(No Model.) 5 Sheets—Sheet 1.

J. F. SEIBERLING.

MACHINE FOR MOLDING PAPER BARRELS.

No. 388,079. Patented Aug. 21, 1888.

FIG. IV.

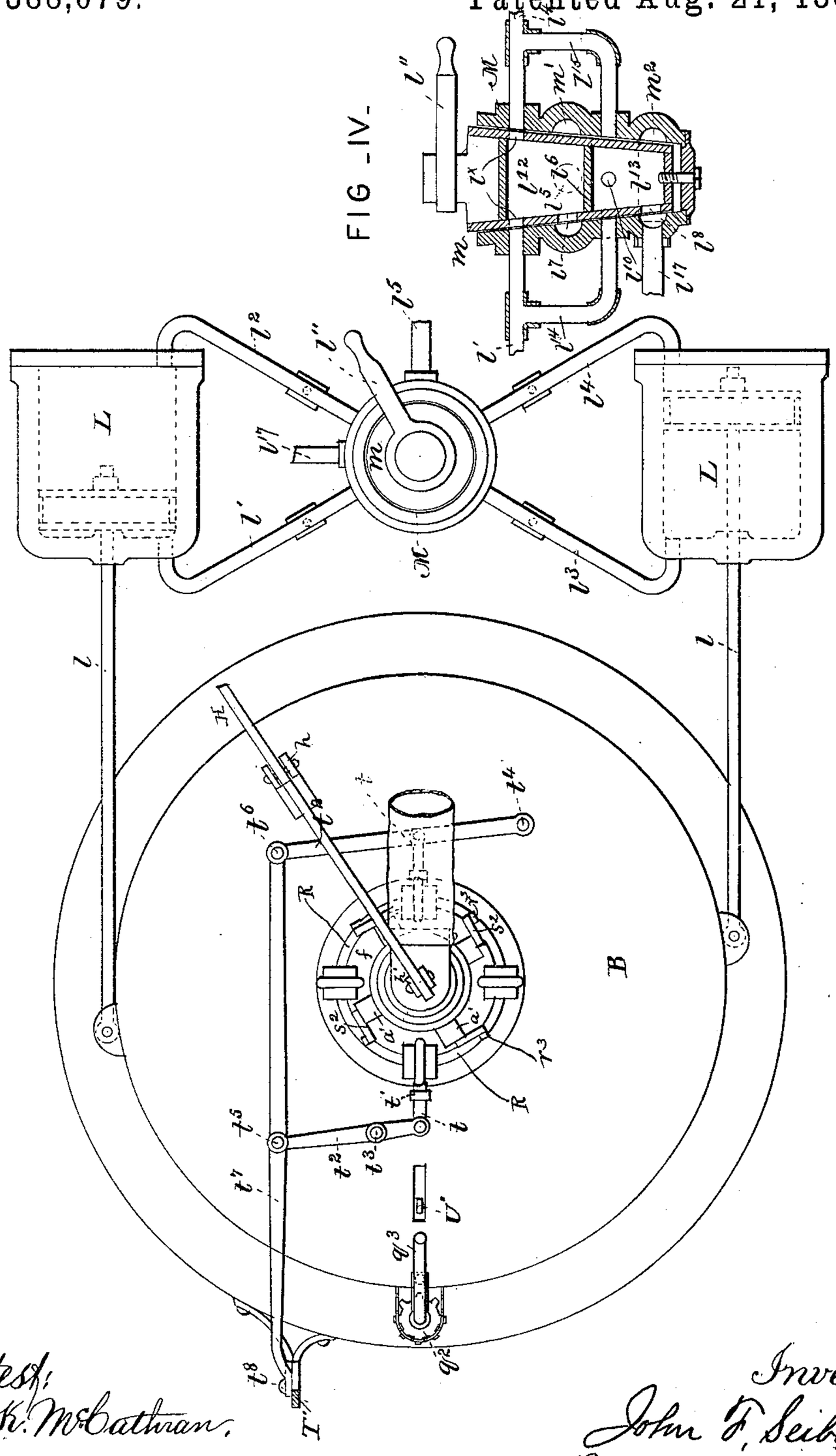

FIG. I.

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(No Model.) 5 Sheets—Sheet 2.

J. F. SEIBERLING.

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FIG. 11.

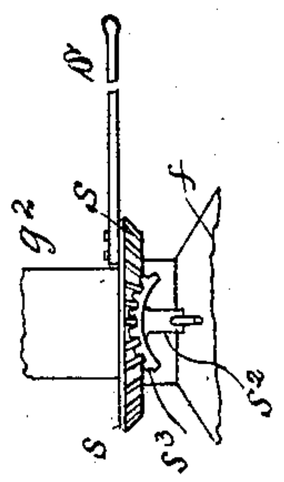

FIG. 11a.

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(No Model.) 5 Sheets—Sheet 3.

J. F. SEIBERLING.

MACHINE FOR MOLDING PAPER BARRELS.

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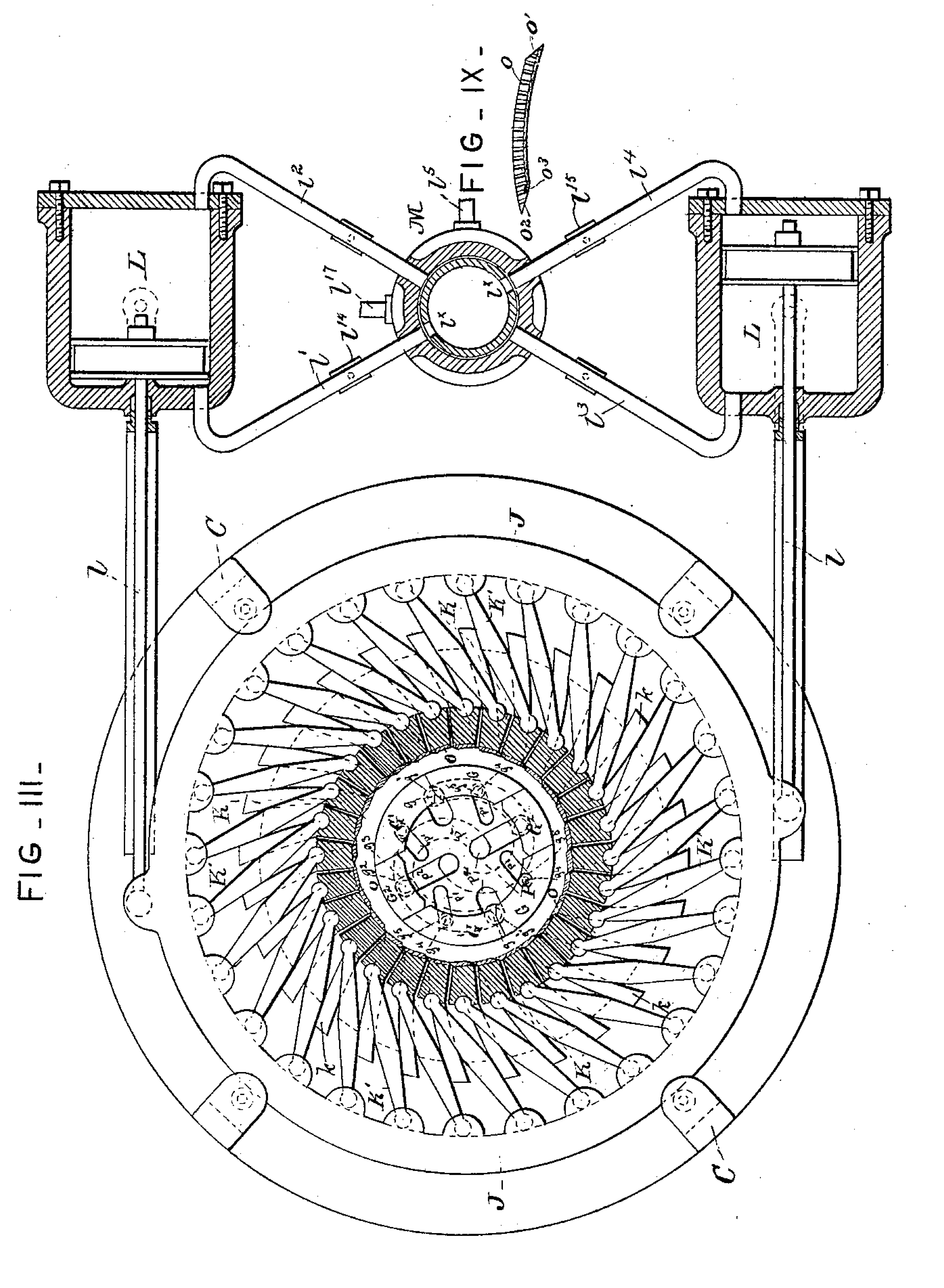

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J. F. SEIBERLING.

MACHINE FOR MOLDING PAPER BARRELS.

No. 388,079. Patented Aug. 21, 1888.

FIG. V.

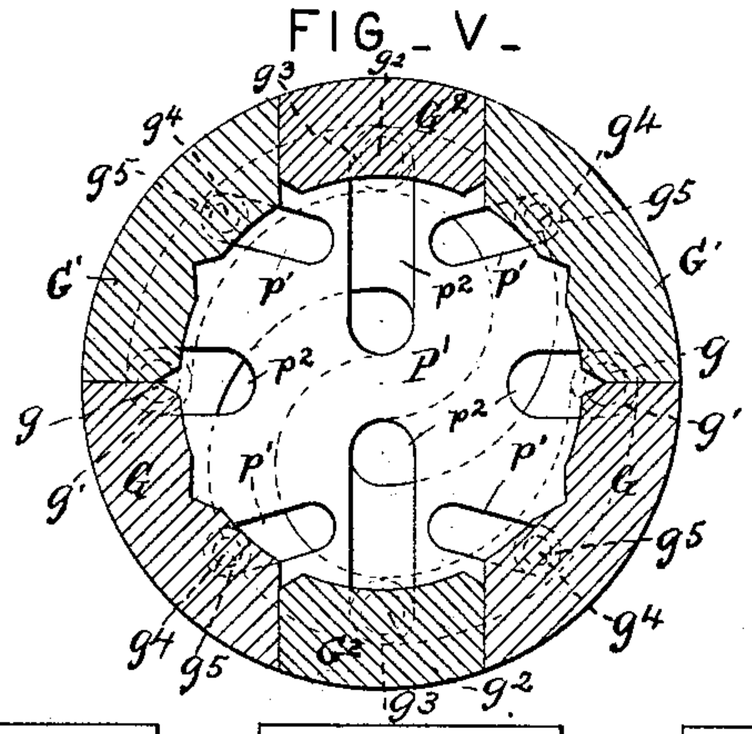


FIG. VI.

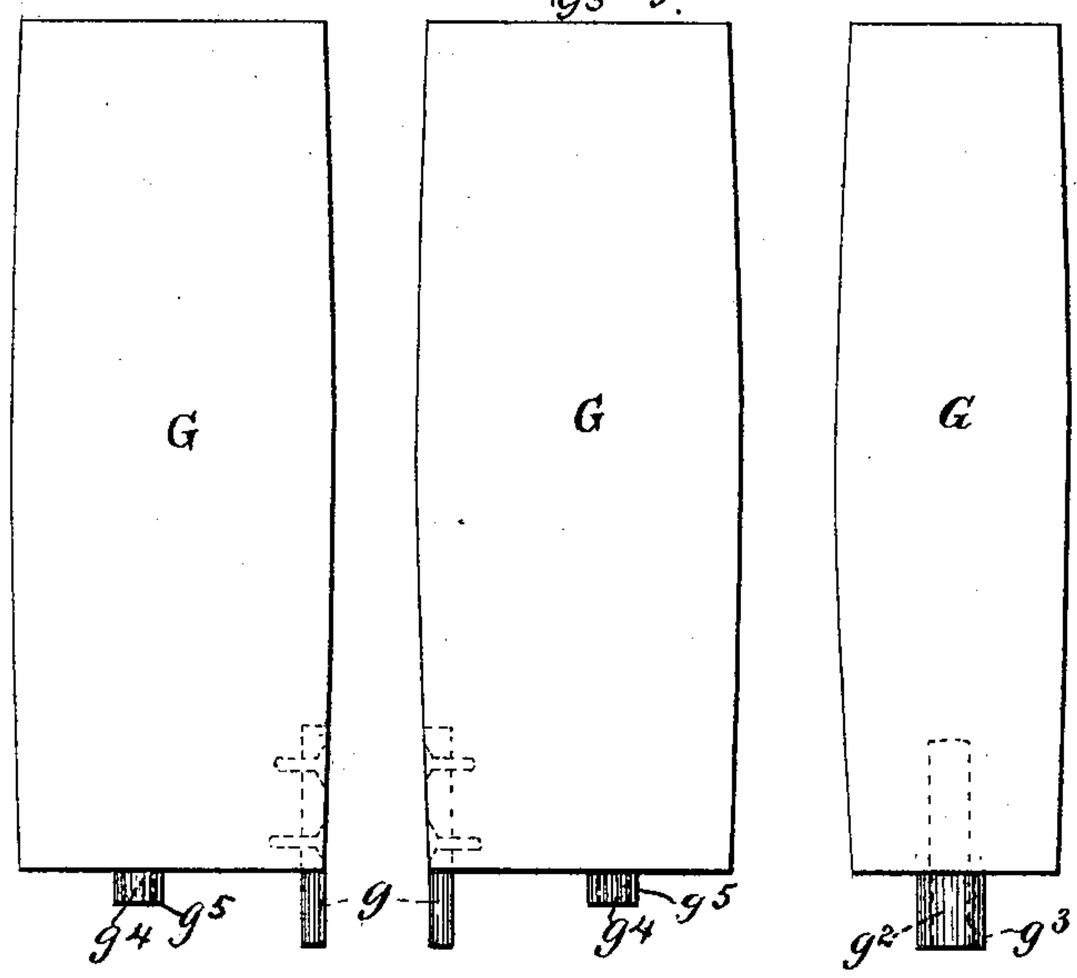


FIG. VII.

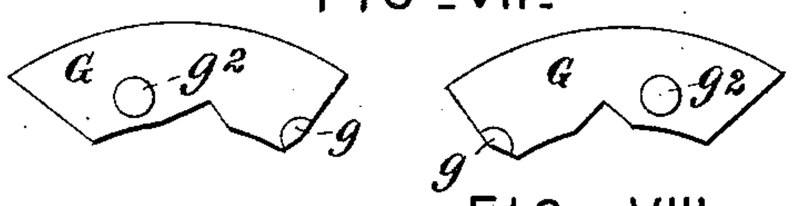
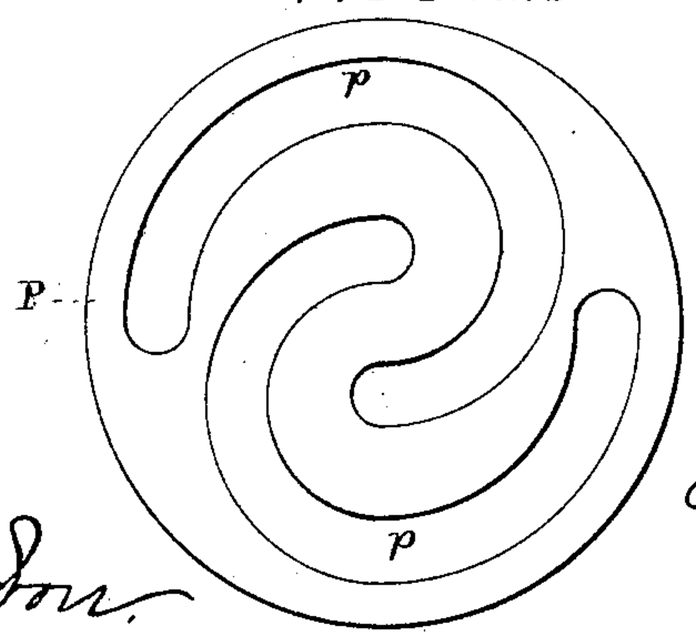


FIG. VIII.



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MACHINE FOR MOLDING PAPER BARRELS.

No. 388,079. Patented Aug. 21, 1888.

FIG. XI.

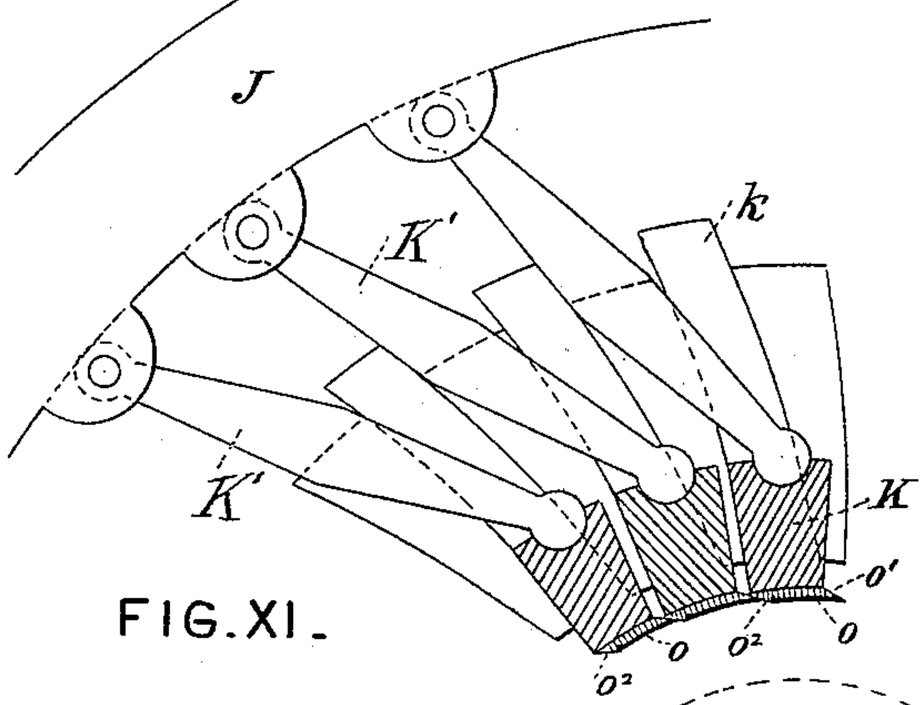


FIG. X.

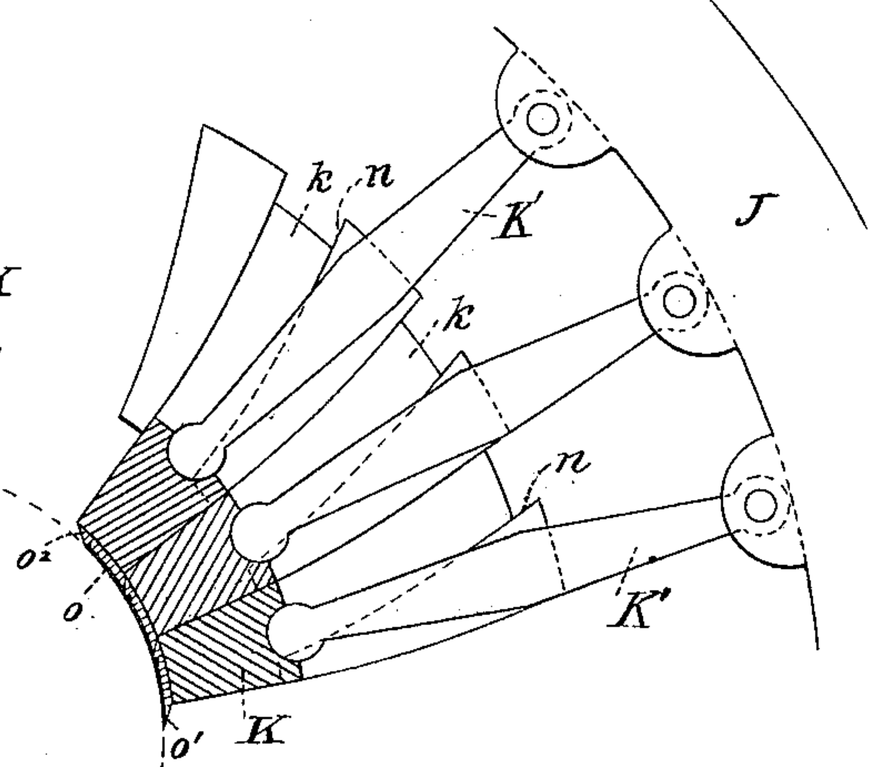
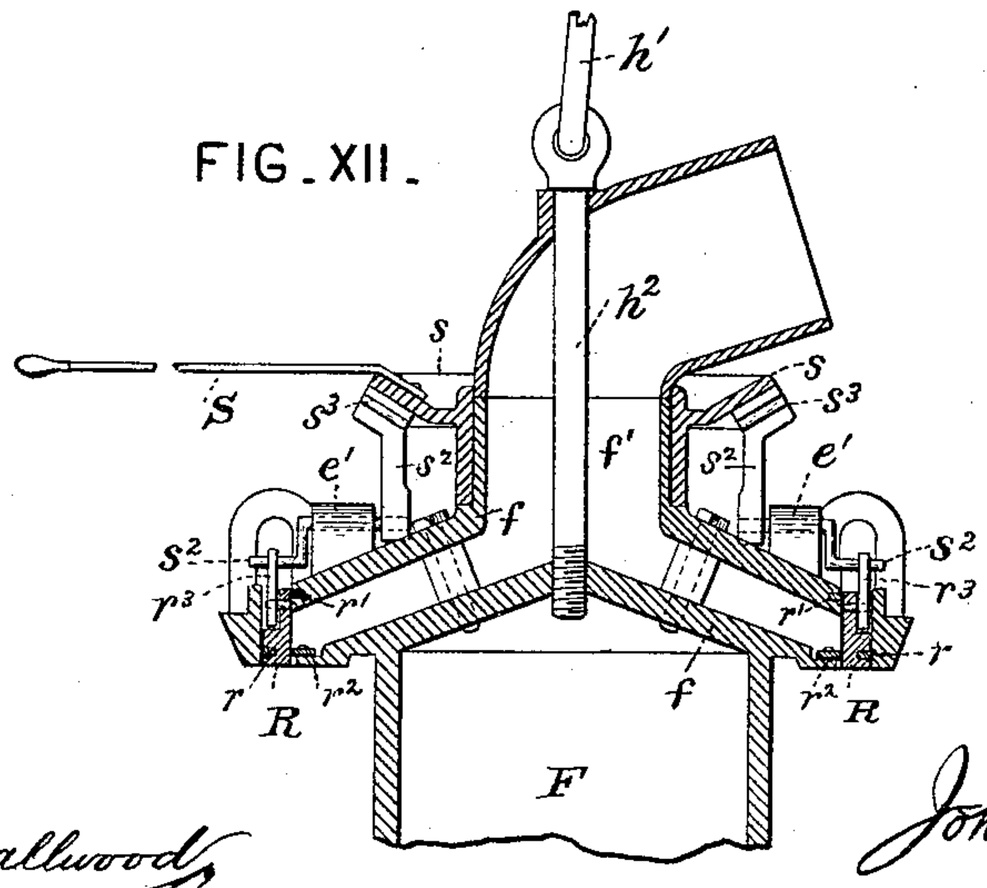


FIG. XII.



Attest.
Geo. T. Smallwood,
Rud. M. Smith.

Inventor.
John F. Seiberling,
By Rud. Smith, atty.

UNITED STATES PATENT OFFICE.

JOHN F. SEIBERLING, OF AKRON, OHIO.

MACHINE FOR MOLDING PAPER BARRELS.

SPECIFICATION forming part of Letters Patent No. 388,079, dated August 21, 1888.

Application filed May 18, 1887. Serial No. 238,679. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. SEIBERLING, of Akron, county of Summit, and State of Ohio, have invented a new and useful Improvement in Machines for Molding Paper Barrels, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to machines for moldingt he bodies of paper barrels and other similar receptacles; and the object of my invention is to produce a machine which shall receive the pulp directly from a suitable reservoir and quickly compress and strain the same and produce a perfectly-molded article.

In order that my invention may be fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure I is a plan view of a barrel-molding machine constructed in accordance with my invention. Fig. II is a transverse vertical section of the same, and Fig. II^a a view showing the gate-lifting device in elevation. Fig. III is a horizontal cross-section of the same on the line 3 3 of Fig. II, the core being omitted. Fig. IV is a sectional view of the double cock or valve. Figs. V, VI, VII, VIII, and IX are detached views illustrating certain details of construction hereinafter referred to. Fig. X is a horizontal section through several of the outer staves, showing their relative positions when thrust in for compressing the pulp. Fig. XI is a similar view showing the relative positions of the staves when withdrawn after the barrel has been completed, and Fig. XII is a sectional view of the hollow cover with its attachments.

In this class of machines as heretofore constructed the outer series of staves were of unequal width when used with bevel-edged plates, as shown, for instance, in Letters Patent No. 308,615, granted December 2, 1884, to G. W. and W. P. Laraway, and an inner stave was carried between each pair of outer staves in order to give the required circular form to the outer side of the molded barrel. Such arrangement has been found defective, owing not only to the lack of durability by reason of the inner stave having no application of propelling-power except its contact with the outer stave at their overlapping beveled edges, but also to the fact that as the outer staves are advanced to compress the pulp the inner staves recede under the pressure, and thereby leave broad spaces, into which the pulp is carried, and thus prevent the proper formation of the body of the barrel. It will be seen from the ensuing description that this defect is avoided in my improved machine and that the staves are uniform in construction and the objections of the inner staves entirely overcome, and the utmost compactness of construction and directness in operation are attained.

In the drawings, A designates the bed or base of the machine; B, its top plate; C, its side pieces, and D its legs or supports, such parts being bolted or otherwise secured together, as shown, so as to be strongly united and at the same time easily separated. The base and top plates are formed, respectively, with openings *a b* at the ends of the molding cavity or chamber E.

F designates the core which supports the inner series of staves or formers, G. This core is formed with a hollow conical top or cap having a central inlet-opening, *f'*, to which the inlet-tube g^2, proceeding from a suitable reservoir, I, is connected, and which is lowered into and raised out of the mold-chamber E by a lever, H. This lever is pivoted upon a standard, *h*, which is secured in vertical position upon the top plate, B, and its inner end is connected by a link, *h'*, to a rod, h^2, extending upward from the top or cap *f* of the core. A weight, h^3, is secured to the outer end of the lever H and serves to counterbalance the weight of the core F. It will thus be seen that the core may be readily manipulated when the molded barrel is to be removed from the machine. Any other suitable equivalent or well-known means may be substituted for the lever in order to raise and lower the core. The inlet-tube g^2 is constructed of flexible material—such as canvas or rubber—in order to accommodate itself to the movements of the core when the latter is raised or lowered.

R designates an annular ring or gate, which is set into the top *f* and surrounds the outer edge of the channel in the said cap, and which serves to regulate the entrance of the pulp between the inner and outer series of staves. In order to prevent leakage of the pulp, the ring

or gate R and adjacent faces of the top or cap *f* are provided with packings *r r' r²*, arranged in such manner that they preserve a close contact between the casing *f* and the ring-gate R at all times, as best shown in Fig. XII. It is not always necessary to employ all these packings, as the ring can be so fitted that some of them may be dispensed with. The ring or gate R is operated by a lever, S, which is connected to and is adapted to operate a beveled gear wheel or pinion, *s*, surrounding the neck of the aperture *f'* in the cap *f*. A number of bosses, *e'*, are formed upon the top of the cap *f*, and form bearings for vibrating crank-arms *s²*, the upper ends of which are provided with gear-teeth or toothed segments *s³* to mesh with the teeth of the beveled gear wheel or pinion *s*, while the lower ends of said arms are pivotally connected in links or bosses *r³* on the ring R. By virtue of this arrangement, when the lever S and wheel *s* are turned, the ring-gate R is raised or oscillated vertically, so as to admit or exclude the flow of pulp between the inner and outer staves.

The core F is held down during the operation of molding by means of two bolts, *t*, which slide through straps *t'*, formed upon the top plate, B. These bolts are operated by levers *t²*, which are pivoted upon the top plate, B, at *t³ t⁴*, and which are pivotally connected at *t⁵ t⁶* to a link, *t⁷*. This link extends laterally beyond the top of the machine, and is actuated by a hand-lever, T', the upper end of which is jointed to the link *t⁷*, as shown at *t⁸*.

The outer series of staves, K, is formed at each end, or at top and bottom, with curved extensions or feet *k*, which work in curved grooves or ways *n*, formed on or secured to the inner face of the upper and lower plates of the machine. On their inner faces these staves are provided with grooves *k'*, and are also provided with perforated plates *o*, secured to them, which are beveled inwardly at *o'* and outwardly at *o²* and extend laterally beyond the staves, as shown in Figs. X, XI, and III, so that the beveled portion *o²* of one plate registers with the beveled portion *o'* of the next contiguous plate. Thus a maintenance of close contact between the two beveled portions *o'* and *o²* is attained, being the result of the circular or curved radial movement of the staves, by reason of the curved feet *k* traveling in the curved ways *n*. It is apparent that if the staves moved in straight radial lines the portions *o'* and *o²* would part as the staves recede, and would leave openings through which the pulp would escape. By the curved or swinging movement of the staves K, however, the outer edge of the bevel-edged face-plate (that edge toward the outside of the circle described by the stave) will travel faster than the opposite or inner edge, and as a result the projecting beveled edge of one plate will ride upon and always bear against the corresponding edge of the next contiguous plate, as will be apparent from inspection of Figs. X and XI.

It has been customary heretofore to cover the faces of the perforated plates with a thin web of wire-gauze or finely-perforated sheet metal, which is connected to the plate with solder or small screws, to prevent the pulp from entering the perforations in said plate. It has been found in practice that this thin sheet of metal or wire-gauze is liable to quickly wear through and tear off at the point where the beveled portions of adjacent plates slide on each other. To remedy this difficulty, I leave the beveled portion of the plate uncovered and recess or groove the plate at the inner edge of the bevel *o²*, as shown at *o³* in Fig. IX. This groove *o³* extends the length of the stave-plate *o*, and is intended to receive and retain the edge of the perforated sheet or wire-gauze when secured to the plate, whereby the gauze is protected from injury by coming in contact with the beveled edge of the next contiguous plate.

At the lower end of the molding cavity or chamber E is a plate, P', which is provided with slots *p' p²*. Underlying this plate is another plate, P, having two scroll-like slots, *p p*.

G, G', and G² represent the inner staves of the machine, which rest upon a suitable base-plate, (indicated at P'.) Said base-plate is stationary and is provided with two sets or series of slots—one oblique series (indicated at *p' p'*) and another radial series, (indicated at *p² p²*.) Underlying this plate P' is a rotary plate, P, provided with two scroll-slots, *p*, as shown in Fig. VIII. Each stave G G' has a guide-pin, *g⁴*, extending from its lower edge downward into one of the slots *p' p'*, and provided with a roller, *g⁵*, working in said groove for reducing friction. The staves G² have each a pin, *g²*, which extends downward through one of the slots *p²* into one of the scroll-slots *p* in the rotary scroll-plate, and is also provided with a friction-roller, *g³*. The staves G and G' are further provided on their adjacent edges each with one-half of a split pin, *g*, which are united or held together by means of a friction-roller, *g'*, similar to the one *g³* on the pin *g²*, and also working in one of the slots *p* in the scroll-plate P. The grooves *p p* of the scroll-plate P are so cut and arranged that the pins *g²* will first be acted upon and the staves G² drawn inward. Then the pins *g* will be engaged by the scroll-plate and the staves G and G' will be drawn in and folded upon the others. As the staves G G' are moved inward by the action of the scroll-plate upon the pins *g*, the pins *g⁴* will move in the grooves *p'* and travel faster than the pins *g* on account of the oblique relation which said slots occupy relative to the radial slots *p²*. Thus the outer ends of the staves G G' will travel more rapidly than the inner adjacent ends. The pressed-paper barrel may now be removed from the machine.

The scroll-plate P is operated by means of a shaft, *q*, extending downward therefrom and provided with a sprocket-wheel, Q, from which a drive-chain extends to a similar sprocket-wheel, *q²*, on the lower end of a shaft, Q', hav-

ing an operating handle or lever, q^3, or its equivalent. Other suitable or well-known means may, however, be employed for rotating the scroll-plate P.

J designates an annulus or ring, which is supported within the machine-frame upon rollers j, which are journaled in brackets j', secured to flanges c, extending inwardly from the side pieces, C. The outer series of staves or formers, K, are pivotally connected to the ring J by a series of toggle-links, K', and the said ring is oscillated or partially revolved horizontally by means of connecting or piston rods l of two hydraulic presses, L. The presses L are both placed at the same side of the machine, and their cylinders are connected by the pipes $l' l^2 l^3 l^4$, which converge from the ends of the cylinders of the presses L to a common central valve or water-cock.

M represents the valve interposed between the cylinders of presses L and contains a plug or cock, m, as shown. The interior of the valve-chamber M is formed with two annular grooves or recesses, $m' m^2$, and perforations are formed in the sides or walls of the chamber for the reception of the pipes $l' l^2 l^3 l^4$, and also of branch pipes $l^{14} l^{15}$, a supply-pipe, l^5, leading from a suitable power-pump, and an exhaust-pipe, l^{17}. The interior of the valve or plug m is divided by a diaphragm, l^6, which divides its interior into two chambers, l^{12} and l^{13}, and its walls are perforated by ports l^7, l^8, l^{10}, and $l^\times$. A handle, l^{11}, is secured to the upper end of the plug and serves to actuate the same. The operation of this part of the machine is as follows, viz: The water enters the valve-casing through the supply-pipe l^5 and passes through perforation l^9 into the recess m', thence through the port l^7 into the chamber l^{12}. From the chamber l^{12} the water flows through the ports $l^\times l^\times$ into and through the pipes l' and l^4 into opposite ends of the cylinders of the presses L, so that the pistons thereof are actuated in opposite directions to turn the ring J. When the cock is turned far enough to bring the ports $l^\times l^\times$ opposite the pipes $l^2 l^3$ for conducting the water to the other ends of the cylinders, the ports l^{10} are brought opposite the pipes l^{14} and l^{15}, from which the water enters the chamber l^{13}. From thence it enters the recess m^2 from which it escapes through a discharge-pipe, l^{17}. Thus it will be seen that by simply turning the valve or plug m a portion of the way round the pistons will be caused to make their return-strokes.

In order to form the bung-hole in the barrel, one of the outer staves, K, is formed with a hollow boss, u, through which extends a pin or plug, U. The outer end of this pin is pivotally connected to a hand-lever, U', which is pivoted at u' to a bracket, u^2, depending from the under side of the top plate, B. When the barrel is being molded, the pin U is forced inward until it rests against the inner stave, and after the barrel has been molded the plug U is withdrawn by the receding or outward movement of the stave, in which it has a bearing.

The inner faces of the plates which are provided for the outer staves, K, are formed with transverse recesses or grooves V, which, when the plup is compressed, form imitations of hoops on the outer surface of the barrel, so as to impart to it the resemblance of a wooden barrel.

When it is desired to remove the pressed barrel from the machine, the toggle-ring J is rotated, thereby withdrawing the outer staves. The lever H is then vibrated for lifting the core F clear of the machine, after which the inner staves are withdrawn by the revolution of the scroll-plate as and by the means above described. This being done, the barrel may be readily removed.

The machine as thus made is simple and compact in construction and yet very strong and durable. The power is directly applied and the operations of the machine are rapid and perfectly uniform.

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

1. In a paper-barrel machine, the combination, with the outer staves thereof provided with curved feet or extensions and with their actuating mechanism, of guideways for said feet, substantially as described.

2. The combination, with the outer movable staves provided with the extensions or feet, of the guide-plates having the curved ways in which said feet move, substantially as and for the purpose described.

3. A series of outer movable staves, in combination with face-plates secured thereto having beveled edges which interlock one with another, substantially as specified.

4. The combination of the outer stave having the tubular socket, the pin or plug for forming the bung-hole, and means for operating said pin, substantially as set forth.

5. The combination, with the inner staves provided with the guide-pins and operating-pins, of the stationary plate provided with slots for receiving and guiding said guide-pins, a rotary plate provided with slots for receiving said operating-pins, and means, substantially as described, for operating said rotary plate, as and for the purpose described.

6. The combination, with the inner series of staves having the guide-pins $g g^2$ and the rollers thereon, of the oscillating scroll-plate with its two scroll-slots $p p$, and the stationary plate with its oblique and radial slots p', and pins projecting through said slots, substantially as and for the purposes described.

7. The combination, with the two contiguous inner staves and their divided pin, of the slotted scroll-plate and means, substantially as described, for operating said scroll-plate, as and for the purpose set forth.

8. The combination, with the adjustable hollow cover, of the ring-gate located on and movable relative to said cover, means for op-

erating said gate, and means, substantially as described, for raising and lowering said hollow cover, as and for the purpose specified.

9. The combination, with the hollow cover having the central inlet, of the tank or reservoir, the flexible pipe connecting said tank and cover, the ring-gate and its operating mechanism, and a lifting mechanism connected to the cover, substantially as set forth.

10. The hollow cover or top having the central inlet-aperture and provided with the bevel-wheel placed around the neck of said opening, in combination with the ring-gate and interposed mechanism for operating the same, substantially as set forth.

11. The combination, with the hollow cover having the central inlet and its surrounding beveled gear-wheel, of the ring-gate and the vibrating crank-arms connected to said gate at one end and provided with toothed segments meshing with the gear-wheel, substantially as and for the purpose specified.

12. The combination, with the top plate and the hollow cover, of the locking-bolts, the pivoted levers for operating said bolts, the connecting link for actuating said levers, and the vertical lever for operating said link, substantially as described.

13. The combination, with the perforated plate secured to the stave K and formed with a recess or groove, of the gauze or pervious covering secured to said plate and having its edge lying in said groove, substantially as and for the purpose described.

In testimony whereof I have hereunto set my hand this 6th day of May, A. D. 1887.

JOHN F. SEIBERLING.

Witnesses:

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W. H. CARTER.