

(No Model.)

5 Sheets—Sheet 1.

J. ECKMAN.  
SOAP PRESS.

No. 504,206.

Patented Aug. 29, 1893.

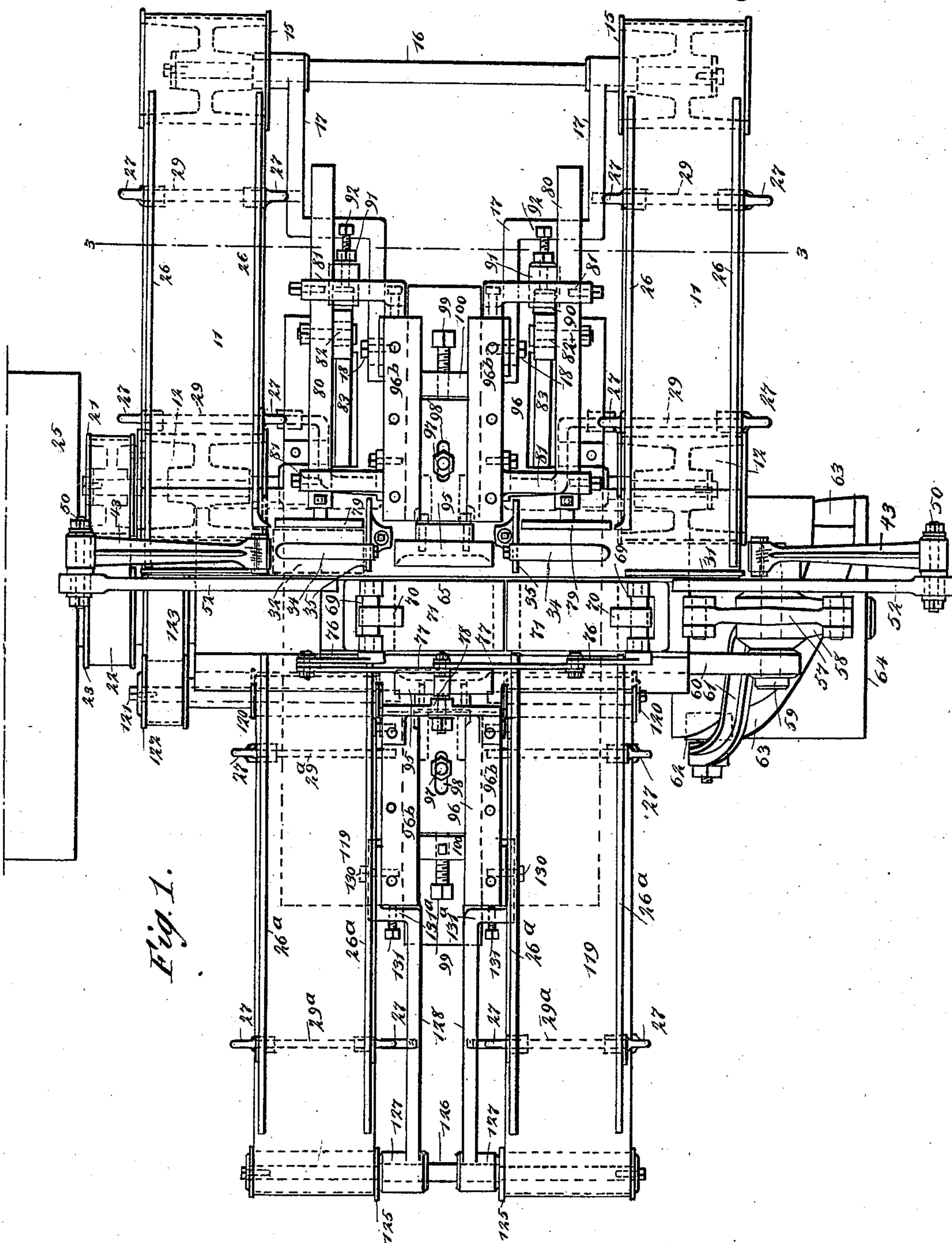


Fig. 1.

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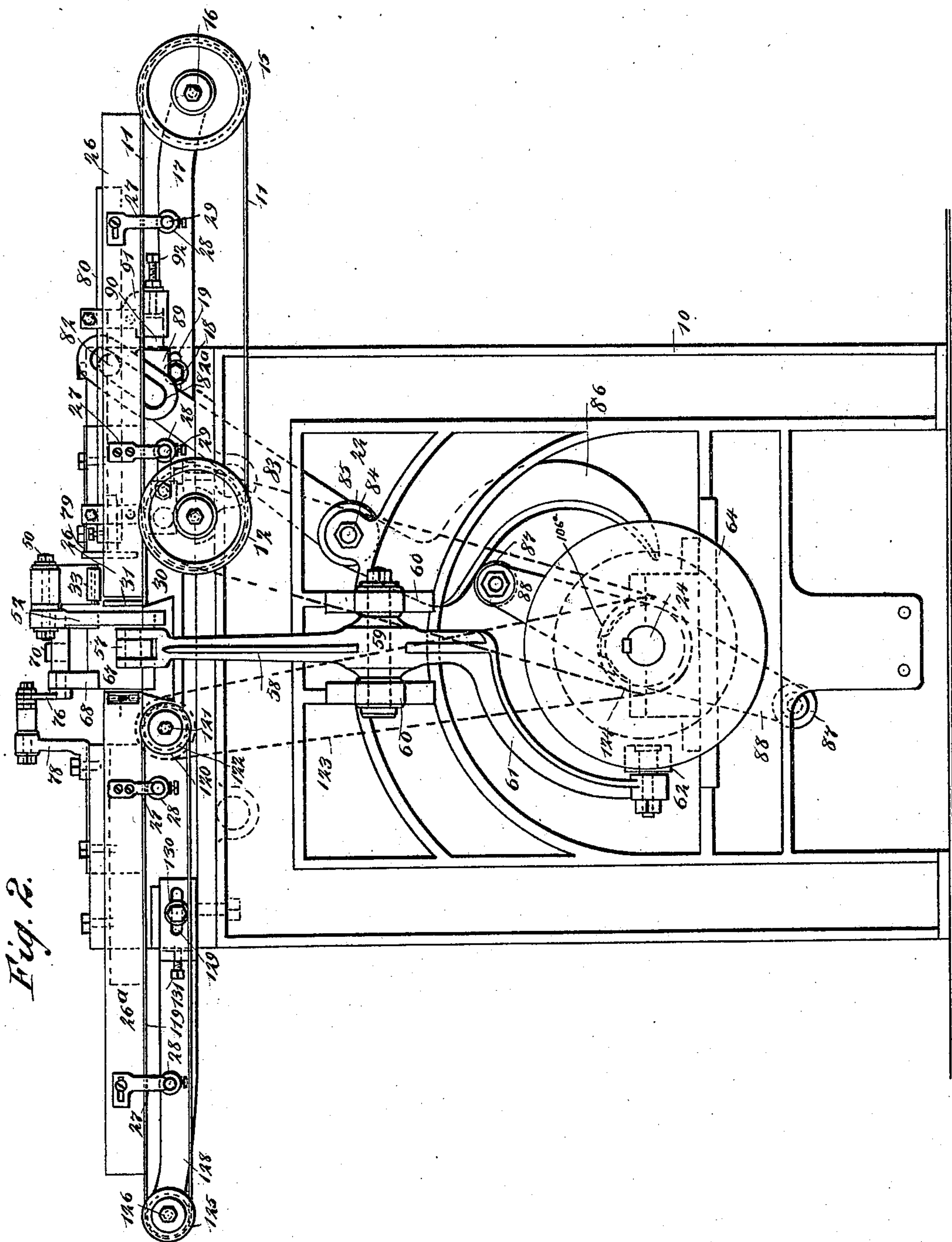
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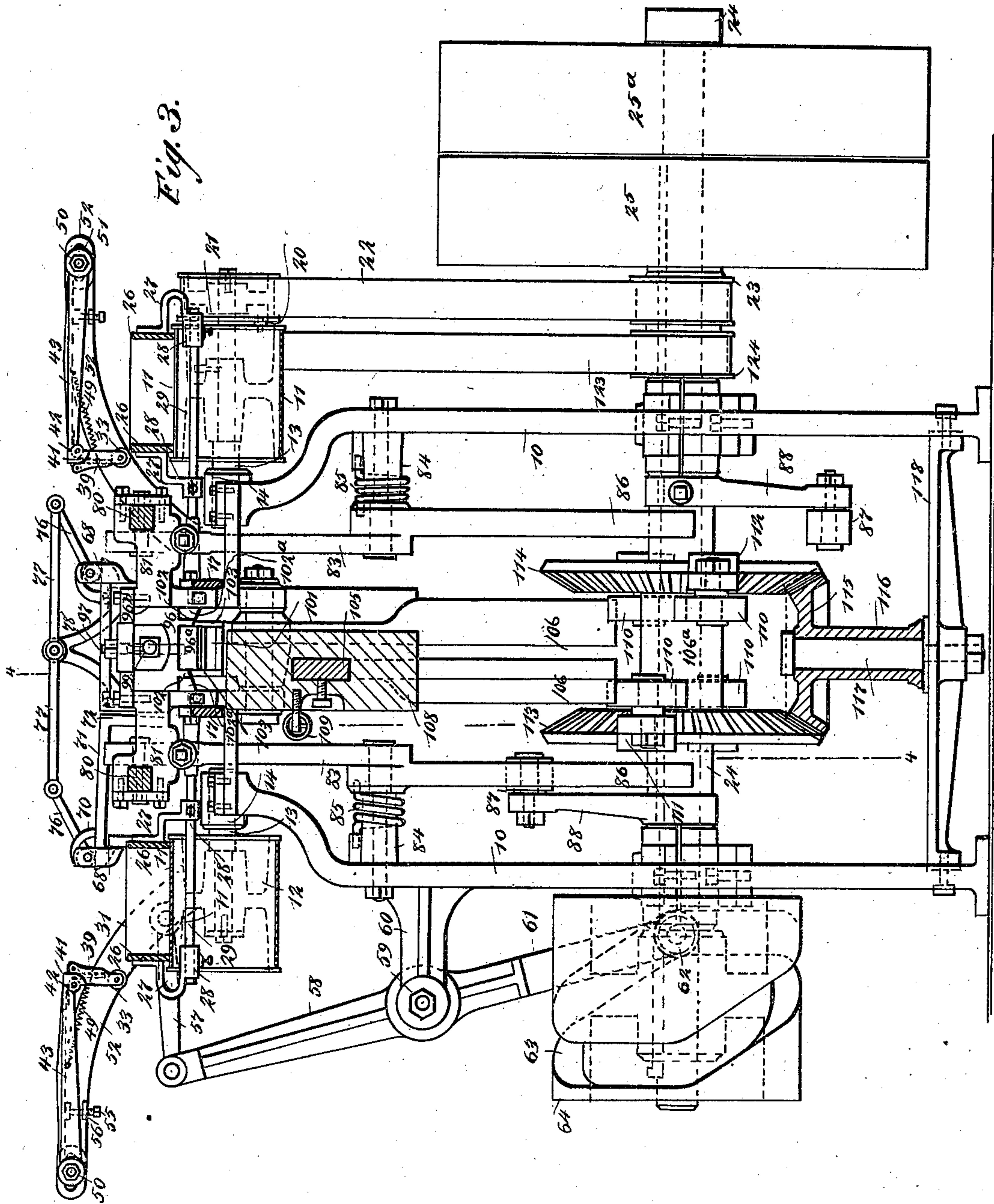
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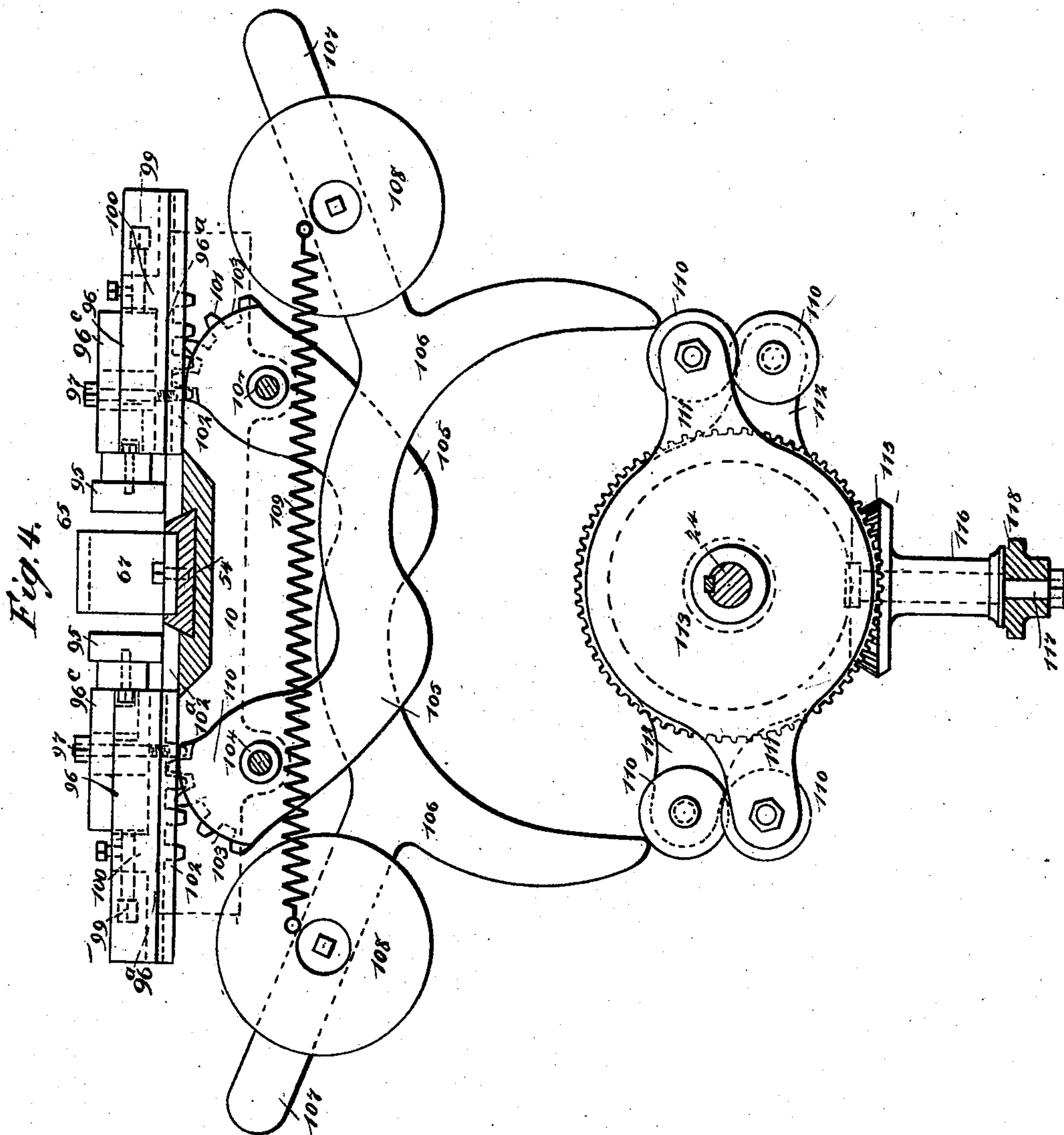
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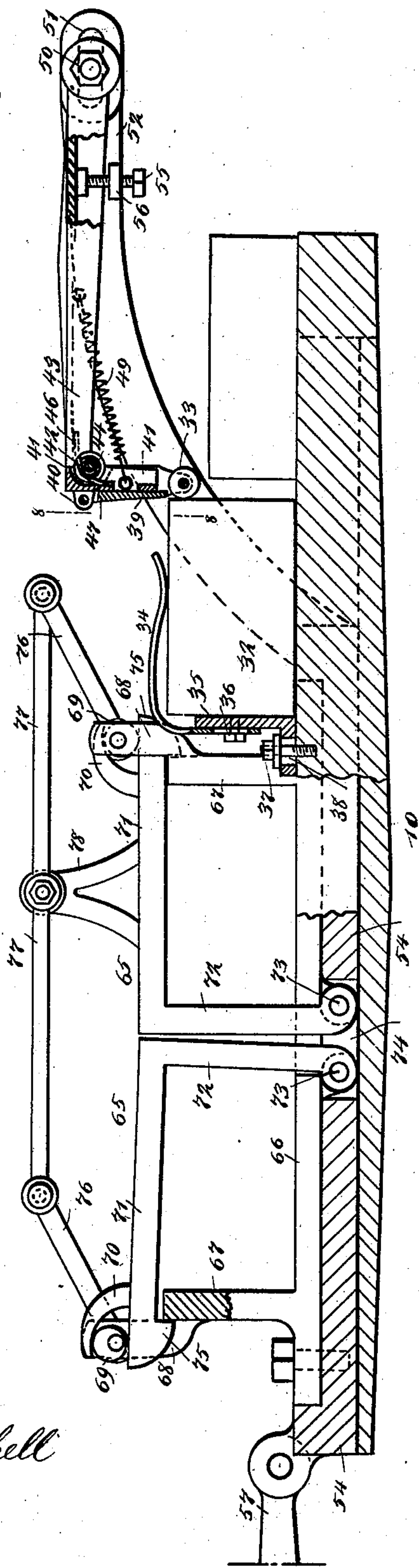
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Fig. 5.



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Fig. 8.

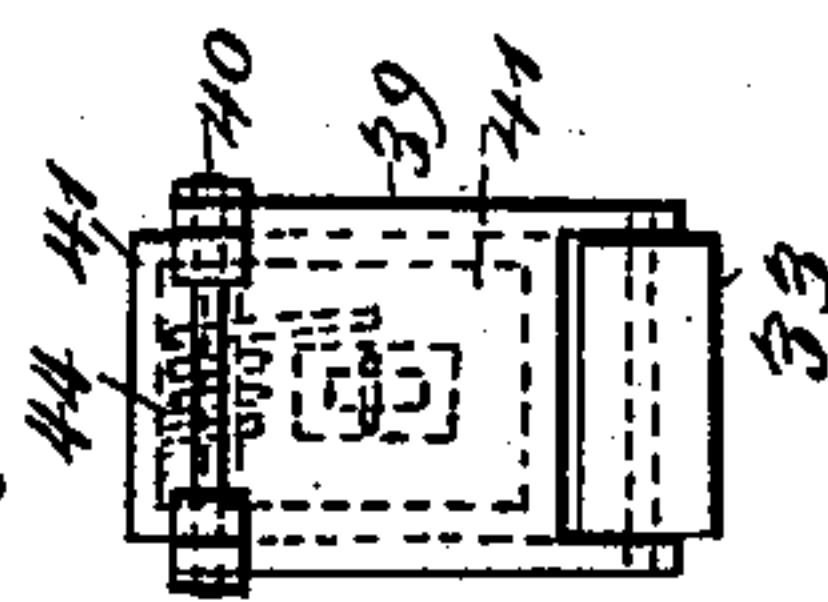
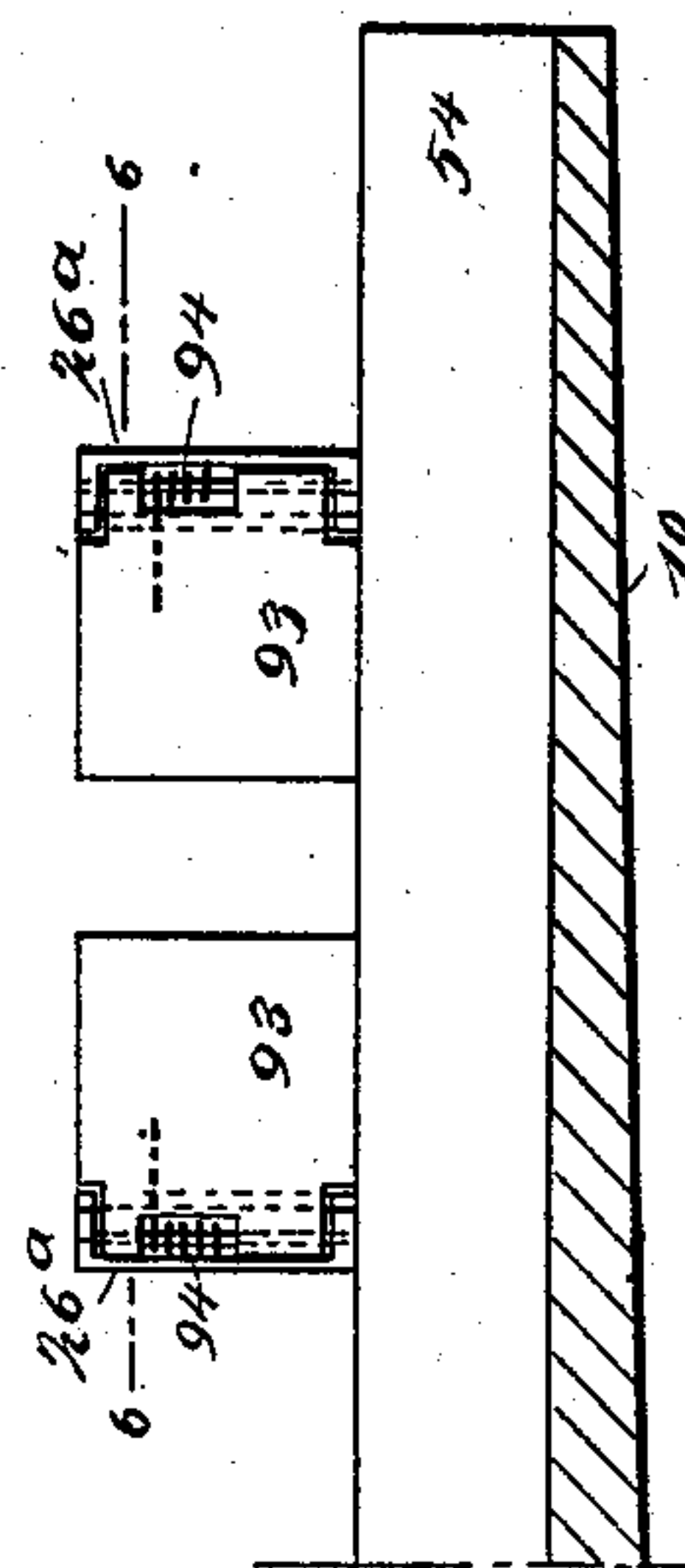


Fig. 7.





# UNITED STATES PATENT OFFICE.

JACOB ECKMAN, OF BROOKLYN, NEW YORK.

## SOAP-PRESS.

SPECIFICATION forming part of Letters Patent No. 504,206, dated August 29, 1893.

Application filed January 28, 1893. Serial No. 460,110. (No model.)

*To all whom it may concern:*

Be it known that I, JACOB ECKMAN, of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Soap-Press, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of soap presses which are adapted to shape cakes of soap; and the object of my invention is to produce an automatic machine which is provided with mechanism adapted to feed a continuous stream of soap cakes into one side of the machine, compress the cakes between dies so as to give them the necessary shape and eject the shaped cakes from the other side of the machine.

A further object of my invention is to construct the machine in such a way that all its parts may be perfectly adjusted and that the operation described may be rapidly and nicely performed.

To this end my invention consists in certain features of construction and combinations of parts, as will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a plan view of the machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is a cross section on the line 3—3 in Fig. 1. Fig. 4 is a vertical section on the line 4—4 in Fig. 3, showing the mechanism for operating the dies. Fig. 5 is a detail sectional view of the soap boxes and a portion of the mechanism for feeding the soap cakes. Fig. 6 is a sectional plan of the spring flies arranged opposite the soap boxes so as to prevent the soap from being thrown through the boxes when it is applied to the same, the section being taken on the line 6—6 of Fig. 7. Fig. 7 is a detail sectional view, showing the flies in closed position; and Fig. 8 is a front elevation of a portion of the soap feeding mechanism, looking from the line 8—8 in Fig. 5.

The machine is provided with a suitable flat topped frame 10, on one side of which and near opposite ends of the frame are horizontal and parallel feed belts or carriers 11 which supply the soap cakes to the machine, and

these belts are, at their inner ends, carried by pulleys 12 which are journaled on short studs or shafts 13 which turn in boxes 14 on the machine frame, as best shown in Fig. 3. The outer ends of the belts are carried by pulleys 15 which are keyed to a shaft 16, see Fig. 1, and this shaft is journaled in the outer ends of parallel arms 17 which at their inner ends are slotted longitudinally, as shown at 19 in Fig. 2, and are held to the frame by bolts 18, this construction enabling the arms to be adjusted in and out so as to give the necessary tension to the carrying belts. One of the pulleys 12 has a pin connection shown at 20 in Fig. 3, with a pulley 21 journaled opposite the outer end of the pulley 12, and the pulley 21 is driven by a belt 22 connecting with a pulley 23 on the driving shaft 24, this shaft extending transversely through the lower portion of the machine and having the usual tight and loose pulleys 25 and 25<sup>a</sup>. It will be seen then that this connection causes one pulley 12 to carry one of the belts 11 and the shaft 16, while one of the pulleys 15 on said shaft, imparts motion to the other carrying belt 11.

Extending above and near opposite edges of each carrying belt are parallel gages or side pieces 26, the distance between which corresponds approximately to the length of the soap cakes carried by the belts, and these gages are supported on bent arms 27, shown best in Fig. 3, which arms at their lower ends terminate in sleeves 28, which are held to slide on bars 29, to which they are secured by set screws, and in this way the gages may be easily adjusted so as to be held the required distance apart.

The top of the frame at a point opposite the inner ends of the carrying belts is made smooth and level with the belt tops, as shown at 30 in Fig. 2, so that the soap will slide readily from the belts upon the frame and against abutments 31 which are arranged opposite the inner ends of the belts and at a sufficient distance from the belts to permit a soap cake to lie between each abutment and the adjacent belt. When in this position, the soap cakes 32, see Fig. 5, are adapted to be pushed one by one, by rollers 33 toward the inner portion of the machine and beneath spring holders 34 which hold the cakes in



position to be pushed into the press boxes, as hereinafter described, and as shown clearly in Fig. 5. This mechanism for pushing the soap cakes in position is duplicated on the opposite side of the machine and its construction will be described below. When a soap cake 32 is pushed transversely inward, opposite the abutment 31 and beneath the spring holder 34, its movement is checked by a second abutment 35 placed at right angles to the abutment 31, as shown best in Fig. 1, and this abutment serves as a support for the spring holder 34, which is secured to the abutment by a bolt 36, see Fig. 5, and is adjustable up and down so as to fit different sized cakes of soap. The abutment is held to the frame of the machine by a bolt 37, which extends through a slot 38, in the abutment, as shown in Fig. 5.

Each roller 33 which is held to move in a horizontal plane and at right angles to the adjacent carrier belt 11, is journaled in the lower end of a swinging vertical plate 39, see Figs. 5 and 8, the plate being hinged at its upper end, as shown at 40, to a second plate 41, which is pivoted, as shown at 42, on the free end of a supporting arm 43 and it is normally pressed forward, or rather inward, by a spring 44, which is coiled around the pivot of the plate 41 and one end 46, of which, presses against the arm 43, while the opposite end presses against the plate 41. The plate 39 and roller 33 are repressed and drawn toward the outer end of the arm 43 by a spring 49, connecting the plate and arm. Each arm 43, the arms being placed in horizontal alignment and on opposite sides of the machine as shown in Fig. 1, carries the mechanism just described, and each arm is secured by a bolt 50 to the slotted end 51 of an upwardly and outwardly extending rigid arm 52, which, at its lower end is secured to a slide 54 which reciprocates horizontally on the top of the machine frame 10, and at right angles to the carrier belt 11. The reciprocation of said slide carries the arms 52 backward and forward and the roller 33 of each arm strikes behind a cake of soap 32, which has been delivered against the abutment 31, and pushes the soap endwise against the abutment 35. It will be seen that the yielding nature of the mechanism which carries the roller 33 prevents the roller from jamming the cake 32 too hard against the abutment. When the roller 33 is pulled back, the spring 49 will yield sufficiently to allow it to ride over the cake of soap which it meets on its back stroke. Each arm 43 is adjustable vertically by means of a set screw 55 which extends upward through a lug 56 on the arm 52, see Fig. 5, and impinges on the arm 43. This adjusting mechanism is to enable the roller 33 to be brought into the right position in relation to the soap cakes.

The slide 54 is reciprocated by a pitman 57 which is pivoted to one end of the slide and which extends outward and is pivoted to the

upper end of an oscillating lever 58, which extends in a nearly vertical position on one side of the machine, being pivoted, as shown at 59 between brackets 60 on the machine frame, and the lower end of the lever is bent outward, as shown at 61, see Fig. 2, and carries at its lower end a roller 62, which runs in a cam groove 63 in a cam wheel 64, which wheel is carried by the driving shaft 24. The cam groove 63 runs from one end of the wheel 64 to the other, so that the revolution of the cam wheel oscillates the lever 58 and imparts the necessary movement to the slide 54. The slide 54 is provided with soap boxes 65 arranged end to end, as shown in Figs. 1 and 5, and these boxes are provided with a common base or bottom 66, which is secured to the slide. This bottom has near opposite ends vertical end pieces 67 which terminate at their upper ends and opposite sides in upwardly-extending posts 68 and between each pair of posts is pivoted a cam roll 69 which is adapted to turn beneath a curved cam plate 70 formed on the top side and near the free end of the cover or top 71 of the adjacent soap box 65.

Each soap box 65 is provided with a cover or top 71 and from the upper surface of the top extends downward an end piece 72 formed integral with the top and forming one end of a box, this end piece extending downward through a slot in the base 66 and being pivoted, as shown at 73, in a recess 74 of the slide 54. The free end of each top or cover 71 terminates in a catch 75 adapted to engage the top edge of the end 67. Each cam roll 69 is oscillated by an upwardly-extending crank 76, and the cranks are secured to horizontally-extending pitmen or rods 77, which are pivoted to a fixed bracket 78, this being secured to the frame 10. It will be seen then, that the reciprocation of the slide 54 will cause the crank 76 to be turned first to one side of the cam roll 69, to which it is attached, and then to the other side so that the rolls will bear alternately upon the cam plates 70 and cause the tops or covers 71 of the soap boxes to be alternately pressed down tightly and loosened. This operation is timed in connection with the pressing mechanism, so that the top will be pressed down tightly at the time the dies come together in the box to shape the soap so as to form a perfect cake, and the loosening takes place when a cake is inserted in a box and when it is ejected, the loosening of the top serving to enable the cake to be inserted and ejected without injury.

The soap cakes are adapted to be fed sideways into the box, being first fed into one box at one side of the machine and then into the second at the other side of the machine, and, after the machine has once started, the insertion of one cake forces out the cake which has been already pressed. The inserting and ejecting are effected by plungers 79 which slide on the frame top at right angles and adjacent to the abutments 35, see Fig. 1, the



plungers being of such size as to pass readily into the boxes 65. The plungers 79 are carried by slide bars 80, which form the shanks of the plungers, and these bars are held to slide in supports 81, to which they are clamped, as best shown in Fig. 3. The plungers 79 are adapted to move forward alternately, each plunger moving forward when a box 65 comes opposite it, and the plungers have their shanks 80 provided with bolts 82 which extend through slots 82<sup>a</sup> in the upper ends of oscillating levers 83, these being held to swing at right angles to the lever 58, and in a plane parallel with the carrier belts 11. Each lever 83 is fulcrumed near its center, as shown at 84, and at this point a coil spring 85 is secured to the lever and to the adjacent portion of the frame, as shown clearly in Fig. 3, so that after the lever has been moved in one direction by the crank mechanism described below, the spring will return it. The lower end 86 of each lever 83 extends into the path of a roller 87 carried by a crank 88 on the driving shaft 24. The cranks 88 extend from opposite sides of the shaft, as shown clearly in Fig. 3, so that the levers 83 and their connected plungers are alternately operated. At the upper ends of the levers 83 and on their outer sides are abutments 89 which strike against rubber cushions 90, and the cushions thus limit the strokes of the levers. Each cushion 90 is held in a socket 91 on the machine frame and the cushion may be set up by a set screw 92, which projects through the socket and against the cushion back.

It will be seen from the above description that at each revolution of the driving shaft the levers 83 will be oscillated and the plungers 79 thrown forward, each plunger pushing in one of the boxes 65, a cake of soap, and at the same time expelling a cake from the back side of the box, and upon discharging carriers, which will be hereinafter described.

To prevent the first cakes from being thrown entirely through the boxes by the movement of the plungers, flies 93 are used, which are held to swing opposite the back sides of the boxes and are supported upon the inner ends of the discharge carrier gages 26<sup>a</sup>, see Figs. 1 and 6, the flies being held closed by the pressure of their springs 94. The springs 94 are so light, however, that the soap cakes are easily discharged between the flies which swing back without injuring the soap, and then return to their normal closed position.

The soap held in the boxes 65 is compressed between reciprocating and oppositely-arranged dies 95, which move inward from opposite sides of the boxes; these dies may be shaped so as to make any desired impression on the soap and they are carried by the plungers 96 which have on their under sides, racks 96<sup>a</sup>, see Figs. 3 and 4, the racks being held to the plungers by bolts 97, see Fig. 1, which project through slots 98 in the plungers. The plungers are held to slide in slide-ways and

beneath a top plate 96<sup>c</sup> shown best in Fig. 1. The plungers are adjusted longitudinally by means of set screws 99 which project through lugs 100 on the racks 96<sup>a</sup>, see Fig. 4. The teeth of the racks 96<sup>a</sup> are on the lower sides of the racks and engage segmental racks 101 on the operating levers which will be described presently, and the racks 96<sup>a</sup> are held between depending inclined flanges 102 on the plunger 96 and the racks 101 have upwardly-extending inclined flanges 103 which meet the flanges 102, and the teeth of the two racks project between the flanges, thus making a sure connection between the two racks. The flanges 102 slide between rails 102<sup>a</sup> on the main frame, see Figs. 3 and 4. The racks 101 are formed on the upper ends of depending curved and oppositely-arranged levers 105 which are fulcrumed on studs 104, see Fig. 4, and the lower ends of the levers are bent to form segmental cams 106, which the operating contact rollers strike to tilt the levers, as described below. Each lever 105 has on its back side an arm 107, to which is secured a heavy weight 108, the weights being adapted to force the levers downward so as to cause an impression to be made by the dies. The weights are connected by a spring 109 which has a tendency to hold the levers 105 together, so that their cam shaped ends 106 will be in the correct position for engagement with the rollers 110 by which they are actuated. There are two rollers 110 for each cam 106 of the levers 105, one set of rollers being journaled on arms 111 on a gear wheel 113, and the other set of rollers being journaled on arms 112 which project from the gear wheel 114. The gear wheel 113 is keyed to the shaft 24, while the gear wheel 114 is loose on the shaft and the two gear wheels are beveled and connected by a horizontally-rotating idler 115 which has a depending sleeve 116 journaled on a stud 117, which stud projects upward from a cross piece 118 near the bottom of the frame 10. It will be seen that this arrangement enables the gear wheels to give the correct movements to the levers 105, and through the medium of the racks described above, to the dies 95. The rollers 110, by striking the cam ends 106 of the levers, spread the levers and separate the dies 95, at the same time raising the weights 108. After the rollers 110 pass the points of the cam ends 106, the weights 108 drop quickly, thus throwing the plungers 96 and dies 95 toward each other and the dies meet in one of the boxes 65 and press into the required shape, the cake of soap which is contained in said box.

On the shaft 24 in the path of the cam ends 106 of the levers 105, is a rubber washer or cushion 106<sup>a</sup>, see Fig. 3, and if the levers should be sprung together when there is no soap between the dies, the cushion will receive the shock of the levers and prevent them or their connections from being broken.

When the soap cakes are discharged from the boxes 65 they are delivered upon dis-



charging carriers 119, which are endless belts, and are similar to the feed carrier belts 11 already described. These belts 119 are arranged parallel with each other and align with the ejecting plungers 79, the inner ends of the belts being carried by pulleys 120 on a shaft 121 which is journaled in suitable bearings parallel with the shaft 24, and a pulley 122 on the shaft 121 is driven by a belt 123, connecting with a pulley 124 on the driving shaft 24. The outer ends of the belts 119 are carried by pulleys 125 on a shaft 126 which is journaled in boxes 127 in the outer ends of arms 128, these arms extending horizontally outward from the machine frame on the back side of the latter, and the inner ends of the arms are slotted longitudinally, as shown at 129 in Fig. 2, and the arms are fastened by bolts 130, extending through the slots and into the frame. The arms 128 may thus be adjusted to regulate the tension of the discharging carrier belts and the adjustment is effected easily by means of set screws 131 which extend through bends 131<sup>a</sup>, see Fig. 1, in the arms and impinge on the frame.

The discharge belts or carriers 119 are provided with gages 26<sup>a</sup>, like the gages 26 already described, these being supported by bent arms 27 which also are provided with sleeves 28 adapted to be adjusted on the supporting bars or rods 29<sup>a</sup>, these being arranged like the bars or rods 29 already described.

When the machine is started the soap cakes 32 are fed upon the feeding belts 11 and as the front cake on each belt reaches the abutment 31 it is pressed inward parallel with the boxes 65 and beneath the holder 34 by the roller 33, in the manner already described, and at this point the plunger 79 advances, being impelled by the swinging lever 83, and pushes the soap cake into the box 65 which lies opposite the cake. It will be seen that if a cake has been previously compressed, said cake will be discharged upon the insertion of another cake; at this point the slide 54, actuated by the pitman 57, the lever 58, and the cam wheel 64, moves inward so as to carry the soap box opposite the dies 95 which are at this point thrown inward by the dropping of the weights 108, and the soap in the box is pressed between the dies. While the soap is being compressed in one box, another cake is being inserted in the adjacent box, and the insertion of one pushes out another in the manner already described, the cake being forced out between the doors or flies 93 and upon one of the discharging carrier belts 119.

The mechanism described is arranged and timed so that a cake of soap will be inserted in one of the boxes from one of the belts 11 and a pressed cake discharged upon one of the discharging carrier belts 119 on one side of the machine, and at the next half stroke of the slide 54, a similar operation takes place on the opposite side of the machine, the feeding and discharging mechanism being duplicated so as to obtain the greatest possible

speed, as this arrangement enables the feeding, dieing or pressing and discharging to go on continuously.

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

1. A soap press, comprising reciprocating boxes, each box having a movable side, feed mechanism for supplying soap cakes to the boxes, reciprocating dies arranged to meet in the boxes and press the soap therein, and a cam mechanism for locking the movable portion of each box at the time the impression of the dies is made, substantially as described.

2. A soap press, comprising reciprocating boxes, feed belts arranged to deliver against abutments and at a point parallel with the plane of the boxes, reciprocating arms held to push the soap cakes inward to a point opposite the boxes, spring holders adapted to receive the soap cakes from the arms, reciprocating plungers arranged to push the soap cakes into the boxes, and reciprocating impression dies arranged to meet in the boxes and compress the soap therein, substantially as described.

3. A soap press, comprising reciprocating soap boxes, feed carrier belts arranged near opposite ends of the soap boxes and adapted to deliver soap cakes at a point near the boxes, reciprocating feed arms held to move parallel with the boxes and adapted to push the cakes opposite the boxes, reciprocating impression dies arranged to meet in the boxes and press the soap therein, reciprocating plungers held to push the soap cakes into the boxes and to push the pressed cakes out of the boxes, swinging spring-pressed flies arranged opposite the boxes and adapted to form resistance to the soap cakes, and discharging carrier belts arranged on the back sides of the boxes and opposite the flies, substantially as described.

4. A soap press, comprising reciprocating boxes, each box having a movable side feed mechanism arranged to deliver cakes into the boxes, oppositely arranged reciprocating dies adapted to meet alternately in the boxes and press the soap therein, cam rolls arranged opposite the movable sides of the boxes, cam plates secured to the said movable sides and extending opposite the cam rolls so as to inclose the cam rolls between themselves and the movable box sides, and mechanism for turning the rolls and locking the box sides at each impression of the dies, substantially as described.

5. In a soap press, the combination with the reciprocating boxes having movable tops, the mechanism for supplying soap cakes to the boxes, and reciprocating dies adapted to meet within the boxes, of curved cam plates secured near the free ends of the movable tops and arranged above said tops, oscillating cam rolls journaled in supports on the boxes and held to turn between the cam plates and the tops, cranks secured to said cam rolls, and



connecting rods pivoted to the cranks and to a fixed support, thus enabling the reciprocation of the boxes to turn the cam rolls, substantially as described.

5 6. In a soap press, the combination with the reciprocating boxes and the dies adapted to meet in each box, of an abutment arranged at right angles to the boxes, a spring holder secured to said abutment and adapted to hold  
10 a soap cake in position against the abutment, a feed belt arranged to deliver soap cakes opposite the abutment, the reciprocating arm adapted to push the soap cakes into the holder, and the reciprocating plunger adapted  
15 to move beneath the holder and push a soap cake into one of the boxes, substantially as described.

7. In a soap press, the combination with the soap boxes and suitable feeding and pressing  
20 mechanism, of the abutment arranged opposite one of the boxes, a curved spring secured to the back of the abutment and extending over the top of the abutment and substantially parallel with the box, and the reciprocating plunger held to move beneath the  
25 spring and push a soap cake into the box, substantially as described.

8. In a soap press, the combination with the reciprocating slide, the soap boxes thereon, the  
30 feed carrier belt, and the plunger arranged to move parallel with the belt and push soap cakes into the boxes, of the arm carried by the box slide, and the swinging spring-sustained roller carried by the arm and adapted  
35 to engage the soap cakes and push them opposite the plunger, substantially as described.

9. In a soap press, the combination with the reciprocating boxes, and the reciprocating plunger held to move at right angles to the  
40 movement of the boxes and to push soap cakes into them, of the holder arranged adjacent to the plunger, the reciprocating arm

held to move with the boxes, swinging spring-pressed plates carried at the free end of said arm, and the roller journaled in one of the  
45 plates and adapted to push the soap cakes into the holder, substantially as described.

10. In a soap press, the combination of the reciprocating boxes, and sliding plungers having outwardly extending shanks and adapted  
50 to push soap into the boxes, the oscillating spring-repressed levers operatively connected with the racks of the plungers to slide the same, and a crank mechanism for oscillating the levers, substantially as described. 55

11. In a soap press, the combination of the soap boxes, the reciprocating dies held to meet in the boxes and having racks on their under sides, the oscillating weighted levers geared to the racks, and mechanism for moving the levers against the resistance of their weights, substantially as described. 60

12. In a soap press, the combination with the soap boxes, of the reciprocating dies arranged to meet in the boxes, the racks secured  
65 to the under sides of the dies, the swinging levers geared to the racks and provided with weights adapted to throw the dies together, the levers having curved or cam-shaped lower ends, and oppositely rotating gear wheels carrying rollers adapted to strike the cam ends  
70 of the levers and move the levers against the resistance of their weights, substantially as described.

13. The combination of the reciprocating  
75 dies, the swinging weighted levers geared to the dies, the cam mechanism for spreading the levers against the resistance of their weights, and a spring connection between the two levers, substantially as described.

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