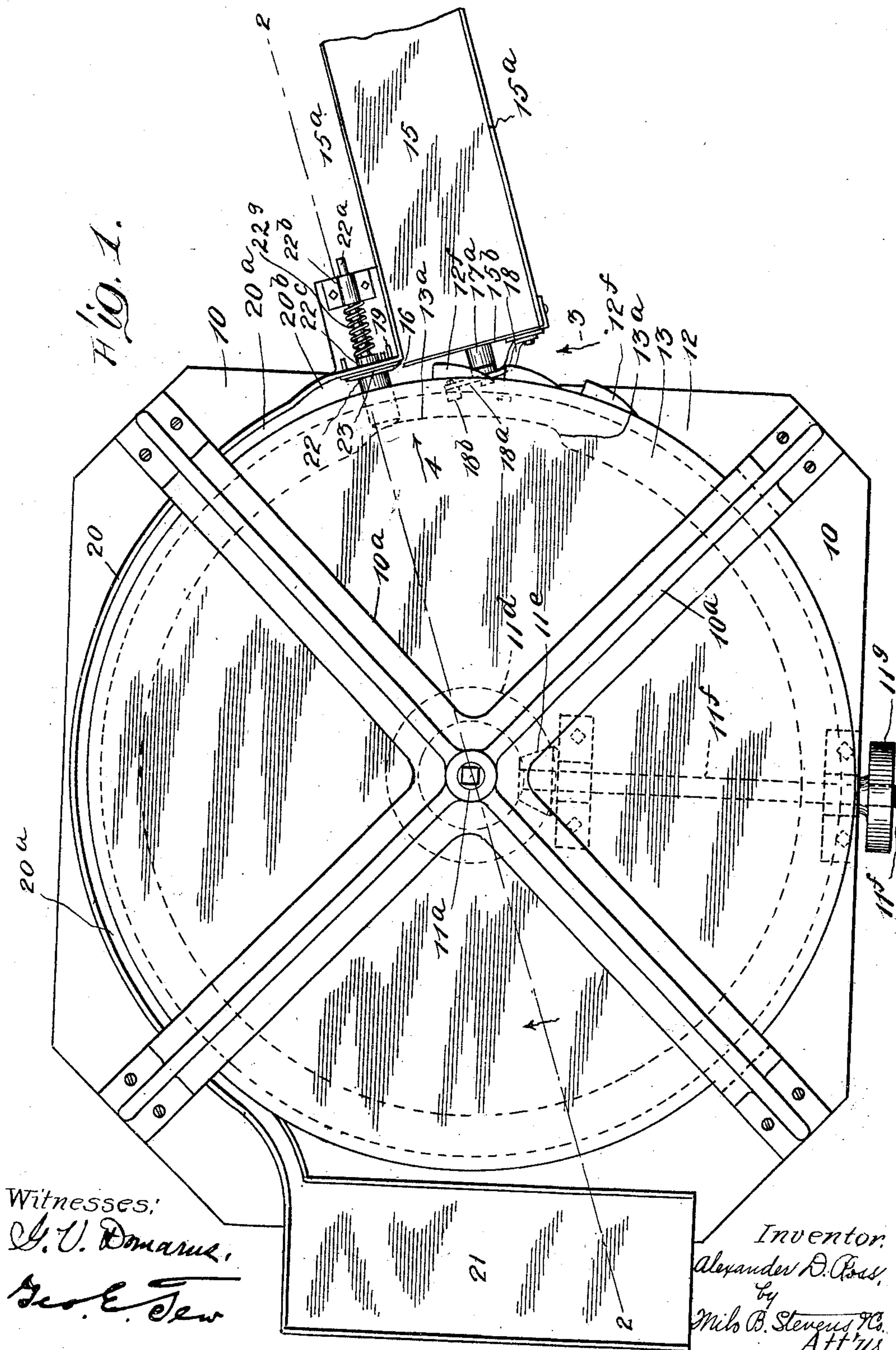


No. 839,960.

PATENTED JAN. 1, 1907.

A. D. ROSS.  
ENVELOP OPENER.  
APPLICATION FILED MAY 18, 1906.

3 SHEETS—SHEET 1.



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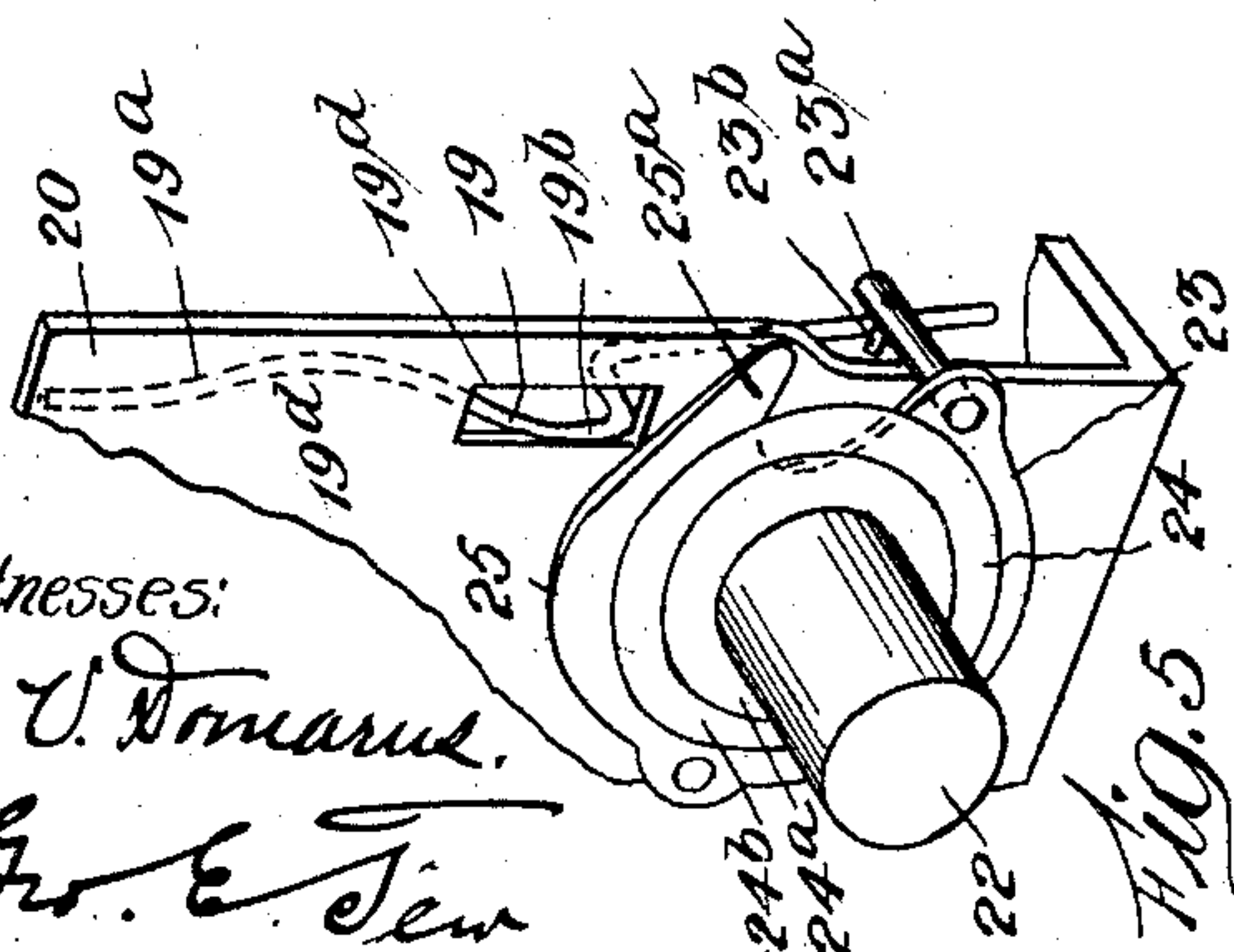
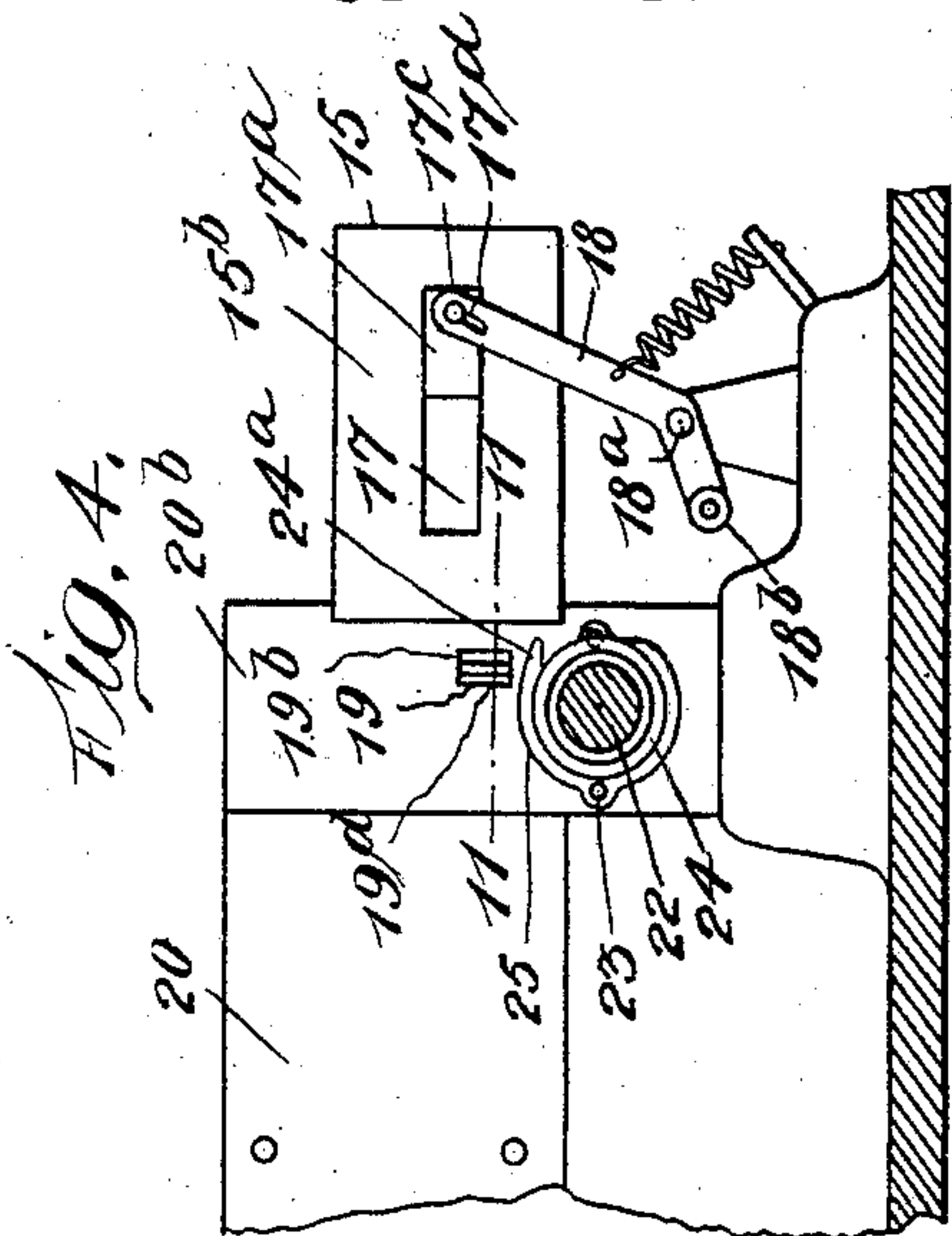
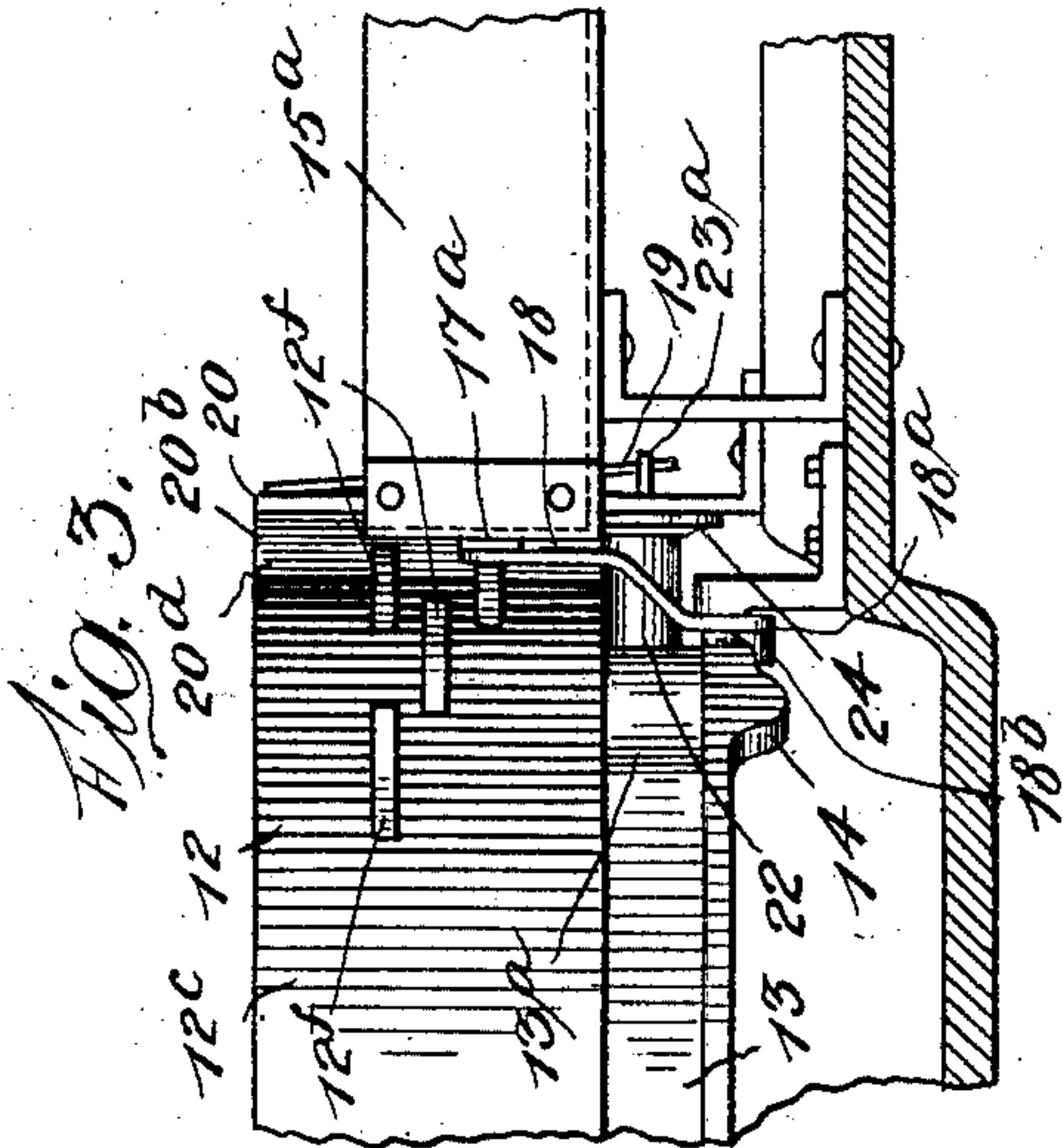
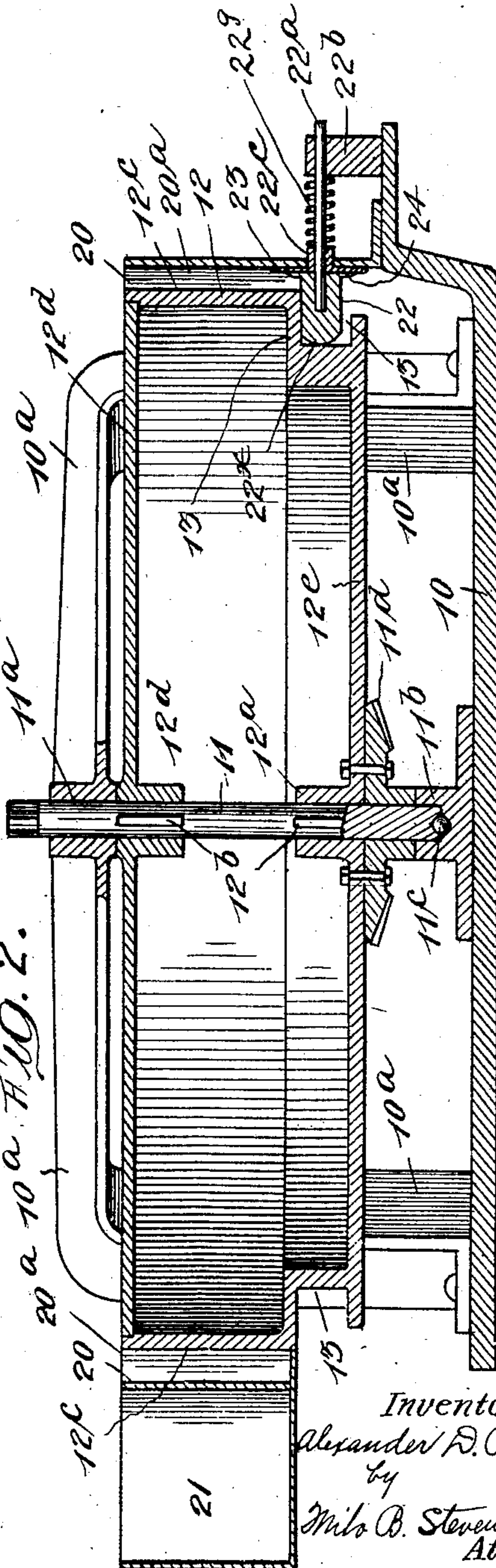


Fig. 2.



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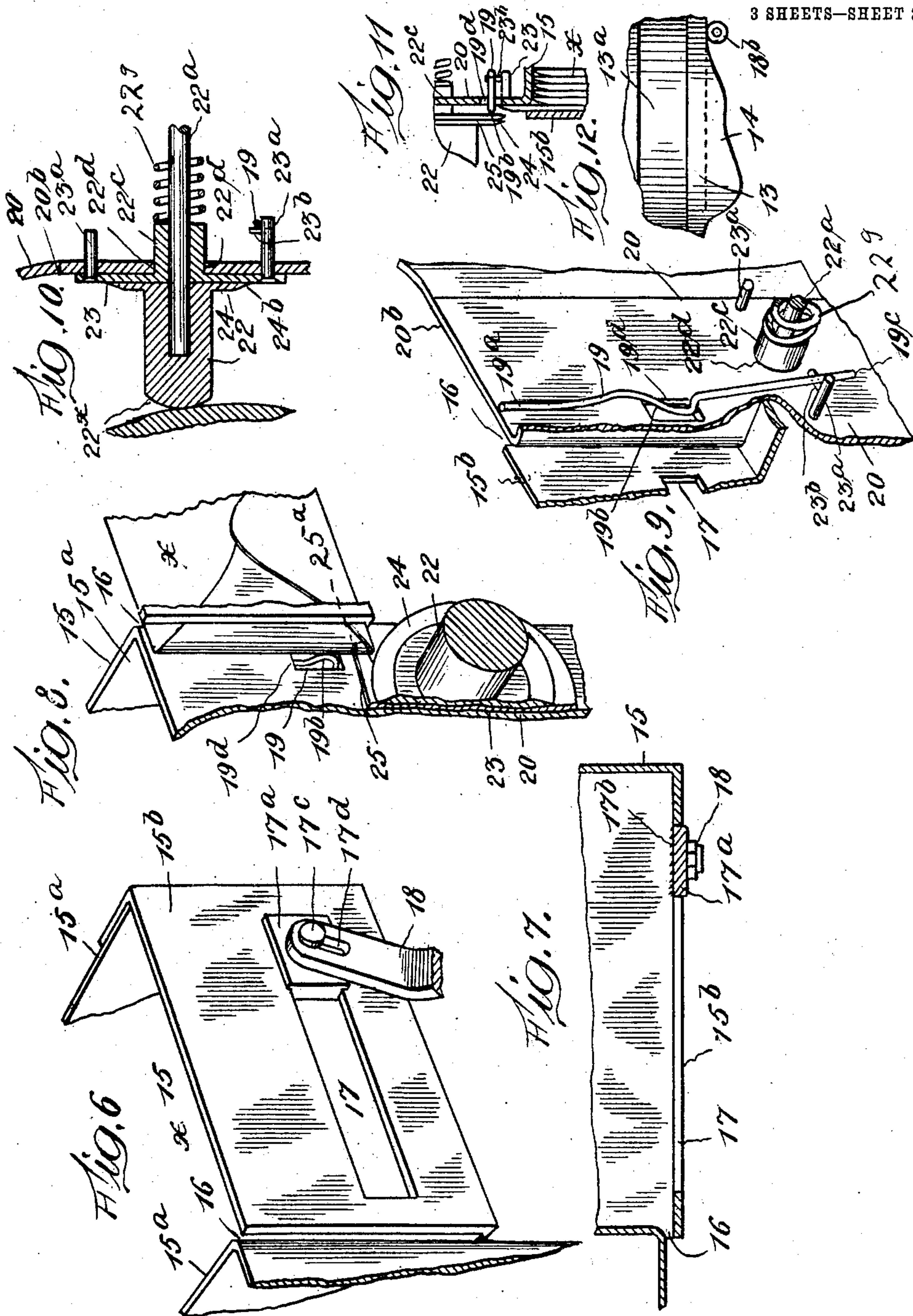
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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

ALEXANDER D. ROSS, OF CHICAGO, ILLINOIS.

## ENVELOP-OPENER.

No. 839,960.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed May 18, 1906. Serial No. 317,464.

*To all whom it may concern:*

Be it known that I, ALEXANDER D. ROSS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Envelop-Openers, of which the following is a specification.

This invention relates to a machine for opening closed or sealed letters; and it is especially intended for opening the envelopes of first-class mail-matter and without cutting or damaging the contents of the envelopes, all the work being performed rapidly and automatically by the machine.

The principal features are a chute device or holder for the envelopes or letters, a rotatable drum provided with cams or means for actuating a feed device and the opener, an opener comprising a flap device or separator and a beveled rotary cutter, and means for delivering the letters.

Other novel features or details of construction will be mentioned hereinafter.

In the drawings, Figure 1 is a plan view of the machine. Fig. 2 is a vertical cross-section taken on line 2 2 of Fig. 1. Fig. 3 is a detail taken in direction of arrow 3, Fig. 1, and showing in elevation the feed device and part of opener. Fig. 4 is a detail viewed at 4, Fig. 1, and showing end of envelop-holder and front of opener. Fig. 5 is a perspective view of the opening device. Fig. 6 is a perspective of the end of the letter or envelop holder or chute and envelop-mover. Fig. 7 is a horizontal sectional detail of same. Fig. 8 is a perspective showing an envelop about to be released from the feed-holder and being engaged by the opening device. Fig. 9 is a perspective showing a portion of outside of casing and the envelop-releasing spring. Fig. 10 is a cross-section of the envelop-cutter. Fig. 11 is a detail, in horizontal section, on line 11 11 of Fig. 4. Fig. 12 is a detail in side view of the cam which operates the envelop-feed.

Referring specifically to the drawings by reference characters, 10 indicates a base or stand having a spider-frame 10<sup>a</sup>, which surrounds or extends over the drum of the machine and its segmental exterior casing.

11 is a vertical spindle having bearings at 11<sup>a</sup> and 11<sup>b</sup>.

11<sup>d</sup> is a bevel-gear secured to the bottom of the drum, and 11<sup>e</sup> is a bevel-pinion engaging

the same and mounted on a shaft 11<sup>f</sup>, having a pulley 11<sup>g</sup>, to which suitable power connections may be made to operate the machine.

12 is the main drum for operating the principal features of the machine. This drum is mounted on the vertical spindle of the machine by means of sleeves 12<sup>a</sup> and keys 12<sup>b</sup> or in any other suitable way. The drum 12 consists of a shell or cylinder having circular sides 12<sup>c</sup>, a top 12<sup>d</sup>, and a bottom 12<sup>e</sup>.

13 is an annular groove or circular recess in the side wall 12<sup>c</sup> near the bottom of the drum. Within this is an outwardly-extending cam 13<sup>a</sup> for operating the envelop-release, flap-opener, and the cutter.

14 is a downwardly-extending cam on the lower edge or bottom of the drum for operating a slide in the envelop-feed.

The drum 12 is provided with a series of projections or fingers 12<sup>f</sup> for shoving the envelop forward.

15 is a box, chute, or receptacle located beside the drum and having an open top and provided with sides 15<sup>a</sup> and an end piece 15<sup>b</sup> at the front end.

16 is a letter-feed slot at one corner of the box near the drum.

The end piece 15<sup>b</sup> has a longitudinal horizontal slot, and mounted in this slot is a sliding-block 17<sup>a</sup>, provided on its face with small teeth or frictional points 17<sup>b</sup>.

18 is a lever pivoted at 18<sup>a</sup> to a small bracket on the frame and connected to the block 17<sup>a</sup> by means of a pin 17<sup>c</sup> and slot 17<sup>d</sup> at the upper end of the lever. The lower arm of the lever is provided with a pivoted roller 18<sup>b</sup>, which extends in position to be engaged at a certain point in the rotation of the drum by the cam 14 on the drum. Vibration of the lever reciprocates the block 17<sup>a</sup>, so as to shove an envelop or letter partially out of the receptacle 15 through the slot 16.

The envelopes are placed on their edges in the chute or receptacle, and suitable means may be employed for shoving them toward the discharging end thereof, or they may be shoved forward by hand. The slide-block 17<sup>a</sup> feeds out only one letter at a time.

19 is a spring-stop for holding the envelop while the flap opener or separator is engaging the same and also until the fingers or studs on the drum are ready to engage the envelop and carry it over the cutter and through the machine.



20 is a segmental guide casing or sheath consisting of a curved vertical plate partially surrounding the drum 12 and forming a vertical passage 20<sup>a</sup> between the drum and the casing. This casing begins at the receptacle 15 and extends around to a delivery-box 21 at the rear end thereof.

At 20<sup>b</sup> the front end of the casing 20 has an offset or recess.

The spring-stop 19 consists of a piece of wire attached at 19<sup>a</sup> to the back of the casing, and this wire is bent so as to have an angular projection or shoulder 19<sup>b</sup> and a depending finger 19<sup>c</sup>. The projection 19<sup>b</sup> extends through a slot 19<sup>d</sup> in the casing and forms a stop for the envelop after partially leaving the receptacle, as stated.

22 is a roller mounted on a spindle or rod 22<sup>a</sup>, which is mounted in a bracket 22<sup>b</sup> just beyond the box 15. The roller 22 runs in the groove 13 on the drum 12, and on the spindle 22<sup>a</sup> is a collar 22<sup>c</sup>, which slides in and out in a hole 22<sup>d</sup> in the offset part 20<sup>b</sup> of the guide-casing 20.

23 is a plate or circular flange projecting from the collar and having pins 23<sup>a</sup>, which work through holes in the casing 20. One of these pins has a small pin 23<sup>b</sup>, which engages behind the finger 19<sup>c</sup> of the spring-stop 19, so as to release the same from engagement with an envelop when the rotary cutter 24 begins to cut the envelop, and the catches on the drum are ready to carry the envelop forward.

The rotary cutter 24 consists of a circular plate having a beveled or cutting edge 24<sup>b</sup>. This cutter may be integral with the roller 22, as shown, or made of a separate plate and attached to the spindle of the roller. The inner end of the roller 22 is slightly rounded, as at 22<sup>x</sup>, where it bears against the cam 13<sup>a</sup> in the groove 13 of the drum. The roller 22 is driven by reason of its frictional contact with the upper side of the slot 13, and the roller thus rotates the cutter 24. A spring 22<sup>g</sup> normally forces the roller 22 and cutter inwardly to produce a space between the cutter and the wall 20.

An envelop engaged by the stop 19 is disengaged when the roller 22 comes in contact with the cam 13<sup>a</sup>, which shoves the spindle and the cutter 24 back or outwardly toward the wall 20. The spindle 22<sup>a</sup> carries the plate 23 and presses its pin 23<sup>b</sup> against the tongue 19<sup>c</sup> of the stop 19, thus releasing the stop from the envelop and allowing the same to be carried forward by the projections 12<sup>f</sup> on the drum. These projections are preferably made of rubber.

25 is a curved finger projecting from the plate 23 and having a pointed tip 25<sup>a</sup>, which projects above and slightly forward of the cutter 24. This curved finger forms a flap opener or separator and engages the envelop before the cutter does, so that the cutter can

readily enter the edge of the envelop and not tear its contents, while the finger separates the flap as it is being cut.

The operation of the machine is as follows: Envelops X are placed in the receptacle 15. The block 17<sup>a</sup> is moved forward by the lever 18, which is operated by the roller 18<sup>b</sup> being engaged by the cam 14 on the drum 12. The said block will move one of the envelops partially forward and out through the slot 16 until it reaches the stop 19. The finger 25 then enters the flap of the envelop (see Fig. 8) and separates or spreads the same outwardly. The cutter is then in position to strike and cut the lower edge of the envelop. At this point the cam 13<sup>a</sup> presses the roller 22 back, thus disengaging the stop 19. The teeth 12<sup>f</sup> now engage the envelop and carry it forward, the finger 25 distending the flap and the cutter 24, which is then on the inner side of the envelop, is pressed by the cam 13<sup>a</sup> against the envelop, slitting or cutting its bottom edge as it is carried around by the drum. The envelop after being opened is carried to the other side of the machine into a delivery-box 21. The operation is repeated with the next envelop, one being opened at a time; but the work is done very quickly and effectively, the only handwork required being to supply the machine with letters or envelops properly arranged and to carry the opened letters away.

I claim—

1. In an envelop-opener, in combination, a guideway, a rotary knife therein disposed in a plane parallel to the length of the guideway, so as to slit the edges of envelops therein, and means to feed envelops along the guideway across the knife.

2. In an envelop-opener, in combination, a guideway, a projecting finger therein, arranged to enter the flap of an envelop, a rotary knife beside the finger, arranged to cut the edge of the flap, and means to feed envelops along the guideway.

3. In an envelop-opener, in combination, a rotary drum, a curved wall extending partially around the same and forming a guideway therebetween, and a rotary knife in the bottom of said guideway, adapted to slit the edges of envelops carried through the guideway by the drum.

4. In an envelop-opener, in combination, a rotary drum, a wall extending partially around the same forming a guideway therebetween, a knife in the guideway arranged to slit the flap of an envelop, a feeding-box at the beginning of the guideway, and means actuated by the drum to feed envelops successively from the box into the guideway, said drum having projections arranged to engage and carry an envelop through the guideway.

5. In an envelop-opener, in combination, a rotary drum, having a groove in its face



and a cam in the groove, a wall extending partially around the drum and forming a guideway therebetween, a rotary knife located in the guideway and having its spindle projecting into the groove, said spindle being longitudinally movable, to move the knife toward or from the said wall, and means to feed letters along said wall, in the guideway, with their flaps presented toward the drum, the cam in the groove being arranged to strike the end of the spindle and force the knife outwardly against the flaps of the envelopes as they are carried along said wall.

6. In an envelop-opener, in combination, a drum having a groove therein, a wall extending partly around said drum and forming a guideway therebetween, a rotary knife in the guideway, on a spindle arranged radially with respect to the drum, said spindle extending into the groove in contact with one of the sides thereof, whereby the rotation of the drum drives the knife, and means actuated by the drum to feed letters into the guideway and across the knife.

7. In an envelop-opener, the combination with means to slit the edge of envelopes, of means to feed the envelopes to said slitting means, comprising a box having a slot in one corner thereof, a block movable across the end of the box, to and from said slot, and constructed to engage an envelop and force the same out of the slot, and means to reciprocate said block.

8. In an envelop-opener, in combination, a rotary drum, a wall extending partly around the same and forming a guideway therebetween, a feed-box at the mouth of the guideway, having a slot which opens into said guideway, a rotary knife in the guideway, arranged to cut the envelopes at the lower edge thereof, and means actuated by the drum to feed letters successively from the box through said slot.

9. In an envelop-opener, in combination, a rotary drum having a guideway around the same, a knife in the guideway, a feeding-box having a vertical slot in one corner at the entrance to the guideway and a horizontal slot in the end of the box adjacent said slot, a lever having at one end a block projecting through said horizontal slot and adapted

to engage an envelop and force the same through the vertical slot, and a cam on the drum arranged to intermittently strike and operate the lever, to feed the envelopes successively from the box.

10. In an envelop-opener, in combination, a rotary drum, having a projection arranged to engage and carry a letter, a wall extending partly around the drum and forming a guideway therebetween, through which the envelop is carried by the projection, a yielding stop extending across the guideway near the entrance thereof, a rotary knife located in said guideway adjacent said stop and having a spindle which is yieldingly movable lengthwise to move the knife toward or from the wall of the guideway, a plate located beside the knife and having a finger projecting in advance thereof and arranged to enter the flap of the envelop, said plate and finger being movable with the spindle to and from the wall of the guideway, means actuated by the drum to feed an envelop between the knife and finger and the wall of the guideway, against said stop, means to release said stop and advance the envelop, and means to immediately press the finger and knife against the envelop, whereby the finger will enter within the flap and the knife will slit the edge thereof as the envelop is advanced along the guideway.

11. In an envelop-opening machine, the combination with a rotary drum, the wall extending partly around the same and forming a guideway, and means to feed envelopes into the guideway, of the stop 19 working through and opening in the wall and into the guideway, the rotary knife 24 below said stop, the finger 25<sup>a</sup> above the knife, the finger being adapted to enter the flap of an envelop and the knife being adapted to slit the same, and means to actuate the stop, the knife and the finger.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ALEXANDER D. ROSS.

Witnesses:

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H. G. BATCHELOR.