

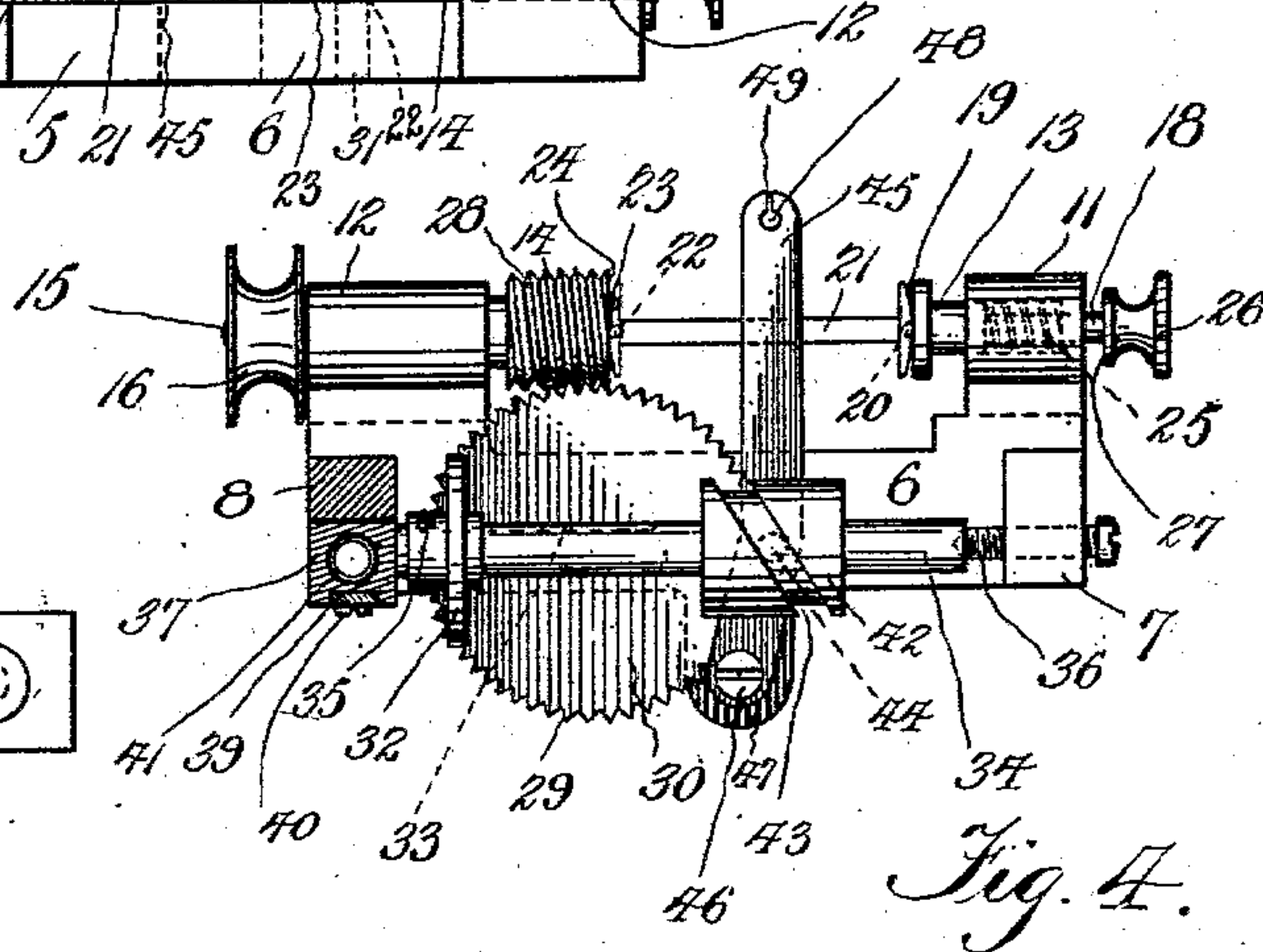
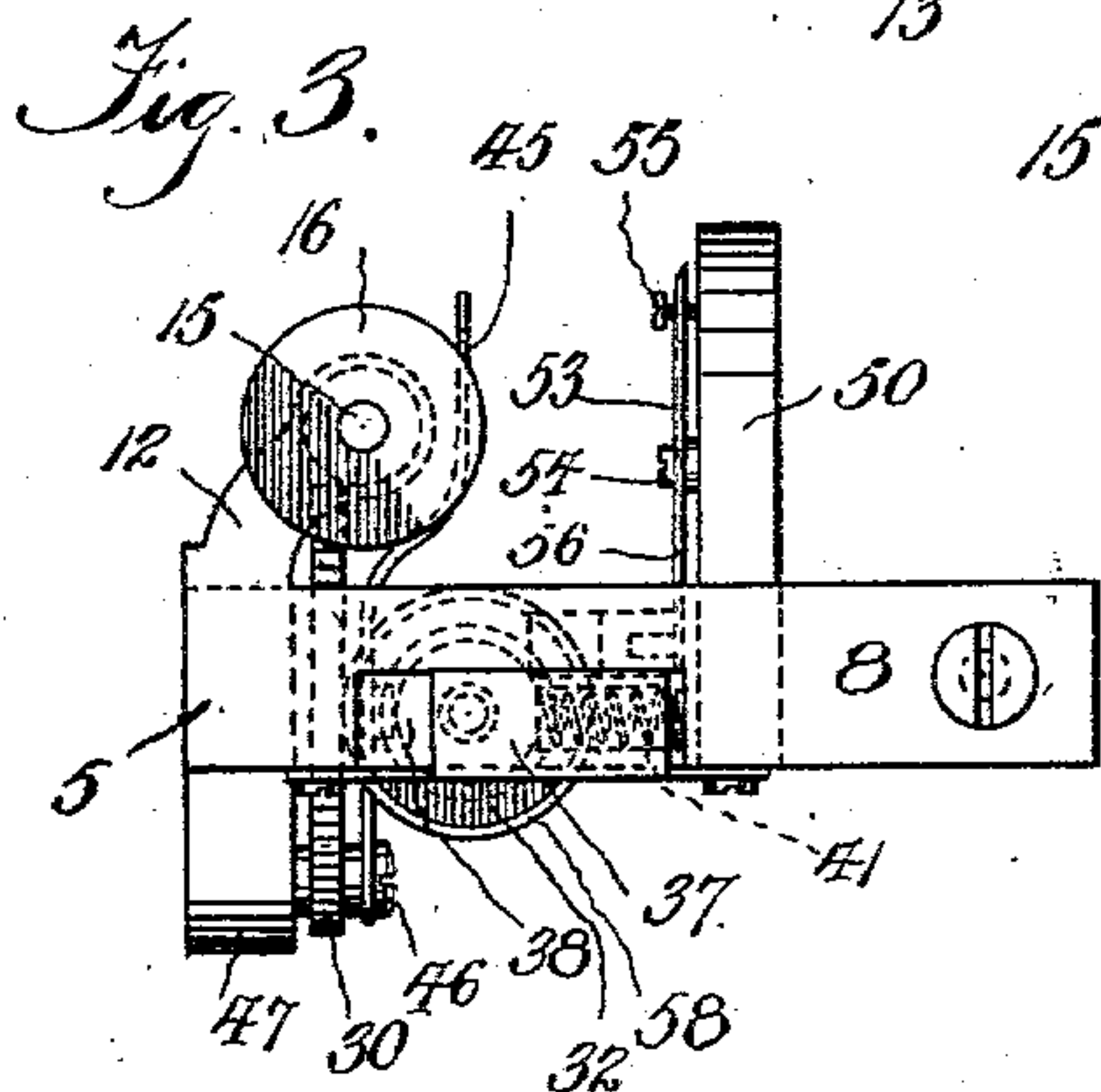
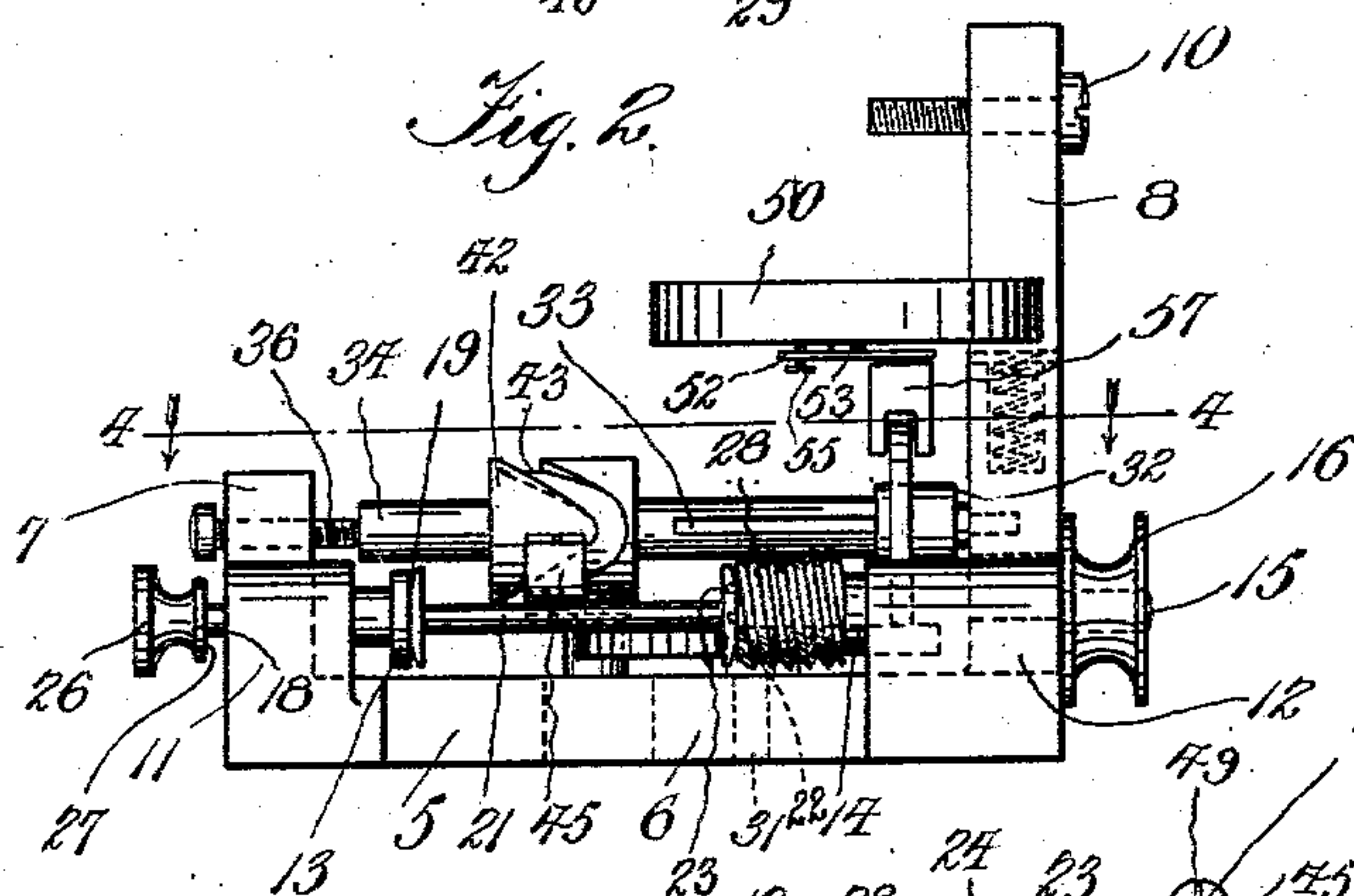
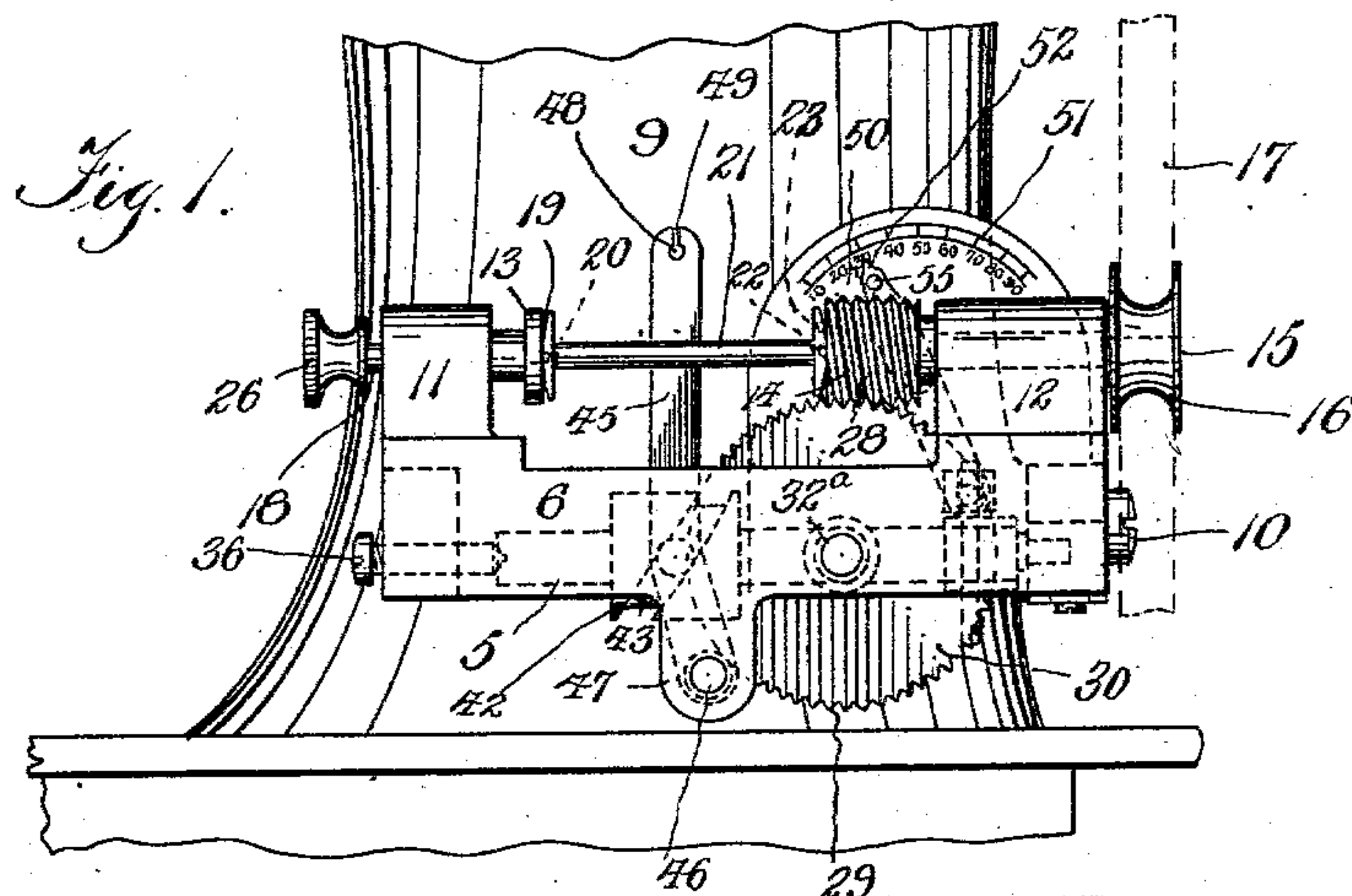
No. 744,089.

PATENTED NOV. 17, 1903.

W. J. MILNE.
BOBBIN WINDER.

APPLICATION FILED MAR. 17, 1902.

NO MODEL.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM JAMES MILNE, OF FORDWICH, CANADA.

BOBBIN-WINDER.

SPECIFICATION forming part of Letters Patent No. 744,089, dated November 17, 1903.

Application filed March 17, 1902. Serial No. 98,476. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM JAMES MILNE, a subject of the King of Great Britain, residing at Fordwich, county of Huron, Province of Ontario, Canada, have invented certain new and useful Improvements in Bobbin-Winders; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an apparatus adapted to wind thread evenly and regularly and with great rapidity upon the bobbins of sewing-machines of the shuttle or lock-stitch type.

The object of my invention is to produce a bobbin-winder which will wind any kind or size of thread regularly and evenly thereon and to provide a simple adjustment for each size of thread used, whereby by merely setting an index-finger to the proper point designated on a dial the machine is set to wind thread thereon of the diameter and size corresponding to the number designated on the dial to which the said index-finger is set, thus winding the thread well all over, doing away with poorly-filled bobbins and preventing the various coils of the thread from becoming entangled with one another, and thus breaking, which is caused by an uneven winding of the thread on the bobbin. So far as is known to me there is no bobbin-winder as yet invented which will perfectly fulfil all these functions.

To these ends my invention consists in a frame of convenient size to be stowed away in the small drawer of a sewing-machine and which when in use is secured to the base of the sewing-machine arm or other suitable point, being provided with a projecting arm on the frame for this purpose. The frame referred to carries a pair of centers or heads, between which the bobbin is adapted to be chucked, being secured by suitable means to one of the heads, which is the live head, to rotate therewith, and the shaft of this head is provided with means for rotating it from the sewing-machine belt and intergearing means, which operates a traverse-arm, adapted to carry the thread from the spool to the bobbin and to be moved backward and for-

ward across the bobbin, according as the thread is wound thereon.

The essential feature of my invention consists in the peculiar mechanism by which the cam which moves the traverse-arm is geared to the live head or stock which rotates the bobbin, and this mechanism consists in a faced friction-disk adapted to rotate a friction-wheel, which is resiliently held in contact therewith by a spring on the end of the cam-shaft of the traverse-arm, on which shaft said friction-wheel is mounted, and I provide a guide for this friction-wheel, so as to move it along the shaft to different positions toward and from the center of said friction-disk, and thus cause the faster or slower reciprocation of the traverse-arm. The guide or shifting means for the said friction-wheel consists in a fork embracing the sides of the wheel, which is mounted upon the end of an index-lever, this lever being pivoted at the center of a dial-plate and having its opposite end extended to form an index-finger, which points to various positions on a dial marked on the plate, this dial being graduated and marked with the different sizes of the thread thereon in such manner that the setting of the index-finger opposite the number corresponding to the thread which is to be wound upon the bobbin will cause a rate of oscillation of the traverse-arm corresponding to that particular size of thread.

My invention consists, further, in the particular combinations and construction of parts, which are described in the following specification and particularly set forth in the claims.

I have shown the preferred form of my improved bobbin-winder in the accompanying drawings, wherein—

Figure 1 is a side elevation of the bobbin-winder shown in position upon the base of the machine-arm and adapted to be operated by the belt of the machine. Fig. 2 is a plan view. Fig. 3 is a rear view, and Fig. 4 is a vertical section taken on the line 4-4 of Fig. 2.

The same numerals of reference denote like parts in all the figures of the drawings.

The apparatus consists, substantially, of a three-sided rectangular frame 5, having a central member 6 and two arms at opposite ends thereof and of unequal length, (desig-

nated, respectively, 7 and 8.) The arm 8 is extended beyond the mechanism carried by the frame in order to permit its attachment to a table or sewing-machine arm 9 by means of a screw 10. Mounted upon the ends of the central member 6 of the frame there are two bearing-lugs 11 12, which have apertures formed therein adapted to rotatively support the two centers or turning heads 13 and 14. The head 14 is a live head and mounted on the inner extremity of an arbor 15, which is mounted to rotate in the bearing-aperture of the lug 12 and extends outwardly therefrom and has mounted on its outer end a small grooved pulley 16, in which the round belt 17 of the sewing-machine is adapted to run and to turn the live head 14 with great velocity. The head 13 is also mounted upon a spindle 18 in the lug 11; but this head is not intended to rotate, being formed merely with a seat 19, formed on its inner face and having a center-pin 20, adapted to form a dead-center for the end of the bobbin 21, whose opposite end is centered upon the pin 22 and engaged by pins 23, projecting from the face 24 of the head 14, so as to cause the bobbin to rotate therewith. To permit the bobbin to be readily inserted and removed and to hold it firmly clamped between the two heads 13 and 14, the head 13 is mounted to reciprocate within its socket in the lug 11, being yieldably pressed inwardly toward the head 14 by means of a coiled spring 25, mounted in the bearing-recess of the head and caused to press, respectively, against a shoulder formed around the aperture and the rear end of the head 13, and to limit the motion of the head and prevent it from leaving its aperture the spindle 18 has fixed to its outer end a handle 26, which is shouldered upon its inner face, as shown at 27, and may be operated to draw back the head 13 through a certain distance against the pressure of the spring 25, thus opening the interval between the two heads sufficiently to allow the insertion of the bobbin 21.

The traverse means to provide for the even winding of the thread on the bobbin is operated in the following manner: Around the circumference of the head 14 is formed a worm or endless screw 28, with which mesh the teeth 29 upon the edge of a friction-disk 30, mounted upon a shaft 31, projecting from one side of the disk 30 in a suitable bearing-aperture 32^a, formed in the member 6 of the frame. The face of this disk 30 engages frictionally with a small friction-wheel 32, which is slidably keyed by means of a long grooved keyway 33 upon one end of the traverse-shaft 34, which is supported on bearings located, respectively, in the two side members 7 and 8 of the frame in a manner that will be presently described. The friction-wheel 32 is rotatively engaged with the shaft by an internal snug or projection 35, formed in the inner periphery of its hub and sliding in the keyway 33, so as to permit the friction-wheel to slide back and forth upon the shaft 34 while rotat-

ing with it. The opposite end of the shaft 34 is supported on a stationary pivot formed by an adjustable screw 36, mounted in a suitable aperture in the arm 7 of the frame; but the end adjacent to the friction-wheel has a special yieldable bearing formed by a block 37, having a bearing-aperture therein and adapted to slide longitudinally in the recess 38, formed on the under side of the arm 8, the block 37 being secured therein by a retaining-bar 39, fastened by screws 40 to the under side of the arm 8. This block 37 is yieldably pressed in the direction of the friction-disk by a coiled spring 41, which is seated in a recess in the end of the block and presses against the rear wall of the recess 38, this arrangement serving to hold the friction-wheel 32 in constant engagement with the disk 30 at a uniform pressure.

On the shaft 34 is mounted the cylindrical traverse-cam 42, which has an oblique groove 43 therein, into which projects a pin 44, carried by the traverse-arm 45, whose lower end is pivoted upon a screw 46, embedded in a lug 47, depending from the lower side of the member 6 of the frame, and the arm extends upwardly above the cam 42 to a sufficient extent to permit of the proper length of travel of the thread-aperture 48 between the ends of the bobbin. The thread-aperture 48 is preferably connected by a slot 49 with the exterior surface of the traverse-arm in order to enable the thread to be readily inserted therein from an intermediate point of the thread.

Now it will be seen that by the train of connections provided the rotation of the head 14 will cause the worm 28 to rotate the disk 30, and this in turn to rotate the friction-wheel 32 and the traverse-shaft 34, and this to reciprocate the traverse-arm 45 at a rate of speed corresponding to the position of the friction-wheel relative to the disk—that is to say, when said friction-wheel is near the outer periphery of the disk it will be caused to rotate rapidly, and when it is near the center of the disk it will rotate slowly, the former corresponding to large sizes of thread and the latter to small sizes.

Now in order to provide for the proper setting and holding of the friction-wheel in the position suitable for a given size of thread, I arrange a semicircular dial-plate 50 upon the opposite side of the traverse-shaft from the friction-disk 30, this index-plate being supported at one side by the arm 8 and preferably cast integral therewith. The upper side of one face of the dial-plate is graduated, as shown at 51, it having a series of numbers marked thereon corresponding to the numbers of thread to be wound on the bobbin. With this dial coöperates an index-finger 52, mounted upon the extremity of an index-lever 53, pivoted at the center of the dial, as shown at 54, and the index-finger is provided with a suitable set-screw 55, adapted to be screwed fast against the face of the plate and to hold the finger either frictionally or otherwise in

any position in which it is set. The lower end 56 of the index-lever 53 is extended downwardly of the pivot 54 and carries connected thereto by a swivel-joint a shifting-block 57, preferably in the form of a bifurcated shift-fork, whose two arms embrace the periphery of the friction-wheel 32. It will be seen that the effect of these connections is that the lever 53 will be turned by simply setting the index-finger to its proper position, and thereby will carry with it the friction-wheel 32, which is slid along the shaft to its proper position in contact with the disk 30, so as to rotate the traverse-arm at the proper rate, and when the index-finger is set against the dial the friction-wheel is held steady in this position and prevented from becoming displaced accidentally or by the rotation of said wheel.

In order to assist the rotation of the friction-wheel at the proper rate and prevent slipping with the disk 30, I have provided it with a rubber tire or rim 58.

While I have shown in the accompanying drawings the preferred form of my invention, it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore reserve the right to make such modifications as are included in the scope of the following claims.

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

1. A bobbin-winder comprising means for rotating a bobbin, a traverse-arm adapted to reciprocate adjacent to said bobbin, means for causing the reciprocation of said traverse-arm, and means for regulating the rate of its reciprocation comprising a variable-speed connection, a shifting-lever therefor, a dial-plate, an index-finger carried by said shifting-lever, and means for clamping said index-finger to said dial-plate.

2. A bobbin-winder comprising means for rotating a bobbin, a traverse-arm adapted to carry the thread and to reciprocate adjacent to said bobbin, means for causing the reciprocation of said traverse-arm operated by the means rotating the bobbin, means for adjusting the rate of reciprocation of the traverse-arm comprising a dial-plate and index-finger movably mounted thereon, a pair of wheels movable relatively to each other and forming a variable gearing connecting said reciprocating means for the traverse-arm with said rotating means for the bobbin, and an operative connection between said variable gearing and index-finger.

3. A bobbin-winder comprising means for rotating a bobbin, a pair of wheels movable relatively to each other and forming a variable gearing rotated by said means, a traverse-arm adapted to carry the thread and to reciprocate adjacent to the bobbin, means

operated by said variable gearing for reciprocating the traverse-arm, a graduated dial-plate, and an index-finger cooperating with said dial-plate and connected with said variable gearing to change the position of the same corresponding to the setting of the finger on the dial-plate.

4. A bobbin-winder comprising means for rotating a bobbin, a variable gearing rotated by said means, a traverse-arm adapted to carry the thread and to reciprocate adjacent to the bobbin, means operated by said variable gearing for reciprocating the traverse-arm, a shifting-lever for varying the speed ratio of said gearing, a graduated dial-plate, an index-finger fixed to said shifting-lever and cooperating with said dial-plate, and a set-screw carried by said index-finger for clamping it in a stationary position.

5. A bobbin-winder comprising a pair of heads or centers for retaining the bobbin between them, means for rotating one of said heads, a gearing rotated by one of said heads, and a friction-disk rotated thereby in a plane parallel to the axis of the bobbin, a traverse-shaft parallel to the bobbin and mounted to rotate adjacent to said friction-disk, a traverse-cam carried thereby, a traverse-arm adapted to be reciprocated by said cam, a friction-wheel slidably keyed to said traverse-shaft and engaging with said friction-disk, means for setting said wheel in various positions upon said disk, and means for clamping said wheel in a fixed position on said disk.

6. A bobbin-winder comprising a pair of heads or centers for retaining the bobbin between them, means for rotating one of said heads, a gearing rotated by one of said heads, a friction-disk rotated thereby, a traverse-shaft mounted to rotate parallel to said bobbin and adjacent to said friction-disk, a traverse-cam carried thereby, a traverse-arm adapted to be reciprocated by said cam, a friction-wheel slidably keyed to said traverse-shaft and engaging with said friction-disk, a dial-plate, an index-lever having an index-finger movably mounted thereon, and an arm extending from said lever and engaging said friction-wheel whereby the position of said wheel is indicated by the position of the index-finger on the dial-plate.

7. A bobbin-winder comprising a pair of heads or centers for retaining the bobbin between them, means for rotating one of said heads, a gearing rotated by one of said heads, a friction-disk rotated thereby, a traverse-shaft mounted to rotate parallel to said bobbin and adjacent to said friction-disk, a traverse-cam carried thereby, a traverse-arm adapted to be reciprocated by said cam, a friction-wheel slidably keyed to said traverse-shaft and engaging with said friction-disk, a dial-plate fixed to the frame of the machine, an index-lever pivotally mounted thereon, and a shift-fork carried by said lever and embracing said friction-wheel, whereby the po-

sition of said friction-wheel is indicated by the position of said lever.

8. A bobbin-winder comprising a pair of heads or centers for retaining the bobbin between them, means for rotating one of said heads, a gearing rotated by one of said heads, a friction-disk rotated thereby, a traverse-shaft mounted to rotate parallel to said bobbin and adjacent to said friction-disk, a traverse-cam carried thereby, a traverse-arm adapted to be reciprocated by said cam, a friction-wheel slidably keyed to said traverse-shaft and engaging with said friction-disk, a dial-plate fixed to the frame of the machine, an index-lever pivoted at the center thereof, an index-finger carried by one end of said index-lever, a shift-fork carried by the other end and embracing the rim of said friction-wheel, and means for clamping said lever in a fixed position on said dial-plate.

9. A bobbin-winder comprising a pair of heads between which the bobbin is adapted to be clamped, means for rotating one of said heads and causing the bobbin to be rotated thereby, a friction-disk connected by gearing to said rotating head so as to be rotated thereby, a traverse-shaft carrying a cam thereon mounted adjacent to said disk, a traverse-arm operated by said cam, a yieldable bearing-block for one end of said traverse-shaft mounted to slide toward and from said disk, a spring mounted to press said bearing-block toward said disk, and a friction-wheel slidably keyed upon the movable end of said traverse-shaft and pressed into engagement with said disk by said spring.

10. A bobbin-winder comprising a pair of heads between which the bobbin is adapted to be clamped, means for rotating one of said heads and causing the bobbin to be rotated thereby, a friction-disk connected by gearing to said rotating head so as to be rotated thereby, a traverse-shaft carrying a cam thereon mounted adjacent to said disk, a traverse-arm operated by said cam, a yieldable bearing-block in which one end of said shaft is mounted to slide toward and from said disk, a spring mounted to press said bearing-block toward said disk, a friction-wheel slidably keyed upon the movable end of said traverse-shaft and pressed into engagement with said disk by said spring, a dial-plate mounted upon the frame of the bobbin-winder, an index-lever pivotally mounted at the center thereof, an index-finger cooperating with the dial of said plate, and a shifting-block carried by said lever and embracing said friction-wheel to adjust the setting thereof.

11. A bobbin-winder comprising a pair of heads between which the bobbin is adapted to be clamped, means for rotating one of said heads and causing the bobbin to be rotated thereby, a friction-disk connected by gearing to said rotating head so as to be rotated thereby, a traverse-shaft carrying a cam thereon mounted adjacent to said disk, a traverse-arm operated by said cam, a yieldable bear-

ing-block carrying one end of the shaft and mounted to slide toward and from said disk, a spring mounted to press said bearing-block toward said disk, a friction-wheel slidably keyed upon the movable end of said traverse-shaft and pressed into engagement with said disk by said spring, a dial-plate mounted upon the frame of the bobbin-winder, an index-lever pivotally mounted at the center thereof, an index-finger cooperating with the dial of said plate, a shifting-block carried by said lever and embracing said friction-wheel to adjust the setting thereof, and means for clamping said index-lever in a fixed position on said dial-plate.

12. A bobbin-winder comprising a three-sided rectangular frame having means for the attachment thereof to a sewing-machine or table, a pair of bearing-lugs carried thereby, heads carried in said lugs and adapted to support a bobbin between them, means for yieldably pressing one head toward the other to support the bobbin, means carried by the other head to rotate the bobbin, a pulley-sheave carried by the arbor of said head to rotate the same, a worm-thread formed on said head, a friction-disk having teeth engaging with said worm-thread, a traverse-shaft mounted parallel to the axis of said heads and turning upon a stationary pivot at one end, a spring-pressed sliding bearing-block supporting the other end, a friction-wheel slidably keyed upon the spring-pressed end of said shaft and pressed into engagement with said friction-disk, a traverse-cam mounted on said shaft, a traverse-lever adapted to be reciprocated by said cam to distribute the thread upon the bobbin, a dial-plate mounted upon the frame of the apparatus and carrying thereon a graduated dial, an index-lever pivoted at the center of said dial-plate, an index-finger mounted upon the upper end of said lever and coacting with said dial-plate, and a shifting-block carried by the lower end of said index-lever and embracing the rim of said friction-wheel.

13. A bobbin-winder comprising a three-sided rectangular frame having means for the attachment thereof to a sewing-machine or table, a pair of bearing-lugs carried thereby, heads carried in said lugs and adapted to support a bobbin between them, means for yieldably pressing one head toward the other to support the bobbin, means carried by the other head to rotate the bobbin, a pulley-sheave carried by the arbor of said head to rotate the same, a worm-thread formed on said head, a friction-disk having teeth engaging with said worm-thread, a traverse-shaft mounted parallel to the axis of said heads and turning upon a stationary pivot at one end, a spring-pressed sliding bearing-block supporting the other end, a friction-wheel slidably keyed upon the spring-pressed end of said shaft and pressed into engagement with said friction-disk, a traverse-cam mounted on said shaft, a traverse-lever adapted to

be reciprocated by said cam to distribute the thread upon the bobbin, a dial-plate mounted upon the frame of the apparatus and carrying thereon a graduated dial, an index-lever 5 pivoted at the center of said dial-plate, an index-finger mounted upon the upper end of said lever and coacting with said dial-plate, a shifting-block carried by the lower end of said index-lever and embracing the rim of 10 said friction-wheel, and a set-screw threaded

into said index-lever to maintain the lever in a fixed position on the dial-plate, substantially as described.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

WILLIAM JAMES MILNE.

Witnesses:

N. McLAUGHLIN,

J. E. MULHOLLAND.