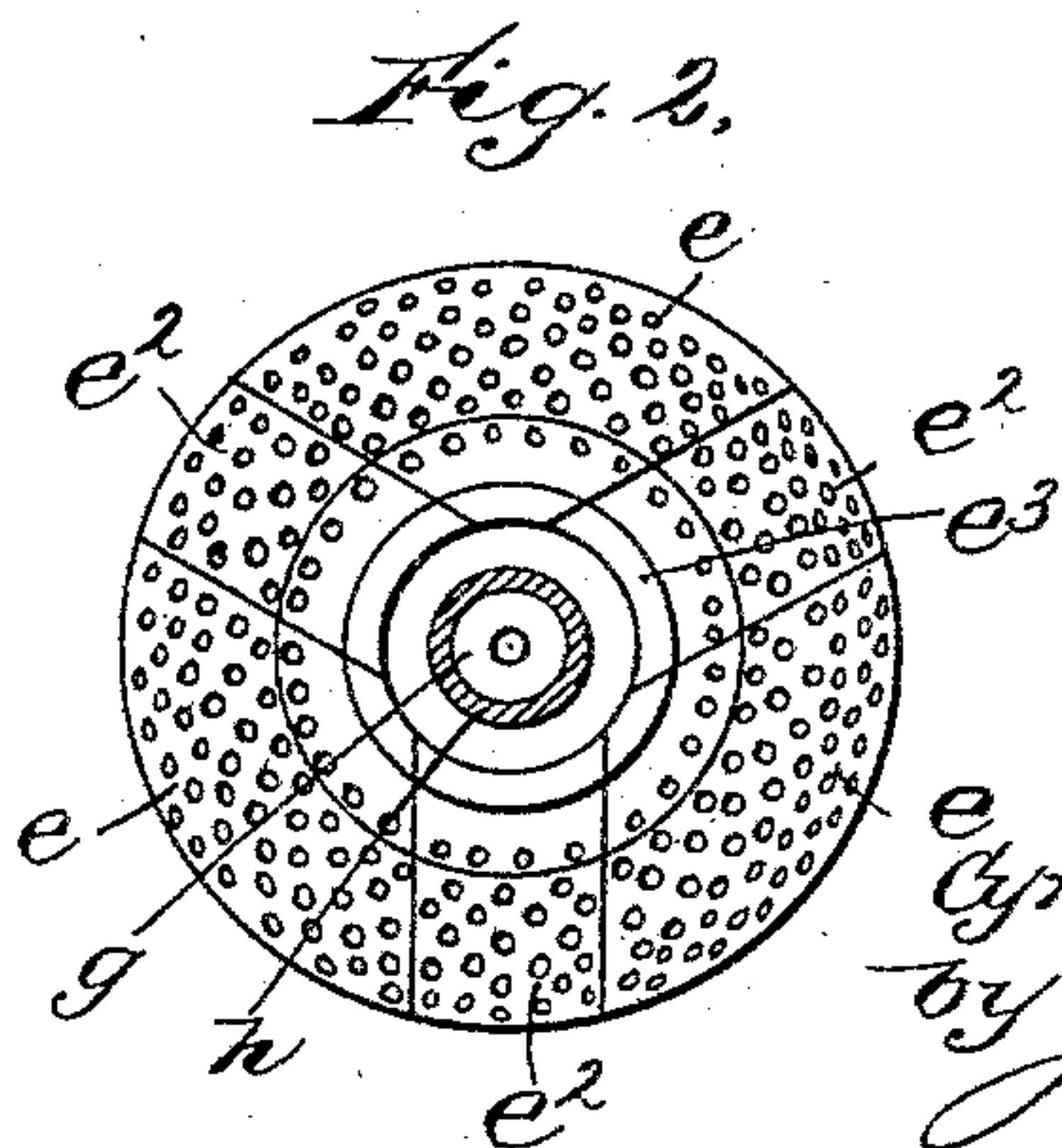
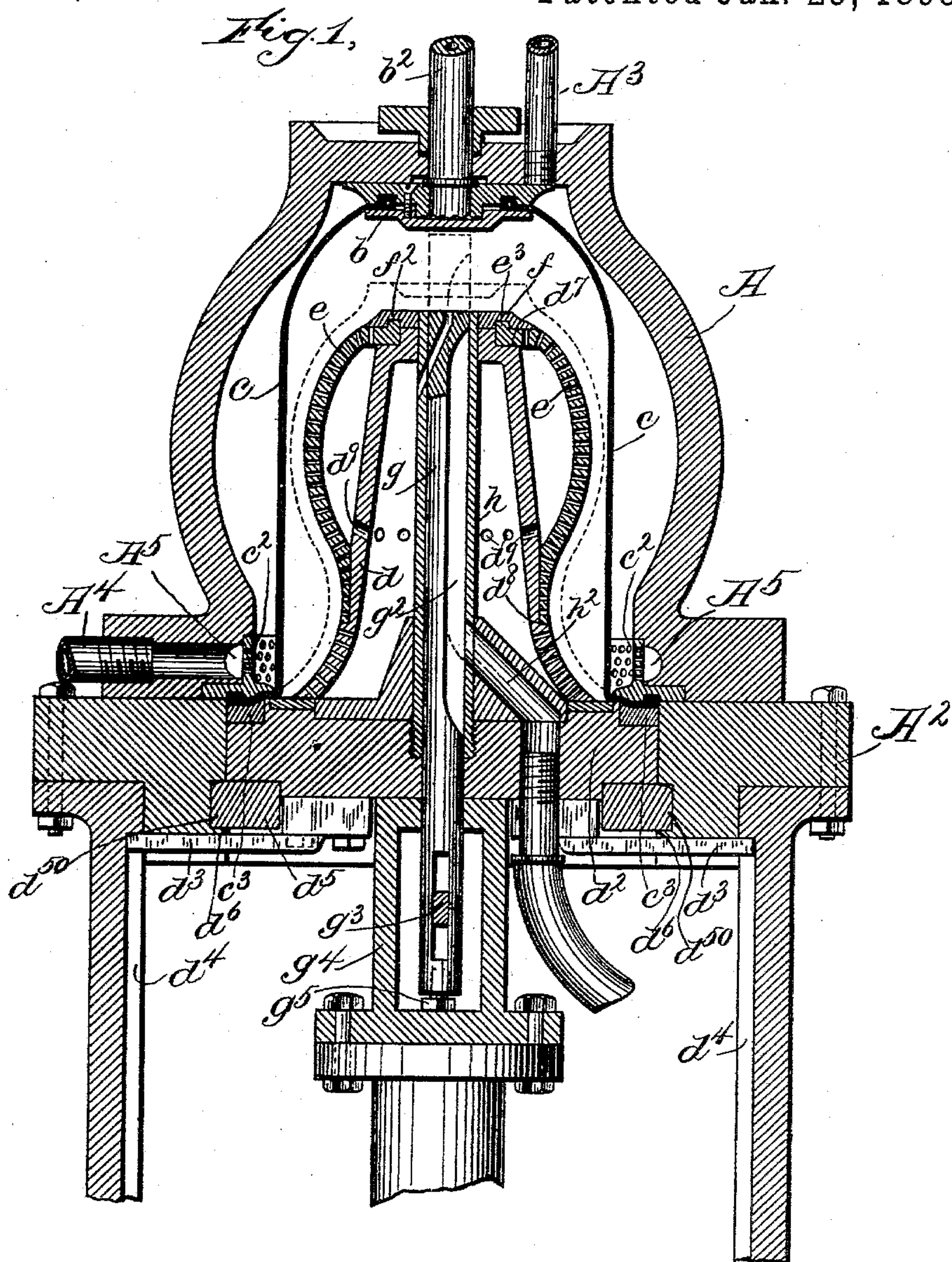


(No Model.)

C. D. ORMISTON.
PULP MOLDING MACHINE.

No. 598,005.

Patented Jan. 25, 1898.



Witnesses
Jas. J. Maloney,
J. P. Livermore

Inventor,
Cyrus D. Ormiston,
by J. P. Livermore
Att'y.

UNITED STATES PATENT OFFICE.

CYRUS D. ORMISTON, OF LOCKPORT, NEW YORK, ASSIGNOR TO THE UNITED
INDURATED FIBRE COMPANY, OF SAME PLACE.

PULP-MOLDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 598,005, dated January 25, 1898.

Application filed November 16, 1896. Serial No. 612,268. (No model.)

To all whom it may concern:

Be it known that I, CYRUS D. ORMISTON, of Lockport, county of Niagara, and State of New York, have invented an Improvement in
5 Pulp-Molding Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The present invention relates to a pulp-
10 molding machine and is shown as embodied in a machine of that class in which a former for the interior of the article to be molded is supported within a dome having a chime-plate adapted to be forced down toward the
15 top of the said former to mold the bottom of the article and a flexible bag or diaphragm extending from said plate to the bottom of the dome and adapted to receive hydrostatic pressure, whereby it is forced toward the sides
20 of the former to mold the walls of the article.

The present invention is embodied, mainly, in a novel device for feeding the pulp into the space between the former and the external molding devices and also in a collapsible
25 former of novel construction and arrangement, whereby it is rendered more easily removable from the interior of the finished article without injury to the same, and also presents a more uniform surface, resulting in a
30 more perfect forming of the interior of the vessel which is molded than is possible with formers such as have been heretofore commonly constructed.

In machines of this class the pulp is com-
35 monly fed through a tube or passage leading upward through the middle of the former, so that the pulp is ejected therefrom over the top of the said former, thus entering the space between it and the external molding devices.
40 To control the feed of the pulp, it is essential that an opening should be provided therefor in the top of the former and that this opening should be closed during the molding operation. To control such opening, a rod or
45 plunger has been used, adapted to be lowered away from the said opening during the feed operation and afterward lifted and supported with its end on a level with the top of the former. Such a construction is objectionable
50 for the reason that the plunger must be supported by means of some movable actuating

device, which is liable to yield before the pressure brought to bear upon the top of the plunger and is also liable to become worn, so that the plunger will not be on a level with
55 the top of the former, the result being that the interior of the molded article is likely to be irregular instead of perfectly smooth and even. To obviate this difficulty, the plunger, which controls the feed in accordance with
60 the present invention, normally stands so that its upper end is level with the top of the former, while its lower end rests upon a solid support, the said lower end being preferably
65 provided with an adjustable engaging portion to compensate for wear. To open the passage and admit the pulp to the interior of the mold, the said plunger is adapted to be lifted instead of lowered and is provided with a longitudinal passage communicating with the
70 pulp-supply, said passage terminating near the upper end of the said plunger, so that when the plunger is down in its normal position the said passage is closed by the plunger-guideway and is brought into communi-
75 cation with the interior of the mold when the said plunger is lifted so that the end of the passage rises above the top of the former.

The former consists of a number of side sections adapted to be supported at their ends
80 upon shoulders formed along the side and top of an interior core, a portion of said sections having parallel sides which are tangential to a common circle concentric with the circumference of the former and constituting keys
85 to support the intervening sections, so that in collapsing the form the said keys may be moved directly away from the surface of the formed article without any lateral movement thereof, which would tend to abrade or injure
90 the interior surface of the molded article, said side sections being retained in operative position by an end section interlocked therewith, as will be hereinafter described.

Figure 1 is a vertical section of a machine
95 embodying the present invention. Fig. 2 is a top plan view of the former with the top plate or end section thereof, which serves to secure the sections together, removed.

The dome A is mounted on the base or support A² and is provided with an inlet-pipe A³
100 and an outlet-pipe A⁴, communicating with

an annular duct A^5 , the said outlet being controlled by a suitable valve (not herein shown) adapted to be closed while the fluid is forced into the dome through the inlet A^3 under pressure during the molding operation. Within the said dome are the external molding devices, consisting of the chime-plate b , mounted on a plunger b^2 , extending through the top of the dome, and the flexible diaphragm c , secured at its upper end to the said chime-plate in any suitable or usual way and at its lower end between a clamping-piece c^2 , extending around the lower end of the dome, and an annular clamping-ring c^3 , suitably secured thereto. The said clamping-piece c^2 is arranged, as shown, with an upwardly-extending wall having openings therein communicating with the annular duct A^5 for the escape of the fluid after the molding operation is complete and the pressure turned off.

The former consists of a core or supporting portion d , mounted on a support or table d^2 , adapted to be moved up and down to and from the base of the dome, so that the article molded can be removed after the molding operation is completed and the former prepared for the next molding operation. The said table d^2 is herein shown as provided with guide projections d^3 , movable in guide-grooves d^4 , formed in the legs of the base A^2 and is held in position by any suitable clamping device, an annular ring d^5 being herein shown adapted to cooperate with shoulders d^6 , the said clamping-ring having projecting portions d^{50} , adapted to become disengaged from the shoulders d^6 when the said ring is turned and being arranged substantially as shown and described in United States Patent No. 549,200 to F. E. Keyes, dated November 5, 1895.

To form the lower interior portion of a vessel having a contracted neck or mouth, such as a spittoon or pitcher, (a former for the latter being herein shown,) the said former is provided with a collapsible or separable portion consisting of sections e , supported at their upper ends upon a shoulder d^7 , formed at the upper end of the core d and at their lower ends upon a shoulder d^8 , and the said sections are held in position by other sections d^2 or "keys," as they may be called, there being an equal number of keys and sections, and the sides of the keys being parallel to each other, so that the said keys may be removed from the interior of the article formed by a movement directly away from the surface thereof, while the removal thereof will leave sufficient space between the sections e to admit of their removal by a similar movement, so that no lateral movement is required in any case, which is desirable since such lateral movement would tend to abrade or injure the interior surface of the molded article while the pulp is soft.

After the sections e and the keys e^2 are properly assembled and supported upon the shoulders d^7 and d^8 preparatory to a molding

operation they are secured together by means of an annular end section or clamping-plate f , interlocked with the side section by a tongue and groove, as shown at f^2 , a portion of said tongue being formed on each of the sections e and keys e^2 , as shown at e^3 . Thus when the former is ready for a molding operation the top thereof presents a smooth and unbroken surface, with the exception of the central opening in the annular clamping-plate f , which is filled, as will be described, by the pulp-feed-controlling plunger g and plunger-guide h during the molding operation. By this construction the sections of the former are firmly supported upon the shoulders d^7 , and the adjoining surfaces thereof are covered by the annular clamping-plate f , so that the top of the former not only presents an unbroken surface for molding, but also tends to prevent a leakage of pulp through to the supports for the sections of the former, which would foul the same and necessitate the removal of the pulp deposited thereon before the former could be reassembled for subsequent operations.

After the former is assembled as described the support d^2 is moved upward into the dome A and secured in the position shown in the drawings and the pulp is supplied to the space between the said former and external molding devices comprising the chime-plate b and flexible diaphragm c . For this purpose the plunger g is provided, longitudinally movable in a guide way or tube h , which extends upward through the middle of the core d and beyond the upper surface thereof, so as to fit the opening in the annular plate f and stand on a level with the surface thereof. The said guide-tube h is provided with an inlet-opening h^2 , communicating with the pulp-supply, the pulp being forced into the said tube under pressure, and the plunger g is provided with a channel g^2 , extending along the surface thereof and terminating just below the upper end. The inlet h^2 is preferably somewhat slanted upward as it enters the tube h , so that when the pulp-supply is turned on the tendency thereof will be to fill the channel g^2 and to move the plunger g upward until the rod rises far enough to bring the said channel above the end of the guide-tube h , thus bringing the pulp into communication with the space between the exterior of the former and the external molding devices. The said plunger g , however, is provided, as shown, with a lever g^3 , adapted to lift the same in order to insure the proper opening of the communicating passage between the pulp-supply and the interior of the mold, the said lever also affording means for closing such communication, if necessary, although the weight of the plunger is ordinarily sufficient to accomplish this after the pulp-supply is turned off. When in its normal position, as shown, and the pulp-supply is turned off, the top of the said plunger g is on a level with the surface of the annular plate f and the end of the plunger-guide

h, so that the former affords a practically smooth upper surface to the pulp. In order that the plunger may be firmly supported in this position, a bracket or supporting portion 5 g^4 is shown as secured between the under side of the table d^2 and the movable support therefor, and upon the said bracket g^4 the end of the plunger normally rests, the said plunger being provided, as shown, with a cap-screw 10 or other adjustable device g^5 in order to take up wear and insure the proper positioning of the said plunger. It is obvious that other means may be utilized for adjusting the relation between the plunger g and its permanent 15 support, the said permanent support consisting, primarily, in the support for the former or some part of said support, the said support for the former being itself movable, so as to give access to the said former after the article is molded, as shown. By this construction a positive support is afforded for the 20 plunger during the molding operation, thus practically insuring a perfect forming of the interior of the vessel, it being obvious that the pressure exerted upon the top of the 25 plunger during the molding operation is withstood by a solid base or support instead of by a movable actuating device or lever, as is the case when the lever is lowered to open the 30 valve and lifted to close it.

In order to insure proper drainage during the molding operation, the sides of the former are made foraminous, as shown, and the core d is provided with openings d^9 , through which 35 the water that has escaped through the upper portion of the former can run out during the molding operation, the base or support also having suitable drainage-openings to permit the final escape of the water from the machine. 40

In the operation of the machine, assuming the former to be assembled and in the position shown in Fig. 1, pulp is admitted to the pulp-supply pipe h^2 and the rod g rises in its 45 guideway, assisted, if necessary, by the manipulation of the lever g^3 , and the pulp then flows into the space between the former and the external molding devices. When sufficient pulp has been admitted, the supply is 50 cut off and the rod g returns to its normal position, closing the pulp-inlet, an unbroken surface thus being presented at the top of the former. Pressure is then admitted to the dome, it being obvious that if the rod g 55 has not previously returned to its normal position the pressure exerted on the external molding devices will have a further tendency to thus restore it, or if for any reason it is not automatically restored the fact is at once 60 apparent to the attendant, who will then restore it by manipulating the lever g^3 . When the article has been molded, the pressure is cut off and the dome drained, and the support for the former is lowered, so that the 65 former, with the article molded thereon, is accessible. The article is then lifted from the core or support d , the separable portion

of the former being lifted with the article from the supporting-shoulders d^7 and d^8 . The key-sections e^2 are then drawn inward toward 70 the middle of the article and removed, thus unlocking the sections e , so that they can be removed in a similar manner. Since the direction of movement is away from the interior of the article, there is no liability of 75 abrading the surface thereof, while the bottom of the article is protected from injury by the clamping-plate f , which substantially covers the same. The separable portions of the former are then reassembled upon the 80 core d , and if any pulp has leaked through during the molding operation and has lodged upon the shoulders d^7 and d^8 it is obvious that this pulp can be very easily removed, since 85 no grooves or small recesses are present in which the pulp can lodge. The clamping-ring f is then applied and the support for the former lifted to its normal position, the former then being completely assembled and within 90 the dome ready for the next molding operation.

I claim—

1. In a pulp-molding machine, the combination with the dome and external molding devices, of a former within said dome, a central 95 opening in the said former, a plunger extending to the mouth of said opening and provided with a pulp-channel, a permanent support for said plunger, and means for lifting said plunger from its permanent support to open communication between the pulp-supply and 100 the interior of the mold, substantially as described.

2. The combination with the former and exterior molding devices of a tube communicating with the pulp-supply and extending to the exterior of said former, a movable plunger 105 within said tube having a permanent support, the end of said plunger normally being on a level with the end of the said tube; and a channel formed in said plunger and terminating below the upper end thereof, substantially as described. 110

3. In a pulp-molding machine, the combination with the exterior molding devices, of a 115 former comprising a permanent core having supporting-shoulders, a series of separable sections supported on said shoulders, and an annular clamping-plate interlocking with the ends of said sections, substantially as described. 120

4. In a pulp-molding machine, the combination with the external molding devices, of a 125 former comprising a core or support, a series of separable sections mounted upon said core, and a similar series of supplemental sections or keys equal in number thereto and having parallel sides tangential to a circle concentric to the circumference of the former, and an annular clamping-plate interlocking with said 130 sections to complete the former, substantially as described.

5. In a pulp-molding machine, the combination with the former comprising a permanent

core and a collapsible portion mounted on said
core, of a tube communicating with the pulp-
supply and extending upward through said
core and opening above the top thereof, an
5 annular clamping-plate for the collapsible
portion of the former surrounding said tube
and having its surface on a level with the end
thereof, and a pulp-controlling device adapt-
ed to normally close said tube and provided
10 with a surface continuous with the upper edge

of said tube and the surface of the said annu-
lar binding-plate, substantially as described.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

CYRUS D. ORMISTON.

Witnesses:

ERNEST A. RINGUCBERG,
WM. H. BAKER.