

No. 876,689.

PATENTED JAN. 14, 1908.

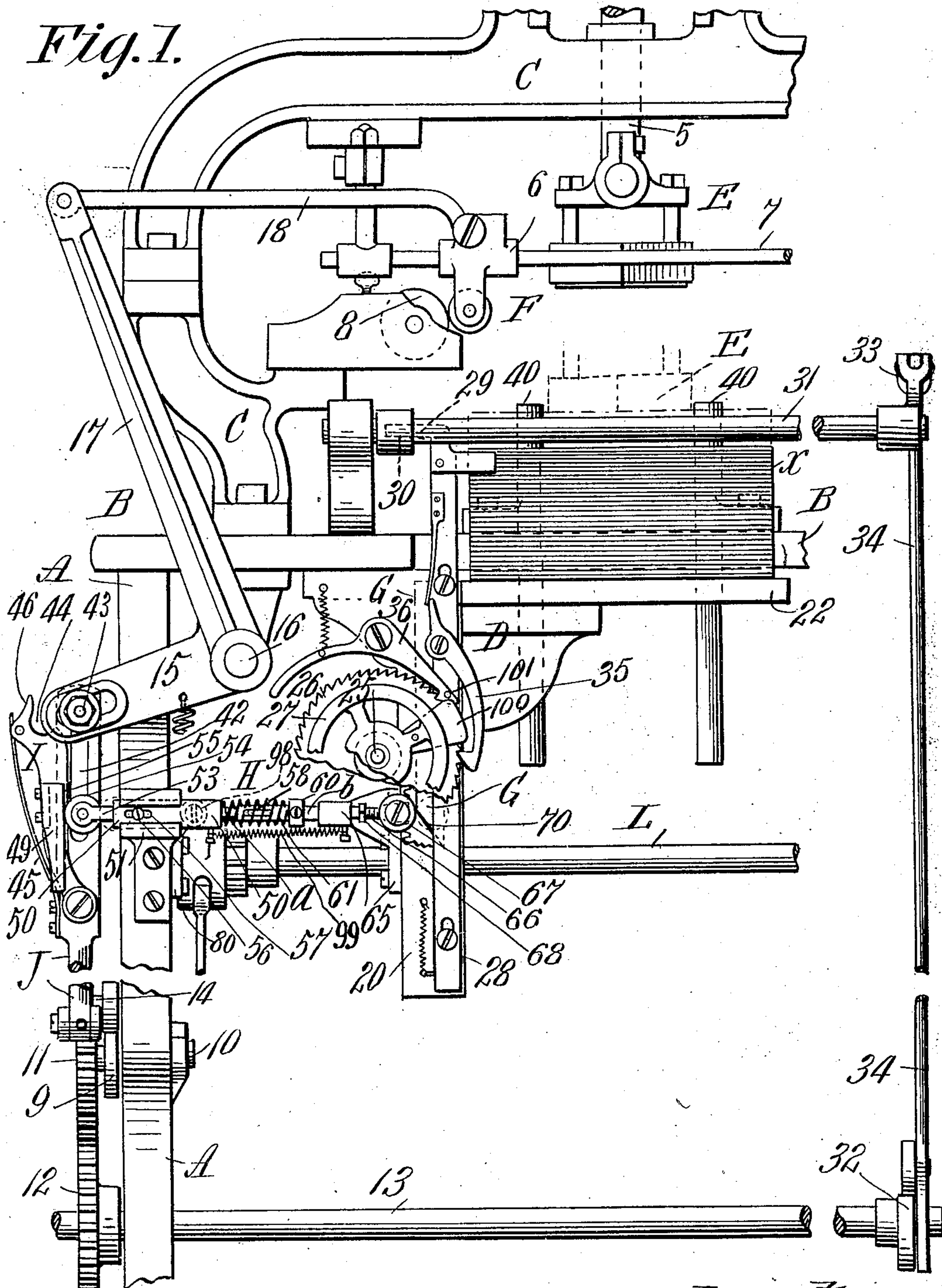
F. A. BURNETT.

ENVELOP MACHINE.

APPLICATION FILED JAN. 8, 1906.

3 SHEETS—SHEET 1.

Fig. 1.



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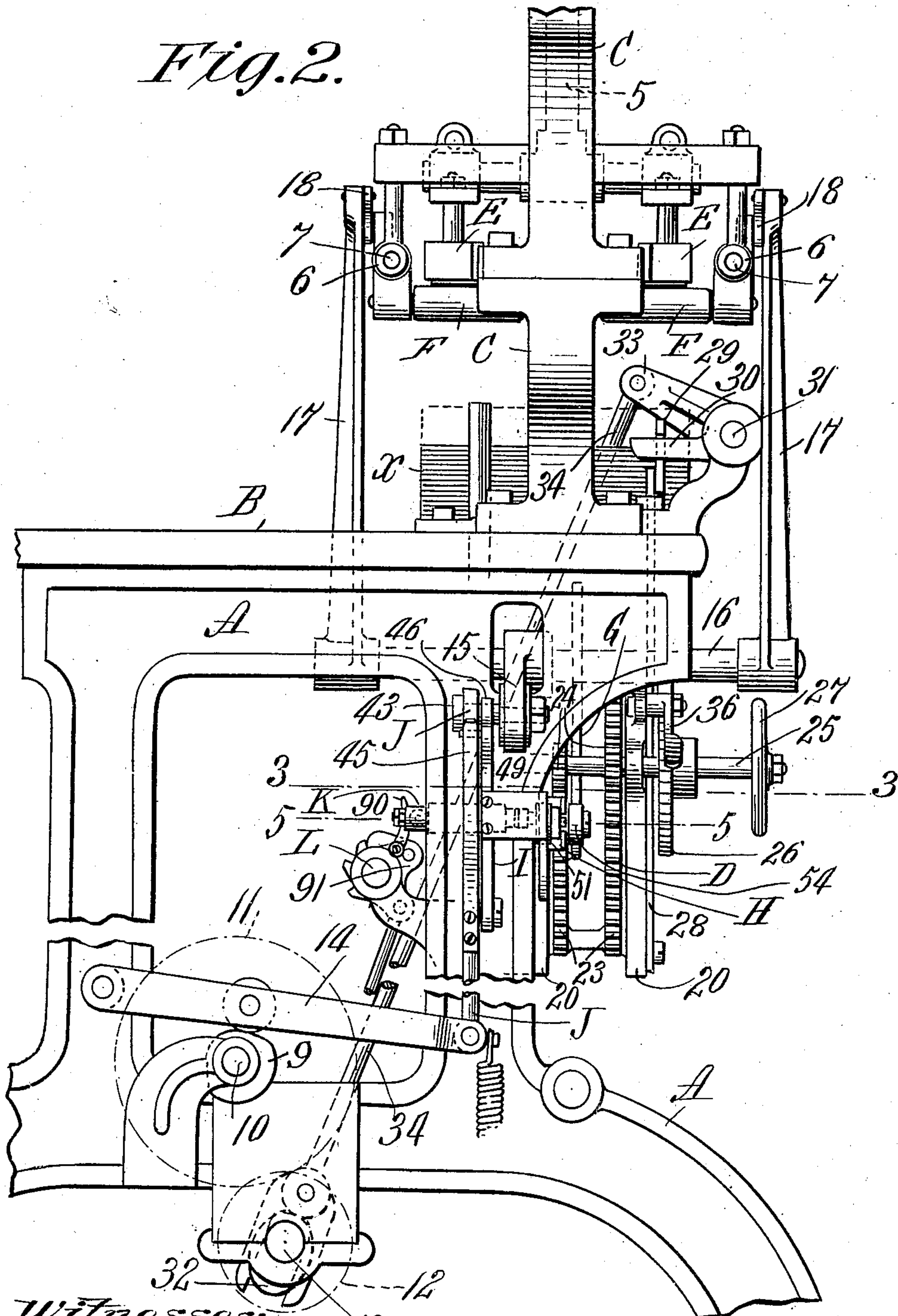
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3 SHEETS—SHEET 2.

Fig. 2.



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3 SHEETS—SHEET 3.

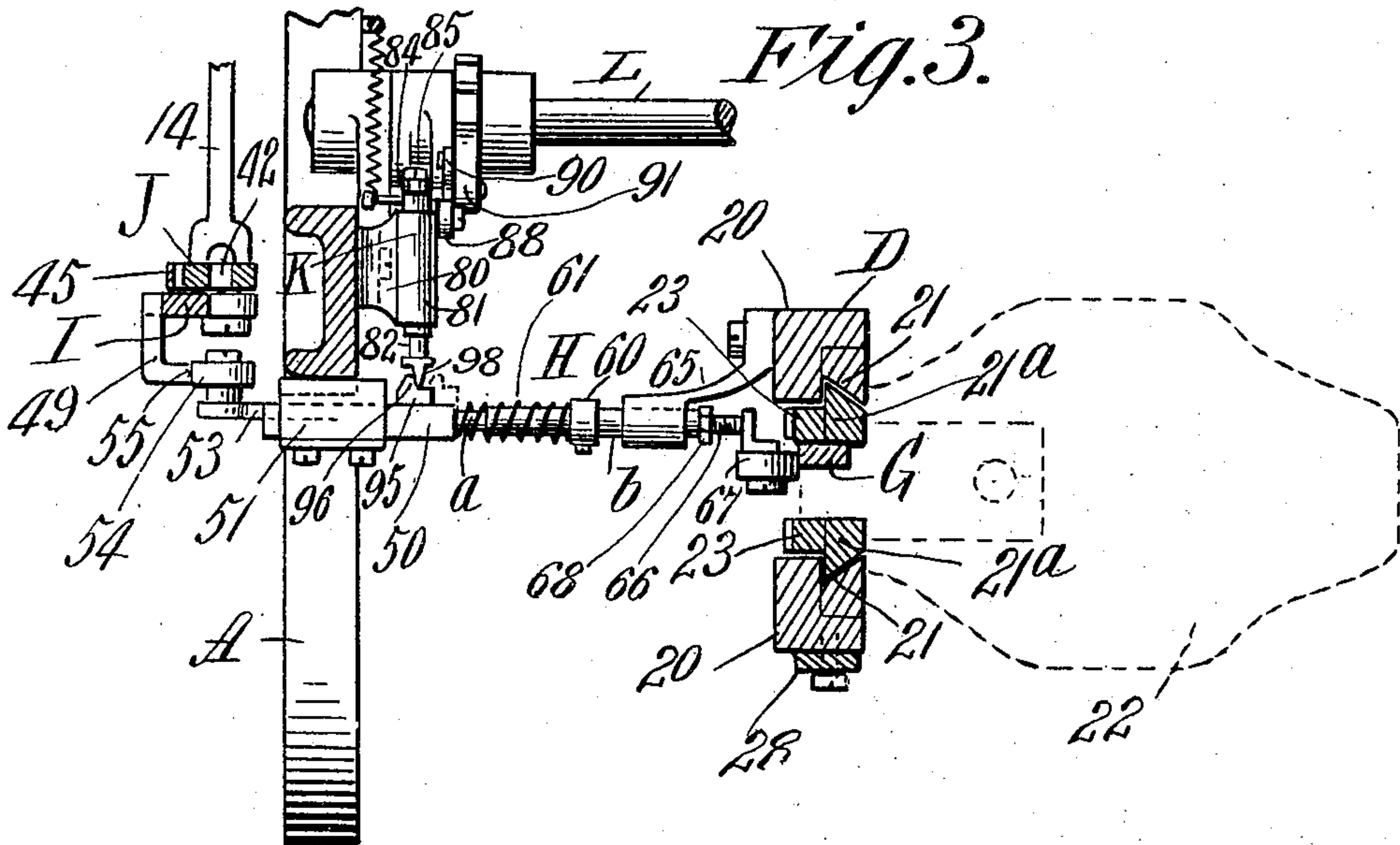


Fig. 4.

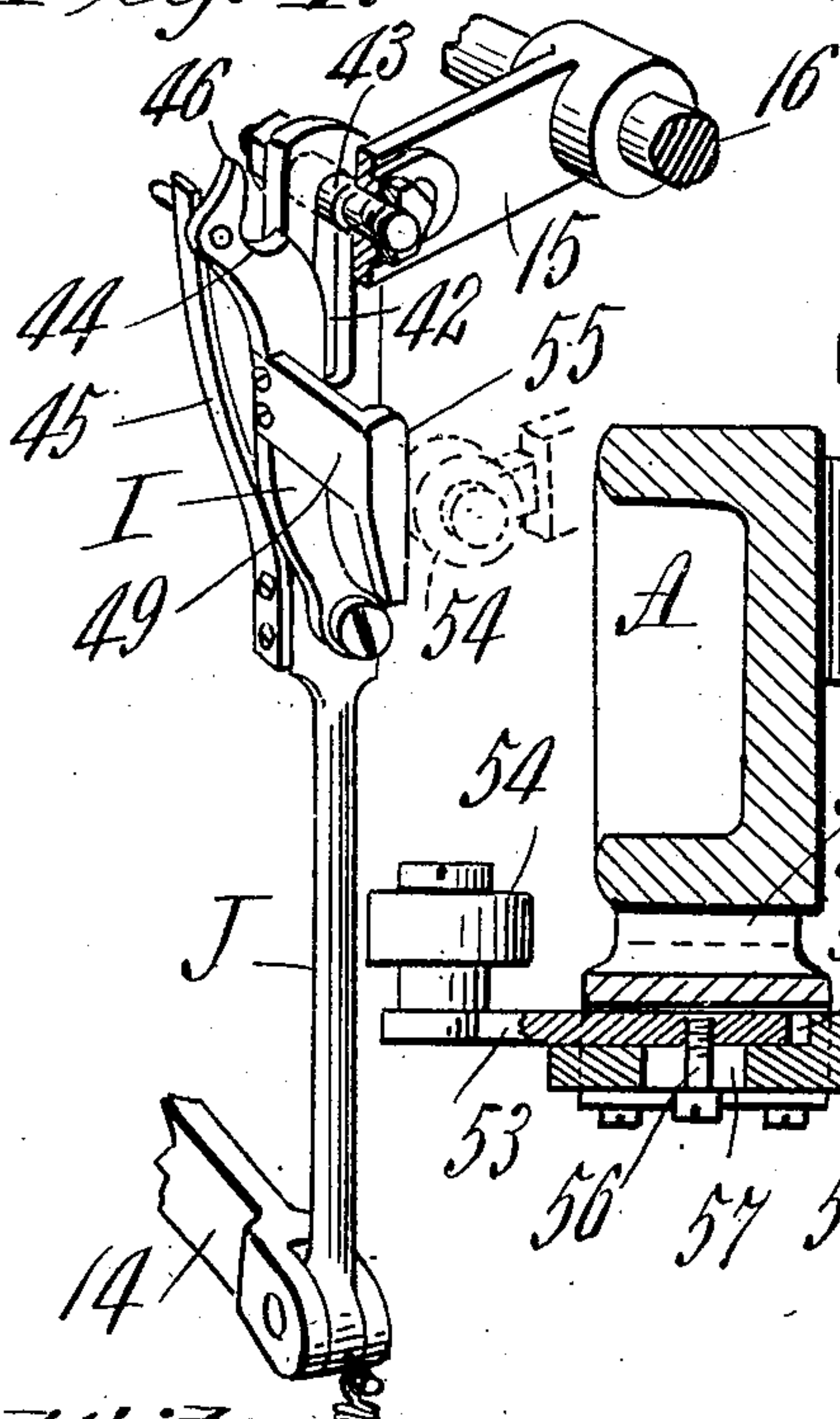
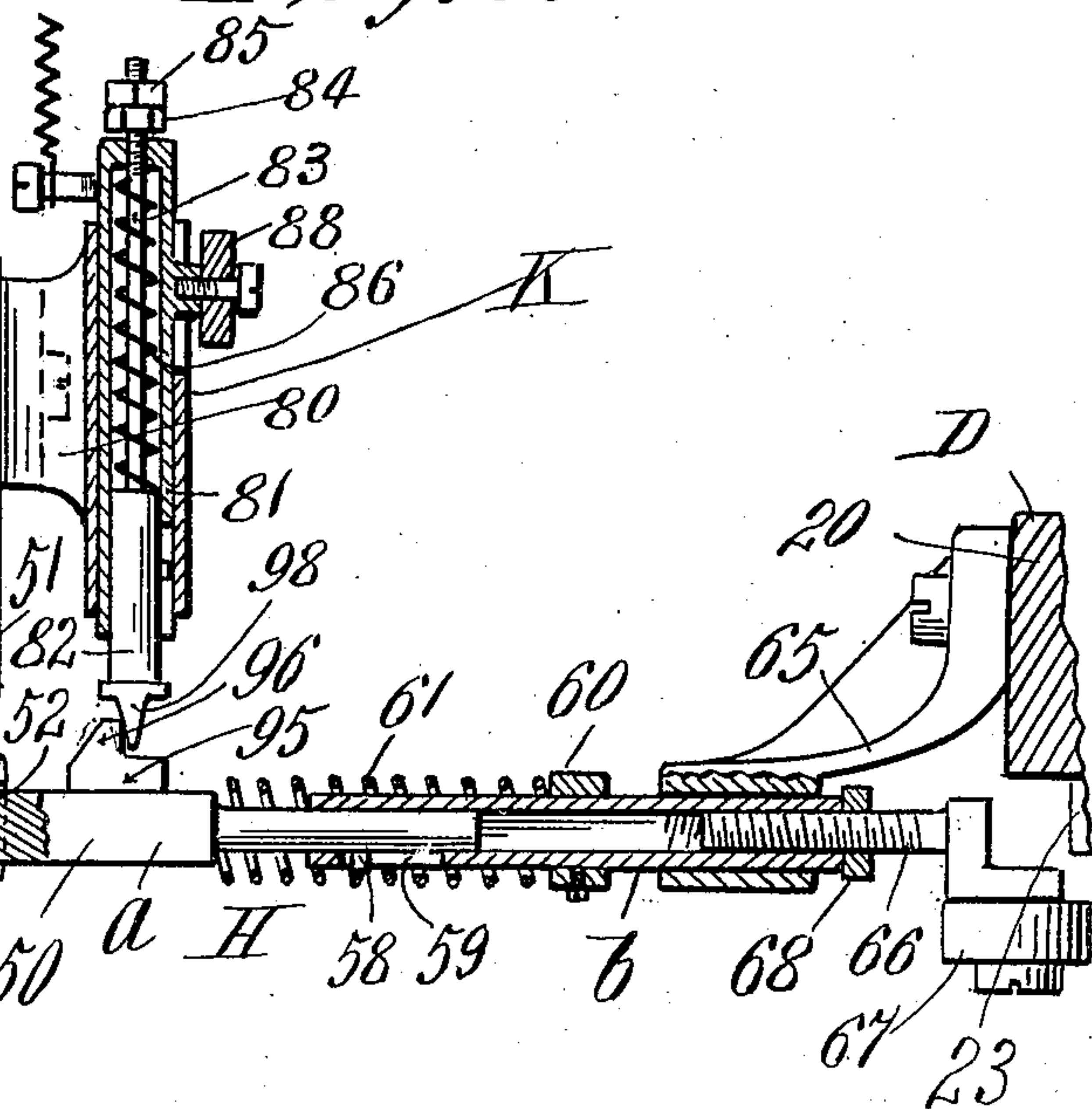


Fig. 5.



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UNITED STATES PATENT OFFICE.

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ENVELOP-MACHINE.

No. 876,689.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed January 8, 1906. Serial No. 295,038.

To all whom it may concern:

Be it known that I, FRANK A. BURNETT, a citizen of the United States of America, and a resident of Holyoke, in the county of Hampden and State of Massachusetts, have invented certain new and useful Improvements in Envelop-Machines, of which the following is a full, clear, and exact description.

This invention relates to improvements in envelop machines and more particularly to improved means therein embodied for preventing repeated applyings of gum to the constantly reciprocating gummer during the time the elevator for the blank pile support is lowered while new blanks, to be made into envelops, are being placed thereon, and during which time of newly supplying blanks no blank is within the reach of the gummer picker to be taken thereby.

As a consequence of having an envelop machine equipped with the present improvements, the accumulation of an excessive quantity of gum on the gummers will be avoided, and hence no one or several of the envelops made in the machine next after the new supply of blanks shall have been provided will be excessively gummed, nor will the gummer in a general way, by reason of a surplus of gum thereon, be unfitted for its best operating action as an envelop blank picker.

The invention consists in the combination, in an envelop machine with a constantly reciprocatory gummer-picker, and a vertically movable blank pile support, of a horizontally reciprocatory gum-supplying roll movable to positions under, and away from under the gummer picker, a rocking lever for operating the gum supplying roll, and a cam-actuated thrust-rod provided with a device for engaging and imparting in its working thrusts rocking movements to said roll operating lever, such device being capable of movement to be non-effective to rock said lever, and means between the pile support, and said device on the thrust rod, and actuated by such support on the lowering thereof to render said device non-operable on the said rocking lever.

The invention furthermore consists in devices coöperating in conjunction with the means between the blank pile support and the movable device on the cam actuated gum roll operating thrust rod which serves to

prevent disconnection of the gum roll from its reciprocating means only at a time when the gum roll is retired from under the picker and in its place near or against the gum distributing roll whereby no injury may be done in the machine by the forcibly descending picker striking the gum roll, as would happen were the gum roll operating connections broken at an unpropitious instant in the operation of the machine.

The invention consists in further combinations and arrangements of parts and the construction of certain of the parts all substantially as hereinafter fully described and set forth in the claims.

In the accompanying drawings,—Figure 1 is a front elevation of so much of an envelop machine as includes the present improvements. Fig. 2 is a side elevation of the same. Fig. 3 is a horizontal sectional view as taken on a line 3—3, Fig. 2. Fig. 4 is a perspective view of a part of the mechanism which includes the cam actuated thrust rod and gummer roll actuating lever, and novel devices pertaining to such connection. Fig. 5 is a horizontal sectional view on a larger scale taken on a line 5—5, Fig. 2.

Similar characters of reference indicate corresponding parts in all of the views.

In the drawings A represents the left side-frame of an ordinary envelop machine; and so much of the table B and arch C are shown as pertain to the group of coacting parts comprising the blank-pile "elevator" D, the pickers E, and the gumming rolls F.

The elevator D by means of which the top of a pile of envelop-blanks *x* carried thereon is automatically maintained at a height as indicated in dotted lines in Figs. 1 and 2 is provided with a vertical cam-bar G which acts upon a horizontal thrust-bar H to move the same laterally against a device,—specifically shown as a pivoted bearing latch I,—on the usual "thrust" or connecting rod J of the vibratory mechanism of the gumming rolls F whereby said gumming roll mechanism will not be horizontally reciprocated at all times when the top of the blank pile *x* is below the above referred to dotted line position, and whereby a cessation of the supplying of gum by the rolls F to the pickers E at such times is caused.

A detailed description of the above-mentioned gum roll controlling devices, forming an important part of the present invention as

well as a brief description of the envelop machine parts coacting therewith will now be presented.

The vertically and intermittently operated gummer-pickers E mounted on the lower end of the plunger rod 5 and guided in the central part of the arch C are of the ordinary construction and the means for their operations are omitted as they are well known, it being sufficient to say that they are located above the envelop blank pile x and have regular and periodical vertical movements to and from the latter, as clear in Fig. 1, the upper position they assume being shown in full lines and the lower or pile engaging position in dotted lines.

The gumming rolls F are carried in the ordinary way in bearings 6 which slide horizontally on guide rods 7 arranged at the front and rear respectively of the pickers E and at such a height relatively thereto that the gum rolls F in passing under the pickers E while in their upper position roll in contact with the under surface of said pickers and in so doing transfer gum thereto from the gum dish distributing roller 8 with which the gumming roll engages at each reciprocation towards the left, and as shown in full lines in Fig. 1.

The required horizontal reciprocating movements to the gumming roll F are imparted through the ordinary means consisting of the cam 9, see Fig. 2, which is mounted on the bracket supported stud-shaft 10, said stud shaft being rotated through its large spur gear 11 which meshes with a smaller spur gear 12 (one-half the size of gear 11) on the main or driving shaft 13. This cam 9 engages a cam-roller on the downwardly spring pressed pivoted lever 14, and alternately raises and lowers said lever.

A connecting rod J is attached by its lower end to the free end of lever 14, and by its upper end portion, in a manner to be later described, engages a short lever arm 15 on the rock-shaft 16. This rock shaft 16 is supported in bearings on the under side of the table B and extends thereunder in a line parallel with the side frame A of the machine, see Figs. 1 and 2.

A pair of long upstanding lever arms 17 are secured to each end portion of the rock shaft 16, their free ends being connected by the link-rods 18 with the gumming roll bearings 6, as shown in Figs. 1 and 2. The arms 15 and 17, 17, connected to, and united by the rock shaft 16, are to all intents and purposes as one angular lever and will be hereinafter for brevity referred to as the gum roll operating rocking lever.

A brief description of the blank-pile elevator and the means for operating the same while forming no part of my invention will now be given as it is through the well known automatic means employed for regulating

the maintenance of the blank-pile at its proper height, and for manually lowering and raising the elevator for loading on fresh supplies of blanks that I have provided for the automatic operation of the gumming roll stop-motion to be later described in detail.

The "elevator" of the type shown in the drawings consists of the depending bracket frame 20 secured to the underside of the table B and having vertical slideways 21 formed therein in which are engaged the "dovetail" slides 21^a of the blank carrying table 22. The slides 21 have formed thereon or secured thereto the vertical rack-bars 23 which are engaged by pinions 24 on a short shaft 25 which is supported in bearings on the elevator frame 20. This shaft 25 has a ratchet wheel 26 and a hand wheel 27 secured thereon, in relative positions as shown in Figs. 1 and 2.

A vertically movable pawl-bar 28 is slidably secured to the elevator frame 20 and extends upwardly above the table B and is provided at its upper end portion with a horizontally extended lug 29 which is engaged by a short lever arm 30 secured on the horizontal rock shaft 31. This rock shaft 31 is supported in bearings on the table B and is operated by a cam 32 mounted on the driving shaft 13 at the right-hand side of the machine (see Figs. 1 and 2), which periodically raises the free end of a short lever-arm 33 secured to the rock-shaft 31 through the connection therewith of the forked and roller-provided thrust-rod 34.

At a point on the pawl-bar 28 adjacent the ratchet-wheel 26 is pivoted the ratchet engaging hook-pawl 35, and at a suitable place on the elevator frame 20 above the ratchet wheel 26 is secured a spring pressed retaining pawl 36. The location and form of this last mentioned pivoted pawl 36 is such that when its pawl end is lifted from engagement with the ratchet wheel 26 by pressure on its handle end, the said pawl end comes in contact with the pawl 35 and lifts that also from its engagement with the ratchet wheel, permitting at such times a free raising or lowering of the elevator manually by means of the hand wheel 27.

A brief description of the operation of the elevator constructed as above described is as follows: Assuming that the blank table 22 has been properly supplied with blanks and that the pawls 36 and 35 have been lifted from the ratchet wheel and the elevator table 22 carrying the blank pile x has been raised to carry the blank-pile top to a level adjacent the top of the pile guiding-posts 40 by manually rotating the hand-wheel 27, and the machine then having been started, the upward feed of the blank-pile is slowly maintained by the ratchet and pawl mechanism before described, and at such times (when a blank pile of not too

It will also be apparent that while the pickers E and other moving parts of the envelop machine are allowed to continue to regularly move upward and downward, the movement of the gumming roll F is caused to cease until the elevator D is again loaded and raised to its working position with the top of the blank pile *x* at its proper place.

It will be apparent from the foregoing description and from reference to the drawings that while the elevator D is in a position to cause the cam-bar G to disengage the connecting rod latch I by the action of the thrust rod H thereon, that the gumming roll will cease to pass under the pickers, and that when the elevator is in a position in which the cam bar G is above the horizontal line of movement of the thrust rod H the said latch I will lock the connecting rod J to the gumming roll operating mechanism and cause the gumming roll to regularly perform its function; but there is a very brief period during the raising or lowering of the elevator D when the thrust rod H might be neither pushed fully out to the leftward by the cam G, nor fully released by the cam at its extreme right hand position, this period being at the time when the cam bar incline 70 is engaging the thrust rod, and during the brief interval required for the moving of the notch 44 of the latch I to or from engagement with the lever arm bolt 43. This movement should be made while the cam rod J is at its downward position, *i. e.* the position shown in Figs. 1 and 4 and when the gum roll is at the limit of its leftward movement; and to prevent any disarrangement of the machine by uncoupling the connecting rod J from the lever-arm 15 at any other time, I have provided a safeguard against accident, from this cause, by the provision of a locking bolt K, shown in Figs. 2, 3, and 5, which is slidably supported in a suitable bearing 80 on the machine frame A at the rear of the thrust rod I. This bolt K consists of a main tubular casing 81 closed at one end and having guided therein a sliding bolt section 82 which is continued rearwardly by a rod-like part 83 which projects through the closed rear end of the casing and is provided beyond the casing end with the adjusting nut 84 and locking nut 85. A spiral spring 86 which surrounds the part 83 of the bolt presses against the shouldered forward end of same and normally preserves the parts in the position as shown in Fig. 5, but which provides a yielding capability which will be later mentioned. A roller 88 is mounted on one side of the bolt-casing 81, which is intermittently engaged by a finger-like cam 90 which is attached to the ordinary pawl-carrier 91, which is a part of the common, and well known pawl and ratchet drive for the drying chain shaft L, and which requires no special description. The rear

side portion of the thrust rod section *a* of the thrust rod H is provided with an affixed block or lug 95 which has a projecting point 96, as clearly shown in Figs. 3 and 5, and against which, on either one side or the other, the wedge shaped end 98 of the bolt 82 is carried by means of the regular backward and forward movement imparted to said bolt by the engagement of the regular moving cam 90 on the chain shaft L with the roller 88 on the bolt K. The operation of this safeguard device is as follows:—While the thrust rod H is in the position shown in the various figures of the drawings, whereby the gumming roll actuating mechanism is disengaged, the bolt K continues a back and forth movement as described but is so timed relatively to the timing of the gumming roll mechanism that whenever the cam rod J is raised or about to rise from the position shown in the drawings the point 98 of the bolt K is always forward, and always at either the right or the left of the point 96 of thrust-rod block, see Fig. 3, to the end that no shifting endwise of the position of the thrust rod H is possible except at such times as the bolt K is withdrawn, which is concurrent with the time at which the cam rod J is in its lowered position. Movement of the section *b* of thrust rod H however, at such a time, caused by the engaging of roller 67 by cam-incline 70, is permitted by the spring 61 interposed between sections *a* and *b* for that purpose.

It will be apparent from the foregoing description that provision has been made against the operation of the thrust rod for the purpose it is intended while in engagement with the cam-incline 70. It is a fact, however, that trouble might be caused by releasing the grip on the handle end of the retaining pawl 36 while in the act of raising or lowering the elevator manually, at a time when the incline 70 was opposite the thrust rod roller 67, which would retain the said latch engaging mechanism in an inoperative position for a prolonged period. This is obviated by providing a shield 100 on the ratchet wheel 26, and a projecting pin 101 on the pawl end of the lever 36. The location and peripheral extent of the shield 100 is such that it corresponds always in its relation to the ratchet wheel with the position on the elevator of the cam incline 70 to the end that it renders it impossible to bring the pawls 36 and 35 into ratchet engagement while the thrust-rod collar 67 is opposite said incline, and by reason of the considerable weight of the elevator D and the consequent strain on the hand-grip of the operator holding the elevator by the hand-wheel 27 at this time, any dwelling or holding of the elevator at this point would be unnatural and in practice does not occur.

In describing the location of the incline 70

great a height is in its properly raised position) the gumming roll F and the pickers E work in properly timed connection with each other. Heretofore this coacting operation of the gumming roll to deposit gum upon the underside edge surfaces of the pickers has most commonly been continued when the elevator has been again manually lowered for the purpose of loading on more envelop blanks; but with the improved gumming-roll stop motion forming the subject of this invention and which will now be described, the continued application of gum to the pickers at such times is checked.

The connecting rod J before described, which has heretofore usually consisted of a plain rod permanently jointed to the cam-lever 14 at its lower end and to the rocking gum roll lever by its upper end, I now make with the usual lower end connection to the lever-arm 14 but at the upper end of the rod I form it with a widened and flat end portion and provide within such part a lengthwise extending slot 42 through which passes the adjustable lever-arm bolt 43.

The bolt engaging latch I, which is pivotally connected by its lower end to the lower part of the flat portion of the connecting rod J has a notch 44 at its upper end, which is normally held in an engaging position underneath the bolt 43 by the action of the latch spring 45. An extended lip 46 at one side of the notch 44 prevents the said notched part from being spring pressed beyond a point directly beneath the lever-arm bolt.

An offset rib 49 is secured to the latch I about midway of its length and receives the end pressure of the thrust rod H. This thrust rod H which extends horizontally and transversely from a point about centrally of the thrust-rib 49 on the latch I to an engaging position adjacent the blank table slides 21^a, see Figs. 1 and 3, is made up of two telescoping sections *a* and *b*.

The rod section *a* is formed with an enlarged flat end portion 50 which is slidably supported in a guiding bearing 51 secured to the front edge of the side frame A of the envelop machine. This portion 50 of the section *a* has at its rear side a rectangular depression 52 within which is adjustably secured a short bar 53. The outer end of this bar 53 has rotatably secured thereon a slightly offset roller 54 which bears against the face 55 of the thrust-receiving rib 49. The position of this roller 54 relative to the thrust rod section *a* is regulated by the adjusting screw 56 which projects from the bar 53 through a slot 57 in the flat portion 50 of the thrust rod. The head of said screw 56 which bears on the outer face of the flat part 50 bordering the slot 57 serves to firmly lock the said parts in adjusted relations to each other.

The tubular section *b* of the thrust rod H receives in sliding engagement therewithin the round portion of the rod section *a* above described, and a pin 58 projecting from the rod *a* through a horizontal slot 59 in tube *b* serves to prevent any rotation of section *a* relatively to section *b*. A collar 60 is adjustably secured on section *b*, and a spiral spring 61, which has a greater strength than the latch spring 45, bears, by its one end against the collar and by its other end against the shouldered end portion of the flat portion 50 of section *a* and while normally not under compression provides for a longitudinal contraction of the thrust-rod in emergencies preceding the proper engagement or disengagement of the latch I with the bolt 43.

The section *b* of the thrust rod H is slidably supported within the tubular portion of a bracket-bearing 65, which bearing is firmly secured to the stationary elevator-frame 20, see Figs. 1 and 3.

A screw threaded rod 66 carrying on its outer end the offset roller 67 has engagement in the tube section *b* and is securely locked in adjusted relation to section *b* by the jam nut 68.

The vertical cam-bar G before referred to, is secured to one of the blank-table slides 21^a, as illustrated in Figs. 1, 2 and 3, and extends vertically downwardly thereon from a point about level with the top of the blank table 22 to a point as far removed from the bottom end of the slides 21^a as the desired height of the blank pile *x*. The lower end of the cam-bar G terminates in an angular incline 70 on which the roller 67 of the thrust rod H automatically moves when brought to engagement therewith.

The spring 99 having one end fastened to the fixture or bracket 65 and its other end to the member *a* of the thrust rod H serves to keep the two part and spring-distended thrust rod always in its proper relation to the cam-provided part G on the blank pile support. This endwise moving of the thrust rod H by being impinged against by the incline 70 of the cam bar G transmits a movement to the latch I on the cam rod J, and serves to connect or disconnect said rod J with the gumming roll operating rocking lever by causing the notched end 44 of the latch I to be brought under or retired from beneath the lever-arm bolt 43. At such times as the said notch 44 is removed from under the said bolt 43 the continued rising and falling movements of the cam rod J impart no rocking movement to the rocking lever, as in such cases the slotted end of said connecting rod merely rises and falls guided in its travel by the engagement of the bolt 43 in the long slot 42, as will be apparent from a reference to the illustration of the said parts in Figs. 1 and 4.

relative to the slide 21^a of the elevator table I have stated that its distance from the lower end of said slide is equal to the desired height or vertical thickness of the blank pile x .

5 I have found in practice, and I believe it will be apparent from the foregoing statement, that if the blank pile is too high a proper delivery of blanks from the top thereof will not be possible as the incline 70 of the cam bar G will not be above the thrust rod roller 67 as it must be before the gumming rolls will do their work, and consequently the operation of the pickers on the blank pile will be ineffectual.

15 By reason of the above necessity compelling the operator to load on a proper sized pile of blanks and no more, my improvements act as an aid to instruct the machine operators, as well as to save them much trouble as caused by the supplying of gum to the pickers at unpropitious times.

I claim:—

25 1. In an envelop machine, the combination with a constantly reciprocatory gummer-picker, and a vertically movable blank pile support, of a horizontally reciprocatory gum-supplying roll movable to positions under, and away from under the gummer-picker, a rocking lever for operating the gum-supplying roll, and a cam-actuated rod provided with a latch movably mounted thereon, for engaging and imparting in its working thrusts, rocking movements to said gum roll operating lever, said latch being capable of movement for disengagement from said lever, and means, between the pile support and said latch, and actuated by such support on the lowering thereof to place the latch in its disengaged position.

40 2. In an envelop machine the combination with a constantly reciprocatory gummer-picker, and a vertically movable blank pile support, of a horizontally reciprocatory gum supplying roll movable to position under, and away from under the gummer-picker, a rocking lever for operating the gum supplying roll, and a cam-actuated rod provided with a latch movably mounted thereon, for engaging and imparting in its working thrusts, rocking movements to said gum roll operating lever, said latch being capable of movement for disengagement from said lever, means intermediate between the pile support and said device on the cam rod, and 55 actuated by the support on the lowering thereof to render said latch non-operable on the said rocking lever, and a locking device having means for imparting thereto regularly reciprocatory movements timed with relation to the movements of the said cam rod, and operable as a lock against an unseasonable operation of said intermediate means.

60 3. In an envelop machine the combination with the gum roll actuating cam rod having a latch movably mounted thereon and

the vertically movable blank pile support having a cam, of a thrust rod between the cam on said support and the cam rod latch for the purpose set forth.

4. In an envelop machine, the combination with the gum roll actuating cam rod having a latch movably mounted thereon and having a spring operable thereagainst, and the vertically movable blank pile support having a cam, of a thrust rod between the cam on said support and the cam rod, and means for yieldingly forcing the thrust rod towards such cam, for the purpose set forth.

5. In an envelop machine, the combination with the gum roll actuating cam rod having a latch movably mounted thereon, provided with an extension rib, and having a spring operable against said latch, and the vertically movable blank pile support having a cam, of a thrust rod, between the cam on said support and the cam rod, constructed with an adjustable section adjacent said latch extension rib, and means for yieldingly forcing the thrust rod towards such cam, for the purpose set forth.

6. In an envelop machine the combination with the gum roll actuating cam-rod constructed with a longitudinal slot, and having a latch movably mounted on the side thereof and made with a notched portion and adapted to be positioned with such notch across said slot, and the vertically movable blank pile support having a cam, of a thrust rod between the cam on said support and the thrust rod.

7. In an envelop machine, the combination with the gum roll actuating cam rod constructed with a longitudinal slot and having a latch pivotally mounted on the side of the cam rod and made with a notched portion 44 and a guard extension or stop 46 and adapted to be positioned with such notch across said slot, of a gum roll operating rocking lever having a stud engaging through said slot and to be engaged and disengaged by said latch, the vertically movable blank pile support having a cam thereon, a thrust rod between such cam and the cam rod latch, and a spring for forcing the thrust rod in a direction towards the pile support cam.

8. In an envelop machine the combination with the gum roll actuating cam rod having a latch movably mounted thereon and the vertically movable blank pile support having a cam, of a thrust rod between the cam on said support and the cam rod, comprising sections one of which is spring pressed relatively to the other and one of said sections having a projection, and a bolt, and means for imparting thereto a reciprocatory motion whereby it has alternately positions of engagement and disengagement relatively to said projection on the thrust rod section.

9. In an envelop machine the combina-

tion with a gum roll actuating cam rod
having a latch movably mounted thereon
and a vertically movable blank pile support
having a cam thereon, of a thrust rod be-
5 tween the cam on said support and the cam
rod comprising sections one of which is
spring pressed relatively to the other and
one of said sections having a lateral projec-
tion, a bolt slidably guided in proximity to
10 said projection and having a roll or projec-
tion 88 thereon, an oscillatory carrier and
means for imparting its movement thereto,
and said carrier having an arm or projection
90 for periodically acting against the roll on
15 said bolt and the spring for retracting the
bolt.

10. In an envelop machine the combina-
tion with a blank pile support having cam G
thereon and the thrust rod H coacting there-
with as described, of the operating shaft for 20
the blank pile support having the hand wheel
and the ratchet wheel, the retaining pawl
having a stud 101, the actuating pawl 35 and
the cam 100, movable in unison with said
operating shaft and coacting with said re- 25
taining pawl stud 101.

Signed by me at Springfield, Mass., in
presence of two subscribing witnesses.

FRANK A. BURNETT.

Witnesses:

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J. D. GARFIELD.