

No. 875,884.

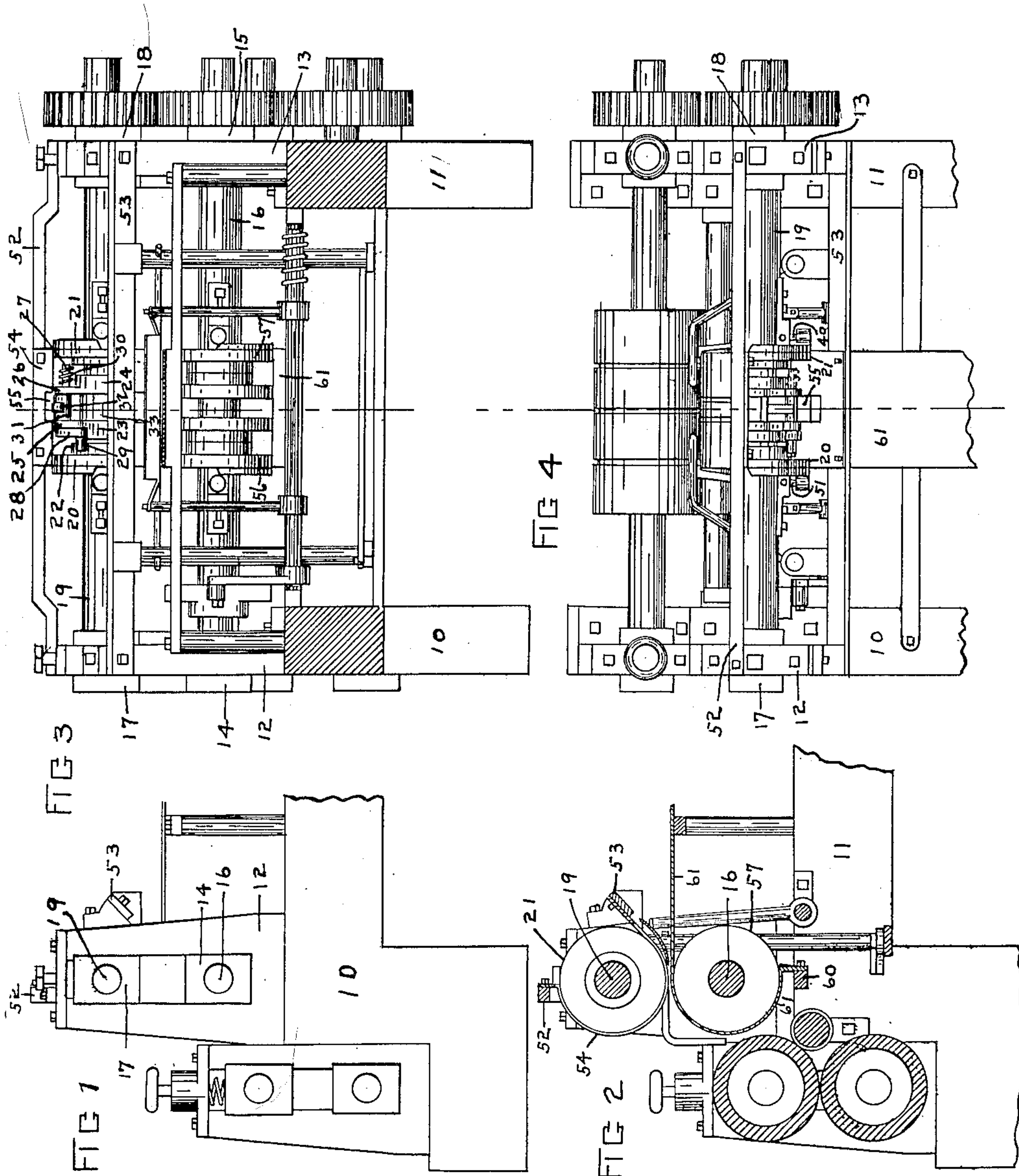
PATENTED JAN. 7, 1908.

P. L. BARTHOLOMEW.

GRIPPING AND FOLDING DEVICE FOR PAPER BAG MANUFACTURING MACHINES.

APPLICATION FILED APR. 26, 1907.

2 SHEETS—SHEET 1.



WITNESSES
Frank Steiner
Blanche Sedgwick

INVENTOR
Phineas L. Bartholomew
BY *Jell & G. Roe*
ATTORNEY

No. 875,884.

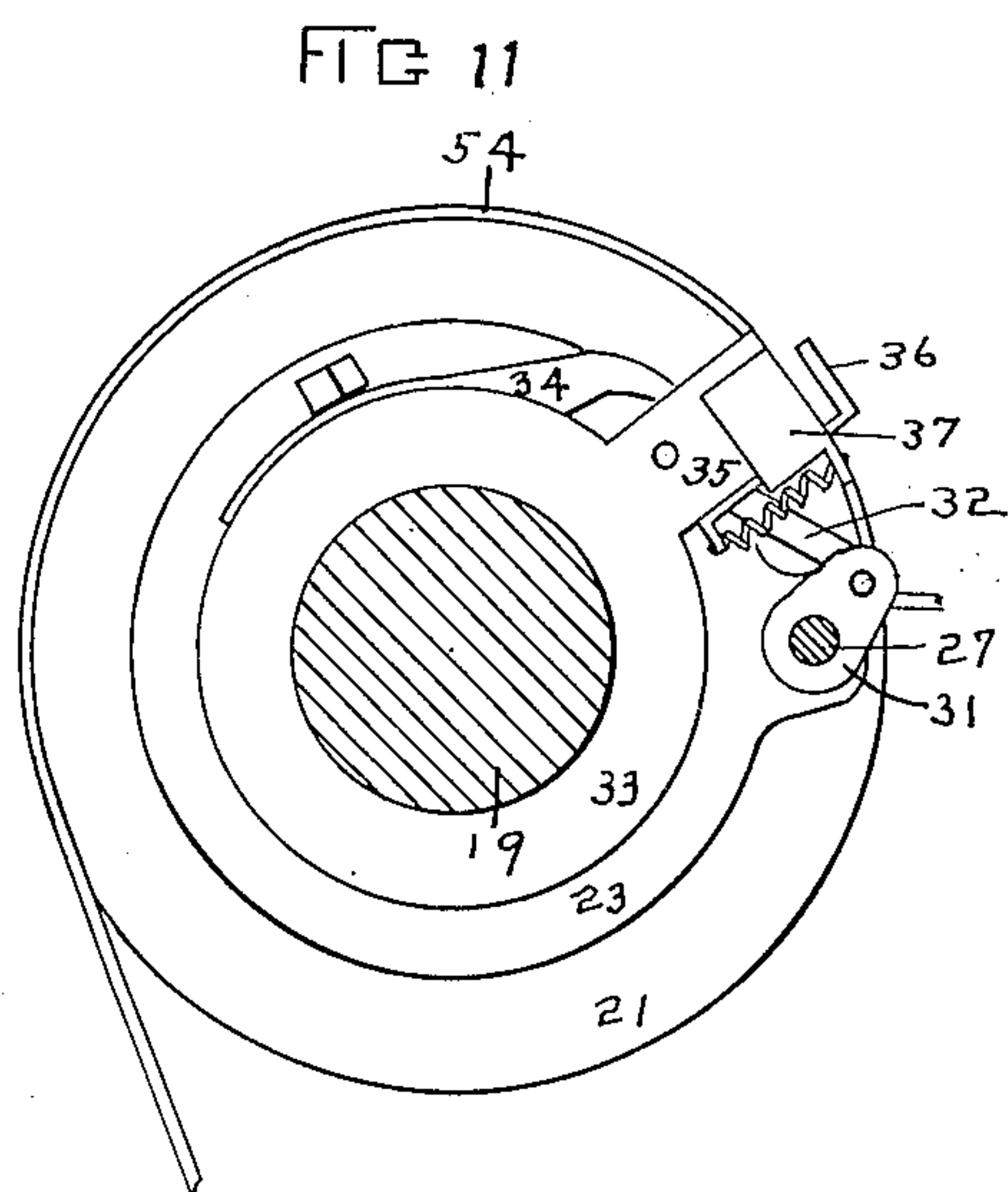
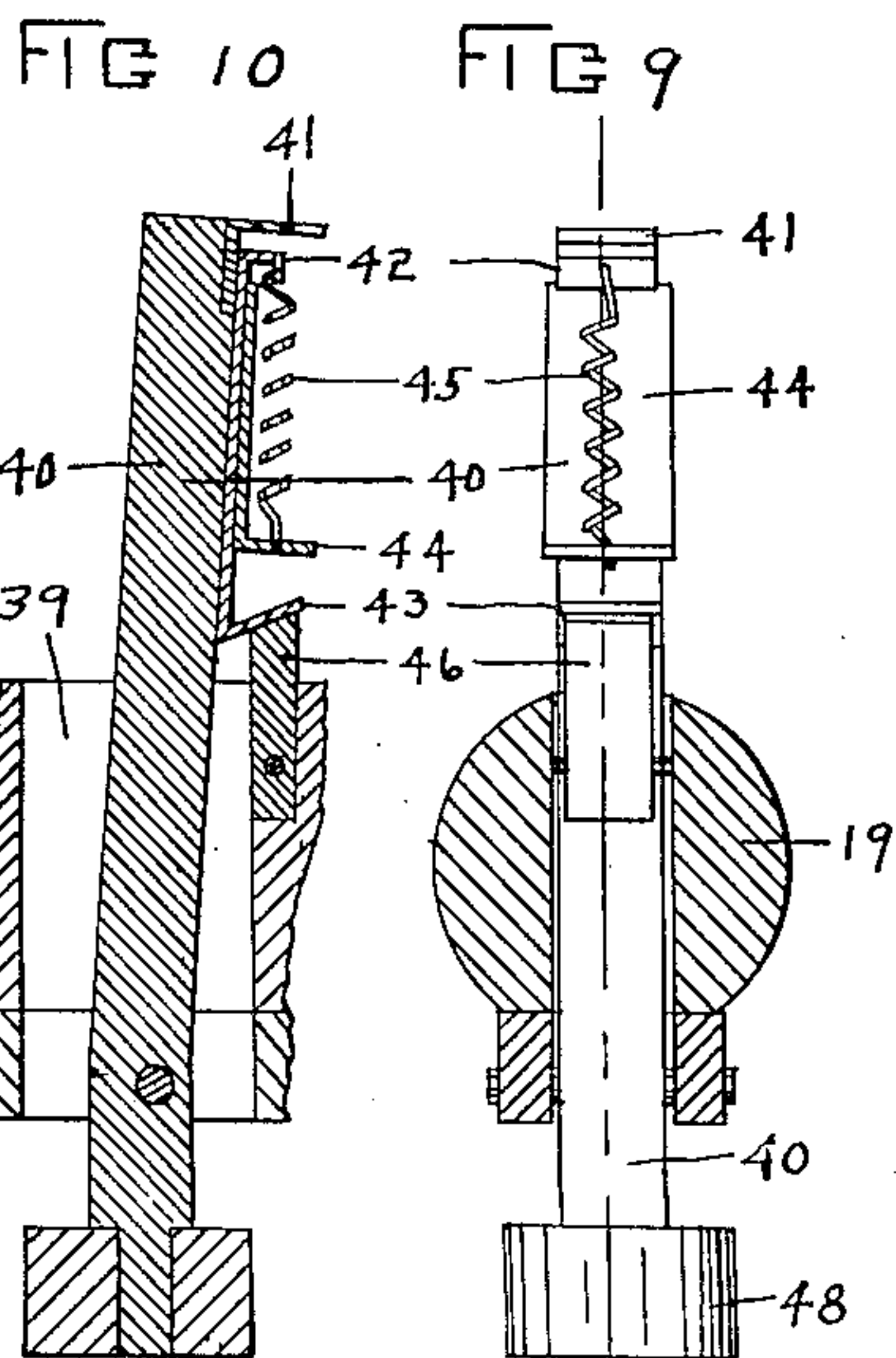
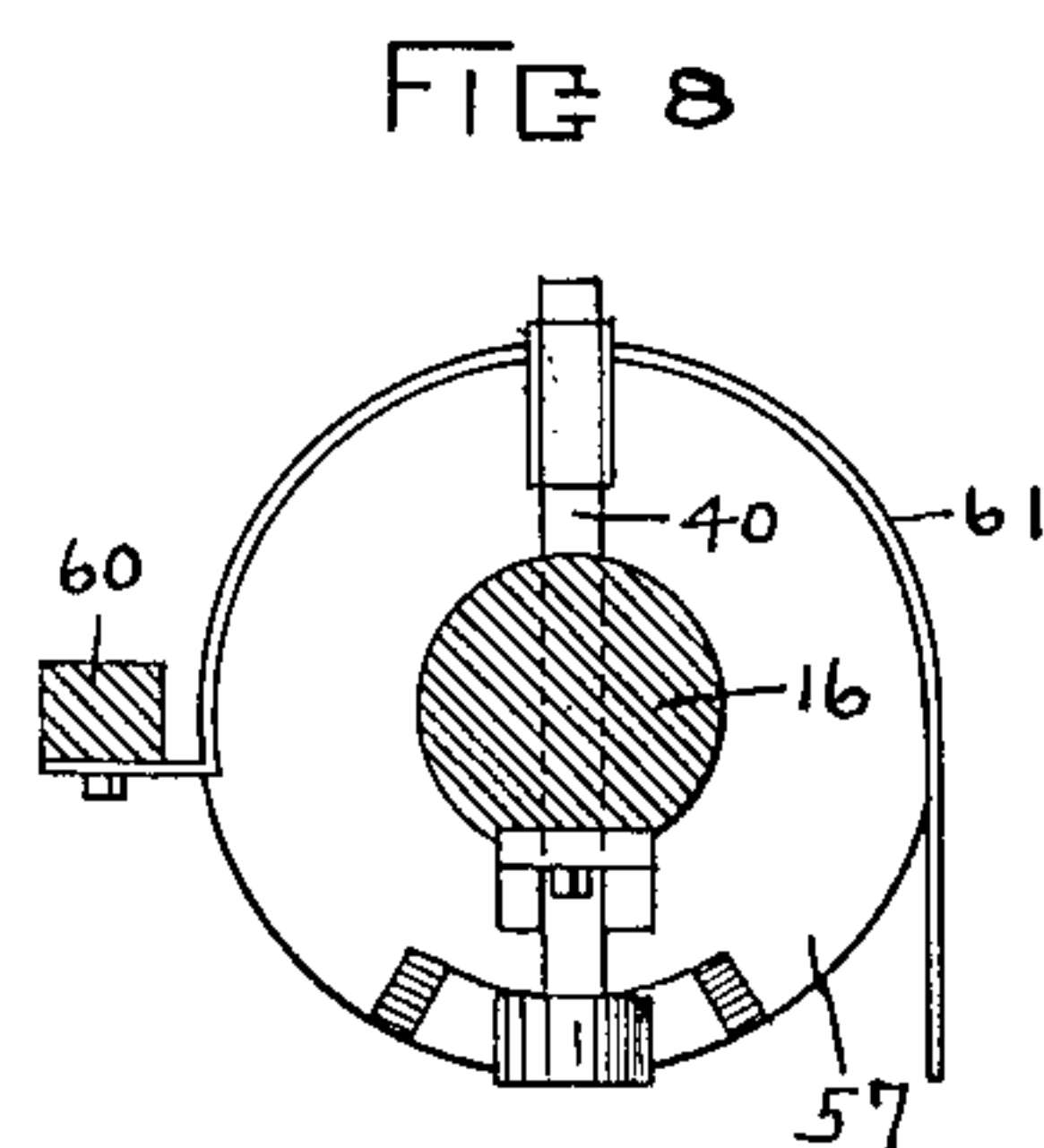
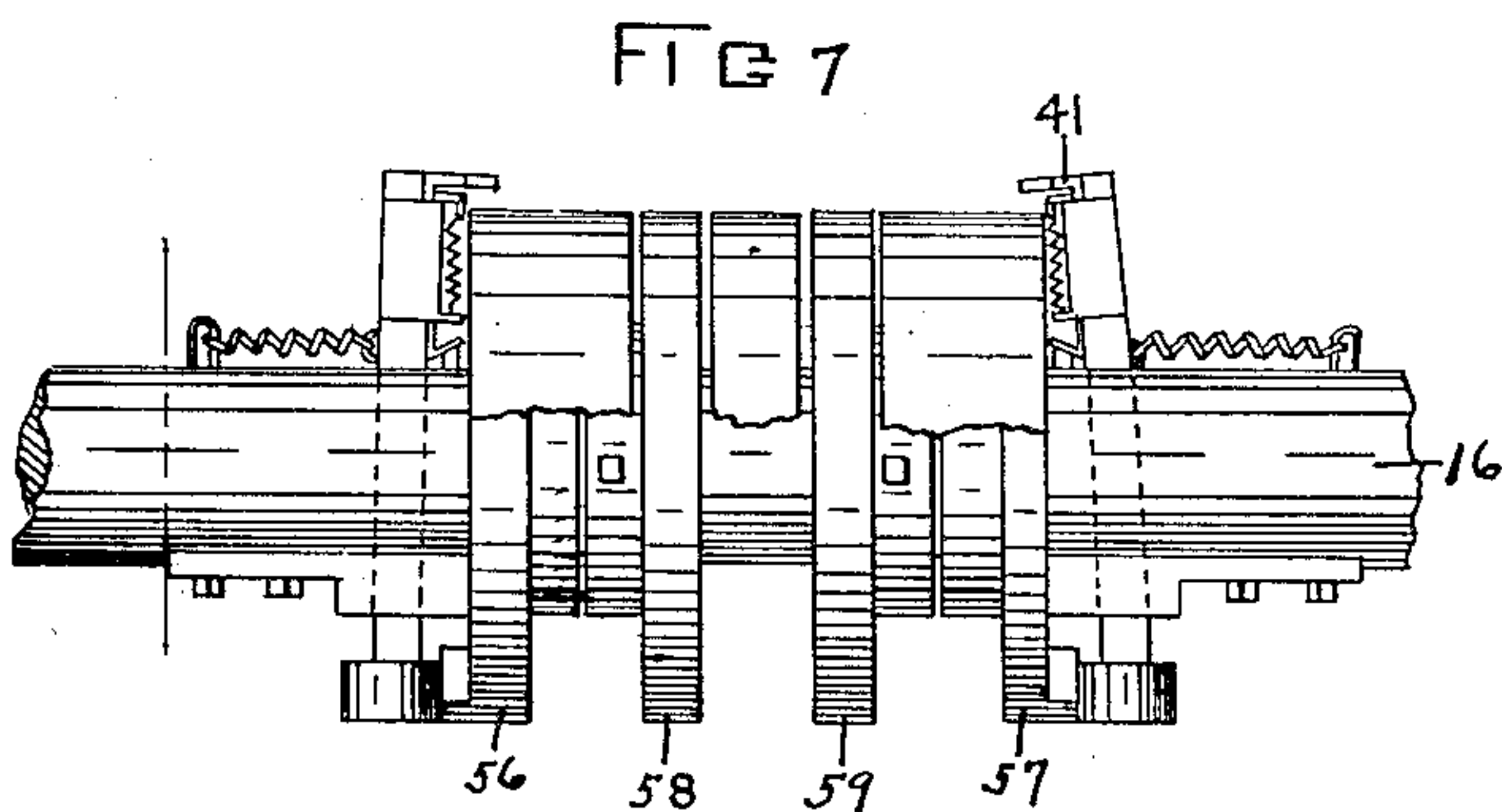
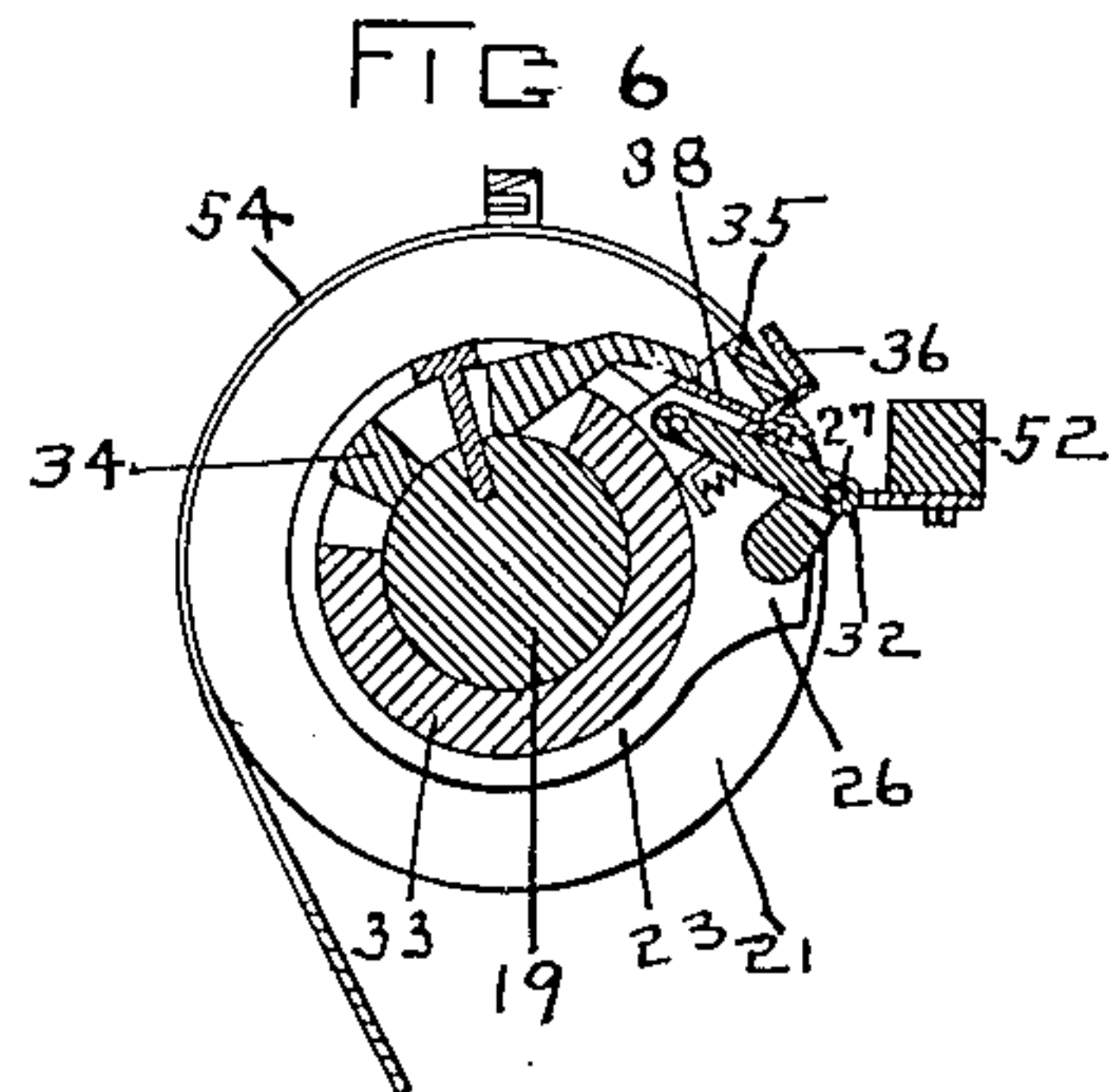
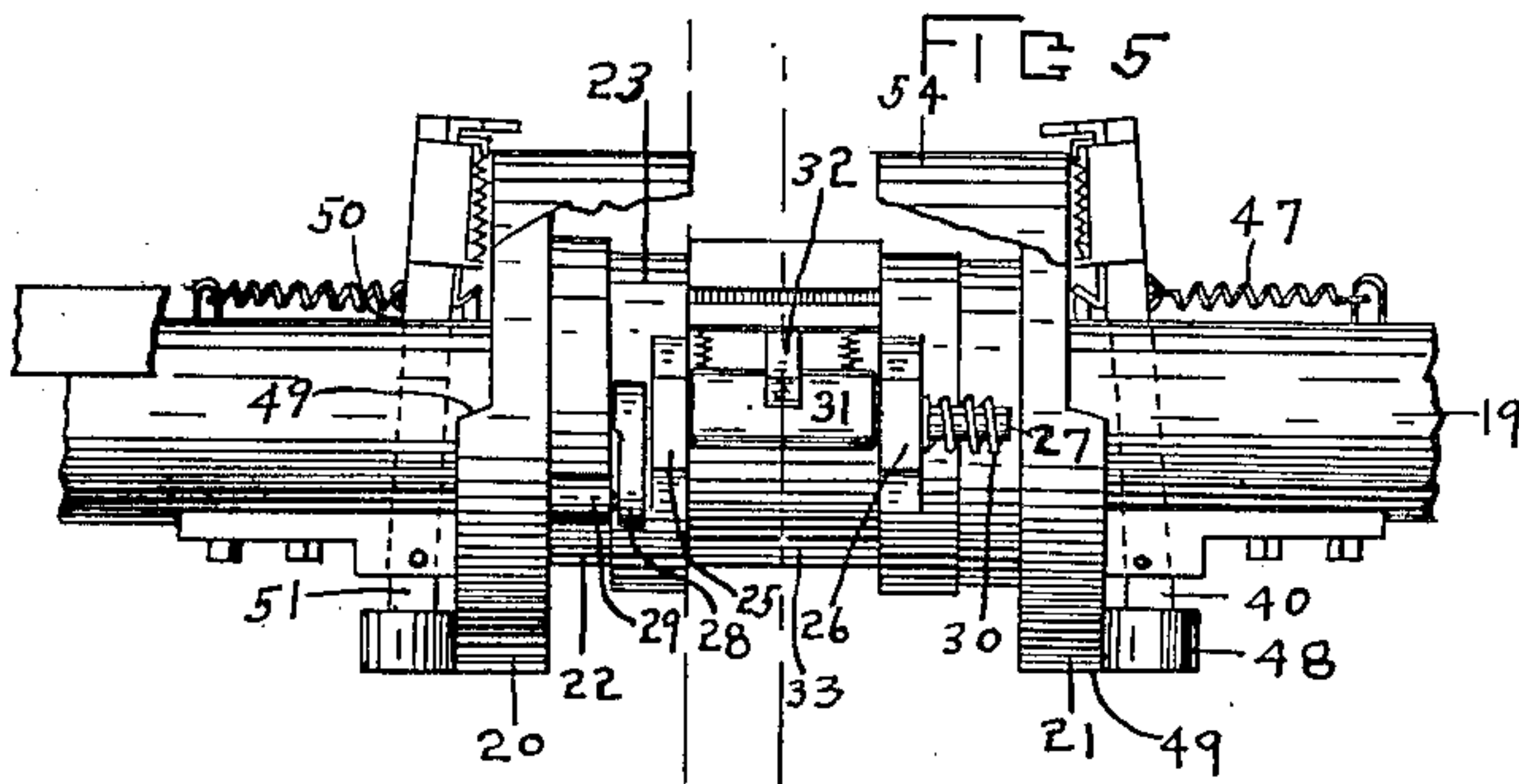
PATENTED JAN. 7, 1908.

P. L. BARTHOLOMEW.

GRIPPING AND FOLDING DEVICE FOR PAPER BAG MANUFACTURING MACHINES.

APPLICATION FILED APR. 26, 1907.

2 SHEETS—SHEET 2.



WITNESSES
Frank Steiner
Blanche Sedgwick

INVENTOR
Phineas L. Bartholomew
BY Jell S. Row
ATTORNEY

UNITED STATES PATENT OFFICE.

PHINEAS L. BARTHOLOMEW, OF AURORA, ILLINOIS.

GRIPPING AND FOLDING DEVICE FOR PAPER-BAG-MANUFACTURING MACHINES.

No. 875,884.

Specification of Letters Patent.

Patented Jan. 7, 1908.

Application filed April 26, 1907. Serial No. 370,420.

To all whom it may concern:

Be it known that I, PHINEAS L. BARTHOLOMEW, a citizen of the United States, residing in Aurora, county of Kane, and State of Illinois, having invented a new and useful Improvement in a Gripping and Folding Device for Paper-Bag-Manufacturing Machines, of which the following is a specification.

The object of my device is to provide, in a paper bag manufacturing machine, a means adapted to grip the severed portion of a bag tube and to produce therein the diamond fold common in paper bags now in use.

A further object is to provide such a means in which all of the various parts will be exposed to view, so that they may be easily and quickly regulated and adjusted, thus obviously doing away with any and all cylinders, in this portion of a paper bag manufacturing machine.

Another object is to produce such a device in a simple, strong, durable and comparatively inexpensive construction.

My invention consists of certain details of construction hereinafter set forth, pointed out in my claims and illustrated in the accompanying drawings in which,

Figure I shows a side elevation view of that portion of a paper bag manufacturing machine wherein are journaled the shafts bearing the various parts of the gripping and folding device; Fig. II shows a transverse sectional view of the same; Fig. III shows a rear end elevation view of the gripping and folding device which I employ, a portion of said view being in section; Fig. IV shows a plan view of the gripping and folding device; Fig. V shows a detail view of the upper shaft I employ; Fig. VI shows a transverse sectional view of the same; Fig. VII shows a detail view of the lower shaft I employ; Fig. VIII shows a detail view of the same; Fig. IX shows a detail view of one of the side gripper fingers I employ; Fig. X shows a transverse sectional view of the same; and, Fig. XI shows a detail view of the central gripper which I employ.

Referring to the accompanying drawings the reference numerals 10 and 11 are used to indicate the side rails, forming the frame of my paper bag manufacturing machine, and the numerals 12 and 13 indicate standards mounted, respectively, on the said rails and designed to receive and retain journal boxes 14 and 15 respectively, in which is mounted, for rotation, a shaft 16.

The numerals 17 and 18 indicate journal boxes mounted in the standards 12 and 13 respectively, directly above and in line with the journal boxes 14 and 15 respectively, said journal boxes 17 and 18 being designed to receive, for rotation, a shaft 19 adapted to operate as a companion to the shaft 16, as will be hereinafter explained.

The numerals 20 and 21 each indicates a disk secured near the central portion of the shaft 19 said disks being exactly similar in every respect and separated by a distance slightly less than the width of the bag tube and the said disks are loosely secured to the said shaft in such a manner as to permit the shaft to rotate within them. Mounted to the said shaft 19 and adjacent to the inner portion of the disk 20 is a cam 22, designed for purposes hereinafter set forth. Mounted between the disks 20 and 21 and near the central portion of the shaft 19 are two other disks 23 and 24 said disks being exactly similar in every respect and separated by a distance equal to the width of the centrally located tongue shaped cut portion in the upper section of the paper tube, said disks being rigidly secured to the said shaft.

I have not illustrated or described the means by which the bag lengths are severed, or partially severed, prior to being engaged by the gripping and folding device, as the said means is not a part of this invention and I will not now describe the condition of the bag tube as it approaches the folding and gripping device, except to say—the upper portion thereof has a centrally located U shaped cut which produces a projecting tongue shaped part, and it is to this part that I have just referred. The said disks 23 and 24 are each provided with lugs 25 and 26, said lugs being exactly similar in every respect and designed to receive a shaft 27 mounted, for rotation, therein said shaft being provided on one end with an arm 28 on which is mounted at right angles an anti-friction roller 29 designed to engage the cam 22, as will be hereinafter explained, and mounted on the opposite end of the shaft 27, and having one of its ends secured to the lug 26, is a coil spring 30, designed to actuate the said shaft. Mounted on the said shaft 27 and between the lugs 25 and 26 is a U shaped bearing 31 said bearing being pivotally secured to a projecting arm 32 for purposes hereinafter set forth.

The numeral 33 indicates a loose ferrule

mounted between the lugs 25 and 26, said ferrule being provided with a centrally located elongated orifice, and rigidly secured to the shaft 19 in said orifice, is a retaining lug or
5 buffer 34 provided with a rearwardly extending portion.

The numeral 35 indicates an upwardly extending, inverted, U shaped lug secured to the said ferrule and between the arms of
10 the said lug, the arm 32 hereinbefore described is secured. Engaging the upper surface of the said lug 35 is a gripper finger 36 said gripper finger being composed, preferably, of a strip of sheet metal, the rear end
15 of said gripper finger extending downwardly from the side of the lug nearest to the shaft 27 to a point below the arm 32 the said strip of sheet metal being provided with a recess to admit of the passage of the said arm 32.
20 The two sides, on the divided lower extremity of the rear portion of said strip of sheet metal, each forms a mounting for one end of a coil spring the upper end of each of said springs being secured to a second strip of
25 sheet metal 37, the said metal strip 37 being rigidly secured to the said lug 35.

The numeral 38 indicates a lug projecting forwardly between the arms of the U shaped lug 35, said lug 38 being secured to the strip
30 of sheet metal forming the gripper finger 36, and designed to be engaged by the rearwardly extending portion on the lug 34, as will be hereinafter explained.

Extending transversely through the shaft
35 19, at a point immediately without the disk 21, is an orifice 39 and loosely mounted in said orifice, and having its bearings either directly in the said shaft 19 or in lugs secured to the said shaft as shown in Fig. III of the
40 drawings, is a lever 40, said lever projecting on one side of said shaft to a point slightly beyond the plane of the periphery of the disk 21, and rigidly secured to the said end of said lever, and extending inwardly therefrom, is
45 a gripper finger 41.

The numeral 42 indicates a companion gripper finger located immediately below the under surface of the gripper finger 41, said gripper finger 42 extending downwardly
50 along the surface of the lever and provided at its base with a shoulder 43. The gripper finger 42 is loosely secured to the lever 40 by means of a collar 44, and is adapted for upward and downward movement therein.

55 The numeral 45 indicates a coil spring having its upper end secured to the gripper finger 42 and its lower end secured to the collar 44 said spring being designed to actuate the said gripper finger 42.

60 The numeral 46 indicates a lug mounted on the shaft 19 said lug being designed to be engaged by the lower end of the gripper finger 42, as the lever 40 moves forwardly from its pivotal mounting in the shaft 19, and the
65 numeral 47 indicates a coil spring secured to

the outer surface of the lever 40 and the shaft 19, said spring being designed to actuate the said lever. Secured to the opposite end of the lever 40 is an anti-friction roller
70 48 designed to be engaged by the lug 49 mounted on the disk 21, as the shaft 19 revolves.

Mounted in the shaft 19, immediately outside the disk 20, is an orifice 50 designed as a companion for the orifice 39, and in said orifice
75 is mounted a lever 51, exactly similar in every respect to the lever 40, said lever 51 being provided with a gripper finger, and the second spring actuated gripper finger, anti-friction roller, coil springs and lugs exactly
80 similar, as stated, to those mounted on the lever 40 the two said levers 40 and 51 being designed to operate as companions in gripping the upper fold of the bellows shaped bag tube, as the same passes into the gripping
85 device.

The numeral 52 indicates a cross-bar secured to the standards 12 and 13 immediately above the shaft 19, and mounted to said cross-bar, and extending downwardly there-
90 from and curving outwardly, downwardly and rearwardly, around the disks 20 and 21, is a plate 54 the opposite end of said plate being secured to a cross-bar 53 and the lateral edges of said plate being secured to the
95 periphery of the disks 20 and 21 respectively, thus obviously causing the plate to be partially circular in conformation.

The numeral 55 indicates a longitudinal orifice extending centrally through said
100 plate from a point near the forward end to a point near the rear end thereof, said orifice being of sufficient width to permit of the passage therethrough of the lug 35 bearing the gripper finger 36
105

The numerals 56 and 57 indicate disks, loosely mounted on the shaft 16, similar to each other and exactly similar to the disks 20 and 21 and mounted in line therewith, and immediately outside of each of said disks I
110 have mounted, transversely, in the shaft 16, a lever bearing gripper fingers actuated by springs, and being designed, in their entirety, to be exactly similar to the levers, gripper fingers, springs, anti-friction roller and lugs
115 as described for the levers 40 and 51, and further designed to operate as companions with each other for gripping the lower fold of the bellows shaped paper bag as the same passes into the said gripping device. Mount-
120 ed rigidly on the shaft 16 between the said disks 56 and 57 are disks 58 and 59 designed to be of the same diameter as the aforesaid disks 56 and 57. Mounted to the rails 10 and 11, at a point below the shaft 16, is a
125 cross-bar 60 and secured to said cross-bar is a plate 61 extending forwardly and upwardly therefrom in a curved plane and rearwardly between the disks mounted to the shaft 16 and the disks mounted in the rear of the
130

standards 10 and 11, said plate being secured to the peripheries of the disks 56 and 57, and being provided with longitudinal channels to permit of the passage therethrough of the said disks 58 and 59.

In practical operation, the bag tube approaching the gripping and folding portions of my machine, the same has been either totally or practically severed into bag lengths and there has also been provided, in the upper section, a forwardly projecting tongue shaped portion, and as this said tongue shaped portion enters between the plates 54 and 61 the lug 35 bearing the gripper finger 36 is immediately in advance of, and in line with, the same. At exactly the right moment, which is secured by timing the gear wheels which I employ to drive my mechanism, the cam 22 forces the anti-friction roller 29 and the arm 28 outwardly thus obviously forcing backward the arm 32 and as this said arm is rigidly secured to the aforesaid loose ferrule it is equally obvious that the entire ferrule, bearing the said gripper finger, will be forced backward toward the approaching tongue shaped cut portion. The coil springs designed to actuate the gripper finger 36, cause the normal position of the same to be in a position removed from its companion lug, but as the said ferrule bearing the said lug and gripper finger is forced rearwardly toward the approaching tongue shaped cut portion in the upper section of the bag tube, the lug 38 engages the under surface of the rearwardly projecting portion of the lug 34, rigidly secured to the shaft 19 within the orifice in the said ferrule, and it is obvious that the said movement will force the lug 38 bearing the gripper finger 36 downwardly, clamping the said gripper finger firmly to its companion lug, and this operation is so timed as to cause the said clamping to take effect at the precise moment that the tongue shaped cut portion in the upper section of the bag tube is between the said companion lug and the gripper finger, thus effectually gripping this portion of the bag tube. By construction the lug 35 is of such a length as to cause it to travel in a plane equal to the plane of the periphery of the disks 20 and 21. As the bag tube continues to feed between the said plates 54 and 61, the gripper fingers secured to the shafts 16 and 19 perform their functions at the proper time, the gripper fingers on the shaft 19 gripping the upper section of the bellows shaped bag tube and gripper fingers on the shaft 16 engaging and gripping the lower fold of the bellows shaped tube, and as the said shafts continue to revolve the two said sections of the bag tube are spread apart, the upper fold engaging the outer surface of the plate 54 and the lower section engaging the outer surface of the plate 61.

The operation of the lever 40, bearing its gripper finger, and its companion levers bear-

ing their respective gripper fingers is as follows; as the shaft 19 revolves the levers mounted therein, as hereinbefore stated, also revolve but the disk 21 remains stationary, being held in position by means of the plate secured to the cross bars, as hereinbefore stated. As the shaft revolves the anti-friction roller mounted on the end of the said lever 40 comes in contact with the lug 49, on the stationary disk 21, thus obviously moving the lower portion of the said lever outwardly and the upper portion, bearing the gripper finger, inwardly and as the said upper portion moves inwardly the shoulder 43 on the lower gripper finger, as described, is engaged by the lug 46 extending forwardly from the inner portion of the orifice 39 thus obviously moving the said lower gripper finger. This movement is so timed and regulated as to take place at exactly the time that the longitudinal edge of the bag tube is between the under surface of the upper gripper finger and the upper surface of the lower gripper finger, thus obviously securely clamping the gripper fingers to the bag tube. At the proper time, as soon as the diamond fold is produced, the aforesaid gripper fingers release their hold upon the various parts of the bag tube, this operation being accomplished by a release of the various lugs as the parts revolve and the operation of various coil springs described, and the bag tube is then designed to be fed downwardly into the pasting cylinders, but as this is no part of my invention I have not shown or described the same. It is obvious that by this construction I have entirely eliminated the necessity of employing cylinders in which to mount the gripping and folding device, employed in paper bag machines, and it is equally obvious that it is a distinct advantage to have these intricate parts, exposed to view, and easy of access, in order that they may be speedily and easily adjusted if they get out of order.

Having thus described my invention what I claim and desire to secure by Letters Patent of the United States is:

1. In a gripping and folding device for a paper bag manufacturing machine the combination with the side rails of the machine of a lower shaft; two centrally located disks rigidly secured thereto; two other disks loosely mounted on said shaft and located one between each end of the shaft and one of the rigidly secured disks; a cam on the outer surface of each of the loosely secured disks; a cross-bar secured to the side rails of the machine at a point beneath the said shaft; a plate secured to said cross-bar a second cross-bar secured to said side rails said plate extending forwardly, upwardly and rearwardly around, and secured to, the said loosely mounted disks, and extending rearwardly to a connection with said second

cross-bar; said plate having two longitudinal openings designed to receive the aforesaid rigidly secured disks; gripper fingers mounted in said shaft, one immediately outside of each of the loosely secured disks, said gripper fingers being designed to be actuated by the cams on their respective disks, all arranged and combined substantially as shown and described

2. In a gripping and folding device for a paper bag manufacturing machine an upper shaft; two disks mounted centrally on said shaft and being slightly separated from each other; a lug mounted on each of said disks levers carried by said lugs; a loose ferrule mounted between said disks having an orifice therein; a lug, rigidly secured to said shaft, mounted within said ferrule and provided with a rearwardly projecting portion; a lug mounted on said ferrule; a gripper finger mounted on said lug, said gripper finger being actuated by said levers mounted in the lugs secured to the said disks; two other disks loosely mounted on said shaft, one between each end of the shaft and one of the aforesaid rigidly secured disks; a cam secured to the outer surface of each of said disks; a lever, bearing gripper finger, secured in the shaft immediately outside of each of the said loosely secured disks said levers being designed to be actuated by their respective cams; a cam mounted on the inner portion of one of said disks and designed to actuate the levers which in turn actuate the aforesaid gripper finger secured to the loose ferrule; a cross-bar mounted immediately above said shaft; a plate secured to said cross bar, said plate extending forwardly, downwardly and rearwardly around the aforesaid loosely secured disks and being secured thereto, the rear portion of said plate being secured to a second cross bar; said plate having a longitudinal opening centrally located therein and designed to receive the gripper finger secured to the said ferrule, all arranged and combined substantially as shown and described.

3. In a paper bag manufacturing machine, a gripping and folding device comprising in combination an upper shaft, standards above said shaft; two similar disks loosely mounted near the central portion of the said shaft, one on each side thereof; a cross-bar mounted in said standards above said shaft; a second cross-bar secured to said standards, a plate secured to said first cross bar and extending downwardly, outwardly and rearwardly therefrom around the said disks, and secured thereto, the rear end of said plate being secured to said second cross bar mounted in said standards; said plate having a centrally located opening therein; a gripper finger located between the said disks; a gripper finger mounted immediately outside of each of said disks; a lower shaft provided with two disks loosely mounted near the central por-

tion thereof; a cross bar below said lower shaft; a plate secured to said cross bar and extending upwardly, forwardly and rearwardly therefrom and secured to said disks, a second cross bar below said lower shaft the rear end of said plate being secured to said second cross bar; a gripper finger located immediately outside of each of said disks; means for operating all of said gripper fingers; means for driving the said shafts, all arranged and combined substantially as shown and described.

4. In a gripping and folding device for paper bag manufacturing machines, an upper shaft provided near its central portion with two rigidly secured disks; companion lugs one mounted on each of said disks; a spring actuated lever mounted in said companion lugs; a loose ferrule mounted on said shaft between said disks; an orifice in said ferrule; a lug provided with a rearwardly extending portion mounted in said orifice and designed to retard the movement of the said ferrule; an upwardly extending inverted U shaped lug secured to said ferrule; a lever projecting forwardly between the arms of said lug, a gripper finger mounted on said lug and designed to be actuated by said lever projecting forwardly between the arms of the said lug, the rear end of said lever being secured to said second spring actuated lever mounted in the companion lugs secured to the said disks; a cam secured to the said disks; a cam secured to said shaft and designed to operate the spring actuated lever, all arranged and combined substantially as shown and described.

5. In a gripping and folding device for a paper bag manufacturing machine, an upper shaft, a loose ferrule centrally secured thereto, a gripper finger mounted upon said ferrule centrally secured to an upper shaft; an orifice in said ferrule; an inverted U shaped lug on said ferrule; a gripper finger extending the entire width of, and engaging the upper portion of, the said lug said gripper finger extending downwardly on the rear portion of said lug and being provided with a forwardly extending portion projecting between the arms of the inverted U shaped lug; a plait rigidly secured to said lug coil springs secured to the base of said gripper finger the other extremity of said springs being secured to said plate rigidly secured to the said lug; means for raising and lowering the said gripper finger by engagement with the forwardly extending portion, all arranged and combined substantially as shown and described.

6. In a gripping and folding device for a paper bag manufacturing machine the combination of an upper shaft, a ferrule loosely secured to the central portion of said upper shaft; a lug on said ferrule; a gripper finger mounted on said lug; two disks one mounted on each side of said ferrule; companion

lugs one mounted on each of said disks; a spring actuated shaft mounted for movement in said lugs; upwardly projecting companion members mounted on said shaft; an arm loosely secured to said companion members its other end being rigidly secured to the aforesaid loose ferrule; an arm mounted on one end of said spring actuated shaft; an anti-friction roller mounted at right angles on said arm; a cam designed to engage said anti-friction roller and operate the spring actuated shaft loosely secured to the upper shaft of the machine, all arranged and combined substantially as shown and described.

7. In a gripping and folding device for a paper bag manufacturing machine the combination with cross bars of an upper shaft; loosely secured circular disks mounted at equal distances from, and one on either side of, the central portion of said shaft, said disks being exactly similar in every respect; a partially circular plate secured to the forward portion of the said disks, the ends of said plate being secured to said cross bars; a cam on the outer portion of each of said disks; an orifice extending transversely through the said upper shaft immediately outside of each of said disks; a lever mounted for forward and backward movement pivotally secured in each of the orifices in the said shaft; an inwardly extending gripper finger rigidly secured to one end of each of said levers; a second gripper finger having an inwardly inclined portion on the under surface thereof mounted beneath each of the aforesaid gripper fingers; a collar designed to retain each of the said second gripper fingers in position and designed to admit of a certain limited upward and downward movement thereof; a coil spring secured to each of the said second gripper fingers its other end being secured to its respective collar; a lug located at the inner end of each of the aforesaid orifices, designed to engage said inwardly inclined portion

mounted on the under surface of each of the said second gripper fingers; a coil spring secured to the outer surface of each of said levers its other end being secured in the said upper shaft; an anti-friction roller on each of said levers, designed to be operated by the cams on their respective disks, all arranged and combined substantially as shown and described.

8. In a gripping and folding device for a paper bag manufacturing machine a driving shaft having a transverse orifice therein a gripper, mounted pivotally within said transverse orifice in the driving shaft, comprising in combination a lever; an inwardly extending gripper finger secured to the upper extremity of said lever; a second gripper finger mounted below the aforesaid gripper finger and designed for engagement therewith; a collar designed to secure said second gripper finger to the said lever and to permit of an upward and downward movement thereof; an inwardly projecting lug at the base of said second gripper finger; a lug secured in the forward part of the orifice in the said shaft, said lug being designed to engage the lug on the said second gripper finger; a coil spring secured to, and extending between, the aforesaid collar and the aforesaid second gripper finger; a coil spring secured to the outer surface of said lever the other end of said spring being secured to the aforesaid shaft; an anti-friction roller on one end of said lever; a disk, provided with a cam designed to engage the aforesaid anti-friction roller, loosely secured to the said shaft, and secured in a stationary manner to the machine, all arranged and combined substantially as shown and described.

PHINEAS L. BARTHOLOMEW.

Witnesses:

JOHN S. SEARS,
P. Y. SMITH.