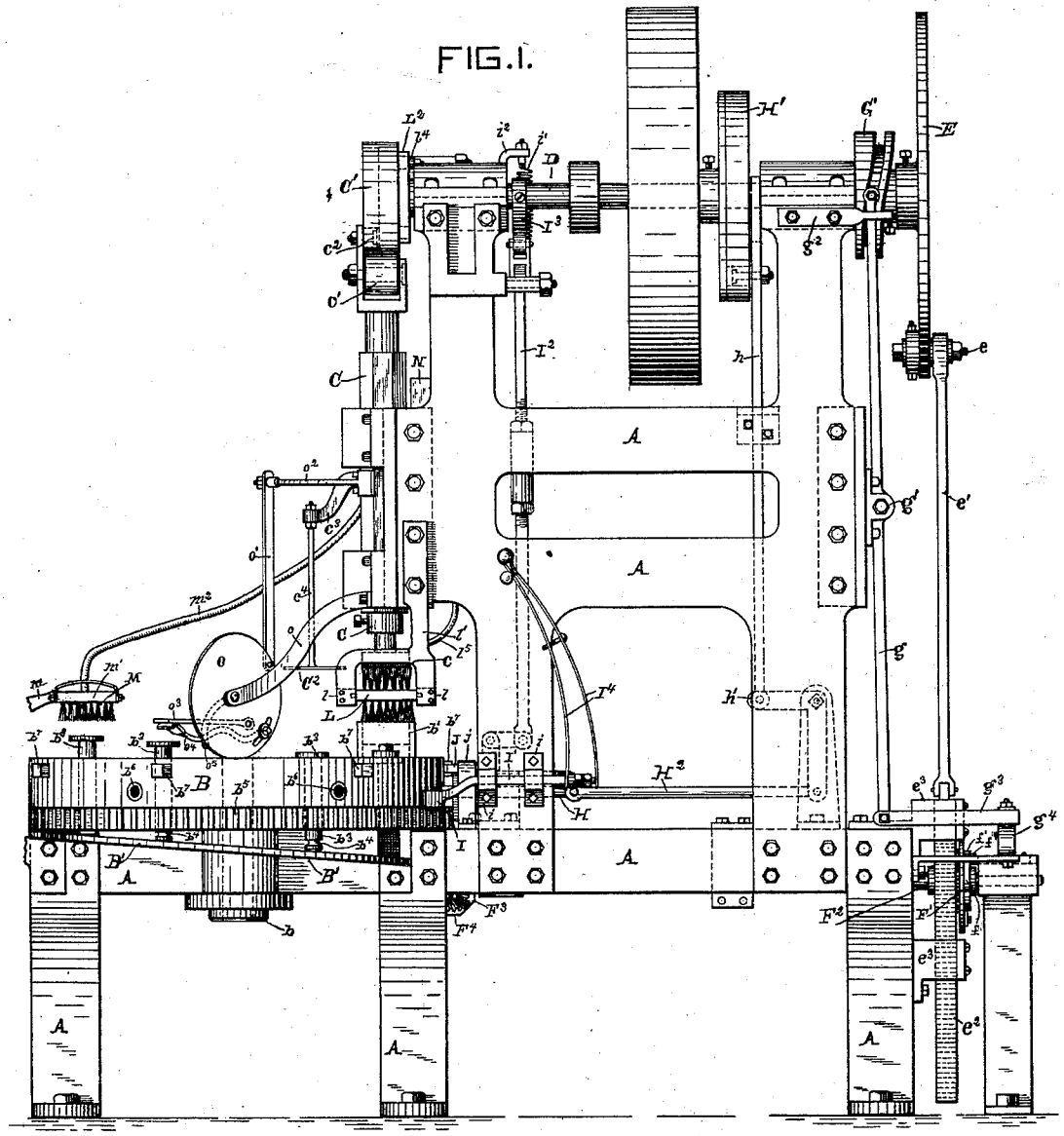
(No Model.) 3 Sheets—Sheet 1.

C. HOFF.

SOAP PRESS.

No. 473,505. Patented Apr. 26, 1892.

FIG. 1.



Witnesses
Frank L. Millward.
M. D. Murray

Inventor
Charles Hoff
By his Attorney Geo. J. Murray

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 2.

C. HOFF.

SOAP PRESS.

No. 473,505. Patented Apr. 26, 1892.

FIG. 2.

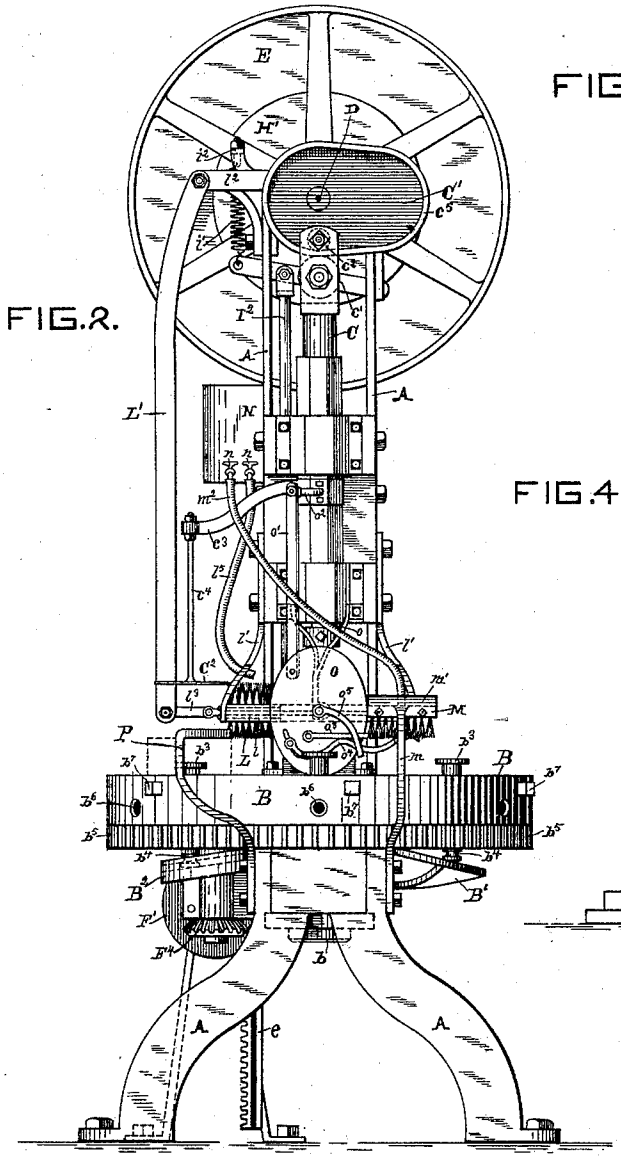


FIG. 3.

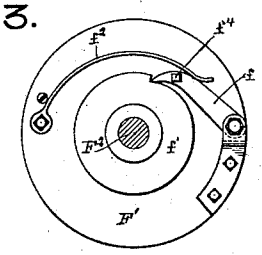
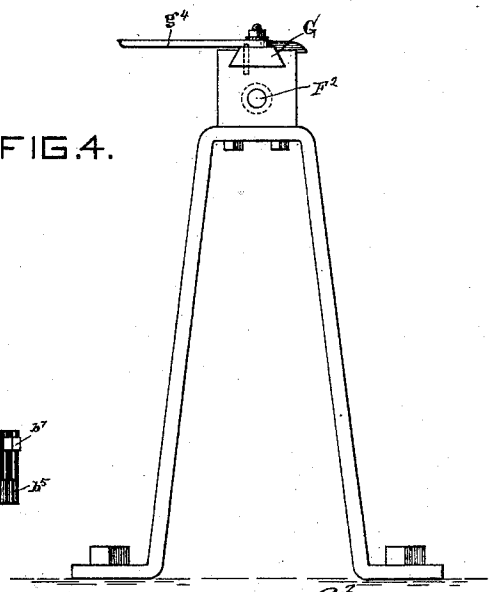


FIG. 4.



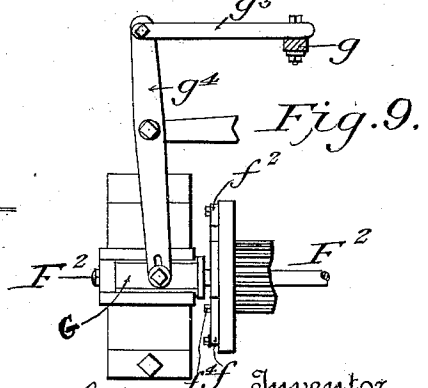


Fig. 9.

Witnesses
Frank L. Millward
M. L. Murray

Inventor
Charles Hoff
By his Attorney Geo J. Murray

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 3 Sheets—Sheet 3.

C. HOFF.

SOAP PRESS.

No. 473,505. Patented Apr. 26, 1892.

FIG. 5.

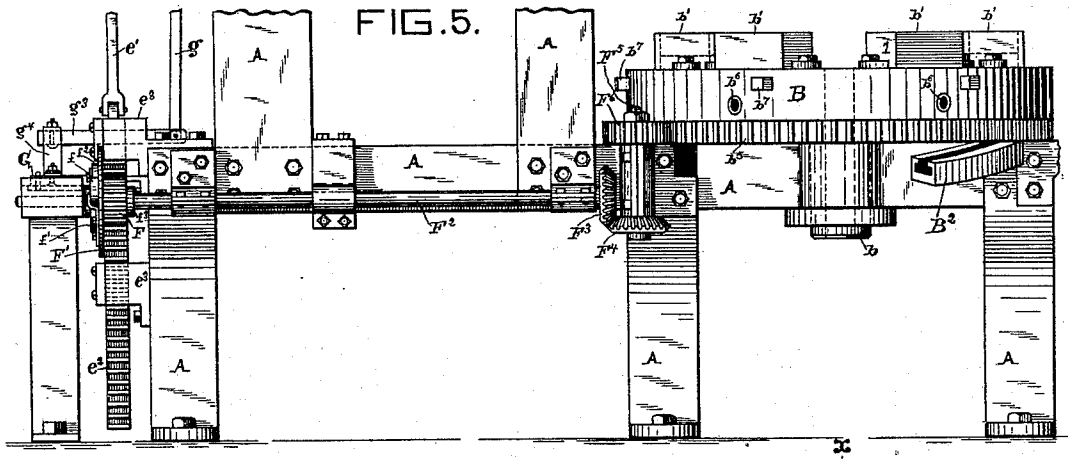


FIG. 7.

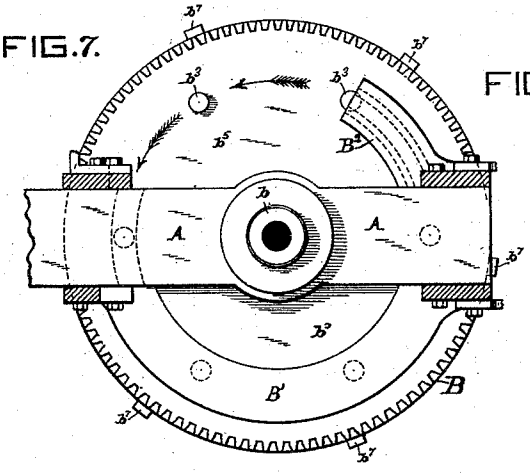


FIG. 6.

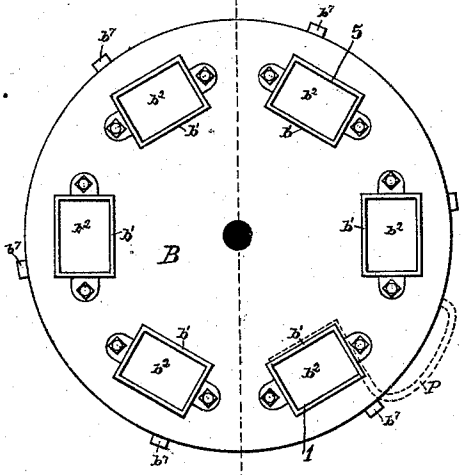
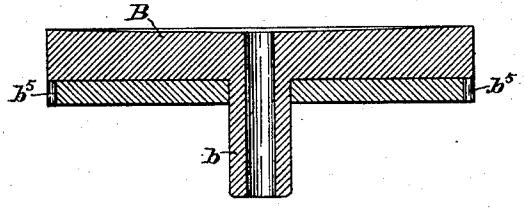


FIG. 8.



Witnesses
Frank L. Millward.
M. L. Murray

Inventor
Charles Hoff
By his Attorney Geo. J. Murray

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

CHARLES HOFF, OF CINCINNATI, OHIO.

SOAP-PRESS.

SPECIFICATION forming part of Letters Patent No. 473,505, dated April 26, 1892.

Application filed June 20, 1888. Serial No. 277,661. (No model.)

To all whom it may concern:

Be it known that I, CHARLES HOFF, a citizen of the United States, and a resident of Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Soap-Presses, of which the following is a specification.

My invention is an improved machine for pressing soap cakes and for marking, ornamenting, or lettering them.

Its object is to provide means whereby the cakes are fed to the machine at some distance from the plungers and automatically discharged after being properly impressed, whereby all danger to the attendant is obviated.

Its object is also to provide means whereby the dies and molds are automatically moistened and kept clean.

Its object is also to produce a machine that requires little attention and may be run continuously, and thus turn out work more rapidly and better than those now in common use.

The invention will be first fully described in connection with the accompanying drawings, and then particularly referred to and pointed out in the claims.

Referring to the drawings, in which like parts are indicated by similar reference letters and numerals wherever they occur throughout the various views, Figure 1 is a side elevation of a machine embodying my improvements. Fig. 2 is a front elevation of the same. Fig. 3 is an enlarged face elevation of the click-movement by which the revolving mold-carrying table is intermittently rotated. Fig. 4 is a detail view, in end elevation, of the means for releasing the click when the table is to be stopped for the purpose of feeding, stamping, and discharging the soap. Fig. 5 is a detail view, in side elevation, of the lower part of the machine. This view is from the opposite side to that shown in Fig. 1. Fig. 6 is a plan view of the revolving table with the soap-molds secured upon it. Fig. 7 is an inverted view of the table and inclined tracks. Fig. 8 is an axial section through the revolving table, taken through line $x\,x$ of Fig. 6. Fig 9 is a detail in plan view of the device for releasing or uncoupling the click-movement by which the mold-carrying table is revolved.

Referring to the parts, A indicates the iron frame of the machine in which the operative parts are mounted.

B is a circular table mounted to revolve in the frame A by means of a hollow hub or concentric journal b, which has its bearings in said frame. Upon this table are secured the soap-molds b'. (Shown in Fig. 6.) Each mold is fitted with a movable bottom b^2, which is secured upon top of vertically-moving plungers b^3. Said plungers slide in vertical perforations in table B and are moved up by an inclined stationary ring-track B′, Fig. 1, and drawn down by a similarly-inclined ring-track B^2, Fig. 5, upon the opposite side of the machine. For this purpose the track B^2 has a T-shaped groove in it, and the lower ends of the shanks b^3 have annular grooves or necks b^4, into which grooves the inwardly-projecting walls of the T-shaped grooves enter. The enlarged lower portions of the heads of the plungers b^3, entering the enlarged portion of the T-shaped groove, draw the plungers and their attached bottoms b^2 down after the soap cake has been discharged from the mold, so as to prepare the mold for the reception of another blank. The blanks are placed in the molds at one side of the machine (at mold 1) and the impressed cakes discharged from the opposite side at mold 5.

I will now describe the means by which the table B is intermittently revolved to bring the molds successively under the plunger C, which carries the upper stamping-die c.

Secured upon one end of the driving-shaft D is a wheel E, having a crank-pin e, upon which pin is journaled one end of a pitman e', which carries at the opposite end a vertically-sliding toothed rack e^2, which rack is guided in its movements in boxes e^3, which are secured upon the frame A. The rack e^2 engages the teeth of a pinion F, which is secured to a driving disk or wheel F′. Both pinion and wheel are journaled upon the table-driving shaft F^2.

To the opposite side of the disk F′ from which the cog or pinion F is secured is pivoted a pawl f, the end of which is held upon the periphery of a notched disk f', which is secured upon the shaft F^2 by a spring f^2. The pinion F and disk F′ are held against the ratchet or notched disk f' by a collar f^3,

which is secured upon the shaft F^2 against the inner face of the pinion. It will be seen that by this click-movement the shaft F^2 is intermittently revolved in one direction upon the downward stroke of the rack or by the pawl f engaging the notch in the ratchet f', while it remains stationary upon the upward stroke of the rack.

As the plunger C and the other devices to be hereinafter described are driven from the same shaft as the rack-bar e^2 and must continue their movements after the table is stopped, some provision is necessary to disengage the pawl from the ratchet f' before the rack e^2 has reached the limit of its downward stroke. It is also necessary that said pawl be disengaged at the moment the table has been revolved one-sixth of a revolution (if the table be provided with six molds, as here shown) in order to bring each mold successively under the plunger C. For this purpose I have provided a sliding tappet G, having an inclined or beveled end, which is intermittently brought in the path of a stud f^4 on pawl f and throws the pawl out of engagement with the notch of wheel f'. The tappet is operated by a lever g, fulcrumed at g' on the frame of the machine. The upper end of the lever is provided with a friction-wheel, which is held in the groove of cam G' by a slotted guide-yoke g^2, in which the end of the lever plays. The lower end of the lever is connected to a sliding bar g^3, which has an arm g^4 at its opposite end, to which the tappet G is secured. The arm g^4 is pivoted on a stud-bolt between its connection with arm g^3 and the tappet G, as clearly shown in Fig. 9.

Upon the end of shaft F^2 is secured a beveled pinion F^3, which meshes with a similar beveled pinion F^4, which latter is secured upon the lower end of a vertical shaft F^5, upon the opposite end of which shaft is secured a cog-wheel F^6, which meshes with the teeth of a cogged rim b^5 upon the lower edge of the table B. It will thus be seen that as the shaft F^2 is intermittently revolved by the click-movement above described an intermittent rotary motion will be imparted to the table B.

The means by which the table B is stopped in proper position to bring the molds under the plunger will now be described. The periphery of table B has six uniformly-spaced perforations b^6, the mouths of which are enlarged or flaring to receive successively the end of a sliding pin or rod H, which is guided horizontally in the frame of the machine and actuated by a grooved cam H', secured upon the driving-shaft D, through a pitman h, which carries a friction-wheel that enters the groove in cam H'. The opposite end of the pitman h is connected to a bell-crank lever h'. The opposite end of the bell-crank lever is connected to the sliding rod H by a connecting-rod H^2.

In order to check the momentum of the table and prevent jarring, I have provided a brake, which comes into play just before the perforations b^6 come in position to receive the rod or pin H. The brake-shoe I, Fig. 1, is secured upon one end of a sliding rod I', guided in boxes i, secured on the frame of the machine. The brake-rod is actuated by a vertically-reciprocating rod I^2, which carries a friction-pulley at its upper end, which pulley is held against the periphery of a cam or eccentric I^3, secured upon the main shaft D by a coiled spring i', the upper end of which is attached to a bracket i^2, secured to or projecting from the frame A. The lower end of the rod I^2 is connected to one arm of a bell-crank lever. (Shown in dotted line, Fig. 1.) The opposite end of the bell-crank is connected to the brake-rod. The brake-shoe is held with elastic pressure against the rim of table B by springs I^4, the tension of which is regulated by nuts upon the end of the brake-rod between the arms of the looped spring. The table is stopped in position to receive the pin H by a sliding rod J, which is guided in a box j and is thrown in the path of stops b^7, which project from the rim of table B. The stop-rod J has its outer end bent at an angle and perforated. Through this perforation the end of the brake-rod I' passes, one of the nuts for regulating the tension of spring I^4 being upon each side of the bent end of the stop rod or pin J. The stop-rod and brake-rod are actuated by the same means and simultaneously. Thus the molds on table B will be brought accurately under the plunger-die, and this is necessary, because in order to insure accurate work the upper die must accurately fit the lower one, and if the dies should not register properly the machine would be broken.

In practice the faces of the upper die c and lower die b^2 are suitably engraved or ornamented, so that both top and bottom of the finished cake are suitably impressed.

The plunger C, carrying the upper die c, is vertically reciprocated by a flanged cam C', which is secured upon the driving-shaft D. The flange of cam C' is embraced by two friction-wheels, which are journaled in the upper end of plunger C, the one c' bearing upon the periphery of the cam C' and the other c^2 bearing upon the inside rim of the flange. By this means the plunger is brought down quickly at each revolution of the shaft and quickly returned, the highest part c^5 of the cam being a short curve for this purpose. The design is to hold the plunger at its upper position during the greater part of the revolution of the shaft D, so that the die moistening and cleansing brushes, hereinafter to be described, will have ample time to perform their functions.

Attached to the plunger C is an arm c^3 which carries at its outer end a vertical rod c^4, to the lower end of which is secured a flat plate C^2. This plate and its attachments are arranged to be actuated by the plunger C and brought down at the same time to act upon the blank cake in the mold in advance of the

one under the action of the die *c*. The object of this is to fairly set the soap-blank in the mold preparatory to receiving the action of the finishing-die *c*.

So far as described it will be seen that the blanks are placed in the molds successively, the table intermittently revolved to bring the molds under the action of the dies, and elevated out of the molds preparatory to being discharged therefrom. It is, however, necessary to the continuous operation of the machine that the molds be moistened and cleansed after each operation to prevent the soap adhering and to insure clean sharp impressions. For this purpose I have provided a movable or sliding brush to cleanse and at the same time moisten the upper movable die and a stationary brush to moisten and cleanse the lower die, with fountain attachments, whereby the brushes are continuously supplied with water. The sliding brush L is fitted in guides *l*, which guides are supported from brackets *l'*, secured to the frame of the machine. The sliding brush has its bristles projecting from top and bottom to sweep both the die and the cake to be pressed and is actuated by crank-lever L', which is pivoted upon a bracket l^2. The lower end of the lever is connected to the sliding brush by a hinged link l^3. The upper horizontal arm of the lever L' has a laterally-projecting pin carrying a friction-wheel l^4, which enters a grooved cam L^2, secured upon the driving-shaft D, by which the arm L' is vibrated to pass the brush under and in contact with the die *c* and cake to be pressed while they are at rest, the die being in its upper position. The stationary brush M is supported above the path of the molds and forward of the particular one from which the finished cake is discharged by a bracket-rod *m*, so that as the table is advanced one space after the cake is discharged the mold from which it has been discharged will be swept by the stationary brush in its passage under it and properly cleansed and moistened. The backs of the brushes L and M are perforated, as is also the bottom of the pan or vessel *m'*, secured upon the top of the brush M.

N is a water-tank having faucets *n n*, over the ends of which are secured flexible tubes l^5 and m^2, which conduct water from the tank N to the vessel *m'* on brush M and upon top of the sliding brush L. The brushes are kept moist by the operator regulating the flow of water from the tank N by means of the faucets *n n*. The water passes through the perforations in the backs of the brushes and thence to the bristles. The top of the table B inclines from the outer edge to the center opening, so that the surplus or overflow from the brushes will be discharged through the central perforated hub or journal of the table.

I will now describe the means for discharging the finished cakes from the machine either upon a slide or endless conveyer-belt. (Not shown.) O is a wheel or disk journaled on a pin in the end of a bracket *o*, which is secured to the frame of the machine. An intermittent vibratory motion is imparted to the disk O by a pitman *o'*, actuated by a rod o^2, which is secured to the reciprocating die-plunger C. To the disk O are pivoted two arms o^3 o^4, one above the other and both guided by a yoke o^5, extending from the journal around the periphery of the disk O. When the table is brought to rest and the die descends to stamp the cake brought under it, the cake just finished is brought in front of the discharging-arms o^3 o^4, the disk O will be given a partial revolution, the arm o^3 is first brought against the side of the finished cake, tilting it up slightly, when the more-quickly-advancing arm o^4 passes under the bottom of the cake, throwing it from the mold upon the conveyer. The arm o^4 is adjustable in a circumferential slot in the disk O for the purpose of regulating it to discharge with more or less force.

In order to insure an accurate placing of the blank within the mold when the blanks are fed by hand, as illustrated in the drawings, I have provided a guide P. (Shown in full line, Fig. 2, and in dotted line, Fig. 6.) This consists of an arm secured to the frame underneath the table B. The arm is bent around the edge of the table and over the top. The upper end is bent to a right angle and is so placed that when the table stops the empty mold will be directly underneath the angular end of the arm P, which then is practically an upward extension of one end and side of the mold beneath it. Now to feed the blank cake to the mold it is placed and held in the angle of arm P, and so soon as the table stops it is dropped down into the mold. If, however, the cake should not be placed perfectly true, the preliminary setting-plate C^2 will press it truly in the mold before it reaches the impression-die *c*.

The mode of operation of the machine is as follows: The machine being started, the attendant, standing in front of the guide-bracket P, feeds the blanks to the molds as they stop underneath this bracket. The filled molds then pass around as the table is revolved, first coming under the action of the presser C^2, then under the action of the die *c*. During the time from which the blank is placed in the mold until it is impressed by the die *c* the bottom die b^2 is in the lower position, but after the next partial revolution of the table, after the soap cake is impressed, the lower die is forced up to the inclined track B' until the mold stops opposite the discharging-fingers of arms o^3 o^4. After the empty mold passes this point the lower end of the shank enters the T-groove in track B^2. As the table is still further revolved the bottom b^2 of mold *b'* is drawn down preparatory to receiving another blank. The machine is thus kept in constant motion, and the only attention it requires is to have the blanks fed to it.

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

1. In a soap-press, the combination, substantially as set forth, of the vertically-reciprocating plunger C, carrying the upper die *c*, the table B, carrying a series of molds arranged to be brought successively under the action of the die *c*, a brake-shoe arranged to bear against the rim of the table, and brake mechanism connected to said shoe and actuated from the driving-shaft to intermittently check the momentum of the table, and stops similarly actuated to stop and hold the table while the plunger is brought down upon the mold beneath it.

2. In a soap-press, the combination, substantially as hereinbefore set forth, of the table B, having a cogged rim, the shafts F^2 F^5, pinions F^3 F^4 F^6, and the click-movement actuated from the driving-shaft for the purpose of imparting an intermittent movement to the table, and a brake-shoe arranged to bear against the rim of the table and connected by a link-movement to a cam on the driving-shaft to gradually check the momentum of the table.

3. The combination of the vertically-moving die *c*, revolving table B, the molds *b'*, secured upon said table, the vertically-movable lower dies b^2, the tracks B' B^2 to elevate and lower said dies as the table is revolved, the gear connecting said table with its driving-shaft, and the click-movement consisting of the disk F, ratchet *f'*, pawl *f*, pinion F', rack *e*, pitman *e'*, and crank-wheel E.

4. The combination, in a soap-press, of the vertically-reciprocating plunger, the revolving table and molds, the click-movement for revolving the table, and the click-releasing devices consisting of the knocker G, cam G', the lever *g*, and rods connecting said knocker G with the cam G' for the purpose of disconnecting the click-pawl from the driving-ratchet, substantially as shown and described.

5. The combination of the reciprocating upper die and mold, the reciprocating brush L, and means, such as shown, to keep the brush moist and pass it in contact with the upper die after each stroke, substantially as specified.

6. The combination, substantially as specified, of the reciprocating plunger and the intermittently-revolving table carrying a series of molds with the sliding brush L, stationary brush M, tanks N, and connections m^2 l^5, leading from the tank to the brushes, for the purpose set forth.

7. In combination with a soap-press comprising a vertically-reciprocating table carrying molds and means to stop said table to bring said molds successively under the action of the upper die, of the guide-bracket P, arranged above mold 1 for convenience in feeding the blanks to the machine, substantially as specified.

8. The combination, substantially as set forth, of the revolving table carrying molds *b'*, and the lower die b^2, vertically movable within said molds, the inclined tracks B B^2 to alternately raise and lower said lower die b^2, the vertically-reciprocating upper die, and the discharging device consisting of fingers o^3 o^4 and their connections with the upper-die carrier, whereby the die-carrier is first tilted and the cake finally discharged from the mold.

9. In a soap-press of the character described, the combination, substantially as specified, of the disk O, the arms o^3 o^4, pivoted to said disk, the arm o^2, connected to the upper-die carrier, and the pitman *o'*, connecting said arm to the disk, whereby said disk is partially rotated by the downward stroke of the die-carrier and the ends of arms o^3 o^4 brought against the finished cake to discharge it from the mold.

10. The combination of the reciprocating upper die, the revolving table, the molds secured thereon, the moistening-brushes for said dies and molds, and means, such as shown, to alternately bring the molds under the upper die and moistening the dies, the said table having a hollow hub and top inclined from the molds to the center, whereby the overflow from the moistening devices is carried off, substantially as specified.

11. The combination of the frame A, the table and driving-shaft D, mounted to revolve therein, the molds secured upon said table, the perforated brushes for moistening said molds, the vertically-moving upper die, and the cams secured upon the driving-shaft and their connections, whereby the machine is operated to revolve the table, stop it in position, press the cake, and moisten the molds and dies, substantially as set forth.

CHARLES HOFF.

Witnesses:
M. L. MURRAY,
GEO. J. MURRAY.