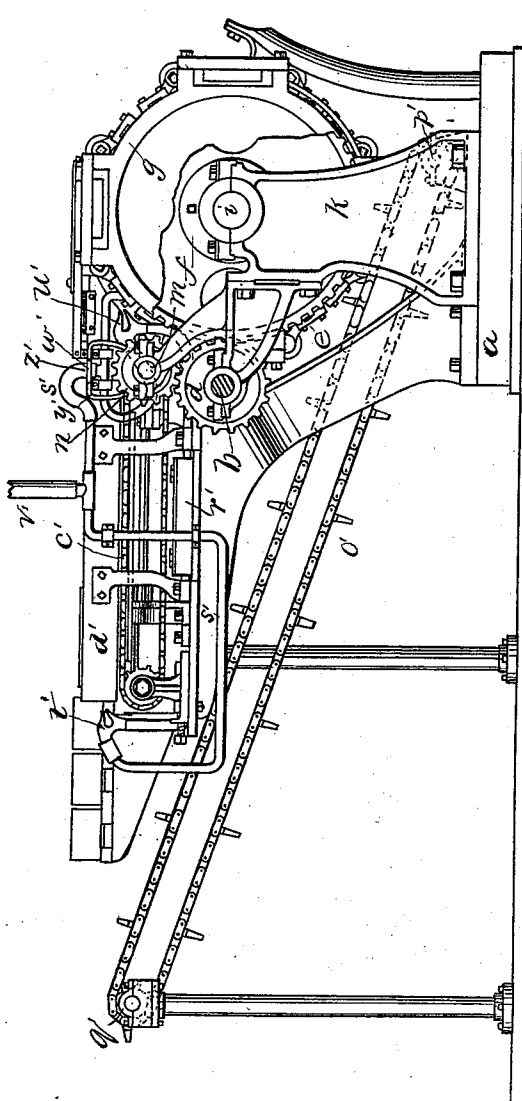


8 Sheets—Sheet 1.

No. 532,891.

Patented Jan. 22, 1895.



7

WITNESSES.

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(No Model.)

8 Sheets—Sheet 2.

E. D. MELLEN & G. C. BECKWITH.
SOAP PRESS.

No. 532,891.

Patented Jan. 22, 1895.

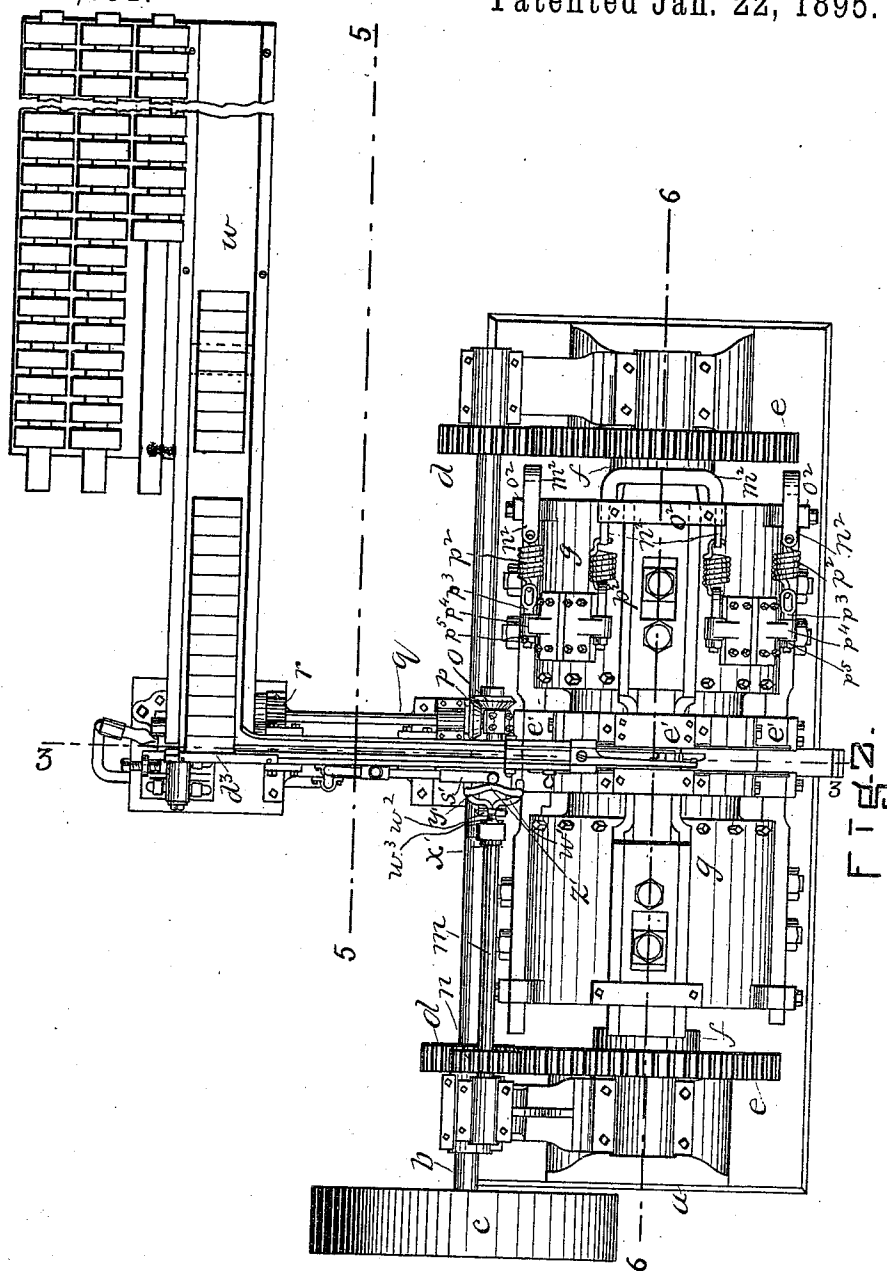


FIG. 2.

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8 Sheets—Sheet 3

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SOAP PRESS.

No. 532,891.

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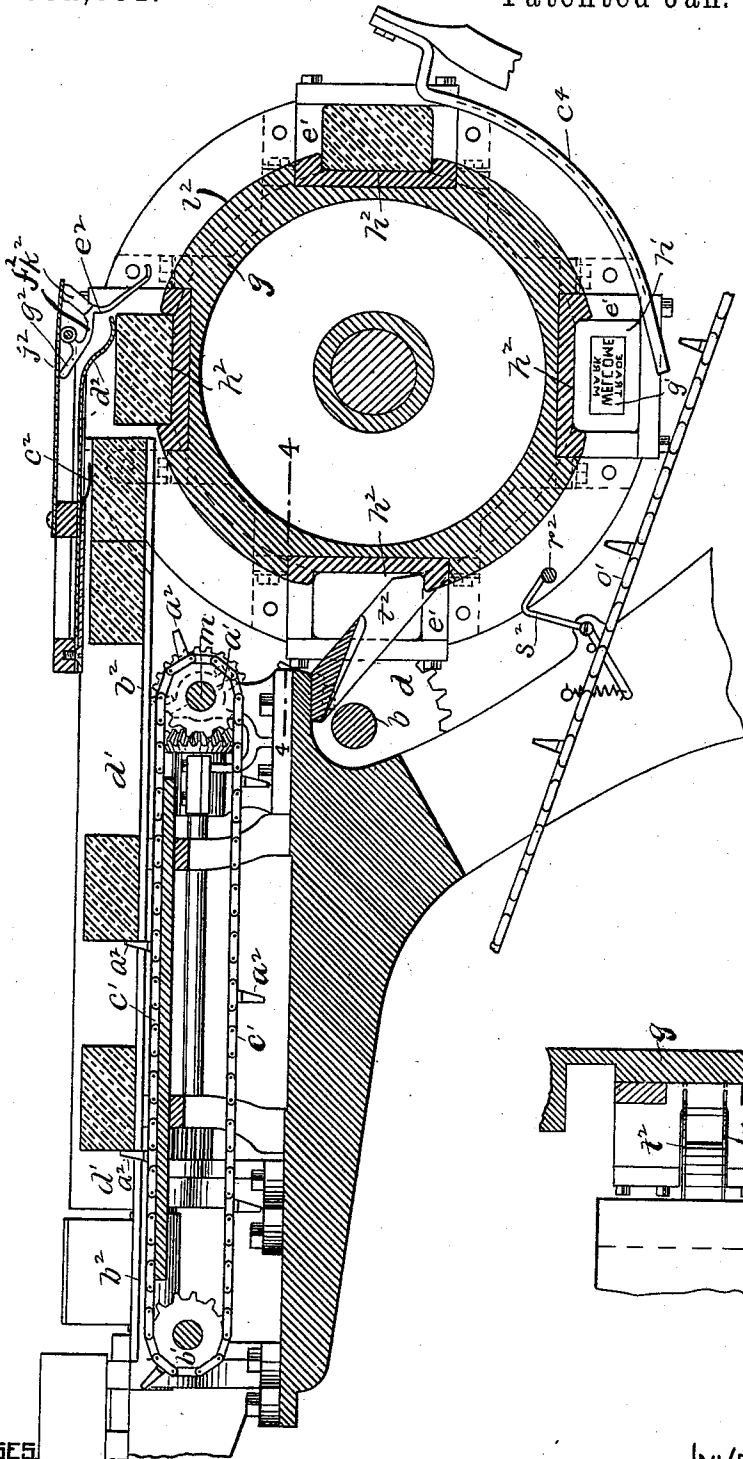


Fig. 3-

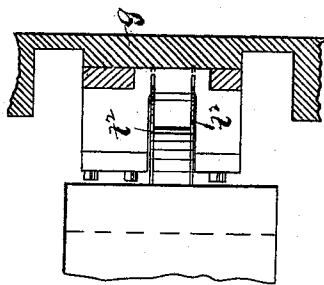


Fig. 4-

WITNESSES

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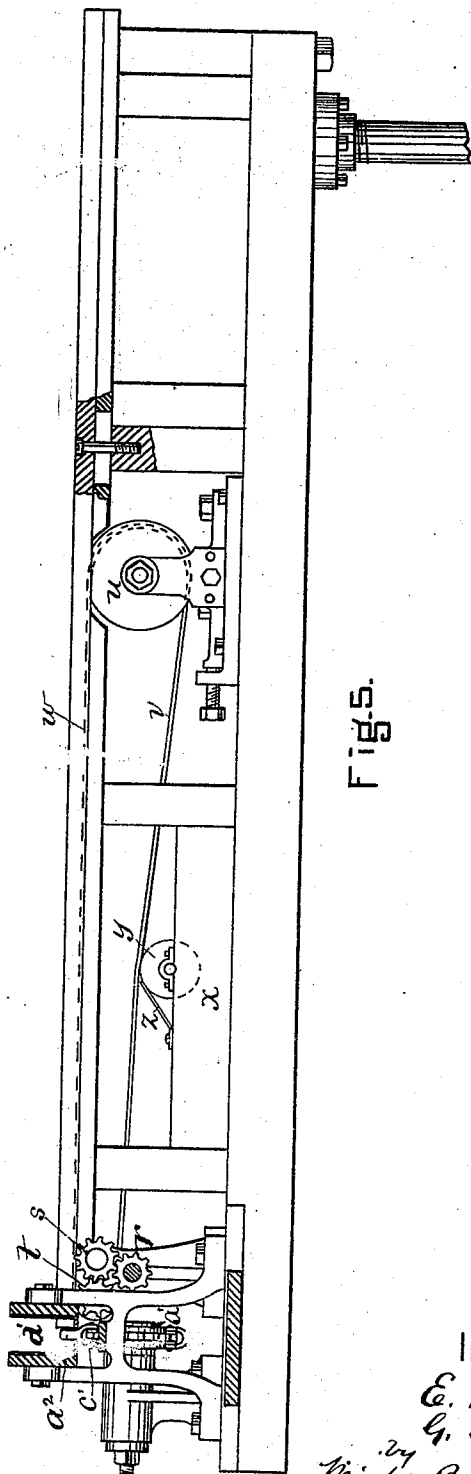


Fig. 5.

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8 Sheets—Sheet 5.

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No. 532,891.

Patented Jan. 22, 1895.

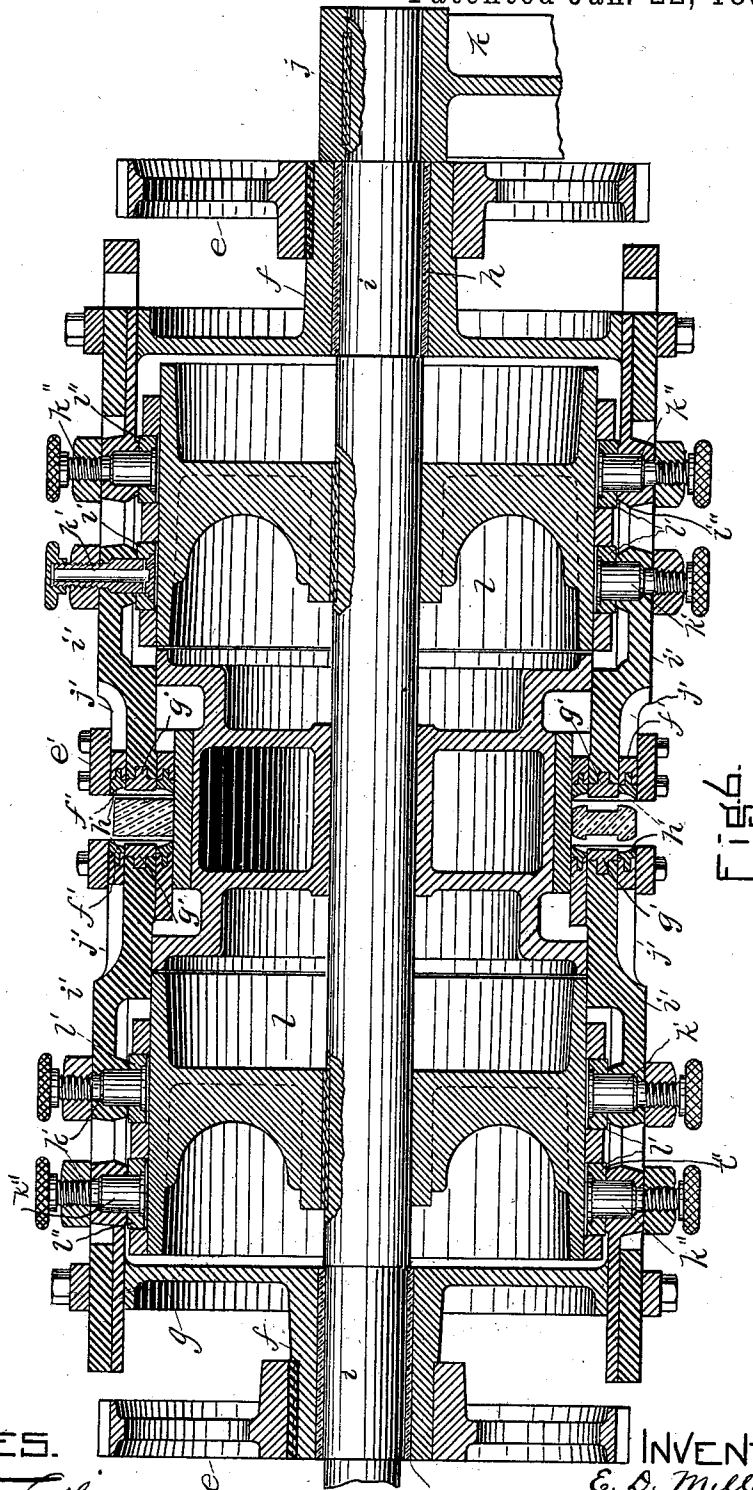


Fig. 6.

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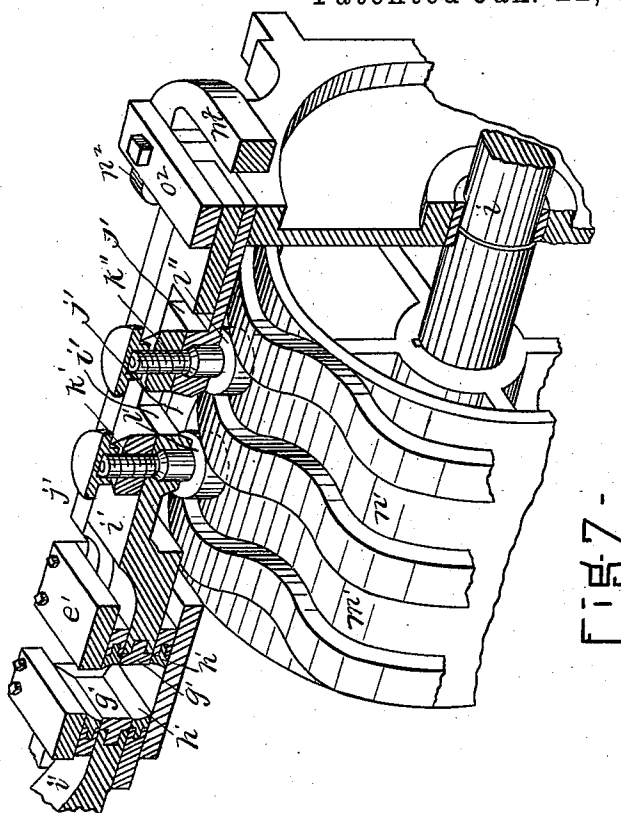
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SOAP PRESS.

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Patented Jan. 22, 1895.



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(No Model.)

8 Sheets—Sheet 7.

E. D. MELLEN & G. C. BECKWITH.
SOAP PRESS.

No. 532,891.

Patented Jan. 22, 1895.

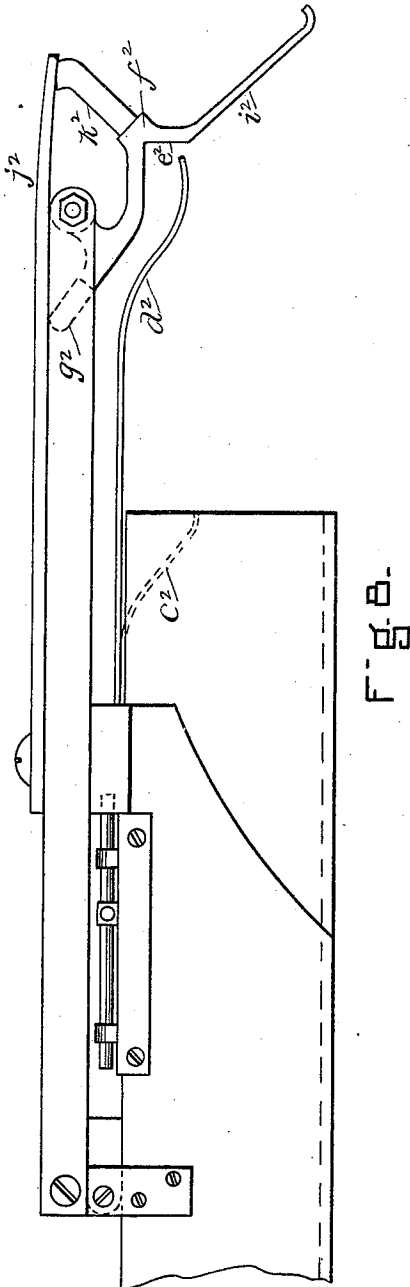


Fig. 8.

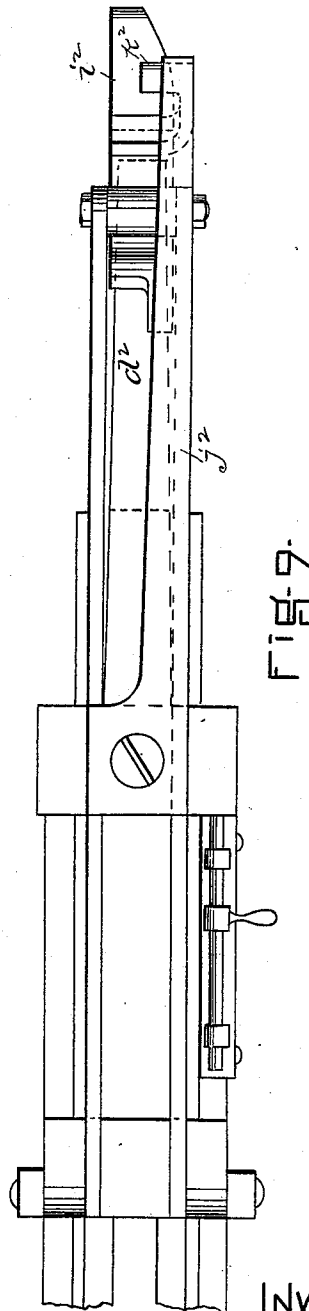


Fig. 9.

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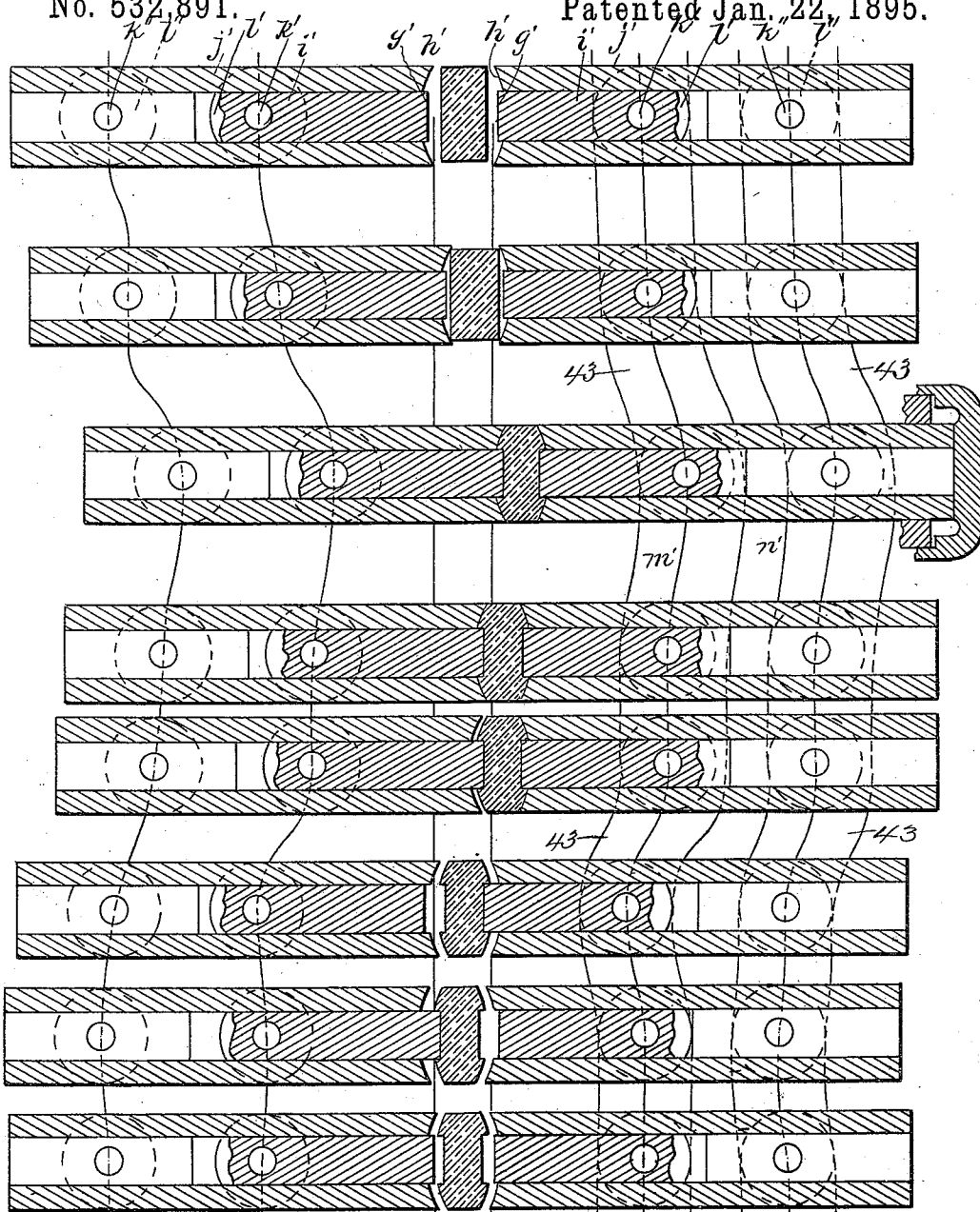
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SOAP PRESS.

No. 532,891.

Patented Jan. 22, 1895.



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Path of faces of die-box.
FIG. 10.

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UNITED STATES PATENT OFFICE.

EDWIN D. MELLEN, OF CAMBRIDGE, AND GEORGE C. BECKWITH, OF SOMERVILLE, ASSIGNORS TO CURTIS, DAVIS & CO., OF CAMBRIDGE, MASSACHUSETTS.

SOAP-PRESS.

SPECIFICATION forming part of Letters Patent No. 532,891, dated January 22, 1895.

Application filed May 10, 1892. Serial No. 432,431. (No model.)

To all whom it may concern:

Be it known that we, EDWIN D. MELLEN, of Cambridge, and GEORGE C. BECKWITH, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Soap-Pressing Machines, of which the following is a specification.

This invention has relation to machines for molding and pressing soap and other compressible substances for the purpose of compacting the same, and giving requisite form to, and stamping or impressing desired ornamentation, mark, or lettering upon cakes or bars thereof.

It is the object of this invention to provide an organized machine for the purpose mentioned, which will accomplish the pressing and molding of soap much more expeditiously, economically, and efficiently than the same can be effected by machines now commonly employed.

Our invention consists of an improved machine, considered as a whole, which is adapted to attain the ends of the before mentioned purpose; and it consists also of improved parts of devices and combinations or groups of parts which may be used as is herein shown and described, or may be employed in machines differently organized, equipped, or arranged.

Our invention will first be described in connection with the annexed drawings, forming a part of this specification, and then be pointed out in the claims appended.

Figure 1, is a side view of our improved machine. Fig. 2, is a top plan view thereof. Fig. 3, is a sectional view taken on the line 3—3, Fig. 2. Fig. 4, is a sectional detail view taken on the line 4—4, Fig. 3. Fig. 5, is a sectional view taken on the line 5—5, Fig. 2. Fig. 6, is a sectional view taken on the line 6—6, Fig. 2. Fig. 7, is a sectional detail view designed particularly to show the manner of operating the die-bars. Fig. 8, is a side elevation of the means employed to control the cake of soap at the time of, and previous to, its being acted upon by the die. Fig. 9, is a top plan view of the means shown in Fig. 8. Fig. 10, is a diagram intended to show the

manner in which the dies act upon a cake of soap from the time the cake is fed into position therebetween to its release or discharge from the dies.

The same letters designate the same parts or features as the case may be, wherever they occur.

In the drawings: *a* designates the frame which may be of any form and composed of any material suited to the operation of the machine.

b is the driving shaft which may be rotated by a belt passing around a pulley *c* and driven from a pulley on a main shaft suitably located. The driving shaft is journaled in suitable bearings on the frame *a*, and has secured upon it two gear wheels *d d* which mesh with gear wheels *e e* secured to the hubs *f f*, or it may mesh with gear teeth formed upon the ends of a cylinder or drum *g*.

The hubs *f f* are provided with suitable bearing bushings *h h* and are journaled upon a stationary shaft *i*, keyed, as at *j*, in a standard *k* of the frame.

l designates a cam cylinder and by this term it is meant to define a cylinder provided with cams or cam grooves keyed to the shaft *i* so as to be held stationary therewith, around which cam cylinder the cylinder or drum *g* is adapted to be revolved.

m designates a shaft provided at one end with a gear *n* which is engaged and driven by a gear *d* on the driving shaft *b*, and provided at its other end with a bevel gear *o* which meshes with and drives a similar bevel gear *p* on the adjacent end of a counter-shaft *q* to the opposite end of which is secured a spur gear *r* which meshes with and drives a small idle gear *s*, the latter engaging and driving a spur gear *t*, which is connected with a pulley or drum (not clearly shown) around which, and a pulley or drum *u*, passes the feed belt or apron *v*, the upper or forward moving portion of which is arranged to advance along the bottom of the feed raceway *w*. See Figs. 2 and 5.

x designates a tank adapted to contain water or other liquid, arranged below the feed raceway, and beneath the outward traveling portion of the belt which passes in contact

with a roller y journaled in bearings on the tank x , and dipping into the liquid therein, in order to lubricate the outer surface of the belt v , if necessary. A suitable spring plate z may be provided below the belt for pressing out undue accumulation of water in the covering of the roller y .

Upon the shaft m is secured a sprocket wheel a' around which, and a sprocket wheel b' arranged at or to the rear of the forward end of the feed raceway, is passed a spiked or studded chain or apron c' , the upper or forward moving portion of which advances along the bottom of the "soap alley" d' , which extends from the forward or inner end of the feed raceway to a point centrally over the revoluble cylinder or drum.

e' designates die-boxes formed in or upon the periphery of the cylinder g , at equal distances apart. There may be as many of these die-boxes and their co-operating adjuncts employed on a single cylinder, as may be found convenient or feasible. In the present instance, the cylinder is equipped with four die-boxes.

f' designates the dies, a pair of which are employed in connection with each die-box so as to operate upon opposite sides of a cake or bar of soap in the die-boxes, and effect the compression, molding, and marking of the same. Each die is composed of two parts; a central or panel part g' and an outer or border part h' . The panel part g' of each die is secured to the forward end of a longitudinally movable bar or plate i' , and the border part is connected to a similar bar or plate j' , movable in like manner, making the two parts of the die independently movable.

A stud or bolt k' is connected with each bar i' and is extended through a slot or opening in the bar or plate j' , and is provided on its inner end with an anti-friction roll l' arranged to operate in the cam groove m' on the face of the stationary cylinder l ; and the bar or plate j' has secured to it a stud or bolt k'' which extends through a slot or opening in the bar or plate i' and is provided on its inner end with an anti-friction roll l'' which extends into the cam groove n' on the face of the stationary cylinder. (See Figs. 7, 8, and 10.) With this construction it will be seen that as the die-carrying cylinder is revolved the cam grooves m' n' may act on the anti-friction rollers of the studs or bolts k' k'' and move the bars i' j' and their attached dies independently or in unison, in a direction axially of the cylinder.

o' designates a studded or spiked chain belt or apron extended over the sprocket wheels p' q' , the former being arranged centrally below the cylinder g and the latter at any desired distant point. One of the said sprocket wheels may be driven in any convenient way, so as to cause the upper portion of the chain belt to travel in a direction from the machine proper, and the lower portion to move toward the sprocket wheel p' .

r' is a tank of water, or other suitable liquid, from which are led pipes s' which communicate with atomizers t' u' , the former to spray and lubricate the "soap alley" d' , and the latter the dies, die-boxes, and associated parts. But one atomizer u' is clearly shown in Fig. 1, but two may be, and in common practice are, used, so that the spray may be made to impinge against each of the faces of the dies, which, as before explained, operate in pairs. Air under pressure may be supplied to the pipes s' from any suitable source through the pipe v' .

The pipes s' may be made of rubber or other compressible material, and in order that the atomizers u' may operate intermittently, so as to throw a spray only when the dies and die-boxes come into position opposite the said atomizers, we may provide an angular bail or loop w' , and hinge or pivot it at the point of its angle as at w^2 upon the frame in such manner and position that its substantially horizontal part w^3 will extend under and be acted upon to intermittently depress it by a cam x' on the revoluble shaft or rod m . (See Fig. 2.) The said bail or loop will be suitably spring-pressed, so that its vertical part or arm y' will normally bear against the flexible pipe at the point z' , and so close the passage through the same, and shut off the air from the atomizing or spraying device u . When, however, the cam x' acts upon the horizontal part or arm w^3 of the bail or loop, the vertical part or arm y' will be drawn away from the flexible pipe s' , air will be admitted there-through and the spraying device will be operated. The parts are so timed as that the spraying device will be operated the moment the dies come into proximity thereto.

d^3 designates what is termed a "dam" against which the cakes of soap carried forward by the apron or belt in the raceway w are stopped so that they can be engaged by the spikes or projections a^2 of the studded chain c' , as hereinafter explained.

b^2 designates the track or bottom of the soap alley d' .

c^2 is a spring arranged to bear upon the cake of soap before it is fed between the dies and arrest the momentum of said cake after the spike a^2 of the chain c' leaves it.

f^2 designates a pivoted holder provided with arms g^2 h^2 upon which bears the free end of a spring j^2 to maintain the holder in normal position.

e^2 designates a stop-shoulder formed on the holder to stop the cake in proper position as it is fed forward between the dies.

l^2 designates a plain surface on the cylinder g between the die-boxes upon which the cake first rests after leaving the support b^2 , and d^2 designates a spring adapted to bear downward on the cake after it is fed thereunder and upon the surface l^2 of the cylinder g .

While the cylinders g and l are equipped with many parts of the same structural character and functions on opposite sides of the

dies and die boxes, neither of the said cylinders is divided along the line of movement of said dies and die-boxes. (See Figs. 3 and 6.) As before stated the cylinder l is fixed on the shaft i and the cylinder g is revolved around the former.

In the operation of the machine, the cakes of soap will be placed upon the traveling apron w and carried by it against the dam d^3 in the "soap alley" d' in the bottom of which, though out of contact with the soap, travels the endless chain or belt c' . The apron or belt v which will have been lubricated by the roller y in the tank x , will be so speeded as to slip beneath the cakes of soap stopped against the dam d^3 , so that a cake may always be in position against the dam to be engaged by a stud or spike a^2 of the endless belt c' and moved along on the support b^2 forming the bottom of the "soap alley" d' . The belt c' will be timed in its movement to accord with the time of movement of the cylinder g , so that the third cake in the rear upon the support b^2 will force forward the cake which had previously passed under and was arrested in its movement by the spring c^2 , ahead upon the surface l^2 of the cylinder g and against the stop-shoulder e^2 of the triple-armed holder f^2 and under the spring d^2 . After the cylinder g shall have moved to the position shown in Fig. 3, bringing a recess h^2 beneath the dies to the sides of the forward cake of soap, the spring d^2 will force the said cake down into place in the said recess between the dies under the arm i^2 of the holder which will maintain it in proper position until it is taken by the dies. A spring j^2 is constructed and arranged to bear upon the arm k^2 of the holder to cause the latter to act in the desired manner and restore it to its normal position after a cake of soap shall have been carried therefrom under, in which normal position the spring j^2 will bear upon both arms g^2 k^2 of the holder. The form of the cam grooves $m' n'$ in the stationary cylinder is such that when a pair of dies arrives on top of the latter cylinder they will be in separate position, so as to receive a cake of soap therebetween, as is shown in the first or uppermost representation in the diagram portrayed by Fig. 10. In the continued movement of the cylinder g , both parts of the striking die will be advanced in unison, (owing to the form of the cam grooves $m' n'$ acting upon the bars $i' j'$), carrying the said cake of soap over against the opposite die, as is indicated in the second position represented in Fig. 10. The dies with the cake of soap held between them will remain in this position until they have advanced from under the arm i^2 of the holder f^2 , when they will advance to the full stroke of the striking dies as shown in the third position in Fig. 10. The bars $i' j'$, carrying the dies which operate at all times in the die-box, are at this point forced against the yoke or bar m^2 which is arranged in their rear, and the angular arms n^2 of which are adapted to

slide in guides or bearings o^2 on the cylinder g . Stout springs p^2 are attached at one of their ends to the said arms n^2 and are connected at their other ends to bolts p^3 which pass through holes formed in lugs p^4 , connected with the cylinder g , and on the screw-threaded ends of the said bolts are nuts, p^5 , by the turning up or out of which the tension of the said springs p^2 may be adjusted. The cam grooves $m' n'$, on the right, as viewed in Fig. 10 are widened between the points 43, 43, where the compression of the soap by the dies takes place, in order that the force exerted by the advance of the striking dies may be received upon the springs p^2 of the bars $i' j'$ of the receding dies, and said dies with their rolls or bowls $l' l''$ may yield axially of the cylinder unconfined by the cam grooves $m' n'$ if the cake under compression should chance to be unduly large. This construction is designed to give suitable and proper compression to shape the cakes, which may vary somewhat in their dimensions before being pressed, and also to relieve the machine from undue strain. The set of dies with the compressed cake between them then recede to the fourth position shown in Fig. 10, in which the "striking" die is clear of the die-box. This position is taken in order that air may be admitted when the outer or border portion of the striking dies recedes as shown in the fifth position of this figure. Then all parts of the die recede in unison until the outer or border portion of the opposite or "buffer" die emerges from the die-box and then pauses. The other parts of the die continue to recede, the panel part of the striking die receding more rapidly than the others, to the sixth position of the figure. At this point the cake of soap will ordinarily be freed from the dies and will fall upon the guide or chute c^4 from which it will slide upon the studded chain o' . Should the cake, however, adhere to the panel part of the "buffer" die, it will be detached by being brought into contact with the border portion of the die as the panel portion recedes to the seventh position of the figure. At the same time, the panel portion of the "striking" die is advanced to knock or jostle the cake should it adhere to the recess h^2 . These movements take place and are completed during the first half of the revolution of the cylinder. The dies then take the position shown in the eighth position of the figure, which they retain during the completion of the cycle. Should the molded cake still have adhered in the recess h^2 after the dies have been retracted, which might happen should the cake or recess have been too freely moistened by the feed belt in the race-way w or by the atomizers, it will be freed by the lower forward corner of the cake being brought into contact with the rod r^2 which extends across the path of the cake as shown in Fig. 3, and which is connected with the upper end of a spring-pressed lever s^2 . The said rod r^2 will yield so

as not to materially deform the molded cake, but will act with sufficient force to free the latter from the recess h^2 and will tip it over upon the studded apron or chain o' .

5 t^2 designates scrap-removing knives supported upon any stationary part of the machine and arranged close to the line of travel of the face of the die-boxes to remove any scrap adhering thereto to prevent clogging.
10 This important feature of the invention is most clearly shown in Figs. 3 and 4.

If the scrap which quickly collects upon the die-boxes were not quite thoroughly removed, the machine would soon become so clogged as
15 to be inoperative.

It is obvious that changes may be made in the form and arrangement of parts comprising the invention without departing from the nature or spirit thereof.

20 It is also obvious that parts of the invention are applicable to other machines than soap-presses, and we do not therefore restrict our improvements to any particular use or uses.

25 Having thus described the nature of our invention and explained a way of constructing and using the same, though without attempting to set forth all of the forms in which it may be made or all of the modes of its employment, we declare that what we claim is—

30 1. A soap press comprising in its construction a revoluble cylinder provided with a die-box and a pair of axially movable dies for acting upon the cakes of soap delivered thereto, substantially as described.

35 2. A soap press comprising in its construction a revoluble cylinder, a die-box, and a pair of axially movable dies for acting upon the soap in the die-box, one of said dies being cushioned or yielding, substantially as described.

40 3. A soap press comprising in its construction a revoluble cylinder, a die-box, a pair of axially movable dies for acting upon the soap, an appliance for cushioning one of said dies, and means for adjusting the cushion to exert greater or less tension, substantially as described.

45 4. A soap press comprising in its construction a revoluble cylinder provided with a plurality of pairs of axially movable dies, a traveling apron for delivering cakes of soap to the dies, and a traveling apron for receiving and carrying away molded cakes of soap delivered
55 from the dies, substantially as described.

50 5. A soap press comprising in its construction a revoluble cylinder provided with a pair of axially movable dies, and a stationary cylinder, around which the first mentioned cylinder revolves, provided with cams to act upon and move the dies, substantially as described.

55 6. A soap press comprising in its construction a revoluble cylinder provided with a pair of axially movable dies, die box, and scrap removing knives arranged in close proximity to

the line or path of travel of the face of the die box, substantially as described.

7. A soap press comprising in its construction a revoluble cylinder provided with axially movable dies, and intermittently operated atomizing or spraying devices for spraying the said dies, substantially as described. 70

8. Means for feeding cakes of soap to dies of a soap press comprising in its construction a "soap alley" provided with a fixed track upon which the cakes of soap may move, a traveling chain or belt arranged parallel with the soap alley but out of line with the track, and provided at intervals with spikes or studs, a carrying apron or belt, arranged at an angle to the soap alley and spiked chain or belt, to carry the cakes of soap to the latter and a dam to stop the cakes of soap at the soap alley, whereby the spikes of the chain or belt may engage the cakes successively and move them forward on the track substantially as described. 75 80 85

9. The combination of the "soap alley" provided with a fixed track upon which the cakes of soap may be moved, means for feeding the cakes of soap to the soap alley, a dam to stop a cake of soap in proper position in the soap alley, with the spiked or studded chain or belt constructed or arranged parallel with the said soap alley but out of line with the track thereof, whereby the spikes of the chain or belt may engage the cakes stopped at the dam and move the same forward on the track, as set forth. 90 95 100

10. A soap press comprising in its construction a revoluble cylinder provided with the plane surface t^2 and the recess h^2 , and axially movable dies carried by the cylinder for molding the soap delivered in the said recess, substantially as set forth. 105

11. The combination, with the "soap alley" and means for feeding the cakes of soap forward therein, of the revoluble cylinder and axially movable soap-molding dies carried thereby, the holder f^2 provided with the stop-shoulder e^2 , and the spring d^2 , substantially as set forth. 110

12. A soap press comprising in its construction a pair of movable dies adapted to engage and press a cake of soap between them, each die being composed of a plurality of parts, and each part being independently movable, and means for moving the parts of each die as a unit, and means for subsequently moving the said parts independently and out of time with another, whereby a cake of soap may be first molded and subsequently automatically freed from the dies, substantially as set forth. 115 120 125

13. A soap press comprising in its construction a revoluble cylinder provided with a plurality of pairs of movable dies, each pair being adapted to engage and press a cake of soap between them, and means for moving the said dies as the cylinder is revolved, substantially as set forth. 125 130

14. A soap press comprising in its construc-

tion a revoluble cylinder provided with a plurality of pairs of movable dies, each pair being adapted to engage and press a cake of soap between them, and a stationary cylinder 5 around which the first mentioned cylinder revolves, the said stationary cylinder being provided with cams for moving the said dies substantially as set forth.

15. A soap press comprising in its construction a continuously movable revoluble cylinder provided with a plurality of pairs of movable dies, each pair being constructed and arranged to engage and press a cake of soap between them and to be separated after the 15 cake is pressed to discharge the same, substantially as set forth.

16. A soap press comprising in its construction a continuously movable revoluble cylinder provided with a plurality of pairs of movable dies, each pair being constructed and arranged to engage and press a cake of soap between them and to be separated after the 20 cake is pressed to discharge the same and a stationary drum around which the cylinder revolves provided with cams for acting upon the dies, to move the same, substantially as set forth.

17. A soap press comprising in its construction a continuously movable revoluble cylinder provided with a plurality of pairs of mov- 30

able dies, each pair being constructed and arranged to engage a cake of soap between them when they arrive at substantially their highest point of travel on the cylinder, to press the said cake, and discharge the same 35 when they arrive at substantially their lowest point of travel, and means as described for moving the dies, substantially as set forth.

18. A soap press comprising in its construction a continuously movable revoluble cylinder provided with a plurality of pairs of movable dies, each pair being constructed and arranged to engage a cake of soap between them when they arrive at substantially their highest point of travel on the cylinder, to 45 press the said cake, and discharge the same when they arrive at substantially their lowest point of travel, and a stationary drum around which the cylinder revolves, provided with cams for acting upon the dies to move the 50 same, substantially as set forth.

In testimony whereof we have signed our names to this specification, in the presence of two subscribing witnesses, this 27th day of April, A. D. 1892.

EDWIN D. MELLEN.
GEORGE C. BECKWITH.

Witnesses:

JAMES W. LOVELAND,
ARTHUR W. CROSSLEY.