

No. 890,976.

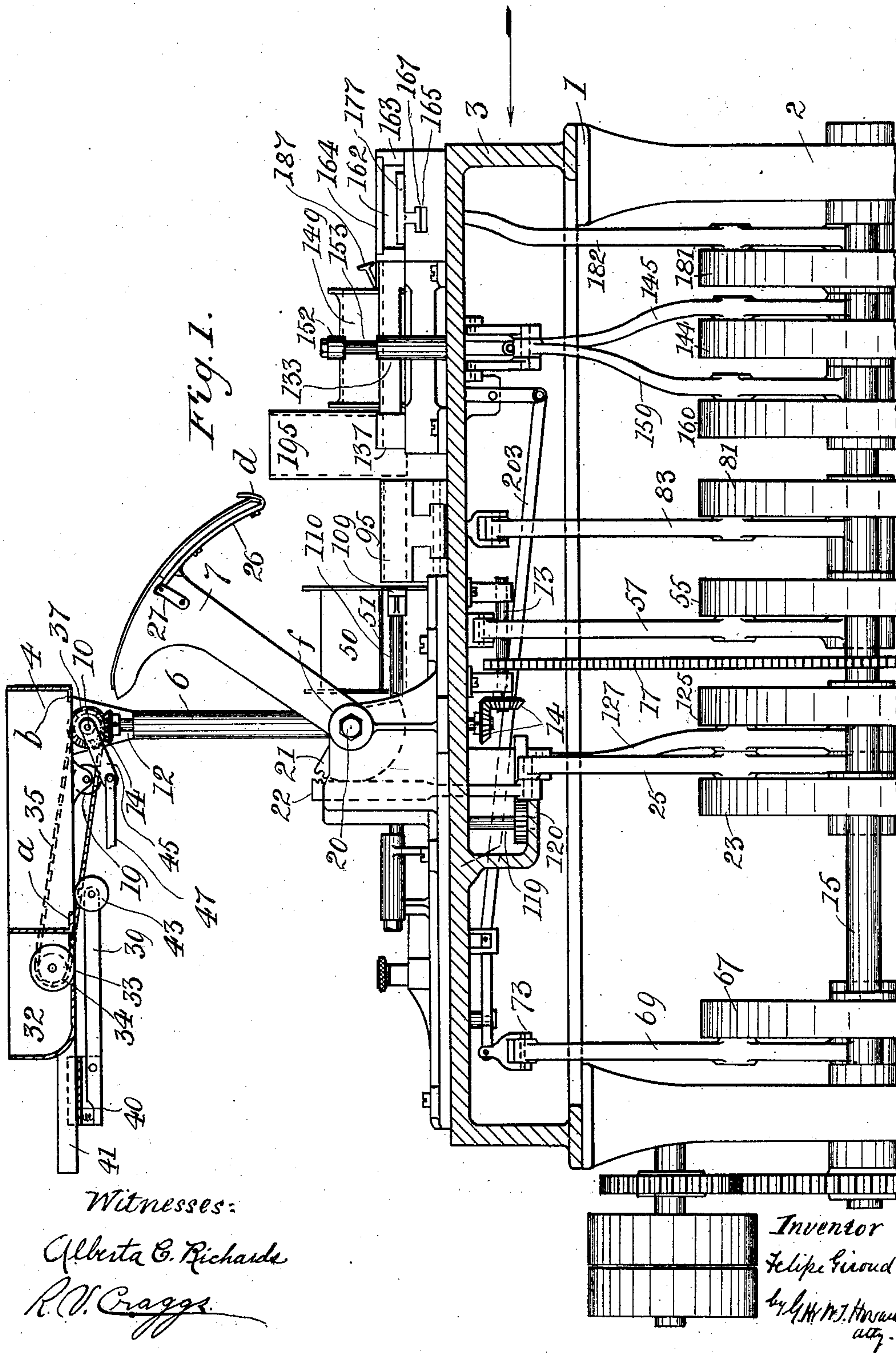
PATENTED JUNE 16, 1908.

F. GIROUD.

PACKAGING MACHINE.

APPLICATION FILED NOV. 12, 1907.

10 SHEETS—SHEET 1.



Witnesses:

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*Inventor*

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attz

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10 SHEETS—SHEET 2.

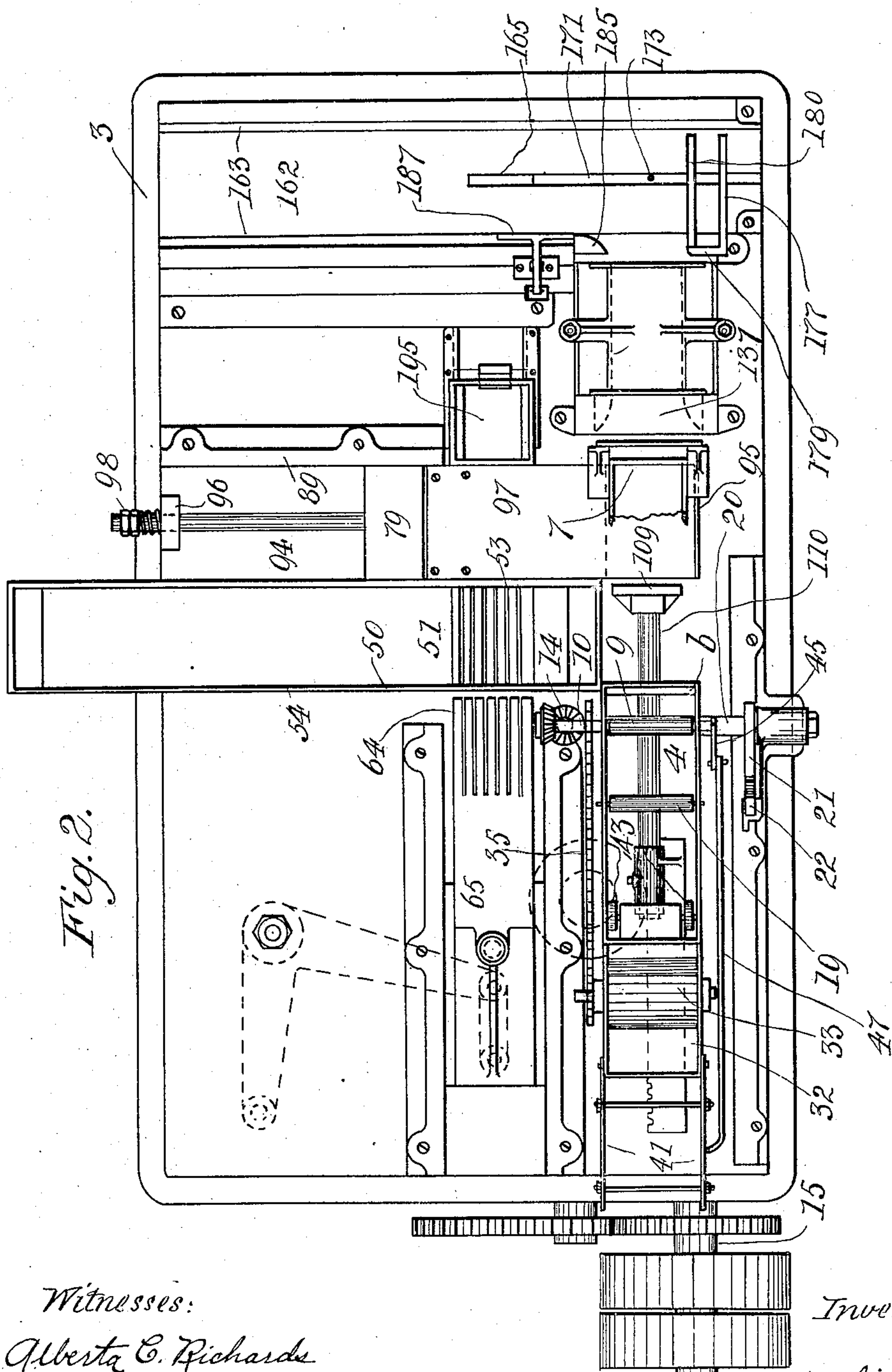


Fig. 2.

Witnesses:

Alberta C. Richards  
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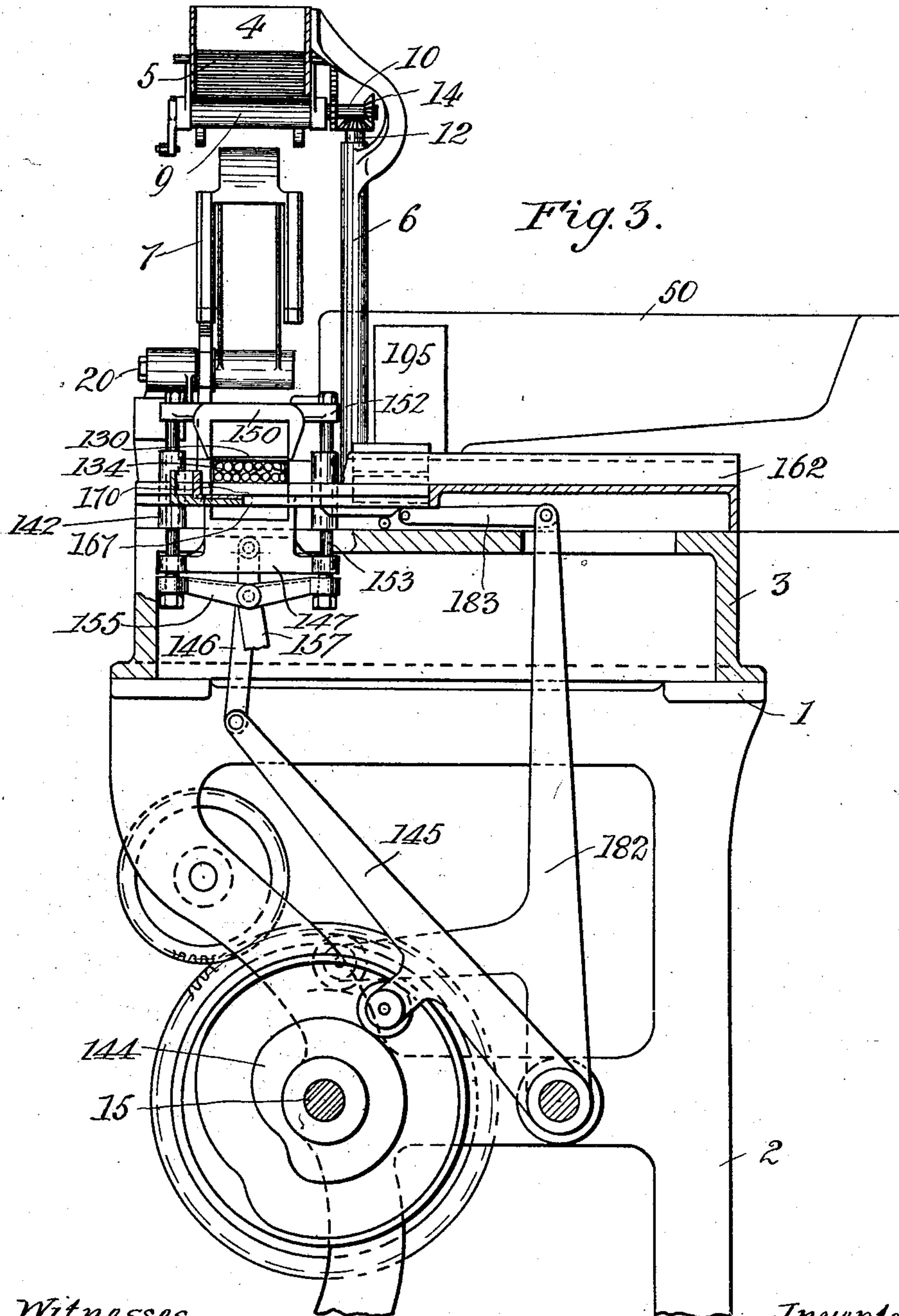
Felipe Giroud,  
by G. H. T. Howard  
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10 SHEETS—SHEET 3.



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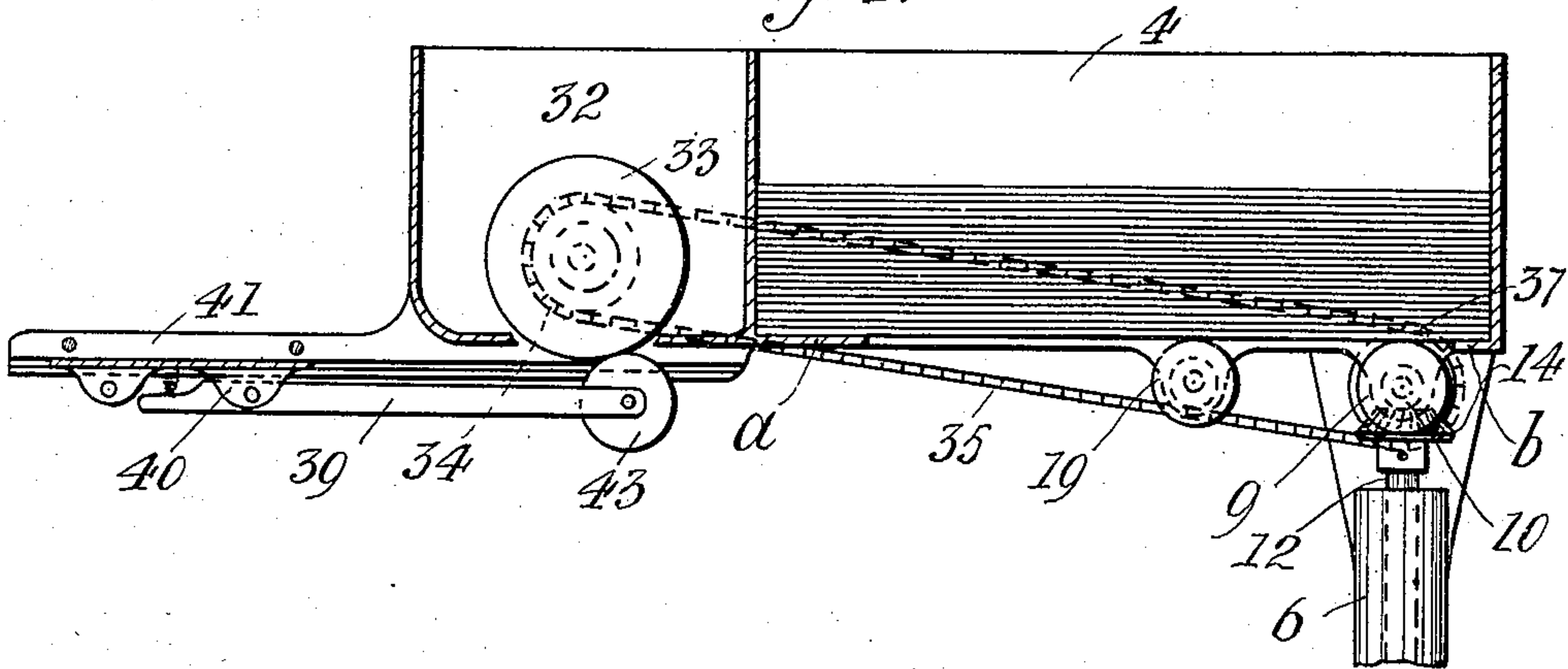
F. GIROUD.

PACKAGING MACHINE.

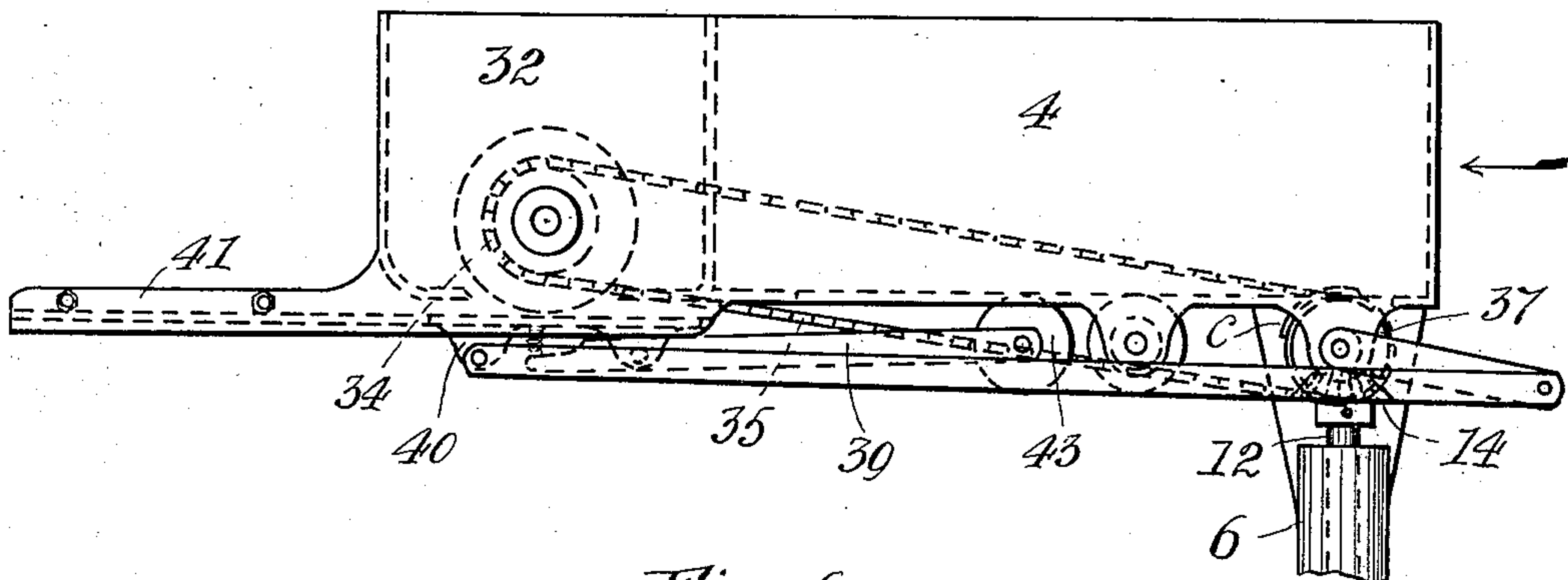
APPLICATION FILED NOV. 12, 1907.

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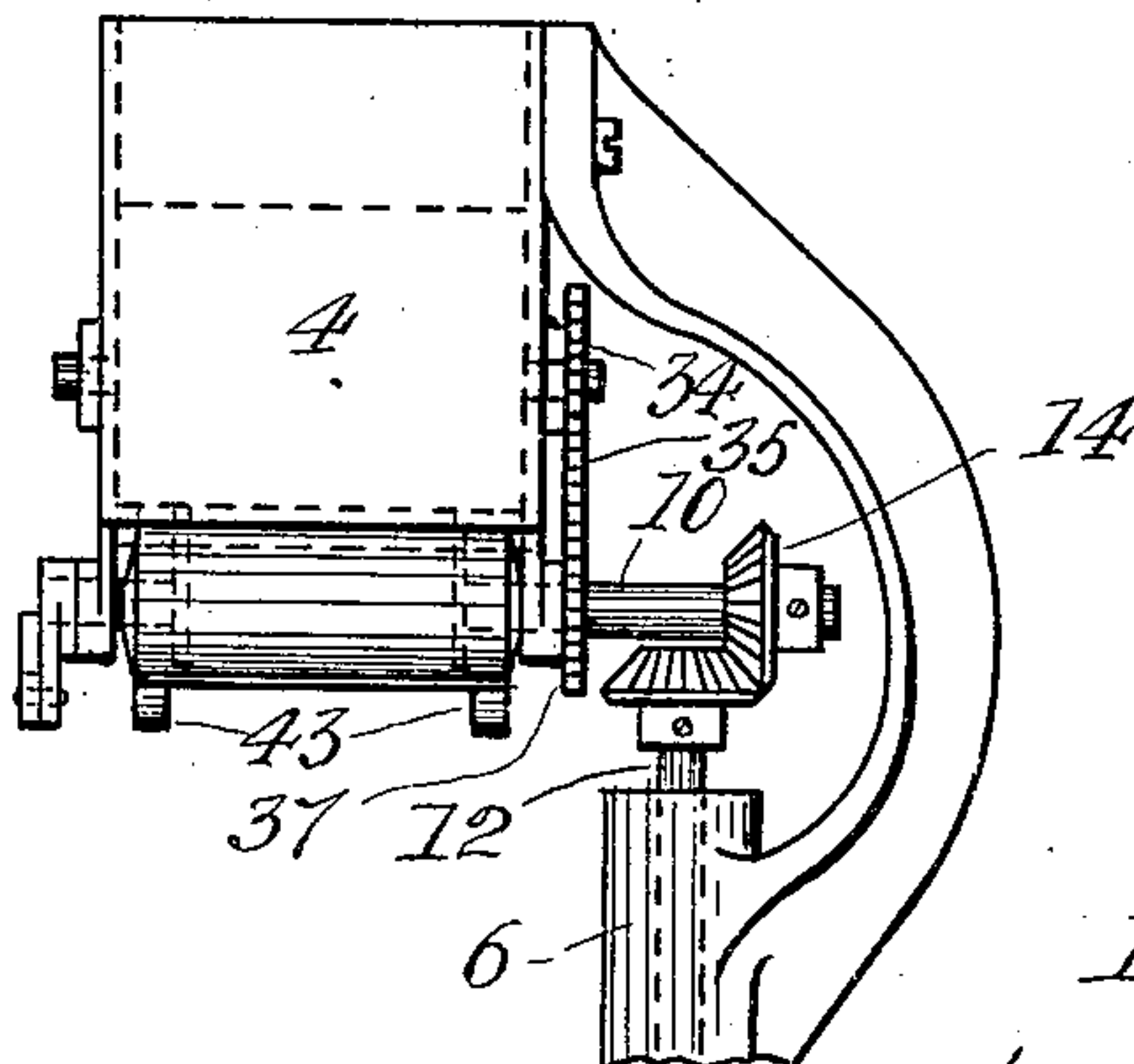
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



Witnesses:

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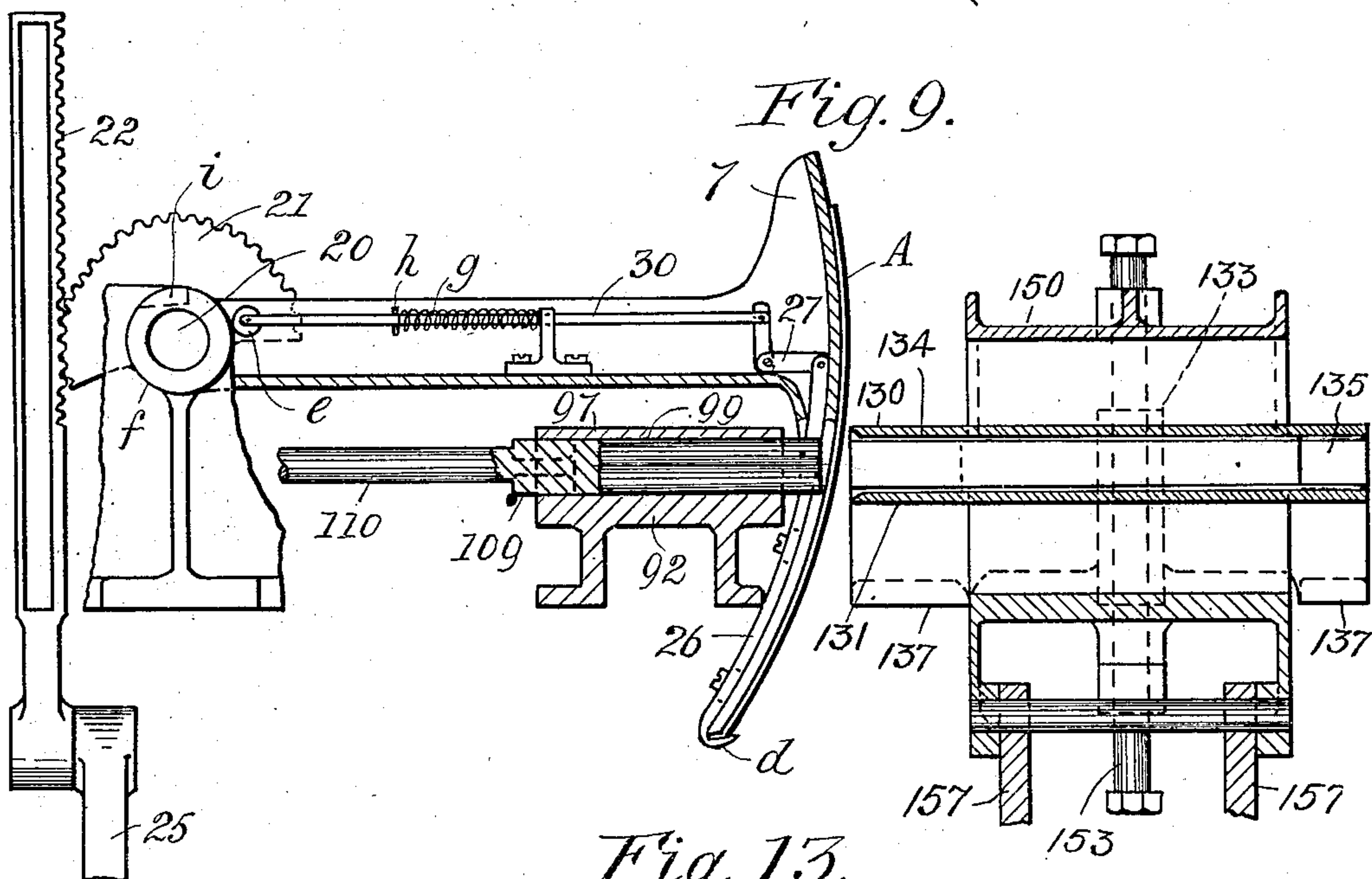
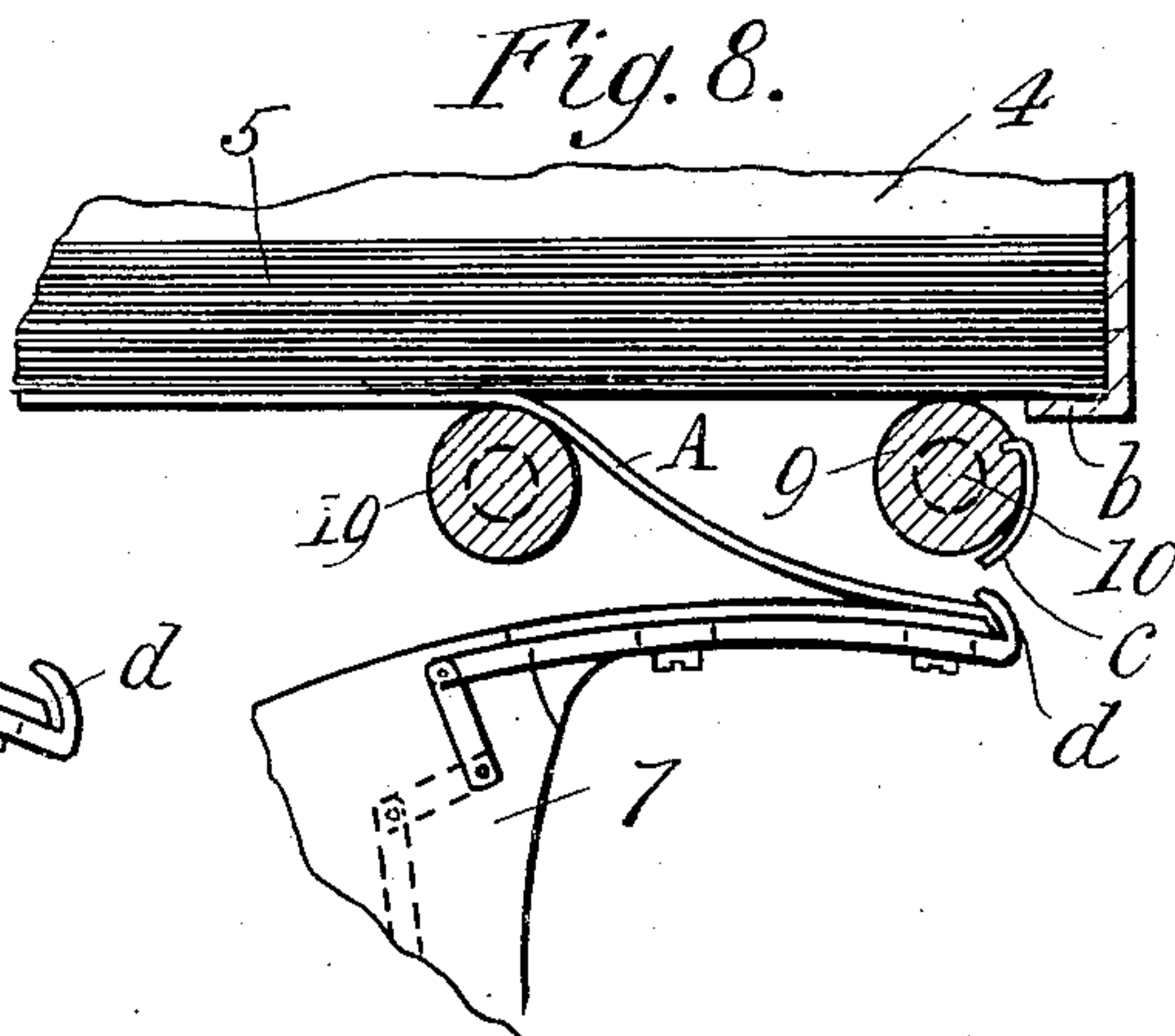
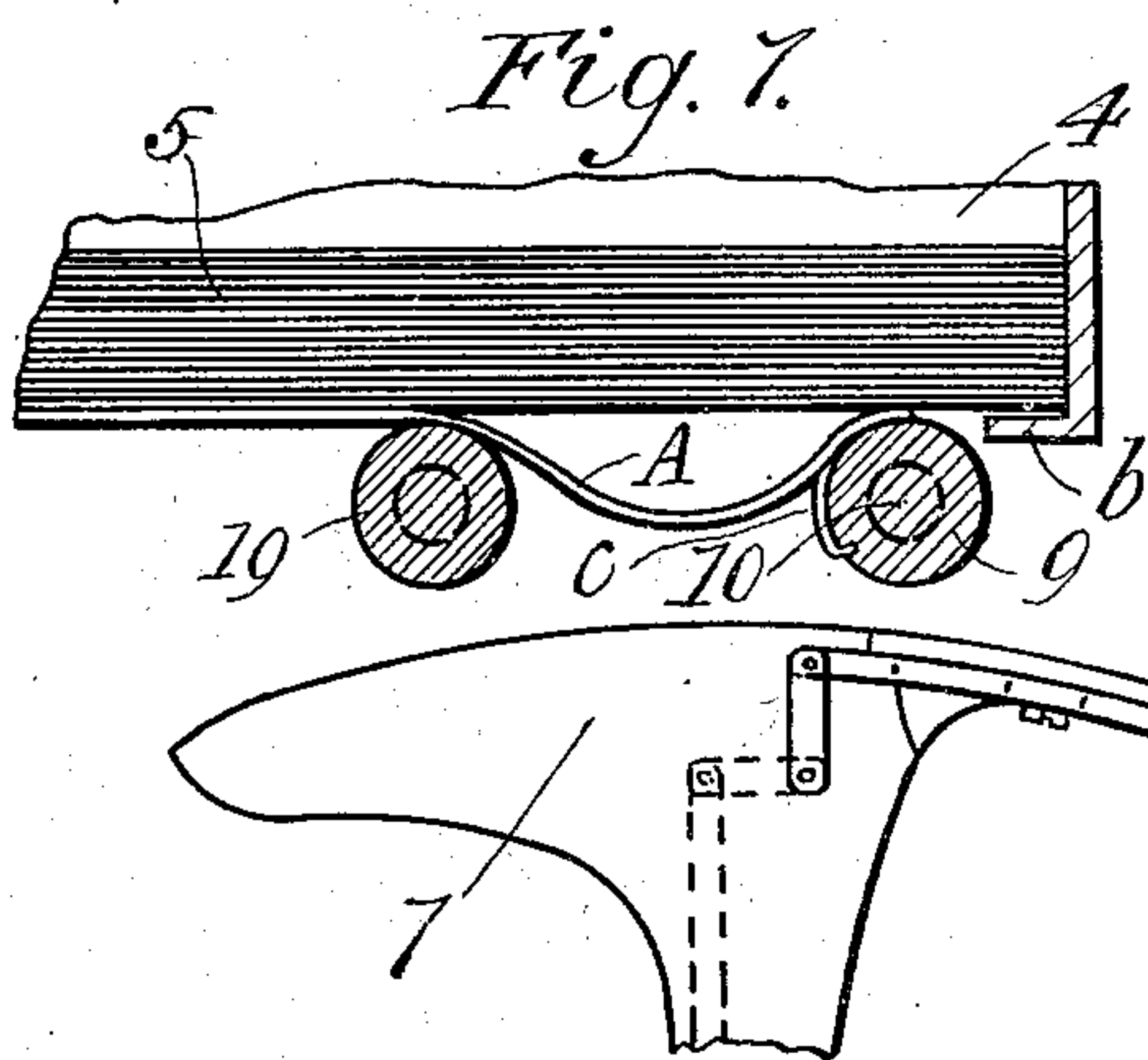
PATENTED JUNE 16, 1908.

F. GIROUD.

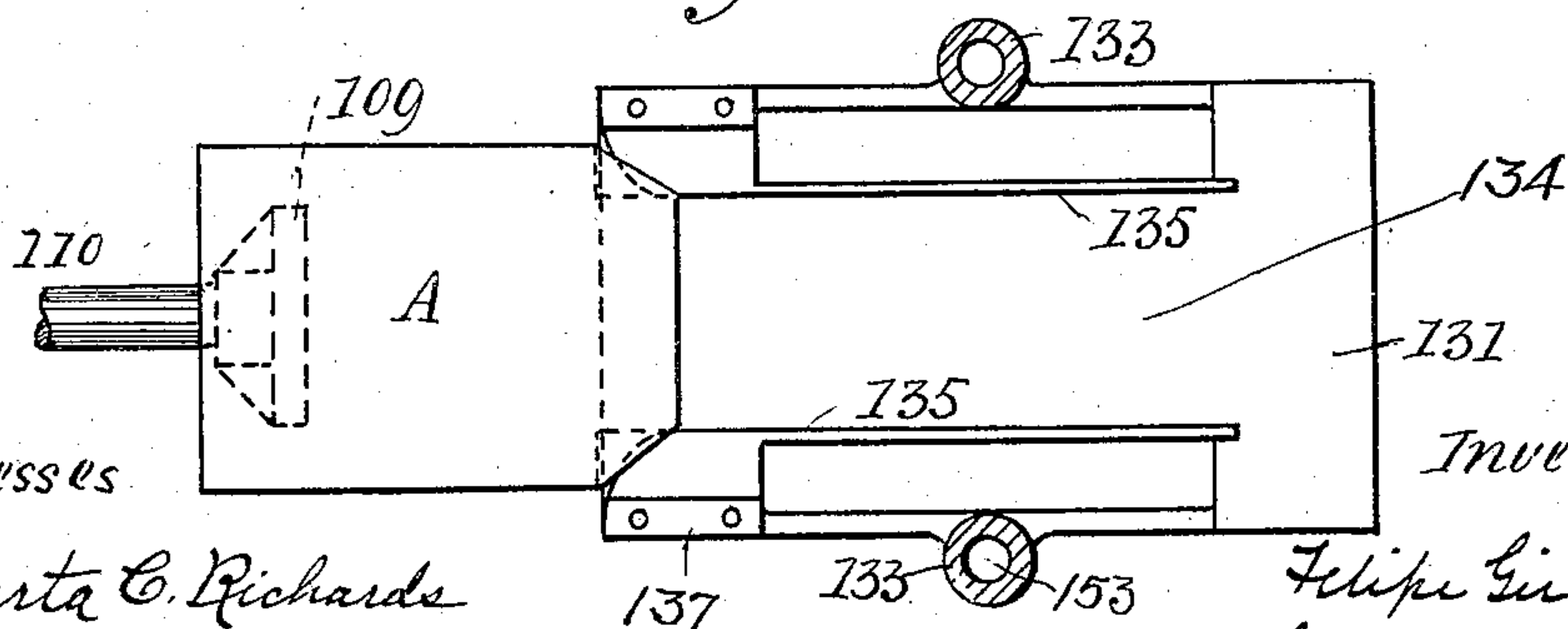
PACKAGING MACHINE.

APPLICATION FILED NOV. 12, 1907.

10 SHEETS—SHEET 5.



*Fig. 13.*



Witnesses

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No. 890,976.

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F. GIROUD.

PACKAGING MACHINE.

APPLICATION FILED NOV. 12, 1907.

10 SHEETS—SHEET 6.

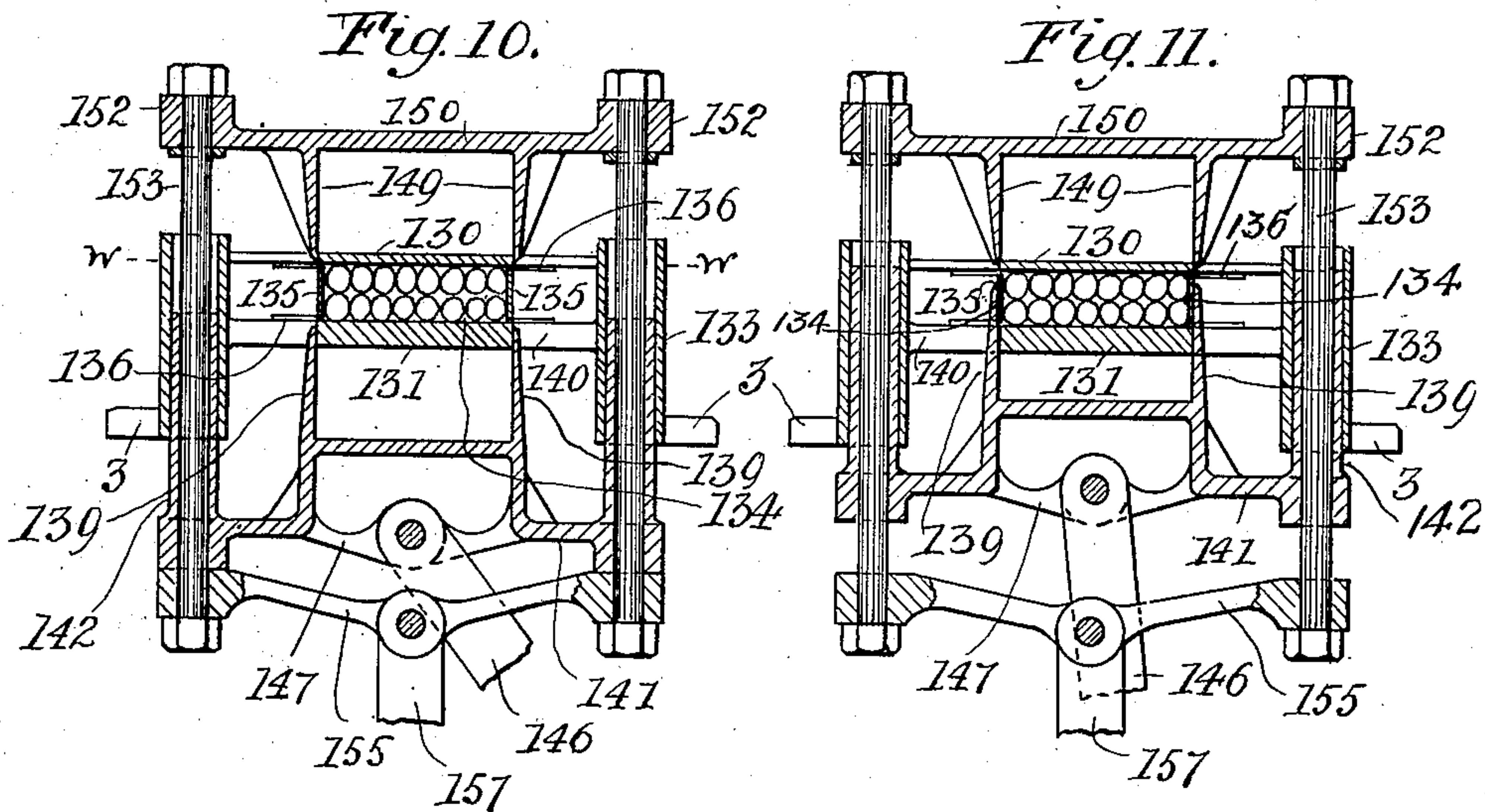


Fig. 32.

Fig. 33.

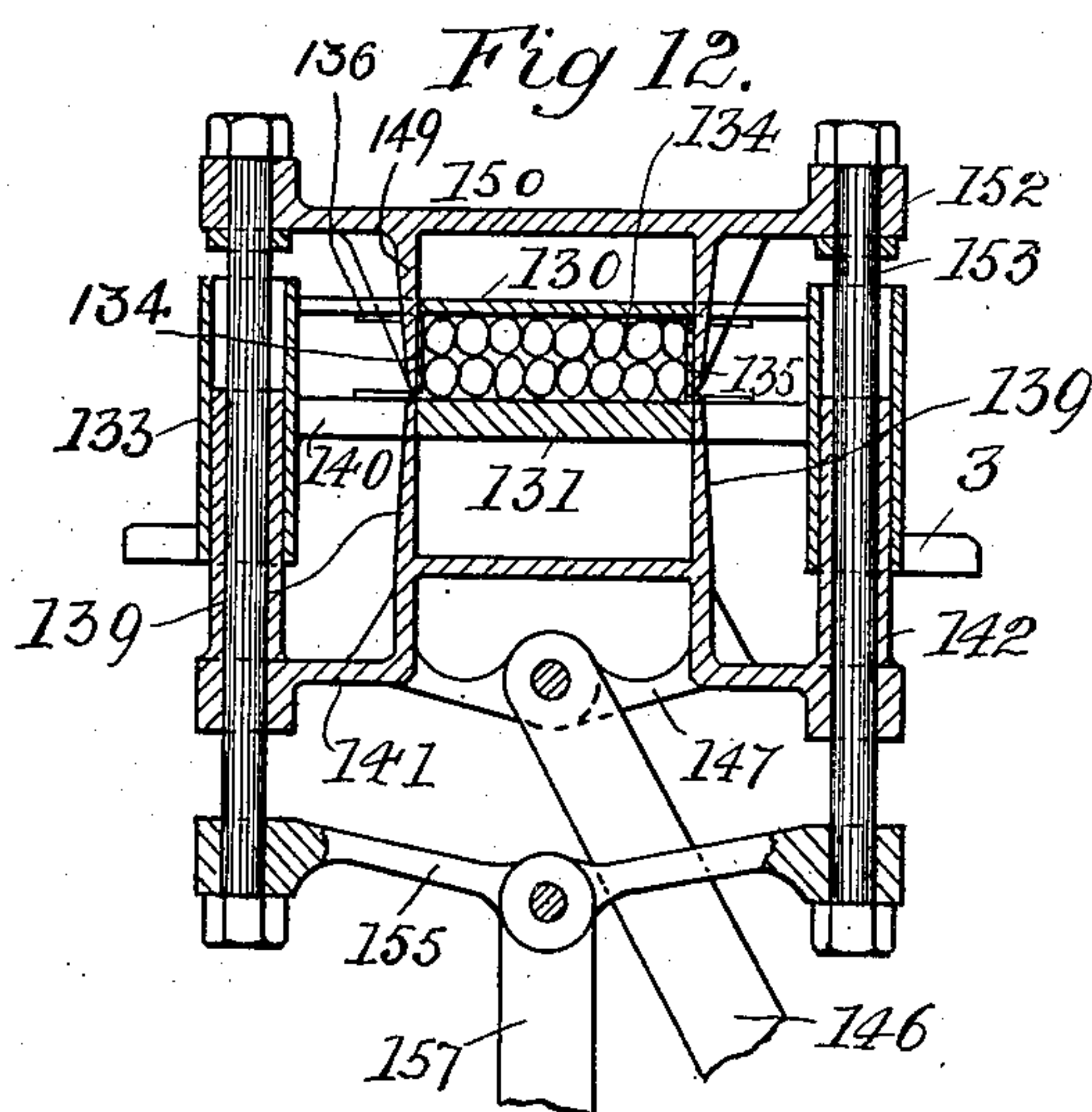
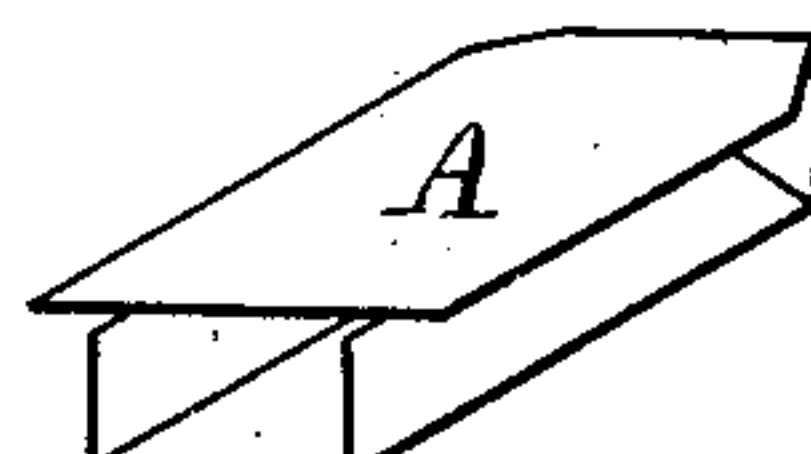
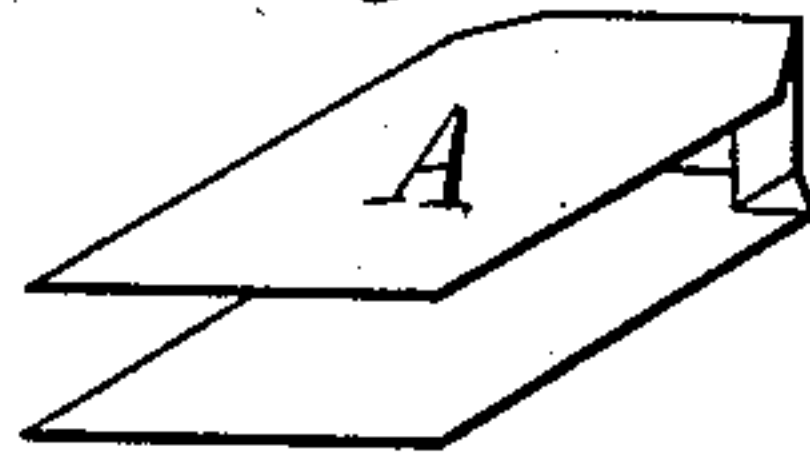


Fig. 34.

Fig. 35.

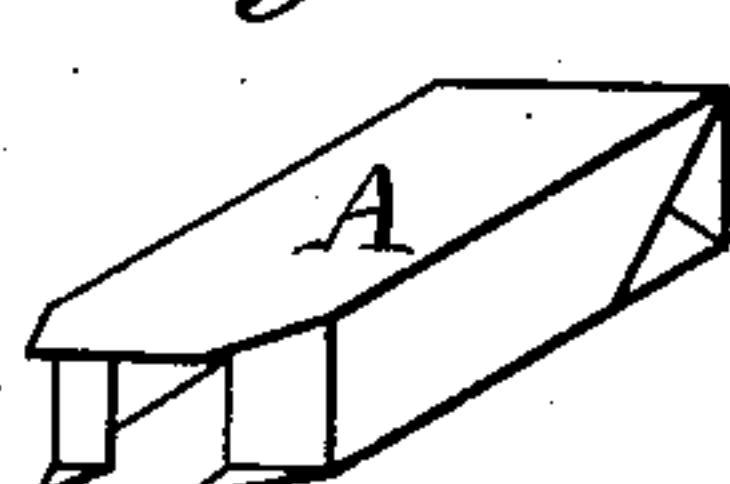
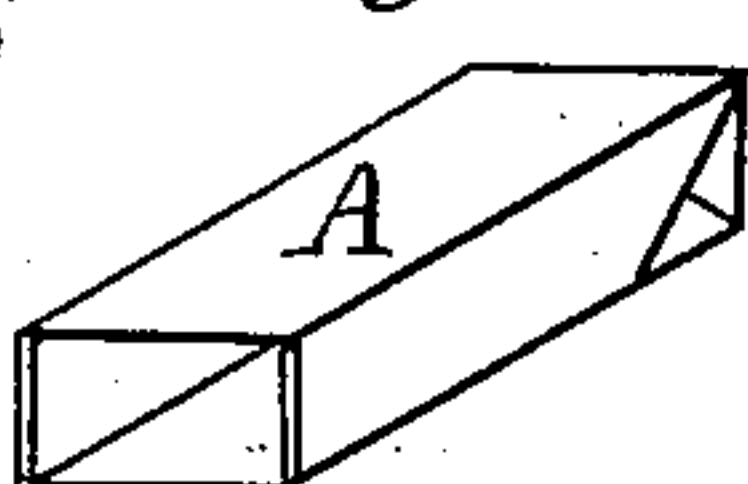
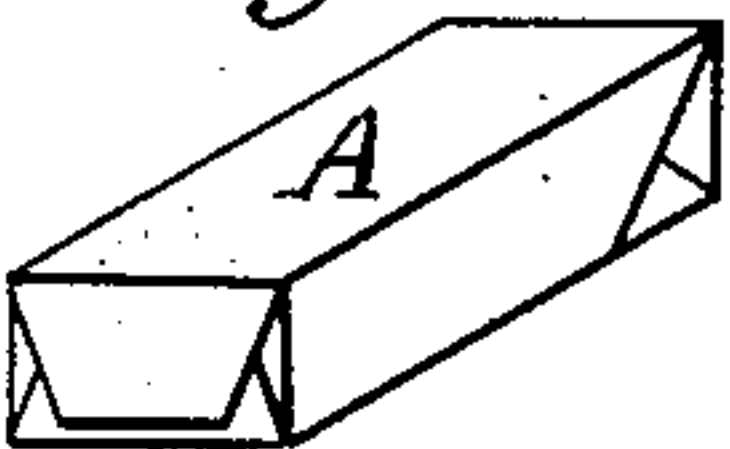
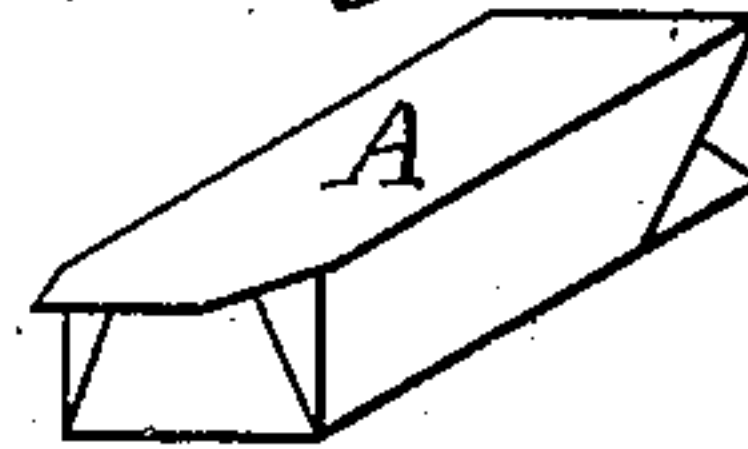


Fig. 36.

Fig. 37.



Witnesses:

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PATENTED JUNE 16, 1908.

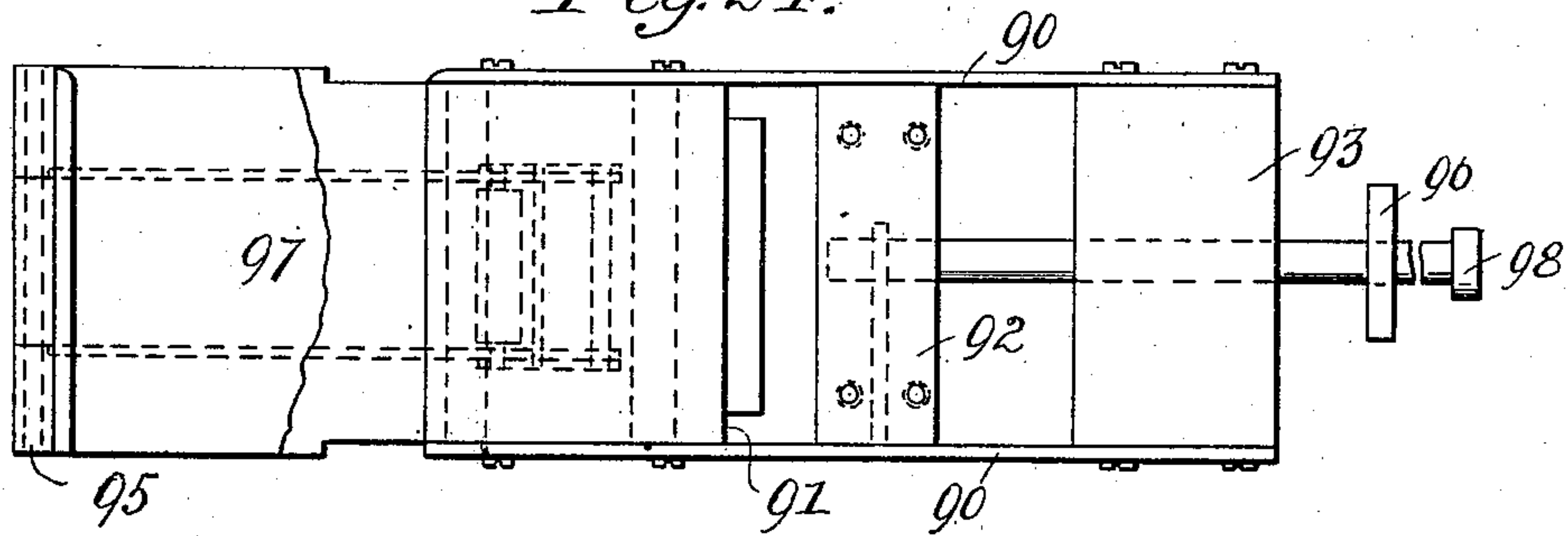
F. GIROUD.

PACKAGING MACHINE.

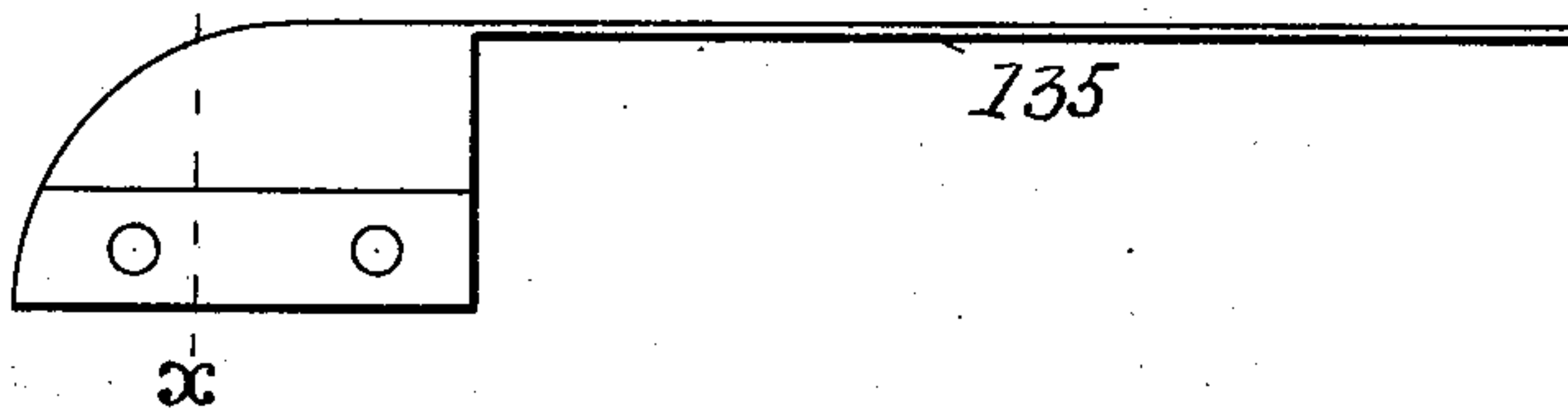
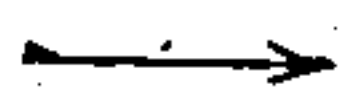
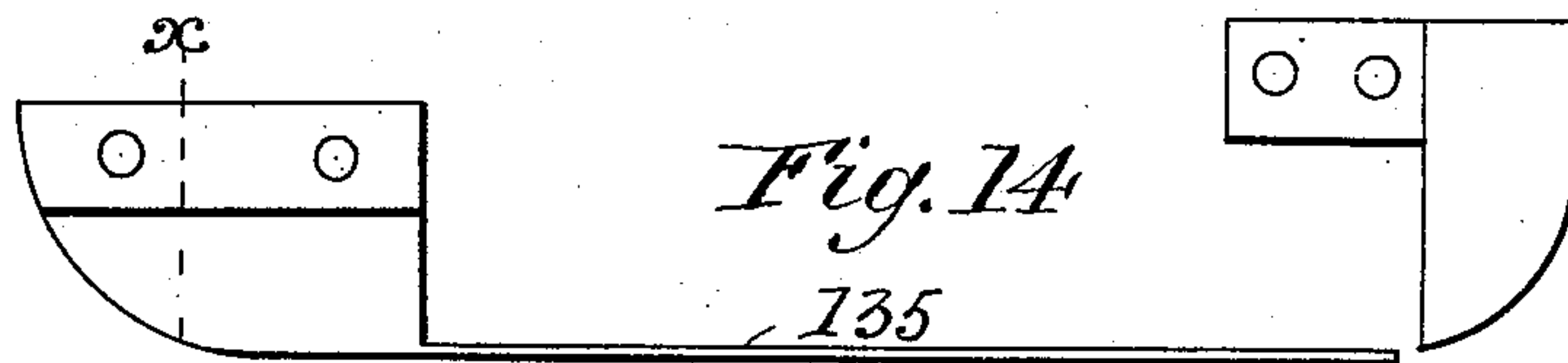
APPLICATION FILED NOV. 12, 1907.

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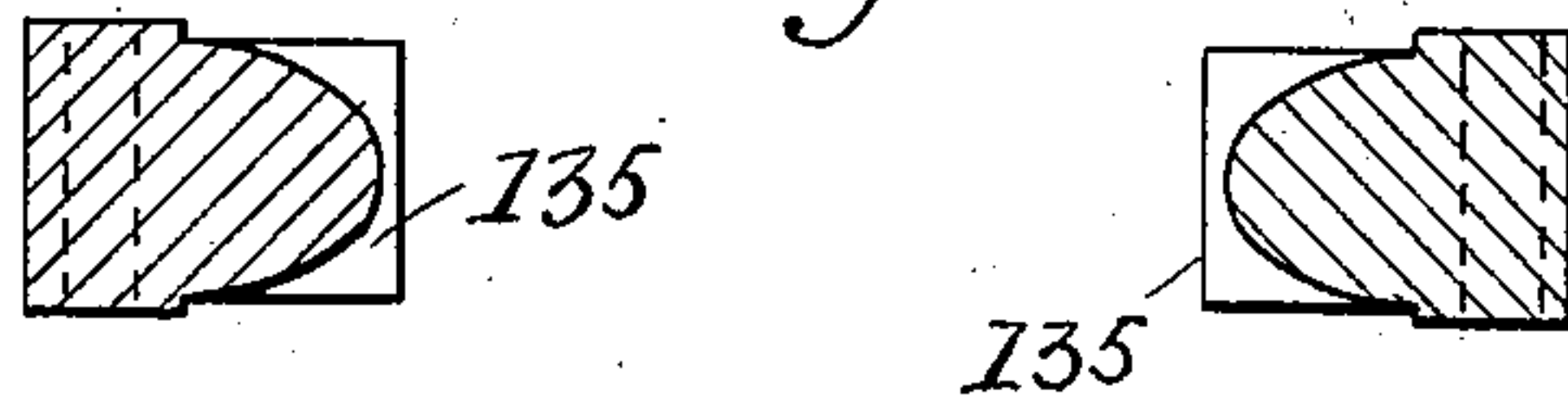
*Fig. 24.*



*Fig. 14.*



*Fig. 15.*



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PATENTED JUNE 16, 1908.

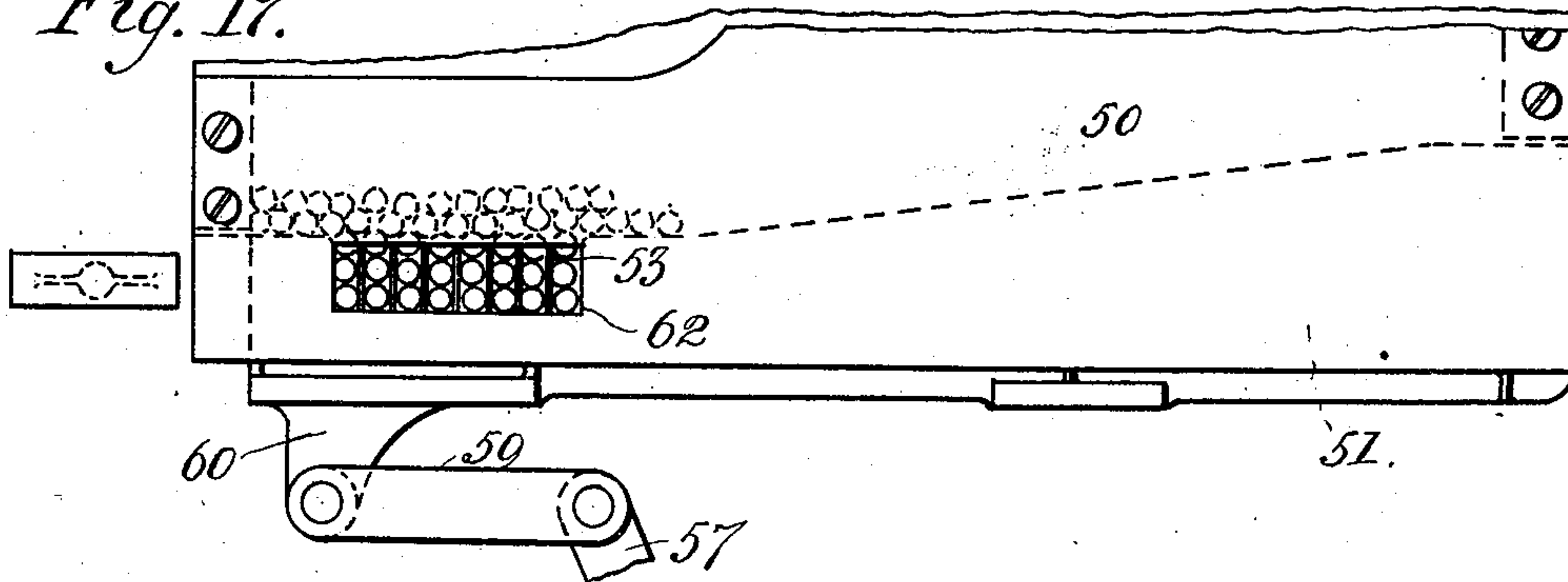
F. GIROUD.

PACKAGING MACHINE.

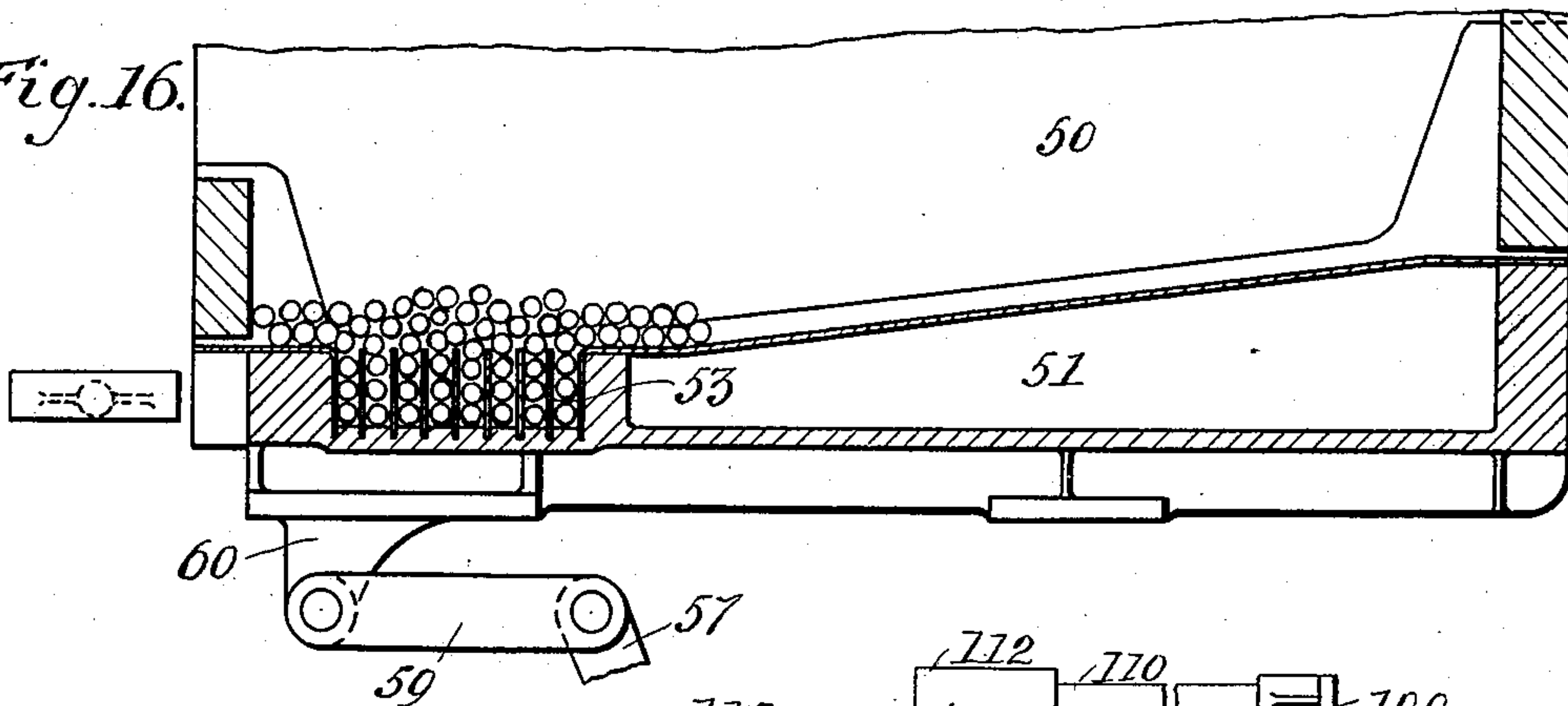
APPLICATION FILED NOV. 12, 1907.

10 SHEETS—SHEET 8.

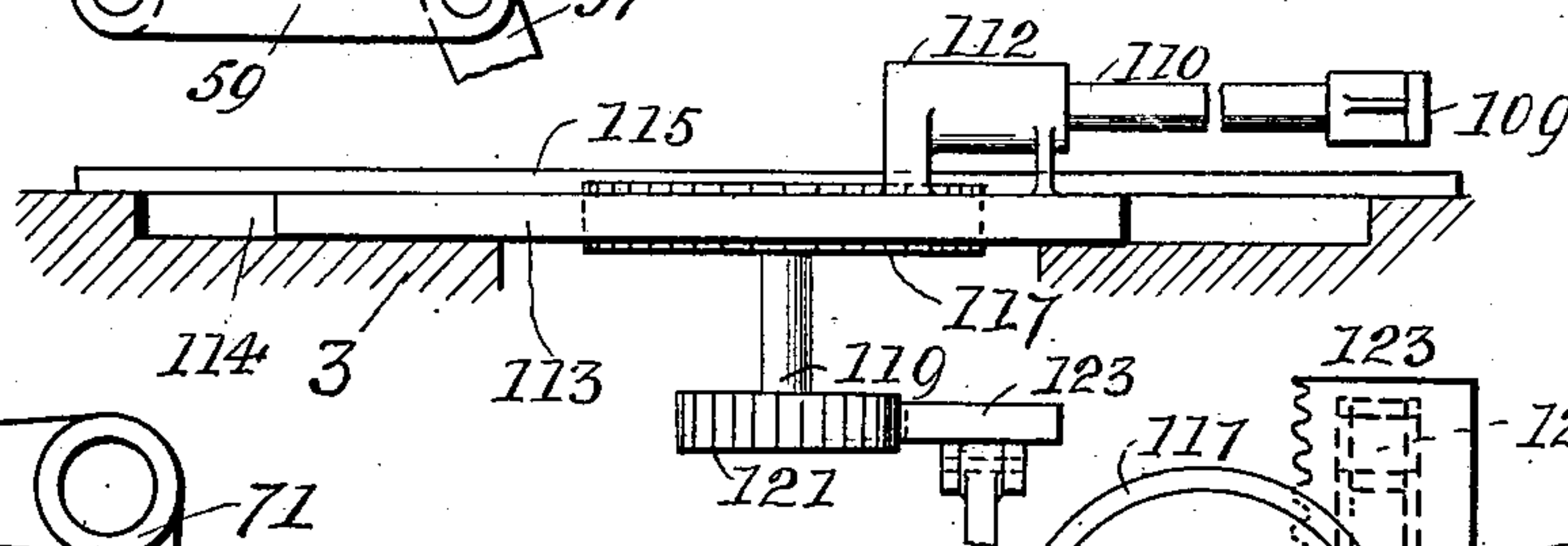
*Fig. 17.*



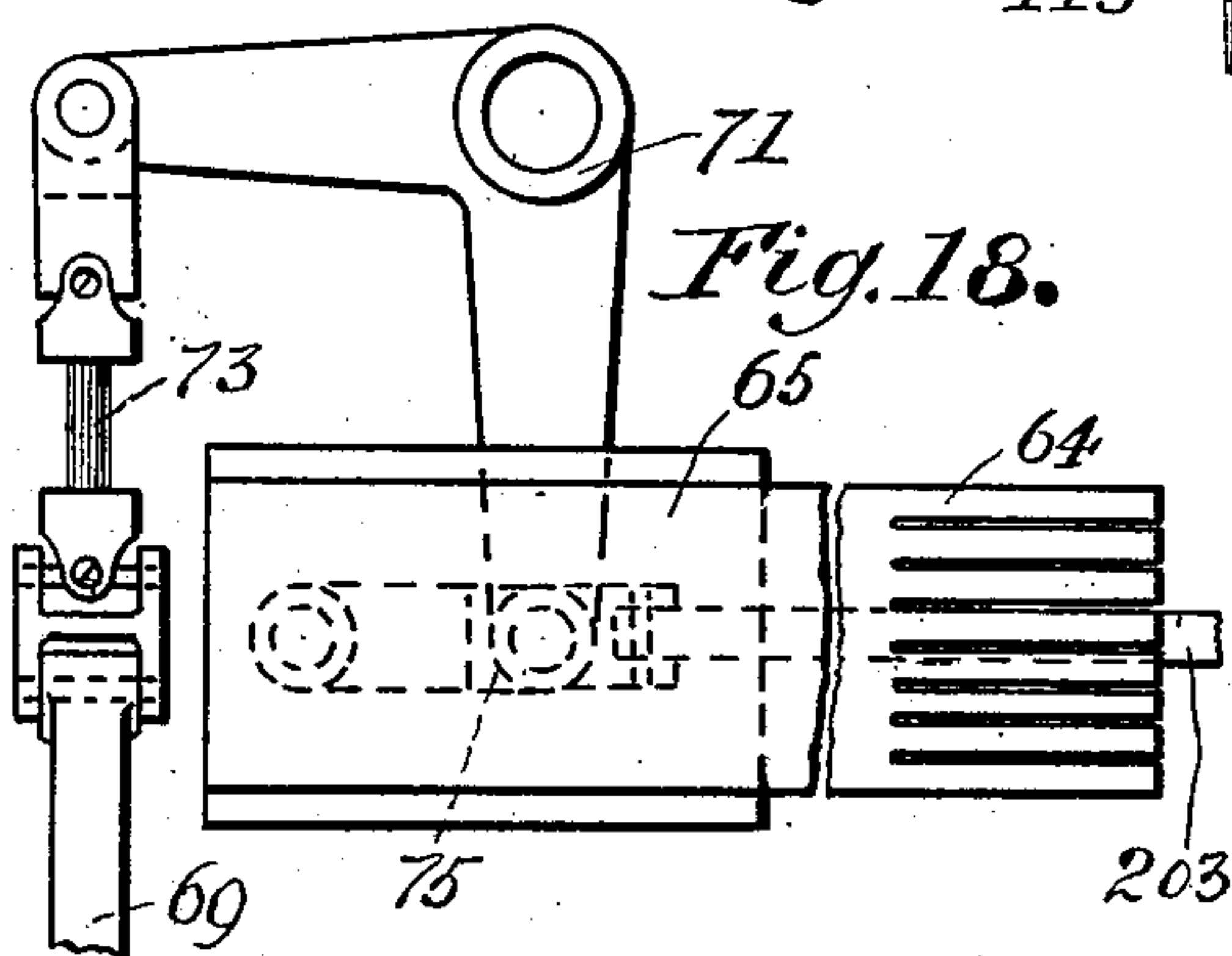
*Fig. 16.*



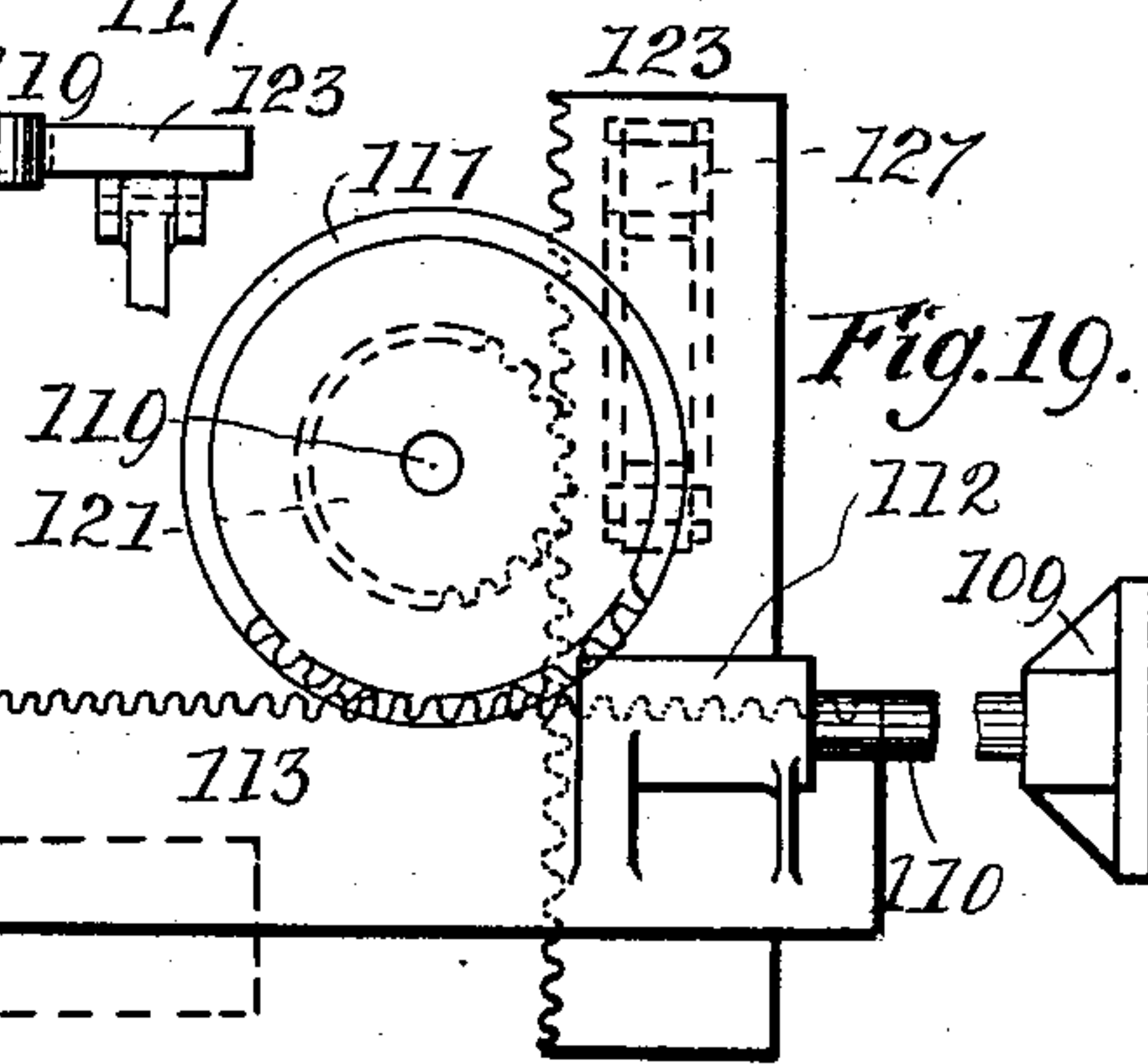
*Fig. 20*



*Fig. 18.*



*Fig. 19.*



Witnesses:

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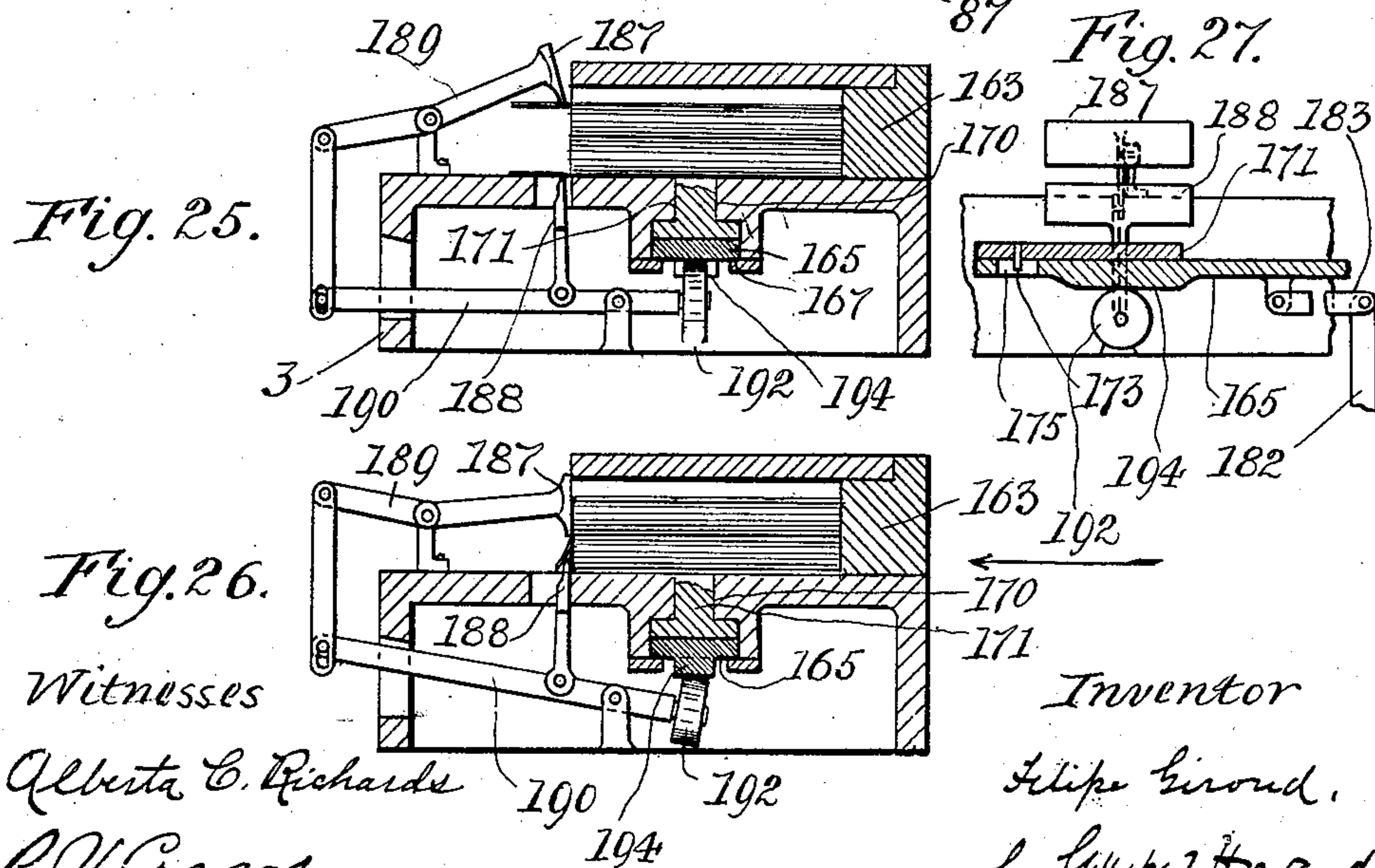
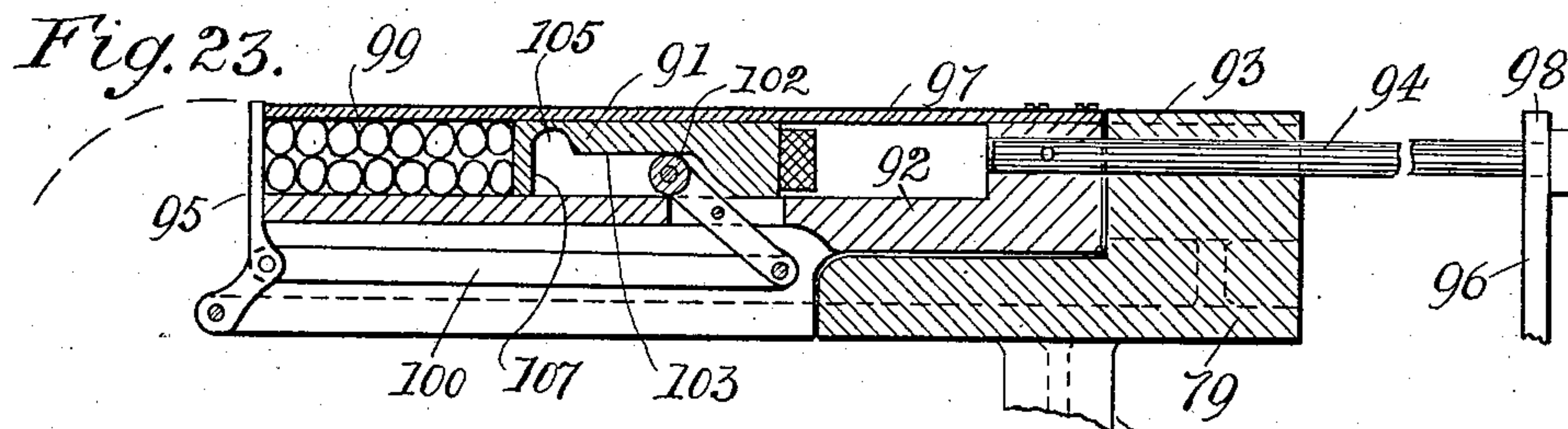
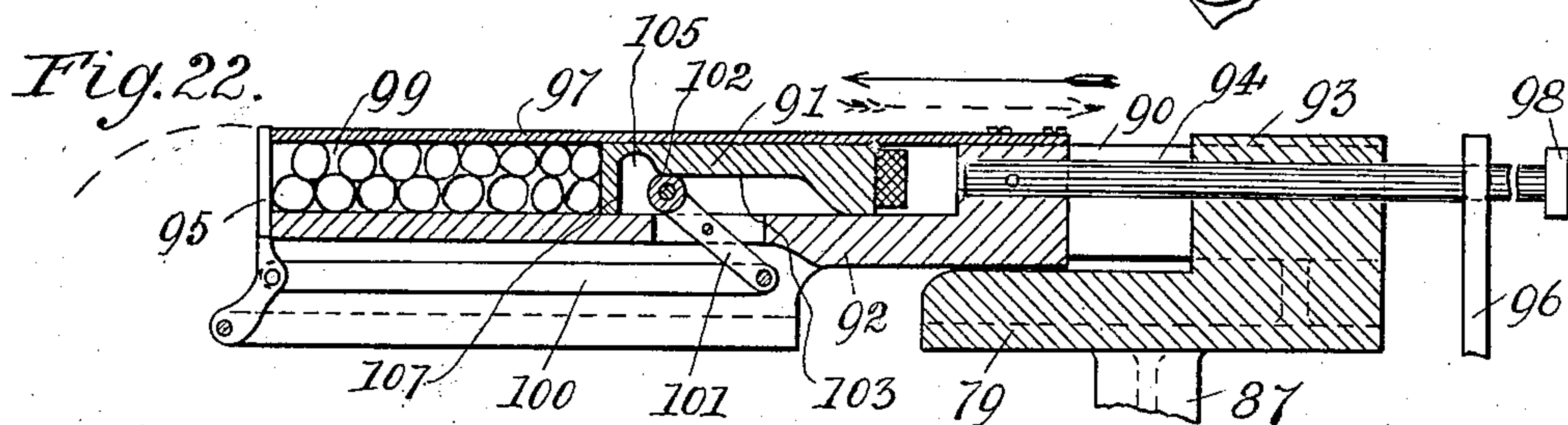
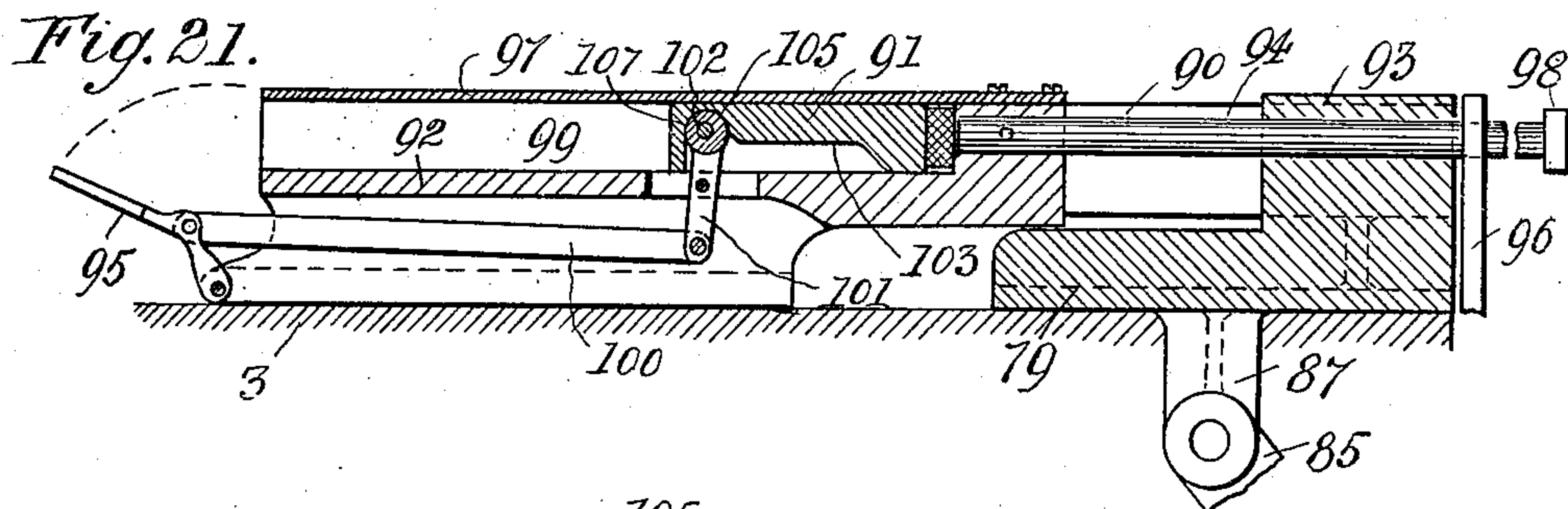
PATENTED JUNE 16, 1908.

F. GIROUD.

PACKAGING MACHINE.

APPLICATION FILED NOV. 12, 1907.

10 SHEETS—SHEET 9.



Witnesses  
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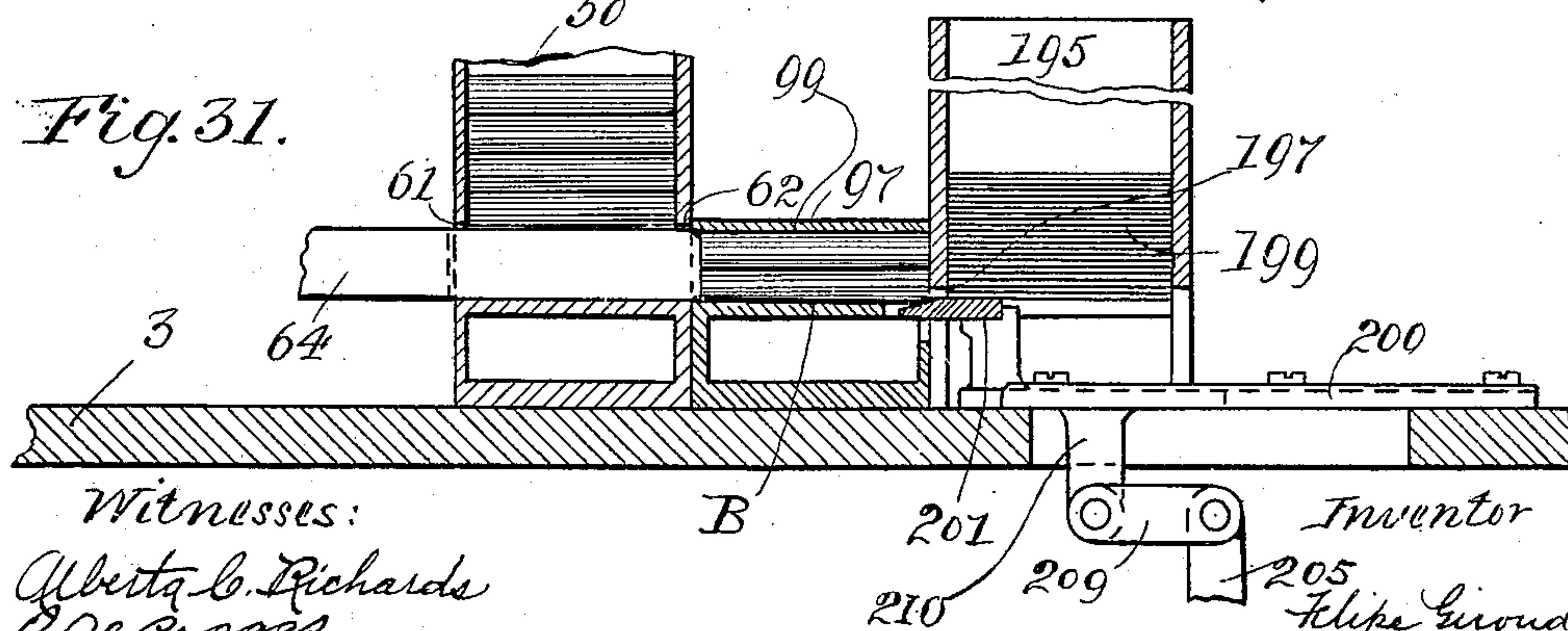
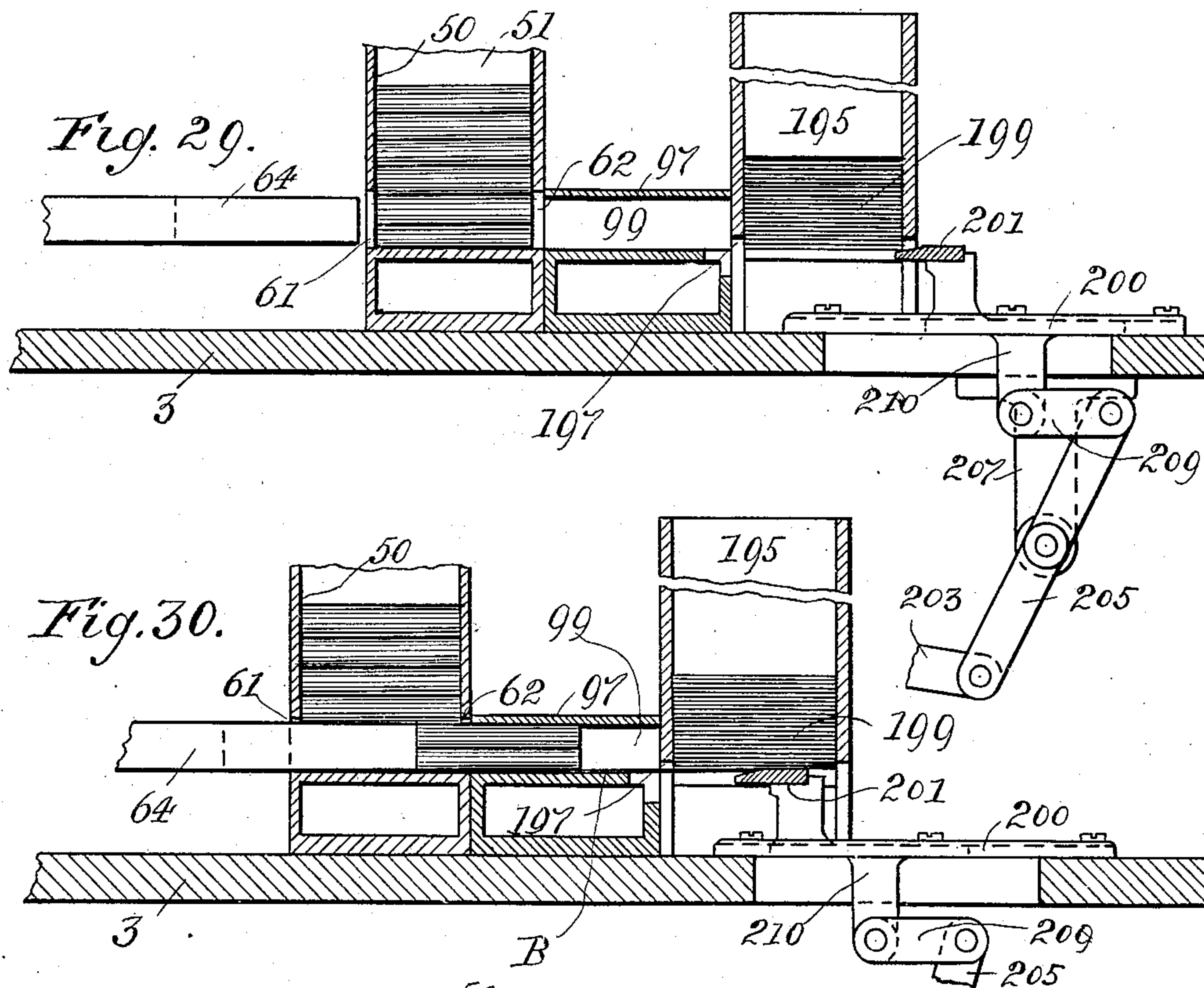
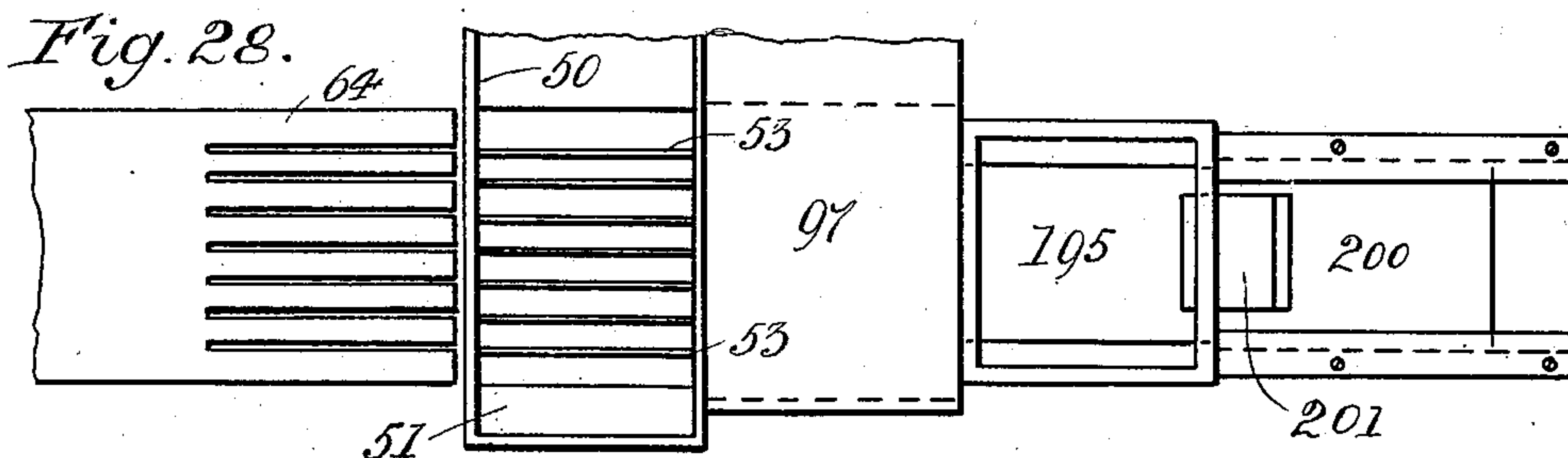
Inventor  
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F. GIROUD.

PACKAGING MACHINE.

APPLICATION FILED NOV. 12, 1907.

10 SHEETS—SHEET 10.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

FELIPE GIROUD, OF NEW YORK, N. Y.

## PACKAGING-MACHINE.

No. 890,976.

Specification of Letters Patent.

Patented June 16, 1908.

Application filed November 12, 1907. Serial No. 401,852.

*To all whom it may concern:*

Be it known that I, FELIPE GIROUD, of New York, in the county and State of New York, have invented certain Improvements in Packaging-Machines, of which the following is a specification.

This invention relates to machines for packaging various articles such for instance as cigarettes, and in the present case the machine is shown and described as for that purpose only.

The object of the said invention is to take from a magazine into which completed cigarettes are placed in bulk, a certain number of the cigarettes at each operation of the machine, and carry them to appliances whereby they are compressed into a compact bunch and provided with a wrapper, as will hereinafter fully appear.

In the description of the said machine which follows, reference is made to the accompanying drawings forming a part hereof, and in which,—

Figure 1 is a sectional front elevation of the improved machine. Fig. 2 is a plan of the same. Fig. 3 is a section of Fig. 1 taken on the dotted line  $v-v$ , and looking in the direction indicated by the arrow in that figure. Fig. 4 is an enlarged sectional front view of the magazine for the wrappers which are to be applied to bunches of cigarettes in the packaging operation, together with a stack of wrappers, a paste box, and certain of the devices whereby paste from the box is applied to the bottom wrapper of the stack. Fig. 5 is an exterior front view of the wrapper magazine and its attachments, showing the paste-applying devices as in different positions with respect to the other elements of the apparatus. Fig. 6 is an end view of Fig. 5, looking in the direction indicated by the arrow in that figure. Fig. 7 is an enlarged sectional front view of a part of the wrapper magazine, together with a portion of the carrier whereby the bottom wrapper is taken from the stack of wrappers in the magazine, and presented to the devices whereby it is applied to a compressed bunch of cigarettes, and illustrating the first movement of the wrapper. Fig. 8 is a view similar to Fig. 7, except that the wrapper carrier is shown as having grasped the end of the wrapper. Fig. 9 is an enlarged partly sectional front view of the wrapper carrier, the means by which it is directly operated, the devices in which the loose bunch of cigarettes is laterally com-

pressed into a compact body, the first set of wrapper-folding appliances, and the plunger whereby the cigarettes are pushed from the compression chamber to the folding appliances. Figs. 10, 11 and 12 are enlarged vertical transverse sections of the first set of wrapper-tucking and folding appliances, illustrating various positions of the elements of the latter. Fig. 13 is a section of parts of Fig. 10 taken on the dotted line  $w-w$ , together with a wrapper shown as just entering between the fixed tuckers, and the plunger whereby the wrapper is forced between the tuckers through the medium of the bunch of cigarettes (not shown) against the end of which the plunger is driven. Fig. 14 is a still further enlarged top view of the fixed tuckers before alluded to, together with a second fixed tucker. Fig. 15 is a cross section of Fig. 14 taken on the dotted line  $x-x$ . Fig. 16 is an enlarged longitudinal side sectional view of the magazine into which the cigarettes are placed in bulk, together with the carriage in which the cigarettes are loosely bunched and whereby the bunch is carried to the mechanism by means of which they are laterally compressed to a compact bunch, and the means whereby the carriage is directly operated. Fig. 17 is an exterior view of Fig. 16. Fig. 18 is an enlarged top view of the appliance whereby the cigarettes are forced from the carriage in the cigarette magazine, to the compressing devices before referred to. Fig. 19 is a plan view of the plunger before referred to, and the means whereby it is directly actuated. Fig. 20 is a view of Fig. 19 looking in the direction indicated by the arrow in that figure. Fig. 21 is an enlarged sectional side view of the mechanism whereby the loose bunch of cigarettes is compressed and carried to the wrapper applying devices, the compression chamber thereof being shown as fully extended. Fig. 22 is a view similar to Fig. 21 except that the compression chamber is shown as reduced in length, and occupied by a loose bunch of cigarettes. Fig. 23 is a view similar to Fig. 22 except that the compression chamber is fully contracted in length, and the bunch of cigarettes therein compressed, and brought into the proper condition to be wrapped. Fig. 24 is an exterior top view of Fig. 22. Fig. 25 is an enlarged section of the end-folding devices, and their connections as they appear before the same have



been placed in operation. Fig. 26 is a view similar to Fig. 25, except that folding devices are shown as they appear immediately before the completion of the end-folding operation. Fig. 27 is a view of certain parts shown in Fig. 26, looking in the direction indicated by the arrow in that figure. Fig. 28 is an enlarged plan view of certain appliances adapted to insert a coupon into the bunch of cigarettes when the same are in a loosely bunched condition, and Figs. 29, 30 and 31 are sectional side views of Fig. 28, showing the moving parts of the apparatus therein illustrated, as in different positions. Figs. 32, 33, 34, 35, 36 and 37 illustrate the condition of the wrapper at various stages of the packaging operation.

Referring now to the drawings, 1 is the frame of the machine, and 2 the legs thereof which are broken off for want of space. 3 a table erected on and secured to the frame 1.

Referring now particularly to Figs. 1, 2, 3, 4, 5, 6, 7, 8 and 9 of the drawings, 4 is the magazine in which a stack of labels or wrappers 5 for the cigarettes is placed. The magazine 4 is situated considerably above and supported from the table 3 by means of the bracket 6, as is best shown in Figs. 1 and 3. The bottom of the wrapper magazine 4 is cut away leaving only the portions *a* and *b* which extend crosswise of the magazine, as shown in Figs. 1, 4, 5, 7 and 8. By this means, a large portion of the underside of the bottom wrapper is exposed, and the wrapper lacking adequate support to keep it in a true horizontal position, may therefore be easily looped or made to assume a curved shape, as shown in Fig. 7, and ultimately have one of its ends withdrawn from the portion *b* of the magazine and allowed to hang down below the same, as shown in Fig. 8, for a purpose hereinafter described.

To effect the curving or looping of the bottom wrapper and the withdrawal of its end from the support *b* in the magazine, in order that the free end of the wrapper may be grasped by the wrapper carrier 7, hereinafter described, and by it presented to the cigarettes to be wrapped, there is placed under the open portion of the magazine and near its front end, a roller 9 which is tight on shaft 10. This shaft carrying the roller 9 is in constant rotation through the medium of the vertical shaft 12 which extends through a tubular part of the bracket 6 and is driven from the horizontal shaft 13 by the two pairs of miter gear wheels 14. The horizontal shaft 13 derives its rotation from the main driving shaft 15 by means of sprocket wheels on the said shaft, and the chain belt 17. In addition to the supports *a* and *b* the bottom wrapper has a third support consisting of an idle roller 19 over which the wrapper is drawn as it is taken from the magazine by the wrapper carrier

7. The object in having this support of cylindrical shape and adapted for free rotation is to prevent giving to the wrapper a permanent curvature as would be the case if a considerable portion of the wrapper were drawn over a device having corners or a sharp edge in contact with the wrapper. In order to increase the friction between the roller 9 and the bottom wrapper which by rotation of the said roller has to be detached from the support *b* to give it the curvature or loop before referred to, the said roller has attached to its surface a strip *c* of rubber or felt of limited width; and by this means a practically intermittent effect is produced, a wrapper being looped only at such time as is required in the operation of the machine, as will hereinafter appear. The wrapper carrier 7 before briefly referred to as the device which takes a wrapper from the magazine 4 and places it in front of a bunch of cigarettes as the preliminary step in the packaging of the same, consists of a sector secured to a horizontal shaft 20 supported in bearings above the table 3; and it is upon the outer curved surface of the sector that the wrapper rests during its transfer from the magazine to the place where it is deposited in front of a bunch of cigarettes.

The extreme upward and backward position of the wrapper carrier is indicated in Fig. 8, and its extreme reverse or downward position in Fig. 9. The movement of the wrapper carrier is derived primarily from the driving shaft 15 through the medium of a toothed sector 21 on the horizontal shaft 20, a vertically moving rack 22 in engagement with the sector, a cam 23, and a suitable connection 25 between the cam and the rack, as shown in Fig. 1; and the movement of the wrapper carrier effected as described, is a regular vibratory one. The means whereby the wrapper carrier is made to grasp the free end of the wrapper as the former reaches its extreme upward position shown in Fig. 8, and release the wrapper, as it reaches its extreme downward position illustrated in Fig. 9, consists as follows: The inner surface of the curved portion of the carrier is provided with a similarly curved plate 26 (see Figs. 1, 7, 8 and 9) susceptible of a limited sliding movement with respect to the said surface, and having a hooked end *d* which extends over the lower edge of the carrier. The upper end of the curved plate is pivoted to one arm of a bell-crank 27, and the other arm of the bell-crank is pivoted to a suitably guided rod 30 which at its free extremity is provided with a roller *e* which at times is in contact with the curved surface *f* of the bearing 31 for the shaft 20. A spiral spring *g* on the rod 30, and confined endwise between a pin *h*, and the guide through which the said rod extends, serves to retain the roller in contact with the bearing. At the top of the bearing



31 is formed a depression *i* into which the roller *e* enters as the wrapper carrier reaches its highest position, thus causing the curved plate 26 to move independently of the carrier and bring the hook *d* of the plate 26 closely in contact with the end or edge of the carrier, as shown in Fig. 8. As this movement takes place at the time that the end of a wrapper is hanging down below the wrapper magazine, the wrapper is clasped as shown in Fig. 8; and in the downward movement of the carrier, the wrapper is carried with it. The hold of the carrier on the wrapper is, however, released as soon as the roller *e* leaves the depression *i* and subsequent to that time the movement of the wrapper is effected by friction between it and the carrier.

In Fig. 9 the wrapper is shown as released and loose on the carrier, and therefore in a condition to be applied to a bunch of cigarettes which at that time is in front of it, as hereinafter described. It is necessary that the wrapper when carried to the position shown in Fig. 9 should have the underside of its lateral edges for a limited distance, coated with some adhesive. I therefore place in the rear of the wrapper magazine a paste box 32 having therein a paste roller 33 which projects through an aperture in the bottom of the box as shown in Figs. 1 and 2. The shaft of this roller is fitted with a sprocket wheel 34 which is driven by a sprocket chain 35 from a similar wheel 37 on the shaft 10 carrying the roller 9 as shown in Figs. 1 and 2. To cooperate with the paste roller 33 and thereby transfer paste directly to the edges of the bottom wrapper for a limited distance longitudinally of the same, a spring-held carriage 39 is pivoted to a cross head 40 adapted to slide in a suitable guide 41 extending rearward from the paste box 32. The end of the carriage 39 is provided with two paste wheels 43 shown in Figs. 1 and 2. The carriage and its movable connections receive a reciprocating movement from the shaft 10 through the medium of a crank 45 and a rod 47 as shown in Figs. 1 and 2, and in this movement the paste wheels take paste from the paste roller 33 and transfer it to the under side of the bottom wrapper in the wrapper magazine. It will be understood that the length of the crank 45 regulates the distance that the paste wheels traverse the wrapper.

Referring now particularly to Figs. 1, 2, 3, 16, 17, 18, 27, 28, 29 and 30, 50 is the magazine into which the cigarettes in bulk are placed. Within the magazine and adapted to have a sliding movement longitudinally thereof, is a carriage 51, the upper surface plate of which is inclined as shown in Fig. 16, in order that the cigarettes by the force of gravity will move toward the inner end of the magazine which is provided with several partition plates 53 extending transversely of the carriage. These partitions are separated to

a distance slightly greater than the diameter of a cigarette, and form pockets having such depth as to hold more than two cigarettes when the same are placed one upon another as shown in Figs. 16 and 17. The part 54 of side of the magazine to the left in Fig. 2 is made of glass for obvious purposes. The glass plate is also shown in Fig. 16. The sliding movement of the carriage before referred to is produced by the cam 55, the arm 57, and the link 59 which is pivoted to a lug 60 on the under side of the carriage. 61 and 62 are ports in the opposite sides or walls of the cigarette magazine 50 for the passage of certain ejecting fingers hereinafter described, whereby a loose bunch of cigarettes is pushed to the devices which compress the bunch and carry it to the wrapper-applying mechanism, as will hereinafter appear.

The ejecting fingers above referred to are best shown in Figs. 2, 18, 28, 29, 30 and 31, in which they are denoted by 64, and they are formed at one end of a plate 65 suitably guided as shown in Fig. 2. The plate 65 has a reciprocating movement derived from the driving shaft 15 by means of the cam 67, arm 69, and the bell-crank 71, (see Fig. 18) one member of which is united to the rod 69 by a universal joint 73, and the other member connected to a lug 75 on the lower side of the plate, as shown in dotted lines in Fig. 18. The height of the fingers 64 is slightly less than the height of the two cigarettes placed horizontally, one upon another, as shown in Figs. 29, 30 and 31; consequently, when the fingers are projected through the port 61 two horizontal rows only of cigarettes are pushed through the port 62 to the mechanism hereinafter described, whereby they are laterally compressed to bring them into a compact bunched condition suitable to be inclosed in a wrapper as hereinafter described; and the cigarettes remaining above those ejected from the magazine by the fingers are not disturbed until the withdrawal of the fingers from the magazine, when those cigarettes which have been resting on the fingers during their forward movement, fall by gravity to the places before occupied by the cigarettes which have been ejected. The reciprocating motion of the carriage 51 before referred to also serves to shake the cigarettes into the pockets formed by the partitions 53, so that the pockets are always fully occupied either by cigarettes alone or by fingers with cigarettes above them.

The mechanism which receives the loosely bunched cigarettes ejected from the magazine 50 by the fingers 64, and in which the bunch is laterally compressed into a proper condition to be wrapped, and conveyed to the wrapper-folding appliances, consists of carrier 79 (see Figs. 1, 2, 3, 9, 21, 22, 23, 28, 29, 30 and 31) adapted for reciprocating movement transversely of the table 3. Its



motion is derived from the driving shaft 15 through the medium of the cam 81, arm 83, and the link 85 which connects the upper end of the said arm with a lug 87 (see Figs. 21, 22 and 23) on the bottom of the carrier, and which extends downward through a slot in the table 3. The carrier 79 is guided at one edge by the adjacent side of the cigarette magazine, and at the other edge by a fixed bar 89, as shown in Fig. 2. The forward end of the carrier 79 is rigidly attached by means of flat side bars 90 (best shown in Figs. 21, 22 and 24) to the compressing ram 91 which bears on a sliding bed plate 92 the rear end of which rests on the carrier 79. The forward end of the bed plate 92 or that part thereof which extends beyond the carrier 79 is seated on the table 3. The bed plate 92 receives a sliding forward movement, indicated by the arrow in full lines, from a lug 93 forming a part of the carrier 79 which comes into contact with its rear end during a portion of the movement of the carrier. In other words, only a portion of the motion of the carrier is imparted to the bed plate 92, and that as the carrier approaches the limit of its forward stroke. The sliding movement of the bed plate 92 in an opposite direction or that indicated by the arrow in dotted lines, is caused by the end of the ram (which is provided with a block of fiber to reduce the jar due to concussion) engaging with a raised portion of the bed plate to which a rod 94 is secured, and the said rod extends loosely through the lug 93 of the carrier and also loosely through a fixed bracket 96 extending from the table 3. The end of the rod 94 has a head 98 which as the bed plate 92 reaches its extreme forward position, independently of the carrier 79, comes in contact with the bracket 96 and prevents any further movement of the bed plate in that direction. This stop mechanism is required for the reason that the stroke of the lug 93 has a tendency to carry the bed plate 92 further than is required to make the compression chamber 99 register with the port 62 in the side of the cigarette magazine. At the time of such registration, the carrier, bed plate and ram occupy the relative positions shown in Fig. 22. The extreme inner end of the bed plate 92 is provided with a hinged door 95 which together with the end of the compressing ram 91, the bed plate 92, and the covering plate 97 which is fastened to the bed plate, produces the cigarette compression chamber 99 before briefly referred to.

For purposes hereinafter described, the hinged door 95 has to be opened soon after the carrier begins its backward stroke, and closed before the cigarettes are introduced into the compression chamber 99; and to effect this result the hinged door 95 is connected by a link 100 to the lower end of a lever 101 fulcrumed in a slot in the bed plate 92. The

upper end of the lever 101 is provided with a roller 102 which at one portion of the stroke of the ram 91 bears against the horizontal flat surface 103, and at another portion of the same enters the depression 105. When the roller 102 is in contact with the horizontal flat surface 103, the lever 101 is forced into an inclined position, and the hinged door 95 thereby closed; and when the said roller comes into contact with the vertical surface 107 at the forward end of the ram, the lever 101 is thrown over into the upright position, (the roller entering the depression 105,) and the hinged door is thereby opened. The conditions making necessary these operations will be hereinafter described.

The means whereby the compressed bunch of cigarettes (see Fig. 23) is pushed from the compression chamber 99 to the appliances whereby it is provided with a wrapper, consist of a plunger 109 shown in Figs. 1, 2, 9, 13, 19 and 20 as forming the outer termination of a bar 110 fastened to and projecting from a lug 112 on a rack bar 113 which is suitably guided in a channel 114 in the table 3 as shown in Fig. 20. The rack bar 113 is held down by flat bars one of which is denoted by 115 (shown in full lines in Fig. 20, and in dotted lines in Fig. 19) and is in engagement with a pinion 117 (see Figs. 19 and 20) tight on a vertical shaft 119 which is supported at its lower end by a bracket 120 shown in Fig. 1. The said shaft has also secured thereto a smaller pinion 121, see Figs. 19 and 20, which engages a second suitably supported and guided rack 123 situated below the table of the machine and has a movement transversely of the same. The second rack bar 123 is driven from the main shaft by means of the cam 125, arm 127 and the links 129, the last named being shown only in dotted lines in Fig. 19. The movement of the plunger 109 in a forward direction is such as to push the compressed bunch of cigarettes from and entirely clear of the compression chamber, to and fully within the wrapper-applying devices, the said bunch carrying with it a wrapper which will be remembered has been placed by the wrapper carrier in front of the wrapper-applying mechanism. In order that in its forward movement, the plunger will not interfere with the wrapper carrier, that device is made of skeleton form which gives space for the passage therethrough of the plunger.

In the operation of the machine, the carrier 79 with its connections begins its backward or return movement after the plunger 109 has passed through the compression chamber 99 in its forward motion, and the bar 110 being still within the compression chamber 99, it follows therefore that some provision must be made for the disengagement of the interfering parts; and it is for this purpose that the compression chamber 99 is provided with



the hinged door 95 which is automatically opened as before described, before the same, if not opened, would come into contact with the said bar.

5 The wrapper represented by A is formed from a sheet of paper of such length that when it is doubled centrally over and longitudinally of the bunch of compressed cigarettes, its ends will extend beyond the exposed ends of the cigarettes; and it is of such  
10 a width as to project laterally over the sides of the bunch to a distance which is equal to the depth of the bunch.

Referring now to Figs. 1, 2, 3, 9, 10, 11, 12  
15 and 13, the wrapper-applying mechanism consists of the upper and lower horizontal plates respectively denoted by 130 and 131 which are held rigidly in position from the table 3 by means of the hollow columns 133.  
20 135, 135 are thin plates placed on edge between the horizontal plates 130 and 131, and held in position by means of suitable holders 137 which are fastened to the table 3, as shown in Figs. 1, 2 and 9. The plates 135  
25 are also shown in Figs. 14 and 15. The horizontal and vertical plates 130, 131 and 135, just referred to, form the folding chamber 134; and in order that the lateral edges of the wrapper at its double end may be tucked-  
30 in as shown in Fig. 32 the entrance ends of the vertical plates 135 where they project beyond the horizontal plates 130 and 131 are thickened and their inner edges rounded, as shown particularly in Figs. 14 and 15. To admit of the upper and lower edges of the doubled wrapper which extend laterally beyond  
35 the bunch of cigarettes passing across the vertical plates 135 over which they are to be folded, the said plates, except where clamped between the horizontal plates 130 and 131,  
40 are made narrower than the height or depth of the folding chamber, as shown in Figs. 10, 11 and 12, thus producing the spaces 136. To bring the wrapper into the condition  
45 shown in Fig. 34, that is to say, with its upper lateral edges lapped over the corresponding lower edges, independently acting lower and upper folders are employed, the former operating in advance of the latter. The  
50 lower folder consists of two vertical blades 139 separated to a distance slightly greater than the width across the vertical plates 135, and adapted to have an up-and-down movement through slots 140 in the horizontal  
55 plate 131. They are united as shown, and provided with flanges 141 having at their edges the hollow uprights 142 which fit loosely within the hollow columns 133 before referred to. The up-and-down-motion of the  
60 lower folder is obtained from the main shaft 15 through the medium of the cam 144, the arm 145, and link 146, which is pivoted to a cross-head 147, extending between and forming a part of the blades 139. The upper  
65 folder has blades 149 similar to the blades

139, except that they are separated to a slightly greater distance, and occupy a reversed position, they depending from the plate 150. 153, 153 are stems with their upper ends fastened within the lugs 152 on the  
70 plate 150. They extend downward through the hollow uprights 142, and are connected at their lower ends by the cross-head 155 to which are pivoted the links 157 which receives a vertical motion from an arm 159  
75 operated by the cam 160.

Fig. 10 shows the relative positions of the two folders before the folding operation; and Fig. 11 their positions at the time that the lower lateral edges of the wrapper have been  
80 turned over and folded against the thin side plates 135 of the chamber 134. The condition of the wrapper at this stage of the folding operation, is shown in Fig. 33.

Fig. 12 shows the lower folder as having  
85 completed its function, and descended to its original position, and the upper folder as having folded the upper lateral edges of the wrapper over the upturned lower edges, and the completion of that portion of the folding  
90 operation which is performed within the folding chamber. The condition of the wrapper at this time is illustrated in Fig. 34.

It must be understood that during the folding operations above described, the plunger  
95 109 is stationary and within the folding chamber, but upon the folders returning to their original or inoperative positions shown in Fig. 10, the plunger again moves forward and pushes the partially completed package  
100 from the folding chamber 134 to the discharge channel 162 which is bounded laterally by the bars 163 and covered by a plate 164 which is preferably made of glass in order that the packages passing through the  
105 channel may be inspected.

165 is a bar (see Figs. 1, 2, 3, 25, 26 and 27) situated in a groove 167 in the table 3 of the machine of which it extends longitudinally,  
110 and 170 is a slot in the bed in communication with the said groove, and in said slot is placed a supplemental bar 171 which rests on the bar 165 beneath, and has a limited sliding movement independently thereof. The limitation of the independent movement  
115 of the supplemental bar 171 is effected by a pin 173 which projects from its under side into a slot 175 of a proper length in the bar 165.

To the bar 165 is attached a cross-head 177  
120 which rests on the bottom of the channel 162, and has an angular extension 179, the end of which, when the bar 165 is in its extreme backward position shown in Fig. 2, is clear of the package as it is discharged from  
125 the folders. 180 is a supplemental cross-head connected to the supplemental bar 171, which when in its extreme backward position is in alinement with the end of the angular extension 179 of the cross-head 171.  
130



The devices just described receive a reciprocating movement longitudinally of the channel 162, from the driving shaft 15 through the medium of the cam 181, the arm 5 182, and the link 183 which is pivoted to a lug on the bottom of the bar 165 as shown particularly in Figs. 3 and 27.

When the package is pushed from the folders to the channel 162 by the plunger 109 as before described, its outer edge is in contact with the stationary supplemental cross-head 180 which serves to keep the adjacent lapped or folded edges of the package closely together until the cross-head 177 moves forward when the end of its extension 179 tucks inward the adjoining projecting lateral edge of the wrapper closely against the ends of the inclosed cigarettes.

As soon as the cross-head 177 comes into contact with the then stationary supplemental cross-head 180, the two cross-heads move forward together and carry the package clear of the path taken by the package which follows it, and in this movement the other lateral edge of the wrapper is tucked in by the rounded fixed projection 185 with which it comes in contact and ultimately passes. The wrapper is now in the condition shown in Fig. 35. The return movement of the cross-heads takes place before another package is presented for their action, and the supplemental cross-head is carried back to its original position by the pin 173 coming in contact with the end of the slot 175 in the bar 165. It now only requires the turning inward of the upper and lower end extensions of the wrapper to complete the folding operation, or bring the wrapper to the condition in which it is shown in Fig. 37, and this operation is accomplished by the vibratory end-folders now to be described.

Referring now to Figs. 1, 2, 3, 25, 26 and 27, 187 and 188 are the upper and lower end-folders which are in vertical alinement one with the other, and situated to the left of the channel 162 as shown in Fig. 2. They are in the path of the extended upper and lower ends of the wrapper as the same move along the channel, and so situated as to be directly opposite a package as it is pushed to its limit by the cross-heads 177 and 180. The upper end-folder 187 consists of a blade forming the termination of a lever 189 fulcrumed to a bracket on the bed of the machine. The other end of the said lever is linked to a second lever 190 fulcrumed to a second bracket and carrying the lower folding blade 188. The free end of the second lever 190 is fitted with a roller 192 which is in contact with the underside of the bar 165 before described. In order that the roller 192 may have an up-and-down-motion as the bar 165 slides backward and forward, the said bar has formed thereon the projection 194 of limited length, as shown in Figs. 25, 26 and

27. Each time that the projection 194 passes over the roller 192, the folding blades 187 and 188 are made to approach each other and fold in the ends of the wrapper; and by a proper arrangement of the mechanism, the lower end-folder operates in advance of the upper one. The action of the end-folders completes the folding operation. In the same cases, it is desirable to introduce into the package of cigarettes, a coupon or other similar advertising device, and as this operation has to be done before the bunch of cigarettes is compressed, I place at one side of the compressing devices the coupon magazine 195 (see Figs. 1, 2, 28, 29, 30 and 31) having a slot 197 in its wall which slot when the compression chamber is between the fingers 64 and the slot, and expanded as shown in Fig. 22, registers therewith.

Underneath the stack of coupons which is denoted by 199, I place on the table of the machine, a sliding plate 200 carrying a pusher 201 which at each forward stroke, transfers the bottom coupon from the magazine through the slot 197 to under the bottom row of cigarettes in the compression chamber as shown in Figs. 29, 30 and 31. The forward and backward sliding motion of the plate 200 with its pusher 201 is obtained by means of the rod 203 which at one end is pivoted to the bell-crank 71 (see Fig. 18) and at the other end hinged to the lower arm of the lever 205 (shown in Figs. 29, 30 and 31) which is fulcrumed to a bracket 207 underneath the table 3. The upper arm of the said lever is connected by a link 209 to a lug 210 forming a part of the plate 200. In Fig. 30 a coupon which is denoted by B is shown as entering the compression chamber, and in Fig. 31 as entirely within the same. Supposing the cigarette magazine to be charged with cigarettes in bulk, a stack of wrappers to be in the wrapper magazine, the paste box provided with paste, and the machine to be in operation, the underside of the bottom wrapper receives a coating of paste, and immediately after, the said wrapper is looped as shown in Fig. 7 and as the loop is increased in depth the end of the wrapper is withdrawn from its support and falls to the position shown in Fig. 8. At this time, the wrapper carrier which is approaching its highest position grasps the end of the wrapper and after drawing it entirely from the magazine, carries it down to the position indicated in Fig. 9.

While the above operation is being performed, the ejecting fingers move forward and force the two lower rows of cigarettes which are in the pockets in the cigarette magazine, to the compressing chamber which at that time is in the extended condition shown in Fig. 22. The loose bunch of cigarettes is then compressed into a compact bunch, as shown in Fig. 23, and then carried



to the entrance of the first set of tucking and folding appliances, against the face of which the wrapper is held, as shown in Fig. 9. The plunger then moves forward and forces the compressed bunch together with the wrapper which is doubled over it, fully into the said tucking and folding appliances, the projecting end of the wrapper being tucked-in in the operation, as indicated in Figs. 13 and 32. The plunger now comes to rest and the lower folder rises which turns the lower longitudinal edges of the wrapper over and upon the thin side plates of the folding chamber, as shown in Fig. 11, thus bringing the wrapper into the condition in which it is shown in Fig. 33. The lower folder now returns to its original position, and the upper folder descends and turns or folds the upper longitudinal edges of the wrapper over the lower ones, as shown in Fig. 12, and bringing the wrapper to the condition shown in Fig. 34. The plunger now resumes its forward motion, and the unfinished package is forced from the folding chamber into the transverse channel, when the cross-head moves forward and its extension tucks-in the overhanging end of the wrapper at one side thereof. At this time the folded edges of the package at one side thereof, are bearing against the supplemental cross-head, and upon the main cross-head coming into contact with that device, both cross-heads move forward together, and the other edge of the wrapper is tucked-in by the tucker which is in its path. The wrapper then assumes the shape shown in Fig. 35. The cross-heads now recede to their first position, and the end-folders perform their office which brings the wrapper to the completed condition shown in Fig. 37.

It will be understood that the packages as completed are moved forward by those which follow, and are discharged from the machine at the end of the transverse channel. It will be further understood that the introduction of a coupon into the package as described is not essential to the completion of the package, but is a separate operation which may be omitted if desired.

I claim as my invention:

1. A packaging machine which comprises a wrapper magazine, a cigarette magazine, a paste holder, means to apply paste to the underside of the bottom wrapper in the magazine, devices to eject a limited number of cigarettes from the magazine, means to compress the ejected cigarettes into a compact bunch, wrapper-folding appliances, a contrivance adapted to grasp the bottom wrapper in the wrapper magazine and carry the same to a position between the bunch compressing devices and the folding appliances, and then release the wrapper, and a device to force the bunch of cigarettes against the wrapper and carry it together with the wrap-

per which is doubled over the bunch, into the wrapper-folding appliances.

2. A packaging machine which comprises a wrapper magazine, a cigarette magazine, a reciprocating carriage situated in the cigarette magazine, the same having pockets therein whereby certain of the cigarettes are separated from the others, devices to eject certain of the cigarettes contained within the pockets, from the magazine, devices to receive the ejected cigarettes and compress them into a compact bunch, wrapper-folding appliances, an oscillating carrier to take a wrapper from the wrapper magazine and deposit it between the bunch compressing devices and the wrapper folding appliances, and a device to force the bunch from the compressing devices against the wrapper and cause both to enter the folding appliances.

3. A packaging machine which comprises a wrapper magazine, a cigarette magazine, a reciprocating carriage situated in the magazine, the same having pockets therein whereby certain of the cigarettes are separated from the others, devices to eject certain of the cigarettes contained within the pockets from the magazine, devices to receive the ejected cigarettes and compress them into a compact bunch, wrapper-folding appliances, an oscillating carrier having grasping devices to take a wrapper from the wrapper magazine and deposit it between the bunch-compressing devices and the wrapper folding appliances, a device to force the bunch from the compressing devices to within the wrapper-folding appliances, the said wrapper moving in advance of the bunch.

4. A packaging machine which comprises a wrapper magazine, a cigarette magazine, a reciprocating carriage situated in the magazine, the same having pockets therein whereby certain of the cigarettes are separated from the others, devices to eject certain of the cigarettes contained within the pockets from the magazine, devices to receive the ejected cigarettes and compress them into a compact bunch, wrapper-folding appliances, an oscillating carrier adapted to grasp the bottom wrapper in the magazine and deposit it between the bunch-compressing devices and the wrapper-folding appliances, a device to force the bunch from the compressing devices to within the wrapper-folding appliances, the said bunch carrying with it the wrapper which is doubled over the bunch, and a second system of folding appliances which operate independently of the first and complete the wrapping operation.

5. In a packaging machine, a cigarette magazine having a port in each of two opposite walls thereof, a carriage having pockets therein which are unvarying in width into which cigarettes fall by gravity and remain loosely therein, means to reciprocate the



said carriage within the magazine, and at one part of its movement bring the pockets into alinement with the ports in the magazine, combined with fingers which are thrust  
5 through the said ports and the said pockets to eject certain of the cigarettes which are resting loosely in the pockets, from the magazine.

6. In a packaging machine, a cigarette  
10 magazine having a port in each of two opposite walls thereof, a carriage having pockets therein which are unvarying in width into which cigarettes fall by gravity and remain loosely therein, means to reciprocate the said  
15 carriage within the magazine, and at one part of its movement bring the pockets into alinement with the ports in the magazine, combined with fingers which are thrust through the said ports and the said pockets to eject  
20 certain of the cigarettes which are resting loosely in the pockets, from the magazine, and a compression chamber to receive the loosely bunched cigarettes ejected from the magazine.

25 7. In a packaging machine, a wrapper-folding appliance to turn-in one upon the other, the upper and lower lateral edges of the wrapper which extend beyond the contents of the package, which appliance consists of a  
30 chamber formed of a pair of fixed horizontal, and a pair of fixed vertical plates, the latter having spaces above and below them for the extended side edges of the wrapper, combined with a pair of upper, and a pair of lower fold-  
35 ing blades, the said pairs having alternate reciprocating movements, the latter moving in advance of the former, whereby the lower extended edges of the wrapper are folded over

the vertical side plates of the folding chamber, and the upper edges of the wrapper folded over the lower edges. 40

8. In a packaging machine, a folding chamber adapted to receive a partially wrapped bunch of cigarettes, having at the sides thereof, plates erected on edge, combined  
45 with means to fold the extended lateral edges of the wrapper over the said plates, and means to force the package from the folding chamber.

9. In a packaging machine, a folding chamber having at the sides thereof, plates erected on edge, combined with means to fold the extended lateral edges of the wrapper over the said plates, the said plates extending beyond the entrance end of the said chamber, and  
55 having their forward ends flared outwardly to form tucking-in devices to operate on the folded end of a doubled wrapper as the same enters the folding chamber.

10. In a packaging machine, apparatus to  
60 inclose within a package, a coupon or its equivalent, which comprises a chamber to hold a loose bunch of cigarettes, combined with a magazine having therein a stack of labels, devices to transfer a label from the  
65 magazine to the chamber containing the cigarettes, other devices to compress the bunch together with the label, and mechanism to carry the bunch and label to appliances whereby the same are provided with a wrap-  
70 per.

FELIPE GIROUD.

Witnesses:

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