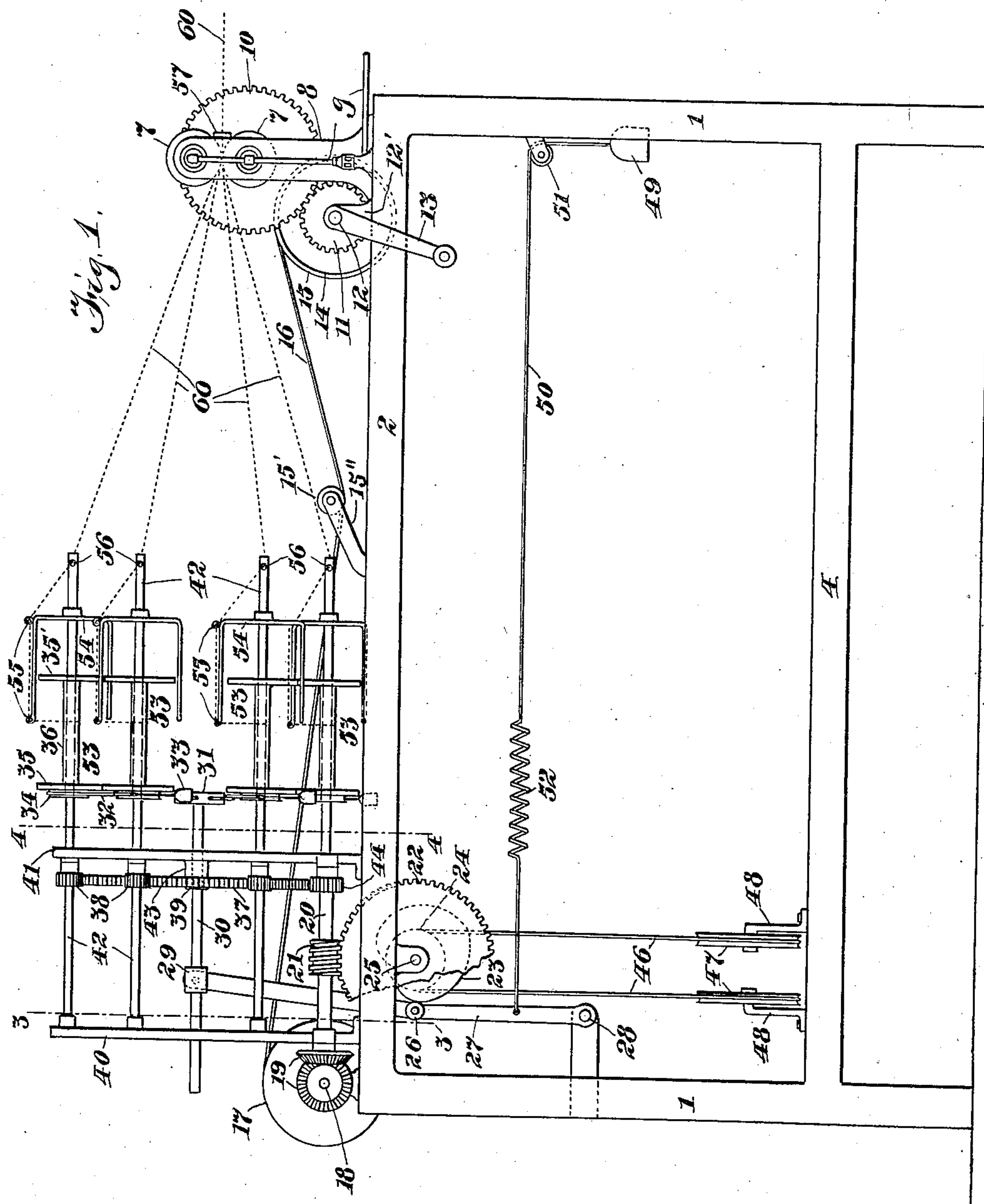


No. 884,104.

PATENTED APR. 7, 1908.

C. E. OTTO.
WINDING MACHINE.
APPLICATION FILED APR. 8, 1905.

4 SHEETS—SHEET 1.



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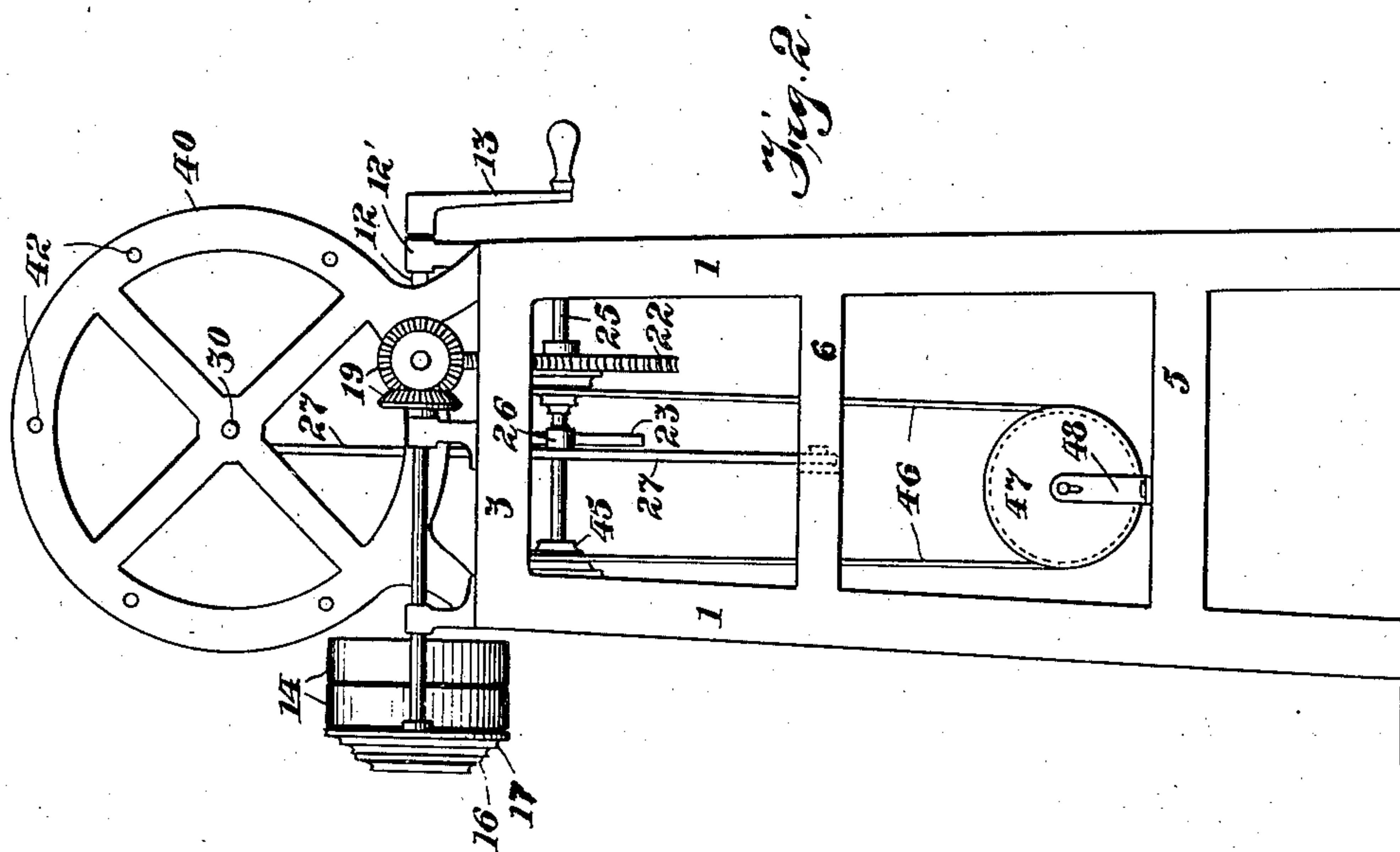
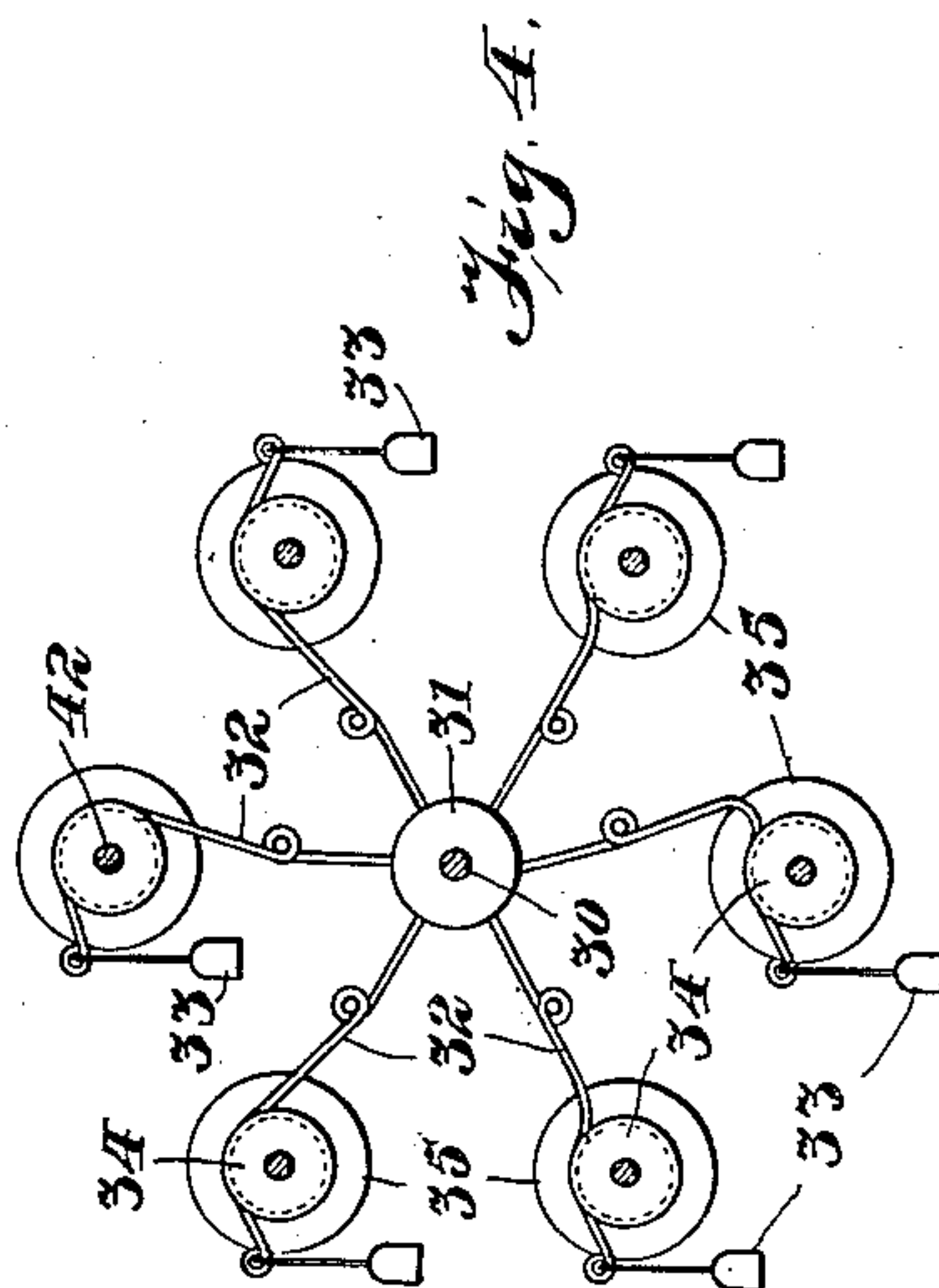
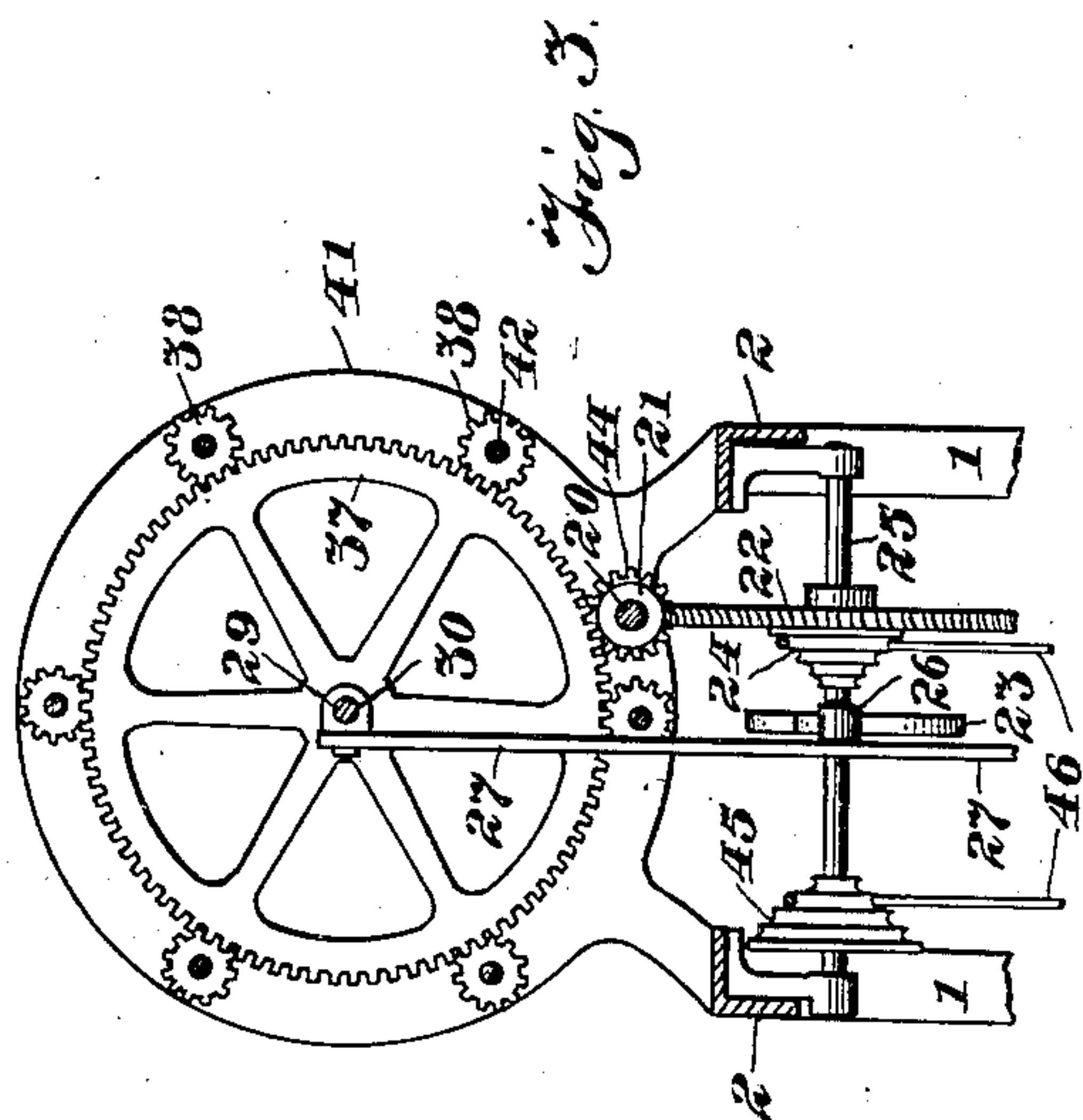
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4 SHEETS—SHEET 3.

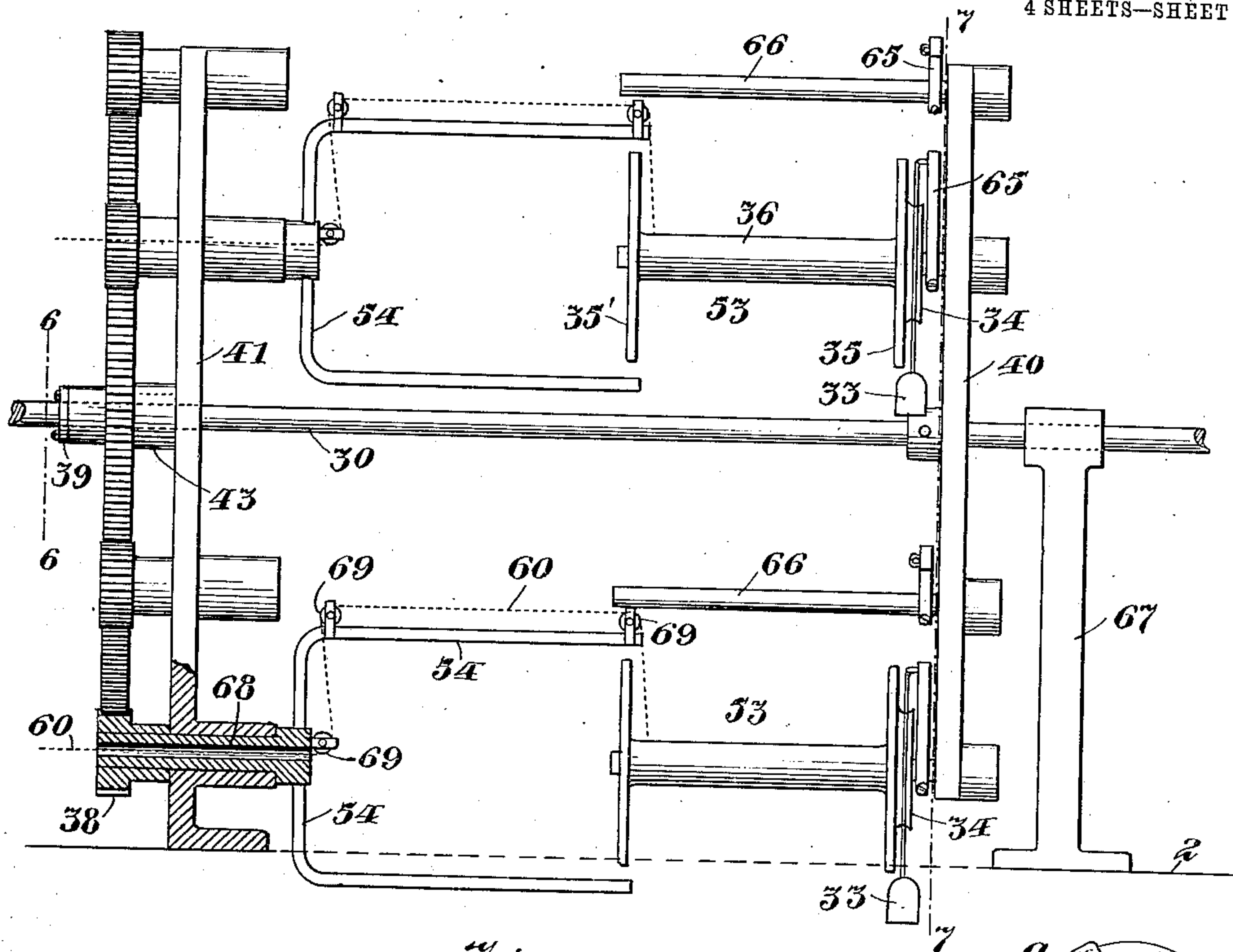


Fig. 5.

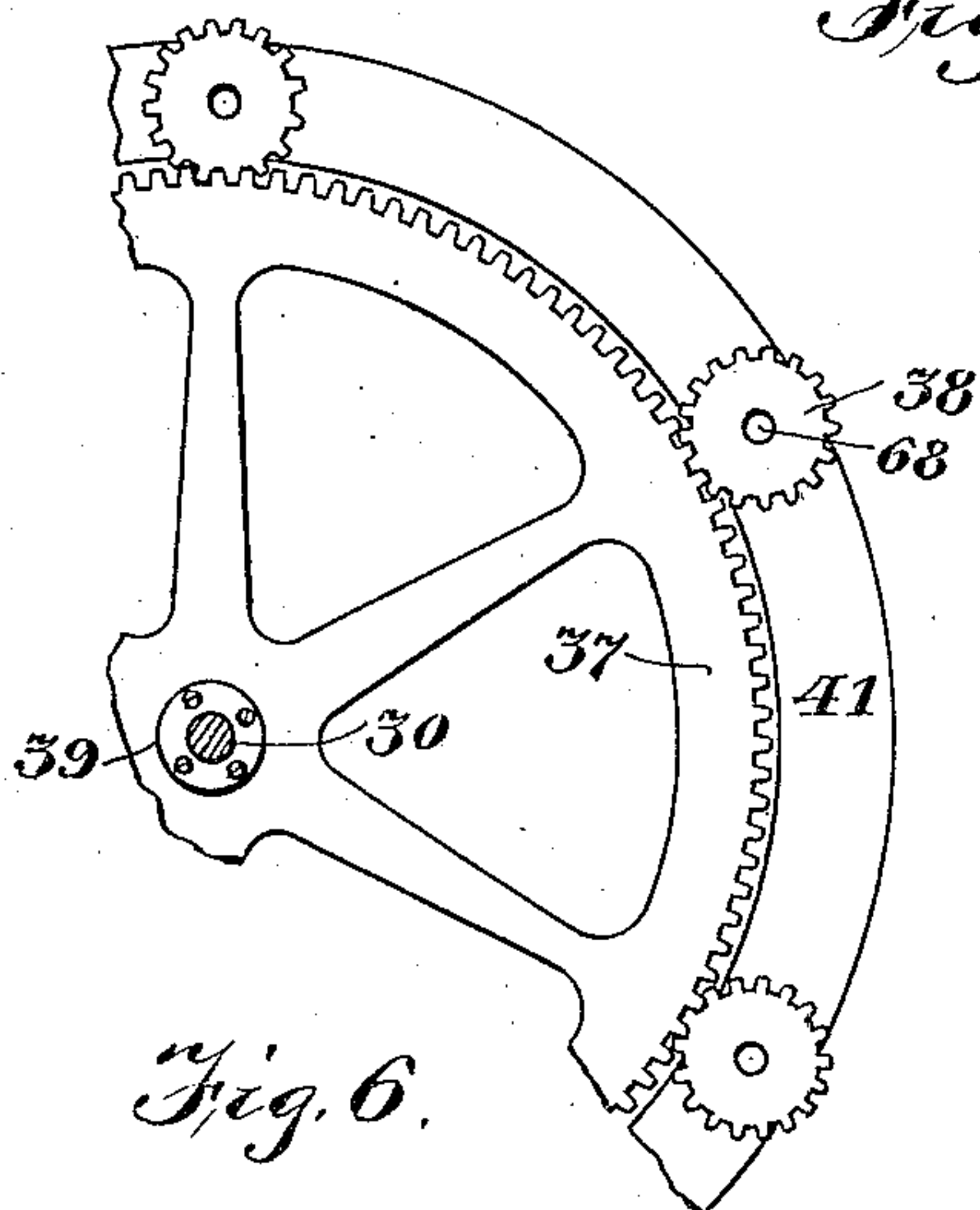


Fig. 6.

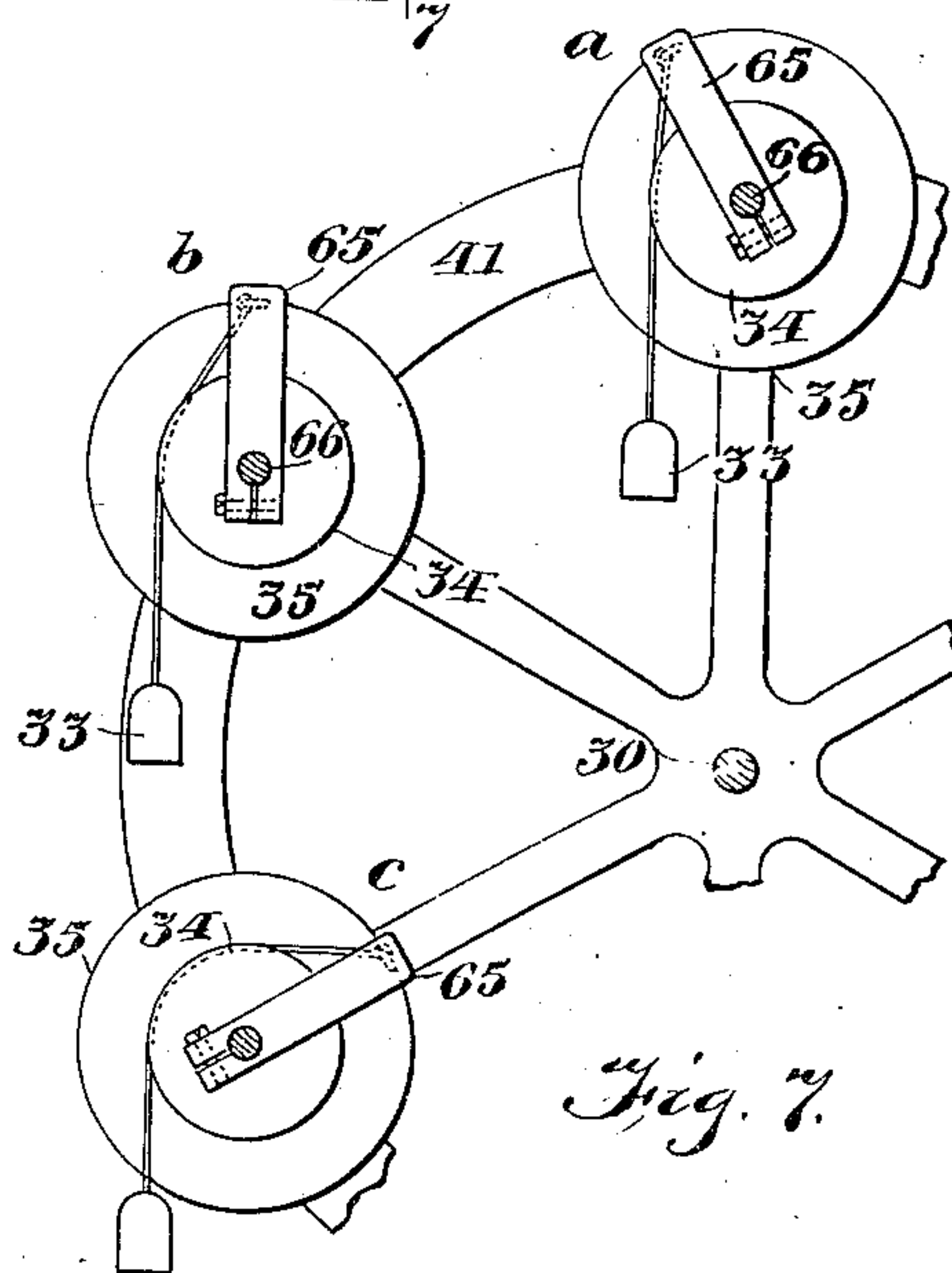


Fig. 7.

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4 SHEETS—SHEET 4.

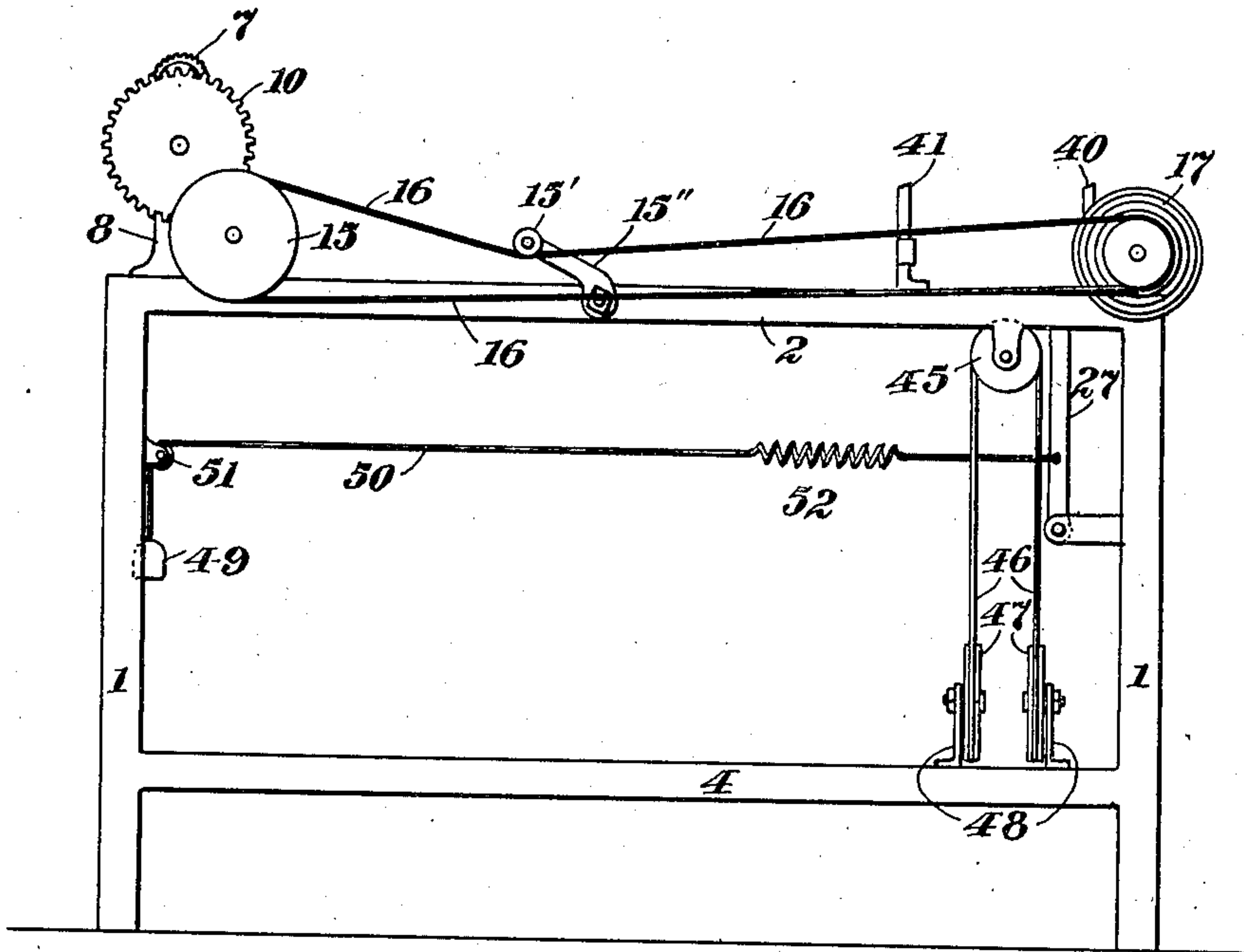


Fig. 8.

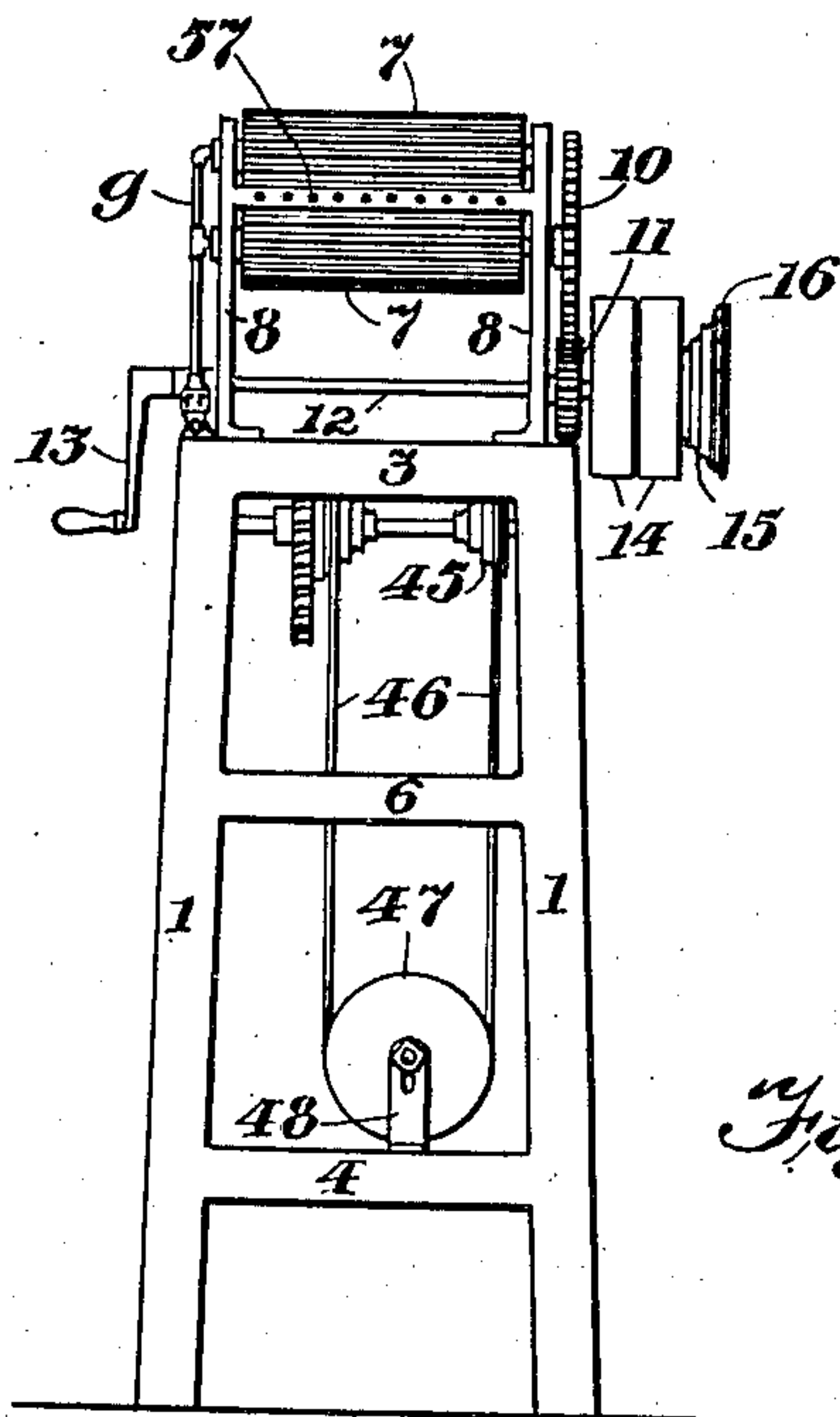


Fig. 9.

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UNITED STATES PATENT OFFICE.

CARL ERNST OTTO, OF NEW YORK, N. Y.

WINDING-MACHINE.

No. 884,104.

Specification of Letters Patent.

Patented April 7, 1908.

Application filed April 8, 1905. Serial No. 254,527.

To all whom it may concern:

Be it known that I, CARL ERNST OTTO, a citizen of Bavaria, Germany, residing in the borough of Brooklyn, city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Winding-Machines, of which the following is a specification.

The present invention, relates to spinning and winding machines used for crimping, twisting and winding upon spools, a strip or ribbon of straw, thread, or other twisted fabric, commonly used in the millinery trade, and has for its object to provide simple and effective means whereby, a plurality of spools may be assembled about a common center, and wound, simultaneously, from one common source intermediate of which may be placed a set of crimping rollers in such a manner as to crimp all the thread or ribbon fed to the several spools at one operation.

It is the purpose of my present invention, to overcome the many defects found in the machines now in common use, and to supplement same with certain other improvements to be hereinafter described.

To the accomplishment of these ends, my invention consists in the construction, combination and arrangement of the several parts, as shown in the accompanying drawings.

While I have shown and described a preferred embodiment of my invention, I do not wish to confine myself to the exact construction shown, as certain minor changes may be made without departing from the true intent and scope of my invention.

In the various figures of the accompanying drawings, similar reference characters are employed to denote similar parts.

Referring to the drawings, Figures 1 and 5 are side views in elevation of my invention in its preferred form; Figs. 2 and 6 are end views of same; Figs. 3 and 4, are sectional views of the super-structure of my machine, taken respectively on the lines 3—3 and 4—4 of Fig. 1. Fig. 7 is a portion of an end view of the super-structure partly in section. Fig. 8 is a side elevation showing part of the driving mechanism. Fig. 9 is an end view of same showing more clearly the corrugated rollers.

The base or frame work, of the machine consists of legs 1 and a skeleton frame formed by the side rails 2 and the end rails 3. Near the lower end of legs 1, is another frame

formed by rails 4, 5 and 6 which gives additional stiffness to the base and serves other purposes as hereinafter shown. Mounted on this base, and near one end of same is a pair of corrugated hollow rollers 7, journaled in bearings 8, means being provided for supplying gas to burners within the rollers, as indicated at 9.

Rigidly mounted upon the same shaft with the lower roller 7, is a spur gear 10 in mesh with gear 11. The gear 11 is fixed upon the main shaft 12, which is journaled in brackets 12', and carries at one end a crank 13, and at the opposite end a pair of loose and tight pulleys 14, and a cone pulley 15, thus making the machine operative either by hand or other suitable power.

At the opposite end of the machine, is a shaft 18, mounted in suitable bearings upon the base portion, and at one end of said shaft is fixed a cone pulley 17, in reverse position to the cone pulley 15, to which it is connected by means of a belt 16. The desired tension of the belt 16 is maintained by the idle pulley 15', which is adjustably mounted on one of the rails 2 of the base portion of the machine, by means of lever 15''. In close proximity with the shaft 18, is mounted a circular frame or spider consisting of the two members 40 and 41, fixed to the frame carrying centrally a sliding rod 30, and arranged about the circumference thereof are a number of shafts 42, properly journaled in the members 40 and 41. Concentric with the spider 40 and 41, is loosely mounted a spur gear 37, upon a hollow stud 43, and is held in place by a washer 39, which is fixed to the stud 43 by screws or other suitable means. In mesh with gear 37, are the several pinions 38, the same being secured to their respective shafts 42. In mesh with gear 37, is another pinion 44, the same being rigidly mounted on the shaft 20. There is also mounted upon shaft 20, near its central portion, a worm 21, and at the extreme end thereof, is keyed one of a pair of miter gears 19, the other miter gear being keyed to the end of shaft 18.

Suspended from the rails 2, in suitable bearings is a shaft 25 on which is operatively mounted a worm gear 22. A relatively small cone pulley 24 is fixed to one side of said worm gear 22 and rotates freely on the shaft 25. A large cone pulley 45 and a cam 23 are fixed to the shaft 25, said cam being adapted to operate vibrating means hereinafter described. The cone pulleys 24 and 45, are

connected by a belt 46 which passes over two loose pulleys 47 adjustably mounted in bearings 48, secured to rails 4.

A lever 27, carrying a cam roller 26 near its center, is fulcrumed at its lower end 28 to a portion of the frame work and its upper end is pivoted to a block 29, rigidly secured to the sliding rod 30. The cam roller 26 is held in contact with the cam 23, by means of a suitable weight 49 which is attached to one end of a cable or chain 50. The cable 50, is passed over the sheave wheel 51, and has its opposite end attached to the lever 27 as shown. A coil spring 52 may be interposed in the cable or chain 50. Loosely mounted on the portion of the shafts 42, which extends beyond the spider 41, are the several spools 53 having a body portion 36 and the flanges 35—35¹ and integral with the flanges 35 is formed a grooved disk 34. In the preferred form of my invention, a longitudinal movement is imparted to the spools 53, and their rotary motion retarded through the agency of a number of springs 32 radiating from a disk 31, fixed to the sliding rod 30. The free ends of the springs 32, are curved, engaging the groove in disk 34, and terminating in a loop from which is suspended a small weight 33.

For the purpose of feeding the threads or ribbons 60, indicated by dotted lines in Fig. 1, with an approximate uniformity to the body portion 36, of the spools 53, I employ a U shaped frame 54, carrying on one of its legs, a set of eyelets 55 through which the threads or ribbons are threaded. The frame 54 is centrally mounted upon the shaft 42 and rotates therewith. Near the end of the shafts 42, are formed openings 56 communicating with a bore in the end of the shafts, through which are passed the threads or ribbons 60. Secured to the bearings 8, and registering with the pitch line of the rollers 7, is a bar 57 having a plurality of holes or perforations through which the threads or ribbons 60 pass, the object of which is to prevent the overlapping of the ribbons, as they are fed to the crimping rollers 7.

The operation of the machine is as follows: The machine is first threaded with the threads or ribbons by passing same through the holes in the plate 57, then between the crimping rollers 7 and through the openings 56, from whence they are passed through the eyelets 55 of the frames, and then to the body portion 36 of the spools 53, where they are made fast. Power is then applied to the shaft 12, either through the pulleys 14, or the crank 13 which imparts a rotary motion to the cone pulley 15, and this rotary motion is conveyed to the various parts of the machine through the medium of the belt 16, the cone pulley 17, shaft 18, miter gears 19, shaft 20, and the pinion 44. The pinion 44, being in mesh with the spur gear 37, the same rotary motion is conveyed thereto, and

from thence to the pinions 38 which revolve the shafts 42, and the U shaped frames 54. Through the worm 21 and the worm gear 22, a relatively slow rotary motion is conveyed to the small cone 24, the belt 46, the larger cone 45 and thence to the shaft 25 and the cam 23, where the motion is converted to a reciprocating action, through the medium of the cam roller 26 and the lever 27. The reciprocating motion, is imparted to the sliding rod 30, through block 29 which is fixed thereto. This reciprocating motion, is further conveyed to the spools 53 through the action of the disk 31, which is carried on the sliding rod 30, and the radial springs 32 which engage the grooves in the disks 34 of the spools 53. It will be understood, that the crimping rollers 7 maintains a fixed velocity in relation to the driving shaft 12, while the spools 53 require a variable feed, in regard to both their rotary and reciprocating motion, for it is readily understood, that the revoluble speed of the spools must diminish as the number of convolutions of thread or ribbon increase, and it is equally apparent that the reciprocating motion of same must quicken in ratio to the width of thread or ribbon to be wound. These conditions, are amply met as follows: The reciprocating or longitudinal motion of the spools 53 is relatively increased or diminished by shifting the belt 46 from the major diameter of the cone pulley 24 to the minor diameter thereof, and from the minor diameter of the cone pulley 45, to the major diameter of same, when it is desired to decrease the longitudinal speed of the spools or vice-versa for an increase of speed. The variable speed of the spools, required for the proper winding of the threads or ribbons, is obtained in the preferred form of my invention, by the pressure of the radiating springs 32 against the periphery of the disks 34, thereby retarding the revolution of the spools, and the pressure of these springs may be varied by changing the weights 33, to meet the requirements imposed by the particular thread or ribbon to be wound.

In the modified form of my invention, I employ a novel method to secure the desired tension on the disk 34, which consists in hanging the weights 33 on adjustable arms 65, mounted on the spindles 66, as shown on Fig. 7, and the degree of tension may be varied according to the position of the arms 65, as indicated at *a*, *b*, and *c*, of Fig. 7. In this form of my invention, the spindles 66, are made just long enough to carry the spools 53, and are fixed to the rim of the spider 40, which in turn is keyed to the sliding rod 30 and moves longitudinally therewith. The rod 30, is journaled in a bracket 67 and the stud 43 of the spider 41. In the rim of the spider 41, are journaled a number of hollow shafts 68 carrying at one end the

U shaped frames 54 and having keyed at the opposite end thereof the several pinions 38 in mesh with the gear 37. In this instance, the ribbons 60, are threaded through the hollow shaft 68 and over the sheave pulleys 69 of the frames 54, to the body portion 36 of the spools 53 as shown in Fig. 5. In all other respects the construction and operation of the machine is the same as herein before described.

Having thus described my invention, I claim:

1. In a winding machine, the combination with a frame of a pair of members secured thereon, a reciprocating shaft mounted in the center of said members, a lever pivotally secured to said shaft, a cam cooperating with said lever to reciprocate the same, a plurality of spindles journaled in said members parallel with the reciprocating shaft, gears secured to said spindles and means for operating said gears.

2. In a winding machine, the combination with a frame of a pair of members secured thereon, a reciprocating shaft mounted in the center of said members, a lever pivotally secured to said shaft, a cam cooperating with said lever to reciprocate the same, a plurality of spindles mounted in said members parallel with said shaft, gears secured to said spindles, a gear mounted on a hollow bearing on one end of one of said members and in operative contact with the gears on the spindles, and means for operating said gear.

3. In a winding machine, the combination with a frame of a pair of members secured thereon, a plurality of spindles mounted in said members, said spindles having apertures on one end for inserting the thread or ribbon preparatory to winding same, U shaped winding frames secured to said spindles and means for operating said spindles.

4. In a winding machine, the combination with a frame, a pair of members secured thereon, a reciprocating shaft mounted in the center of said members, a lever pivoted to said shaft, a cam-roller carried at an intermediate point of said lever, a cam engaging said roller to reciprocate said lever, and means including a worm and worm-wheel for operating said cam.

5. In a winding machine, the combination with a frame of a pair of members secured thereon, a reciprocating shaft journaled in the center of said members, a disk attached to said shaft, having tension springs assembled thereon, a plurality of spindles assembled in said members parallel with the reciprocating shaft, U-shaped winding frames attached to said spindles, spools mounted on the spindles, and held in restraint by means of said springs on the disk, and means for reciprocating the disk and shaft.

6. In a winding machine, the combination with a frame, of a pair of members secured

thereon, a shaft slidably mounted in the center of said members, a disk fixed to one end of said shaft, springs mounted around the periphery of said disk, means including a lever and cam for reciprocating said shaft, a plurality of spindles assembled on said members parallel with the center of said members, said spindles being provided with apertures in one end for inserting the thread or ribbon preparatory to winding same, U shaped frames secured to said spindles, spools having flanges movably mounted on said spindles, said flanges being provided with grooves adapted to engage the springs mounted on said disk, gears fixed to said spindles, a gear mounted on a hollow bearing on one end of one of said members and in operative contact with the gears on the spindles, and means including a pair of miter gears for operating said gear thereby operating said spindles.

7. In a winding machine, the combination with a frame of a pair of members mounted thereon, a shaft journaled in said members, a disk secured to said shaft, springs assembled radially on said disk, weights attached to said springs, a cam, a lever pivotally secured to said shaft, a pivotal support for said lever, a roller mounted on said lever and in operative contact with said cam, a spring connected with said lever, a cable connected to said spring with a weight, a pulley over which the cable runs, said cable and weight adapted to hold the lever in operative contact with the cam, means including pulleys and gears to operate said cam.

8. The combination with a frame, of a crimping means mounted thereon, comprising rollers journaled in bearings, a guide fixed to said bearings having perforations for guiding the thread or ribbon through said rollers, the periphery of said rollers being corrugated, a gear attached to one end of one of said rollers, a shaft journaled in bearings on said frame, a gear fixed to said shaft and in operative contact with the gear on the end of one of said rollers, pulleys secured to said shaft, a handle lever secured to said shaft for manually operating said crimping means, a pair of members mounted on said frame, a plurality of spindles assembled around the periphery of said members, said spindles being provided with perforations on one end for inserting the thread or ribbon preparatory to winding same, U shaped frames fixed to said spindles, eyelets mounted on said U shaped frames, spools movably mounted on said spindles, gears fixed to said spindles, a gear journaled on a hollow bearing on one of said members in operative contact with the gears on the spindles, means for operating said gear, a reciprocating shaft journaled in said members, a disk secured to one end of said shaft, spring brakes assembled radially on said disk and adapted to engage the spools

and hold them in restraint during the winding operation, means including pulleys and gears for operating said winding frames and reciprocating means.

- 5 9. In a thread or ribbon winding machine comprising a frame, a pair of members mounted thereon, a plurality of spindles assembled around the periphery of said members, U-shaped winding frames attached to said spindles, spools mounted on said spindles, means including gears for operating said spindles, a movable shaft mounted in the center of said members, a disk secured to one end of said shaft, friction springs assembled around the 10 periphery of said disk and adapted to engage a groove in the flange of the spools, a lever pivotally secured to said shaft adapted to reciprocate said shaft, means including a cam for reciprocating said lever.
- 15 10. In a winding machine comprising a frame, a pair of circular members mounted thereon, a plurality of spindles assembled around the periphery of said circular members, U-shaped winding frames fixed to the 20 spindles, gears attached to said spindles, a gear journaled on a hollow bearing on one

end of one of said members and in operative contact with the gears on the spindles and adapted to rotate said spindles and winding frames, a reciprocal shaft journaled in said 30 members, means including a cam for reciprocating said shaft during the winding operation.

11. In a winding machine comprising a frame, a pair of circular members secured 35 thereon, a plurality of spindles mounted around the periphery of said circular members, each spindle having a gear attached thereto, a gear journaled on one of said members and in operative contact with the gears 40 on said spindles, the combination of spools movably mounted on said spindles, a brake for each spool adapted to retard the operation of said spools, a reciprocative shaft connected to the brake means, a lever and connections from said lever to means for reciprocating said shaft.

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