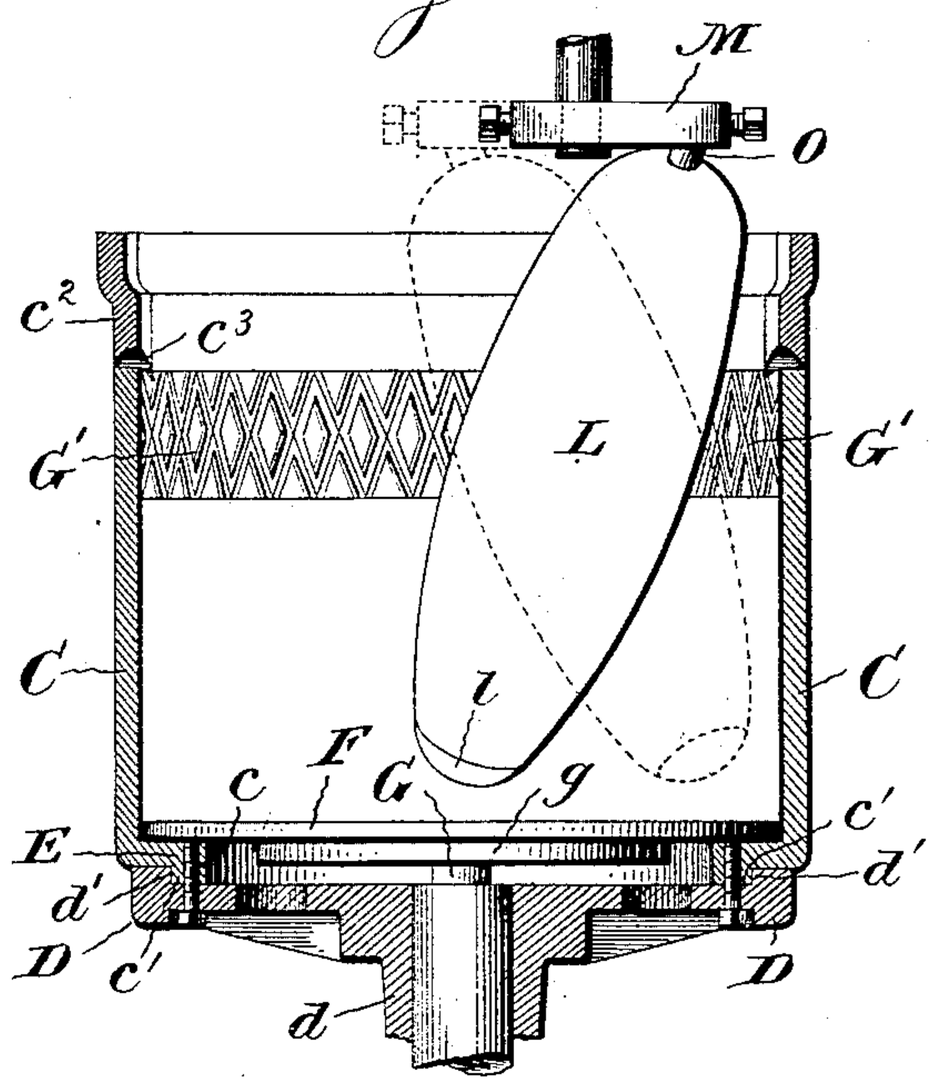

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Fig. 5.

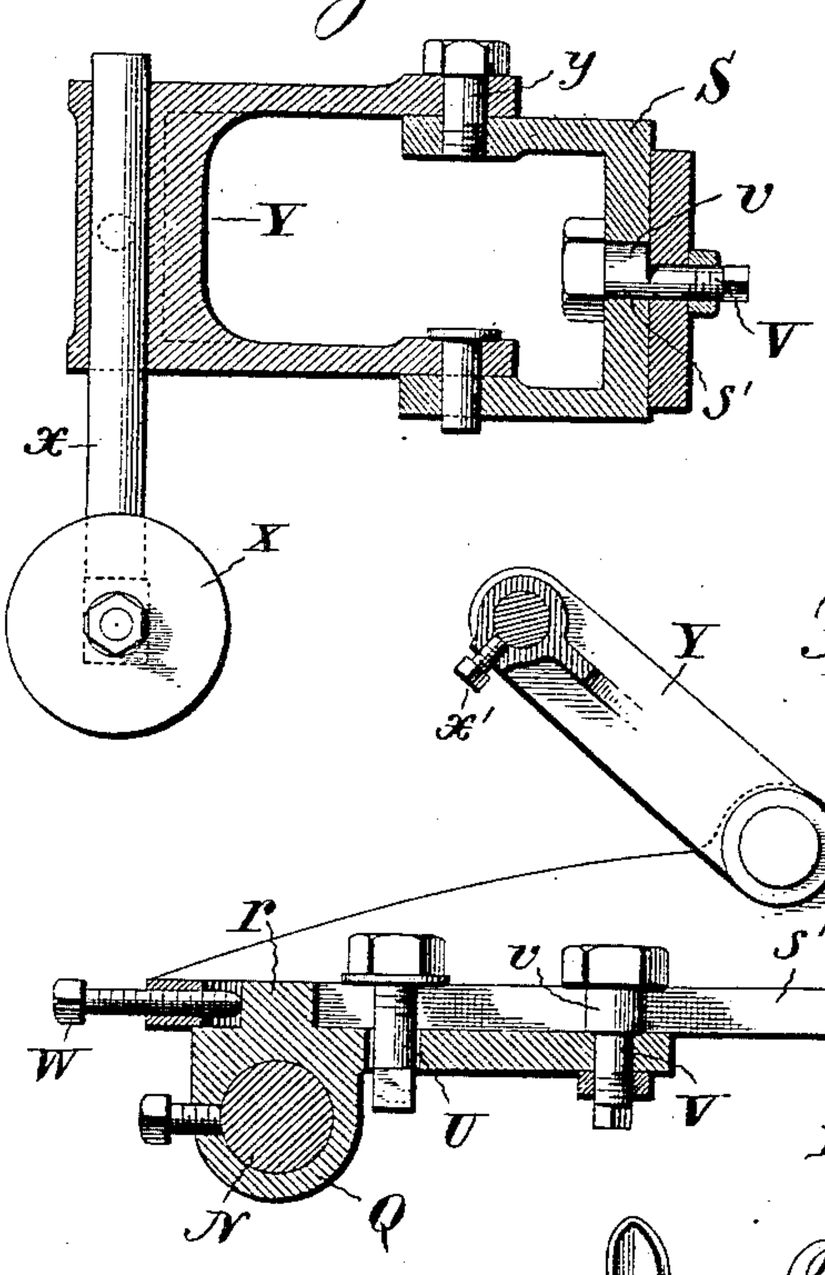


Fig. 6.

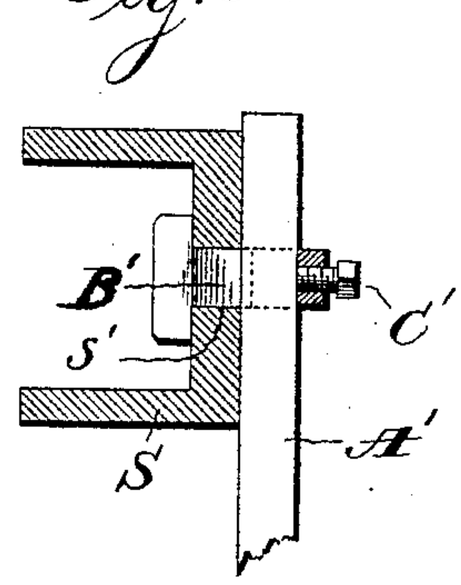


Fig. 7.

Fig. 8.

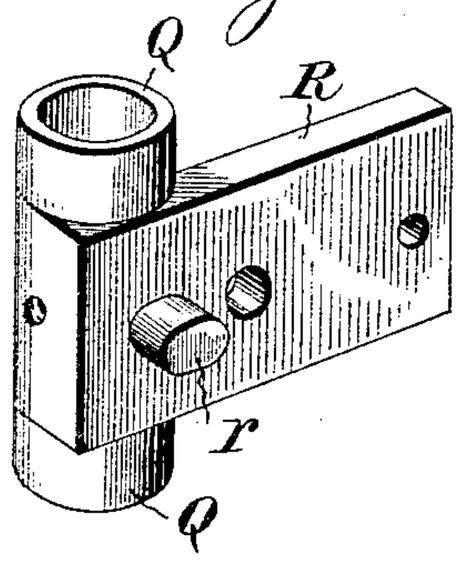
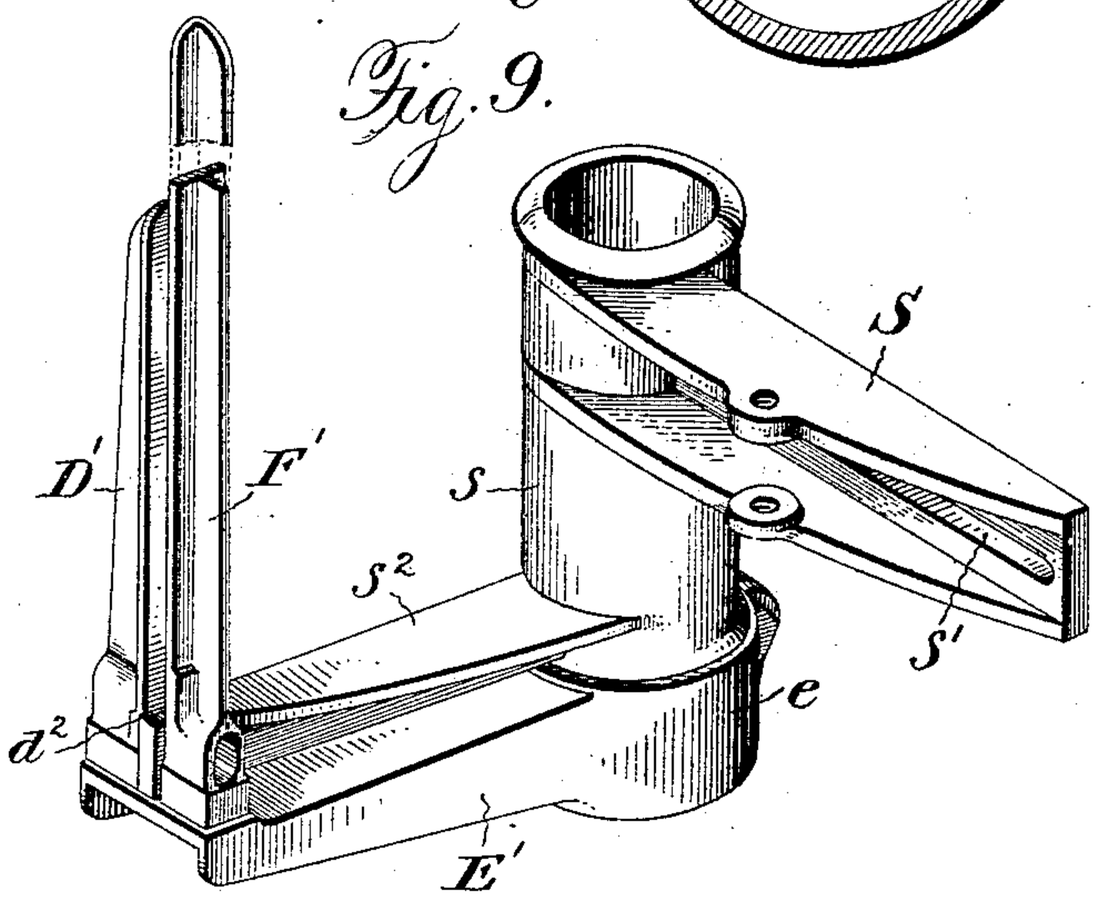


Fig. 9.



Witnesses:
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UNITED STATES PATENT OFFICE.

FREDERICK H. WEEKS AND CHARLES D. WEEKS, OF AKRON, OHIO.

POTTERY-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 616,378, dated December 20, 1898.

Application filed June 9, 1898. Serial No. 683,027. (No model.)

To all whom it may concern:

Be it known that we, FREDERICK H. WEEKS and CHARLES D. WEEKS, of Akron, in the county of Summit, and in the State of Ohio, have invented certain new and useful Improvements in Pottery-Molding Machines; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of the machine; Fig. 2, a vertical section thereof; Fig. 3, a horizontal section on line *x x* of Fig. 2; Fig. 4, a detail view, in vertical section, on an enlarged scale, through the jolly, showing in full and dotted lines different positions of the shaping or forming roll. Fig. 5 is a detail view in cross-section, showing the means for mounting the edge-forming wheel and for adjusting the plate which supports the vessel-forming roll; Fig. 6, a like view showing the means for supporting the knife or trimming-tool. Fig. 7 is a horizontal section through the arm that supports the various forming devices. Fig. 8 is a detail view in perspective of the plate which supports the vessel-forming roll. Fig. 9 is a detail view in perspective of the sleeve and arms for supporting the forming devices and holding the same in operating position, and Fig. 10 is a detail view of the means for adjustably supporting the vessel-forming roll.

Letters of like name and kind refer to like parts in each of the figures.

The object of our invention is to provide certain improvements in pottery-molding machines, whereby they may be enabled to do more efficient, better, and cheaper work; and to these ends said invention consists in the machine and the parts thereof having the construction substantially as hereinafter specified.

In the carrying of the invention into practice there is employed a frame A, having horizontal arms *a* and *a*, which journal a vertical shaft B, upon the upper end of which is mounted a mold or form preferably of iron. Upon the shaft B are fast and loose pulleys *b* and *b'*.

The mold or form shown being designed for the making of a cylindrical-shaped vessel has the form of a hollow cylinder C, with a flat bottom D, that is fastened at its center to the shaft B, a hub or sleeve *d* on the under side of the bottom shrunk on the shaft, making the connection a rigid one. The cylinder C and bottom D are detachably connected together by bolts or screws E and E, which pass through said bottom into an annular flange *c* at the lower edge of the cylinder. The bottom is rabbeted to form an annular shoulder *d'*, that is engaged by a similar shoulder *c'* on the flange *c*, the object of such construction being to enable the ready centering of the cylinder on the bottom D. By making the cylinder and bottom detachable forms of varying size and interior shape can be used by simply substituting a cylinder of one size or shape for one of a different size or shape.

For the manufacture of vessels having ears or handles the interior of the mold or form is provided at diametrically opposite points with two openings extending from the top downward, into each of which is placed a removable block c^2, in whose bottom edge is formed a cavity c^3, which, with a portion of the surface of the bottom of the opening, forms the mold for a handle or ear. The blocks may be made removable in any desired way; but preferably each is hinged at one side so as to swing outward from the mold, leaving a clear space for the ear or handle to pass through. Each block has a sliding spring latch or bolt c^4 for fastening it in position. The provision of the mold with these removable blocks enables the formation of vessels with ears or other projections and avoids the necessity of the separate formation of the ears and their attachment to the vessel, as has been the practice.

The clay or material to be operated on does not rest upon and receive its exterior shape from the bottom D, but rests upon and takes its external shape from a plate or table F within the mold or form, resting loosely upon a cap or disk *g* on the upper end of a longitudinally-movable rod G, that passes through an axial opening in the shaft B and has its lower end carried to a point below the floor or other resting-place of the machine. The rod is made capable of being raised and lowered to enable the plate or table F to be raised for the removal of the finished vessel from the form and to receive the material for mak-

ing a vessel and to be lowered in position for a shaping operation. Any suitable means may be employed for giving the rod these movements; but that shown is simple and efficient, consisting of a block H, on the top of which the rod rests, which is slidably mounted on a vertical guide-bar I and has a wheel *h* on one side, over which passes a cord or rope J, one end of which is fastened to some fixed point and the other to a windlass K. By means of the latter the rod may be raised, carrying the table F, while gravity will cause its descent when it is free to descend.

For causing the clay to take the form desired there is employed a former, consisting of a roll L, of wood or other material, that is attached at its upper end to a radial arm M upon the lower end of a shaft N, the axis of the roller being so inclined relative to the axis of said shaft and to a plane radial to said shaft, passing through the roller-axis at the upper end of the roller, that its operative position relative to the mold or form is at the beginning of a forming operation, with its lower end at, or substantially at, the center thereof and inclining upward and outward toward the side thereof and also rearward with reference to the direction of revolution of said form; or the position of the roll may be described as such that its upper and lower ends are respectively intersected by two planes radial to the axis of the shaft N and not by one plane passing diametrically through the latter and with the lower end in advance of the upper end as the roll is revolved by the shaft N. The surface of the roll is convexly curved longitudinally. On the upper end of the shaft N is a hand-wheel *n*, by which it may be revolved. The roll is journaled on a shaft O, to which it is secured by means of a cap-plate P, fastened to its lower end by a screw, which plate engages a shoulder on the interior of the roll, and by the cap *l*, having a shank screwed or otherwise secured in an opening in the lower end of the roll.

The shaft N is located eccentric to, but in an area that is circumscribed by, the walls of the mold, so that the curved path traveled by the roll is a circle wholly within the mold and of a diameter that reaches from the central part thereof to the wall save for a distance equal to the thickness of the wall of the pottery article. Said shaft is journaled in a bearing Q on a plate R, that is attached to a horizontal arm S, that projects radially from the upper end of a sleeve *s*, mounted on a round column or standard T, so as to be capable of being moved vertically and swung horizontally. The column or standard is secured at its lower end to the top of the frame A by being placed in a vertical opening therein and clamped by a bolt *a'*, the frame being slit vertically to enable it to be gripped upon the standard.

On the rear side of the plate R, at the center of the bearing Q, is a stud *r*, that projects into a horizontal slot *s'* in the arm S, and also passing through the plate and through said slot are two bolts U and V, the former being nearer the stud *r* than the latter. The bolt V has an eccentric part *v*, that engages the opening in the plate R, and hence, by rotating the bolt, the plate can be swung on the stud *r* as a center to change the angle at which the shaft stands and vary the relation of the roll to the mold. The end of the bolt V is squared to permit the application of a wrench to rotate it. The diameter of the bolt U is, as indicated in Fig. 2, sufficiently less than the width of the slot *s'* to allow the described movement of the plate R. A reference to said Fig. 2 will make it plain how the angle of the shaft N can be changed by rocking the plate R, as described. A bolt W, tapped through the outer end of the arm S and abutting against the stud *r*, provides means for the close adjustment of the roll toward the side of the mold.

For compacting and giving a smooth surface to the upper edge of the vessel a wheel or roller X, having its periphery given the desired configuration, is journaled at the lower end of a vertical rod *x*, which is secured at its upper end by a set-screw *x'* within a vertical opening in a bracket Y, that is pivoted to the arm S, so that it may be swung horizontally. The bracket Y is bifurcated and one member rests upon and is pivoted to an upper horizontal flange on the arm S, and the other member rests upon and is pivoted to a lower horizontal flange on said arm. One of said pivots is a screw or bolt *y*, which serves to clamp or hold the bracket in position. It will be seen that the roller can be adjusted vertically and horizontally to adapt it for vessels of varying height and diameter. To supplement the action of the roller, a knife Z is provided, that is placed so as to remove any clay which may be squeezed over the top edge of the cylinder C between it and the lowermost point reached by the roller. The knife is supported on the lower end of a vertical bar A', that is attached to a clamp B', which is secured to the bar S by being passed through the slot *s'* and having lugs to engage the bar on one side and by the engagement of the bar A' with the other side of the bar S. The bar A' and the clamp are held in place by the set-screw C', which presses the bar A' against the side of the arm S. The position of the knife can be varied by adjusting the bar A' vertically.

The purpose of making the arm S vertically and horizontally movable is the usual one—to permit the taking of the forming-tool and its support out of the way to give access to the mold or form, and the arm and attached parts are suitably counterbalanced, so that they can be readily raised and lowered. The arm when in its lowered position, with the roll L in proper position relative to the mold, is securely held from swinging horizontally by means of a radial arm s^2 at the lower end of

the sleeve *s*, placed, preferably, at an angle of forty-five degrees from the arm S, that at its outer end engages a vertical bar D′, that is attached at its lower end to the outer end of a radial arm E′, extending from a split sleeve *e*, which is clamped to the column T. A horizontal offset or shoulder d^2, near the bottom of the bar D′, under which the arm s^2 is moved, prevents any accidental upward movement of the latter and the parts connected therewith. Parallel with the bar D is a second vertical bar F′, which extends to a higher point than the other and higher than it is necessary to lift the arm s^2 to remove the roll from the mold. In returning the roll to the mold it is swung until the arm s^2 strikes the portion of the bar F′ above the bar D′, and then the parts are moved downward, the arm s^2 passing down between the two bars until its lower side strikes the base-piece, to which both bars are attached, and the lower end of the sleeve *s* strikes the top of the sleeve *e*.

For producing an ornamented or figured surface on the exterior of the vessel being made the mold or form is lined with lace, embossed rubber, lincrusta, or other figured material, as shown at G′, Fig. 4, the markings of which are faithfully reproduced in the clay. For producing colored effects colors can be applied by a roller or otherwise to the relief surfaces of the lining, which will be imparted to the corresponding depressed surfaces formed in the vessel. Of course, instead of using an embossed or figured lining, a mold can be used, having its surface figured or cut into a desired design.

When it is desired to work without a lining for the mold, whether plain or embossed, this can be done and the clay be prevented from adhering to the mold by heating the latter either all of the time the machine is in use or only when the vessel is to be removed. Gas, steam, or other heating medium may be employed. For illustration there is shown in Fig. 2 a steam-jacket H′, inclosing the cylinder C, provided with pipes *h′* and *h′* for the inlet and outlet of steam.

The operation of the machine is as follows: The arm S being raised and turned to one side, to remove the roll L from the mold or form the rod G is raised to position to receive the mass or bat of clay to be worked, which is placed at the center of the table F. The rod, with the table, is then lowered, and the roll L, by the swinging and lowering of the arm S, is placed in the mold with its lower end in the bat of clay. The mold being revolved by power applied to the shaft B in the direction indicated by the arrow, Fig. 3, and the roll-carrying shaft N being revolved in the same direction by the hand-wheel *n*, the clay, by reason of the peculiar arrangement of the roll, is gradually forced outward, first forming the bottom of the vessel, and then pressed against the side wall of the mold, gradually producing the wall of the vessel, working from the bottom upward. By its revolution with the shaft N the surface of the roll at points successively farther and farther along travels parallel with the bottom and the side of the mold. Owing to the angle at which the roll stands but a small part of the clay at a time is being pressed with the finishing or final pressure against the mold, and hence the full power is exerted to the best possible advantage. The tendency of the roll from the friction of the interposed mass of clay is, by the revolution of the mold, to move outward toward the wall of the latter, revolving on the shaft N, and this tendency is of material aid in the operation of the machine; and but for the fact that the work can be done faster by revolving the roll by the hand-wheel *n* no such manipulation need be provided for, because once started the roll would complete its work without intervention. With this machine coarse clay—clays ground only half as fine as ordinary—and stiff clays can be perfectly and uniformly worked and the work be rapidly and well done. The vessel being finished, the revolution of the mold is stopped, the roll lifted and turned out of the way, and the rod G raised to lift the table F to the top of the mold to permit the vessel by means of said table to be removed from the machine.

Besides being adapted for forming different-sized vessels by changing the cylinder C the same cylinder can be used for vessels of less diameter by placing slats or staves within it of the required thickness, two staves at diametrically opposite points being cut in two and formed to make ears, such provision being similar to that for the same purpose before described. Vessels of different height can be made by placing blocks beneath the cap or disk *g* and by correspondingly raising the sleeve *e* on the column T, which limits the descent of the sleeve S and the roll L. By adjusting the plate R to place the shaft N at an angle to the axis of the mold the formation of the bottom of the vessel can be varied, so that its upper or inner surface will incline in greater or less degree from its center, either upward or downward, toward the side. Of course, by changing the form of the mold and the shape of the roll the form of the vessel to be made can be varied at will.

Having thus described our invention, what we claim is—

1. The combination of a form or mold, and a shaping-tool mounted to revolve bodily around an eccentric axis that is not exterior to the mold, and held at an incline so that its ends are intersected by different planes radial to said axis, substantially as and for the purpose described.

2. The combination of a form or mold, and a shaping-tool mounted to revolve bodily around an eccentric axis that is not exterior to the mold, and so held that a line passing

through it from end to end is inclined relative to said axis, substantially as and for the purpose described.

3. The combination of a form or mold, and a shaping-tool mounted to revolve bodily around an eccentric axis that is not exterior to the mold and so held that a line passing through it from end to end is inclined relative to said axis with its ends located so they are intersected by different planes radial to such axis, substantially as and for the purpose described.

4. The combination of a form or mold, a shaping-tool, and an eccentric axis for said tool around which it travels during a forming operation, said tool being supported so that a line passing from end to end of it stands at an incline relative to such axis with one end in advance of the other as the tool revolves on such axis, substantially as and for the purpose specified.

5. The combination of a rotatable form or mold, a shaping-tool, a shaft, by which the tool is revolved during a forming operation, and connections between the tool and shaft, which eccentrically support the latter from the former at an incline which places one end of the roll in advance of the other as the tool is revolved by said shaft, substantially as and for the purpose described.

6. The combination of a rotatable form or mold, a rotary shaping-roll, a shaft journaling the same, a second shaft, by which the roll is revolved during a forming operation, and a crank or eccentric connection between the two shafts, the roll-journaling shaft being held at an incline which places one end of the roll in advance of the other end, as the roll is carried by said second shaft, substantially as and for the purpose described.

7. The combination of a form or mold, an inclined shaping-tool, a shaft from which the latter is eccentrically supported, by means of which said tool is caused to travel in a curved path, and an adjustable support for said shaft, whereby the inclination of the tool may be varied, substantially as and for the purpose described.

8. The combination of a form or mold comprising a bottom and sides, a shaping-roll, a shaft eccentric to the mold, but within the area of the walls thereof, and a roll-supporting part connected to said shaft, from which the roll extends at an incline to the shaft-axis, with its inner or lower end free, and in advance of the other end, as the roll is revolved by the shaft, substantially as and for the purpose described.

9. The combination of a form or mold, a tool for causing the material to conform to the mold, an arm carrying said tool, a wheel or roller for forming the edge of the vessel to be made, and a support for said wheel, pivoted to said arm on an axis parallel with the mold-axis, substantially as and for the purpose described.

10. The combination of a form or mold, a tool for causing the material to take the form of the mold, a wheel or roller to form the edge of the vessel to be made, and a trimming-tool in position to act on the latter at a point where the roller and mold coöperate, substantially as and for the purpose described.

11. The combination of a mold or form, a shaping-tool, an arm carrying the latter, a support on which the arm is mounted for movement in line with the mold, and for rotary movement, an arm on said support, and a stop-bar having portions that engage the side, and overhang the said second-named arm to hold it from movement, substantially as and for the purpose described.

12. The combination of a form or mold shaped to form projections, having for each projection-forming part a hinged block or piece, substantially as and for the purpose shown.

13. The combination of the form or mold, a shaping-tool, a pivoted plate holding the latter, a support for said plate, and a bolt having an eccentric portion, connecting the plate to the support, substantially as and for the purpose described.

14. The combination of the form or mold, a tool to coöperate therewith, an arm or support, a bar for said tool, a clamp engaging the bar, and a screw that holds both clamp and bar, substantially as and for the purpose described.

15. The combination of a mold or form, a shaping-tool, an arm carrying the latter, a support on which the arm is mounted for movement in line with the mold and for rotary movement, an arm on said support and two parallel stop-bars, one of which is longer than the other to engage said second-named arm, and the shorter one having a lug or shoulder to overhang the arm, substantially as and for the purpose specified.

In testimony that we claim the foregoing we have hereunto set our hands this 3d day of June, 1898.

FREDERICK H. WEEKS.
CHARLES D. WEEKS.

Witnesses:
JNO. E. SIEBER,
C. D. WOODY.