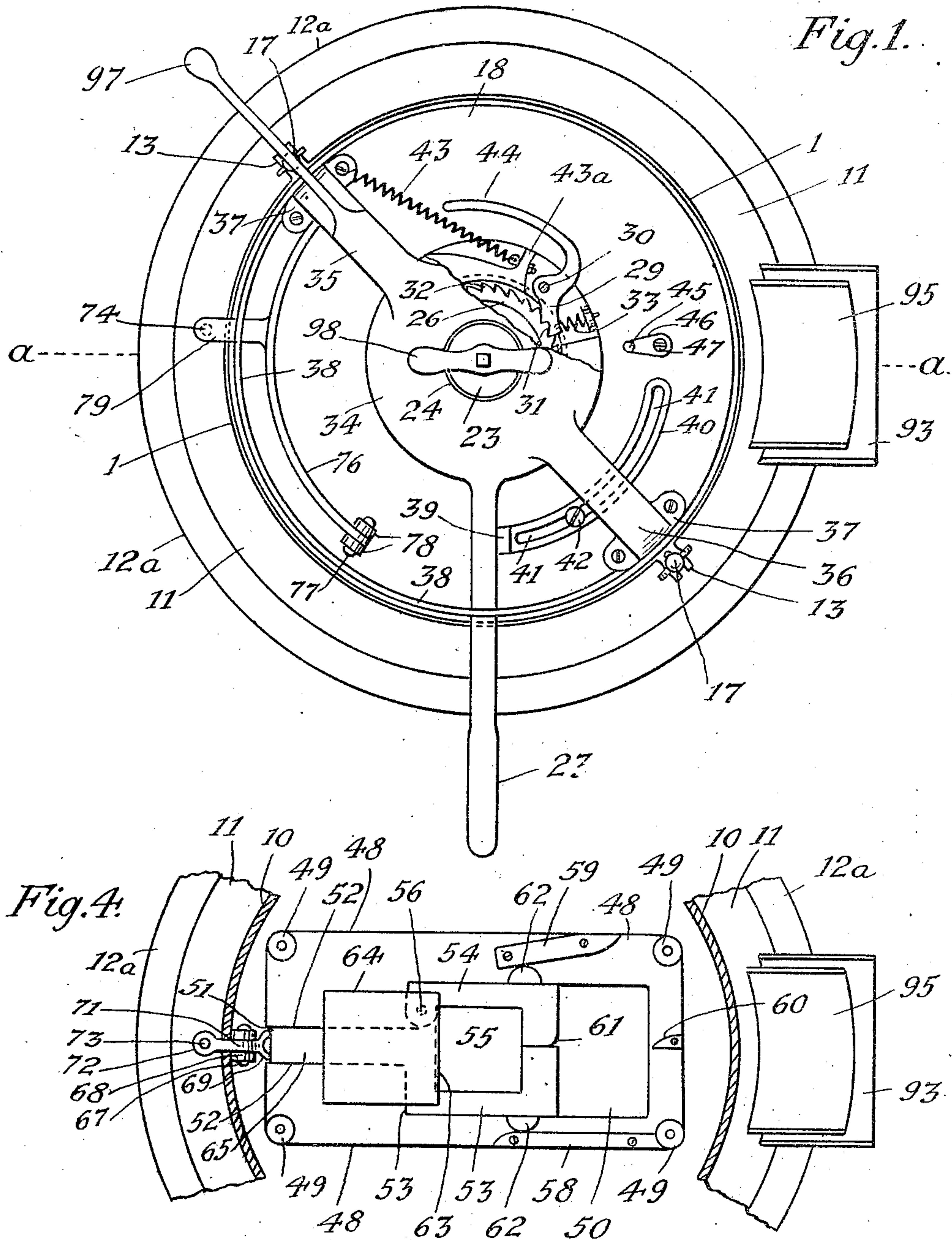


G. H. EBEL.  
MOLDING MACHINE.  
APPLICATION FILED JUNE 4, 1910.

999,970.

Patented Aug. 8, 1911.

3 SHEETS-SHEET 1.



Witnesses:  
Thos. Lagaard.  
H. A. Bowman

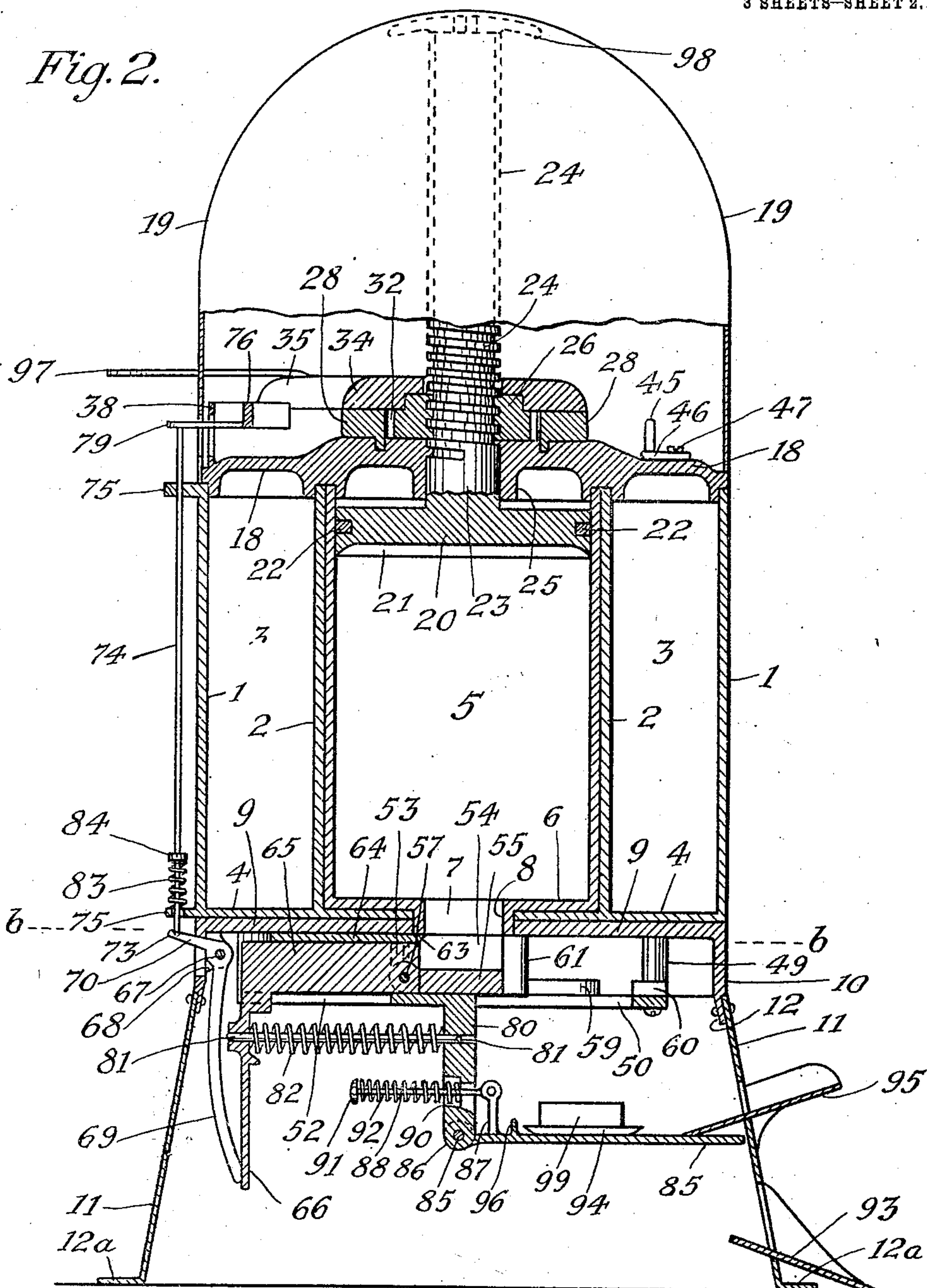
Inventor:  
George H. Ebel.  
By *P. H. Lunkel*  
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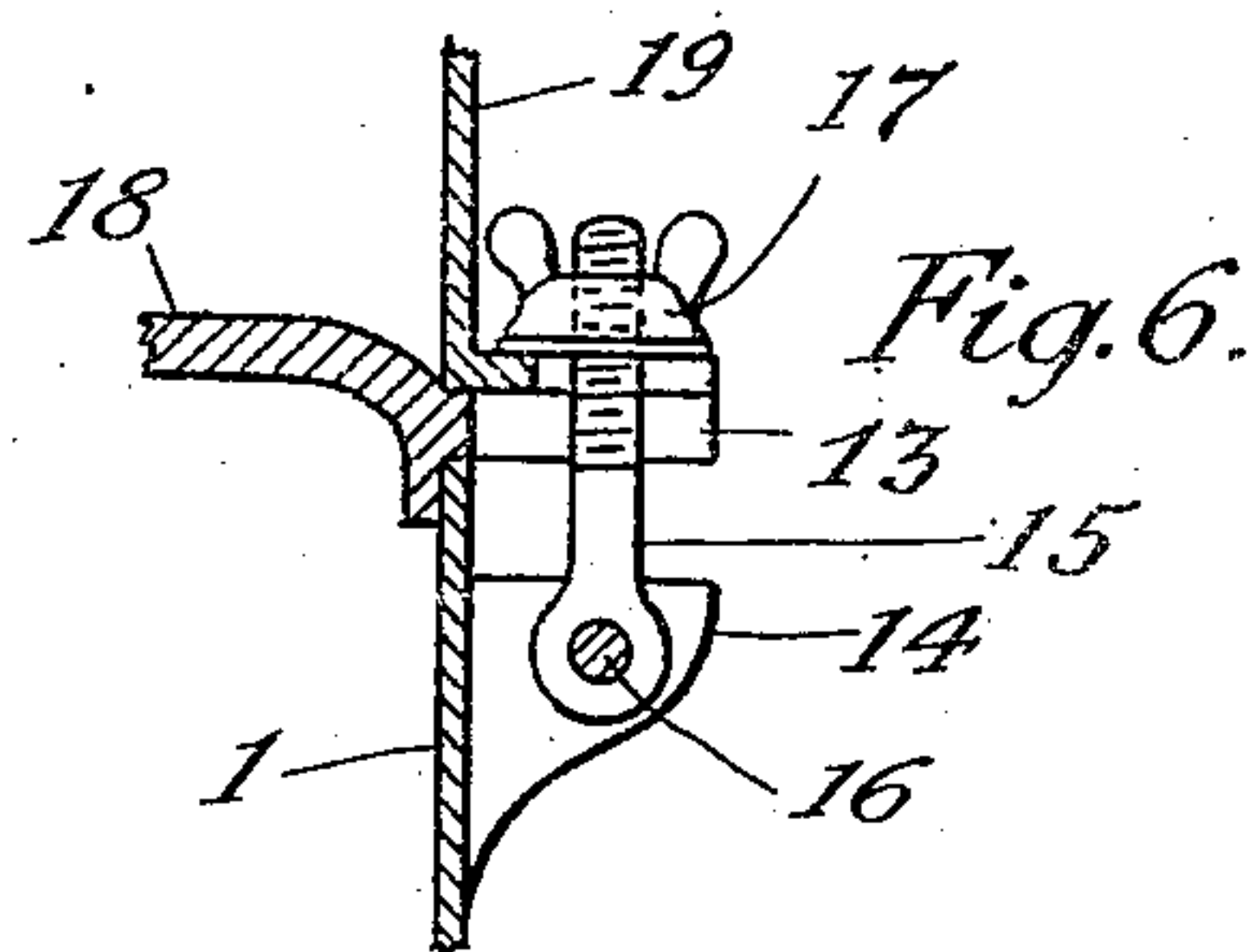
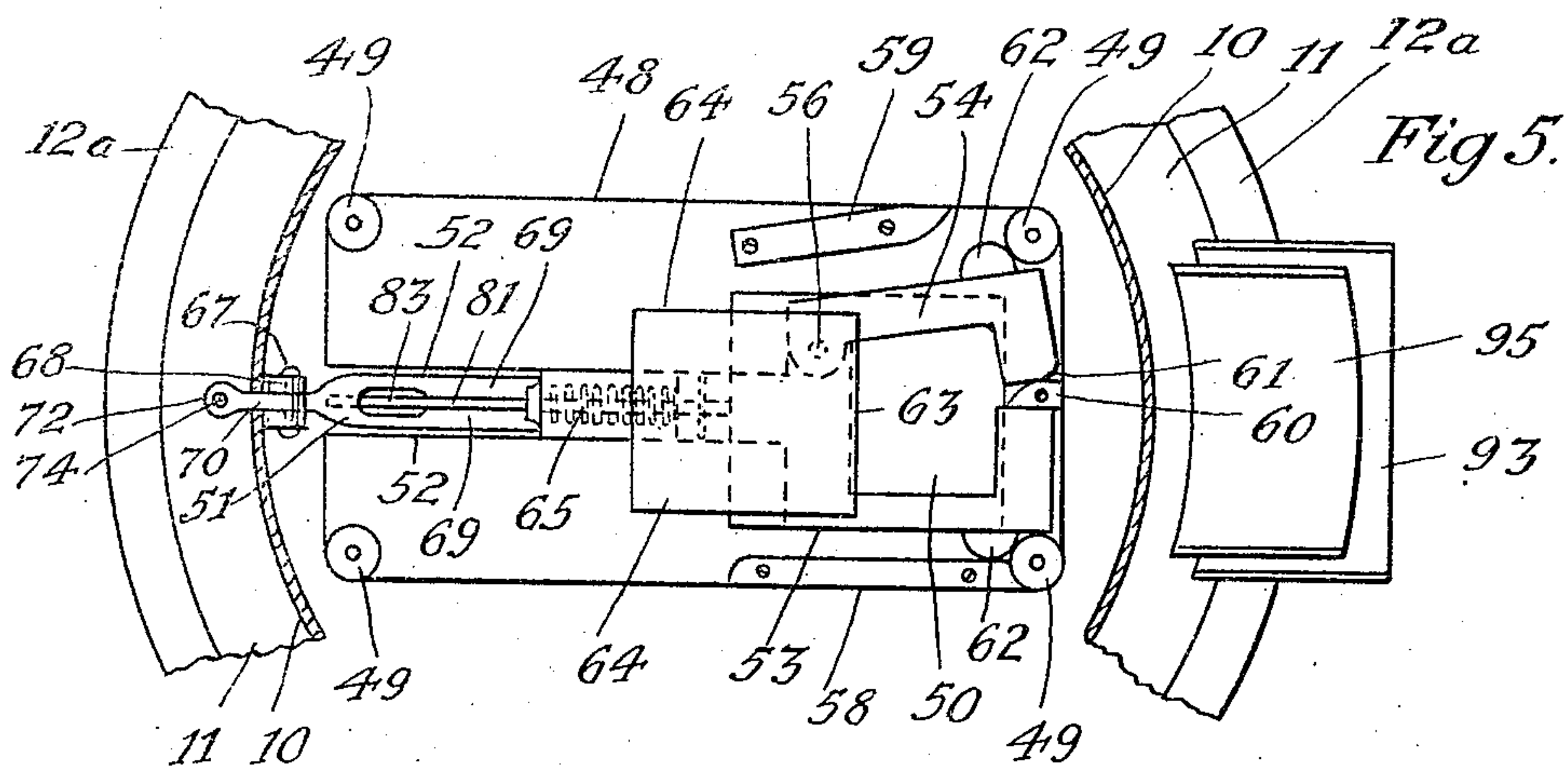
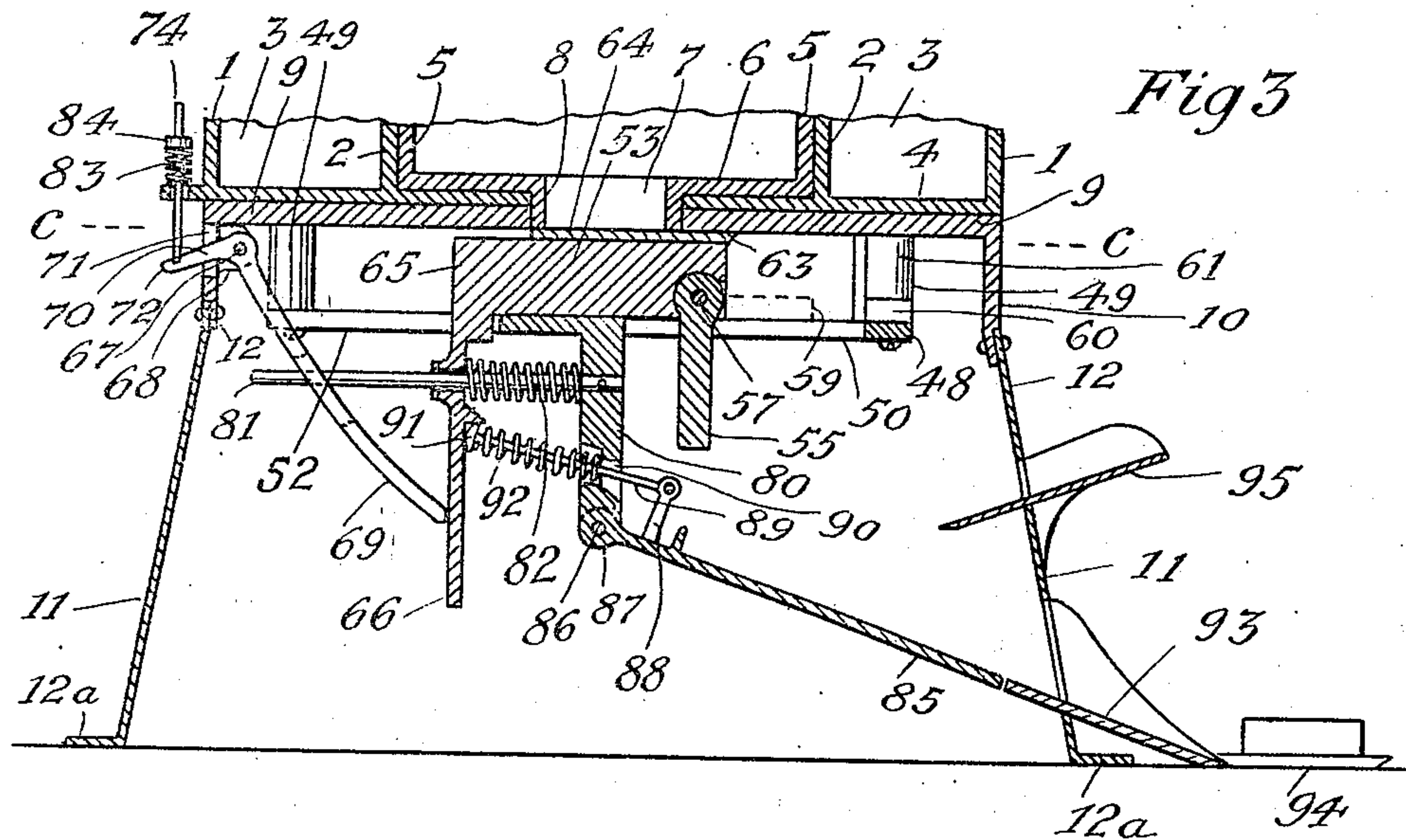


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3 SHEETS-SHEET 3.



Witnesses  
Thos. Lagaard.  
H. A. Bowman.

Inventor:  
George H. Ebel.  
By *G. H. Ebel*  
his Attorney.



# UNITED STATES PATENT OFFICE.

GEORGE H. EBEL, OF ST. PAUL, MINNESOTA.

MOLDING-MACHINE.

999,970.

Specification of Letters Patent.

Patented Aug. 8, 1911.

Application filed June 4, 1910. Serial No. 564,970.

*To all whom it may concern:*

Be it known that I, GEORGE H. EBEL, a citizen of the United States, residing at St. Paul, in the county of Ramsey and State of Minnesota, have invented certain new and useful Improvements in Molding-Machines, of which the following is a specification.

My invention relates to machines for molding plastic substances; and the principal object of the invention is to organize a convenient machine for molding relatively small portions of butter, ice-cream, and similar plastic substances into compact and desirable shapes for individual use.

Stated in a general way the machine comprises a casing providing a cooling jacket, an inclosed container for the plastic substance having a discharge opening, a screw-press and operating lever and connections for periodically ejecting material through the opening, a mold for receiving the ejected material, connections with the operating mechanism for sliding the mold away from the container opening, means for automatically opening the mold during such movement, means for returning and closing the mold, and means for discharging the molded pat or cake from the machine.

My improvements are illustrated in the accompanying drawings, in which—

Figure 1 is a plan view of a molding machine embodying my improvements. Fig. 2 is a central vertical sectional view of the same approximately on the line *a—a* of Fig. 1. Fig. 3 is a sectional elevation similar to the lower portion of Fig. 2 but showing the mold and other movable parts in altered positions. Fig. 4 is a horizontal section on the plane of the line *b—b* of Fig. 2 showing the mold in operative or receiving position. Fig. 5 is a view similar to Fig. 4 but taken on the plane of the line *c—c* of Fig. 3 and showing the mold in discharging position. And Fig. 6 is a detail view of the devices for joining the casing sections.

In the drawings 1 and 2 designate outer and inner concentric cylindrical casing members separated by an annular space 3 which is closed by a bottom 4 and adapted to contain ice or a cooling liquid. Within the inner member is a suitable cylinder 5 for holding the butter. These cylinders are open at the top, but their bottoms 4 and 6 extend toward the center where an opening 7 of

desired shape is provided. The butter cylinder bottom 6 has a central flange 8 that extends downwardly past the edges of the bottom 4. The casing bottom 4 seats on a centrally open plate or disk 9 corresponding with the bottom 4 and having a downward flange 10 flush with the exterior of the cylinder 1; and the flange 10 seats on the top of a truncated conical hollow base 11, to which it is bolted by means of lugs 12, and the base is supported on a horizontal flange 12<sup>a</sup>.

The casing 1 is connected at opposite sides to the flange 10 by means of pairs of slotted lugs 13 and 14, respectively, thereon and bolts 15 that are fulcrumed by pins 16 to the lower lugs 14 so that the bolts may be swung in and out of the slots in the lugs 13, and thumb nuts 17 are provided for holding the bolts in place in the latter slots. The tops of the cylinders 1, 2, and 5 are closed by a cover 18 which may be secured by means of similar slotted lugs 13 and 14, respectively, on the cover and casing and pivoted bolts 15 and thumb-nuts 17. On the cover 18 is seated a dome-shaped removable cap 19 for housing the upper working parts of the machine. By unscrewing the thumb nuts 17 the bolts may be swung out of the slots to permit the cover 18 and cap 19 in the one instance and the entire upper casing in the other to be lifted.

In the cylinder 5 is a piston or follower comprising a body 20 having a dished head 21 and provided with a packing-ring 22 of cloth or other suitable material; and the piston rod 23 has its body portion 24 screw-threaded. The rod is guided in its up and down movements by a central guide flange 25 on the cover 18. A ratchet-wheel 26 which seats loosely on the cover 18 has a threaded open center which engages the threads of the screw 24 and serves to turn it when the ratchet is rotated. An operating lever 27 that extends through a slot in the cap 19 carries a flat circular head 28 on which at the side nearly opposite the lever handle is a pawl 29 pivoted at 30 to the head and having a tooth 31 for engaging the ratchets 32 of the wheel 26; and a coil spring 33 seated in a socket in the head 28 serves to hold the pawl in engagement with the teeth 32. The wheel 26 and lever head 28 are guided and prevented from upward move-



ment by a disk 34 that is attached by means of arms 35 and 36, flanges 37, and screws to the top of the cover 18.

The operating lever rests and is guided in horizontal direction in a slot in a semi-circular guide-way 38 formed or secured on the cover 18 and extending from one of the arms 35 and 36 to the other, the lever being capable of swinging movement between the two arms as stops. For limiting the lever movement in the direction of the arm 36 an adjustable stop 39 is provided on a plate 40 which has a curved slot 41 and is held in place on the cover 18 by a binding-screw 42. By thus shortening the throw of the lever less butter will be pressed out of the container opening 7. A spring 43 connected to a lug 43<sup>a</sup> on the lever head 34 and to one of the plates 37 serves to return the lever to starting position.

As the pawl 29 swings with the operating lever and as it is desirable in the operation of the machine to stop the rotation of the ratchet-wheel before the lever reaches the limit of its working throw, an arm 44 projects outwardly and rearwardly from the pawl and a trip pin 45 is arranged in the path of the arm's movement to engage it and turn the pawl on its pivot 30 to retract the tooth 31 from engagement with the ratchet-teeth 32, and thus prevent further actuation of the ratchet-wheel. The pin 45 is on a plate 46 that is adjustably supported by a binding-screw 47 on the cover 18. In this way the extent of operation of the follower or piston may be regulated and controlled regardless of the extent of the swing of the lever 27.

The downward movement of the follower obviously will force butter through the cylinder opening 7, and means are shown for molding the butter thus expressed. The form of mold selected for purposes of illustration is one for making rectangular pats of small size for individual use; but the pats or cakes may be made of other shapes and of any desired size. Below the casing member 9 is a rectangular shelf 48 that is supported from the plate 9 by hangers 49, and it has near one end an opening 50 through which the butter pats when formed and released may gravitate; and in the other end a slot 51 the sides 52 of which are parallel and horizontal.

The mold is slidably supported on the shelf 48 and consists of three parts, a principal member 53, which supplies one of the mold sides, a side member 54 hinged to the member 53, and a bottom 55 also hinged to the member 53. The side 54 is hinged to the body 53 by a vertical pin 56 which permits the part to swing horizontally, and the bottom 55 is hinged to the body 53 by pins 57 at opposite sides which permit the bottom to swing in vertical direction.

A guide-strip 58 on the shelf guides the side of the mold body 53 in a straight course, while an inclined guide-strip 59 permits the mold side 54 to swing outwardly when over the shelf opening 50, but serves to move it inwardly to operative position when the mold is retracted to register with the cylinder outlet 7. To cause the side 54 to swing outwardly when moved over the opening 50 a wedge-shaped lug 60 is placed on the shelf in position to be engaged at the proper time by the beveled end 61 of the mold side 54 at its point of juncture with the end of the opposite mold side 53. Rounded lugs 62 are provided on the mold sides for contacting with the guides 58 and 59.

A blade 63 for cutting off the charge of butter in the mold from the body of butter in the throat 7 is secured on the mold member 53 and the blade body 64 should be large enough to close the throat 7 when the mold is moved to position over the shelf opening 50.

From the mold body 53 an arm or block 65 extends into the shelf slot 51, the slot sides 52 serving as guides for the block, and the outer end of the block carries a depending arm 66. Between the end of the shelf and the casing 10 is arranged an angular lever that is fulcrumed at 67 to lugs 68 on the casing wall 10, the inner and lower arm 69 of the lever being arranged to contact with the lower portion of the mold arm 66, and the upper arm 70 of the lever being extended outside the casing 10 through a vertical slot 71 therein. The depression of the exposed lever-arm 70 serves to swing the inner arm 69 and thereby slide the mold on the shelf to the discharge opening 50. The arm 69 is in effect a cam-arm cooperating with the cam-plate 66, the coaction of these parts furnishing essentially a cam-action, which pushes the mold-block 53 forward with a diminishing acceleration that is one of the most desirable features of my invention, as it moves the mold rapidly at first, diminishing in speed until the end of the stroke when the mold is spread and the print dropped. For thus depressing the lever arm 70 its exposed portion is provided with a suitable plate 72 having a socket 73 in which the end of a reciprocating upright rod 74 seats. This rod passes loosely through holes in upper and lower lugs 75 on the casing and normally rests on the lever plate 72. The rod is thrust downward by the operation of the hand-lever 27 which, after the earlier portion of its stroke serves to operate the piston to press butter into the mold, engages an inclined curved lever or bar 76 and moves its outer end downward carrying with it the rod 74. The coöperation of the lever 27 with the curved side of the bar 76 furnishes a cam-like action,



which serves gradually to depress said bar throughout the latter part of the stroke of the oscillating lever 27. The lever 76 is connected at one end by a pivot 77 to a pair of studs 78 on the cover 18; and the free portion of the lever carries a lateral flange or plate 79 which extends through a slot in the cap 19 and below the guide 38 to position over the top of the rod 74.

For retracting the mold from discharging to operative position, and at the same time restoring its actuating devices to initial position, the shelf 48 is provided with a depending lug 80 to which a rod 81 is attached that extends through a hole in the mold arm 66, and on the rod between the arm 66 and the body 80 is a coil spring 82 which is compressed when the mold is moved to discharging position and which by expansion when released restores the mold and its actuating devices to their initial positions. To aid in restoring the rod 74 to normal position it is provided near its lower end with a coil spring 83 between a collar 84 on the rod and the lug 75. The lever arm 69 has an elongated slot to permit the lever to swing inwardly past the rod.

To receive the pat of butter when it is dropped from the mold through the shelf opening 50, a lower shelf 85 is hinged at 86 between a pair of lugs 87 at the under side of the lug 80. On this shelf is a post 88 to which a horizontal rod 89 is pivotally connected and extends loosely through an opening 90 in the lug 80; and on its opposite end is a head 91 between which and the lug 80 is a coil spring 92. When the mold arm 66 is moved inwardly to contact with the rod head 91 it will thrust the rod and thereby turn the shelf on its hinge 86 to downward inclination and permit the pat of butter, or the plate upon which it has dropped, to slide off the end of the shelf 85 onto a discharge chute 93 and thence outside the casing. When the mold is retracted and the rod 89 released the spring 92 will lift the shelf to its horizontal position. To introduce a plate 94 to the shelf 85 an upper inclined chute 95 is provided that leads to the shelf 85; and the plate is stopped in proper position under the opening 50 by an abutment 96.

To raise the follower when it has been worked to the bottom of the container, the cap 19 may be removed by means of a handle 97 attached to the cover arm 35, and the screw 24 is turned in reverse direction by a handle 98 on its upper end.

In operation, the container 5 having been supplied with butter and the mold being in operative position, the lever 27 is swung horizontally to operate the screw-press. The first effect is to force butter through the container opening 7 to fill the mold. The further swinging of the hand lever to the

limit of its movement serves to depress the lever 76 and thereby thrust the rod 74 downward; and the rod thrust serves to oscillate the mold-moving lever on its fulcrum 67. The oscillation of the lever-arm 69 pushes the mold arm 66 inwardly and thereby slides the mold from the position under the opening 7, shown in Figs. 2 and 4, to that shown in Figs. 3 and 5, where the mold is shown over the shelf opening 50. As the mold bottom is free to swing downwardly in the shelf opening, and the hinged mold side 54 is turned outwardly by its contact with the spreader 60, and the butter pat 99 is free to fall from the mold to the plate 94 on the hinged shelf 85. This sliding movement of the mold compresses the coil spring 82, and when the hand-lever 27 is released and returned by the spring 42 to normal position, the expansive force of the spring 82 slides the mold back to the opening 7, the guide 59 effecting the closing of the hinged mold side 54 and contact of the bottom 55 with the top of the wall of the shelf opening 50 serving to swing the bottom upwardly to closed position; and the same return movement lifts the rod 74 and its operating lever 76 to their normal positions.

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

1. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a slidable mold adapted to receive and cut off material so discharged, and means for automatically spreading portions of the mold to free its contents.

2. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a mold adapted to receive and cut off material so discharged, means for reciprocating the mold to and from said opening, and means for automatically freeing the contents of the mold, including means for spreading portions of the mold.

3. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a mold, automatic means for reciprocating it to and away from registry with said opening, means provided on the mold for cutting off the material at said opening, and means for automatically freeing the contents of the mold, including means for spreading portions of the mold.

4. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the



opening, a mold, automatic means for reciprocating it to and away from registry with said opening, and means for automatically spreading portions of the mold to free  
5 its contents.

5. In a machine of the class described, a container for holding plastic material and having a discharge opening, a press for periodically forcing material through said  
10 opening, a lever and connections for operating the press, a slidable mold registering with said opening, connections between the operating lever and the mold for reciprocating the mold to and away from registry  
15 with said opening, and means for automatically spreading portions of the mold to free its contents.

6. In a machine of the class described, a container for holding plastic material and  
20 having a discharge opening, a press for periodically forcing material through said opening, a lever and connections for operating the press, a slidable mold registering with said opening and carrying means for  
25 cutting off material at said opening, connections between the operating lever and the mold for reciprocating the mold to and away from registry with said opening, and means for automatically spreading portions of the  
30 mold to free its contents.

7. In a machine of the class described, a container for holding plastic material and having a discharge opening, a screw-press therein for forcing material through said  
35 opening, a turning-nut for the screw, an oscillating lever and connections for periodically turning the nut, a slidable mold adapted to receive and cut off material so discharged, and means for automatically  
40 spreading portions of the mold to free its contents.

8. In a machine of the class described, a container for holding plastic material and having a discharge opening, a screw-press  
45 therein for forcing material through said opening, a turning-nut for the screw, an oscillating lever and connections for periodically turning the nut, a slidable mold registering with said opening, and connections  
50 between the oscillating lever and the mold for reciprocating the mold to and away from registry with said opening.

9. In a machine of the class described, a container for holding plastic material and  
55 having a discharge opening, means for periodically pressing material through the opening, a slidable mold having a pivotally connected bottom and side, a support and guide for the mold adjacent to said opening,  
60 automatic means for reciprocating the mold to and away from registry with said opening, and automatic means for the timely opening and closing of the mold.

10. In a machine of the class described,  
65 a container for holding plastic material and

having a discharge opening, means for periodically pressing material through the opening, a slidable mold having a pivotally connected bottom and side and a blade for cutting off material at said opening, a support  
70 and guide for the mold adjacent to said opening, automatic means for reciprocating the mold to and away from registry with said opening, and automatic means for the timely opening and closing of the mold. 75

11. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a slidable mold having a pivotally connected bottom and side and a blade for cutting off material at said opening, a support  
80 and guide for the mold adjacent to said opening, automatic means for reciprocating the mold to and away from registry with said opening, means for opening the pivoted mold side as the mold is moved away from and for closing it on return to said opening, and means for correspondingly releasing  
85 and returning the mold bottom. 90

12. In a machine of the class described, a container for holding plastic material and having a discharge opening, a screw-press therein for forcing material through said  
95 opening, a turning-nut for the screw, an oscillating lever and connections for periodically turning the nut, a spring for returning the lever to initial position, and a slidable mold adapted to receive and cut off material so discharged. 100

13. In a machine of the class described, a container for holding plastic material and having a discharge opening, a screw-press therein for forcing material through said  
105 opening, an oscillating lever for operating the press, a slidable mold registering with said opening, a lever for engaging the mold to slide it away from said opening, a spring for retracting it, and a rod reciprocated by the working stroke of the press lever for engaging the mold lever to move the mold  
110 against the resistance of said spring.

14. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a slidable mold adapted to receive and cut off material so discharged, means for spreading portions of the mold to allow its contents to gravitate, and means for receiving the molded material and conducting it  
115 out of the machine. 120

15. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a blade for cutting off material at said opening, a mold arranged to register with said opening and having a pivotally connected bottom and side, and means for opening  
125 130



ing and closing such pivoted bottom and side.

16. In a machine of the class described, a container for plastic material, a casing providing a cooling chamber around the sides of the container, means for periodically ejecting material from the container, a slidable mold arranged to receive and cut off the ejected material, and means for automatically spreading portions of the mold to release its contents.

17. In a machine of the class described, a container for plastic material, a casing providing a cooling chamber around the sides of the container, means for periodically ejecting material from the container, a slidable mold arranged to receive and cut off the ejected material, means for reciprocating the mold to and from receiving position, and automatic means for opening and closing the mold during its reciprocations.

18. In a machine of the class described, a container for plastic material, a casing providing a cooling chamber around the sides of the container, means for periodically ejecting material from the container, a slidable mold arranged to receive and cut off the ejected material, means for releasing the molded material, and automatic means for conducting the molded material outside the casing.

19. In a machine of the class described, a container for holding plastic material and having a discharge opening, means for periodically pressing material through the opening, a slidable mold having a pivotally connected bottom and side and a blade for cutting off material at said opening, means for reciprocating the mold to and away from registry with said opening, a mold support adjacent to said opening, guides provided on the support one of which is adapted to close the pivoted mold side, and a spreader for opening said side.

20. In a machine of the class described, an upright container for holding plastic material and having a discharge opening, a screw press for discharging such material through the opening, having a vertically extending threaded shank, a turn-nut on said shank for operating the screw press, a hand lever mounted for oscillation directly upon the nut periodically to operate the same, a slidable mold arranged to receive and cut off the discharged material, and connections between said hand lever and the mold to reciprocate the mold.

21. In a machine of the class described, a container for plastic material having a discharge opening therein, means for forcing said material through the opening, means for receiving and cutting off the discharged

material, and a hand lever mounted for oscillation directly upon the container having connections to both of said means, whereby each oscillation of the hand lever in a forward or active direction will operate the discharging means and the receiving and cutting-off means.

22. In a machine of the class described, a container for plastic material having a discharge opening therein, means for forcing said material through the opening, means for receiving and cutting off the discharged material, a hand lever mounted for oscillation directly upon the container and cooperating directly with the forcing means to operate the same, and cam-means on the lever cooperating with connections to the receiving and cutting-off means for actuating the same.

23. In a machine of the class described, a container for plastic material having a discharge opening therein, means for forcing said material through the opening, means for receiving and cutting off the discharged material, a hand lever mounted for oscillation directly upon the container and cooperating directly with the forcing means to operate the same, and cam-means on the lever cooperating with connections to the receiving and cutting-off means for actuating the same, said connections including a cam-arm cooperating with a cam-plate on the receiving and cutting-off means.

24. In a butter-molding machine, a sliding mold having a pivoted bottom piece and a pivoted side piece, a guideway for said mold, means to reciprocate the mold on the guideway, and a cam-piece to cooperate with the pivoted side piece at the end of the reciprocation and move the same on its pivot to spread the mold.

25. In a butter-molding machine, a sliding mold having a pivoted bottom piece and a pivoted side piece, a guideway for said mold, means for reciprocating the mold on the guideway, stops on the mold, stops on the guideway cooperating with the stops on the mold for limiting the extent of reciprocation of the mold, cam-means on the guideway for spreading the sides of the mold relatively at the end of a reciprocation of the mold, and other cam-means on the guideway for closing said sides together during the return reciprocation of the mold.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses this 19th day of May, 1910.

GEORGE H. EBEL.

Witnesses:

JULIA E. KNAUFT,  
F. E. HUFNAIL.