

Aug. 20, 1935.

J. SCHNUR

2,011,829

PACKAGING MACHINE

Filed Aug. 27, 1932

8 Sheets-Sheet 1

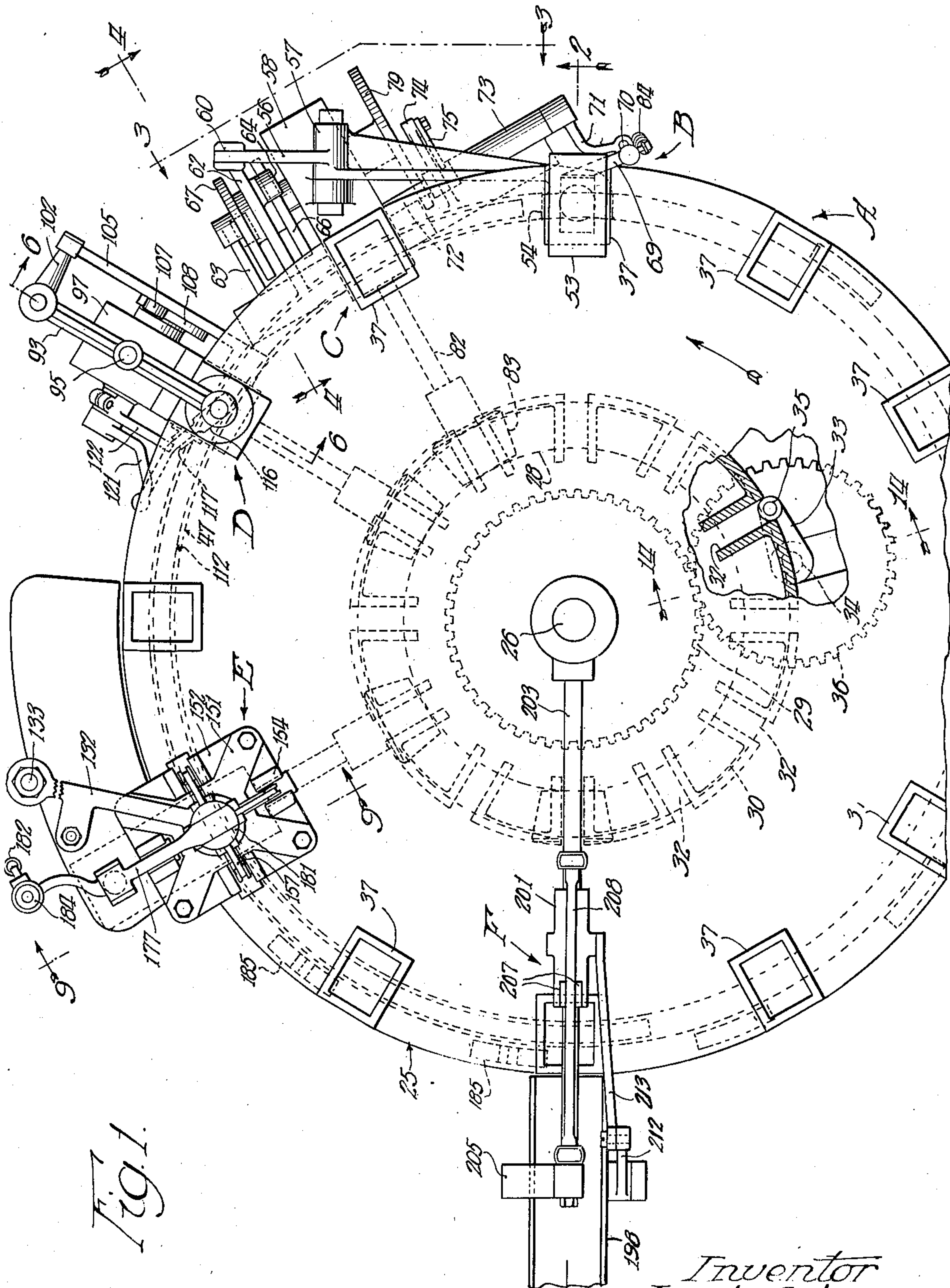


Fig. 1.

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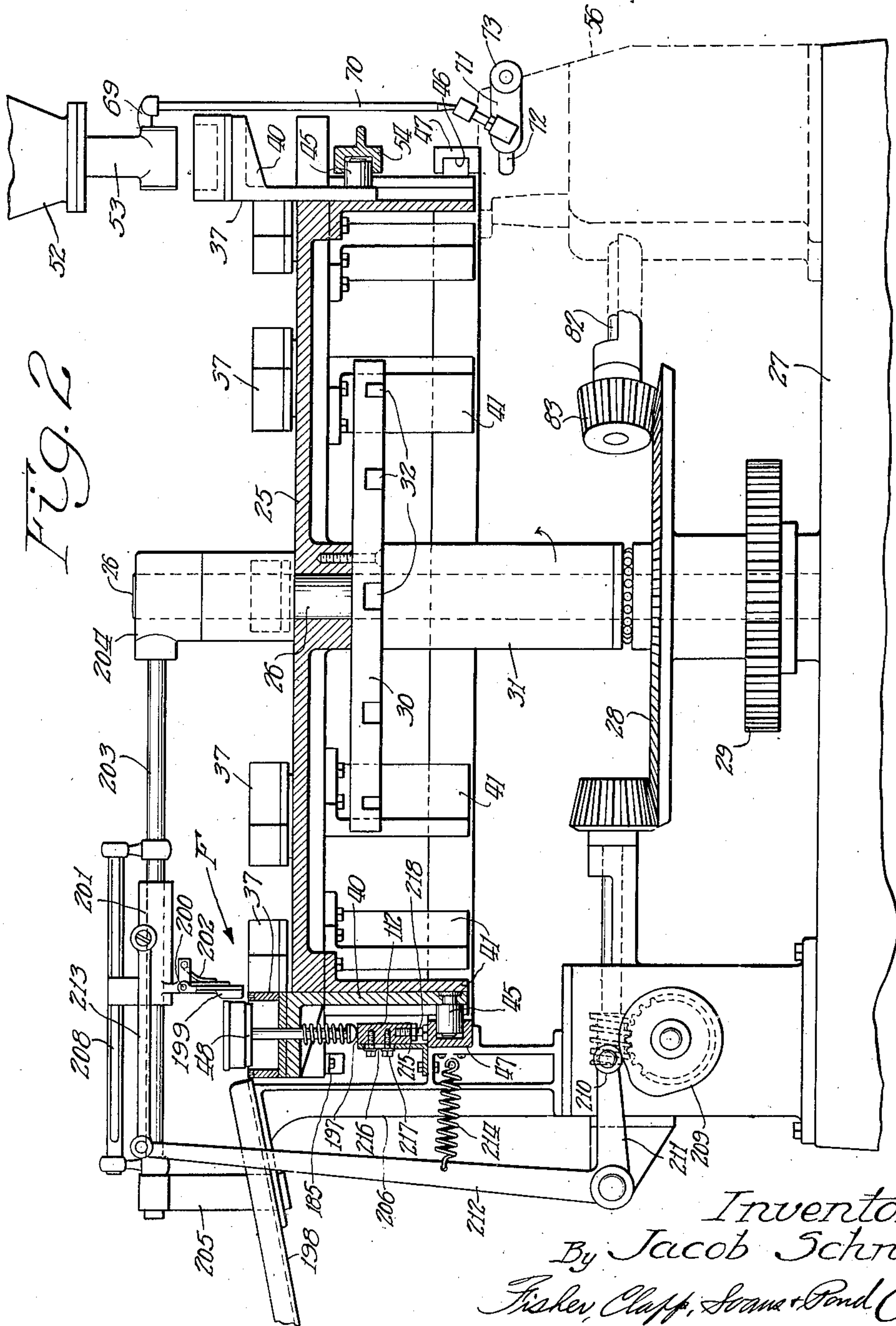
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PACKAGING MACHINE

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8 Sheets-Sheet 2



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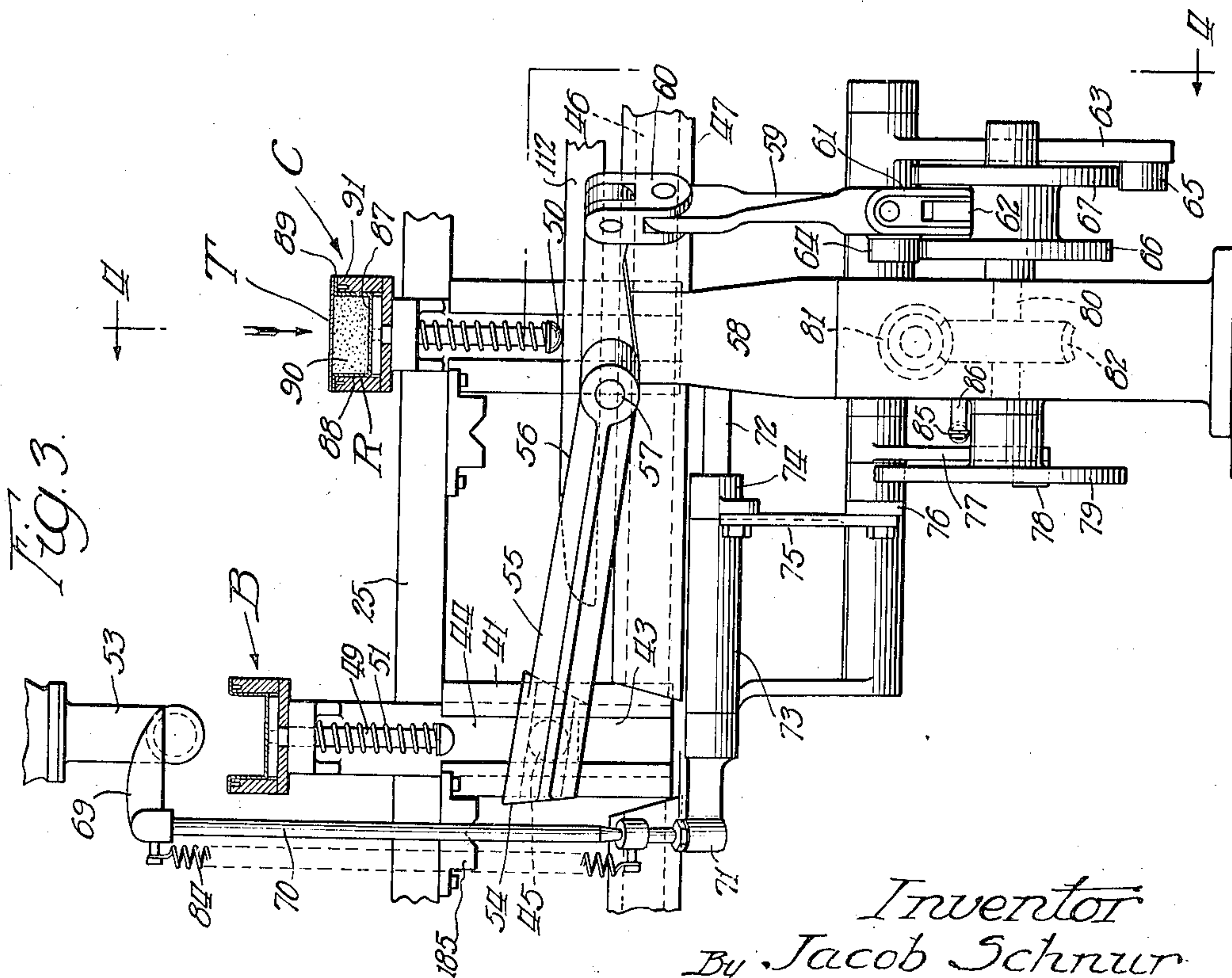
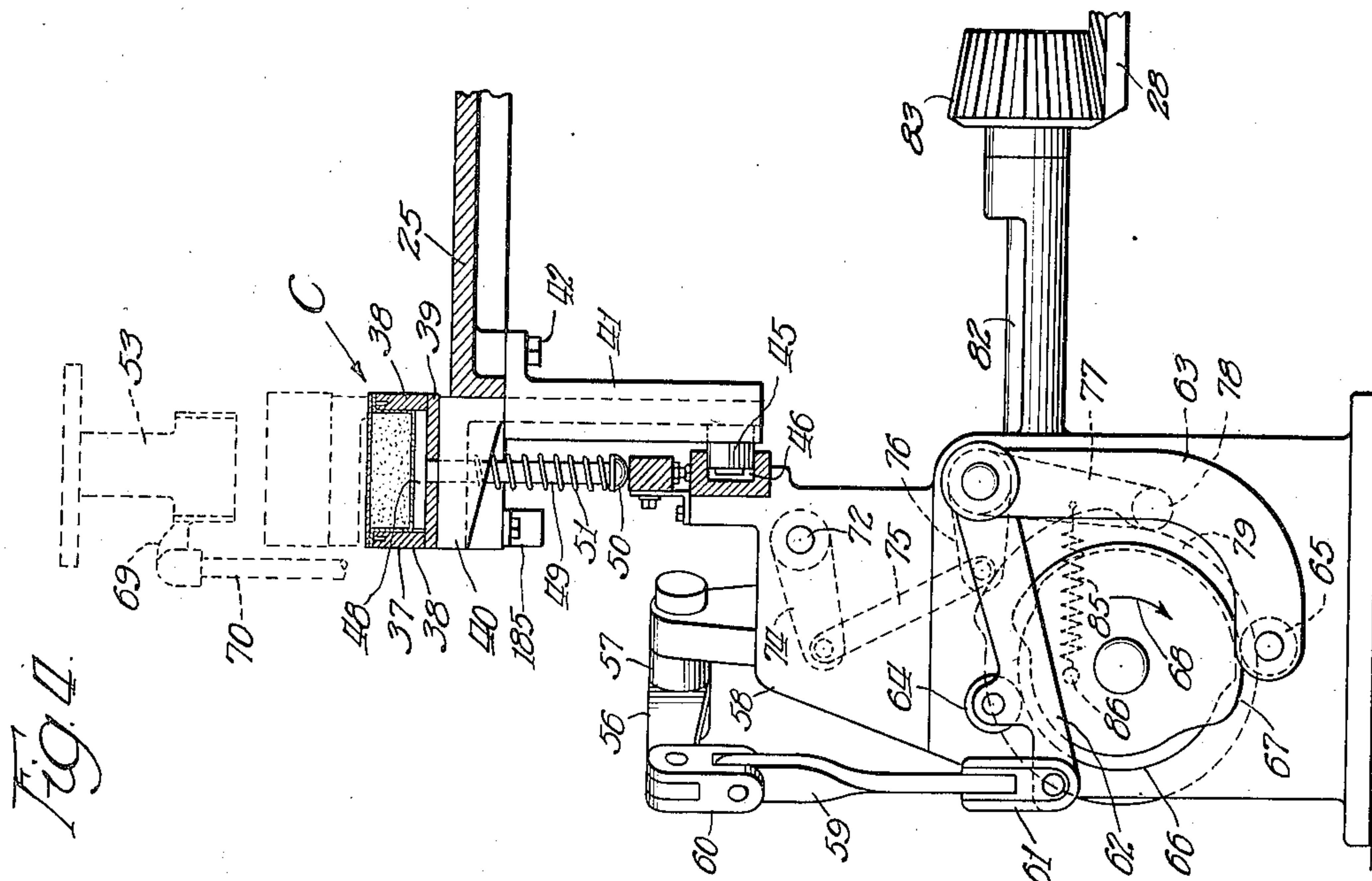
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PACKAGING MACHINE

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8 Sheets-Sheet 3



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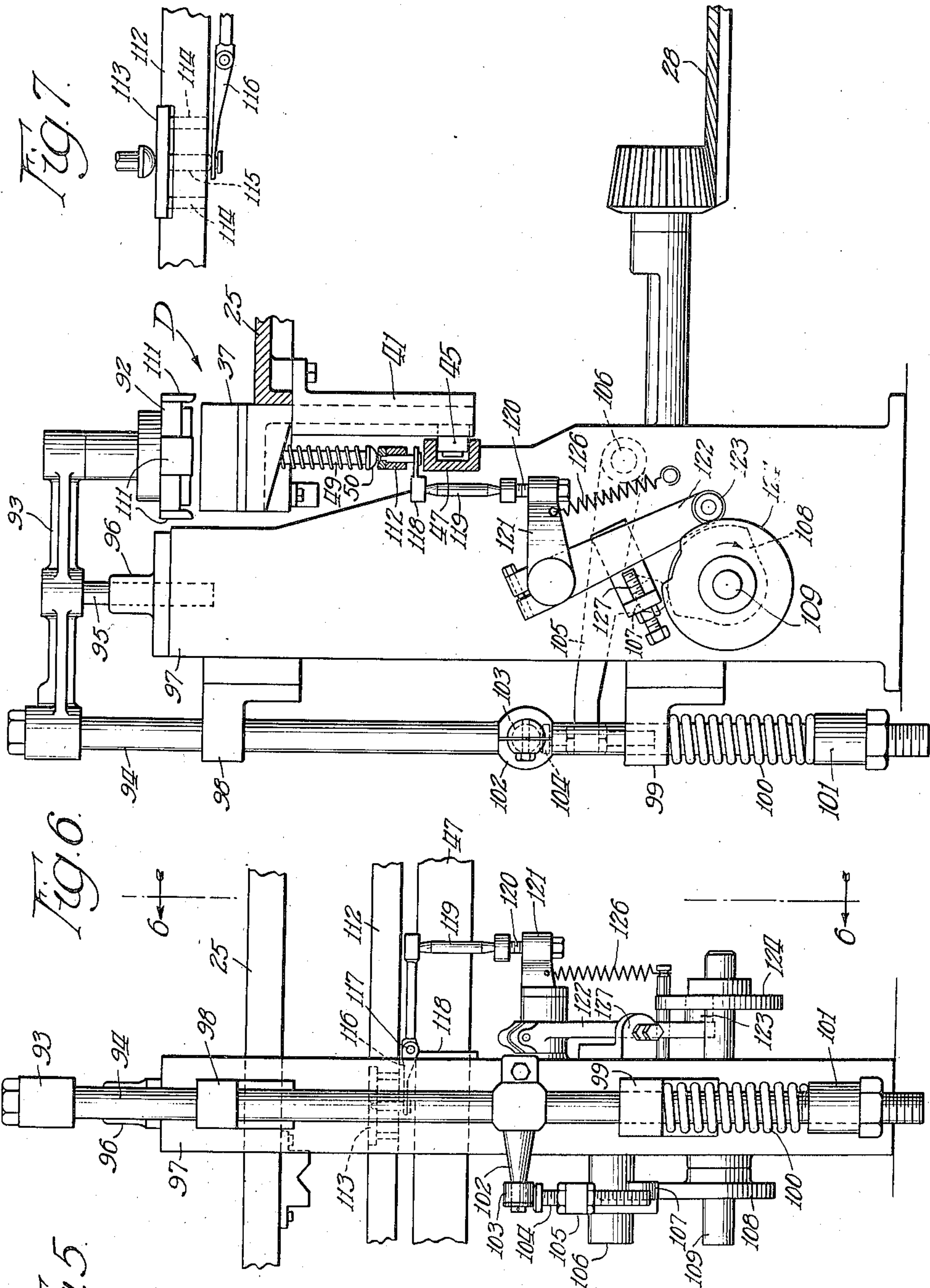
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8 Sheets-Sheet 4



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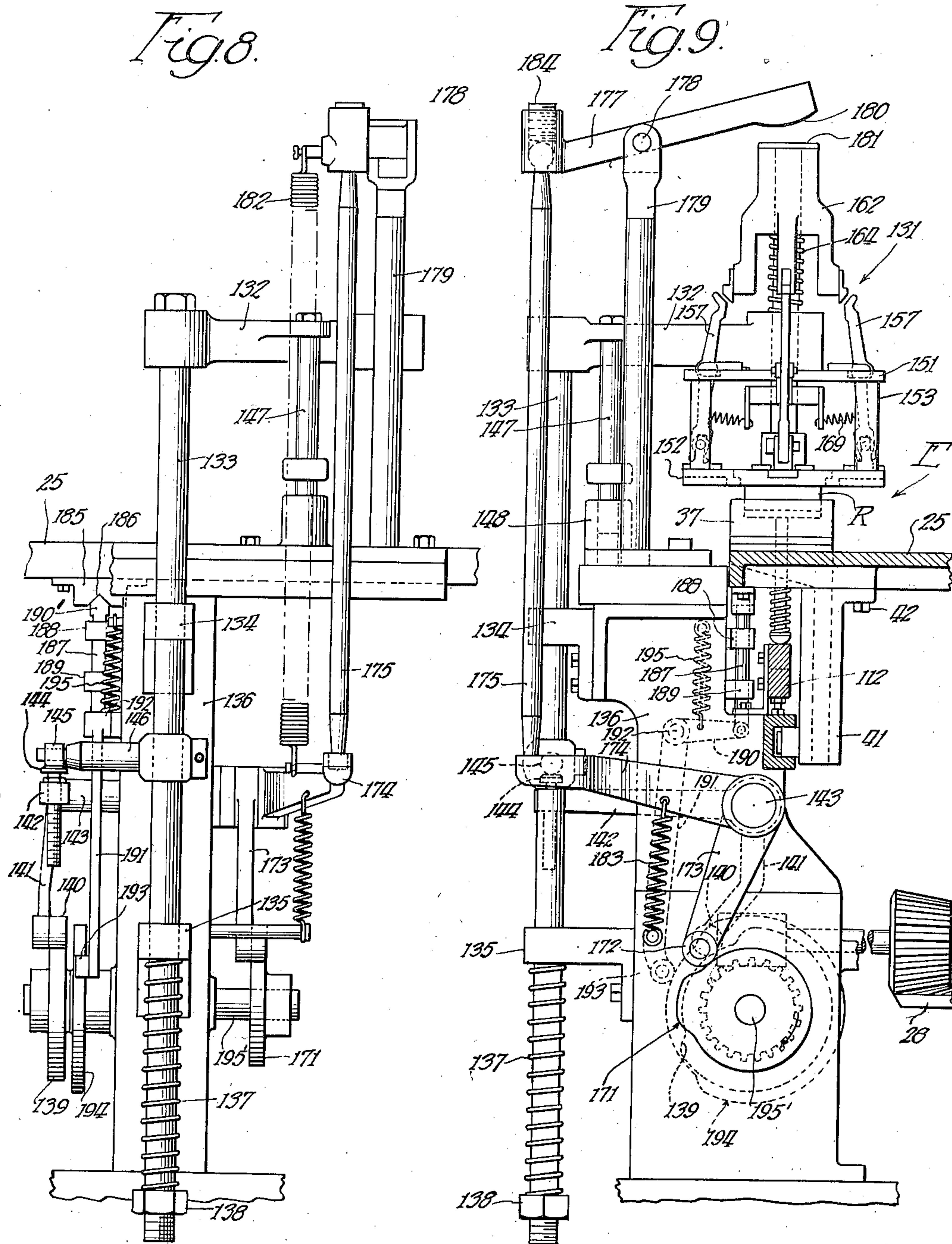
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PACKAGING MACHINE

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8 Sheets-Sheet 5



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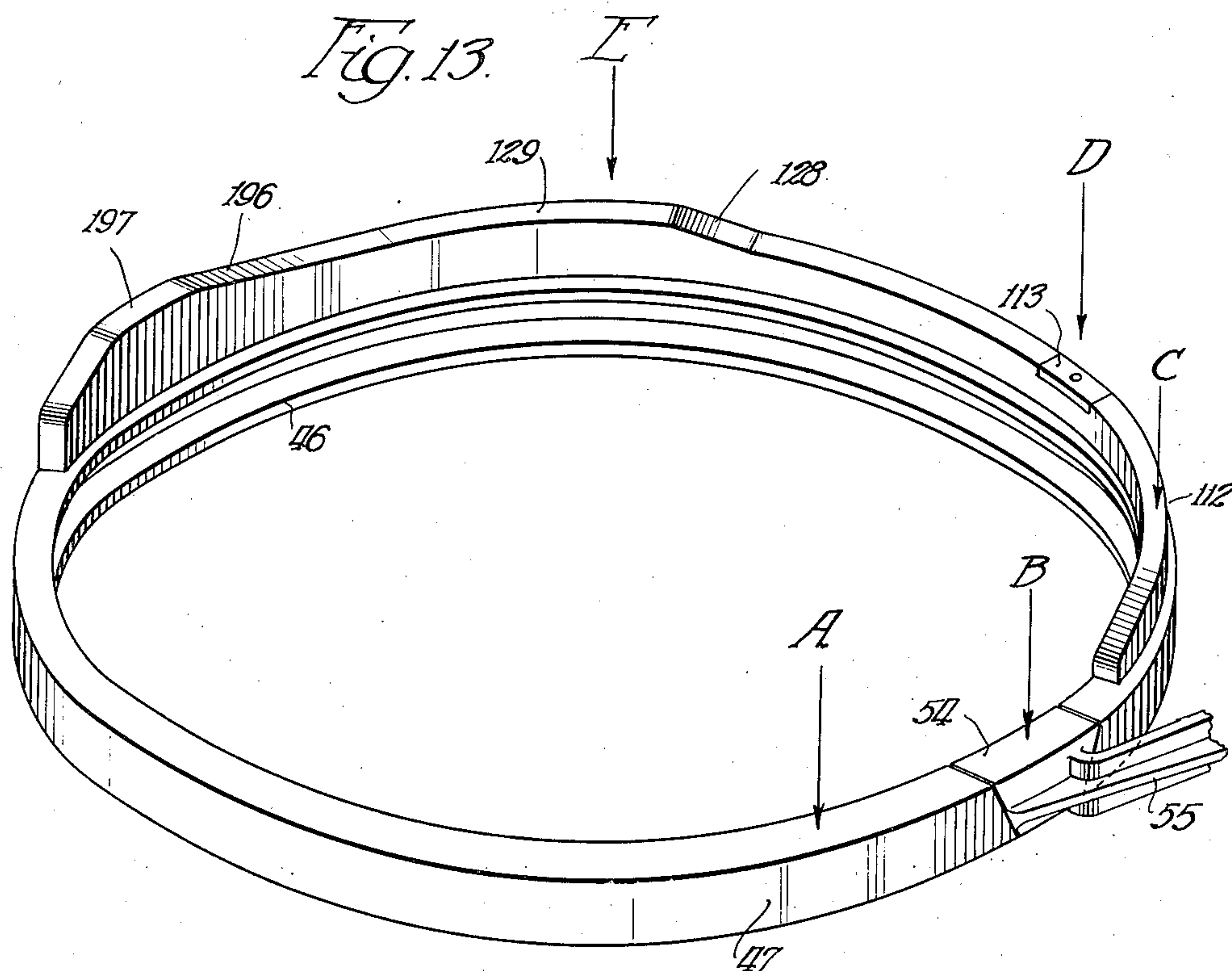
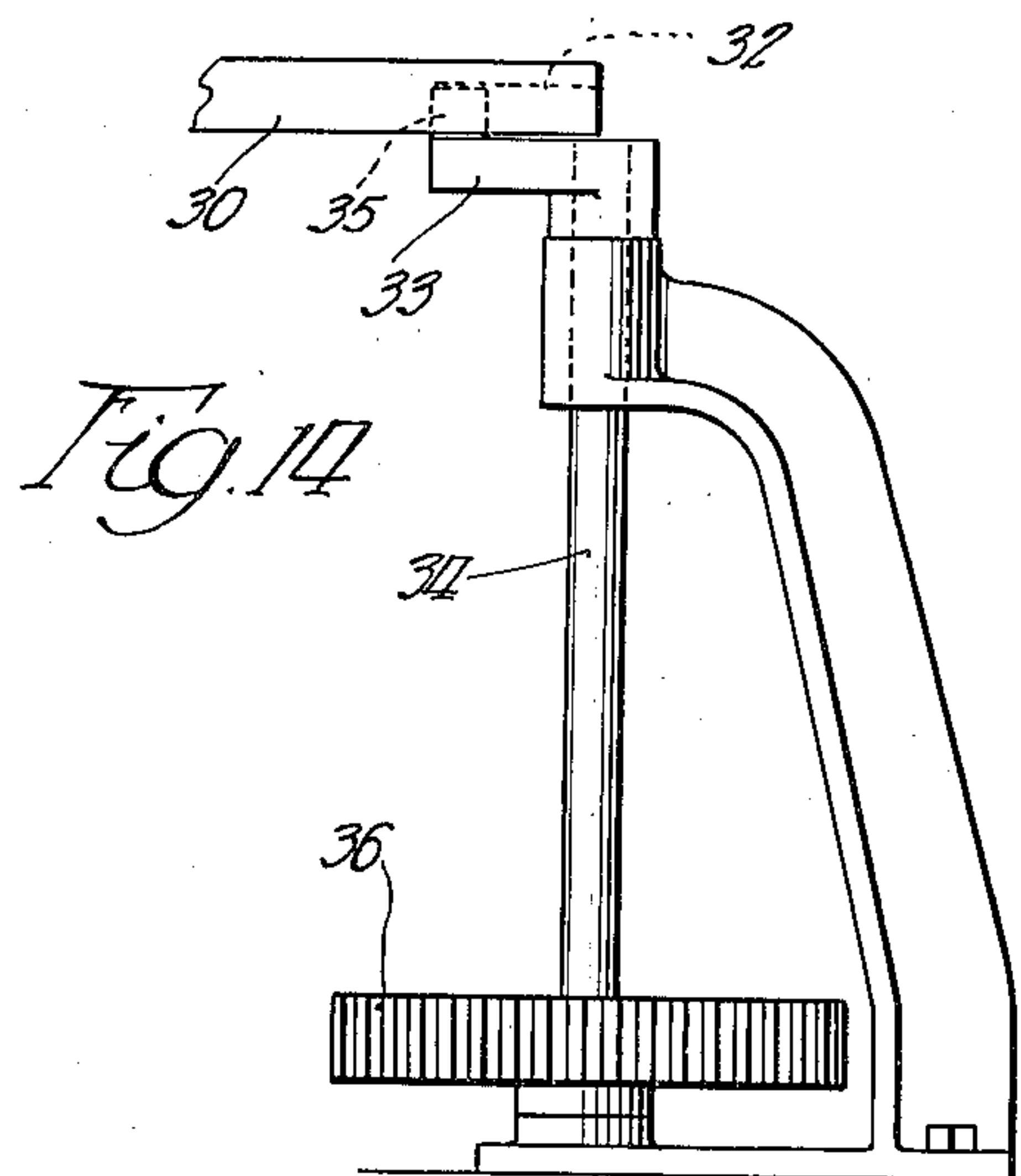
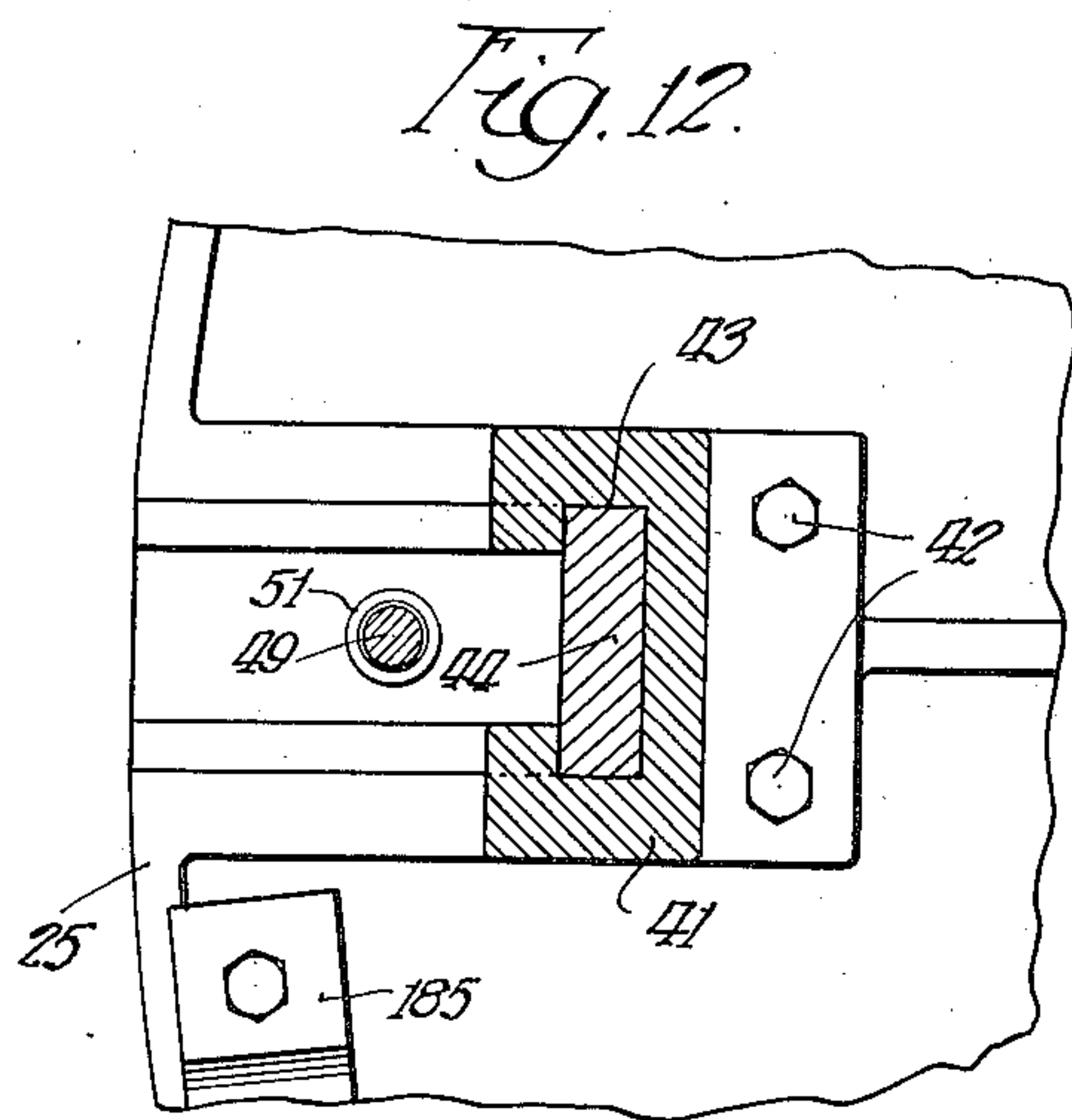
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PACKAGING MACHINE

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8 Sheets-Sheet 7



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2,011,829

PACKAGING MACHINE

Filed Aug. 27, 1932

8 Sheets-Sheet 8

Fig. 15.

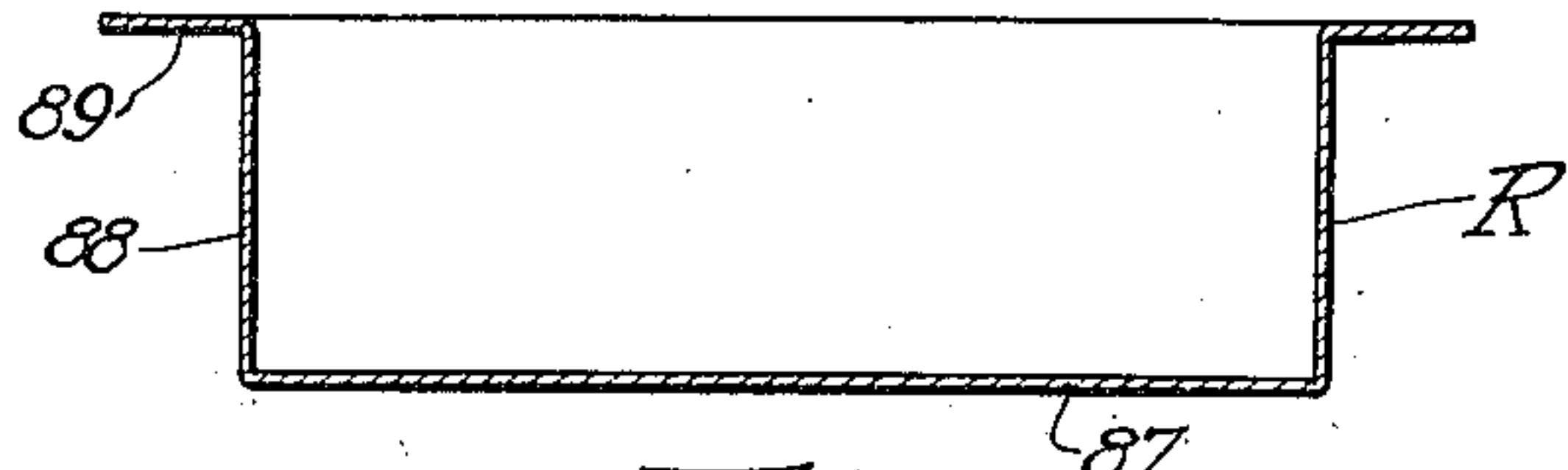


Fig. 16.

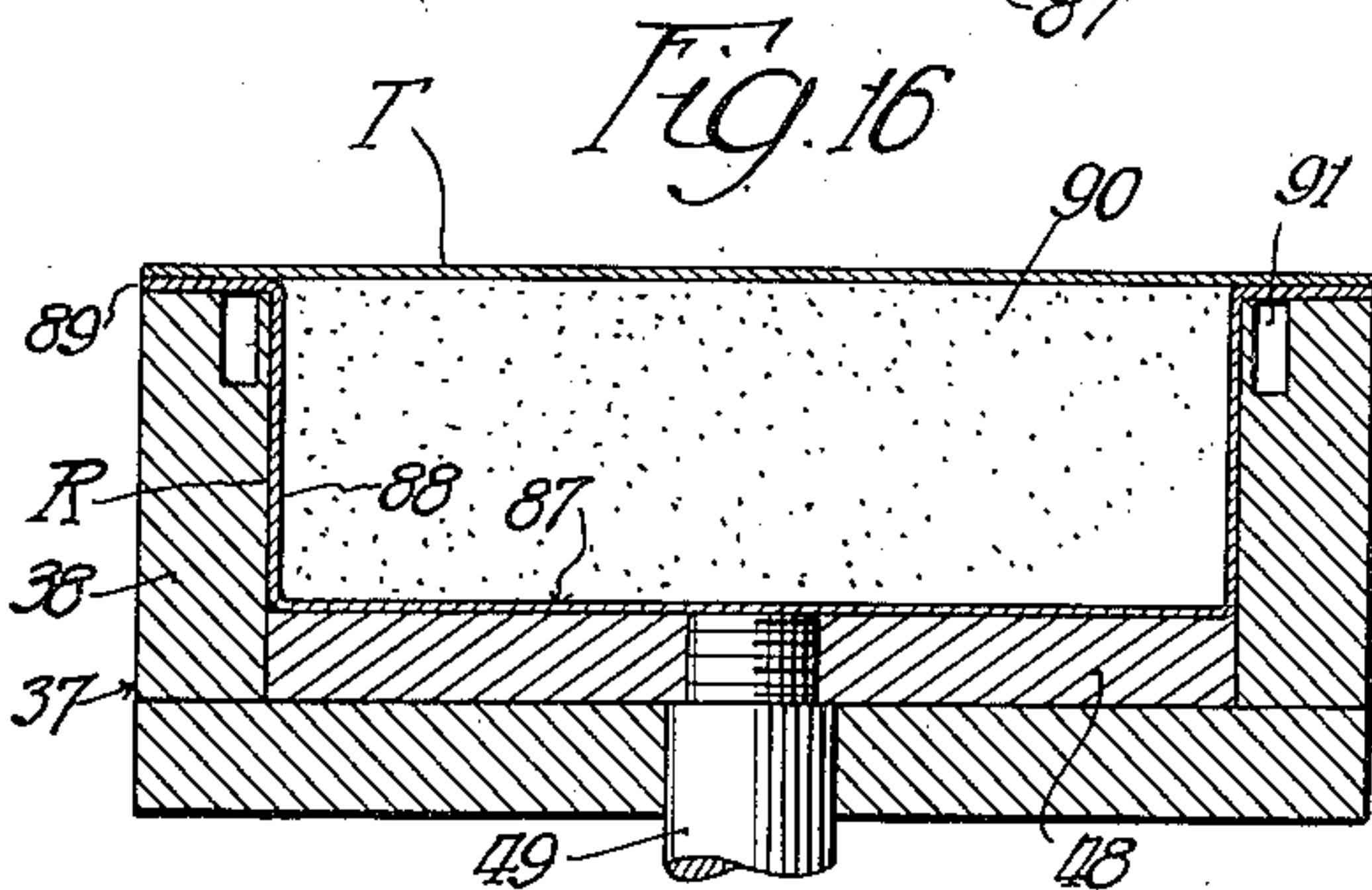


Fig. 17.

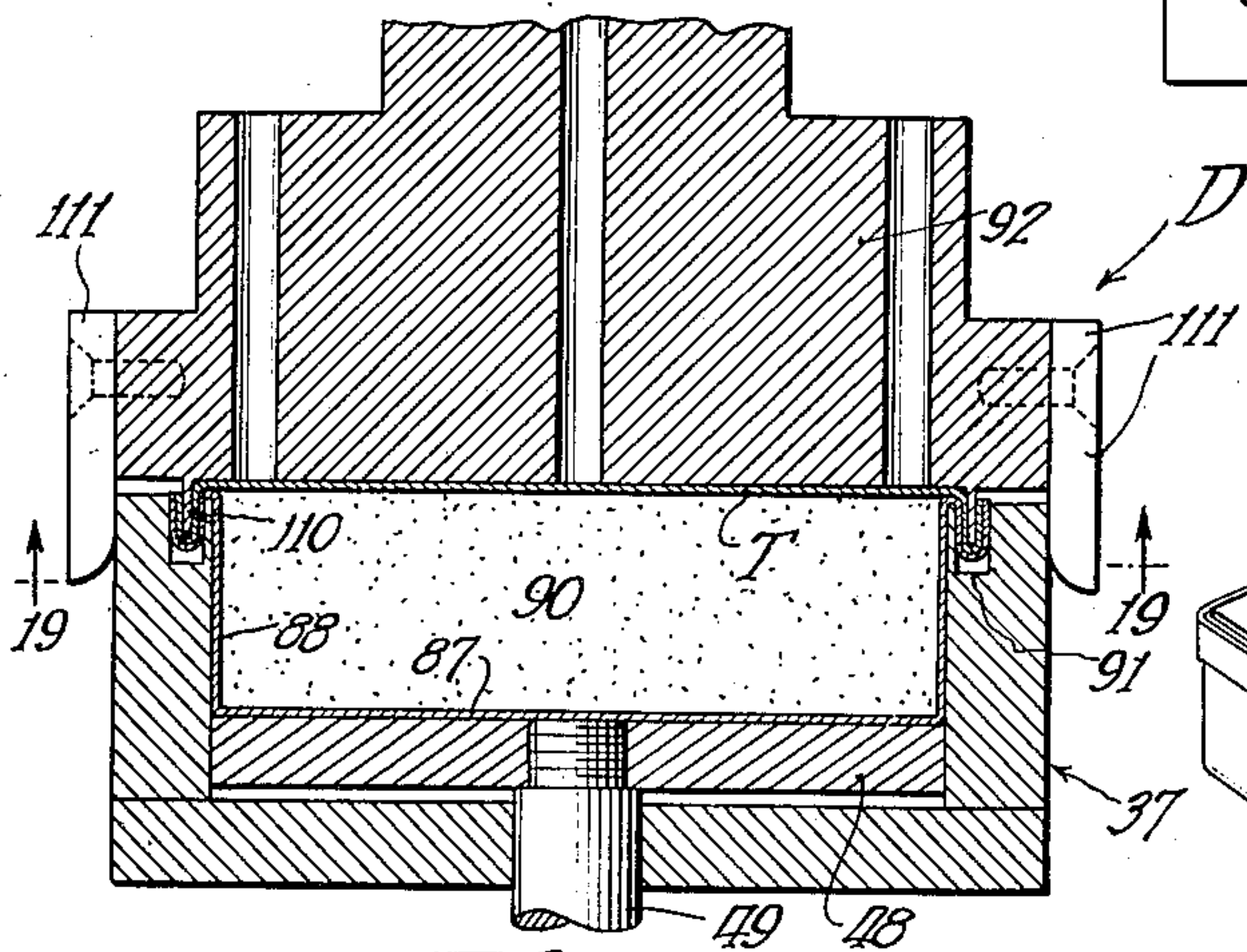


Fig. 18.

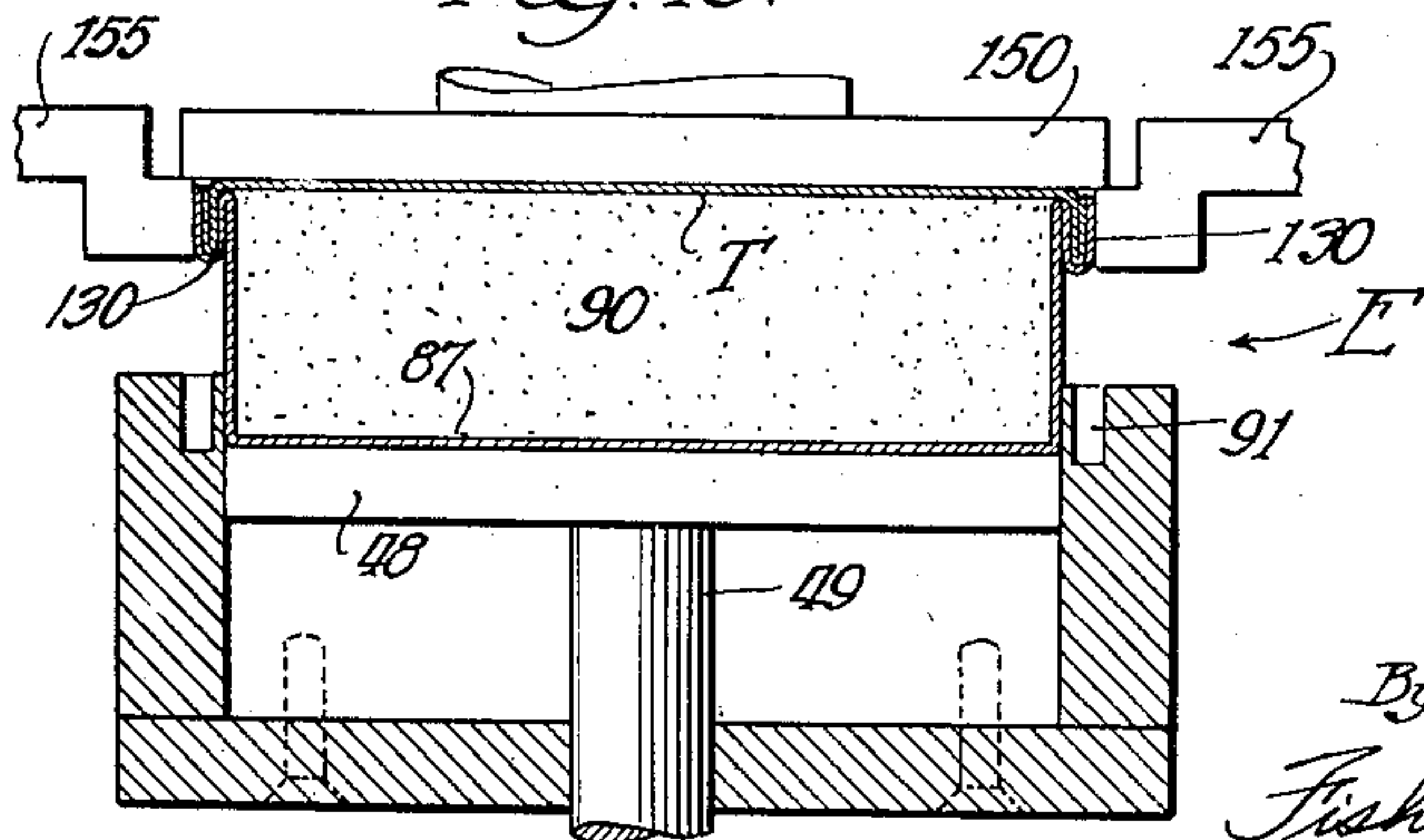


Fig. 19.

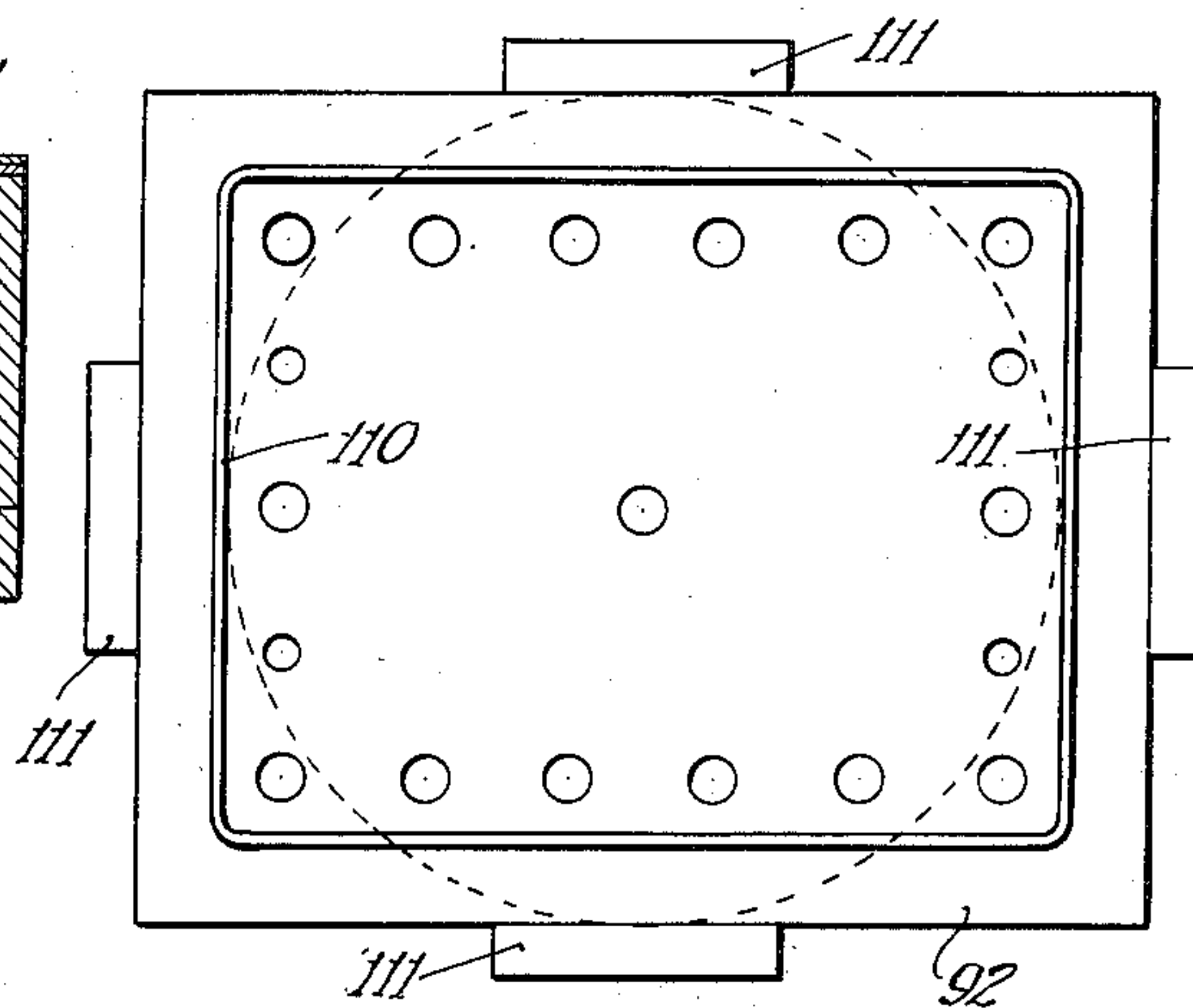
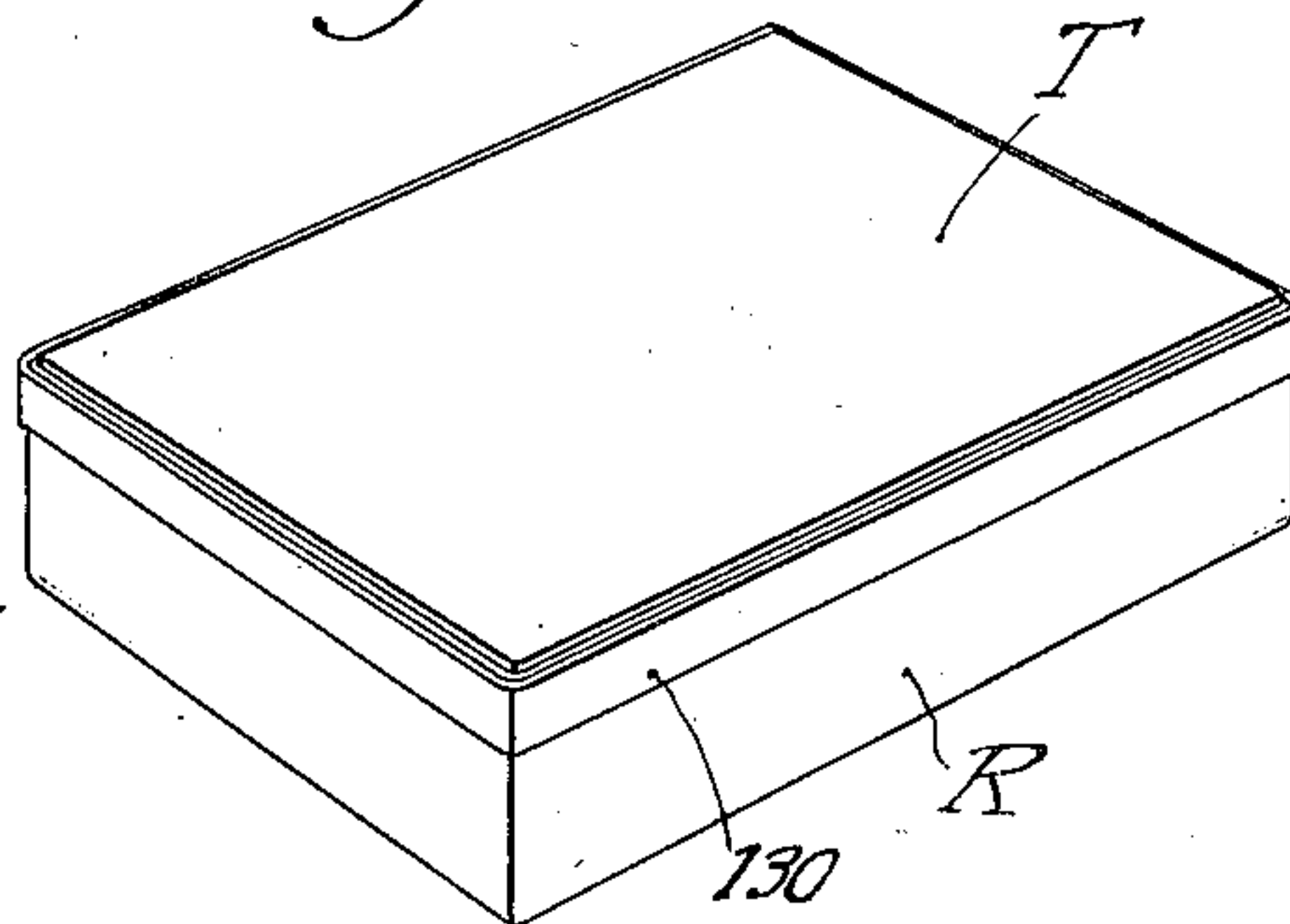


Fig. 20.



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UNITED STATES PATENT OFFICE

2,011,829

PACKAGING MACHINE

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poration of Delaware

Application August 27, 1932, Serial No. 630,627

25 Claims. (Cl. 93—6)

This invention relates to improvements in a machine for making packages, especially packages for material which deteriorates upon exposure to air.

5 The packages made by the particular machine disclosed in this application are rectangular, brick-like cheese packages in which a predetermined quantity of cheese or cheese product is enclosed in an impervious, preferably metal foil, wrapper. The wrapper is made of two parts, one of which constitutes a receptacle having a bottom and side walls, and a cover sheet which closes the top of the receptacle. The receptacle part is provided with a rim flange portion and the cover part has a marginal portion which overlaps the rim flange of the receptacle and the said flange and marginal portions are interfolded and closed against the side wall surface of the package to form a substantially impervious seal between the two parts forming the wrapper for the package content.

10 The main objects of this invention are to provide mechanism for facilitating the filling of a receptacle with the desired product; to provide automatic mechanism for interfolding portions of the receptacle and cover sheet to form a tight joint between the two parts; to provide comparatively simple mechanism for the purpose set forth which will not be apt to get out of order but will be durable and will operate smoothly and efficiently with a minimum of attention by an operator; and in general, it is the object of the invention to provide an improved machine of the class described.

15 Other objects and advantages of the invention will be understood by reference to the following specification and accompanying drawings (8 sheets) in which a packaging machine embodying a preferred form of the invention is illustrated.

In the drawings:—

Fig. 1 is a plan.

Fig. 2 is a section on the line 2—2 of Fig. 1.

20 Fig. 3 is a fragmentary elevation of the portion of the mechanism indicated by the line 3—3 of Fig. 1.

Fig. 4 is a section on the lines 4—4 of Figs. 1 and 3.

25 Fig. 5 is a fragmentary side elevation illustrating another portion of the mechanism.

Fig. 6 is a section on the lines 6—6 of Figs. 1 and 5.

30 Fig. 7 is an enlarged view of a portion of the mechanism illustrated in Fig. 5.

Fig. 8 is a side elevation of another portion of the mechanism shown in Fig. 1.

Fig. 9 is a section on the line 9—9 of Fig. 1, and a side elevation of the mechanism shown in Fig. 8.

Fig. 10 is a section illustrating the details of construction of a part of the mechanism shown in Fig. 9.

Fig. 11 is a section on the line 11—11 of Fig. 10.

Fig. 12 is a section on the line 12—12 of Fig. 10.

Fig. 13 is a perspective illustrating certain guide and cam elements of the machine.

Fig. 14 is a detail illustration of certain driving mechanism located in the plane indicated by the line 14—14 of Fig. 1.

Figs. 15, 16, 17, and 18 are illustrative of successive steps in the operation of packaging as carried on by the machine illustrated.

Fig. 19 is a bottom plan of an upper die member, the plane of the plan being indicated by the line 19—19 of Fig. 17, and

Fig. 20 is a perspective of a completed package produced by the machine illustrated.

Referring now to the drawings, and for the present, more particularly to Figs. 1 and 2, the machine herein disclosed includes a turntable or conveyor 25 which is rotatably mounted on a vertical shaft or post 26, the latter being mounted in fixed position in a base 27. The shaft 26 does not rotate but is stationary.

A bevel gear 28 is rotatably mounted on the shaft 26 and is suitably keyed or otherwise secured to a spur gear 29 so that the said gears 28 and 29 rotate as a unit. The gears 28 and 29 may be continuously driven by means of any suitable driving means which may, for example, include a driving gear meshing with either of the gears 28 and 29. Inasmuch as the source of power may vary according to the various installations of the machine, no specific driving arrangement is herein shown, it being within the skill of any mechanic to apply a suitable driving means.

The turntable 25 is to be rotated intermittently and for the purpose of so rotating the turntable, a Geneva movement is provided. In this instance, the Geneva movement includes a disc member 30 having a hub 31 whereby it is rotatably mounted on the shaft 26, the disc being suitably slotted as indicated at 32. A crank arm 33 secured to the upper end of a shaft 34 is provided with a roller or pin 35 which engages the successive slots 32 in the wheel of the well-known Geneva movement to intermittently propel the disc 32 and conveyor table 25 (see also Fig. 14).

As shown in Fig. 2, the Geneva disc 30 is pinned to the conveyor table 25 so that these parts rotate together as a unit. The shaft 34 which carries the Geneva operating crank 33 is rotatably mounted in a suitable bracket such as illustrated in Fig. 14, and the shaft may be rotated by means of a gear 36 secured to the shaft and meshing with the gear 29 on the vertical shaft 26.

A plurality of package holders 37 are mounted on the turntable near its periphery, these holders being all of substantially identical construction and adapted to receive and position packages in predetermined relation to the turntable and in predetermined relation to other devices which operate on the packages, as will presently be described.

Each holder 37 is in the form of a rectangular box having side walls 38 and a bottom 39, these parts being suitably united and mounted on a supporting post 40. The supporting post 40 is vertically adjustably mounted on the turntable 25 through the agency of a bracket 41 which is bolted as indicated at 42, or otherwise secured to the turntable 25. The bracket 41 is provided with a way 43 which vertically, slidably receives a stem portion 44 of the holder supporting member 40. Near its lower end, the stem portion 44 is provided with a roller 45 which enters a groove 46 in a guide member 47. As shown in Fig. 13, the guide member 47 is circular so that the roller 45 remains in the guideway groove 46 throughout the travel of the turntable 25.

Each holder is provided with a false bottom element 48 which is vertically adjustable in the holder, and which is carried by the upper end of a depending stem or rod 49. As clearly shown in Figs. 4 and 10, the rod 49 is provided with a head 50 at its lower end and a spring 51 disposed around the rod and compressed between the said head 50, and the bottom face of the top portion of the support 40 serves to yieldingly hold the false bottom element 48 in its lowermost position in the holder as illustrated in Fig. 4.

In a fully automatic machine, suitable means would be provided for delivering to one of the holders 37, a suitable sheet of impervious material such as metal foil from which a package receptacle can be formed in the holder by means of suitable plunger mechanism cooperating therewith at one of the holder stations on the turntable. The present machine is, however, illustrated as a semi-automatic machine, and it is contemplated that preformed metal foil receptacles will be inserted into the respective holders 37 at a suitable point, for example at A (Fig. 1), which may be considered the starting point of the packaging operation as carried on by this machine.

The first movement of the turntable 25 carries the holder with a metal foil receptacle placed therein from the station A to the station indicated at B, where it is filled with a predetermined quantity of the desired material; for example, cheese or cheese product. In Figs. 1, 2, 3, and 4, the lower end 52 of a supply hopper is shown as provided with a measuring discharge valve device 53 of well-known construction. It is preferred to elevate the holder and its receptacle of metal foil from normal position as shown in full lines in Fig. 4 to elevated position adjacent the discharge nozzle 53 as shown in full lines in Figs. 2 and 3, and in broken lines in Fig. 4.

For effecting such upward adjustment of the holder 37, a portion 54 of the guide 47 is made

separable from the guide 47 and it is secured to or formed integral with the free end 55 of a lever 56. The lever 56 is pivoted intermediate its ends as indicated at 57 on a suitable upstanding lug or like portion of a frame element 58. The opposite end of the lever 56 is connected to one end of a link 59 through the agency of a universal joint 60, and the other end of the link 59 is connected through the agency of a universal joint 61 to the free end of an arm 62. The arm 62 constitutes one arm of a bell crank, the other arm being indicated at 63. The arms 62 and 63 are respectively provided with rollers 64 and 65 which engage cams 66 and 67 respectively. The cams 66 and 67 rotate in the direction of the arrow 68 (Fig. 4), and the cam 67, acting through the arm 63, serves to rock the lever 56 so as to elevate the outer end 55 thereof, whereby the holder 37 is also elevated to substantially the position illustrated in Fig. 3. Upon completion of the filling operation, the cam 66, acting through the arm 62 serves to lower the holder and filled receptacle to lowered position as shown in full lines in Fig. 4.

While the holder and receptacle are in elevated position, a measuring valve element constituting part of the discharge nozzle 53 is automatically actuated. The means for actuating the valve includes a lever 69 constituting part of the valve mechanism, the free end of the lever 69 being connected through the agency of any suitable form of universal joint (for example, a ball and socket joint) to the upper end of a rod 70, the lower end of which is similarly connected to the free end of the arm 71 (see Figs. 1 and 3) which is carried by one end of a shaft 72, the latter being suitably journaled in a bracket element 73 carried by the frame work of the machine and the frame part 58. Another arm 74 is secured to the shaft 72 and has its free end connected by means of a link 75 to the end of an arm 76 which is one arm of a bell crank, the other arm of which is indicated at 77. The arm 77 carries a roller 78 which engages a cam 79 which serves to rock the bell crank arms 76 and 77 and thereby to actuate the measuring valve 53.

The cams 66, 67, and 79 are carried by opposite ends of a shaft 80 rotatably journaled in the frame 58, which is preferably in the form of a housing for worm and worm wheel speed reducing gearing 81 and 82 through which power is transmitted to the shaft 80 from the bevel gear 28. The worm wheel 81 is secured to one end of a shaft 82 which is rotatably mounted in suitable bearing elements formed integral with or mounted on the frame or housing element 58 and provided with a bevel gear 83 which meshes with the bevel gear 28. A spring 84 stretched between the free end of the lever 69 and the free end of the lever 71 serves to prevent separation thereof and escape of the intermediate rod 70 and a spring 85 stretched between the bell crank lever 77, and a pin 86 carried by the frame housing 58 causes the cam follower 77-78 to follow the cam 79 so that the valve 53 is closed, as provided for by the shape of the cam 79.

While the receptacle is being filled in one of the holders 37 at station B, the filled receptacle in the holder 37 at station C may be covered with a cover sheet of metal foil or other impervious material. Such cover sheet may be automatically applied, but in this instance, it is contemplated that the cover sheet will be manually deposited since the mechanism disclosed is in the nature of a semiautomatic machine.

By reference to Figs. 3 and 4, it will be seen

that the package embodies a receptacle element R which includes a bottom 87, side walls 88 and an outwardly extending rim flange 89, a filling of material 90 and a top or cover sheet T which has a marginal portion overlapping the rim flange portion 89 of the receptacle, (see also Figs. 15 and 16). As most clearly shown in Fig. 16, the upper edge of the side wall 38 of the holder is provided with a groove or recess 91 which extends entirely around the holder and is preferably spaced outwardly from the wall thereof.

At station D, mechanism is operated to interfold the marginal portion of the cover or top T and the rim flange 89. This mechanism includes an upper die member 92 which is carried by a cross head 93, the latter being secured to the upper end of a vertically adjustable rod 94. Intermediate its ends, the rod 93 is secured to a shaft 95 which is vertically slidable in a suitable bearing member 96 mounted on the top of a supporting frame element 97.

The rod 94 is vertically slidably supported in bearing brackets 98 and 99 which are respectively secured to the supporting frame 97. A spring 100 disposed around the lower end portion of the rod 94 and interposed between the bearing bracket 99 and an adjusting nut 101 on the lower end of the rod serve to normally urge the rod to move downwardly. Intermediate the bearing brackets 98 and 99, the rod 94 has secured to it a laterally extending arm 102 which carries an anti-friction roller 103 adapted to engage the head of a member 104 which is adjustably mounted in the free end of an arm 105. The arm 105 is pivoted as indicated at 106 on the side of the supporting frame element 97, and is provided with a roller 107 which engages a cam 108 secured to one end of a shaft 109 which is driven at reduced speed through speed reducing gearing from the bevel gear 28 as previously described in connection with the holder elevating mechanism.

The cam 108 is so shaped that it will act on the roller 107 and lever 105 to raise the rod 94 against the pressure of the spring 100. For a predetermined period during the intermittent movement of the turntable 25, the rod 94, cross-head 93 and upper die member 92 are maintained in elevated position by the cam 108. When the conveyor table 25 reaches a predetermined position and while it remains at rest, the cam 108 permits the spring 100 to lower the rod 94 and upper die member 92 to effect interfolding of the relatively overlapping portions of the cover or top T and receptacle R.

By reference to Fig. 17, it will be seen that the upper die member is provided with a depending tongue or flange-like part 110 which operates to tuck the overlapping marginal portions of the receptacle and top into the recess or groove 91 of the holder, thereby interfolding the said top and receptacle portions. Guide fingers 111 are secured to the upper die member at its opposite sides to insure proper alignment of the upper die member with the holder 37 which constitutes, in effect, a lower die member.

To insure the formation of a firm and sharply formed or neat appearing package, means is provided for effecting limited compression of the package upon completion of the interfolding operation so far described. Since the interfolded marginal portions of the receptacle and cover are not, prior to the compressing operation, joined tightly enough to form an air-tight joint between them, the compressing operation also serves to

expel air which may have been trapped within the package.

The compressing means referred to includes the false bottom element 48 which is vertically adjustable within the holder. It will be recalled that the false bottom element 48 is secured to the upper end of a depending rod 49, the lower end of which is provided with the head 50. The bottom of the head 50 is rounded and is adapted to ride on the top edge of a cam track 112 which is mounted above the guide member 47. As shown in Fig. 13, the guide track 112 is segmental in form and extends around slightly more than one half the path of travel of the rod heads 50. When the holder 37 arrives at station D, the rod head 50 at station D rests on the top of the cam track 112 but has not been moved upwardly thereby.

The part of the cam track 112 which is engaged by the rod head 50 at station D is provided with an independent, vertically adjustable insert element 113 which is guided in its vertical adjustment by a pair of depending pins 114, carried by the insert 113 and slidable in suitable openings in the guide track. A stud 115 depending from the insert 113 and extending through a suitable aperture in the track 112 is suitably connected at its lower end below the bottom of the track 112 with one end of a lever 116 which is pivoted as indicated at 117 intermediate its ends to a bracket 118 which is secured to the side of the supporting frame 97. The other end of the lever 115 is connected by means of a ball and socket connection to one end of a link rod 119, the other end of which is similarly connected to a member 120 which is adjustably mounted in the free end of an arm 121.

The arm 121 has associated with it an arm 122 (the arms 121 and 122 constituting, in effect, a bell crank), and the free end of the arm 122 is provided with a roller 123 which engages a cam 124. The cam 124 is so shaped that in properly timed relation with the forming of the interfolded joint previously described, a spring 126 is permitted to effect downward movement of the arm 121 and consequently upward movement of the cam track insert 113. The upward movement of the insert 113 and of the false bottom element 48 is thus controlled by the cam 124 and is yieldingly effected by the spring 126. In one embodiment of the invention, one-sixteenth of an inch has been found to be ample movement of the bottom element 48 for the purpose mentioned. As shown, a special adjustable stop 127 may be provided for facilitating adjustment of the limit of upward movement which may be imparted to the cam track insert 113.

During the travel of the holder from station D to station E, the false bottom member 48 is further elevated as an incident to passage to the roll head 50 over the upwardly inclined portion 128 of the cam track 113, and when the holder is disposed in station E, the said rod head rests on the horizontal or rest portion 129 of the said cam track. By reference to Figs. 9, 10 and 18, it will be seen that in station E, the package is so elevated that the interfolded marginal portions designated 130 are displaced from the recess 91 and are exposed so that the mechanism about to be described may operate on the said interfolded portions to close the same against the adjacent surface of the package.

The closing mechanism referred to is indicated generally by the reference numeral 131, this mechanism being carried by a cross head 132 75

which is secured to the upper end of a rod 133. The rod 133 is vertically slidably mounted in spaced bearing brackets 134 and 135 which are secured to adjacent portions of the supporting frame 136. A spring 137 disposed around the lower portion of the rod 133 and compressed between the lower bearing bracket 135 and a nut 138 serves to normally move the rod 133, cross head 132, and closing mechanism 131 downwardly.

Downward movement of the rod 133 and parts carried thereby under the influence of the spring 137 is controlled by means of a cam 139 which acts against a roller 140 carried by the free end of an arm 141 which is one arm of a bell crank, the other arm being shown in 142. The bell crank 141—142 is pivoted on the frame 136 as indicated at 143 so that it may be rocked about the pivot 143 by the cam 139. The free end of the arm 142 is provided with an adjustable member 144 which is adapted to engage a roller 145 carried by an arm 146 which projects laterally from the vertically adjustable rod 133.

It will be seen that the cam 139 will be operative through the bell crank arms 141—142 and the arm 146 to move the rod 133 upwardly against the pressure of the spring 137 and that when the cam permits, the spring 138 will be operative to lower the rod and parts carried thereby.

Horizontal swinging movement of the cross-head 132 about the axis of the rod 133 is prevented by suitable guide means which, in this instance, includes a guide rod 147 which is rigidly secured to the cross head 132 and is vertically slidable in a bearing 148 which is carried by a portion of the framework of the machine.

The mechanism 131 includes a guide rod 149 which is fixedly secured in the end of the cross head 132. The guide rod 149 projects both above and below the cross head and at its lower end serves to support a presser plate 150. The cross head 132 also carries a cage-like structure which includes a top plate 151 and an annular bottom plate 152, the two plates being rigidly united by posts 153.

The annular bottom plate 152 is provided with a plurality of ways 154 for horizontally slidably guiding tongue portions 155 of jaw members 156. As clearly shown in Fig. 10, the jaw portions 156 are offset downwardly relative to their respective tongue portions so as to be operative immediately below the pressure plate 150. By inspection of Fig. 11, it will be observed that one pair of oppositely disposed jaws 156 is operative between the other pair.

The jaws 156 are adapted to be adjusted horizontally through the agency of levers such as 157 which are pivoted intermediate their ends as indicated at 158 in suitable ears or lugs carried by the top plate 151. The lower ends of the levers 157 are forked to fit over pins 159 which are carried by ears such as 160 which extend upwardly from the tongue portions of the respective jaws. The upper ends of the levers 157 are provided with inclined cam engaging end portions 161.

For actuating the levers 157 and thereby the jaws 156, a cam head 162 is vertically, slidably mounted on the upper end of the guide shaft 149, a suitable key arrangement such as indicated at 163 being provided to prevent turning of the cam head on the shaft. A coil spring 164, interposed between the lower end 165 of the head 162, and the top surface 166 of the cross head 132, serves to normally urge the cam head to move upwardly. The cam head is provided with

depending ears 167 which are respectively provided with cam fingers 168 suitably secured to the respective ears and beveled for engagement with the inclined end portions 161 of the respective levers 157. It will be seen that when the cam head 162 is lowered against the pressure of the spring 164, the cam fingers 168 will engage the inclined ends of respective levers 157 to spread the upper ends thereof, thereby effecting inward adjustment of the closing jaws 156. Upon upward movement of the cam head 162, the springs, such as indicated at 169, interposed between the respective levers near their forked ends, and ears 170 which are suitably secured to the shaft 149, serve to swing the levers in the opposite direction to move the jaws outwardly.

Down movement of the cam head 162 is effected by means of a cam 171 which acts on a roller 172 carried by the free end of an arm 173. The arm 173 is one arm of a bell crank, the other arm being indicated at 174, and the bell crank being pivotally mounted on the cross shaft 143. The free end of the bell crank arm 174 is provided with a ball and socket connection to one end of a rod 175, the opposite end of which is similarly secured to one end of a lever 177 which is pivoted intermediate its ends as indicated at 178 in the upper end of a standard 179. The other end of the lever 177 is provided with a rounded head portion 180 which is adapted to engage the top 181 of the cam head 162. A spring 182 which connects the arm 174 and lever 177 serves to prevent disengagement of the ball and socket connections between the said arm and lever and the respective ends of the rod 175. A spring 183 stretched between the arm 174 and a fixed point on the supporting frame, serves to swing the bell crank 173—174 at a counterclockwise direction, as viewed in Fig. 9, so as to maintain the cam follower 172 in engagement with the operating cam 171.

It will be seen that when the cam 171 rotates, it will act against the roller 172 to swing the bell crank 173—174 in a clockwise direction, thereby rocking the lever 177 in a clockwise direction so that its end 180 presses the cam head 162 downwardly to thereby move the interfold closing jaws inwardly.

As shown in Figs. 9 and 10, the closing mechanism 131 and rod 133 are in lowered position, wherein the jaws 156 are in alignment with the interfolded portions of the package wrapper. It will, however, be understood that when the turntable 25 is moving to advance one of the holders and its package from the interfolding station D to the closing station E, the closing mechanism 131 and rod 133 are in an elevated position so as to permit the package (which is elevated in the holder) to move into its proper position in the station E. Downward movement of the mechanism 131 and rod 133 is effected by the means explained after the turntable is stopped, and the interfolding operation is, of course, effected during a period of rest of the turntable. The extent of downward movement of the closing mechanism 131 as an incident to the downward movement of the rod 133 is so adjusted that the presser plate 150 will engage the top of the package without materially squeezing the package against the false bottom element 48 of the holder. Since the package is confined between the presser plate 150 and the false bottom element 48 around its sides by the side wall 38 of the holder, the closing pressure of the jaws 158 will not deform the package but will merely serve to press the inter-

folded portions of the package into a closed fold against the surface of the package substantially as indicated in Fig. 18. For clearness in illustration, the thickness of the wrapper material has been materially exaggerated and it will, therefore, be further understood that in actual packaging, the interfolding portions 130 will not project materially beyond the surface of the package. In fact, the arrangement may obviously be such that the extra thickness of the wrapper caused by the overlapping plies of wrapping material in the interfolded portions may be pressed into the package sufficiently to cause outside surface of the interfolded portions to be substantially flush with the adjacent surface of the package.

Adjustment of the extreme lowered portion of the presser plate 150 is easily accomplished by adjusting the member 144 through which movement of the rod 133 is controlled by the cam 139. The extent of downward adjustment of the cam head 162 may be controlled by adjusting the stop screw 184 in the lever 177 to thereby adjust the relation between the arm 177 and bell crank lever 174.

To insure accurate positioning of the turntable 25 and for preventing shifting thereof when the crank pin 35 is disengaged from the slots 32, the following locking arrangement is provided. A series of blocks 185 respectively associated with the holders 37 in predetermined relation thereto are secured to the bottom of the turntable, each such block being provided with a V-notch 186. A plunger rod 187 slidably mounted in suitable brackets 188 and 189 is provided with a head 190' which is adapted to enter the V-shaped notch 186 to lock the turntable in fixed position. The plunger rod 187 is connected at its lower end to the end of an arm 190 which constitutes one arm of a bell crank, the other arm of which is shown at 191. The bell crank 190—191 is pivoted as indicated at 192 on the supporting frame 136, and the free end of the arm 191 is provided with a roller 193 which engages a cam 194. A spring 195 stretched between the arm 190 and a fixed point on the frame 136 serves to swing the bell crank 190—191 counterclockwise as viewed in Fig. 9 to maintain the roller 193 in engagement with the cam 194. The cam 194 is so shaped that in properly timed relation with the intermittent movement of the conveyor table 25, the spring is permitted to raise the plunger 187 into locking engagement with the notched block 185. At the end of each period of rest of the turntable, the cam 194 acts against the roller 193 to swing the bell crank 190—191 in a clockwise direction to thereby lower the plunger rod 187 to thereby unlock the conveyor.

The cams 139, 171, and 194 are carried by a shaft 195' which is driven at proper speed by means of suitable speed changing gear mechanism similar to that described in connection with the mechanism of station B, the source of power being the central bevel gear 28.

If the interfolded portions of the wrapper are closed against the sides of the package as above explained, the closing mechanism 131 is elevated to free the package therefrom and the turntable is again advanced. During the travel of the package from the closing station E to the station indicated at F in Fig. 1, the package is completely ejected from the holder. The package is ejected by reason of the rise 196 in the cam track 112, and when the package arrives in the station F, it is supported in ejected position by the high spot 197 of the said cam track.

A discharge chute 198 is aligned with the holder in station F and the following mechanism is provided for moving the finished package from the elevated false bottom 48 of the holder into the discharge chute 198.

A pusher 199 hinged as indicated at 200 to a lug depending from a slide 201 is held by a spring 202 in substantially vertical position so that when the slide 201 is moved outwardly, the pusher 199 will engage the adjacent side of the package and force it into the chute 198. The spring 202 is provided to permit the pusher 199 to yield in the event that the package is prevented from freely moving in front of the pusher.

The slide 201 is slidably supported on a rod 203 which is supported at its inner end in a bracket 204 secured to the upper end of the stationary shaft 26 and supported at its outer end in a bracket 205 which is carried by a frame part 206. The slide 201 is provided with a pair of upwardly extending ears 207 which embrace a guide rod 208 spaced upwardly from and secured to the rod 203 to prevent turning of the slide 201 on the rod 203.

Sliding movement of the slide 201 along the rod 203 is effected by means of a cam 209 which acts against a roller 210 carried by an arm 211. The arm 211 is one arm of a bell crank, the other arm of which is shown at 212 and which is connected by means of a link 213 with the slide 201. A spring 214 stretched between the arm 212 and a stationary support of the frame 206 serves to swing the bell crank 211—212 in such a direction that the roller 210 is maintained in engagement with the operating cam 209. The cam 209 is continuously driven at predetermined speed by suitable worm and worm wheel driving mechanism, from the central bevel gear 28 and it is so shaped that in properly synchronized relation with the feed movements of the turntable 25, the slide 201 and pusher 199 are moved outwardly to discharge a completed package and then returned to innermost position to permit another package to be brought into the discharge station F.

As shown in Fig. 2, the cam track 112 may conveniently be adjustably mounted on the various frame portions of the machine through the agency of reversed L-shaped brackets 215 which are slotted as indicated at 216 to permit clamping screws 217 to move vertically with the track 112. When adjusted to the proper position, the screws 217 are tightened to hold the track in such adjusted position. The track may further be supported in such adjusted position by means of a plurality of spaced supporting screws such as indicated at 218 which are threaded into the bottom of the cam track and provided with lock nuts for locking them in adjusted position. As shown, the supporting screws 218 rest on the top of the guide 47 and thereby resist downward displacement of the cam track.

While the package mechanism herein described is illustrated for forming rectangular packages, it will, of course, be apparent to those skilled in the art that shapes other than rectangular may be similarly made. The described arrangement is, however, suitable for making commercial packages of a type which has been found to be quite satisfactory to the trade. The interfolded joint between the receptacle and cover portions of the wrapper provides an efficient seal-in that it is practically impervious so that the content of the package is protected against deterioration by exposure to air. The product is maintained in a fresh condition for a

much longer period than is the case with other commercial types of packages.

Changes in the described structure may be made without departing from the spirit of the invention, the scope of which should be determined by reference to the following claims, the same being construed as broadly as possible, consistent with the state of the art.

I claim as my invention:—

10 1. In a machine for closing a package receptacle and its cover, the combination of a conveyor for propelling the package along a predetermined path of travel, vertically movable means for inter-
15 folding rim flange and marginal portions respectively of the receptacle and cover while on said conveyor, and transversely movable means for closing said interfolded portions against the adjacent portions of the package.

20 2. In a machine for closing a package receptacle and its cover, the combination of a holder for positioning a filled receptacle, said holder having a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge, said receptacle having a flange ex-
25 tending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, and means adapted to enter and cooperate with said recess for effecting interfolding of said
30 flange and marginal portions in said recess.

3. In a machine for closing a package receptacle and its cover, the combination of a holder for positioning a filled receptacle, said holder having a wall portion embracing the filled recep-
35 tacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and re-
40 cessed edge, means adapted to enter and cooperate with said recess for effecting interfolding of said flange and marginal portions in said recess, means for elevating the receptacle relative to said
45 holder so as to expose said interfolded portions, and means for closing said interfolded portions against the surface of the package.

4. In a machine for closing a package receptacle and its cover, the combination of a holder for positioning a filled receptacle, said holder
50 having a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge spaced outwardly from the inside of the holder wall, said receptacle having a flange extending outwardly over said recessed edge and
55 being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, and means adapted to enter and cooperate with said recess for effecting interfold-
60 ing of said flange and marginal portions in said recess.

5. In a machine for closing a package receptacle and its cover, the combination of a holder for positioning a filled receptacle, said holder having a wall portion embracing the filled recep-
65 tacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and re-
70 cessed edge, means adapted to enter and cooperate with said recess for effecting interfolding of said flange and marginal portions in said recess, means for elevating the receptacle relative to said holder so as to expose said interfolded por-
75 tions, means for closing said interfolded portions

against the surface of the package, and means for ejecting the package from the holder.

6. In a machine for closing a package recep- 5
tacle and its cover, the combination of a holder for positioning a filled receptacle, said holder having a wall portion embracing the filled recep-
tacle and the wall portion having a recess in its upper edge, said receptacle having a flange ex- 10
tending outwardly over said recessed edge and being covered with a cover sheet having a mar-
ginal portion overlapping said flange and re-
cessed edge, means adapted to enter and cooper- 15
ate with said recess for effecting interfolding of said flange and marginal portions in said re-
cess, means for elevating the receptacle relative
to said holder so as to expose said interfolded 20
portions, means for closing said interfolded por-
tions against the surface of the package, means
for ejecting the package from the holder, and
means for carrying the ejected package away 25
from the holder.

7. In a machine for closing a package recep- 25
tacle and its cover, the combination of a conveyor, means for intermittently advancing said con-
veyor, a holder carried by said conveyor for posi-
tioning a filled receptacle thereon, said holder 30
having a wall portion embracing the filled recep-
tacle and the wall portion having a recess in its upper edge, said receptacle having a flange ex-
tending outwardly over said recessed edge and
being covered with a cover sheet having a mar- 35
ginal portion overlapping said flange and recessed edge, means operative during a period of rest of
said conveyor to enter and cooperate with said
recess to effect interfolding of said relatively over- 40
lapping flange and marginal portions in said re-
cess, means operative during another period of
rest of the conveyor to close said interfolded por-
tions against the surface of the package, and
means for ejecting the package from the holder 45
and discharging the ejected package from the
conveyor.

8. In a machine for closing a package recep- 45
tacle and its cover, the combination of a holder for positioning a filled receptacle, said holder having
a wall portion embracing the filled receptacle and
the wall portion having a recess in its upper edge, 50
said receptacle having a flange extending out-
wardly over said recessed edge and being covered
with a cover sheet having a marginal portion over-
lapping said flange and recessed edge, means
adapted to enter and cooperate with said recess 55
for effecting interfolding of said flange and mar-
ginal portions in said recess, and means for clos-
ing said interfolded portions against the surface
of the package.

9. In a machine for closing a package recep- 60
tacle and its cover, the combination of a con-
veyor, means for intermittently advancing said
conveyor, a holder carried by said conveyor for
positioning a filled receptacle thereon, said holder
having a wall portion embracing the filled recep-
tacle and the wall portion having a recess in its
upper edge, said receptacle having a flange ex- 65
tending outwardly over said recessed edge and
being covered with a cover sheet having a mar-
ginal portion overlapping said flange and recessed
edge, means operative during a period of rest of
said conveyor to enter and cooperate with said
recess to effect interfolding of said relatively over- 70
lapping flange and marginal portions in said re-
cess, means operative during another period of
rest of the conveyor to close said inter-folded
portions against the surface of the package, and
means movable relative to the conveyor while at 75

rest for discharging the ejected package from the conveyor.

10. In a machine for closing a package receptacle and its cover, the combination of a conveyor, means for intermittently advancing said conveyor, a holder carried by said conveyor for positioning a filled receptacle thereon, said holder having a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, means operative during a period of rest of said conveyor to enter and cooperate with said recess to effect interfolding of said relatively overlapping flange and marginal portions in said recess, means for effecting compression of the package after said interfolding operation to expel air from the package, means operative during another period of rest of the conveyor to close said interfolded portions against the surface of the package, and means for ejecting the package from the holder and discharging the ejected package from the conveyor.

11. In a machine for closing a package receptacle and its cover having mutually overlapping rim flange and marginal portions respectively, the combination of a conveyor, means for interfolding said rim flange and marginal portions, means for compressing the package after said interfolding operation to expel air from the package, and movable means operable after said compressing operation for engaging and closing said interfolded portions against the adjacent portions of the package.

12. In a machine for closing a package receptacle and its cover, the combination of a conveyor, means for intermittently advancing said conveyor, a holder carried by said conveyor for positioning a filled receptacle thereon, said holder having a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, means operative during a period of rest of said conveyor to enter and cooperate with said recess to effect interfolding of said relatively overlapping flange and marginal portions in said recess, means operative during succeeding travel of the conveyor to elevate the package relative to the holder so as to expose said interfolded portions, means operative during a succeeding period of rest of the conveyor to close said interfolded portions against the surface of the package, means operative during further travel of the conveyor to eject the package from the holder, and means for removing the ejected package from the conveyor.

13. In a machine for closing a package receptacle and its cover, the combination of a conveyor, means for intermittently advancing said conveyor, a holder carried by said conveyor, a vertically movable bottom member and a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, means operative during a period of rest of said conveyor to enter and cooperate with said recess to effect interfolding of said relatively overlapping flange and marginal portions in said recess, means for effecting limited

upward movement of said bottom member for compressing the package to exclude air therefrom, means for effecting further limited upward movement of said bottom member during succeeding travel of the conveyor to elevate said interfolded portions out of the said recess, means operative during a succeeding period of rest of the conveyor for closing said interfolded portions against the surface of the package, means for effecting further upward movement of said bottom member during further travel of the conveyor for ejecting the package from the holder, and means for discharging the package from said bottom member.

14. In a machine for closing a package receptacle and its cover, the combination of a conveyor, means for intermittently advancing said conveyor, a holder carried by said conveyor for positioning a filled receptacle thereon, said holder having a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, means operative during a period of rest of said conveyor to effect interfolding of said relatively overlapping flange and marginal portions in said recess, a vertically adjustable bottom member in said holder, a stationary cam track, means extending from said bottom member into engagement with said cam track whereby the cam track controls the position of vertical adjustment of said bottom member, an element normally constituting a part of said cam track but vertically adjustable relative thereto, means for effecting limited upward movement of said element to thereby adjust said bottom member upwardly upon completion of said interfolding operation to compress and expel air from the package, said cam track having a cam portion operable during succeeding travel of the conveyor to elevate the package relative to the receptacle so as to expose said interfolded portions, means for closing said interfolded portions against the surface of the package, and said cam track having another portion operative upon further movement of the conveyor to eject the package from the holder.

15. In a machine of the class described, a conveyor, a holder adapted to receive an empty receptacle to be filled, said holder being vertically adjustably mounted on said conveyor and having a part provided with a laterally extending roller, a guide member having a groove therein for receiving said roller so as to thereby control the vertical position of adjustment of said holder, said guide having a separate section which is vertically movable relative to its normal position in the guide to thereby elevate the holder to a position adjacent a filling means above the normal position of horizontal adjustment of said holder, and means for effecting upward adjustment of said guide section in predetermined timed relation to the travel of the conveyor.

16. In a machine for closing a package receptacle and its cover, the combination of a conveyor, means for intermittently advancing said conveyor, a holder carried by said conveyor for positioning a filled receptacle thereon, said holder having a wall portion embracing the filled receptacle and the wall portion having a recess in its upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, means operative during a period of rest of said conveyor

to effect interfolding of said relatively overlapping flange and marginal portions in said recess, a vertically adjustable bottom member in said holder, a stationary cam track, means extending from
 5 said bottom member into engagement with said cam track whereby the latter controls the position of vertical adjustment of said bottom member, an element normally constituting a part of said cam track but vertically adjustable relative
 10 thereto, and means for yieldingly effecting limited upward movement of said element to thereby adjust said bottom member upwardly upon completion of said interfolding operation to expel air from the package.

17. In a machine for closing a package receptacle and its cover, the combination of a holder for positioning a filled receptacle thereon, said holder having a wall portion embracing the filled receptacle and the wall portion having a recess in its
 20 upper edge, said receptacle having a flange extending outwardly over said recessed edge and being covered with a cover sheet having a marginal portion overlapping said flange and recessed edge, an upper die having means adapted to enter the
 25 recess in said holder to interfold said overlapping flange and marginal portions in the recess, and cam-controlled, yieldingly actuated means for lowering said upper die.

18. In a machine of the class described, means
 30 for closing interfolded receptacle and cover portions against the surface of a package, comprising a holder for positioning the package, horizontally movable jaws adapted to engage and close the interfolded portion against the surface of the
 35 package and vertically movable means for actuating said jaws.

19. In a machine of the class described, means for closing interfolded receptacle and cover portions against the surface of a package, comprising
 40 a holder for positioning the package, horizontally movable jaws adapted to engage and close the interfolded portion against the surface of the package, vertically movable cam means, and levers operatively connected to said jaws and adapted to be actuated by said cam means for
 45 actuating said jaws.

20. In a package making machine of the class described, the combination of a conveyor, a holder on said conveyor for positioning a filled receptacle on the conveyor, means associated with
 50 said holder for interfolding peripheral portions of the receptacle in said holder and a cover for the receptacle, means for causing the package to assume an elevated position relative to the holder to expose the interfolded portion
 55 of the receptacle and cover, and means for closing said interfolded portions against the surface of the receptacle comprising a vertically adjustable head, a plurality of jaws laterally adjustably mounted on said head, means for lowering
 60 said head so as to cause said jaws to embrace said interfolded portions, and means carried by said head and adjustable relative thereto for actuating said jaws.

21. In a package making machine of the class described, the combination of a conveyor, a holder on said conveyor for positioning a filled receptacle on the conveyor, means associated with

said holder for interfolding peripheral portions of the receptacle in said holder and a cover for the receptacle, means for causing the package to assume an elevated position relative to the holder
 5 to expose the interfolded portions of the receptacle and cover, and means for closing said interfolded portions against the surface of the receptacle comprising a vertically adjustable head, a plurality of jaws laterally adjustably mounted on
 10 said head, means for yieldingly lowering said head so as to cause said jaws to embrace said interfolded portions, means carried by said head and adjustable relative thereto for actuating said jaws, and means for yieldingly actuating said
 15 last mentioned means.

22. In a package making machine of the class described, the combination of a conveyor, a holder on said conveyor for positioning a filled receptacle on the conveyor, means associated with
 20 said holder for interfolding peripheral portions of the receptacle in said holder and a cover for the receptacle, means for causing the package to assume an elevated position relative to the holder to expose the interfolded portion of the receptacle
 25 and cover, and means for closing said interfolded portions against the surface of the receptacle comprising a vertically adjustable head, a plurality of jaws laterally adjustably mounted on said head, means for yieldingly lowering said head
 30 so as to cause said jaws to embrace said interfolded portions, and means for yieldingly actuating said jaws.

23. In a machine for making rectangular packages of the class described, means for producing
 35 a package including a receptacle and a cover having interfolded flange and marginal portions respectively, means for closing such interfolded portions against the respective sides of the package comprising two pairs of jaws respectively associated with oppositely disposed sides of the
 40 package, means for effecting substantially simultaneous inward movement of the jaws of one of said pairs, and means for subsequently effecting substantially inward movement of the jaws of the other pair.

24. In a machine for closing a package receptacle and its cover, the combination of male and female die means for interfolding rim flange and marginal portions respectively of the receptacle and cover, and presser means movable laterally relative to the direction of movement of said
 50 die means for engaging and closing said interfolded portions.

25. In a machine for closing a package receptacle and cover having mutually overlapping
 55 rim flange and marginal portions respectively, the combination of male and female die means for interfolding said rim flange and marginal portions in outside overlapping relation to a marginal side portion of the package, and presser means movable laterally relative to the direction of movement of said die means for engaging and closing said interfolded portions against the
 60 underlying side portions of the package.

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