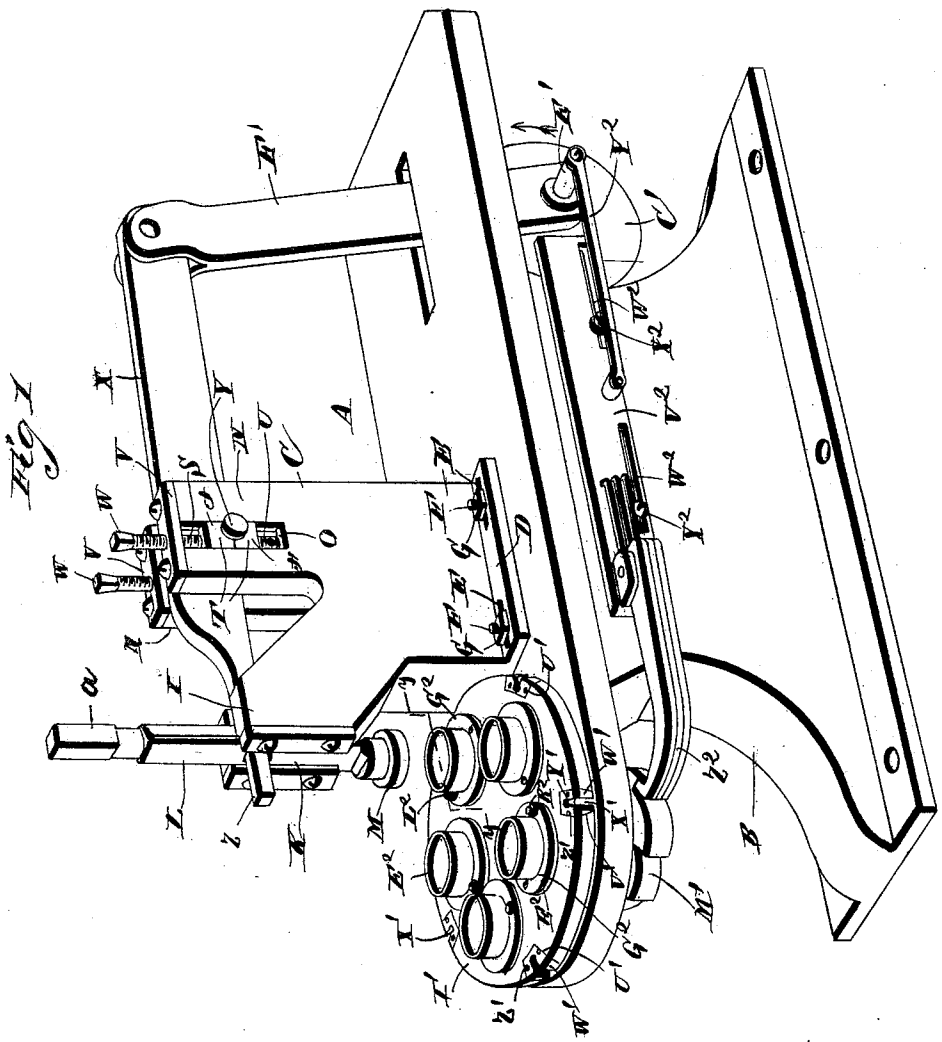
(No Model.) 3 Sheets—Sheet 1.

C. P. OLDHAM.

MACHINE FOR STAMPING AND MOLDING SOAP.

No. 407,233. Patented July 16, 1889.



Witnesses
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(No Model.) 3 Sheets—Sheet 2.

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Fig. 2.

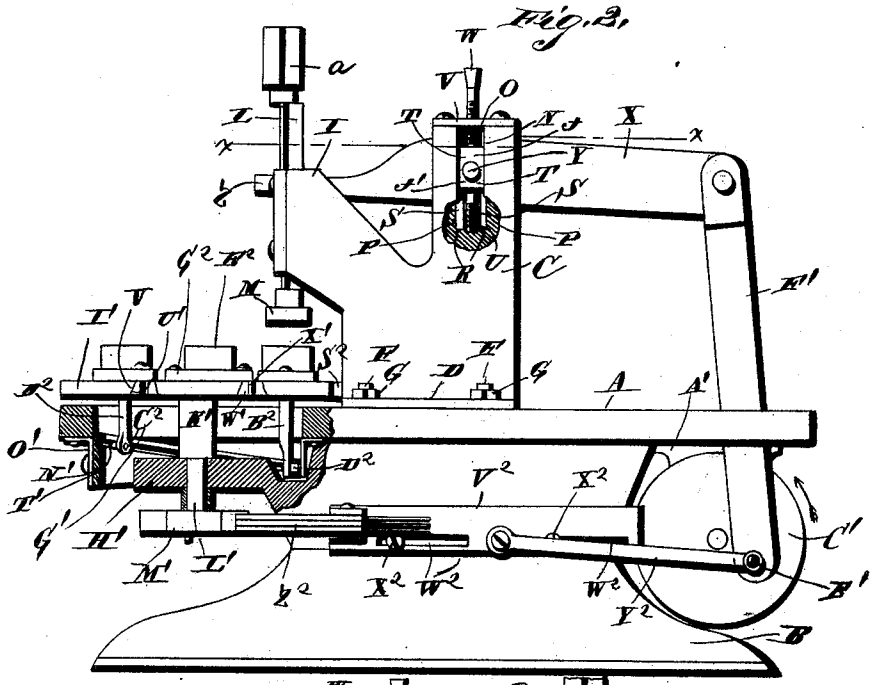

Fig. 3.

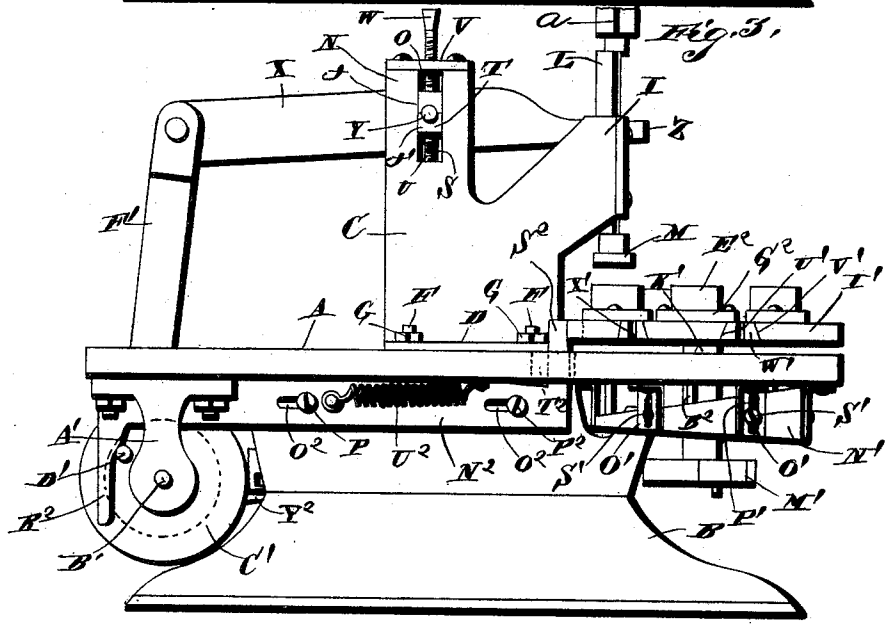

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Fig. 4.

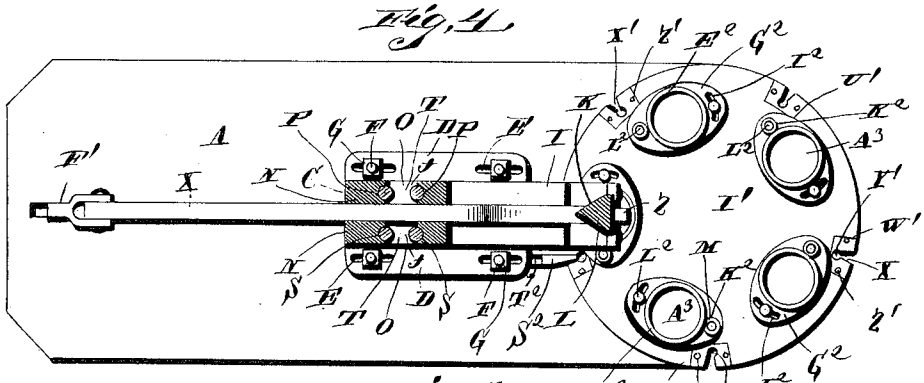


Fig. 5.

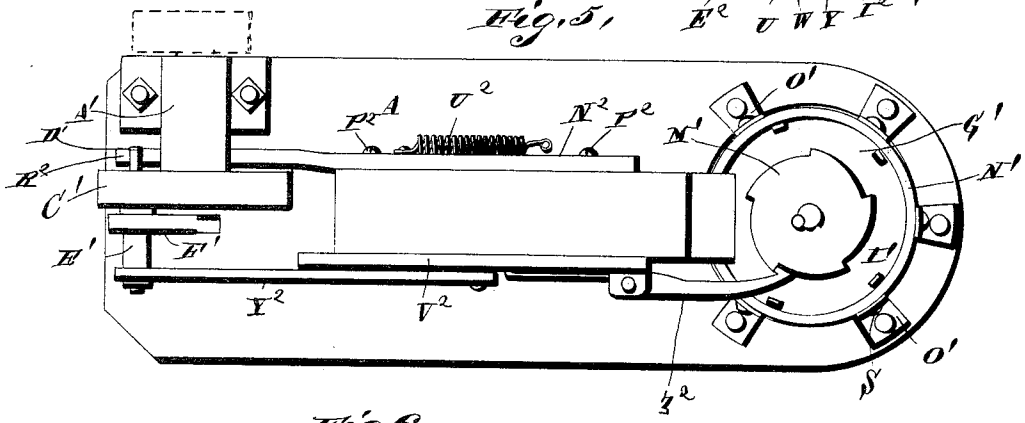


Fig. 6.

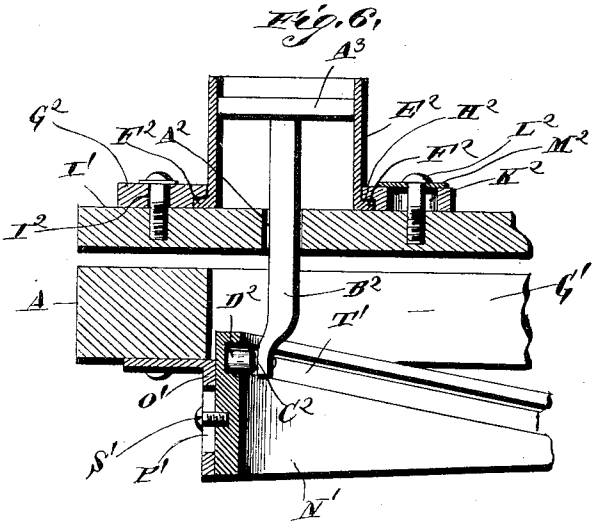
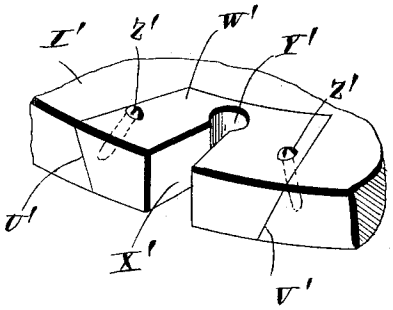


Fig. 7.



Witnesses
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UNITED STATES PATENT OFFICE.

CARRICK P. OLDHAM, OF KNOXVILLE, TENNESSEE, ASSIGNOR OF ONE-HALF TO SAMUEL H. McNUTT AND EDWARD S. SHEPARD, OF SAME PLACE.

MACHINE FOR STAMPING AND MOLDING SOAP.

SPECIFICATION forming part of Letters Patent No. 407,233, dated July 16, 1889.

Application filed February 29, 1888. Serial No. 265,726. (No model.)

To all whom it may concern:

Be it known that I, CARRICK P. OLDHAM, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented a new and useful Improvement in Machines for Stamping and Molding Soap, &c., of which the following is specification.

My invention relates to an improvement in machines for stamping and molding soap; and it consists in the peculiar construction and combination of devices that will be more fully set forth hereinafter, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a perspective view of a soap stamping and molding machine embodying my improvement. Fig. 2 is a side elevation of the same. Fig. 3 is a similar view of the opposite side of the machine. Fig. 4 is partly a top plan view and partly a horizontal section taken on the line *x x* of Fig. 2. Fig. 5 is an inverted plan view. Fig. 6 is a transverse sectional view taken on the line *x x* of Fig. 4. Fig. 7 is a detail view.

A represents the bed or table of the machine, which is provided on its lower side with a depending foot or standard B, which is adapted to be secured to a suitable foundation of masonry, so as to support the machine firmly in position and prevent the same from jarring when in operation.

On the upper side of the table A, near the center of the same, is arranged a vertical standard C, which standard is provided with horizontal flanges D at its lower side, and said flanges are provided with longitudinal slots E. Bolts F extend through the table or bed and through the said slots, and are provided at their upper ends with clamping-nuts G, by means of which the standard is secured firmly to the bed or table and is rendered longitudinally adjustable thereon. From the front side of the standard projects an arm I, in the outer side of which is formed a vertical guideway K.

L represents a vertically-movable arm or plunger, which is guided in the way K and is provided at its lower end with a die M, of suitable size and shape. From the rear side of standard C project a pair of vertical arms N, the said arms being provided with vertical open slots O. The sides of the said slots are provided with vertical semi-cylindrical grooves P, and communicate with cylindrical openings R, made in the arm at the bottom of the slots.

S represents cylindrical rods, which are arranged in the groove P and have their lower ends secured in the openings R. Said cylindrical rods are preferably made of steel or other hard material, and form guides which enter similarly-shaped grooves in opposite sides of bearing-blocks T. Said bearing-blocks are each made in two sections *t t'*.

U represents elevating-screws, which have their threaded ends engaged in threaded openings in the standard C at the lower ends of slots O. The heads of said elevating-screws bear under the lower sections *t'* of the bearing-blocks, so as to support the same at any desired elevation. Plates V are screwed to the upper ends of vertical arms N and cover the upper ends of the slots. Set-screws W engage threaded openings in said plates and bear on the upper sides of the upper sections *t* of the bearing-blocks.

X represents a rocking lever, which is provided at a suitable distance from its front end with a pair of trunnions Y, that are journaled in the bearing-boxes T. The front end of this rocking lever is reduced to form an arm Z, that projects through a vertical opening in the vertically-movable bar L and thereby connects said rocking lever to the said bar, and causes the latter to be reciprocated in a vertical direction when the lever X is rocked.

A' represents a bearing, which is bolted to the rear side of the table or bed A and depends therefrom. In this bearing is journaled a shaft B', which is provided at its outer end with a crank-handle or with a driving-pulley, by means of which it may be rotated, and is provided at its inner end with a crank-wheel C'. From one side of said wheel C' projects a tappet-pin D', and from the opposite side thereof extends a wrist-pin E'.

F' represents a connecting-rod, which has its upper end pivoted to the rear end of the

rocking beam X, and has its lower end pivoted on the wrist-pin E′.

The front end of the table, which projects beyond the standard C, is rounded, as shown, and is provided with a large circular opening G′, and from the front side or end of the standard B projects an arm H′, which extends under the center of the projecting portion of the table.

I′ represents a circular die-plate of suitable size, which is provided at its center with a depending hub or offset K′, which extends down through the center of opening G′ and bears upon the upper side of the arm H′, at the outer end of said arm. A shaft L′ is rigidly secured to the center of the circular die-plate and passes downward through a vertical opening in the arm H′, and is thereby journaled therein, and to the lower end of said shaft is rigidly secured a ratchet-wheel M′.

N′ represents a circular cam, which is supported in an inclined position under the projecting end of the table and concentrically with the opening G′, by means of brackets or arms O′, which depend from the said projecting end of the table and are provided with vertical slots P′.

Bolts R′ have their heads countersunk in openings on the inner side of the cam-ring, and their threaded outer ends project through the slots P′ and are provided with clamping-nuts S′, by means of which the cam-ring is supported in an inclined position and is adapted to be adjusted vertically under the projecting end of the table. On the inner side of the cam-ring is a cam-groove T′, for the purpose to be hereinafter described.

The circular die-plate is provided in its perimeter with a series of recesses U′, which are arranged equidistant apart and correspond in number with the teeth of the ratchet-wheel and are in line with said teeth. The said recesses U′ have their opposite sides beveled or flared, as at V′, and in the same are arranged removable blocks W′, which are preferably made of steel and have their sides beveled to fit the beveled sides of the recesses, and are thereby countersunk therein, so that the faces of said blocks are flush with the faces of the die-plate. In each of the said blocks is formed a slightly-tangential wedge-shaped notch X′, the outer end of which is open and the inner end of which communicates with the vertical circular opening Y′. The said blocks are secured in position in the recesses of the die-plate by means of pins or screws Z′.

A^2 represents a series of openings, which are made through the die-plate at a suitable distance from the periphery thereof, said openings being equidistant apart and corresponding in number to the teeth of the ratchet-wheel and the recesses in the die-plate. In each of the said openings A^2 is feathered a vertically-movable ejecting-pin B^2, said pins being thereby prevented from rotating in said openings. These pins extend downward from the die-plate and are provided at their lower ends with transverse spindles C^2, on which are journaled anti-friction rollers D^2, that engage the cam-groove.

E^2 represents a series of cups or molds, which may be of any suitable size and shape, according to the size and shape desired to be imparted to the cakes of soap when the same are formed, and said cups or molds have their upper and lower sides open, and are provided at their lower edges with outwardly-projecting flanges F^2.

G^2 represents a series of plates, which are provided with central countersunk openings H^2, which fit over the molds or cups and receive the flanges thereof. The ends of the said plates project in opposite directions, and on one of the projecting ends of each plate is made a longitudinal slot I^2, and in the opposite end of each plate is an enlarged circular opening K^2.

L^2 represents screws or bolts, which extend through the slots I^2 and openings K^2 and enter threaded openings in the die-plate. Those screws which extend through the openings K^2 are provided with washers M^2 under their heads, which washers are larger than the openings K^2 and cover the latter, and thereby enable the screws to clamp plates G^2 to the die-plate and permit said plates G^2 to be adjusted on the die-plate, either radially or longitudinally, as will be readily understood, thus enabling the cup-molds to be shifted about on the face of the die-plate, and secured on the same in such a position that they will register perfectly with the die on the lower end of the reciprocating plunger-rod L in succession as the die-plate rotates. By reason of the standard C being longitudinally adjustable on the table or bed, so as to enable the plunger-rod and die to be moved inward or outward over the die-plate, and by reason of the plates G^2 being adjustable on the die-plate, the cups or molds and the die may be removed and replaced with others either larger or smaller and of different shapes, so as to enable the machine to be used for stamping and molding cakes of soap of any desired size or shape.

N^2 represents an endwise-moving detent rod or bar, which is arranged under the bed or table and bears against one side of the standard B. The said detent-rod is provided with longitudinal slots O^2, through which screws or bolts P^2 extend and secure the detent-rod to the standard B and guide the same thereon. At the rear end of the detent-rod is a depending tappet-arm R^2, which is adapted to be engaged by the tappet-pin D′ of crank-wheel C′ once every rotation of said crank-wheel, and at the front end of the detent-rod is a vertical arm S^2, which projects upward through a longitudinal slot T^2 in the bed-plate, is adapted to move back and forth therein, and is wedge-shaped, as shown, and is thereby adapted to enter the recesses or notches X′ in the perimeter of the revoluble die-plate.

U^2 represents a coiled retractile spring,

which has one end secured to the detent-bar, and has the opposite end secured to the under side of the table. The function of this spring is to keep the wedge-shaped arm of the detent at all times in engagement with the perimeter of the circular cam-plate, so as to force the same into each notch X′ of said plate in succession and thereby arrest the rotation of the plate.

V^2 represents an endwise-movable operating-rod, which is arranged on the side of standard B opposite the detent-rod, and is provided with longitudinal slots W^2. Screws or bolts X^2 extend through the said slots and form guides for the rod and engage threaded openings in the standard.

Y^2 represents a pitman, which has one end connected to the wrist or crank pin and has its opposite extremity pivoted to the operating-bar V^2.

Z^2 represents a number of spring-actuated pawls, which are pivoted to the outer end of the operating-rod and bear against one side of the ratchet-wheel, and are adapted to engage one of the teeth thereof when the rod reaches the forward limit of its stroke, and partly to rotate said ratchet-wheel in one direction as the said rod moves rearward, as will be very readily understood. Secured to the upper end of each ejecting-pin B^2 and arranged in each of the cups or molds is a counter-die A^3.

The operation of my invention is as follows: The machine is in its initial position when the circular die-plate has one of its notches X′ engaged by the detent, and when the die or plunger-rod L is at the upper limit of its stroke the cup or mold registers therewith, so that the said die is raised above the cup or mold, and when the counter-die in the mold or cup is at the bottom of the same and the roller D^2 at the lower end of the pin B^2, is in the lowest portion of the groove in the cam-ring. Cakes of soap which roughly approximate the size and shape of the finished cakes, and while in a plastic condition and yet sufficiently hard to retain their shape, are placed one in each cup or mold just before the same is moved under the die by the revoluble die-plate. At the initial rotary movement of the shaft B′ the crank-pin of wheel C′ causes the connecting-rod F′ to move upward and thereby rock the bar X, so as to cause the front end of the same to be lowered and thereby force the plunger-bar L downward and cause the same to force its die M into the cup or mold, so as to firmly compress the cakes of soap in the latter between the die and the counter-die and thereby give said cake of soap the requisite density and solidity and also impart to it the desired shape and size. While the die is moving downward in the mold and compressing the cake of soap the operating rod or bar V^2 is moving forward, by reason of the pitman which connects it to the crank-wheel, and the spring-actuated pawls are being thrust forward on one side of the ratchet-wheels and caused to engage one tooth thereof. By this time the crank-pin has passed the upper dead-center and begins to descend, so as to raise the front end of rocking beam X and thereby raise the die out of the mold or cup after having compressed the cake of soap. By this time the crank-wheel C′ has brought the tappet-pin D′ into engagement with the lower inner side of the arm R^2 of the detent-rod, and as the said crank-wheel continues to revolve said tappet-pin moves upward on said arm and thereby withdraws the latter against the tension of the spring U^2, so as to disengage the wedge-shaped engaging-point of the detent S^2 from the notch X′ of the die-plate. At this instant the operating-rod V^2 moves rearward and causes its pawls to turn the ratchet-wheel through a partial rotation and thereby impart a partial rotation to the die-plate, so as to carry the cup or mold in which the cake of soap has been formed from under the vertically-movable die and plunger-rod, and to range the next succeeding cup or mold under said die. At the instant that the die-plate reaches this position the detent is returned to its normal position by the spring U^2, and causes the wedge-shaped point thereof to engage the next succeeding notch X′ of the die-plate and thereby lock the same rigidly in position, as before, when the operation before described is repeated and a second cake of soap is pressed or molded. As the die-plate rotates, the pins B^2, attached to the counter-dies, are caused by their friction-rollers, which engage the inclined cam-groove, to rise, so as to force the counter-dies upward in the cups or molds and thereby eject the finished cakes of soap therefrom. The said counter-dies reach the upper limit of their stroke when they are directly opposite the vertically-movable die or plunger-rod, and as the die-plate continues to revolve said counter-dies are drawn downward to their initial positions in the bottoms of the molds or cups as their anti-friction rollers slide downward in the descending plane of the cam-groove.

It will be understood from the foregoing description and by reference to the drawings that when the plunger or die bar is being operated so as to compress the cakes of soap in the cup or mold the other parts of the machine are quiescent, create no friction, and thereby all of the force expended in turning the shaft B′ is utilized in operating the die.

I show in the accompanying drawings a weight *a*, formed at the upper end of the die-rod, in order to add to the effectiveness of the machine and to cause said die-rod to descend with additional force.

The depth to which the die or plunger descends in the mold or cups, and consequently the density of the cakes of soap or the thickness of the same, may be regulated by adjusting the bearings T vertically, in which the trunnions which form the fulcrum of the rocking beam X are journaled, this being ac-

complished by turning the adjusting-screws which support said bearing-blocks, as will be readily understood.

The height to which the counter-dies rise in the cups or molds may be controlled by adjusting the cam-ring vertically, and thereby the machine is enabled to form or press cakes of soap of any desired thickness and density.

I do not limit myself to the precise construction of the various parts of my machine hereinbefore described, as it is evident that modifications can be made therein without departing from the spirit of my invention.

The circular die-plates may be made of any desired size, and may be provided with any number of cups or molds.

The blocks W′, which are inserted and secured in the radial peripheral recesses in the die-plate, may be removed therefrom and replaced with new ones when the notches X′ therein become worn to such an extent as to impair the efficiency of the machine. As the wedge-shaped point of the detent bar or rod becomes worn by the friction of the same with the sides of the notches X′, said point will be forced farther into said notches by the spring U^2, so as to take up wear.

Having described my invention, I claim—

1. The combination of the revoluble die-plate having the ratchet-wheel and the notches X′, the spring-pressed longitudinally-moving detent to engage said notches and provided with arms R^2, the reciprocating rod V^2, having the pawls (one or more) to engage and rotate the ratchet-wheel, the crank-wheel having the tappet-pin D′, to engage the arm of the detent and release the same, and the pitman connecting the rod V^2 with the crank-wheel, substantially as described.

2. In a machine for stamping and molding soap, &c., the revoluble die-plate having the ratchet-wheel and the notches X′, the spring-pressed detent to engage the notches, the rod V^2, having the pawl to engage the ratchet-wheel, the rocking bar X, the plunger attached thereto and having the die, the crank-wheel C′, the rod F′, connecting the latter to the rocking bar, the pitman W^2, connecting the crank-wheel to the rod V^2, and the tappet-pin on the crank-wheel to operate the detent, the pawl-actuating rod, and the plunger, as set forth.

3. In a soap-molding machine, the combination of the pivoted die-plate having the notches X′, the longitudinally-moving detent N^2, having the arm R^2 and the engaging-point S^2, the spring U^2, to move the detent in one direction and engage its point with the die-plate, and the revolving wheel C′, having the tappet-pin D′, to engage the detent-arm, for the purpose set forth, substantially as described.

4. In a machine for stamping soap, the combination of the revoluble die-plate, the pawl-and-ratchet mechanism to rotate the same intermittently, the plunger carrying the die, the lever mechanism for reciprocating the plunger, and the driving-shaft, to which both pawl-and-ratchet mechanism and the lever mechanism are respectively connected, and the expelling devices for the die-plate, comprising the plungers in the molds, and the cams arranged under the die-plate, said devices being operated by the cam-face, whereby as the die-plate turns said devices will ride up the cam-face to cause the expulsion of the stamped soap from the die.

5. The combination of the bed or table having the horizontal arm H′ at one end and the vertical standard, the vertical shaft L′, journaled in arm H′, the die-plate secured to the upper end of said shaft, the ratchet-wheel secured to the lower end thereof, the cups or molds arranged on the die-plate in a concentric series, the plunger guided on the standard, the rocking lever connected to the plunger, the crank-wheel connected to and operating the lever, the reciprocating rod V^2, having the pawls engaging the ratchet-wheel, and the pitman connecting said rod to the crank-wheel, substantially as described.

6. In a soap-press, the combination of the plunger-rod, the standard C, having the slots or ways, the boxes T, adjustable in said slots or ways, the screws to raise and lower the boxes, and the beam or lever having its bearings in the adjustable boxes and connected with and adapted to operate the plunger-rod, substantially as described.

7. In a soap-press, the combination of the bed or table constituting the frame or support, the pivoted revolving die-plate having the series of concentrically-arranged cups or molds, the peripheral notches and the ratchet-wheel, the reciprocating rod V^2, the pawls pivoted thereto and engaging the ratchet-wheel, the crank-wheel having the tappet-pin D′, the pitman connecting said wheel to rod V^2, the plunger-rod, the rocking lever connected thereto, the pitman F′, connecting the crank-wheel to the rocking lever, the detent having the arm in the path of the pin D′, and the spring to engage said detent with the notches of the die-plate in succession, substantially as described.

8. In combination with the revoluble die-plate having the cups or molds and the openings A^2, the vertically-adjustable cam-ring N′, having the groove T′, the plungers in the cups or molds, the depending pins B^2 on the plungers, and rollers D^2 on their lower ends traveling in the groove T′ of the cam-ring, as set forth.

9. The die-plate having the cups or molds provided with flanges F^2, the circular plates G^2, provided with central countersunk openings H^2, which fit over the molds or cups and receive the flanges thereof, the slots I^2 in one of the ends of plates G^2 and enlarged circular openings K^2 in the other ends, the screws or bolts L^2, which extend through the slots I^2 and openings K^2 and enter the die-plate, and

the washer M^2 on the bolts L^2 to cover the openings K^2 and enable the screws to clamp the plates G^2 to the die-plate, as set forth.

10. The revoluble die-plate and the removable interchangeable and adjustable molds or cups thereon, combined with the standard C, adjustable toward or from the die-plate and carrying the plunger for the cups or molds, whereby the standard with the plunger can be adjusted relative to the adjustment of the cups or molds, for the purpose set forth.

11. The revoluble die-plate, the cups or molds thereon, and the ratchet-wheel carried by the die-plate, combined with the standard C, the rocking lever X, pivoted to the standard, the plunger L, guided in the standard and connected to the rocking lever, the crank-wheel C′, connected to and operating the rocking lever, the reciprocating rod V^2, having the pawl engaging the ratchet-wheel, and the pitman Y^2, connecting the rod V^2 to the crank-wheel, as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

CARRICK P. OLDHAM.

Witnesses:
E. G. SIGGERS,
J. H. SIGGERS.