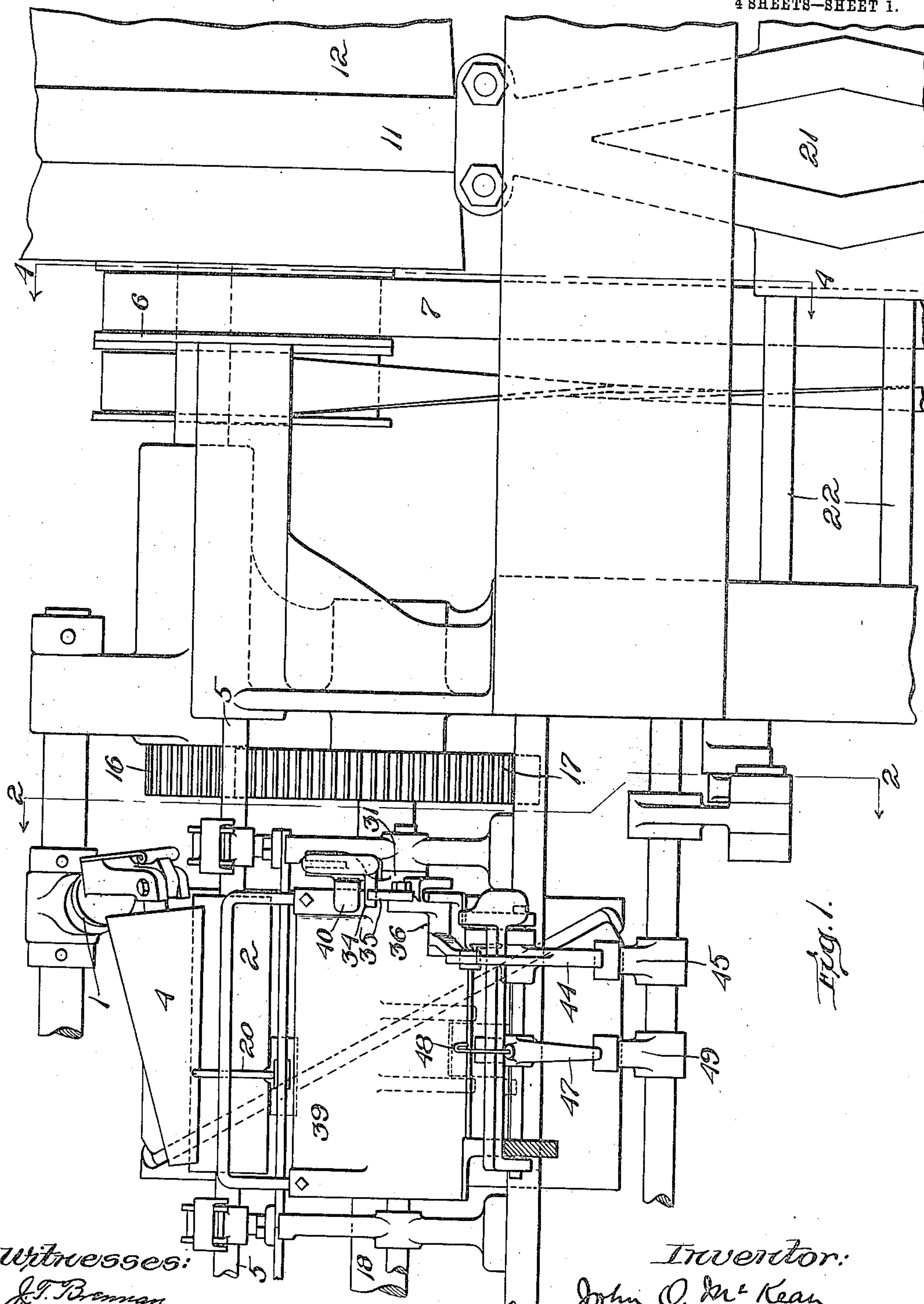


952,015.

J. O. McKEAN.
WINDING MACHINE.
APPLICATION FILED APR. 16, 1908.

Patented Mar. 15, 1910.

4 SHEETS—SHEET 1.



Witnesses:
J. T. Brennan.
Anna B. Lindsay.

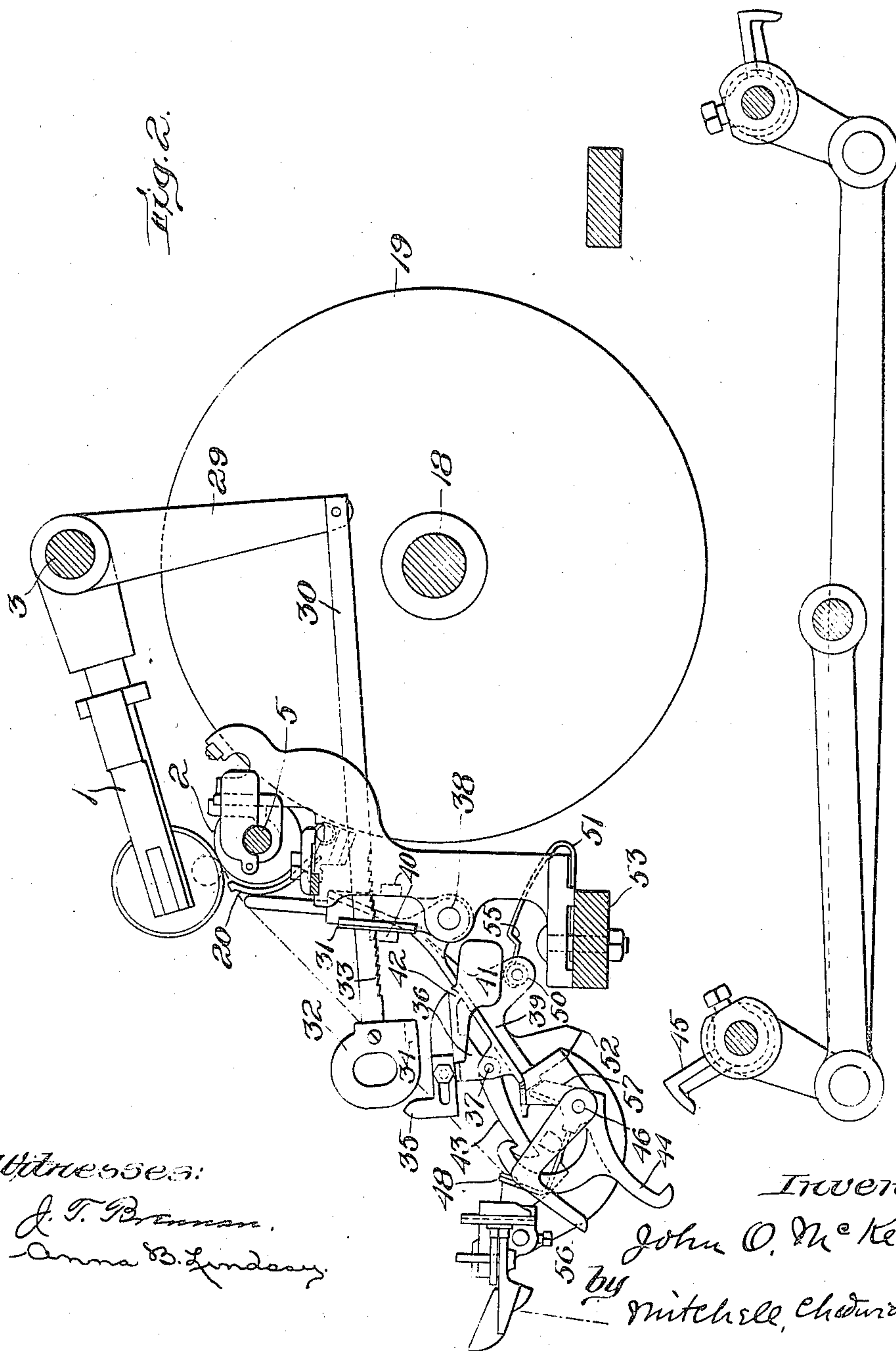
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APPLICATION FILED APR. 18, 1908.

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4 SHEETS—SHEET 2.



Witnesses:

J. T. Brennan.
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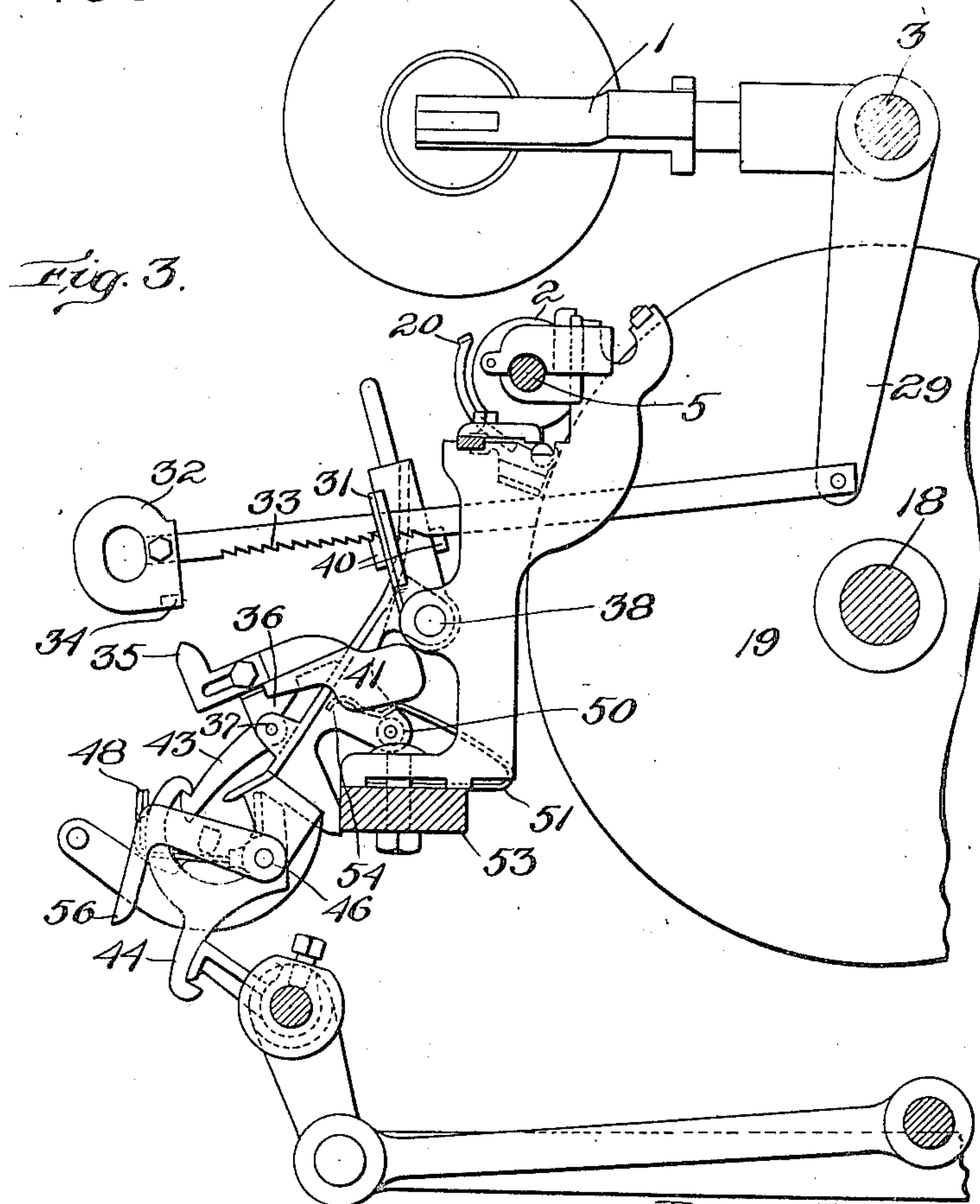
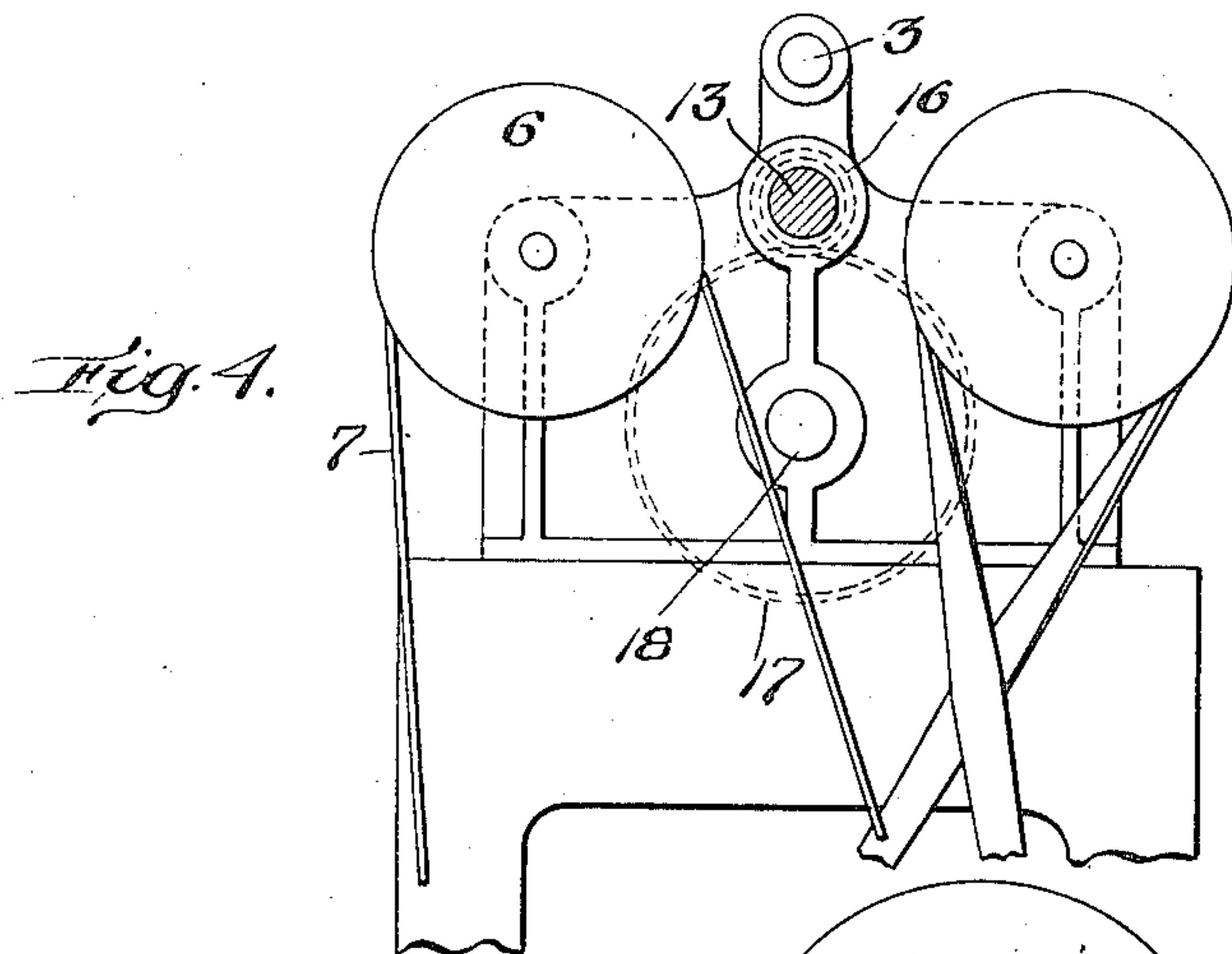
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4 SHEETS—SHEET 3.



Witnesses:
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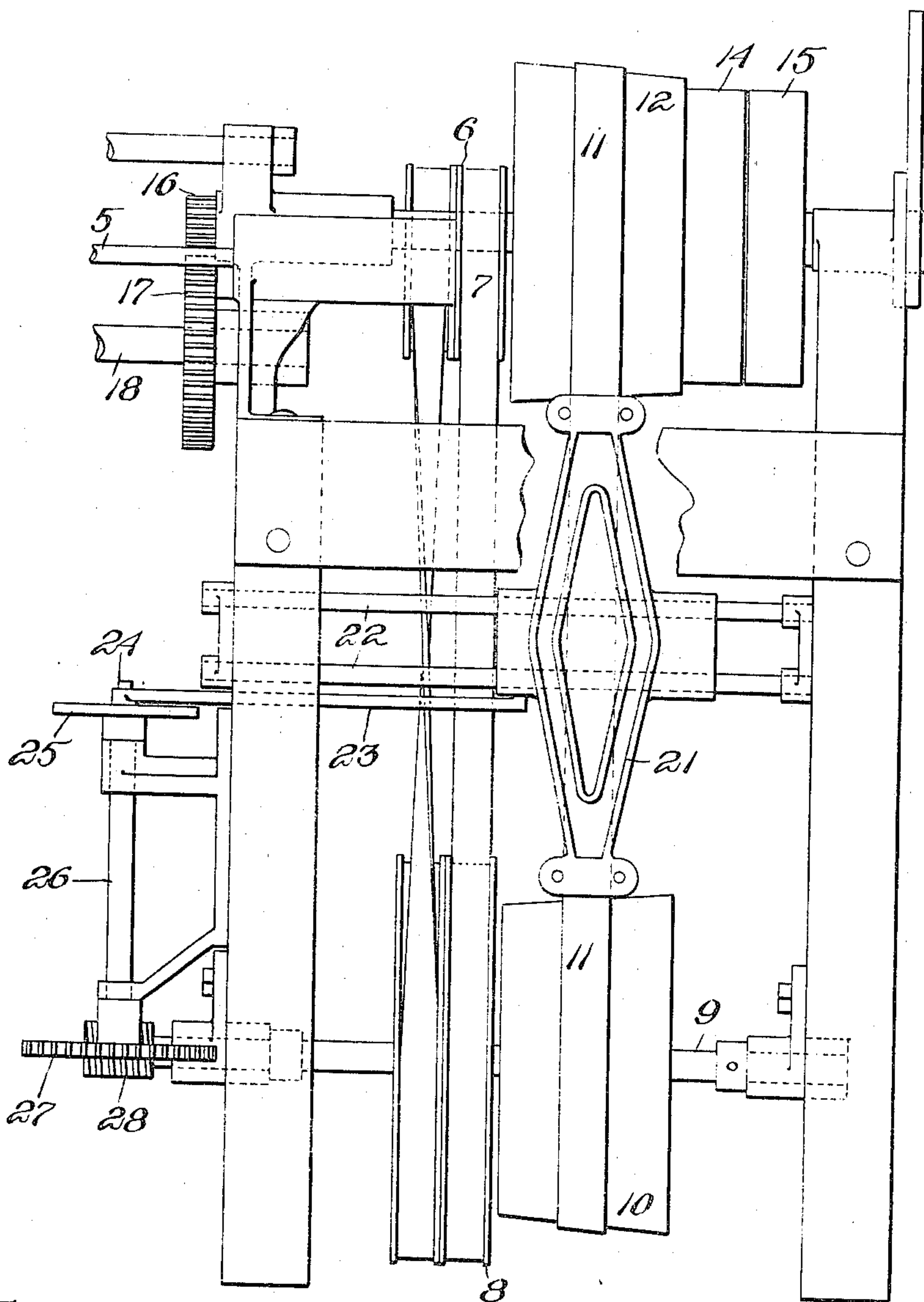
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4 SHEETS—SHEET 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN O. McKEAN, OF WESTFIELD, MASSACHUSETTS, ASSIGNOR TO FOSTER MACHINE COMPANY, OF WESTFIELD, MASSACHUSETTS, A CORPORATION OF MAINE.

WINDING-MACHINE.

952,015.

Specification of Letters Patent.

Patented Mar. 15, 1910.

Application filed April 16, 1908. Serial No. 427,327.

To all whom it may concern:

Be it known that I, JOHN O. McKEAN, a citizen of the United States, and resident of Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Winding-Machines, of which the following is a specification.

My invention relates to winding machines and particularly to that class of winding machines wherein the cop being formed is surface driven frictionally by a constantly rotating cop-driving roll.

The object of my invention is to improve the construction of machines of this class so as to wind cops of a pre-determined size, and also to improve such machines with respect to the stop motion whereby the winding is stopped when a thread breaks, and with respect to the automatic control for the driving roll whereby the speed of the latter with relation to the speed of the thread guide is varied to control the laying of the thread or threads on to the cop.

A feature of my invention consists in providing automatic means to shift the cop out of contact with its driving roll to stop the winding when the cop has been wound to a pre-determined size.

Another feature of my invention consists in having this automatic size controlling means controlled also by the thread which is being wound so that when the latter breaks said size controlling means is automatically operated so as to shift the cop out of contact with its driving roll and stop the winding operation.

A third feature of my invention resides in the improved means hereinafter described for varying the relative speeds of the reciprocating thread guide and the driving roll for the purposes fully set forth in my Patent No. 716,923 dated December 30, 1902.

Other features of my invention are hereinafter pointed out.

In the accompanying drawings:—Figure 1 is a partial front elevation of a winding machine embodying one form of my invention; Fig. 2 is a section on line 2—2 of Fig. 1; Fig. 3 shows the left hand side of Fig. 2 with the parts in another position; Fig. 4 is a section on line 4—4 of Fig. 1; Fig. 5 shows in side elevation the drive end of the machine shown in Fig. 1.

Having reference to the drawings, 1 represents the holder for the cop shell and 2 the cop driving roll. The holder 1 is of ordinary construction and is as usual pivoted loosely on a rod 3 supported at its ends by the frame of the machine. The shell 4 onto which the thread is to be wound is supported by holder 1 so as to be free to rotate and is pressed against the drive roll 2 by the weight of holder 1. The drive roll 2 is fixed to a shaft 5 journaled on the frame of the machine and carrying at one end a pulley 6 connected by a belt 7 with a pulley 8 fast to a counter shaft 9. Shaft 9 also carries a cone pulley 10 connected by belt 11 with an opposed cone pulley 12, fast on the main drive shaft 13 of the machine. On shaft 13 is a tight pulley 14 through which said shaft is driven, and a loose pulley 15. At its inner end shaft 13 also carries a pinion 16 driving a gear 17 fast to the cam shaft 18. Shaft 18, as usual, carries a cam 19 for each section of the machine which reciprocates the usual thread guide 20.

The belt 11 through which the drive rolls 2 are driven from main shaft 13, is engaged by a shipper 21 mounted to slide on two rods 22 fixed to the frame. Shipper 21 is connected by a link 23 with a crank or wrist pin 24 carried by a disk 25 fixed to the upper end of a shaft 26. Shaft 26 at its lower end carries a worm gear 27 that is driven by a worm 28 fast to the counter shaft 9. It will now be clear that while shaft 13 acts through pinion 16 and gear 17 to drive cam shaft 18 continuously at a uniform rate of speed, it also acts through belt 11, shaft 9, and belt 7 to drive shaft 5 that carries the drive roll 2, but the rotation of wrist pin 24 acts through link 23 to shift belt shipper 21 back and forth on rods 22 thereby shifting belt 11 back and forth on cone pulleys 10 and 12 so that the speed of shaft 5 is varied it being alternately accelerated and retarded as belt 11 is thus shifted back and forth. It will be noted that wrist pin 24 is driven from shaft 9 and therefore its speed of rotation varies with that of shaft 9 so that belt 11 is held at the larger end of pulley 10 for a longer time and at the smaller end of said pulley for a shorter time than would be the case if shipper 21 were shifted back and forth at a uniform rate of speed. Consequently a greater variation in the "pitch" and number of the windings on the cop is

secured than would be the case if a uniform motion were imparted to shipper 21.

The cop holder 1 is provided with a rigid arm 29 to the lower end of which is pivotally connected the inner end of a bar 30 that extends through a slotted arm 31 and carries at its outer end a handle 32. Upon the under side of bar 30 is a rack of ratchet teeth 33 to engage the arm 31 when the latter is moved in one direction only, said teeth slipping idly past said arm when said arm is moved in the opposite direction or when said bar is moved outwardly. Projecting from the side of handle 32 is a lug 34 cooperating with a bracket 35 adjustably clamped to a latch 36 pivoted at 37 to a lever frame 39. The lever frame 39 is fulcrumed at 38 to the frame of the machine and is embraced at one side by a pair of lugs 40 projecting from the arm 31 which is mounted on the same fulcrum rod 38 as said lever frame 39, so that the two, lever frame 39 and arm 31 are thus locked together and swing on rod 38 as one. The latch lever 36 carries at one side of its pivot 37, a weight 41 that holds the latch lever 36 in its normal position with a stop 42 on said lever 36 resting against lever frame 39, and with a latch arm 43 provided on lever 36 at the other side of pivot 37, in position to engage the upper arm of a drop hook 44 so as to hold the lower arms of said hook out of the path of a continuously vibrating arm 45. The drop hook 44 is fixed to rock shaft 46 journaled on the lever frame 39. This rock shaft 46 has loosely mounted on it a second drop hook 47 provided with an arm 48 that normally is engaged and supported by the thread as shown in Fig. 2 so that the lower arm thereof is held out of the path of a continuously vibrating arm 49. It is to be noted that the two hooks 44 and 47 although mounted on the same shaft 46 are independently movable, one being normally supported by the latch arm 43 and the other by the thread. Upon its under side the lever frame 39 carries a roller 50 and a spring latch 51, fast to the frame of the machine, engages this roll and holds the lever frame 39 in its normal position shown in Fig. 2. When however, the thread breaks and drops hook 47 or latch lever 36 is operated to drop hook 44, then arm 45 or 49, of the hook that is dropped, engages and pulls down on said hook thus swinging lever frame 39 on fulcrum 38 and causing arm 31 which is always in engagement with teeth 33 to pull bar 30 outwardly thereby lifting the cop out of contact with the drive roll 2 as shown in Fig. 3. The lever frame 39 is provided on its under side with a stop lug 52 to engage the longitudinal bar 53 of the frame of the machine and limit the swinging movement of lever frame 39 in one direction. When lever frame 39 is pulled down as just de-

scribed the roll 50 passes from a hook 54, (Fig. 3) to a hook 55, both formed in the spring latch 51, the hook 54 serving to yieldingly hold the lever frame in the position shown in Fig. 2 and the hook 55 serving to yieldingly hold said frame in the position shown in Fig. 3.

The rock shaft 46 has fixed to it a handle 56 to be grasped and lifted upon by the operator to restore the parts to normal position. If the parts have been shifted into the position shown in Fig. 3 through the dropping of hook 44 then an upward pull upon this handle 56 acts first to rock shaft 46, thereby swinging hook 44 out of the path of arm 45 until a stop arm 57 on said hook engages lever frame 39, at which time the upper arm of hook 44 reengages latch lever 36. Thereafter lever frame 39 swings on fulcrum 38 until stopped by roll 50 engaging hook 54 of latch 51. If the parts have been shifted into the position shown in Fig. 3 through the dropping of hook 47, then an upward pull upon handle 56 immediately lifts lever frame 39, the hook 47 being moved and held out of the path of arm 49 by hand as the handle 56 is lifted. The reengagement of arm 48 with the thread holds hook 47 in normal position.

When the winding is started the bar 30 occupies its innermost position and as the cop grows in diameter during the operation of winding the arm 29 shifts the bar 30 outwardly, the teeth 33 sliding idly through arm 31. The bracket 35 is fixed to latch lever 36 so that when the cop reaches the desired size the lug 34 by striking bracket 35 moves latch lever 36 in opposition to weight 41 and frees hook 44 which thereupon drops into the path of arm 45 and, as above described the cop holder 1 is lifted and the winding stopped.

The handle 32 is provided so that at any time bar 30 may be pulled out by hand to lift the cop holder 1 and stop the winding operation, the slot in arm 31 being made high enough to permit of lifting lug 34 over bracket 35 so as to avoid dropping hook 44.

The means for stopping the winding operation when the cop reaches a predetermined size is simple and efficient; and may be adjusted to provide for cops of any desired size within the limits of its capacity. Moreover by the simple addition of the hook 47 the mechanism is adapted to automatically stop the winding operation when a thread breaks.

What I claim is:—

1. In a winding machine, in combination, a cop driving roll; a cop holder movable toward and from said roll; a positively, power operated, constantly moving actuator for shifting the cop holder into inoperative position; and automatic means controlled by the cop holder to connect the cop

holder and the constantly moving actuator when the cop has reached a predetermined size.

2. In a winding machine, in combination, 5
a cop driving roll; a cop holder; a lever connected to the cop holder; a positively, power operated, constantly moving actuator; linkage connected to the lever and normally held out of the path of the constantly 10
moving actuator; and automatic means, controlled by the cop holder, to place the linkage in the path of the constantly moving actuator when the cop reaches a pre-determined size, to cause the constantly moving actuator to shift the cop holder. 15

3. In a winding machine, in combination, a cop driving roll; a cop holder movable toward and from said roll; a bar connected with the cop holder; a cop holder actuating

lever connected with the bar with provision 20
for adjustment of said bar with the cop holder as the latter is shifted by the growth of the cop; a latch carried by the lever and controlled by the bar; a pair of drop hooks carried by said lever and normally held in 25
inoperative position, one by the thread being wound and the other by the latch, and means for engaging either hook when dropped by the latch or thread to operate the lever and shift the cop holder away from 30
the drive roll.

Signed by me at Boston, Suffolk county, Massachusetts, this eleventh day of April 1908.

JOHN O. McKEAN.

Witnesses:

AGNES A. COLGAN,
ANNA B. LINDSAY.