

(No Model.)

3 Sheets—Sheet 1.

M. L. DEERING.

MACHINE FOR MOLDING HOLLOW WARE FROM PULP.

No. 536,190.

Patented Mar. 26, 1895.

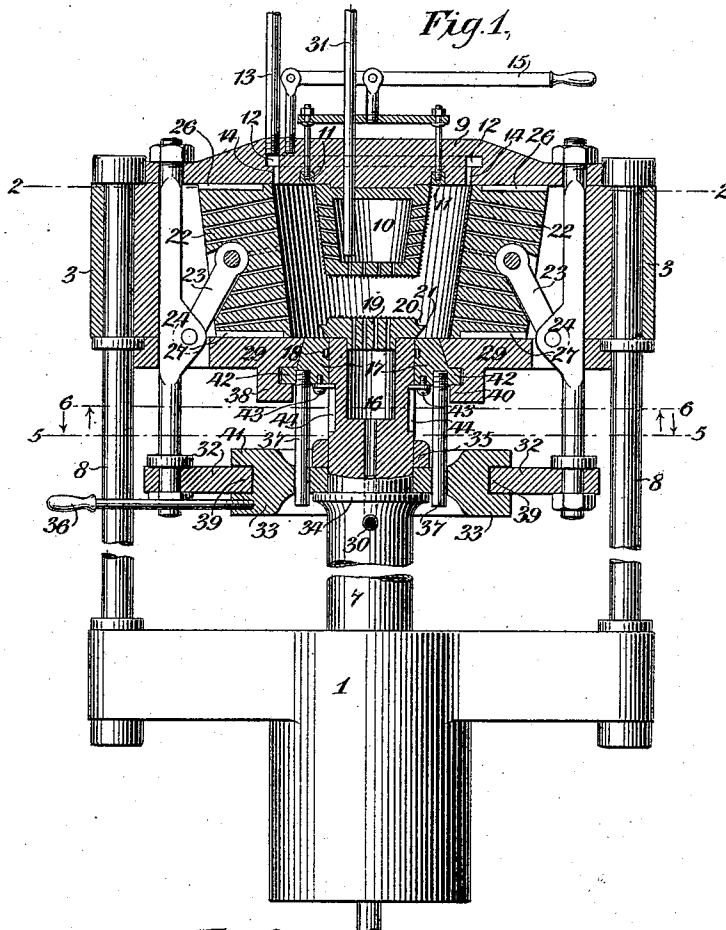
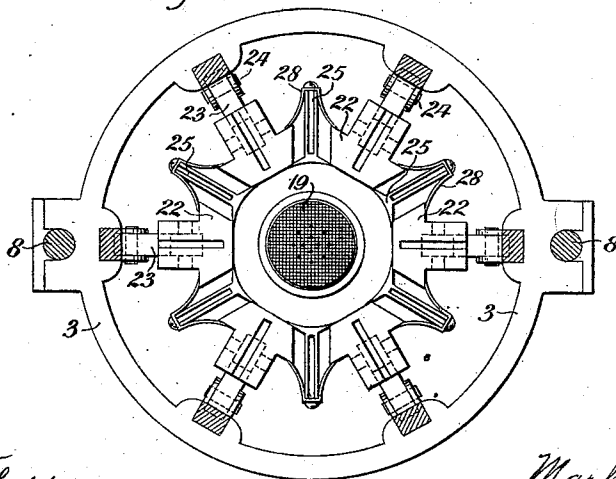


Fig. 2.



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Fig. 3,

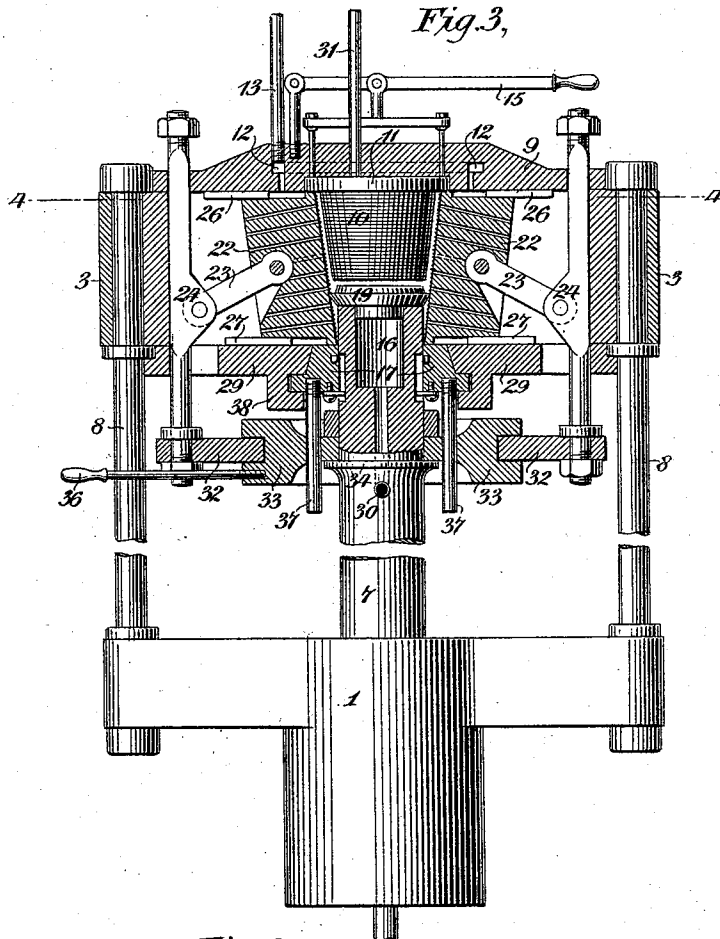
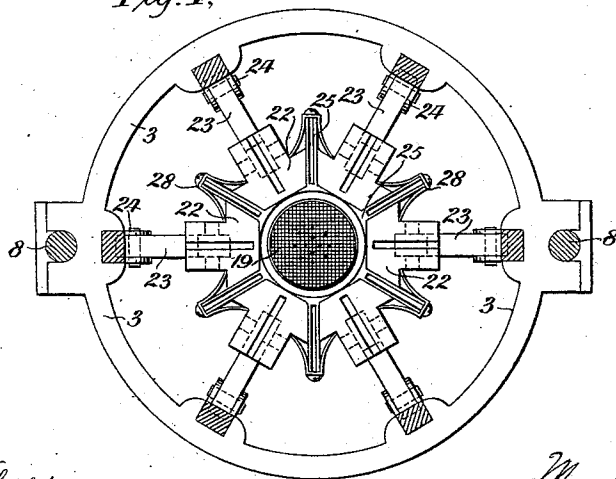


Fig. 4,



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Fig. 5,

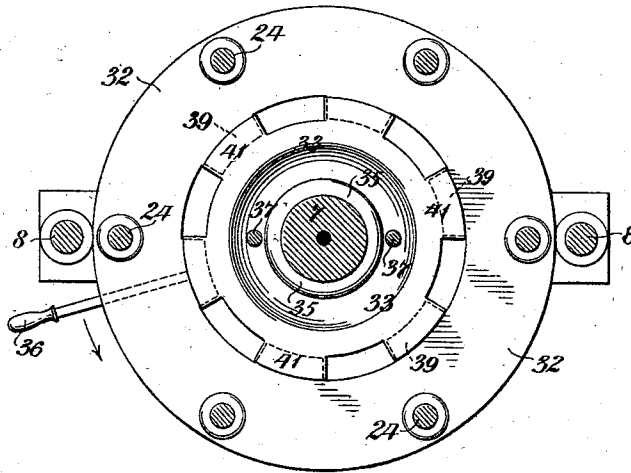
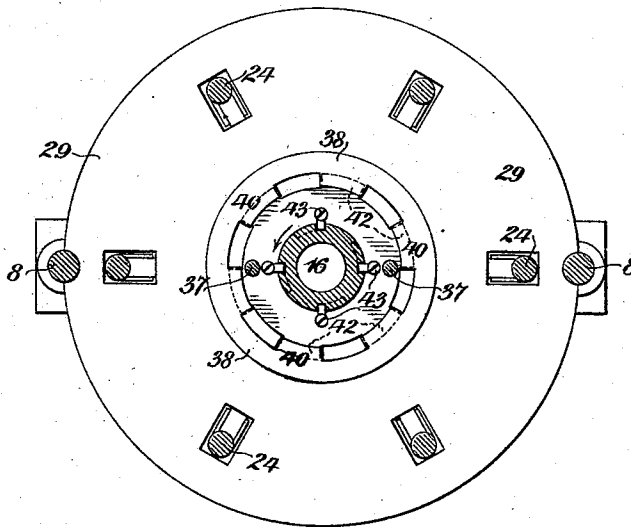


Fig. 6.



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UNITED STATES PATENT OFFICE.

MARK L. DEERING, OF BROOKLYN, NEW YORK.

MACHINE FOR MOLDING HOLLOW WARE FROM PULP.

SPECIFICATION forming part of Letters Patent No. 536,190, dated March 26, 1895.

Application filed March 21, 1892. Renewed August 17, 1894. Serial No. 520,618. (No model.)

To all whom it may concern:

Be it known that I, MARK L. DEERING, of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Improvement in Machines for Molding Hollow Ware from Pulp, of which I declare the following to be a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

This invention relates to improvements in machines whereby a pail or other similar vessel may be formed from a single mass of pulp, and the invention consists of a machine with its various parts constructed, arranged and combined substantially as is herein described and claimed.

In the accompanying sheets of drawings, Figure 1 is a vertical section of the upper and a front elevation of the lower portion of the machine, the mold being expanded; Fig. 2, a horizontal view with the top plate and former removed, in and below the plane 2, 2, Fig. 1; Fig. 3, a view similar to Fig. 1, but showing the mold contracted; Fig. 4, a view similar to Fig. 2, in and below the plane 4, 4, Fig. 3; Fig. 5, a horizontal view in and below the plane 5, 5, Fig. 1, as indicated by the arrows pointing downward; Fig. 6, a horizontal view in and above the plane 6, 6, Fig. 1, as indicated by the arrows pointing upward.

Similar reference numbers designate like parts in the several views.

By means of this invention a pail-machine mold similar in construction to that shown in my recently filed application, Serial No. 425,213, may be operated by power located below the mold, and arranged to exert the pressure required for forming the pail in an upward direction, instead of downward from the top of the machine as represented in that application. In this case the mold is adapted to be operated by hydraulic mechanism. The base 1 contains the cavity in which fits the hydraulic piston 7. Above the base is a casing 3 secured on the columns 8, 8, which are erected in the base, and on this casing is fastened the top-plate 9. The former 10 is attached at the base to the under side of the top-plate. In a groove in this plate is fitted a ring 11 which is adapted to lie flush with the surface of the plate, and to be forced downward around the base of the former by

means of the lever 15, connected with the pins extending from the ring up through the top-plate, as shown in Fig. 1. A circular channel 12 is formed in the top-plate with an opening in which is inserted a pipe 13, above the channel, and with several ports 14 surrounding the base of the former in the under face of the plate.

The upper part of the piston consists of the hollow hub 16, on which is mounted a collar 17, provided with packing 18, and of the plate 19 fixed on the end of the hub, and having the rabbet or groove 20 and cutting edge 21. On the bottom of the casting 3 is fastened a plate 29 in which is a central opening adapted to fit tightly around the collar 17, so that the upper surface of the collar shall lie flush with the surface of the plate. The series of sections 22 are arranged around the former, between the top-plate and the plate 29, and each of these sections is connected by a link 23 with a slide 24 held in guides against the side of the casing. The slides 24 project up through holes in the top-plate and have nuts on their upper ends. With the sections mentioned are combined the sections 25 which alternate therewith, and each of which overlaps the faces of the sections adjacent to it, and on the back of each of the sections 25 is fastened a stout spring 28 which bears against the backs of the adjacent sections. Guides 26 and 27 for the ends of the sections are formed in or on the top-plate and the plate 29. The sections, the former, and the plate 19 on the end of the piston, are perforated and faced with perforated sheet-metal or wire gauze, so as to enable the water to be expelled from the mold, the space within the hub 16 having an outlet from the bottom through the piston at 30, while a pipe 31, inserted in the top-plate, affords a passage through which the water is pumped out of the former.

The slides 24 pass through openings in the plate 29, and their lower ends are inserted in an annular plate 32, which is fastened against shoulders, or collars fixed on the slides, by nuts underneath the plate. This plate is adapted to be interlocked with and disconnected from the ring 33, which is mounted on the piston 7, between the shoulder 34 and the collar 35, and provided with a handle 36. In

the collar are fixed pins 37 that project downward from the collar, and enter holes in the ring 33, so that if a rotary movement is given to the ring a similar movement will be imparted to the collar by these pins. The collar 17 is adapted to be interlocked with and disconnected from the plate 29 by a coupling like that made by the ring 33 with the plate 32. These couplings are illustrated in Figs. 5 and 6. The plate 32 and the hub 38, on the under side of the plate 29, are provided with series of radial lugs 39 and 40, and on the ring 33 and collar 17 are formed similar lugs 41 and 42 which are adapted to pass through the spaces between the lugs on the plates. When the collar 17 is flush with the top of the plate 29, and the flange on the lower side of the ring 33 is in contact with the plate 32, as represented in Fig. 1, the ring and collar may be locked with the plates, by turning them by means of the handle 36 so that their lugs 41 and 42 come directly over the lugs 39 and 40 of the plates, and may be unlocked by turning them so that their lugs may descend between the lugs on the plates. On the collar 17 are several stops 43 projecting into grooves 44 in the hub 16, the grooves extending partly around the hub as indicated by dotted lines in Fig. 6, and in a vertical direction as shown in Fig. 1.

The piston must descend from the position which it occupies in Fig. 1, far enough to enable the newly molded vessel, when it is removed from the machine, to clear the hub 38 on the plate 29, and to render this possible sections of suitable length should be added to the piston 7 and columns 8 at the places where they are shown broken apart, in Figs. 1 and 2.

The mold is represented in Fig. 1 as ready to be charged with pulp for the formation of a pail. The pulp is admitted into the mold through the pipe 13, and the channel 12 and ports 14 in the top-plate. When the pressure is applied, the ring 33 and with it the plate 32 are raised by the piston, and the plate acting on the slides 24 forces these upward causing the links 23 to drive the mold-section inward toward the former, the sections 25 being carried forward by the sections 22, and at the same time the hub 16 moves upward through the collar 17, so that the plate 19 likewise approaches the former, the stops 43 on the collar being then in the vertical branches of the grooves 44 in the hub, and the pins 37 protruding below the ring 33, as indicated in Fig. 3. The pulp is thus compressed into the form of a pail, the water being squeezed out through the sections and into the former and hub, while the surplus material below the edge 21 of the plate 19 is cut off by this edge as the sections contract around it. The piston is then caused to descend to the position it occupies in Fig. 1, and with it are drawn downward the slides 24 through the action of the plate 32 and ring 33, and the mold-sections are retracted from

the former by the links 23, the sections 25 being drawn back by the sections 22 acting against the springs 28. At this point the pail, which adheres to the former, is loosened therefrom by depressing the lever 15, which forces downward the ring 11 and the pail with it, when the pail descends to the bottom of the mold, where it rests on the plate 19, and the ring is restored to its place in the top-plate. The handle 36 is then moved so that the ring 33 and the collar 17 are unlocked from the plates 32 and 29 respectively, in the manner above described, but the collar 17 is at the same instant locked to the hub 16 by the lugs 43 which enter the transverse branches of the grooves 44 in the hub, and the piston being again lowered the collar 17 separates from the plate 29, while the ring 33 leaves the plate 32 supported on the slides 24, and the pail passes down on the plate 19 through the opening in the plate 29.

After the removal of the pail from the machine the piston is moved upward until the collar 17 and ring 33 are in position to be interlocked with the plates 29 and 32, the collar being supported on the hub 16 by the lugs 43 in the transverse branches of the grooves 44, when the ring and collar are turned by the handle 36, and the mold is prepared to receive the charge of pulp for the next pail.

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

1. In a machine for molding hollow ware from pulp, the combination of a plate 9, and a plate 29 having a central opening therein, the former 10, the contracting and expanding system of sections surrounding the former and abutting against the plates, the piston facing the end of the former, the movable collar surrounding the piston and fashioned to fit the opening in the plate 29, means whereby the collar may be locked in the plate, and mechanism whereby the piston and sections are actuated simultaneously, substantially as described.

2. In a machine for molding hollow ware from pulp, the combination of a plate 9, and a plate 29 having a central opening and lugs 40, the former 10, the contracting and expanding system of sections surrounding the former and abutting against the plates, the piston facing the end of the former, the movable collar having lugs 42, surrounding the piston, and fashioned to fit the opening in the plate 29, and mechanism whereby the piston and sections are actuated simultaneously, substantially as described.

3. In a machine for molding hollow ware from pulp, the combination of a plate 9, and a plate 29 having a central opening therein, the former 10, the contracting and expanding system of sections surrounding the former and abutting against the plates, the movable collar fashioned to fit the opening in the plate 29, the piston inserted in the collar, and having on its end a projecting edge, and mech-

anism whereby the piston and sections are actuated simultaneously, substantially as described.

4. In a machine for molding hollow ware from pulp, the contracting and expanding mold composed when the mold is expanded of the combination of the plate 9, and the plate 29 having a central opening therein, the former 10, the system of movable sections surrounding the former and abutting against the plates, the collar within the opening in the plate 29, and the piston extending through the collar, substantially as shown and described.

5. In a machine for molding hollow ware from pulp, the combination with the top-plate, former, system of movable sections, and operating mechanism, of the plate 29, having a central opening, the movable head or piston, the collar on the piston, and means whereby the collar may be locked alternately in the plate 29 and on the piston, substantially as described.

6. In a machine for molding hollow ware from pulp, the combination with the top-plate, former, system of movable sections, and operating mechanism, of the plate 29 having a central opening and lugs 40, the movable head or piston having grooves 44 in its side, and the collar, on the piston, having lugs 42 and stops 43, substantially as described.

7. In a machine for molding hollow ware from pulp, the combination of the plate 29 having a central opening, the collar adapted to be locked therein, the piston adapted to slide in the collar, a ring 33 on the piston adapted to turn thereon, and pins 37 extending from the collar to the ring, substantially as described.

8. In a machine for molding hollow ware from pulp, the combination of the top and bottom plates of the mold, a supplemental plate or collar of greater diameter than the vessel to be molded, adapted to fit into one of the plates and to be removed therefrom, and a movable head or piston adapted to pass through one of the plates, the former, the system of sections surrounding it, and mechanism, whereby the sections are forced inward and retracted, adapted to be connected with and disconnected from the piston, substantially as described.

9. In a machine for molding hollow ware from pulp, the combination of the top and bottom plates 9 and 29 of the mold, the plate

29 having a central opening of greater diameter than the vessel to be molded, the collar adapted to fit in this opening and to be removed therefrom, the movable head or piston adapted to fit in the collar, the former, the system of sections surrounding it, and mechanism, whereby the sections are forced inward and retracted, adapted to be connected with and disconnected from the piston, substantially as described.

10. In a machine for molding hollow ware from pulp, the combination with the fixed parts of the mold, of the system of sections adapted to slide horizontally and to contract and expand around the former, the vertically movable head or piston, and mechanism whereby the sections are actuated, adapted to be connected with and disconnected from the piston.

11. In a machine for molding hollow ware from pulp, the combination with the fixed parts of the mold, of the system of sections adapted to slide horizontally and to contract and expand around the former, the vertically movable head or piston, the series of slides and links whereby the sections are actuated, and a coupling whereby the slides are connected with and disconnected from the piston, substantially as described.

12. In a machine for molding hollow ware from pulp, the combination with the fixed parts of the mold, of the system of sections adapted to slide horizontally and to contract and expand around the former, the vertically movable head or piston, the series of slides and links whereby the sections are actuated, the plate 32 secured on the slides, and means whereby the plate is connected with and disconnected from the piston, substantially as described.

13. In a machine for molding hollow ware from pulp, the combination with the fixed parts of the mold, of the system of sections adapted to slide horizontally and to contract and expand around the former, the vertically movable head or piston, the series of slides and links whereby the sections are actuated, the plate 32 secured on the slides and provided with lugs 39, and the ring 33 secured on the piston and provided with lugs 41, substantially as described.

MARK L. DEERING.

In presence of—

S. G. METCALF,
J. J. WILSON.