

No. 827,285.

PATENTED JULY 31, 1906.

M. H. BALLARD.  
WRAPPING MACHINE.  
APPLICATION FILED DEC. 23, 1904.

3 SHEETS—SHEET 1.

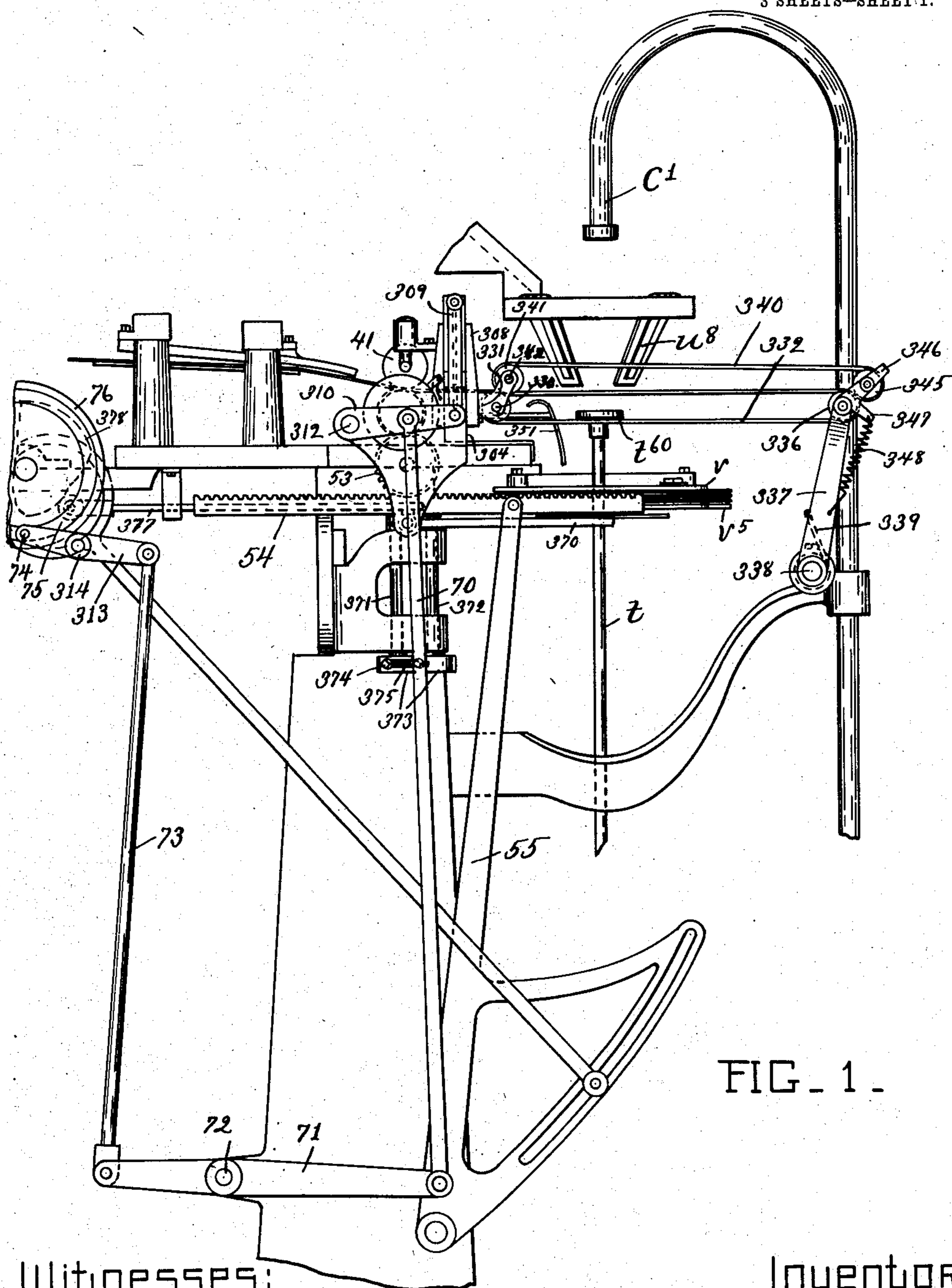


FIG. 1.

Witnesses:

*H. B. Davis.*  
*Wm. M. Piper*

Inventor:

*Milton H. Ballard*  
*By James H. Harrison*  
*attys*

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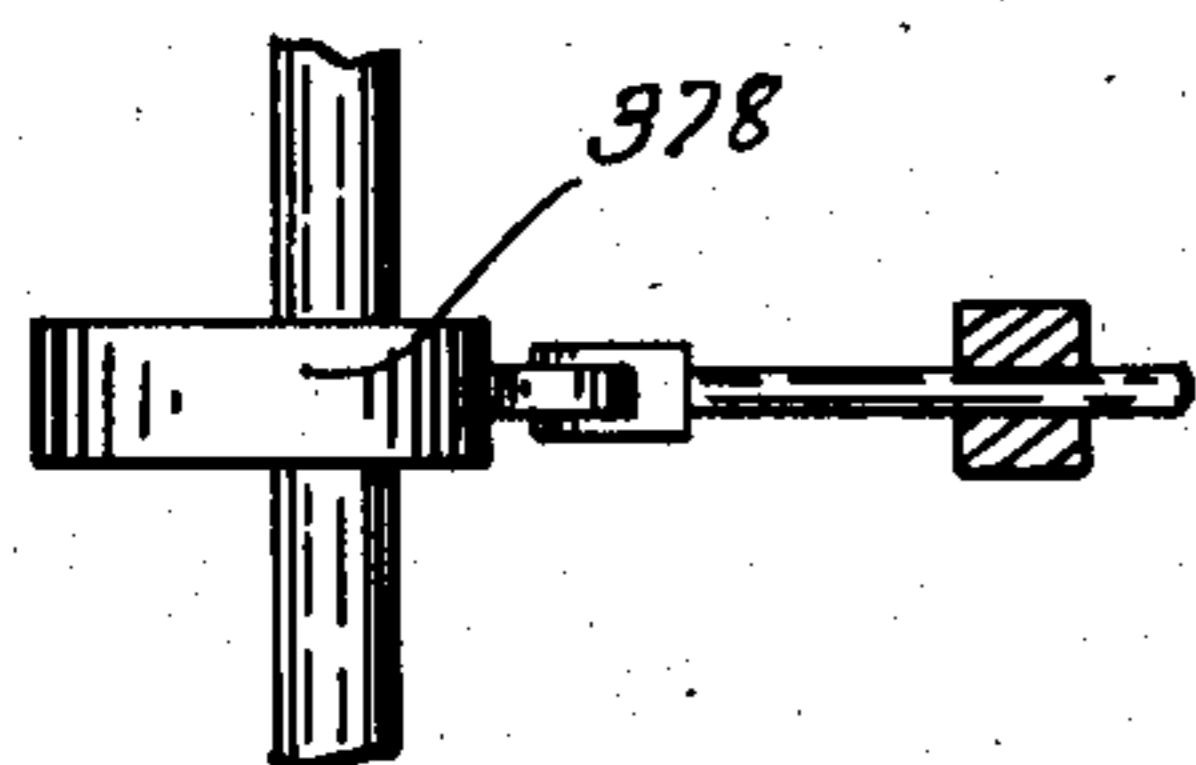
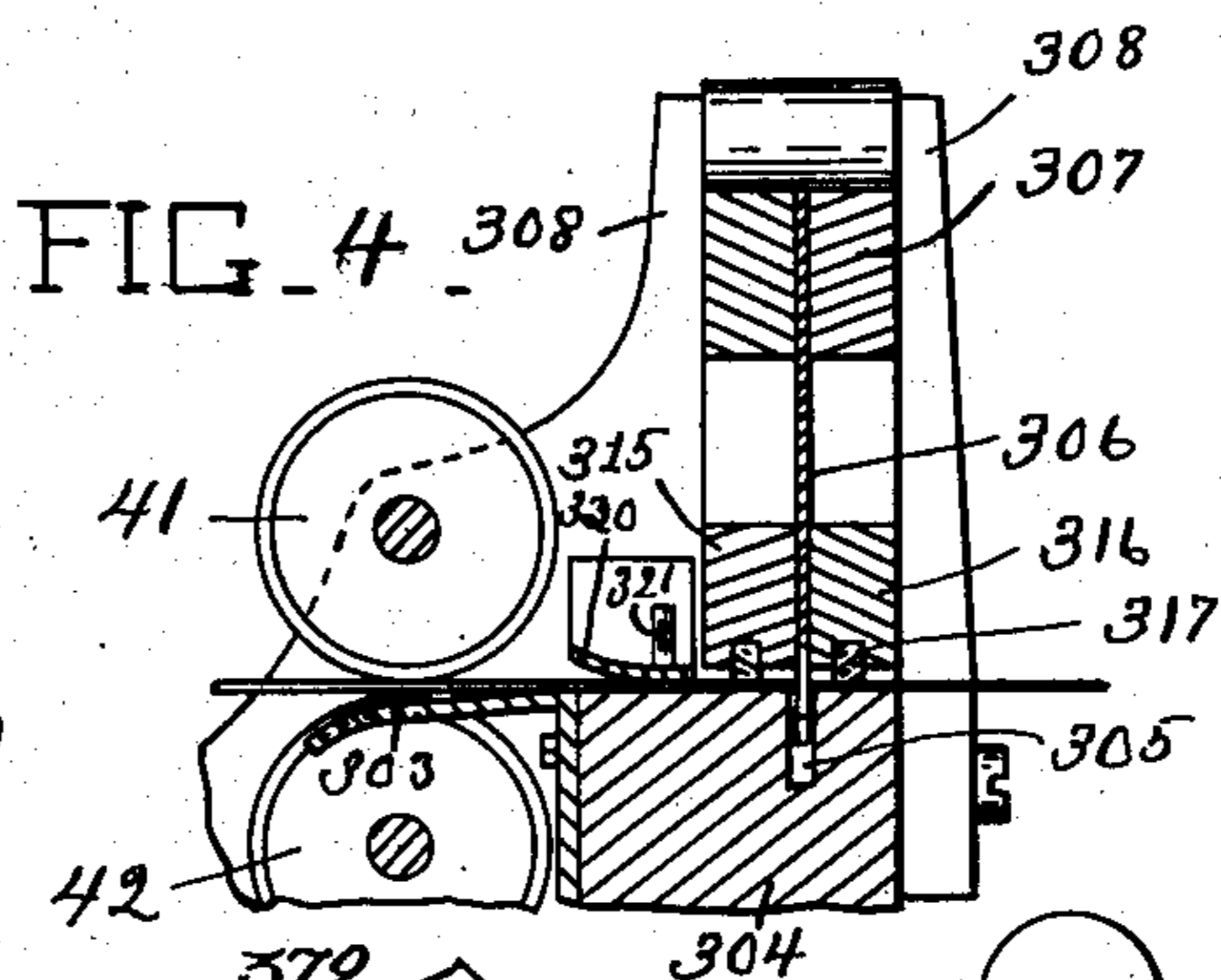
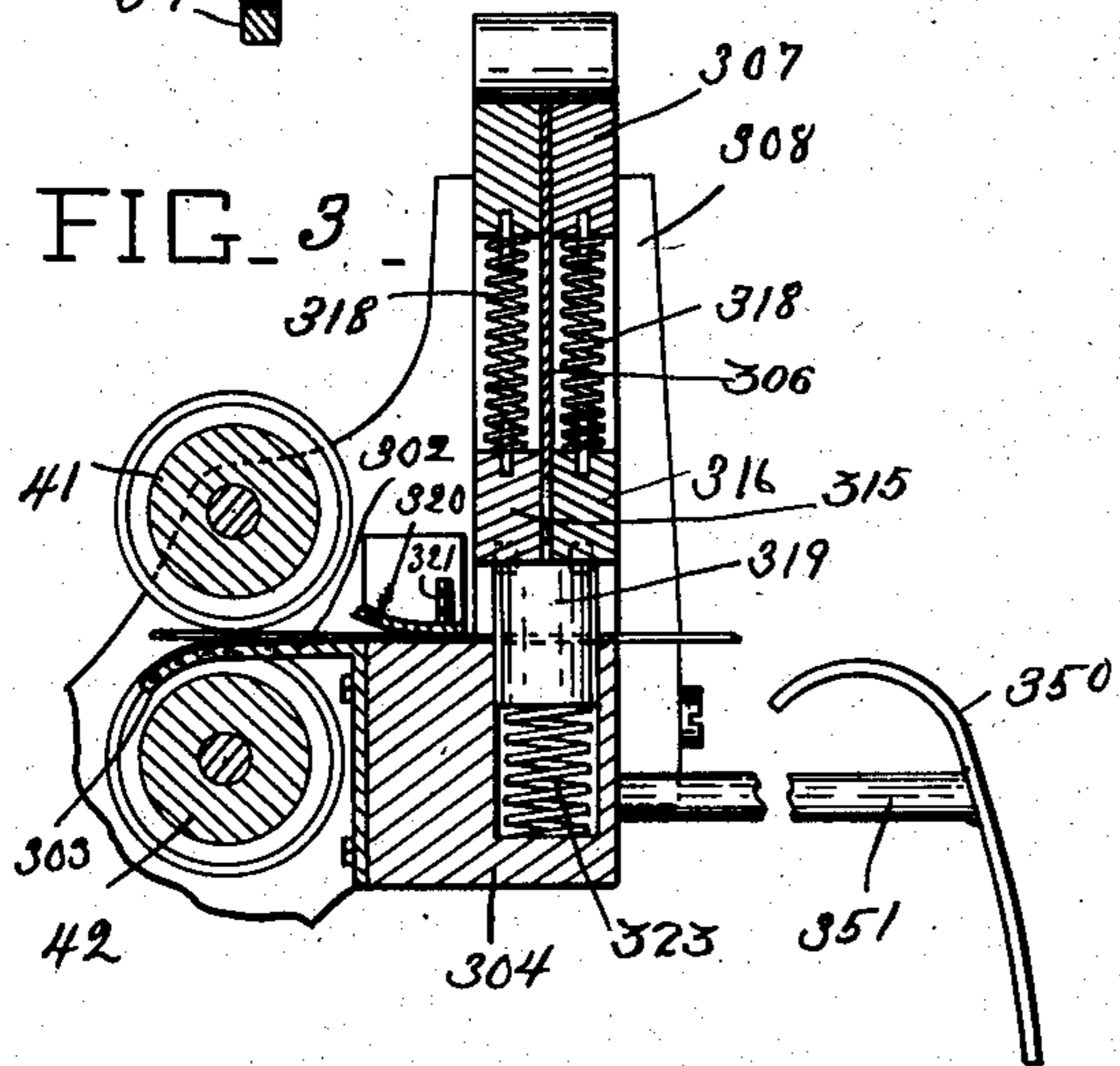
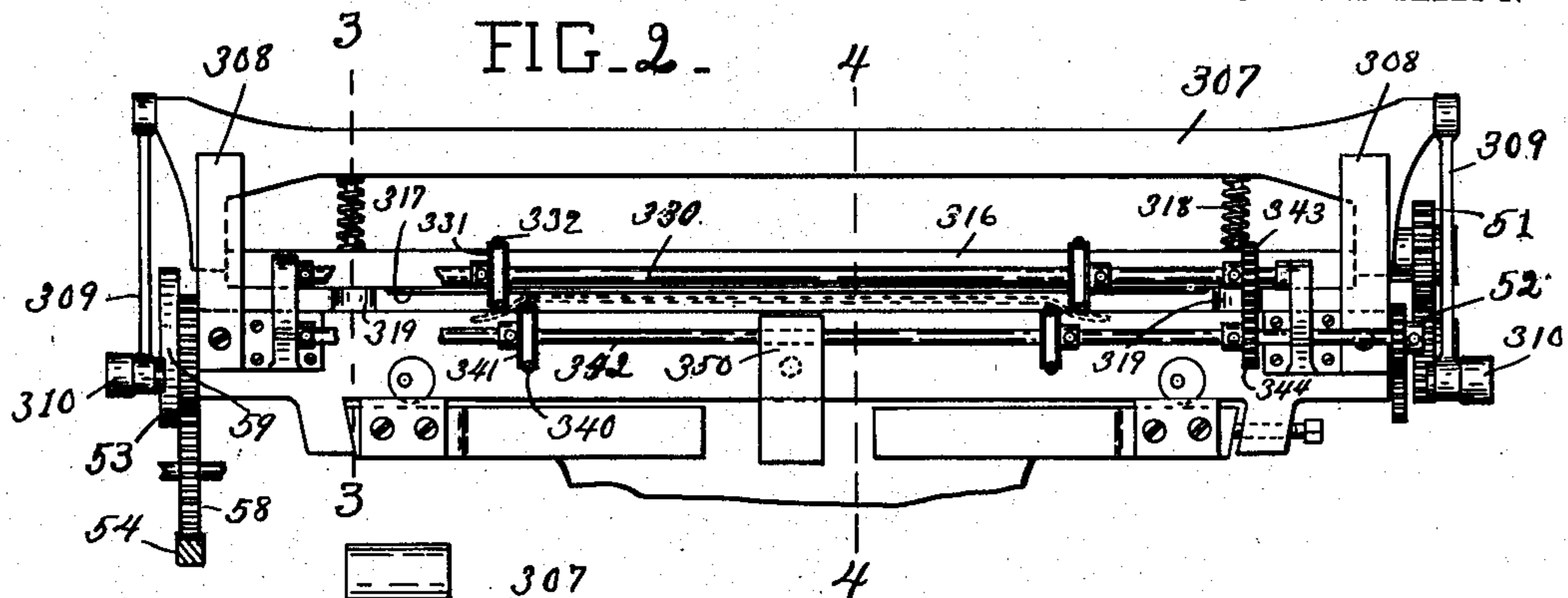


FIG. 6.

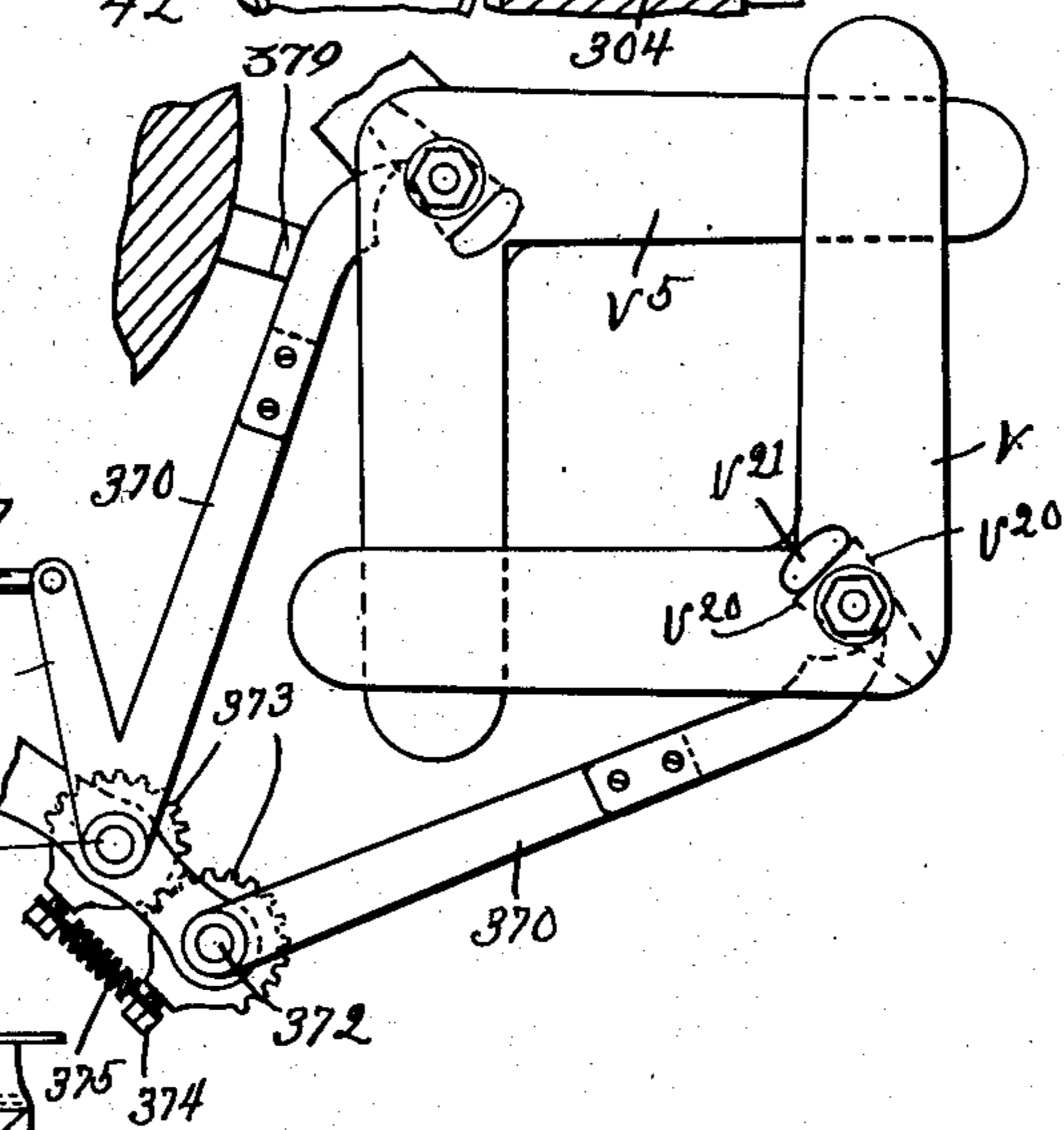
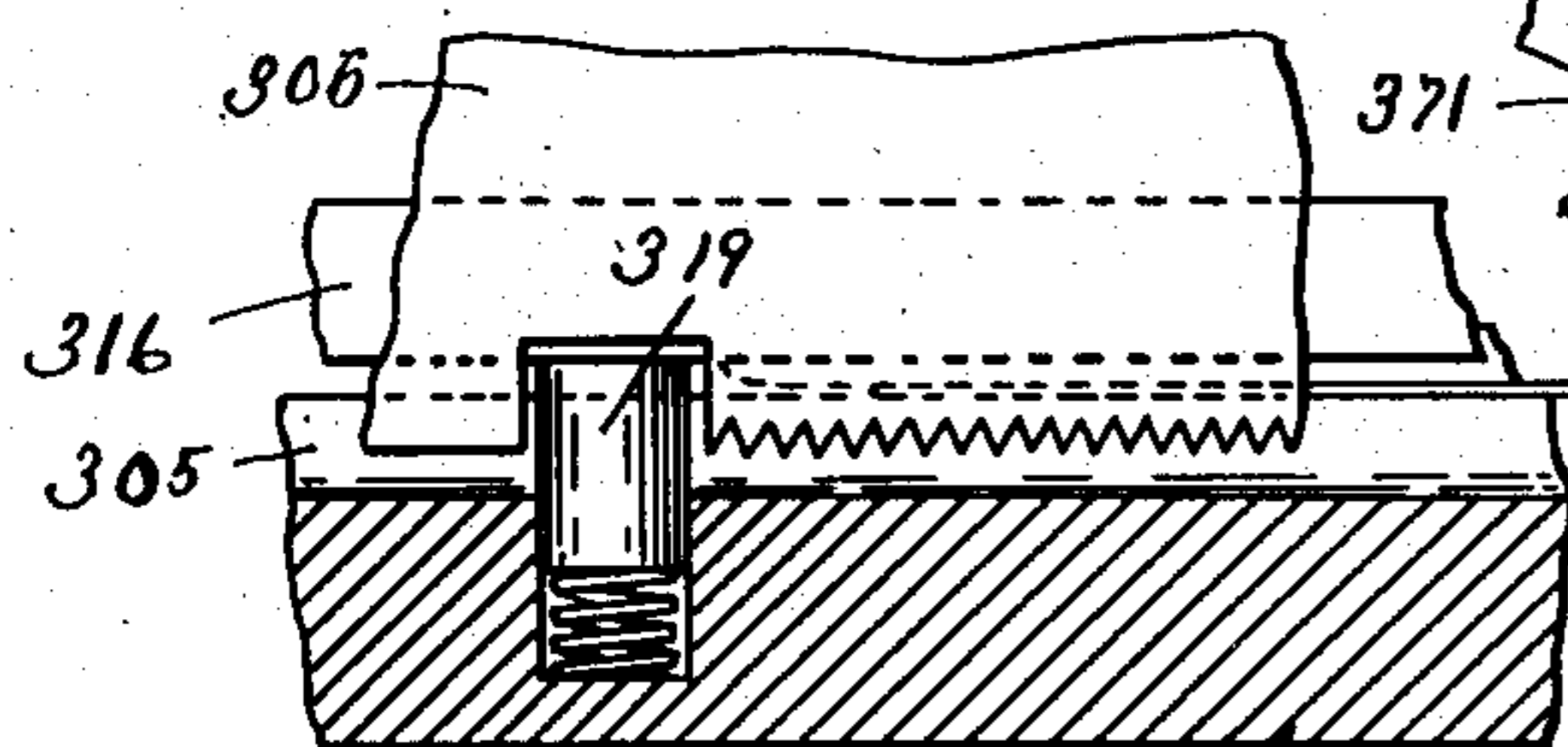
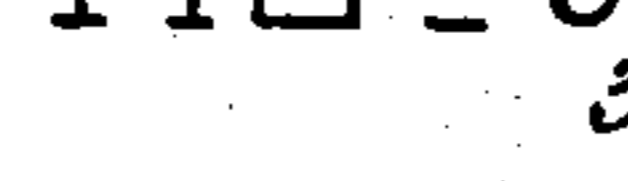


FIG. 5.

Witnesses:

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Att'y

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3 SHEETS—SHEET 3.

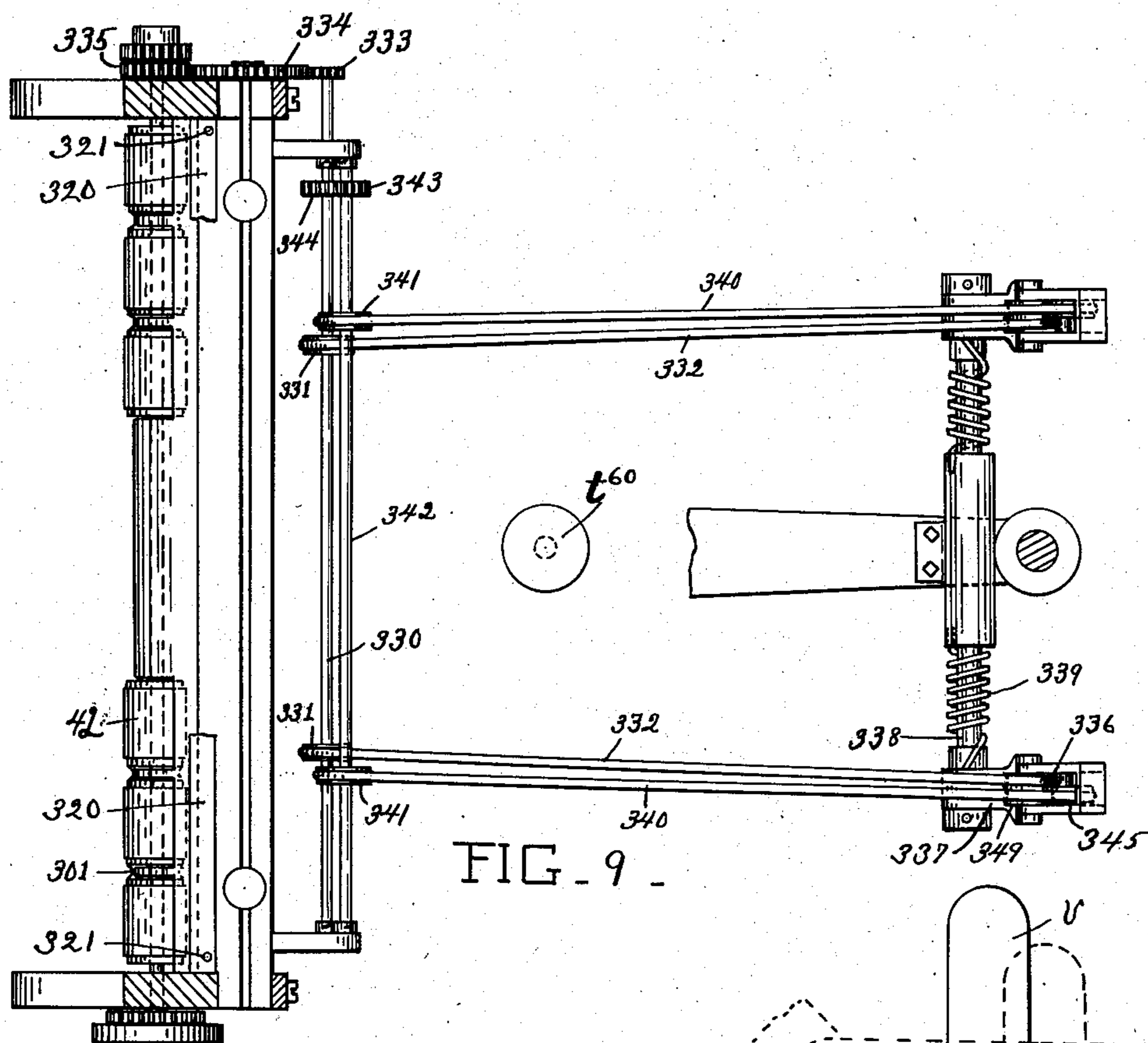
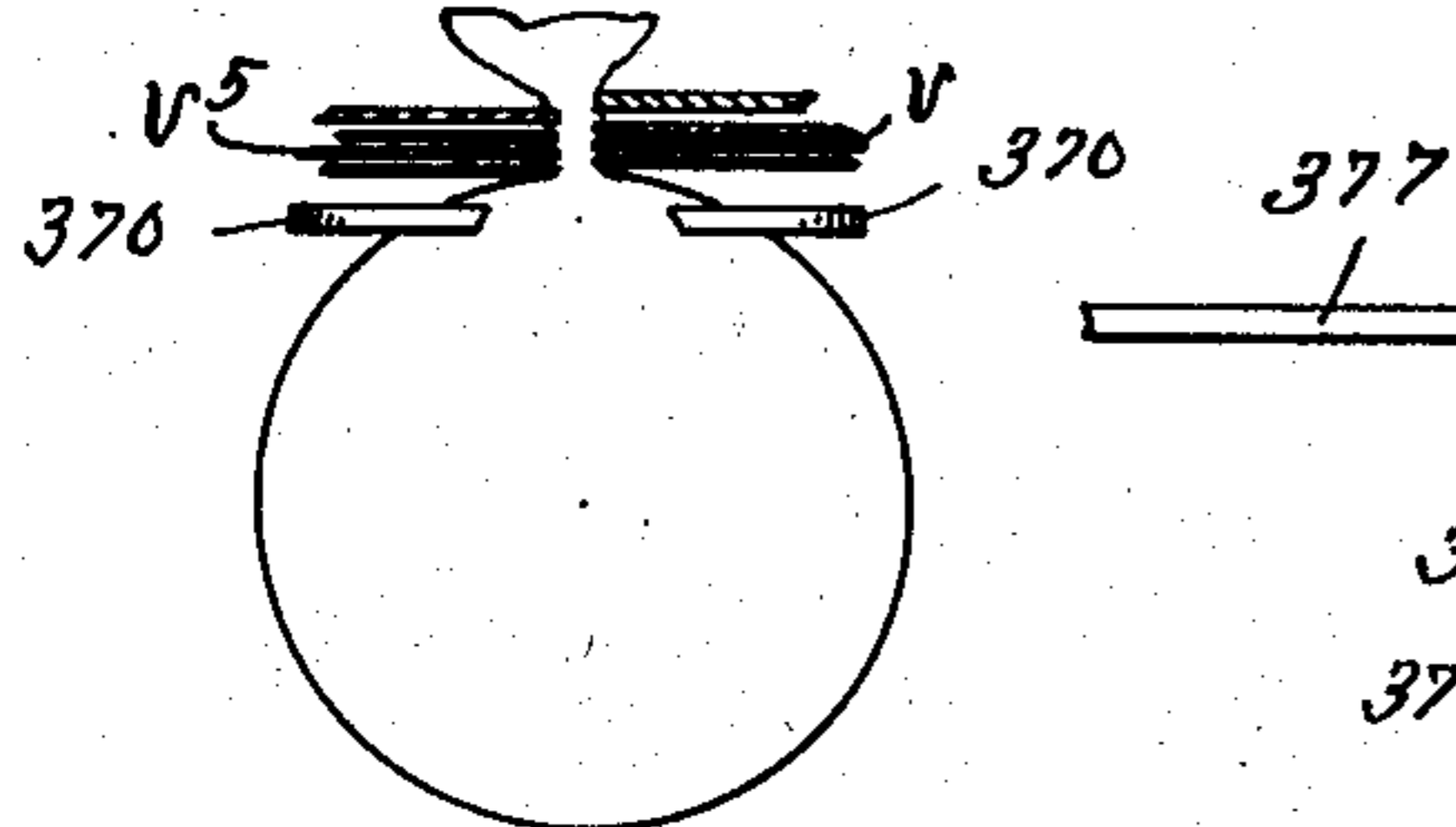


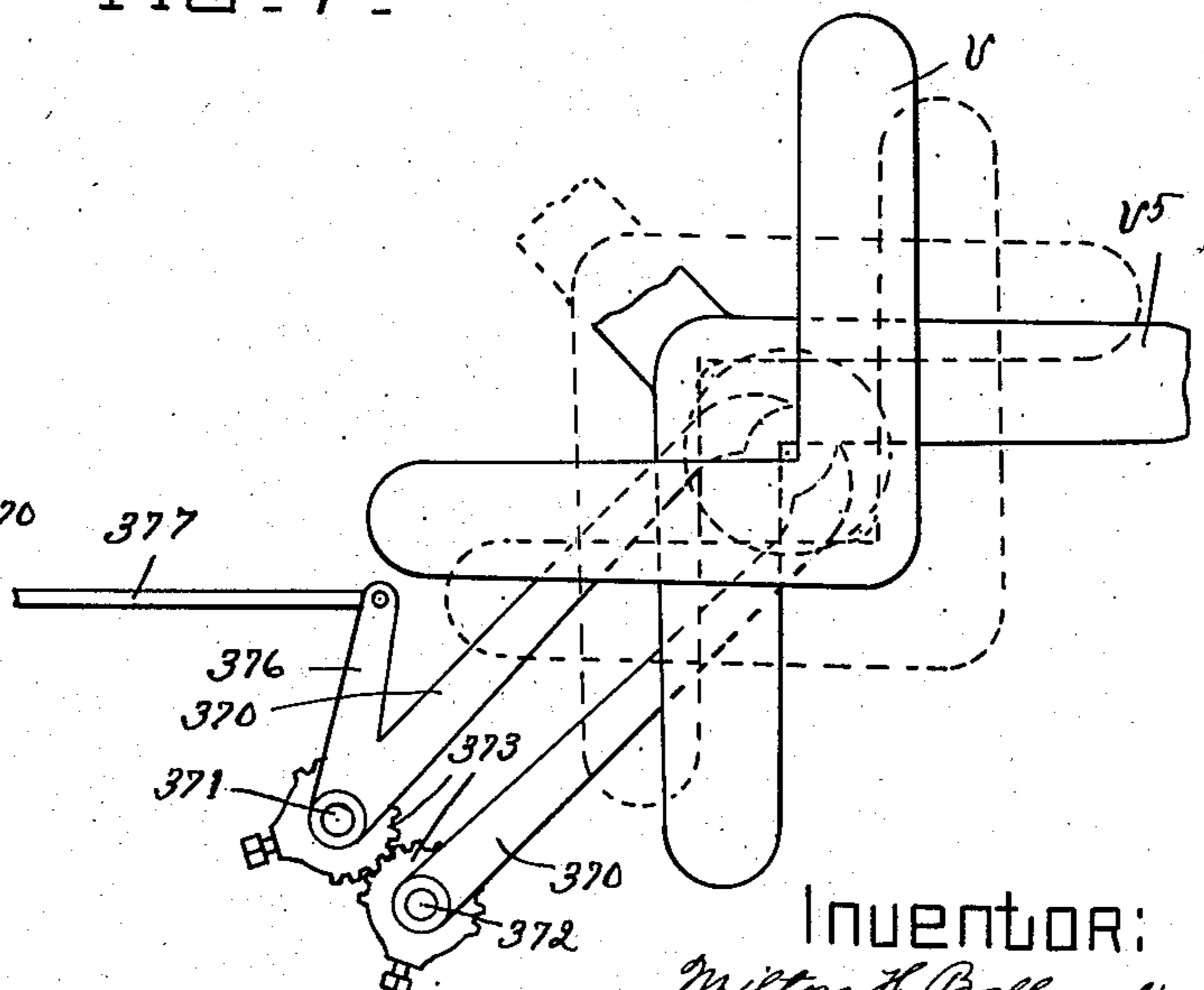
FIG. 9.



Witnesses:

H. B. Davis.

Maud M. Piper



INVENTOR:

Milton H. Ballard

FIG. 7 - *Melrose Ballard*  
*by Tracy & Harriman*  
*attys*

# UNITED STATES PATENT OFFICE.

MILTON H. BALLARD, OF LYNN, MASSACHUSETTS, ASSIGNOR TO TRIPP  
FRUIT WRAPPING MACHINE COMPANY, OF LYNN, MASSACHUSETTS,  
A CORPORATION OF MAINE.

## WRAPPING-MACHINE.

No. 827,285.

Specification of Letters Patent.

Patented July 31, 1906.

Application filed December 23, 1904. Serial No. 238,074.

*To all whom it may concern:*

Be it known that I, MILTON H. BALLARD, of Lynn, county of Essex, State of Massachusetts, have invented an Improvement in Wrapping-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to wrapping-machines, and is intended as an improvement upon the wrapping-machine shown and described in United States Patents No. 472,202, dated April 5, 1892; No. 516,136, dated March 6, 1894; No. 548,677, dated October 29, 1895; No. 595,421, dated December 4, 1897; No. 682,823, dated September 17, 1901, and the machine shown in my application for Letters Patent, Serial No. 193,392, filed February 13, 1904, said machine being especially designed for wrapping more or less spherical objects, such as oranges.

The invention has for its object to improve the construction of the severing device for the wrappers, to the end that the same may be sharpened and adjusted by an ordinary workman, thereby obviating the services of an experienced mechanic; also, to provide means, such as movable paper-engaging devices, for engaging the loose end portion of the strip of paper which is fed forward by the feeding device between the cooperating members of the cutting device and feed it forward into proper position relative to the wrapping devices and hold it at rest while the cutting device severs it and thereafter hold the severed end portion or wrapper at rest until it is disengaged therefrom; also, to provide a stationarily-supported guide at a point adjacent the rest, on which the article reposes while being, wrapped so located with respect thereto as to direct the article downward in its regular vertical course, even though acted upon by certain forces tending to divert it; also, to provide means for holding the wrapped article relative to its support while the jamming or pinching jaws or members recede from each other to thereby obviate pulling the wrapped article away from the rest; also, to provide means of escape from the jamming-jaws of the small pieces of paper which frequently become detached from the corrugated neck of the wrapper.

Figure 1 shows in side elevation a sufficient portion of a wrapping-machine to illustrate my invention. Fig. 2 is a front elevation of the severing device for the wrapper and the paper-feeding device. Fig. 3 is a vertical section of the severing device, taken on the dotted line 3 3, Fig. 2, the knife being shown in its elevated position. Fig. 4 is a vertical section of the severing device, taken on the dotted line 4 4, Fig. 2, the knife being shown in its lowermost position. Fig. 5 is an enlarged detail showing a portion of the knife. Fig. 6 is a detail showing in plan view the jamming or pinching device and means for holding the wrapped article while the members of the jamming or pinching device move away from each other. Fig. 7 is a detail similar to Fig. 6, the means for holding the wrapped article being in position to engage the wrapped article. Fig. 8 is a detail showing the wrapped article in connection with the jamming or pinching device and means for holding the wrapped article. Fig. 9 is a detail showing in plan view the paper-feeding device, and means for holding the severed wrapper in correct relation to the wrapping devices.

The paper from the paper-carrying roll is fed to the cutting-off device by means of a pair of positively-driven feed-rolls 41 42. The feed-rolls each have secured to them at one end a toothed gear 51 52, and said gears are in engagement with each other, and the lowermost feed-roll 42 has secured to it at its opposite end a flanged disk 59 and has loosely mounted on its shaft a toothed gear 53, bearing pawls (not shown) adapted to engage the flange of said disk 59, and a toothed gear 58 engages said gear 53, which is engaged by a rack-bar 54, loosely connected to the upper end of an arm 55, pivoted at its lower end to the framework. As the arm 55 is oscillated the rack-bar 54 will be reciprocated and the feed-rolls positively driven.

Each feed-roll has a plurality of circumferential grooves or spaces 301, to thereby provide a plurality of paper-engaging portions, and a guide-plate 302 is located between the pair of feed-rolls and the cutting device, upon which the paper rests as it is moved along, and said guide-plate has fingers 303, which extend between the rolls 41 42 and occupy positions in the circumferential grooves 301. The guide-

plate 302 is secured to a frame-bar 304, having a flat top over which the paper is fed, and said frame-bar extends transversely the machine and is made wider than the strip of paper and has formed in its upper face a groove 305, extending longitudinally thereof, which is adapted to receive the lower or cutting edge of a vertical knife 306, employed for cutting the paper to form the wrappers. The guide-plate and frame-bar, to which it is attached, serve as a guide or table upon which the paper rests as it is fed by the feed-rolls to the cutting-off device.

The vertical knife 306 is carried by a cross-head 307, extending transversely the machine, and the lower edge of said knife, which is adapted to serve as the cutting edge, is corrugated and sharpened, to thereby present a series of sharpened teeth as a cutting edge. The cross-head 307 is guided at its ends by vertical guides 308, extending upward from the frame, and the opposite ends of said cross-head are connected by links 309 to the extremities of arms 310, secured to a transversely-disposed rod 312, having its bearings in the framework, and one of said arms 310 is loosely connected by a link 70 to one end of a lever 71, pivoted at 72, the other end of said lever being connected by a link 73 with one end of a lever 313, pivoted at 314, the opposite end of which bears a stud 74, with or without a roll thereon, working in a groove 75, formed in a disk 76, secured to one of the operating-shafts of the machine. As the shaft revolves the arms 310 are moved up and down and the knife correspondingly moved.

To hold the paper, which is very thin, firmly on the guide or table while being cut, a pair of parallel presser-bars 315 316 are provided, which are located one each side of and contiguous the vertical knife, and said presser-bars each have upon their under sides a strip of rubber or equivalent yielding material, as 317, which is adapted to engage and hold the paper. These presser-bars being located at opposite sides of the knife serve to hold the paper firmly at opposite sides of the groove 305, so that as the knife descends its lower edge will enter said groove and cut the paper.

The presser-bars are supported in position and held down by spiral springs 318, which are vertically arranged between the cross-head and the presser-bars and which are held in place by pins projecting from the cross-head and presser-bars, and said presser-bars are held up to a normal elevation above the table by spring-pressed studs 319, two in number, set in sockets in the guide or table 304 near the opposite ends thereof. The studs are projected upward by the springs beneath them and are held in continuous engagement with the presser-bars. As the cross-head descends the presser-bars press down the yielding studs 319 until stopped by

engaging the paper on the guide 304, and then the springs 318 yield to permit the cross-head to continue its downward movement in order that the knife may sever the paper and enter the knife-receiving slot 305.

The paper used for wrapping oranges and most articles is very thin, and in practice much difficulty is experienced in cutting the paper with shears, as shown in the patents heretofore referred to, notwithstanding the care exercised, as the shears must be kept sharpened and also must be accurately adjusted to cut the thin paper, and the ordinarily-skilled workman cannot be depended upon to keep the shears in proper working order. Hence the employment of the knife, as herein shown and described. No adjustment is required for the knife and there is but one blade to sharpen. Therefore it possesses many advantages over the shears. Between the pair of paper-feed rolls 41 and 42 and the knife means are provided for continuously holding down the paper on the guide or table, and said means consists of a bar 320, having a slightly-curved under or paper-engaging face and having holes at each end to fit loosely upon pins 321, projecting upwardly from the guide or table, said pins thereby supporting the bar in correct position on the guide or table. This bar rests by gravity upon suitable shoulders formed on the pins 321 just above the paper. The cutting device and means for holding the paper at opposite sides of the knife while the knife operates to sever it form the subject-matter of a divisional application, Serial No. 290,110, filed by me.

The strip of paper is fed forward by the feed-rolls 41 42 a predetermined distance at each operation of the machine, and the end portion of the strip projecting from the feed-rolls passes beneath the knife and into correct position relative to the wrapping devices. Then the knife descends and severs the strip, and the severed portion thereof constitutes the wrapper.

Heretofore the end portion of the strip projecting from the feed-rolls has been pushed forward between suitable wires designed to support it in proper position relative to the wrapping devices; but in practice the wires are remotely disposed relatively to each other and do not grasp and thereby hold the wrapper, and in case a draft should strike the severed wrapper it will be blown away, and frequently the wrapper has a tendency to curl, and in either event its position relative to the wrapping devices is changed. Hence means are herein provided for engaging the end portion of the strip of paper projecting from the feed-rolls and while holding it taut conveying it to a proper position relative to the wrapping devices and after the end portion is severed to form the wrapper holding said severed portion or wrapper un-

til it is disengaged therefrom. The means herein shown for carrying out this part of my invention consists of movable paper-engaging devices adapted to engage the strip of paper near its edges and advance it, and, for the sake of illustration, said devices consist of two pairs of moving endless bands disposed in vertical planes and widely separated, the bands of each pair coöperating to engage the strip of paper at or near its edge, the lower bands of each pair being located beneath and the upper bands of each pair above the end portion of the paper projecting from the feed-rolls.

330 represents a shaft having its bearings in the frame and disposed transversely the machine close to the knife, and 331 331 are two grooved pulleys secured thereto over which the endless bands 332 pass, which bands are located beneath the paper. The shaft 330 has also secured to it a toothed gear 333, which engages an idle toothed gear 334, suitably supported by the frame, and said idle gear is engaged and driven by a toothed gear 335, secured to the shaft of the feed-roll 42.

The lower endless bands 332 occupy approximately a horizontal position, and said bands are located a short distance apart and on each side of the wrapping devices and extend to and pass over grooved pulleys 336, mounted to revolve freely in suitable bearings at the upper ends of upright arms 337, loosely mounted upon the opposite ends of a horizontal rod 338, which is fixed at a point intermediate its length to an arm of the main frame. The upright arms 337 thus support the outer ends of the endless bands, and said arms incline in a direction away from the shaft 330 and are held in their inclined positions by springs 339, which encircle the rod 338 and which are connected at their inner ends to the fixed support of the rod or bar and at their outer ends to the arms. The pressure of the springs acts to thrust the arms 337 in a direction away from the shaft 330, so that the arms besides supporting the outer ends of the endless bands will act independently in holding the endless bands taut.

The upper endless bands 340 are located in a plane above the bands 332, the inner ends of said bands 340 passing over grooved pulleys 341, secured to a horizontal shaft 342, disposed in parallellism with the shaft 330. The shaft 342 has secured to it a toothed gear 343, which is engaged and driven by a toothed gear 344, secured to the shaft 330. The outer ends of the endless bands 340 pass over grooved pulleys 345, supported near the extremities of the short arms 346, which are pivoted to the upper ends of the arms 337. The arms 346 each have short arms 347 extending from them, the extremities of which are connected by springs 348 with the arms 337, said springs acting to draw the arms 346

in a direction away from the shaft 342, to thereby hold the endless bands taut. On the shafts bearing the pulleys 336 grooved pulleys 349 are mounted, over which the bands 340 pass, said pulleys, however, serving only as guide-pulleys for the bands.

The bands 332 340 of both pairs move in the same general direction—that is, away from the knife—and as they are disposed one above the other the strip of paper projecting from the feed-rolls will be engaged by said bands and while held taut will be conveyed by them to the wrapping devices as the paper is fed forward, and said bands act to hold the strip while the knife operates to sever it and thereafter to hold the severed portion, constituting the wrapper, until said wrapper is positively disengaged therefrom. The bands engage the strip of paper near its side edges, and as they lead from the knife they gradually diverge, as shown in Fig. 9, so that while engaging the paper frictionally they will have a tendency to draw out gradually any wrinkles which may exist, and thereby hold the paper flat. The bands 332 and 340 are driven so that their surface speeds are greater than the surface speeds of the feed-rolls, so as to pull slightly on the paper, and thus insure it being drawn or held taut, and as the bands engage the strip frictionally this action of the bands is made possible.

The endless bands occupy positions at opposite sides of the rest  $t^{60}$ , upon which the article is thrust by the action of the plunger  $c'$ , and also upon opposite sides of the spring-arms  $u^8$ , which serve as the centering device for the article, and the upper and under bands engage and hold the wrapper in a plane between the rest  $t^{60}$  and the lower ends of the arms of the centering device, so that as the article is pushed down through the centering device onto the rest and passes between the two pairs of bands or other paper-engaging devices the wrapper will be engaged thereby and partially or wholly disengaged from the bands, and as the rest descends with the article and wrapper upon it said wrapper, if not previously disengaged, will then be disengaged from the bands.

If for any reason the paper should not be completely severed by the knife or if the severed end of the wrapper should become caught at a point adjacent the knife, the tendency is for the article to be swerved to one side of its normal path of progress by the wrapper thus caught while being thrust down by the plunger  $c'$ , and to obviate such irregular movement of the article a guide is employed which is located at a point adjacent the rest  $t^{60}$ , said guide acting to direct the article downward and hold it in its proper position on the rest  $t^{60}$  in case the inner end of the wrapper should not be free. The guide herein shown for the sake of illustrating this feature of my invention consists of a curved

plate 350, secured to an arm 351, extending from the framework. This guide may be made adjustable in and out.

In the machine herein shown a jamming or  
 5 pinching device for the wrapper is employed, which is similar to that shown in Patent No. 595,421, comprising, essentially, two piles of slightly-separated angularly-formed plates  $v$   
 $v^5$  and means for moving them toward and  
 10 from each other, and these plates jam or pinch the wrapper, so as to produce a corrugated neck. It sometimes happens that the material of the wrapper becomes wedged between the plates of the jamming or pinching  
 15 device in such manner that as the two members recede from each other the corrugated neck of the wrapper will follow one of the members when disengaged from the other member, and as a result the wrapped article  
 20 will be pulled away from the rest  $t^{80}$  to one side, and herein means are provided for obviating this difficulty.  $v v^5$  represent the jamming or pinching jaws or members, which occupy horizontal planes and which when  
 25 moved toward each other engage the wrapper and form a corrugated neck. In a plane slightly below the two piles of plates  $v v^5$  a pair of jaws 370 are located, which also move in horizontal planes. These jaws are pivoted  
 30 at 371 372 and have secured to their pivots toothed gears 373, which engage each other so that the two jaws 370 will move in opposite ways in unison. A pin 374 projects radially from each toothed gear, and said pins  
 35 are connected together by a spring 375, the tendency of which is to throw the jaws apart, as shown in Fig. 6, until one of them strikes a stop 379. An extension 376 is formed on the arm of one of the jaws 370, to which a rod 377  
 40 is connected, having a roll thereon which engages a cam-disk 378, secured to one of the main shafts of the machine. By means of this cam the jaws 370 will be moved toward each other. The movement of the jaws 370  
 45 toward each other is sufficient to engage the wrapped article just below the jamming or pinching device, and the action of the cam is so timed that said jaws will remain in engagement with the wrapped article while the jam-  
 50 ming or pinching jaws recede, or at least for a part of the receding movement of said jaws. The jaws 370 thus engage the wrapped article and hold the wrapper in position thereon while the jamming or pinching jaws recede,  
 55 even though the material of the wrapper should become wedged between the plates of the jamming or pinching device.

As the jamming device severely compresses and corrugates the neck of the wrapper, small pieces of the wrapper frequently become detached, and particularly when  
 60 very thin paper is employed, and many of these small pieces of paper congregate between the several plates composing the jaws. Heretofore the separating-plates, which are

disposed between the jamming-plates of each jaw, have been made with two straight edges at right angles to each other, and they have been so disposed between the plates of each jaw, that said straight edges are in parallel-  
 70 ism with the wrapper-engaging edges of the jamming-plates of the other jaw, and while some of the small pieces of paper are ejected from between the jamming-plates of each jaw by the jamming-plates of the other jaw  
 75 working in the spaces between the plates many pieces accumulate next the straight edges of the separating-plates, which instead of being ejected will be crowded against said straight edges until masses accumulate at  
 80 these points, which are sometimes sufficient to limit the movement of the jamming-plates toward each other, and thereby shorten the stroke. In such event the neck of the wrapper will not be perfectly formed and corru-  
 85 gated. To obviate thus crowding together the small pieces of paper in a mass against the edges of the separating-plates, said separating-plates of each jaw are herein formed with wedge-shaped portions  $v^{20} v^{20}$ , (see Fig. 6,) pointing in directions at right angles to  
 90 each other and to the wrapper-engaging edges of the jamming-plates of the other jaw, so that as the jaws move toward each other the jamming-plates of each jaw will approach  
 95 the apices of the wedge-shaped portions  $v^{20} v^{20}$  of the separating-plates in direct lines and the small pieces of paper will be pushed toward said wedge-shaped portions and will be  
 100 diverted thereby in different directions. The small pieces which are directed along on the outside edges of the wedge-shaped portions of the separating-plates escape freely; but to  
 105 provide for the escape of the small pieces which are directed along on the inside edges of the wedge-shaped portions of said plates the several jamming-plates composing each jaw, with the exception of the lowermost one, are  
 110 each provided with a hole  $v^{21}$  through it adjacent the separating-plates at a point between the two wedge-shaped portions  $v^{20} v^{20}$  of the separating-plates, and up through these holes the small pieces of paper are free to and do  
 115 escape. The holes will be made of any suitable size and shape.

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

1. In a wrapping-machine, the combination of a paper-carrying roll, a paper-cutting  
 120 device, a paper-feeding device located between said roll and cutting device, means located at the opposite side of said cutting device adapted to engage the end portion of the  
 125 strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip, and thereafter hold the  
 130 severed end portion at rest, and means for

forcing the article into engagement with said severed end portion and for disengaging it, substantially as described.

2. In a wrapping-machine, the combination of a paper-carrying roll, an intermittently-operated paper-cutting device, an intermittently-operated paper-feeding device located between said roll and cutting device, intermittently-operated paper-engaging devices, located at the opposite side of said cutting device adapted to engage the end portion of the strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip, and thereafter hold the severed end portion at rest, and means for forcing the article into engagement with said severed end portion and for disengaging it from said engaging devices, substantially as described.

3. In a wrapping-machine, the combination of a paper-carrying roll, a paper-cutting device, a paper-feeding device located between said roll and cutting device, a pair of widely-separated paper-engaging devices located at the opposite side of said cutting device adapted to engage the edges of the end portion of the strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip, and thereafter hold the severed end portion at rest, and means for forcing the article into engagement with said severed end portion and for disengaging it from said engaging devices, substantially as described.

4. In a wrapping-machine, the combination of a paper-carrying roll, a paper-cutting device, a paper-feeding device located between said roll and said cutting device, paper-engaging devices located at the opposite side of said cutting device adapted to engage the end portion of the strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip and thereafter hold the severed end portion at rest, means for intermittently and simultaneously operating said paper-feeding device and said paper-engaging devices, and means for forcing the article into engagement with said severed end portion and for disengaging it from said engaging devices, substantially as described.

5. In a wrapping-machine, the combination of a paper-carrying roll, an intermittently-operated paper-cutting device, an intermittently-operated paper-feeding device located between said roll and cutting device, paper-engaging devices connected with said feeding device and operated simultaneously therewith, which are located at the op-

posite side of said cutting device, and adapted to engage the end portion of the strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip and thereafter hold the severed end portion at rest, and means for forcing the article into engagement with said severed end portion and for disengaging it from said engaging devices, substantially as described.

6. In a wrapping-machine, the combination of a paper-carrying roll, an intermittently-operated paper-cutting device, a pair of feeding-rolls located between said roll and cutting device, means for operating them simultaneously, two pairs of intermittently-operated endless belts located at the opposite side of said cutting device adapted to engage the edges of the end portion of the strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip, and thereafter hold the severed end portion at rest, and means for forcing the article into engagement with said severed end portion and for disengaging it from said belts, substantially as described.

7. In a wrapping-machine, the combination of a paper-carrying roll, an intermittently-operated paper-cutting device, a pair of feeding-rolls located between said roll and cutting device, means for operating them intermittently, two pairs of endless belts located at the opposite side of said cutting device, adapted to engage the edges of the end portion of the strip of paper which is fed forward by the feeding device, between the cooperating members of the cutting device, and feed it forward, and hold it at rest while the cutting device severs the strip, and thereafter hold the severed end portion at rest, means connecting the driving-shaft of said belts with the driving-shaft of the feeding-rolls, whereby they are intermittently operated in unison and simultaneously with said feeding-rolls, and means for forcing the article into engagement with said severed end portion and for disengaging it from said belts, substantially as described.

8. In a wrapping-machine, the combination of a set of jamming or pinching jaws for the wrapper, and means for operating them, means for forcing the article and wrapper down between said jaws and for supporting the article while said jaws operate, a pair of pivoted jaws, moving in a plane below said jamming or pinching jaws, gears connected to said jaws which engage each other, and means for operating said jaws to engage the wrapped article and hold it relative to its support while the jamming or pinching jaws recede, substantially as described.

9. In a wrapping-machine, the combina-

tion of means for holding the article with its wrapper, and a set of jamming or pinching jaws for the wrapper, each jaw comprising several wrapper-engaging plates and separating-plates interposed between them, and bolts securing said plates together, said wrapper-engaging plates having holes through them adjacent said separating-plates, which provide for the escape of small pieces of paper, substantially as described.

10. In a wrapping-machine, the combination with means for holding the article with its wrapper, a set of jamming or pinching jaws for the wrapper, each composed of a pile of jamming or pinching plates, and separating-plates interposed between said jamming or pinching plates having wedge-shaped portions pointing at different angles, said jamming or pinching plates having holes through them, adjacent said separating-plates, between the wedge-shaped portions thereof, substantially as described.

11. In a wrapping-machine, the combina-

tion with means for holding the article with its wrapper, a set of jamming or pinching jaws for the wrapper, each composed of a pile of two-armed jamming or pinching plates, the arms of which are arranged at right angles to each other, and separating-plates interposed between said jamming or pinching plates having two wedge-shaped portions pointing at right angles to each other, the inner side edges of said wedge-shaped portions being in alinement, said jamming or pinching plates having holes through them, at the junctions of the arms thereof, at points between the two wedge-shaped portions of the separating-plates, substantially as described.

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

MILTON H. BALLARD.

Witnesses:

B. J. NOYES,

H. B. DAVIS.