

No. 701,589.

Patented June 3, 1902.

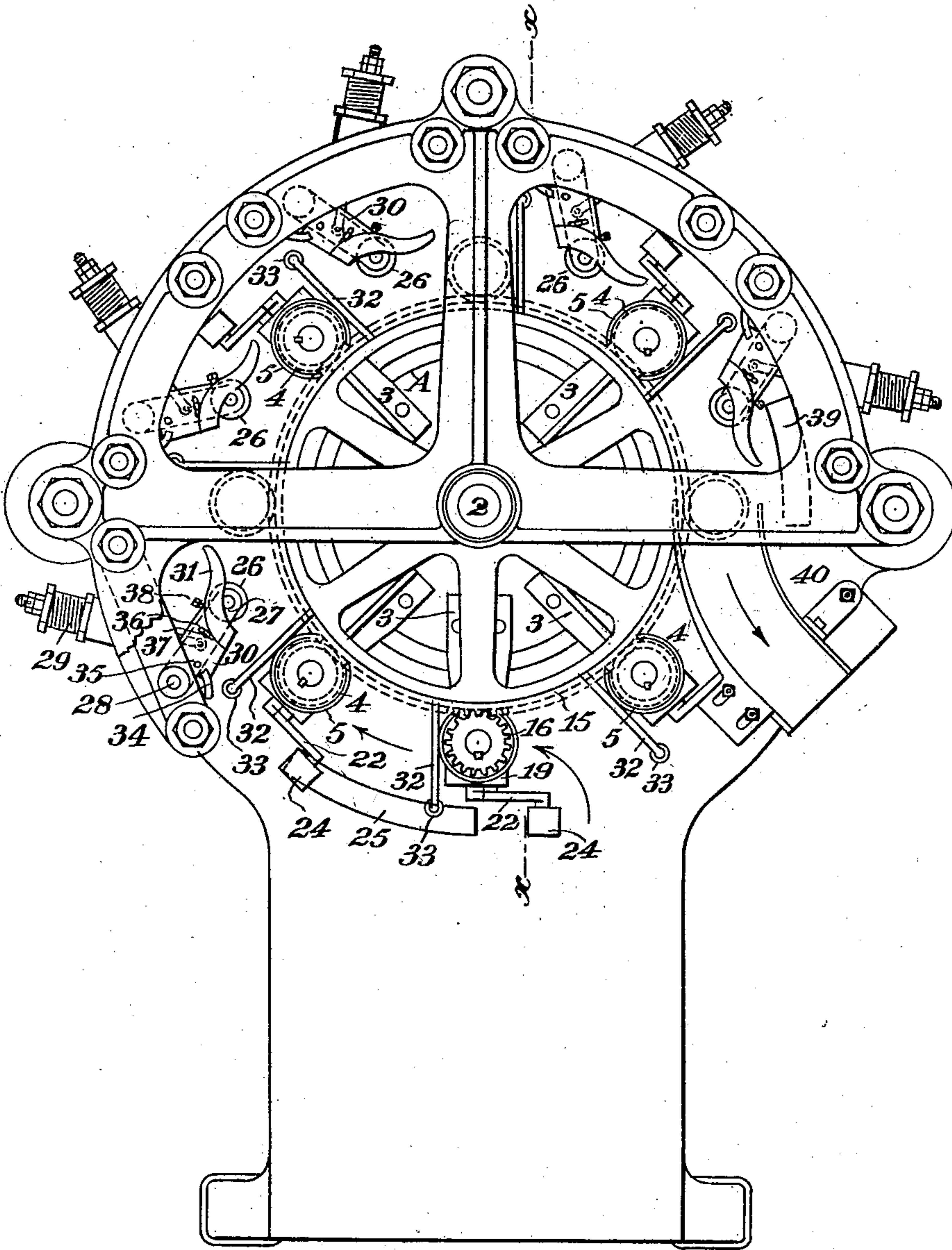
A. W. LIVINGSTON.  
CAN HEADING MACHINE.

(Application filed Dec. 19, 1901.)

(No Model.)

3 Sheets—Sheet 1.

Fig. 1.



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3 Sheets—Sheet 2.

Fig. 2.

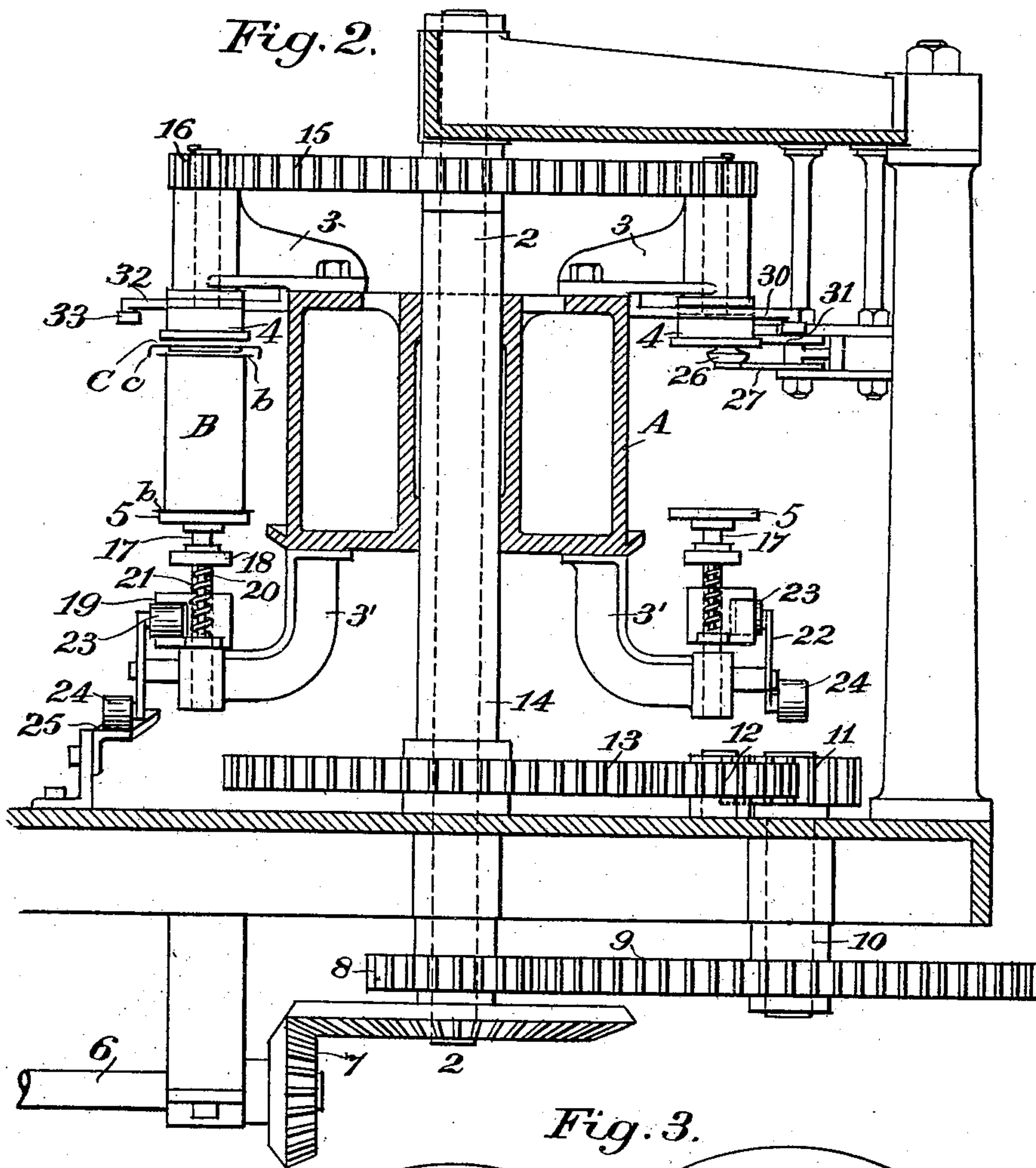
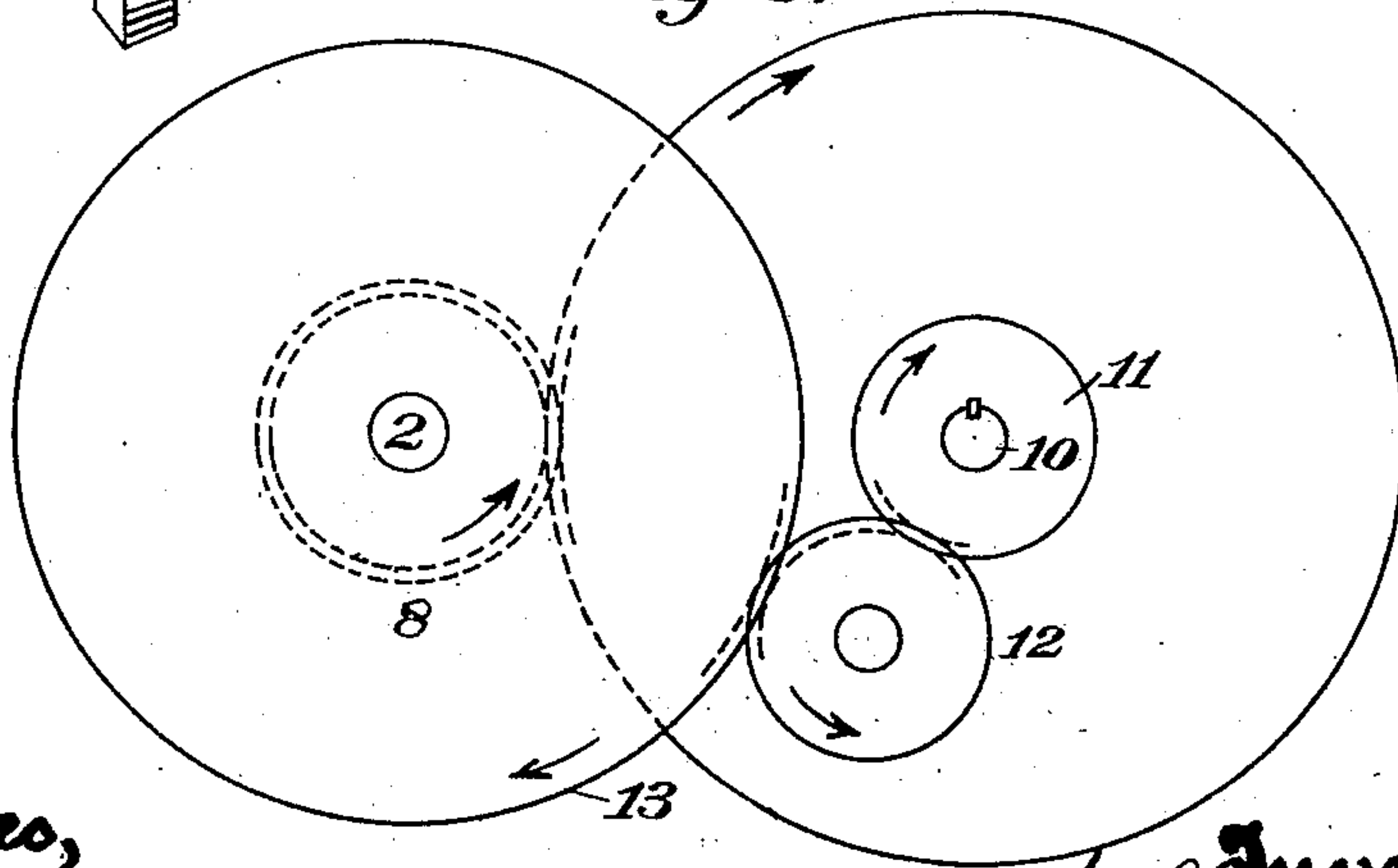


Fig. 3.



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Fig. 4.

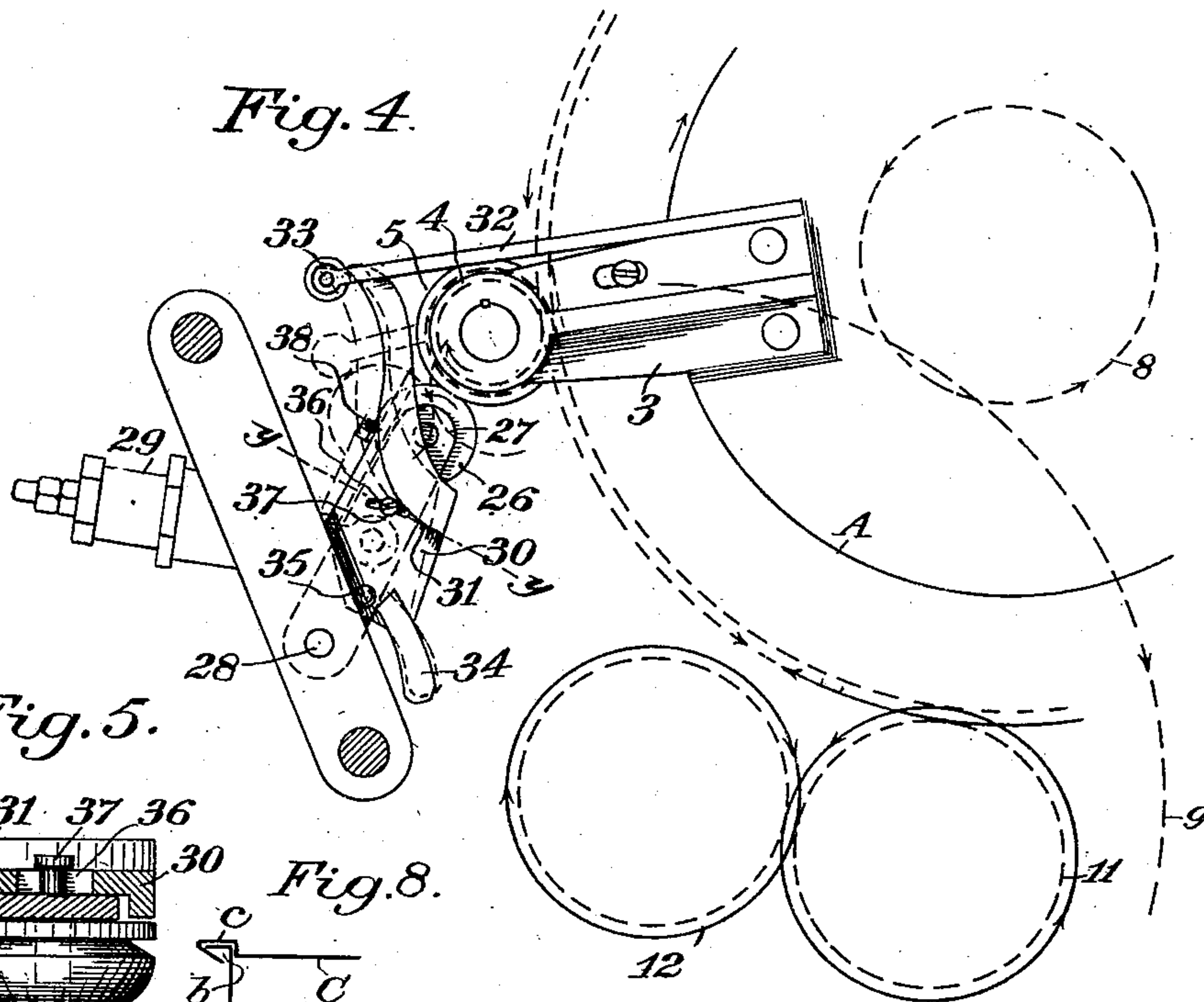


Fig. 5.

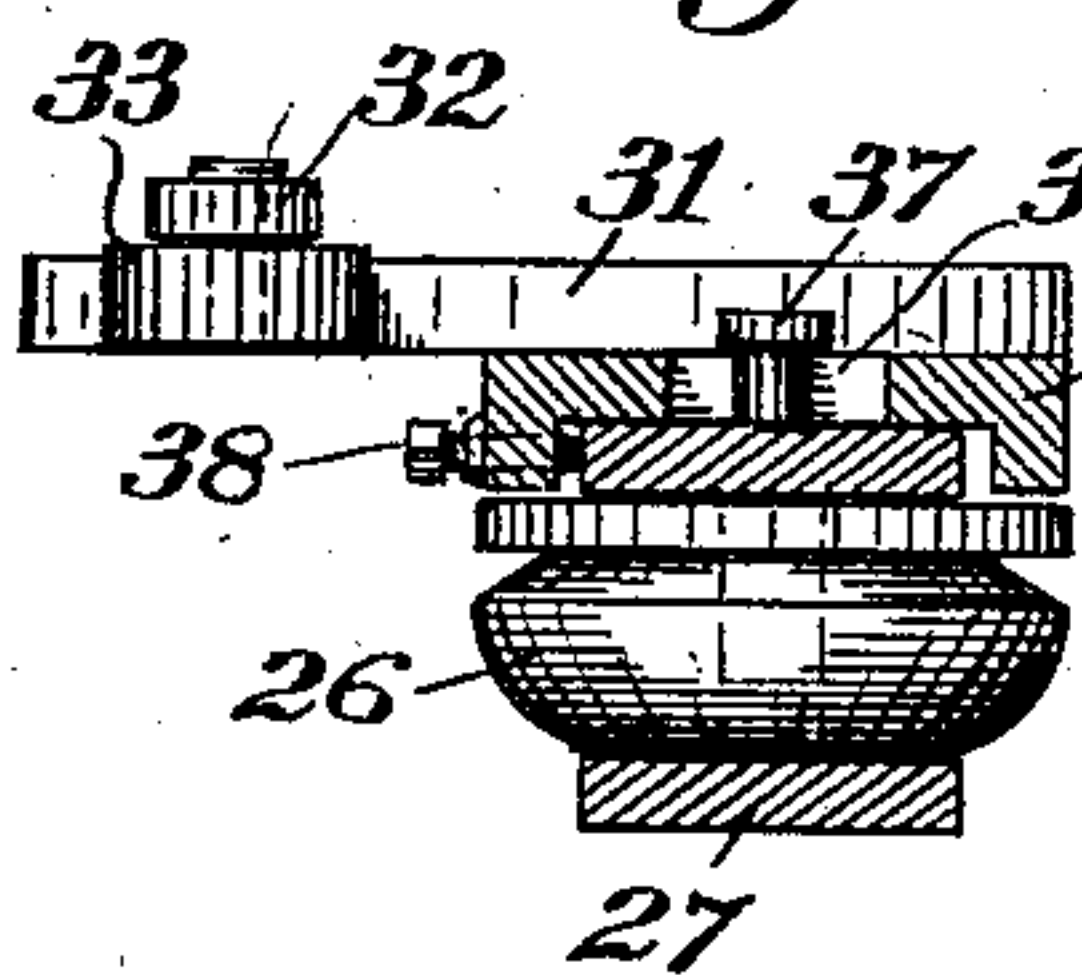


Fig. 8.

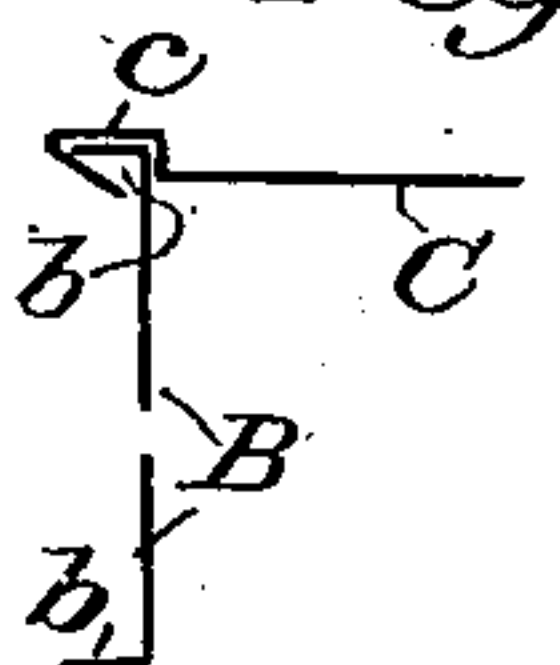


Fig. 6.

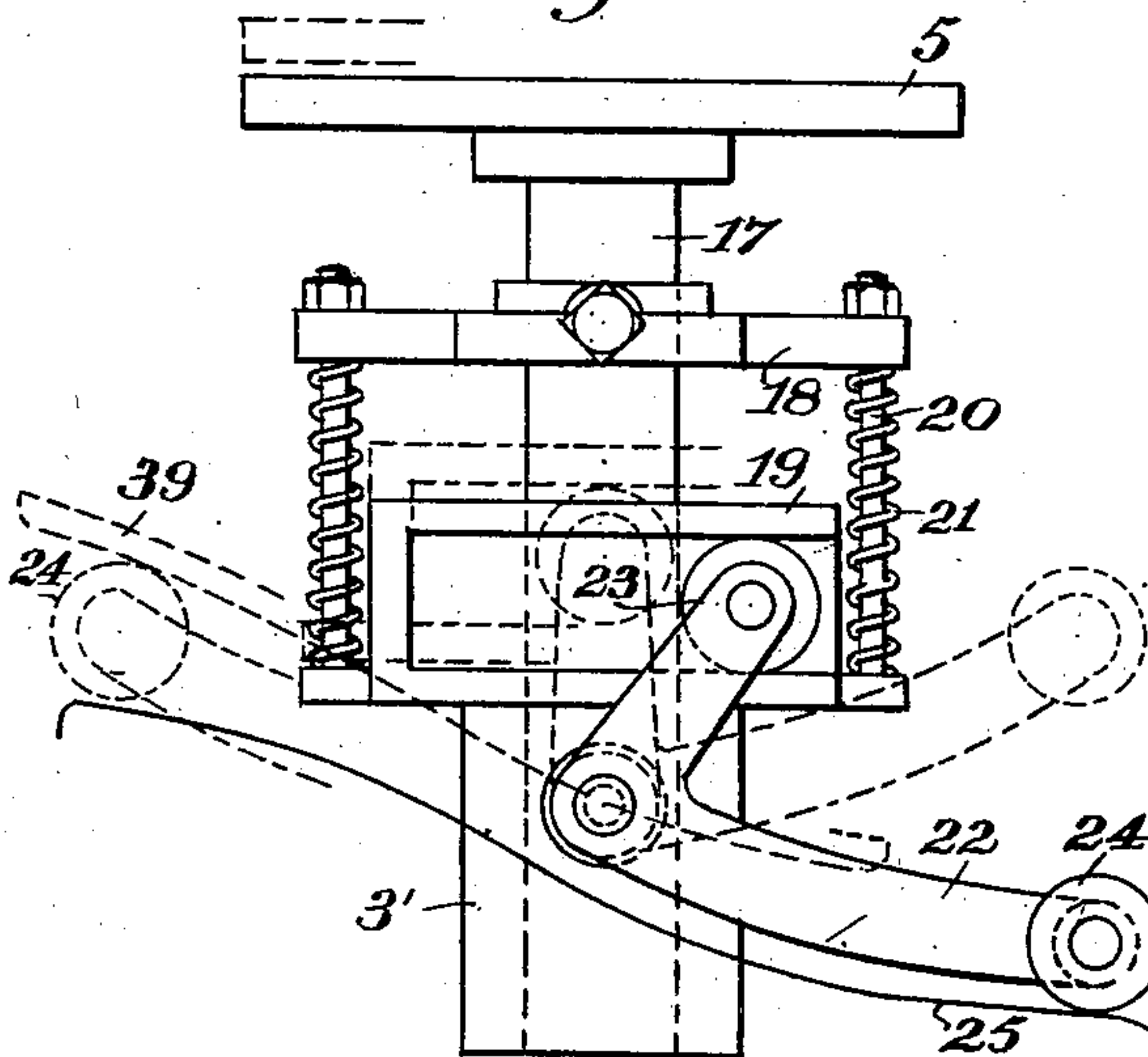
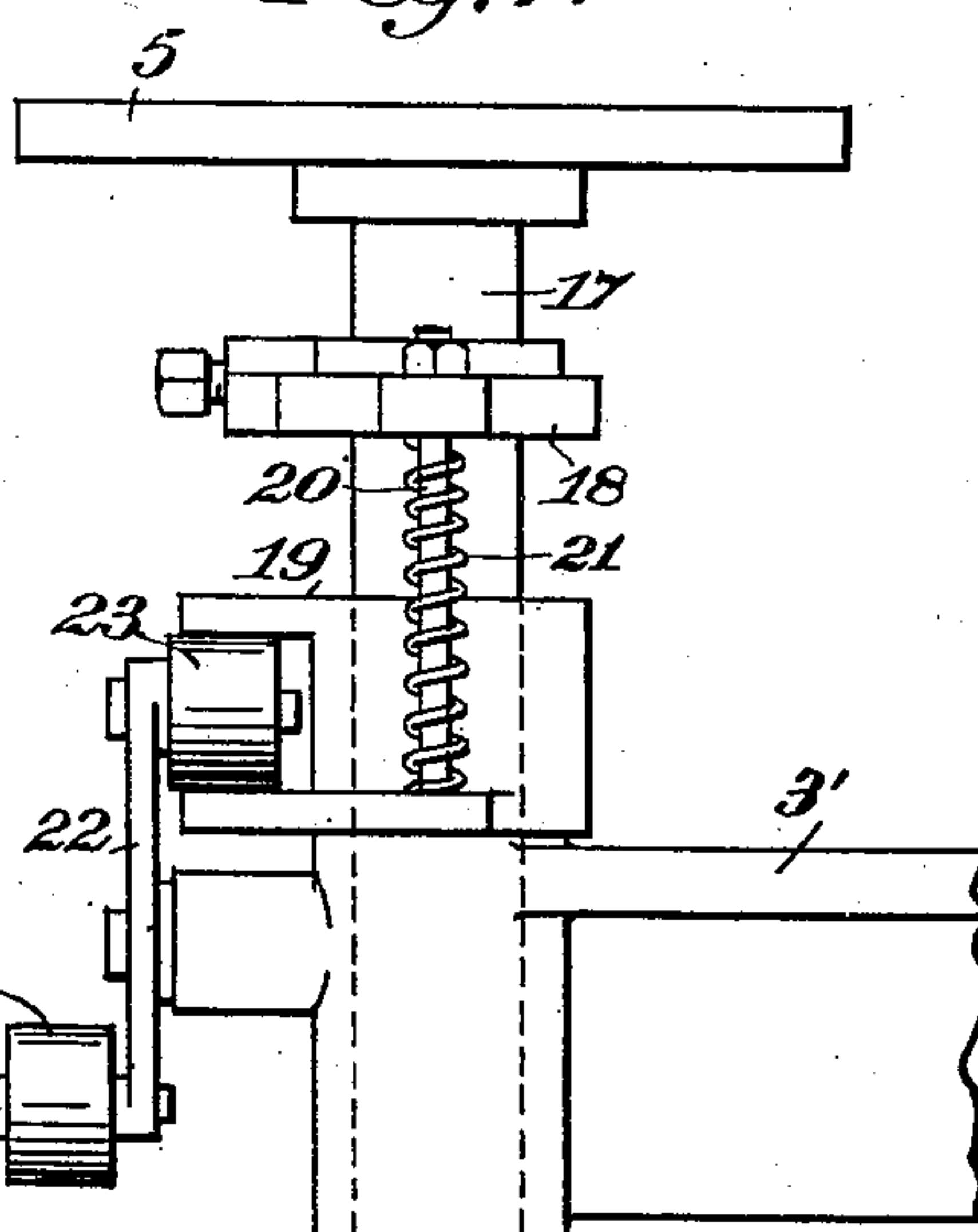


Fig. 7.



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# UNITED STATES PATENT OFFICE.

ANDREW W. LIVINGSTON, OF ALAMEDA, CALIFORNIA.

## CAN-HEADING MACHINE.

SPECIFICATION forming part of Letters Patent No. 701,589, dated June 3, 1902.

Application filed December 19, 1901. Serial No. 86,519. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW W. LIVINGSTON, a citizen of the United States, residing in Alameda, county of Alameda, State of California, have invented an Improvement in Can-Heading Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to improvements in can-heading machines of the type where the can-body with head in position is received between revolving chucks upon a revolving drum and the flanges of the head and body seamed by engaging with the crimping members.

My invention consists, first, in means by which the lower chuck is raised to clamp and hold the can against the upper chuck, and, second, in means for bringing and holding the crimpers in contact with the can-flange, and, thirdly, in causing the drum and chucks to revolve in the same direction.

The object in each instance is to avoid injury to the can by effecting a more gradual and more uniform action of the various parts than is accomplished by the ordinary appliances in use.

The details will be set forth more fully hereinafter, having reference to the accompanying drawings, in which—

Figure 1 is a plan of my invention. Fig. 2 is a vertical section on the line  $x x$  of Fig. 1. Fig. 3 is a diagram of the lower driving-gearing. Fig. 4 is a detail plan of the crimping or seaming mechanism. Fig. 5 is a section on the line  $y y$ , Fig. 4. Fig. 6 is an enlarged front elevation of the lower chuck. Fig. 7 is a side view. Fig. 8 is a section through a can body and head.

A represents a drum revoluble upon the shaft 2 and upon which are the brackets 3 and 3', carrying the respective upper and lower chucks 4 and 5. Motion is imparted to the drum and the upper set of chucks by the following chain of gears: 6 is a main drive-shaft suitably connected, as by the bevel-gearing 7, with the shaft 2. The latter has a small gear 8 meshing with a large gear 9 upon a shaft 10. This shaft 10 carries a pinion 11, meshing with an idle gear 12, which in turn engages the gear 13 on the hub 14 of the

drum to drive the latter. The upper end of the shaft 2 is provided with a large gear 15, which meshes with a pinion 16 on the shaft of each of the upper set of chucks 4 to revolve the latter. By reason of this gearing the drum and chucks will each revolve in the same direction. The necessity of such similarity of movement will be shown later.

In Figs. 2 and 8 is shown a can-body B, provided at either end with the annular flanges  $b$ , and also a can head or end C, having an annular flange  $c$ , corresponding to the flange  $b$  of the can-body. By suitable means (not necessary here to be shown) the end is inserted on the can-body with the adjacent flanges  $b$  and  $c$  in close contact. Thus in position the can is delivered upon a lower chuck 5, the latter is raised to bring the headed end of the can against the upper chuck, whereupon the can is rapidly revolved and brought successively against the seamers or crimpers in a manner to be described later.

The raising of the lower chucks is effected as follows: The spindles 17 of these chucks are slidable vertically in their bearings and the chuck is turnable independently of the spindle. These spindles each carry a cross-head 18 below, to which a box 19 is resiliently supported by means of the standards 20 and springs 21. A bell-crank lever 22 is pivoted to the bracket 3', and its shorter arm is provided with a roller 23, movable in the box 19. The bell-crank lever has its longer arm in the form of an arc of a circle and carries a roller 24 at its outer end. This lever is the important feature of this part of my invention. As the drum revolves with a can in place upon the chuck 5 the roller 24 engages an incline or cam 25, secured to the frame of the machine. The length of this cam and the relative lengths of the arms of the bell-crank lever are such that the chuck will be gradually lifted till the other end of the can is brought against the upper chuck and the short arm stands vertically, so as to automatically lock and hold the chucks.

Heretofore where a short straight lever, fulcrumed at its center was used, with one end of the lever adapted to move in the box and the other end to engage a cam, the upward movement of the chuck was such as to drive



the can so forcibly against the upper chuck as to cause the can-body flange resting on the chuck to crinkle or be bent upward from the horizontal, so that the can would sometimes  
 5 slip in the chucks when brought against the crimpers, because with a short straight lever, as shown in my Patent 690,593, the stationary cam engaged by it is necessarily sharp and necessarily operates in the nature of a  
 10 fixed stop or projection which the short vertical arm of the lever engages as it passes on the continuously-revolving drum, support, or carrier for the cans and their chucks, whereas with a bent lever having a long arm in this  
 15 particular combination the stationary cam may be made as gradual as desired and an easy gradual clamping movement given to the chuck.

By the use of a lever of the bell-crank lever  
 20 form and fashioned as here shown I have been able to overcome completely the difficulties previously experienced.

26 represents the seaming-rollers, carried on the swinging arms 27, which are suitably  
 25 pivoted to the frame, as at 28.

By means of the spring tension member 29 the roller is made to project into the path of the flange edges of the head and body to be seamed. Heretofore it has been customary  
 30 to rely solely on these tension members to hold the seamer against the can. Naturally as these springs had to be still in order to hold the crimpers to the work the result would be that the can-flange would come forcibly  
 35 against the crimper and the flange would be dented instead of being taken hold of gradually and turned over evenly. When the crimper let go, the machine would give a noticeable jerk and the next crimper engaged would cause another dent in the can.  
 40 Also where the drum and the chucks revolved in opposite directions the result was a feeding or drawing in and crinkling of the flange as the chucks brought the can against  
 45 the roller and occasioning a further unsteadiness in the running of the machine. Hence the obvious purpose of interposing the idle gear 12, whereby all bump of the can against the roller is obviated and the flange feeds up  
 50 naturally and smoothly to the roller, and instead of drawing in the tendency of the revolving can is to repel the roller.

My other improvement rests in the manner in which I hold the seamer to the can and  
 55 bring the two into gradual engagement.

Upon the upper side of each of the arms 27 is a plate 30, which is provided with the sinuous guides or cam-surfaces 34 and 31.

Secured to the brackets 3 on the drum are  
 60 arms 32, carrying rollers 33. As the drum revolves the roller 33 strikes the guide 34 before the seamer contacts with the can, acting to turn the arm 27 on its pivot to bring the seamer gradually against the can, so as to relieve the parts of any shock and consequent  
 65 liability to indent the can. The roller then

engages the surface 31 at the moment the flange contacts with the seaming-roller.

The pivoting of the arms 27 and the sinu-  
 osity of the guides 31 and 34 allow the seam-  
 ing-rollers or seamers, or "crimpers," as they  
 are termed, to be carried out and around the  
 cans and then be drawn in behind the latter  
 before the rollers 33 leave the guides. This  
 insures a positive and continuous engage-  
 75 ment of the seamer with the can and at the same time avoids the shock of contact and release before experienced.

It is understood that the tension of the  
 spring members 29 is only such as to cause  
 the arms 27 to lie normally in the path of an  
 approaching can, and were it not for some  
 such means as the roller 33 and the cam-plate  
 30, by which the several seaming-tools 26 on  
 the swinging arms or levers 27 are positively  
 85 held or pressed against the seaming-flanges on the can body and cover, the seamer would be pushed out of the way by the can without rolling the seam or being held or pressed  
 against the flanges of the can-cover and can-  
 90 body with the force or pressure necessary to roll or fold the same into a double or other seam.

The plates 30 are pivotally secured to the  
 arm 27, as at 35, and each plate is slotted, as  
 95 at 36. A guide-pin 37 on the arms extends into these slots and the adjustment of these plates is effected by means of a set-screw 38. By turning this screw the plate is moved so  
 that the roller 33 is made to draw the seamer  
 100 in more or less against the can according to the pressure desired.

There may be as many seamers success-  
 ively arranged as is necessary to effectually  
 complete the operation of rolling the seam. 105

When the can has passed the last seamer, the lever 22 engages an incline 39 on the frame, which trips the lever, causing the lower  
 chuck to drop and release the can. It is  
 thence removed by a guide 40 into a chute  
 110 or other suitable receptacle.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an automatic can-heading machine  
 115 the combination of a revoluble support, an upper and lower set of chucks carried thereon, means whereby the upper chucks may be revolved independently of the drum, and means including a bell-crank lever having one arm  
 120 connected with the spindle of the lower chuck, and a cam-surface in the path of the end of the other arm of the lever, whereby a lower chuck may be gradually raised to engage and hold a can interposed between said sets of  
 125 chucks.

2. In a can-heading machine the combination of revoluble upper and lower chucks, each of said lower chucks provided with a bell-crank lever having a longer curved arm,  
 130 the shorter arm of said lever secured to the spindle of said lower chuck in such manner



that when the longer curved arm is oscillated in one direction the lower chuck will be made to gradually approach its respective upper chuck and hold a can interposed therebetween.

3. In an automatic can-heading machine the combination of a revolving support, rotating chucks thereon between which the cans are held and revolved independently of the support, pivoted arms carrying seam-rollers and means upon said revolving support whereby said pivoted arms are engaged to hold said seam-rollers against the can.

4. In a can-heading machine, a revoluble drum, rotating chucks thereon between which the cans are held and revolved, pivoted arms carrying seam-rollers, a cam upon each of said arms and means whereby said cam may be engaged to bring the same-roller into and hold it in engagement with the can.

5. In a can-heading machine, the combination of a revolving support or drum, means thereon for holding and revolving cans, rollers with which the flanges of said cans are adapted to be engaged and crimped, a sinuous cam-surface in connection with said rollers and means upon the drum engaging said surface whereby said rollers are held against the passing can.

6. In a can-heading machine, the combination of a revolving drum, means thereon for holding and revolving cans, pivoted arms carrying seam-rollers, a plate on each of said arms a sinuous guide on said plate and means by which said guide may be engaged to hold a seam-roller against a passing can.

7. In a can-heading machine the combination of a revolving drum, means thereon for holding and revolving cans, arms carrying seam-rollers, a plate pivoted on each of said arms, a sinuous cam-surface on said plate, a projection on the drum adapted to engage said surface to hold the seamer against the can and means whereby the pressure of said seamer on the can may be regulated.

8. In a can-heading machine the combination of a revolving drum, upper and lower sets of chucks carried thereon and concentric therewith, connections with a source of power whereby said drum and chucks are revolved independently of each other and in the same direction, and adjustable seamers with which the cans are adapted to engage during the rotation of the chucks and drum.

9. In a can-heading machine the combination of a revolving support or drum, upper and lower chucks carried thereon said chucks and drum revoluble independently but in the same direction, a bell-crank lever fulcrumed in relation to the spindle of each of said lower chucks, said lever having a longer segmental arm adapted to engage a cam whereby the said lower chuck is raised to hold securely a can interposed between said lower chuck and its respective upper chuck, pivoted arms carrying seam-rollers, a cam-surface in connection with each of said arms, a projection on

the drum and a roller on the projection adapted to engage said cam-surface whereby the seamer is drawn and held against the passing can and means by which the bell-crank lever may be tripped to separate the chucks and release the can.

10. In a can-heading machine the combination of a traveling support, sets of rotatable chucks thereon, a movable arm carrying a seam-roller, a cam on said arm and means for engaging said cam to bring said roller into engagement with the revolving can.

11. In a can-heading machine the combination of a traveling support, sets of rotatable chucks thereon, a movable member carrying a seam-roller, a cam-surface on said member and a movable arm engaging said cam to draw said roller into and hold it in engagement with the revolving can.

12. The combination with a continuously-revolving can-carrier, drum or support, of a plurality of sets of rotating can-chucks thereon, a plurality of swinging arms or levers each furnished with a seaming-roller, and interengaging cams and projections for automatically and positively holding and pressing the seaming-rollers against the seaming-flanges of the cans as the same are rotated and carried continuously along in the rotating chucks on the traveling carrier, substantially as specified.

13. The combination with a continuously-moving can carrier or support, of a plurality of sets of rotating can-chucks thereon, a plurality of seaming-rollers, a plurality of swinging arms mounted on the stationary frame of the machine and carrying said seaming-rollers, and interengaging devices on said swinging arms and carrier for forcing and holding the seaming-rollers against the rotating cans as they pass, substantially as specified.

14. The combination with a plurality of continuously-traveling rotating sets of can-chucks, of a plurality of seaming-rollers engaging the rotating cans successively as they pass in their traveling chucks, and mechanism for positively forcing and holding the seaming-rollers against the traveling and rotating cans as they pass, substantially as specified.

15. The combination with a plurality of continuously-traveling rotating sets of can-chucks, of a plurality of seaming-rollers engaging the rotating cans successively as they pass in their traveling chucks, and mechanism for positively forcing and holding the seaming-rollers against the traveling and rotating cans as they pass, said mechanism comprising interengaging cams and projections, substantially as specified.

16. The combination with a continuously-moving can-carrier having a plurality of sets of rotating can-chucks thereon, of a plurality of seaming-rollers, and a plurality of interengaging cams and projections for positively forcing and holding the seaming-rollers



against the rotating cans as they travel past the seaming-rollers, substantially as specified.

17. The combination with a continuously-moving can-carrier having a plurality of rotating can-chucks thereon, of a seaming-roller mounted on a movable device independent of said carrier, and an interengaging cam and projection for forcing and holding the seaming-roller against the can as it passes in the traveling and rotating can-chuck, substantially as specified.

18. The combination with a traveling support or carrier, of a plurality of sets of rotating can-chucks thereon, a swinging arm mounted on the stationary frame of the machine and provided with a seaming-roller, and interengaging cam and projection members for positively holding the seaming-roller against the rotating can as it passes, one of said members being on said swinging arm and the other on said traveling support or carrier, substantially as specified.

19. The combination with a traveling support or carrier, of a plurality of sets of rotating can-chucks thereon, a swinging arm mounted on the stationary frame of the machine and provided with a seaming-roller, and a cam and projection for positively holding the seaming-roller against the stationary can as it passes, said cam being on the swing-

ing arm and said projection on the constantly-rotating carrier, substantially as specified.

20. The combination with a traveling support or carrier having a plurality of sets of rotating can-chucks thereon, a plurality of swinging arms mounted on the stationary frame of the machine, a cam and a seaming-roller on each of said arms, and a plurality of projections on the carrier engaging said cams on said arms to press and hold the seaming-rollers against the cans as they pass, substantially as specified.

21. The combination with a traveling support or carrier having a plurality of sets of rotating can-chucks thereon, a plurality of swinging arms mounted on the stationary frame of the machine, a cam and a seaming-roller on each of said arms, a plurality of projections on the carrier engaging said cams on said arms to press and hold the seaming-rollers against the cans as they pass, and a spring for each of said swinging arms, substantially as specified.

In witness whereof I have hereunto set my hand.

ANDREW W. LIVINGSTON.

Witnesses:

S. H. NOURSE,

JESSIE C. BRODIE.