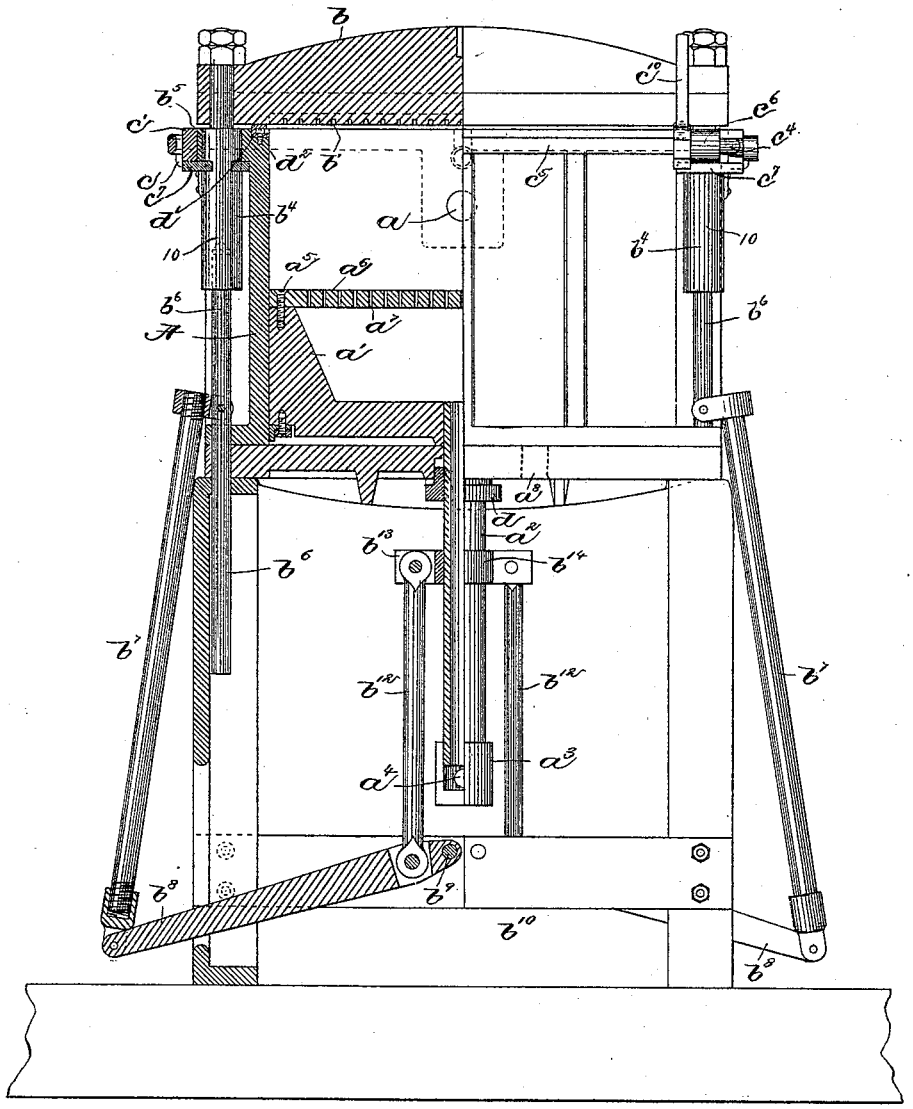
(No Model.) 2 Sheets—Sheet 1.

H. CARMICHAEL.

MACHINE FOR MOLDING PULP ARTICLES.

No. 454,849. Patented June 30, 1891.

Fig: 1.



Witnesses.
Howard F. Eaton.
Edgar A. Goddin

Inventor.
Henry Carmichael,
by Crosby & Gregory Attys

(No Model.) 2 Sheets—Sheet 2.

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Fig: 2.

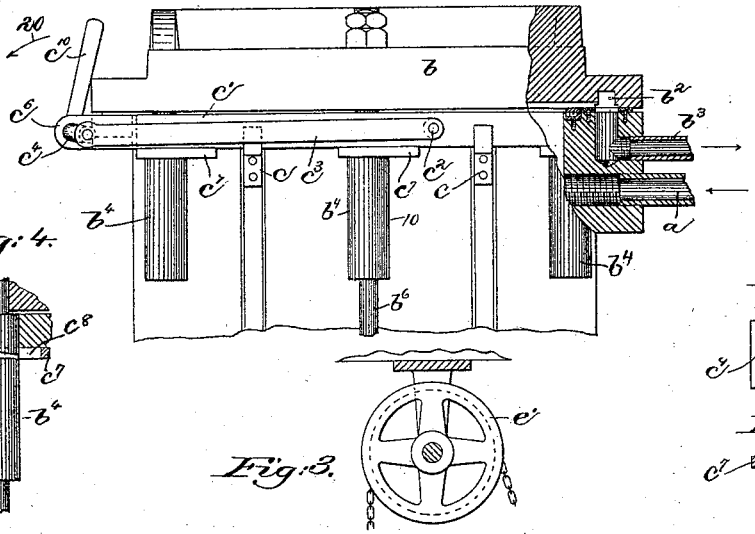


Fig: 4.

Fig: 5.

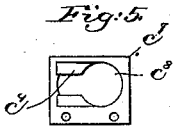
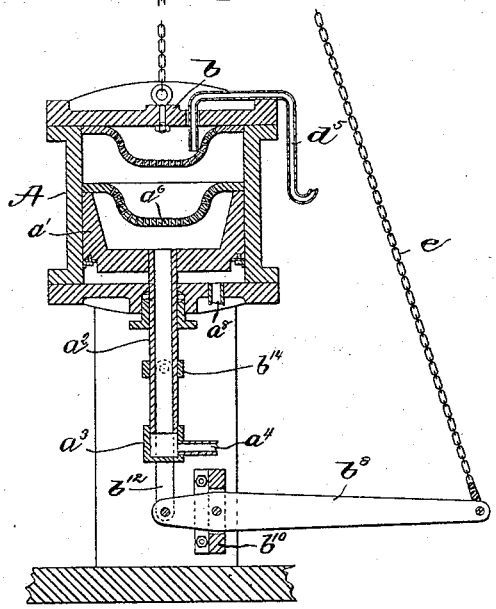


Fig: 6.

Fig: 3.



Witnesses.
Edgar A. Goddin
Howard T. Eaton.

Inventor:
Henry Carmichael,
by Crosby & Gregory
Attys.

UNITED STATES PATENT OFFICE.

HENRY CARMICHAEL, OF MALDEN, MASSACHUSETTS.

MACHINE FOR MOLDING PULP ARTICLES.

SPECIFICATION forming part of Letters Patent No. 454,849, dated June 30, 1891.

Application filed February 4, 1889. Serial No. 298,580. (No model.)

To all whom it may concern:

Be it known that I, HENRY CARMICHAEL, of Malden, county of Middlesex, State of Massachusetts, have invented an Improvement in Machines for Molding Pulp Articles, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention relates to apparatus for the manufacture of articles from wood pulp and other fiber, and is an improvement upon the apparatus substantially such as described in United States Patent No. 397,778, granted to me February 12, 1889, it having for its object to improve the construction of the same, whereby the top plate or cover of the apparatus is raised at an accelerated speed by the upward movement of the plunger when the latter has reached a predetermined point, the article at such time being completed. In accordance with my invention the stem of the plunger, which is extended through the bottom of the frame of the apparatus, is provided with a cap or projection adapted to engage a device (shown as a loose collar) which is connected to one or more levers pivoted to the frame and joined, as will be described, to the cover, the said loose collar being acted upon by the projection on the plunger-stem to turn the lever and raise the cover or top plate of the apparatus.

Another feature of my invention consists in providing a novel locking device, as will be described, by which the cover or top plate is firmly locked in position until positively released.

The particular features of my invention will be pointed out in the claims at the end of this specification.

Figure 1 shows in section and elevation one form of apparatus for making pulp articles embodying my invention; Fig. 2, a side view, partially broken out, of a portion of the apparatus shown in Fig. 1, looking toward the left; Fig. 3, a modification to be referred to, and Figs. 4, 5, and 6 details to more clearly show the locking device for the top plate.

Referring to Fig. 1, the case or cylinder A, provided with the pulp-inlet a, and the plunger a', having its stem a^2 made hollow and provided at its lower end, preferably, with a cap a^3, having the outlet-port a^4, may be substantially such as shown and described in my application referred to. The plunger a' has secured to it, as by screws a^5, a flat platen a^6, provided with drainage-orifices a^7; but instead of the particular form of plunger and platen I may use any other form of platen to produce the article of the shape desired.

The cylinder A is provided with the water-inlet port a^8, (see dotted lines, Fig. 1,) through which the water to raise the plunger is admitted.

The case or cylinder A is provided with a cover or top plate b, having on its under side, as herein shown, drainage orifices or slots b', which communicate with the channel b^2 at one side of the said top plate, the said channel having communicating with it a discharge-pipe b^3. (See Fig. 2.) The top plate b is provided at its opposite sides with dowel-pins b^4, extended through an opening in a side flange b^5 of the cylinder or case A, there being, preferably, three dowel-pins on each side of the top plate, as shown in Fig. 2. The center dowel-pin b^4 on each side of the top plate, which is herein marked 10, has secured to or forming part of it a rod b^6, and each rod b^6 is joined by a connecting-rod b^7 to the long arm of a lever b^8, pivoted, as at b^9, to the cross-bar b^{10} of the supporting-frame, the said lever being connected by the rod b^{12} to an ear b^{13} on an engaging device, shown as a collar b^{14}, loosely encircling the stem a^2. The sides of the case or cylinder A have secured to them angle-irons c, which form with the sides of the flange b^5 guideways for locking-bars c', having joined to them, as at c^2, connecting-rods c^2, joined at their other end to cranks c^4 on the opposite ends of a shaft c^5, (see Fig. 1,) having bearings in projections c^6 on the case or cylinder A. The locking-bars c' have bolted or otherwise secured to them on their under side, as herein shown, one or more wedge-plates c^7, (see Fig. 5,) having a circular opening c^8, through which the dowel-pin b^4 may rise and fall, and provided with wedge-shaped flanges or ears c^9, which enter slots $c^\times$ (see Fig. 4) on opposite sides of the dowel-pin b^4. The shaft c^5 is provided with a handle or lever c^{10}, by which the said shaft may be turned to impart a sliding or reciprocating motion to the wedge-plates.

The apparatus, with its parts in the position shown in Fig. 1, is ready to form an article of pulp, the cover or top plate *b* being securely locked against upward movement. The pulp is admitted into the case or cylinder above the platen a^6, and when sufficient pulp has been admitted to form the article desired the water is admitted below the plunger to raise the same. On the upward movement of the plunger the pulp is compressed, the water escaping through the drainage-orifices a^7, hollow stem a^2, and outlet a^4, and also through the orifices b', channel b^2, and pipe b^3. When the pulp has been compressed to the desired density, the cap a^3 on the hollow stem a^2 of the plunger strikes the collar b^{14} and raises it. The upward movement of the collar b^{14} is transmitted through the rods b^{12}, levers b^8, connecting-rods b^7, and rods b^6 to the cover or top plate *b*. Before the cap a^3 engages the collar b^{14} the operator temporarily relieves the pressure of water upon the plunger, as by cutting off the supply, and then turns the handle c^{10} in the direction of arrow 20, Fig. 2, from the position shown to one substantially at right angles thereto, thus withdrawing the wedge-shaped ears c^9 from the slots $c^\times$ and moving the wedge-plate, so as to have the dowel-pin extend through the circular opening c^8, in which position the said pin is free to move vertically. By means of the lever b^8 and connecting-rods the upward movement of the top plate *b* is many times that of the collar b^{14}, so that while the collar b^{14} may only travel but a short distance, yet the top plate is quickly lifted a considerable distance above the cylinder A. The upward movement of the collar b^{14} is limited, as herein shown, by a stop, (shown as a stuffing-box or gland *d*,) and when the said collar strikes against the said stop the platen a^6 or top of the mold is substantially on a level with the top of the cylinder or case A, so that the article of pulp may be readily removed. The upper edge of the cylinder or case A is provided with a suitable packing d', preferably a leather strip secured in a slot by a screw d^2.

I do not desire to limit myself to the particular mechanism shown in Fig. 1 for raising the top plate, as other means than the connecting-rods b^6 b^7 may be employed to join the levers b^8 with the top plate—such, for instance, as a chain *e*, secured to the long arm of a lever b^8 and passed about a pulley above the apparatus and having its other end secured to the cover or top plate *b*. This form of connection is especially adapted when small ware—such as pails or basins—are to be made.

I do not desire to limit myself to any particular form of mold or plunger, as the same may be varied according to the article it is desired to produce.

With the apparatus shown in Fig. 3 the drainage from the cover or top plate is effected, as herein shown, by a siphon-tube d^5, trapped at its lower extremity to retain the charge of liquid.

I claim—

1. In an apparatus for the manufacture of pulp articles, the combination, with a cylinder or case provided with a pulp-inlet, and a plunger within said case provided with a stem having a cap or projection, of a cover or top plate for said cylinder, an engaging device on the said stem, and intermediate mechanism, substantially as described, between said engaging device and top plate, whereby movement of the engaging device is transmitted to the top plate, substantially as and for the purpose specified.

2. In an apparatus for the manufacture of pulp articles, the combination, with a cylinder or case provided with a pulp-inlet, and a plunger within said case provided with a stem having a cap or projection, of a cover or top plate for said cylinder, a lever, an engaging device, and mechanism connecting said cover, lever, and engaging device, the said engaging device being adapted to be engaged by the cap or projection on the plunger-stem, whereby movement of the engaging device is transmitted to the top plate, substantially as and for the purpose specified.

3. In an apparatus for the manufacture of pulp articles, a cylinder or case provided with a pulp-inlet, a plunger within said case provided with a stem having a cap or projection, a cover or top plate, and a locking device, substantially as described, to secure said cover to the case or cylinder against upward movement, combined with a collar on the said stem and with intermediate mechanism, substantially as described, between said collar and top plate, whereby movement of the engaging device is transmitted to the top plate, substantially as and for the purpose specified.

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

HENRY CARMICHAEL.

Witnesses:
FREDERICK L. EMERY,
BLANCHE DEWAR.