No. 678,901. Patented July 23, 1901.

F. W. PRAEL.

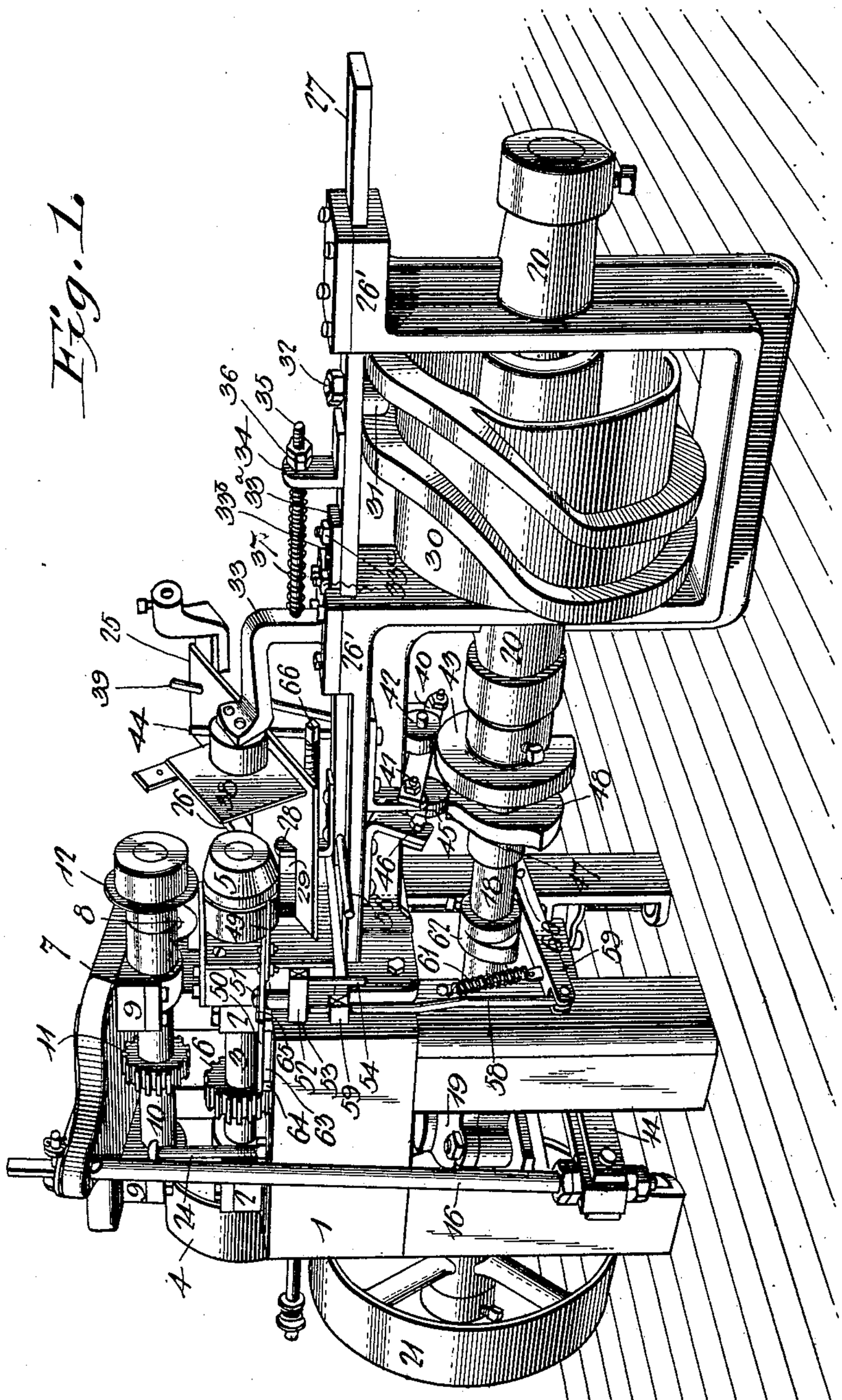
CAN CUTTING MACHINE.

(Application filed May 8, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



Witnesses

J. Stanfield Caldwell.

J. W. Garner

F. W. Prael, Inventor.

by C. A. Snow & Co.

Attorneys

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(No Model.) 3 Sheets—Sheet 2.

Fig. 2.

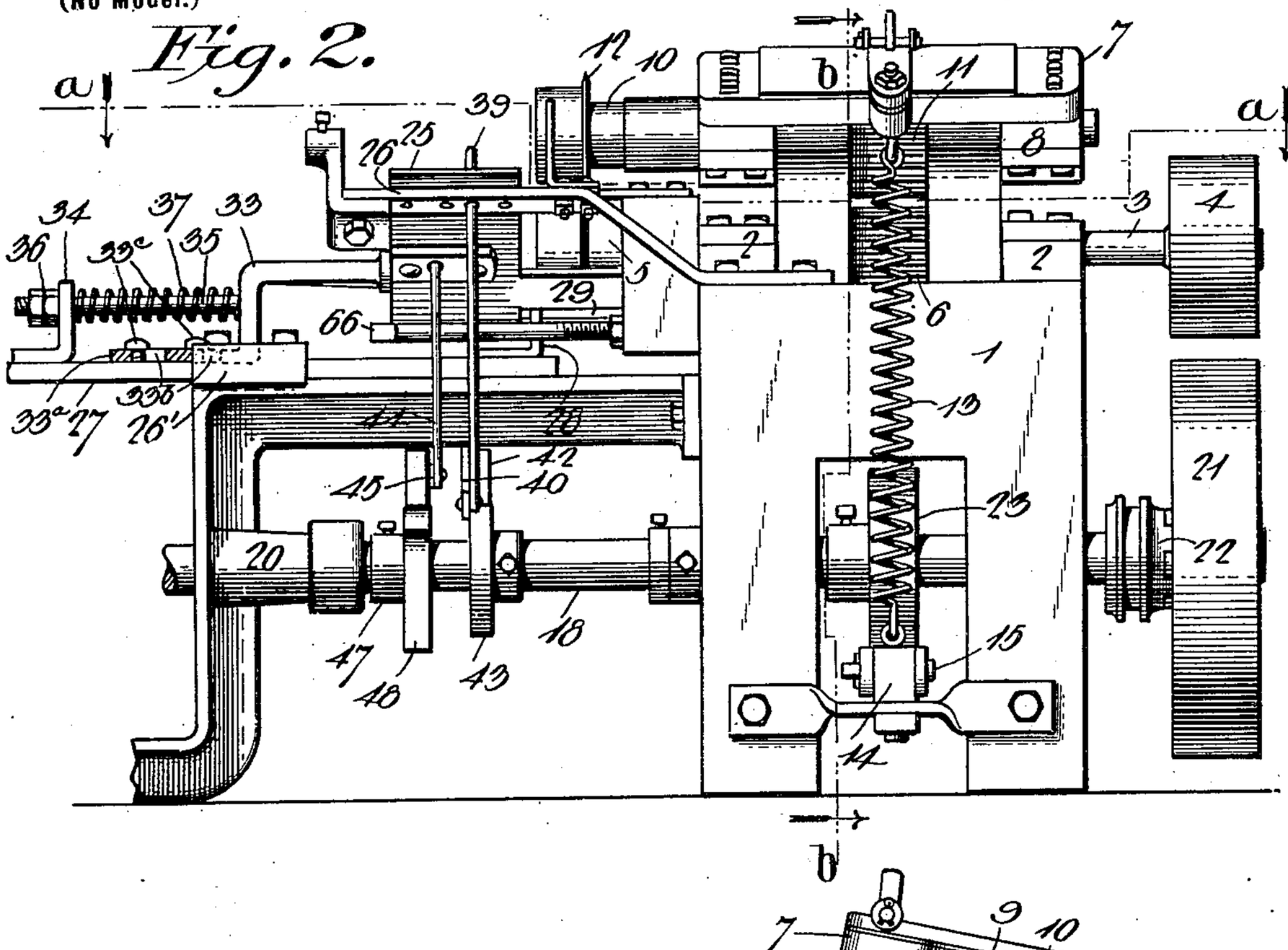


Fig. 5.

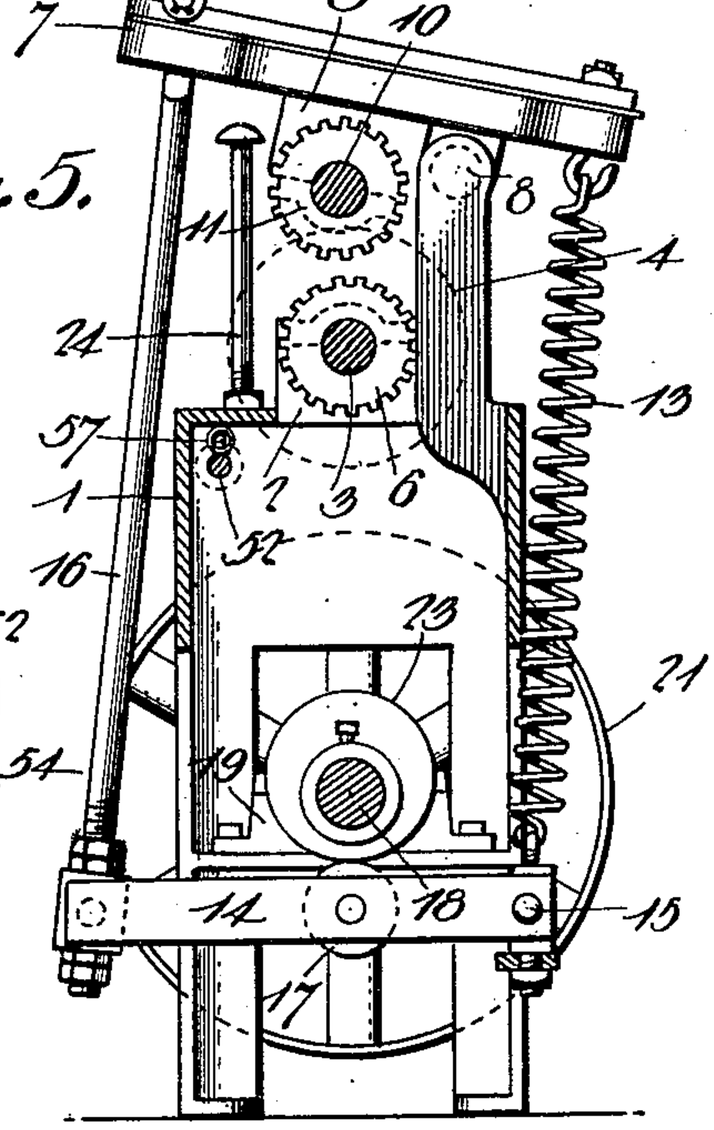
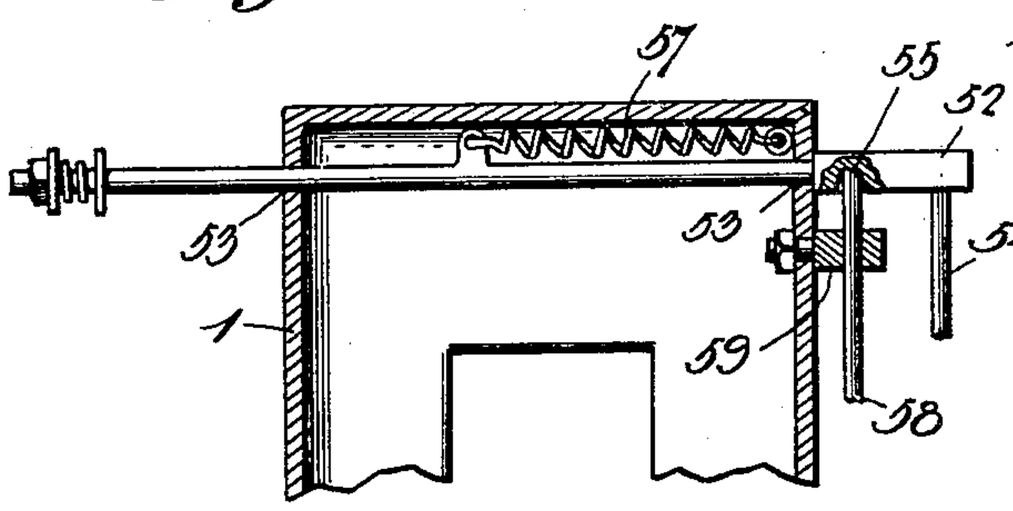


Fig. 6.



Witnesses
J. Frank Calvert.
J. W. Garner

F. W. Prael, Inventor.
by Church & Co.
Attorneys

No. 678,901. Patented July 23, 1901.

F. W. PRAEL.

CAN CUTTING MACHINE.

(Application filed May 8, 1901.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 3.

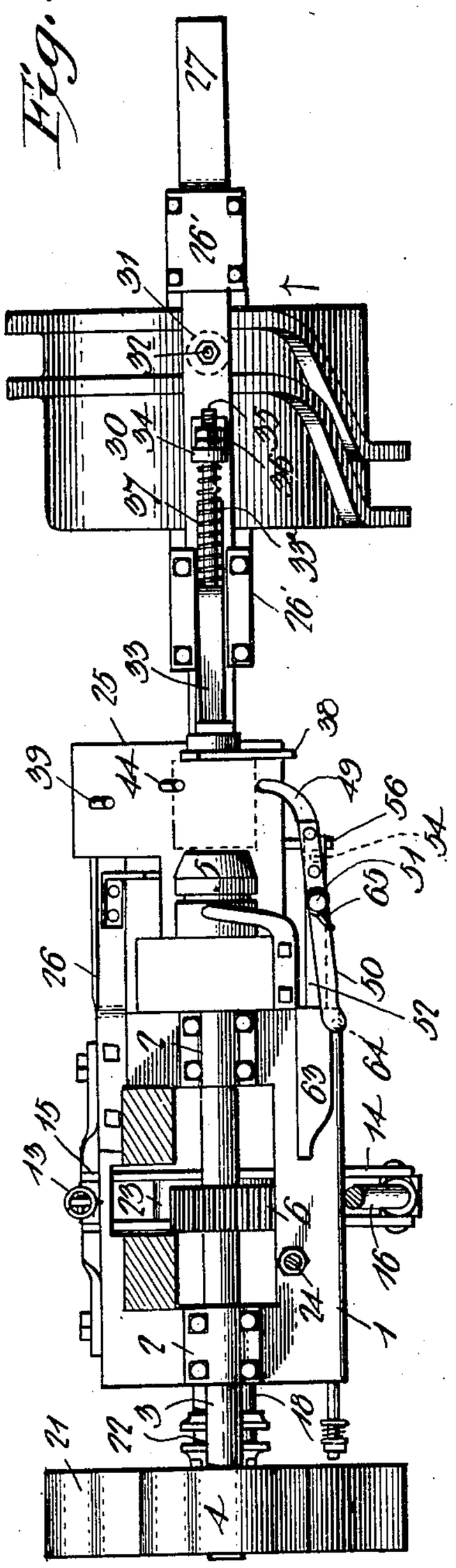
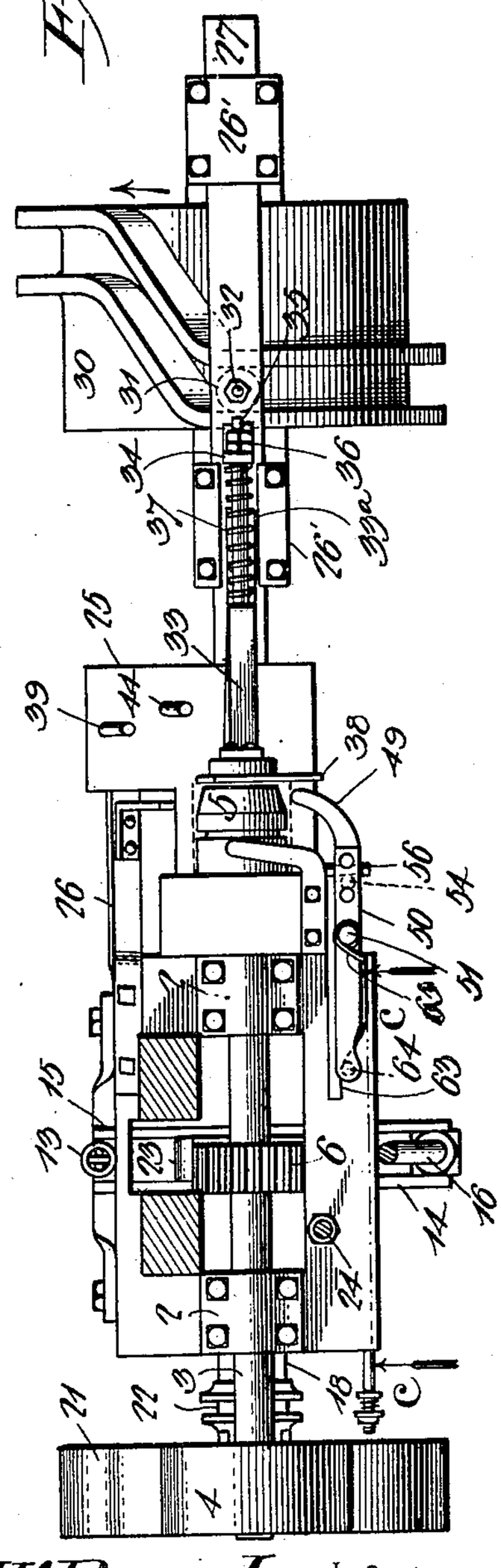


Fig. 4.



Witnesses

J. Frank Culverwell.

J. W. Garner

F. W. Prael, Inventor.

by C. A. Snow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

FRED WILLIAM PRAEL, OF FAIRHAVEN, WASHINGTON.

CAN-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 678,901, dated July 23, 1901.

Application filed May 8, 1901. Serial No. 59,313. (No model.)

To all whom it may concern:

Be it known that I, FRED WILLIAM PRAEL, a citizen of the United States, residing at Fairhaven, in the county of Whatcom and State of Washington, have invented a new and useful Can-Cutting Machine, of which the following is a specification.

My invention is an improved can-body-cutting machine for cutting cylindrical can-bodies such as are formed by an ordinary can-body-forming machine into appropriate lengths, thereby enabling the can-bodies to be formed on the body-forming machine in lengths exceeding the required length of the can-bodies and to cut the same into appropriate lengths for the cans, hence increasing the capacity of the can-body-forming machine by enabling it at each operation to form a body of a length sufficient for two or more cans instead of only one, as heretofore, and correspondingly reducing the cost of making the cans.

My invention consists in the peculiar construction and combination of devices hereinafter fully set forth and claimed.

In the drawings, Figure 1 is a perspective view of a can-body-cutting machine constructed in accordance with my invention. Fig. 2 is a partial elevation of the reverse side of the machine. Fig. 3 is partly a top plan view and partly a horizontal section, taken on a plane indicated by the line *a a* of Fig. 2. Fig. 4 is a similar view showing the parts of the machine in another position. Fig. 5 is a vertical transverse sectional view taken on a plane indicated by the line *b b* of Fig. 2. Fig. 6 is a detail sectional view taken on a plane indicated by the line *c c* of Fig. 4.

The bed 1 of the machine may be either of the form here shown or of any other suitable form, and on the same, at one end thereof, are bearings 2 for a shaft 3. Said shaft has at its outer end a power-pulley 4 and at its inner end is provided with a revoluble mandrel or head 5, which is cylindrical in form, is of the diameter of the can-bodies to be cut thereon, and has its outer end tapered, as shown. On the said shaft, at a point between the bearings 2, is a spur-gear 6.

A rocking yoke 7 is pivotally mounted on the bed 1, as at 8. The said rocking yoke is provided on its under side with bearings 9, in which is journaled a shaft 10. Said shaft has a spur-gear 11, which is adapted to mesh with the gear 6 when said rocking yoke is depressed and to disengage said gear 6 when said rocking yoke is elevated. One end of the shaft 10 projects over the mandrel 5 and is provided with a circular cutter 12, which may be either of the form here shown or of any other suitable form and which when depressed and rotated by power conveyed from the shaft 3 to the shaft 10 through the spur-gears coacts with the mandrel to cut a cylindrical length of sheet metal into two parts, each of which will form the body of a can. A spring 13, which is attached to the rocking yoke 7, serves to maintain the latter normally in the elevated position shown in Figs. 1, 2, and 5, with the gear 11 disengaged from the gear 6. A rock-arm 14 has one end pivotally connected to a fixed point, as at 15. The opposite end of said rock-arm is connected to the rocking head 7 by a rod 16. Said rock-arm has an antifriction-roller 17.

A main shaft 18, which is of suitable length, is journaled in suitable bearings 19 20, with which the bed is provided. Said shaft has at one end a power-pulley 21, which is loose on said shaft and may be locked thereto by a clutch 22 of suitable form. The lever for shifting the clutch is not here shown, as the same is of the usual form and is well understood by persons skilled in the mechanic arts. On the shaft 18 is a cam 23, which coacts with the roller 17 to depress the rocking arm 14, and thereby depress the rocking yoke 7 when the shaft 18 is rotated. The rod 16, which connects the rocking arm 14 to the rocking yoke 7, causes the former to be raised by the latter owing to the action of the spring 13. An adjusting-screw 24 is provided which serves to arrest the descent of the rocking head or yoke 7 and to regulate the descent thereof.

An inclined feed-table 25 is supported by a bracket-arm 26 or by any other suitable means and is disposed with its lower inner portion under the mandrel 5, but approximate thereto. The said feed-table extends transversely with relation to the mandrel.

The bed 1 is provided with suitable guideways 26′, in which operates a reciprocating slide-bar 27 of suitable dimensions. At the

inner end of the slide-bar is an upturned ejector 28, the upper end of which projects a slight distance above the plane of the feed-table 25. Said ejector operates in a slot 29 in said feed-table. On the main shaft 18 is a cam 30, which is engaged by an antifriction-roller 31, that has its bearing on a stud 32, which depends from the slide-bar 27. Hence the said cam when the shaft 18 is rotated serves to move said slide-bar 27 alternately in opposite directions. The construction of the cam 30 is such that the said slide-bar is permitted to dwell or remain at rest for an appreciable period of time at the limits of the strokes thereof. An arm 33 is secured on said slide-bar 27 in such manner that said arm 33 is adapted to slide or to be adjusted on said slide-bar. The latter has on its upper side a standard 34, in which operates an adjusting-screw 35, that is connected to the arm 33 and bears against the outer side of the same. The screw 35 is adapted to slide freely through an opening in the standard 34 and is provided with adjusting-nuts 36, which by engagement with said standard limit the movement of said screw and said arm 33 in one direction. A coiled extensile spring 37 on said screw 35 bears between said arm 33 and said standard 34 and normally maintains said arm 33 in the position shown in the drawings. The foot 33^a of the arm 33 is provided with adjusting-slots 33^b. Bolts 33^c, which operate in said slots, secure the foot on said slide-bar 27. A head-plate 38 is secured to the arm 33 at right angles to the feed-table 25, on the upper side of the latter, and is adapted to move on said feed-table toward and from the mandrel 5. Said head-plate is disposed opposite the outer end of said mandrel and moves in line therewith. It will be understood that the longitudinal movement of the slide-bar 27 is communicated to the head-plate 38, and hence the latter is caused to move toward and from the mandrel. It will be further understood that by means of the adjustable arm 33 on said slide-bar, which arm carries the head-plate, the latter may be adjusted and the extent of its stroke with relation to the opposing end of the mandrel may be regulated.

A stop-pin 39 operates in an opening near the upper side of the inclined feed-table. The lower end of said stop-pin is connected to a rocking arm 40, which is pivotally attached to the bed 1, as at 41, and has an antifriction-roller 42. The latter is engaged by a cam 43 on the main shaft 18, and the construction of the said cam is such that on the rotation thereof with said main shaft the stop-pin 39 will be alternately raised and lowered. On the upstroke of the stop-pin 39 the upper end thereof rises above the feed-table 25, as shown in Fig. 1. On the downstroke thereof the upper end of said stop-pin descends slightly below the plane of the upper surface of said feed-table.

A stop-pin 44 is disposed to one side of the stop 39 and operates in a lower opening in the feed-table 25. The lower end of said stop-pin 44 is connected to a rocking arm 45. Said rocking arm is pivotally connected to the bed 1, as at 46, and has an antifriction-roller 47, which is engaged and operated by the cam 48 on the main shaft 18. The action of the stop-pin 44 is similar to that of the stop-pin 39, and the relation of the cams 43 and 48 is such that the stop-pin 44 is lowered while the stop-pin 39 continues in its elevated position.

A stop-arm 49, which is disposed over the lower portion of the feed-table and to one side of the mandrel, is carried by a bar 50, which is pivotally mounted, as at 51, on a slide 52, that operates in suitable guide-openings 53 in the bed 1. Said slide has at its front end a depending tappet-rod 54 and is provided on its under side, at a suitable distance from said tappet-rod, with a stop-notch 55. The stop-bar 54 is disposed in the path of a tappet-bar 56, which is carried by the slide-bar 27. A spring 57, which is shown in Fig. 6, is connected to the slide 52 and moves the same in one direction. A vertically-movable stop-rod 58 operates in a guide 59, with which the bed 1 is provided, and the upper end of said stop-rod is adapted to engage the stop-notch 55 in said slide 52. The lower end of said stop-rod 58 is connected to a rocking arm 59, which is pivotally connected, as at 60, to a fixed support and is normally raised by a spring 61, so that the stop-rod 58 is normally engaged with the stop-notch 55 of slide 52, and the latter is normally locked in the position indicated in Figs 1 and 6. A cam 62 on the main shaft 18 coacts with the rocking arm 59 to depress the latter once during each rotation of the main shaft to depress the stop-rod 58, release the same from the stop-notch 55, and thereupon permit the spring 57 to move the slide 52 outward, and hence carry the stop-arm 49 to the position shown in Fig. 3, beyond the outer end of the mandrel and over the feed-table. A cam 63 on the bed 1 is engaged by a tappet 64, which depends from the bar 50. A spring 65 acts on said bar to keep said tappet in engagement with said cam. As the bar 50 is carried outward by the movement of the slide 52 to dispose the stop-arm 49 in the position shown in Fig. 3, the stop-arm is moved by the coaction of the cam and the bar 50 to a position directly in line with the outer side of the mandrel. I term the outer side of the mandrel that side thereof which is farthest from the upper feed side of the feed-table 25.

In operation my improved can-body-cutting machine coacts with a can-body-forming machine, such as the Bliss machine, well known to those skilled in this art, which can-body-forming machine converts metallic sheet-blanks into cylindrical can-bodies ready for the attachment thereto of the caps and the bottoms. Heretofore the can-bodies made by machines of this class have been of the length of the cans. In carrying out my invention,

however, the cylindrical bodies formed by the can-body-making machine are two or more times the length of the can, and the purpose and object of my present improved machine are to receive these cylindrical bodies from the can-body-making machine as they are discharged therefrom and to cut the same in two, hence doubling the output, as the can-body-making machine can make a cylindrical body of a length double that of a can as readily and in the same length of time as it can make a cylindrical body of the required length of the can.

The cylindrical body when discharged from the can-body-making machine bears against the stop-rod 39 and is by the latter retained on the upper portion of the feed-table 25. When said stop-rod 39 is depressed by the means and in the manner hereinbefore described, the cylindrical body passes the same and rolls on the feed-table until it comes in contact with the stop-rod 44. When the latter is depressed in the manner and by the means hereinbefore described, it clears the cylindrical body, and the latter rolls downward on the feed-table to a position directly in line with the mandrel 5, where it is stopped by the stop-arm 49. When the latter is in position to stop the cylindrical body, the head-plate 38 is by the action of the slide-bar 27 moved outward and disposed at the outer limit of its stroke with relation to the mandrel, as shown in Figs. 1 and 3, and hence the said head-plate is disposed at the outer end of said cylindrical body, and the inner end of the latter is directly opposite and proximate to the outer reduced end of the mandrel. While the head-plate and the stop-arm are in this position (shown in Figs. 1 and 3) the rocking head 7 is raised, as shown in Figs. 1 and 5, to disengage the gear 11 from the gear 6 on the continuously-revoluble shaft 3, which carries and rotates the mandrel. It will be understood that the ejector 28, which partakes of the movement of the slide-bar 27, is directly under the outer end of the mandrel, as shown in Fig. 1, when the head-plate and the stop-arm are in the positions hereinbefore described. It will be further understood that while the head-plate and the stop-arm are in these positions, with the cylindrical body disposed in line with the mandrel, and prior to the inward movement of the head-plate 38 the stop-pin 44 rises to catch and retain another cylindrical body immediately above the body positioned as before described. On the instroke of the head-plate the cylindrical body is moved inward and disposed upon the mandrel and rotated thereby, and thereupon by the means and in the manner hereinbefore described the rocking yoke 7 descends, the gear 11 is engaged with the gear 6, and power is thereupon communicated to the circular cutter 12, which coacts with the mandrel to cut the cylindrical body into two can-bodies. The slide-bar 27 thereupon moves outward, the head-plate 38 and ejector 28 moving therewith, the latter moving the severed separated can-bodies with it, which as each of them passes beyond the outer end of the mandrel roll downward on and from the feed-table. It will be understood that while the head-plate is being moved outward by and with the slide-bar 27 the slide 52 is retained in its locked position. (Shown in Figs. 1 and 6.) As the head-plate 38 reaches the outer limit of its stroke and immediately after the severed can-bodies are discharged from the feed-table the stop-rod 58 is by the means and in the manner hereinbefore described disengaged from the slide 52, and the latter is by the spring 57 moved to its initial position, hereinbefore described, and shown in Fig. 3, with the stop-arm 49 in position to hold a cylindrical body in line with the mandrel. An adjusting-screw 66 coacts with the adjusting-screw 35 to adjust the head-plate 38 to the required length of the can-bodies cut by the machine.

Having thus described my invention, I claim—

1. In a machine of the class described, the combination of a mandrel, a cutter and means to move the same to and from the mandrel, a feed-table, a stop, to aline a body with the mandrel and means to move said body on said mandrel, substantially as described.

2. In a machine of the class described, the combination of a mandrel, a cutter and means to move the same to and from the mandrel, a feed-table, a stop to aline a body with the mandrel, and a movable element having a head-plate and an ejector, for the purposes set forth, substantially as described.

3. In a machine of the class described, the combination of a revoluble mandrel, a movable element, a revoluble cutter, carried by said movable element to and from said mandrel, said cutter and mandrel having gears adapted to engage when said cutter is moved to said mandrel and communicate power from the latter to the former, a feed-table, a stop, to aline a body on said feed-table with said mandrel, and a movable element having a head to push said body onto said mandrel, substantially as described.

4. In a machine of the class described, the combination of a mandrel, a cutter to coact therewith, a feed-table, a movable stop to aline a body with said mandrel and clear said body, means to actuate said stop, means to push a body onto said mandrel, and means to actuate said body-pushing means, substantially as described.

5. In a machine of the class described, the combination of a continuously-revoluble mandrel, a rocking yoke, means to rock the same, a revoluble cutter carried by said rocking yoke and adapted to coact with said mandrel, and gears carried by said mandrel and cutter to transmit power from the former to the latter, when said cutter is in operative relation to said mandrel, substantially as described.

6. In a machine of the class described, the

combination of a mandrel, a cutter to coact therewith, an inclined feed-table disposed transversely under the mandrel, a movable stop to alternately aline a body with said mandrel and clear said body, and a reciprocating element having a head-plate and ejector, movable therewith and coacting with said feed-table to push a body onto said mandrel to be cut and to eject said body after the same has been cut, from said mandrel, substantially as described.

7. In a machine of the class described, the combination of a mandrel, a cutter to coact therewith, an inclined feed-table disposed transversely under the mandrel, a movable stop to alternately aline a body with said mandrel and clear the said body, a reciprocating element having a head-plate and ejector movable therewith and coacting with said feed-table to push a body onto said mandrel to be cut and to eject said body after the same has been cut, and movable step-stops disposed one above another on said feed-plate, coacting with each other and with said feed-plate to feed a body by a step-by-step movement to a position in line with the mandrel, substantially as described.

8. In a machine of the class described, the combination of a mandrel, a cutter, an inclined feed-table disposed transversely with relation to the mandrel, a reciprocating element, an ejector carried thereby, and a head-plate, carried by and adjustable on said reciprocating element, said head-plate coacting with said feed-table, for the purpose set forth, substantially as described.

9. In a machine of the class described, the combination of a mandrel, a cutter, a feed-table, a reciprocating element having an ejector and a head-plate, the latter coacting with said feed-table for the purpose set forth, a spring-actuated slide, a stop-arm carried thereby, said stop-arm serving to alternately aline a body on the feed-table with the mandrel and to clear said body when the same is ejected from the mandrel, and connections between said reciprocating element and said slide, to move the latter in one direction against the tension of its actuating-spring, substantially as described.

10. In a machine of the class described, the combination of a mandrel, a cutter, a feed-table, a reciprocating element having an ejector and a head-plate the latter coacting with said feed-table, for the purpose set forth, a spring-actuated slide, a bar pivotally mounted thereon, a spring and cam coacting to move said bar on its pivot, a stop-arm carried by said bar, said stop-arm serving at the limits of its stroke to alternately aline a body on the feed-table with the mandrel and to clear said body when the same is ejected from the mandrel, and connections between said reciprocating element and said slide, to move the latter in one direction against the tension of its actuating-spring, and means to alternately lock and release said slide, substantially as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRED WILLIAM PRAEL.

Witnesses:
DOROTHY PRAËL,
ALLEN CAMPBELL.