

(No Model.)

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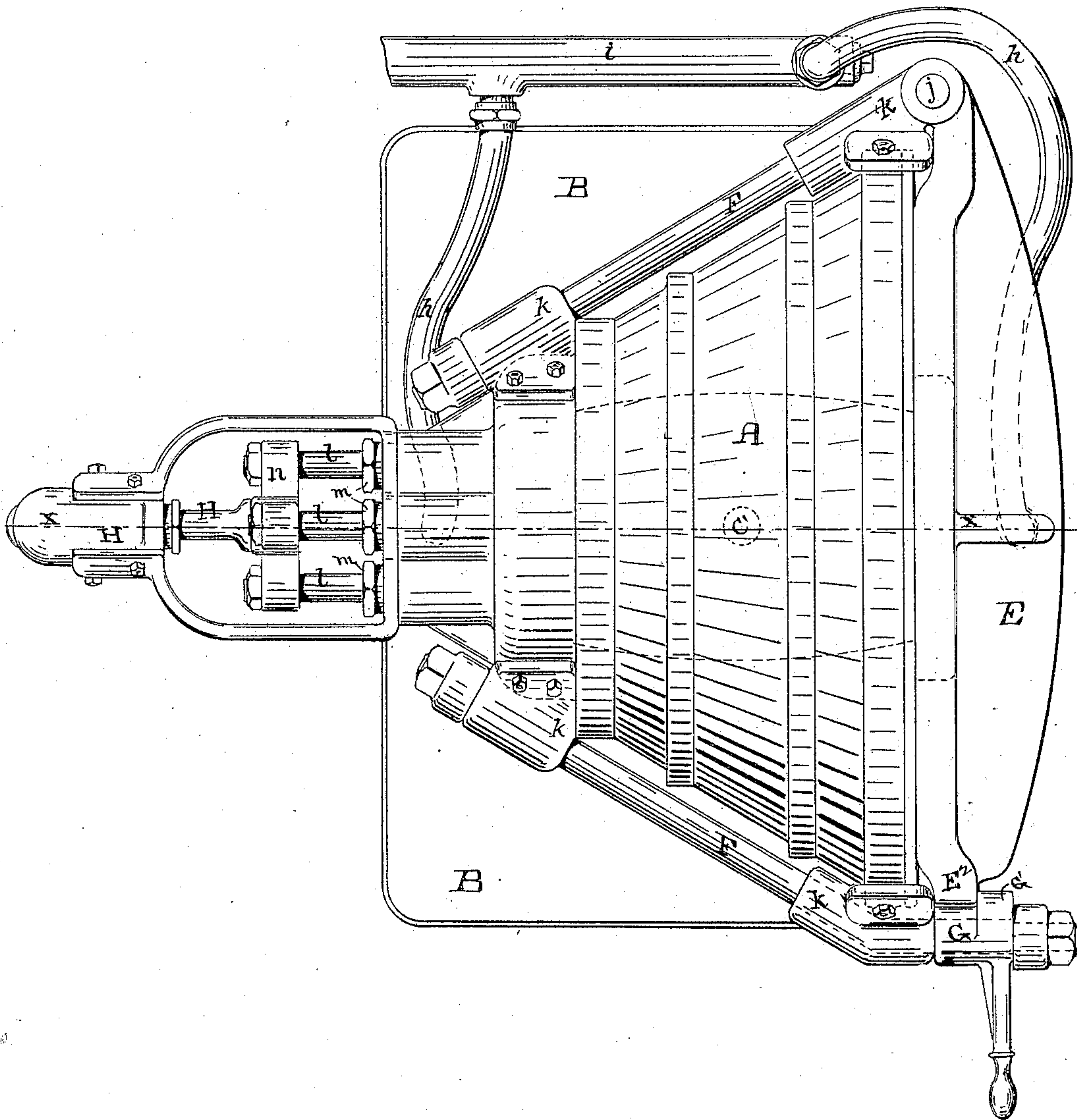
W. L. CHASE.

MACHINERY FOR FORMING OR MOLDING ARTICLES FROM PULP.

No. 298,730.

Patented May 20, 1884.

Fig. 1.



Witnesses,
Ewell A. Dick
J. Walter Blandford

Inventor,
Wm L. Chase
by Marshall Bailey
his attorney

(No Model.)

2 Sheets—Sheet 2.

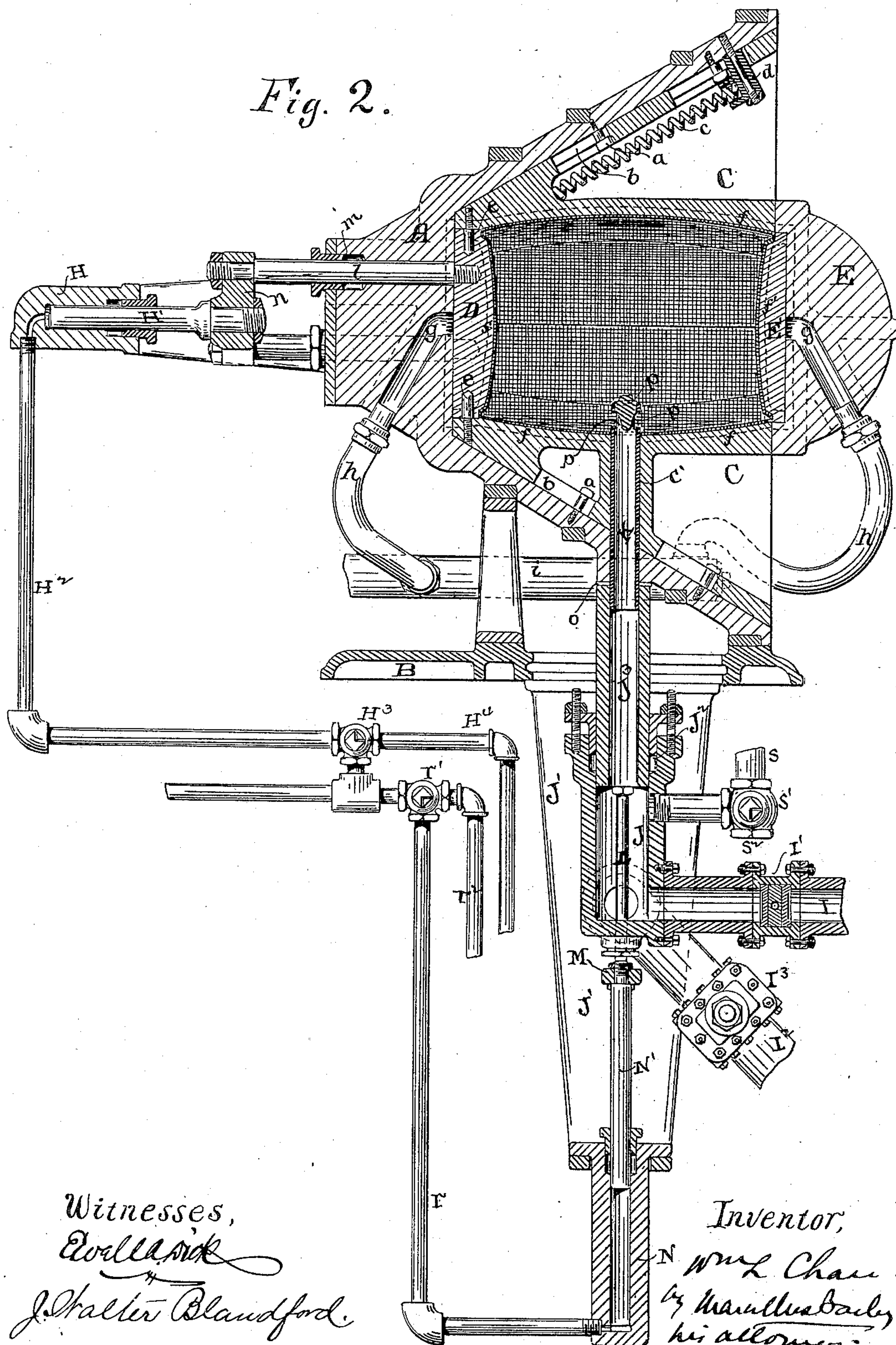
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Fig. 2.



Witnesses,
Evelyn A. Rick
J. Walter Blandford.

Inventor,
N. Wm L Chan
by Marshall Bailey
his attorney.

UNITED STATES PATENT OFFICE.

WILLIAM L. CHASE, OF PORTLAND, MAINE.

MACHINERY FOR FORMING OR MOLDING ARTICLES FROM PULP.

SPECIFICATION forming part of Letters Patent No. 298,730, dated May 20, 1884.

Application filed September 25, 1883. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM L. CHASE, of Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Machinery for Forming or Molding Articles from Pulp, of which the following is a specification.

My invention is directed to the molding from pulp of seamless barrels, casks, and other hollow articles. Its object is to provide an apparatus for this purposes in which the entire article, with its two heads and body in one, can be molded or formed rapidly, economically, and with facility, and can be readily removed from the mold or die after having been formed.

I shall first describe the machine in which my improvements are embodied in their preferred form, and will then point out those features in which I believe my invention to be more particularly comprised.

In the accompanying drawings, Figure 1 is a plan of the machine arranged for molding seamless barrels. Fig. 2 is a sectional elevation of the same on line X X, Fig. 1.

The die A is mounted horizontally upon the base B. It is hollow and closed at one end or head, and thence its interior walls flare outwardly toward its other end or head, which latter is open. The die is provided with a sectional shell or lining composed of longitudinal sections or staves C—six in number in the present instance—which, when drawn up into normal position in the die, as shown in the drawings, fit together so as to present an unbroken inner surface of the shape to be imparted to the molded pulp article. The sections on their outer surface have a slant or inclination corresponding to the flare of the walls of the die, and are held to said walls by T-headed bolts *a*, which are secured to the latter and project through slots *b* in the sections. The sections which are thus capable of longitudinal movement are held up in normal position by springs *c*, which bear at one end against studs *d*, affixed to the die A, and at the other end against the sections. When moved longitudinally against the stress of these springs, they are, by reason of the flaring form of the die to which they are held, caused to expand or spread apart, thus releas-

ing or detaching themselves from the molded article. Within the inner ends of the sections C is fitted a false bottom, D, which is connected to said sections by pins *e* on the latter, which project loosely into sockets in the periphery of the bottom, the arrangement being such that while the sections and bottom move together longitudinally of the die, the former can spread apart or draw together independently of the bottom. The interior faces of the parts D C are grooved or channeled, said channels communicating by passages *f* (indicated by dotted lines in Fig. 2) with a discharge-chamber, *g*, or duct in the die. The channeled faces of the parts D C are covered by perforated metal and fine wire-gauze, so as to prevent passage of particles of pulp, while allowing free egress to water. A die possessing these characteristics is not here claimed, the same having been made by me the subject of an application for Letters Patent filed September 19, 1883, Serial No. 106,841. The open end of the die is closed by the plate E, which carries at its center a head, E', which fits within the outer end of the sections, and serves to constitute the other end or head of the die, having for this purpose the proper configuration. This part E', like D, is channeled and covered with wire-gauze to permit passage of water only, and its channels communicate through passages *f'* with a discharge chamber or duct, *g'*, in the plate E. The ducts *g g'*, through flexible tubing *h h*, are in communication with the suction-pump pipe or other wasteway *i*. Plate E is hinged on a vertical axis to the die at *j*. To enable the plate to resist the thrust which comes upon it, rods F are provided, which are secured firmly by bolts or otherwise to ears *k*, secured to the ends of the die. The outer end of one rod is screwed into the ear in which the hinge-pin *j* of the die has its bearing. On the outer end of the other rod is mounted the eccentric clamp G, by which the plate is locked in its closed position. By giving the clamp a quarter-turn its eccentric part G' will be moved away from the lug or ear E' on plate E, and the latter will be free to swing back on its hinge.

The mechanism for operating the die sections or staves C to move outwardly consists

of three guide-pins, l , fastened at their inner ends to the false bottom D , and thence extending out through holes in the die A (provided on the outside with stuffing-boxes m) to a three-armed yoke, n , to which they are made fast. To the center of yoke n is fastened the piston-rod H' of a hydraulic ram, H , which is supported in housings attached to die A . Hydraulic pressure admitted through pipe H^2 , controlled by three-way cock or valve H^3 , will cause the piston-rod to move forward, and thus thrust the false bottom and sections outwardly. The hydraulic pressure is relieved through waste-pipe H^4 , which is also controlled by valve H^3 .

The devices through the instrumentality of which the fluid pulp is introduced into the closed die will now be described. It enters through a side opening or passage, C' , in the die extending through one of the sections C , and corresponding in position to the bung-hole of the barrel. The pulp, which is contained under any desired pressure in a suitable reservoir, is led therefrom to the apparatus through a pipe, I , controlled by valve I' . This pipe opens into the bottom of a vertical cylinder, J , from the side of which latter also leads the exhaust-pipe I^2 , fitted with valve I^3 , for carrying off the surplus pulp, after a deposit of the requisite thickness has been obtained in the die. Cylinder J is supported in housings J' underneath the base B , and is provided at its upper end with a stuffing-box, J^2 , through which passes the hollow piston J^3 , open from end to end. Into the upper end of the piston J^3 is screwed a pipe, K , which fits snugly and is adapted to slide in the passage C' in the die and under section or stave, when the piston J^3 is caused to travel in its cylinder. Pipe K is of such length that the piston J^3 is moved up to the full extent, (at which time it comes in contact with the packing-ring o on the die around the mouth of passage C' .) The slots or openings p in the tip of pipe K may stand with their lower ends above the surface of the stave a trifle more than the thickness of the wall of the barrel which is to be formed. The object of this is to prevent the outflowing surplus pulp from washing away the edges of the deposited film of pulp around the bung-hole. The tip of the pipe is plugged, as at p' , and the slots or openings p are made in the side of the pipe, with a view to break the force of the inflowing current of liquid pulp. The cylinder J is of sufficient length to permit its hollow piston J^3 to drop to such an extent as to allow the tip of pipe K to be withdrawn entirely from the under die stave or section, C , thus leaving the sectional lining free to be slid outwardly on the flaring walls of the die. With a view to impart the requisite motion to the hollow piston J^3 , it is made fast at its lower end to two rods, L , which pass down through stuffing-boxes in the bottom of cylinder J , and are attached to a cross-head, M , to the center of which is fastened the upper end

of the piston-rod N' of a hydraulic jack, N , whose cylinder is supported by the housings J' . Through pipe r and waste-pipe r^2 , both of which are controlled by the three-way valve r' , hydraulic pressure may be admitted to and relieved from the cylinder, with the effect of lifting the piston J^3 or permitting it to descend. If the piston and its connected parts do not drop of their own weight when pressure is relieved in the jack N , weights may be attached to the cross-head, or the jack may be made double-acting. Through pipe s , provided with controlling-valve s' , leading from the side of cylinder J , communication is made with a reservoir containing air at any desired pressure. The cylinder J and piston J^3 are virtually a telescopic pipe or tube, the parts of which telescope into one another, so as to permit the working length of the pipe to be increased or decreased according as it is desired to project it into or withdraw it from the interior of the hollow die or mold.

The operation of the apparatus is as follows: The parts being in the position shown in Fig. 2, valve I' is opened and fluid pulp flows through the parts J J^3 K into the die or mold, which it fills. The valve is allowed to remain open until a sufficient thickness of pulp has been deposited on the perforated interior surface of the mold to make the required strength of barrel or cask. This thickness can be regulated by the character and consistency of the pulp, by the amount of pressure maintained, and by the length of time the operation is continued, and is determined by trial. When the required thickness is obtained, valve I' is closed and valve I^3 is opened, which permits the surplus pulp to flow out of the mold back through pipe I^2 to a stuff-chest, (not shown,) to be again pumped into the reservoir. When the mold is empty, valve I^3 is closed and valve s' is opened, thus admitting to the mold air under pressure, which, in its passage through the deposited film of pulp, compacts it upon the inner surface of the mold, and also dries the pulp to a considerable extent. Valve s' is now closed, and the air-pressure still within the mold is allowed to spend itself through the film of pulp; or it may be relieved by turning the three-way air-cock s' to the waste-opening s^2 . By relieving the pressure in the jack N , the piston J^3 is allowed to drop, and pipe K is consequently withdrawn from the die far enough to clear the sectional lining therein. The eccentric clamp G is turned to unlock the head-plate E , the latter is swung back, and hydraulic pressure is admitted to the cylinder of hydraulic ram H , with the result of pushing sections C forward, and thus releasing the molded article, which can now be removed, either by hand or by sliding under it a thin shoe upon which it may be withdrawn.

It may be necessary under some circumstances to place valves in the waste-passages g g' , in order to have the mold entirely filled with fluid pulp before permitting water to escape, and thus secure a more uniform deposit;

but ordinarily the conditions of pressure maintained in the pulp-reservoir and the capacity of the feed-pipes can be made such that this will not be necessary.

5 In some cases it may be desirable to place the bung-hole of the cask or barrel in one of its heads. This could be done without difficulty by such modifications as would readily suggest themselves to the skilled mechanic.

10 In practice, the valves hereinbefore described, or devices for operating the same, would all be assembled together in a position where they could be conveniently reached and worked by the operator.

15 What I claim herein as new and of my own invention is as follows:

1. The combination, with the die and the expanding sectional lining longitudinally movable therein, of the head-plate arranged to close the open end of the die and to form one head or end of the mold, and movable away from said end of the die, for the purpose of permitting the outward longitudinal movement of the sectional lining, substantially as and for the purposes set forth.

2. The die and its expansible and longitudinally-movable sectional lining, in combination with the hinged head-plate forming part of the mold, and movable on its hinge, so as to close or open the die, as desired, and means for locking said head-plate in its closed position, substantially as and for the purposes hereinbefore set forth.

3. The hinged or movable head-plate provided with a head-piece forming part of the mold-surface, grooved or channeled for the passage of water only, and communicating with a waste pipe or conduit, in combination with the

die and its expansible and longitudinally-movable sectional lining, substantially as and for the purposes hereinbefore set forth.

4. The combination, with the die and its longitudinally-movable sectional lining, of the telescopic feed pipe or conduit composed of two or more sections which telescope into one another, so as to permit the pipe to be projected into or withdrawn from the interior of the die through the sectional lining, substantially as and for the purposes hereinbefore set forth.

5. The combination, with the die and its sectional lining, of the feed-pipe composed of tubes K J³ J, and means for moving tube J³ back and forth in tube or cylinder J, substantially as and for the purposes hereinbefore set forth.

6. The combination, with the die, the sectional lining, and the false bottom, of the discharging-pins connected to the false bottom, and the hydraulic ram attached to and adapted to operate said discharging-pins, substantially as and for the purposes hereinbefore set forth.

7. The combination, with the die and its sectional lining, of the sliding or longitudinally-movable tube-pipe having its inner end adapted to project into the interior of the die, so that its lateral discharge aperture or apertures shall be beyond the film of pulp to be deposited, substantially as and for the purposes set forth.

In testimony whereof I have hereunto signed my name this 25th day of September, A. D. 1883.

WM. L. CHASE.

Witnesses:

EWELL A. DICK,

J. WALTER BLANDFORD.