No. 892,783. PATENTED JULY 7, 1908.

E. WALDER.

BOBBIN WINDER.

APPLICATION FILED MAY 7, 1907.

3 SHEETS—SHEET 1.

Fig. 1.

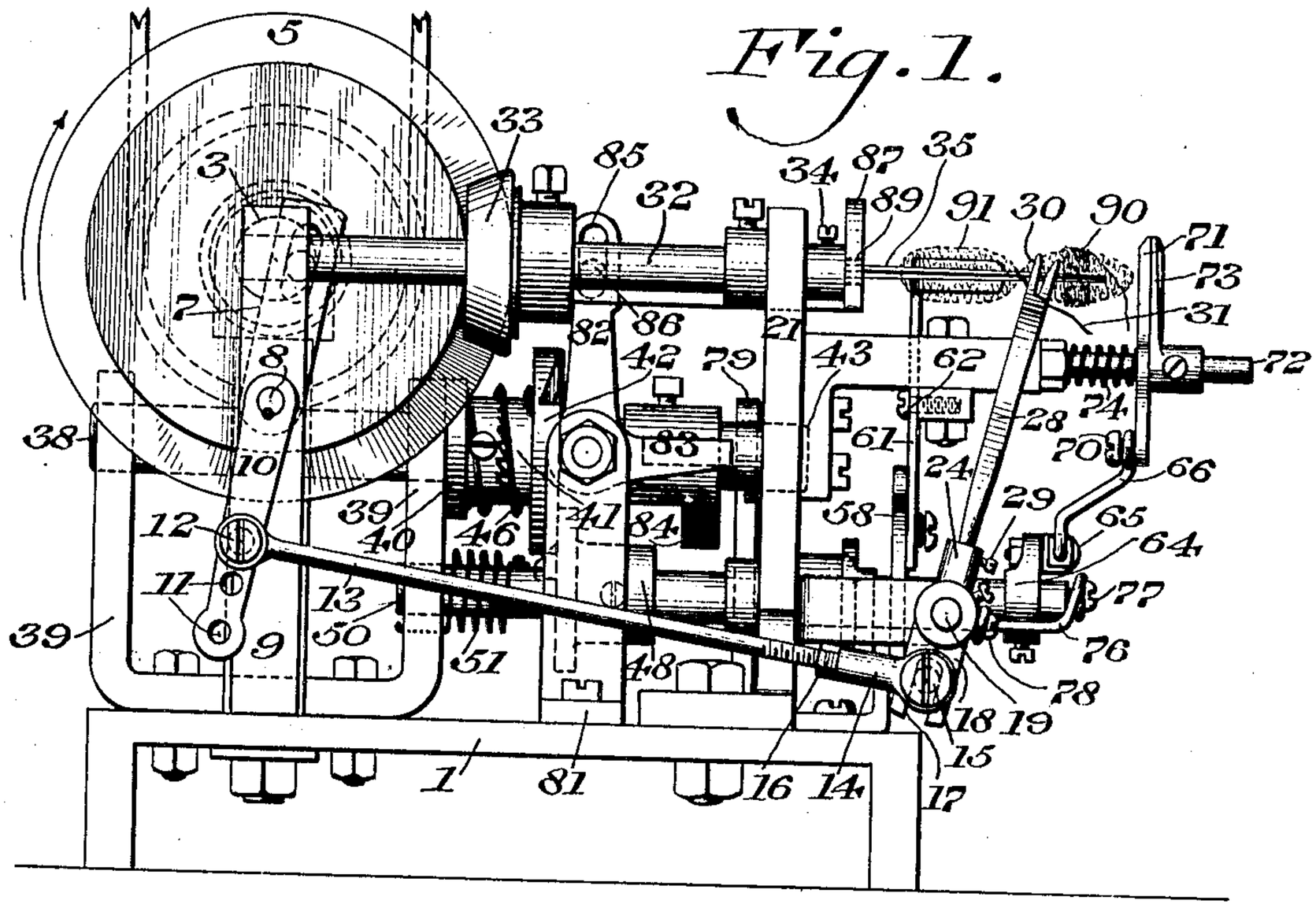
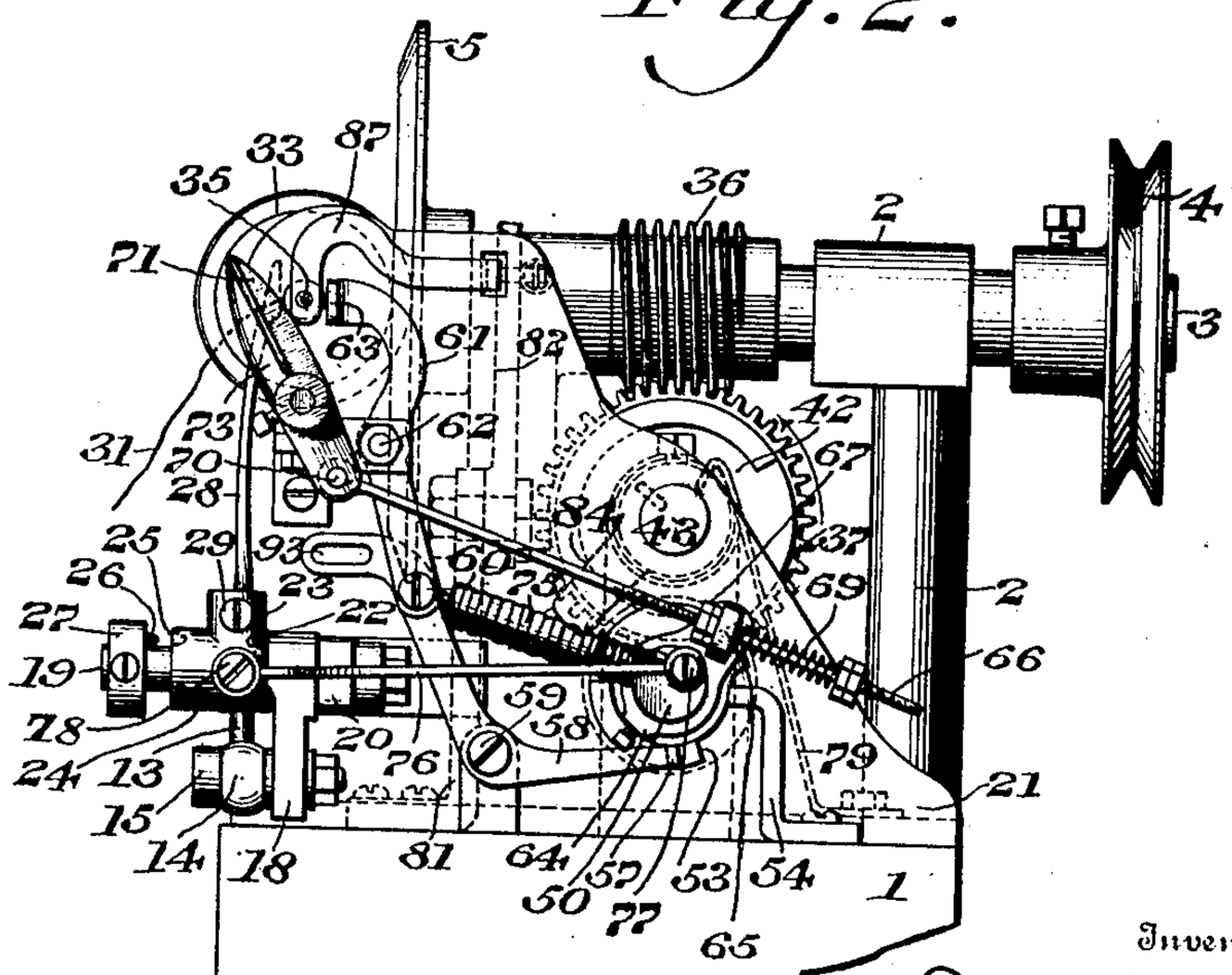


Fig. 2.



Witnesses

P. F. Eagles.

C. L. McVay

Inventor

Emil Walder,

By Wiederhein & Fairbanks

Attorneys

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3 SHEETS—SHEET 2.

Fig. 3.

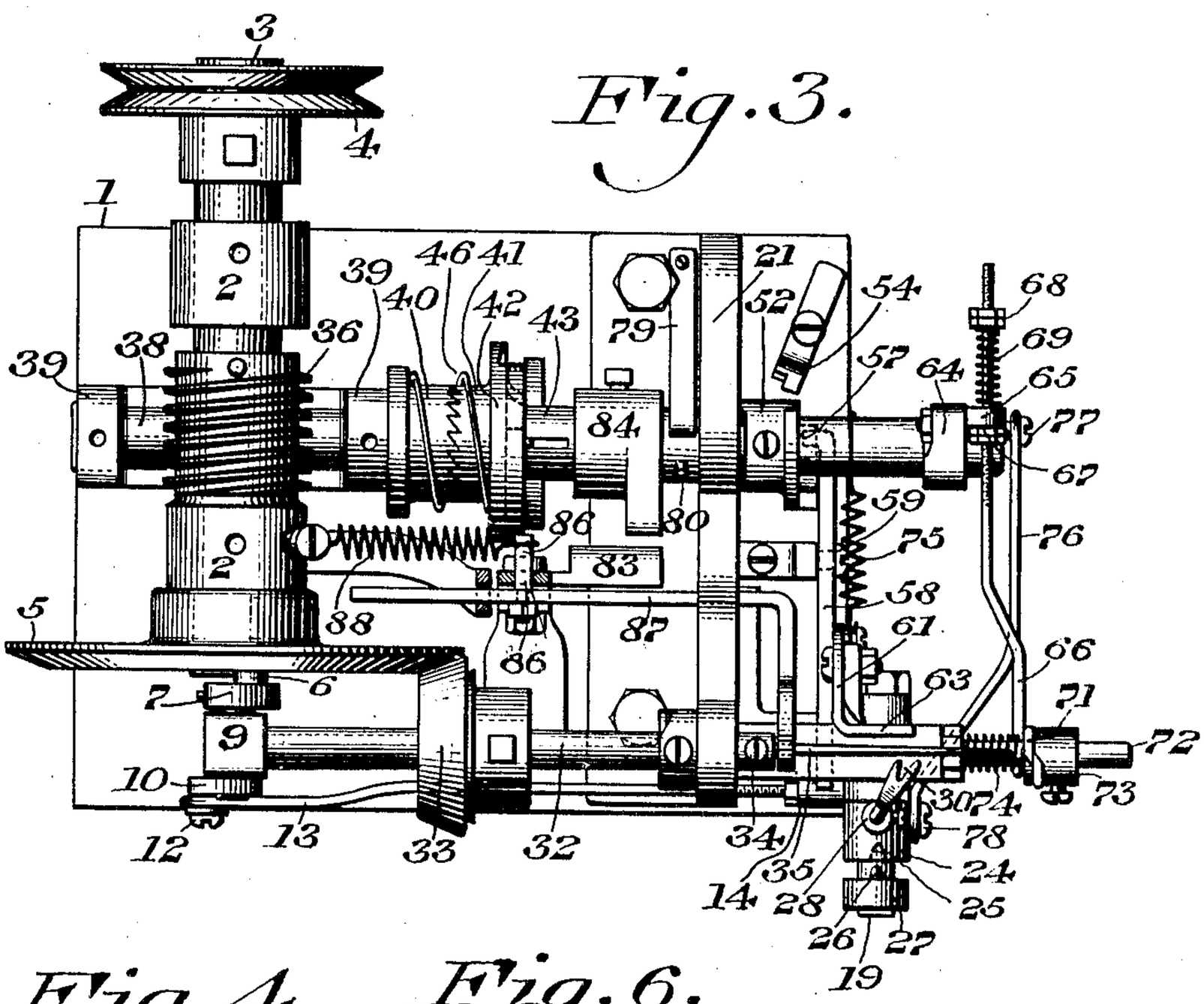


Fig. 4.

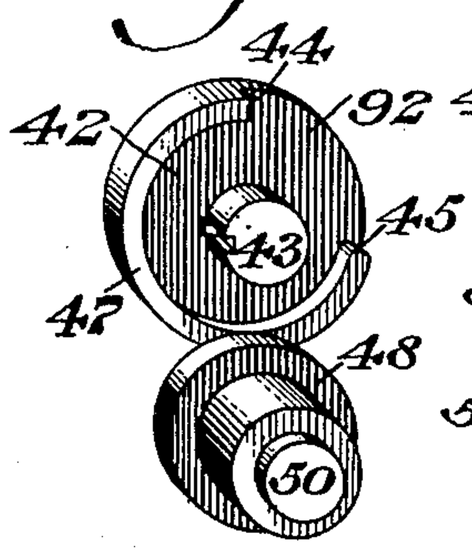


Fig. 6.

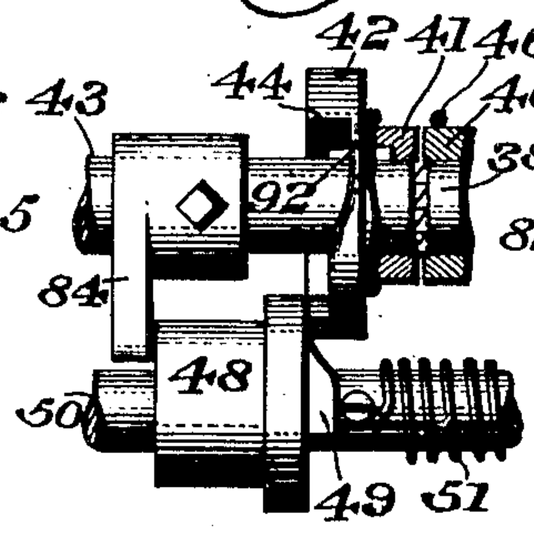


Fig. 7.

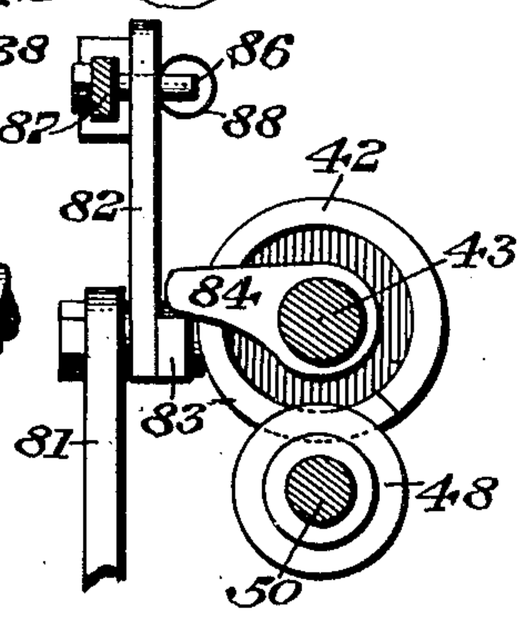
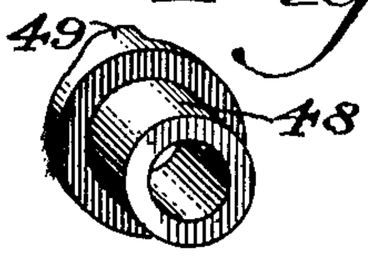


Fig. 5.



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3 SHEETS—SHEET 3.

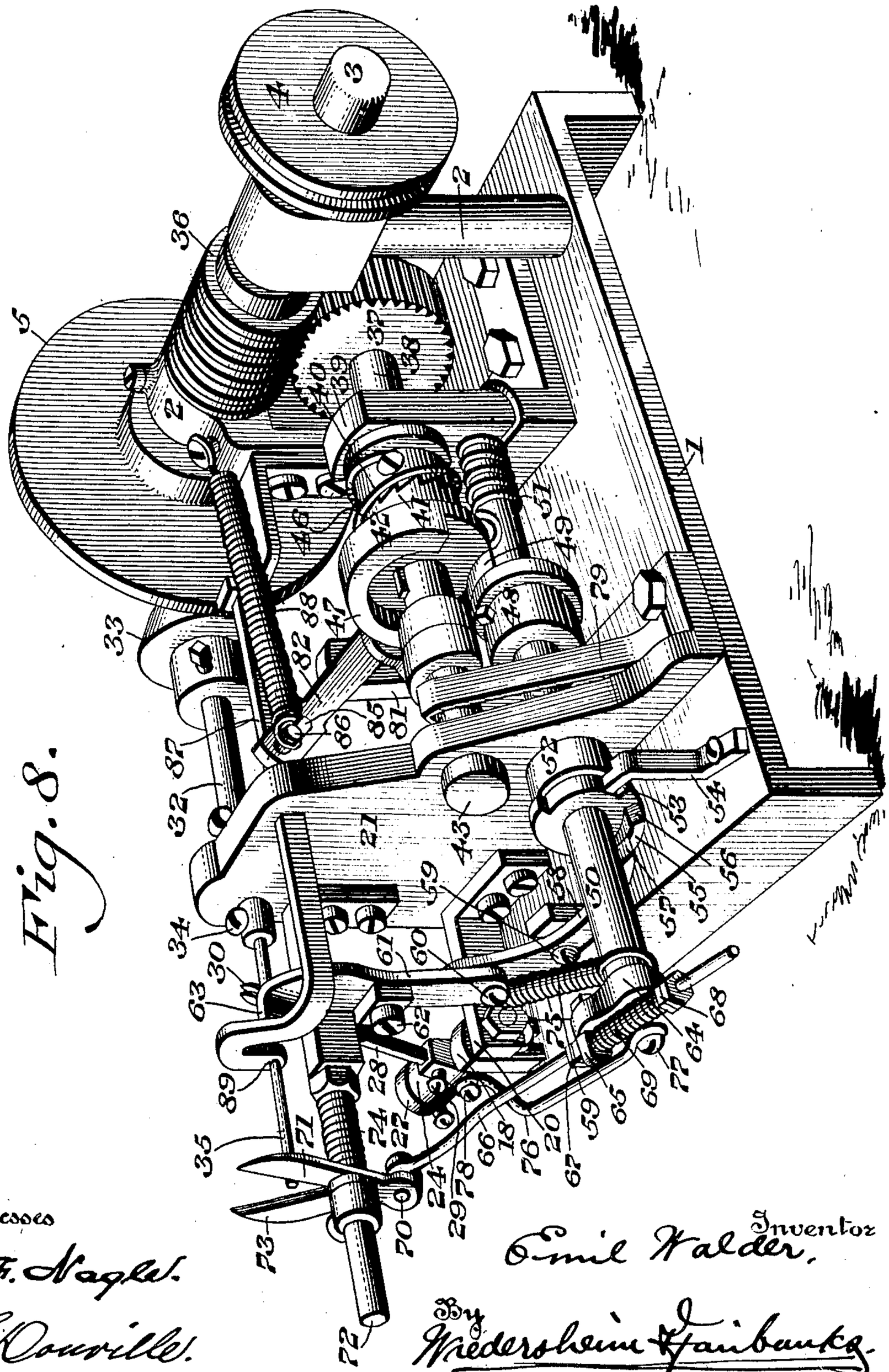

Fig. 8.

Witnesses

P. F. Nagle.

L. Doville.

Inventor

Emil Walder.

By Wiedersheim & Fairbanks.

Attorneys.

UNITED STATES PATENT OFFICE.

EMIL WALDER, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO ALBERT GREINER AND ONE-THIRD TO CHARLES MERKLING, BOTH OF PHILADELPHIA, PENNSYLVANIA.

BOBBIN-WINDER.

No. 892,783. Specification of Letters Patent. Patented July 7, 1908.

Application filed May 7, 1907. Serial No. 372,456.

To all whom it may concern:

Be it known that I, EMIL WALDER, a subject of the Emperor of Germany, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Bobbin-Winder, of which the following is a specification.

My present invention consists of a novel construction of a bobbin winder in which bobbins of a uniform size are produced, said bobbins when finished being automatically discharged from the machine and separated from each other.

It further consists of a novel construction of winding mechanism, discharge mechanism and severing mechanism which are so correlated and timed that the several operations take place at predetermined times.

It further consists of novel means for maintaining the feeding lever stationary at predetermined times.

It further consists of novel means actuated by the driving shaft for intermittently actuating the severing mechanism.

It further consists of novel means controlled by the size of the bobbin being wound for controlling the discharge of the bobbins from the machine.

It further consists of other novel features of construction, all as will be hereinafter fully set forth.

For the purpose of illustrating my invention I have shown in the accompanying drawings, one form of a device since this embodiment best illustrates the principle thereof and has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown.

Figure 1 represents a front elevation of a bobbin winder embodying my invention. Fig. 2 represents an end elevation thereof. Fig. 3 represents a plan view thereof. Fig. 4 represents a perspective view of two of the parts employed, in detached position. Fig. 5 is a perspective view of one of the parts seen in Fig. 4. Fig. 6 represents a side elevation partly broken away showing parts seen in Fig. 4. Fig. 7 represents a sectional view of a portion of Fig. 2 showing the actuating means for the discharge mechanism. Fig. 8 represents a perspective view of my device, viewed from the rear.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—1 designates the base of the machine from which rise standards 2, in which is journaled a driving shaft 3 on which latter is adjustably mounted a pulley 4 which may be driven in any suitable manner.

5 designates a friction disk mounted on the driving shaft and having eccentrically secured thereto a pin or lug 6 which engages a slot near one end of a lever 7, the other end thereof being secured to a rock shaft 8 mounted in a standard 9 carried by the base 1.

10 designates a crank arm, one end of which is secured to the rock shaft 8, the other end thereof being provided with a plurality of apertures 11 with one of which the fastening device 12, on which is loosely mounted one end of the connecting rod or arm 13, is adapted to engage. The outer end of the rod 13 has threaded or other engagement with a sleeve 14 pivotally mounted on a pin or rod 15 and is held in its adjusted position by a lock nut 16. The rod 15 is adjustably secured in the slot 17 of the crank arm 18, which latter is loosely mounted on a rod or shaft 19 secured to a bracket 20 carried by a standard 21 in any suitable manner.

22 designates a pin or lug carried by the crank arm 18 and having its end preferably beveled or pointed in order that it may engage with a recess or depression 23 in a crank arm 24 loosely mounted on the shaft 19. The crank arm 24 is also provided with a recess or aperture 25 with which is adapted to engage at a desired time a pin or lug 26 carried by a set collar 27 adjustably secured on the shaft 19 so that during the operation when the lug 22 engages the recess 23 the crank arm 24 will be rocked, and when the lug 26 engages the recess 25 the crank arm 24 will be held stationary. The pin or lug 22 and its coöperating recess 23 are the same as the pin or lug 26 and its coöperating recess 25 which latter are clearly shown in Fig. 2.

28 designates a feeding lever, one end of which is adjustably secured to the crank 24 by means of a set screw 29, the other end thereof being slotted as seen at 30, thereby adapting it to retain the thread 31, as seen most clearly in Fig. 1.

32 designates a shaft journaled in the stand-

ards 9 and 21 and having adjustably secured thereon a friction disk 33 adapted to be driven by the friction disk 5. The shaft 32 has adjustably secured thereto at its end by means of a set screw 34 a polygonal shaped and preferably tapering needle 35, it being noted that the feeding lever 28, as most clearly seen in Fig. 2, is deflected so that the slotted end thereof reciprocates in proximity to the needle 35.

36 designates a worm mounted on the driving shaft 3 which meshes with a gear wheel 37 carried by a shaft 38 journaled in standards 39.

40 designates a clutch member mounted on the shaft 38 which is adapted to co-act with the clutch member 41 integral in the present instance with the cam 42 keyed on a shaft 43 journaled in the standard 21. The cam 42 is cut away on one side to form a release face 44 and a leading face 45.

46 designates a spring interposed between the two clutch members 40 and 41 and normally tending to move the member 41 out of engagement with the member 40. The clutch members are normally held in engagement with each other by the engagement of the flange 47 with the side of a cam block 48 having an operative cam face 49 and fixedly mounted on shaft 50 journaled in the standards 21 and 39. The shaft 50 is maintained in normal position by means of a torsional spring 51, one end of which is fixed to the standard 39, the other end thereof being secured to said shaft 50.

52 designates a set collar fastened on the shaft 50 having a portion of its periphery cut away to form a shoulder 53, which is adapted to be stopped by the upper end of the standard 54 carried by the base 1. The set collar 52 has a flange 55 on its outer side which is cut away to form a stop 56 with which the deflected end 57 of a lever 58 is adapted to engage, said lever being pivoted intermediate its ends as at 59 to a suitable portion of the base. The opposite end of the lever 58 has pivoted thereto at 60 a lever arm 61 which is pivoted intermediate its end, as at 62 to an extension from the standard 21. The upper end of the lever 61 is deflected as seen at 63 to form an extension, which is substantially parallel with the needle 35 and which will engage the bobbin which is being wound, as will be clearly understood from Fig. 1 of the drawing.

64 designates a crank adjustably mounted on the shaft 50 and having pivoted thereto a swivel 65 through which passes the knife actuating rod 66, the end of which is threaded and provided with lock nuts 67 on one side of the swivel 65, which serve as a stop to limit the movement of the rod 66 in one direction.

68 designates lock nuts on the rod 66, between which and the swivel 65 is interposed a spring 69 whereby the rod 66 is normally maintained in its rearmost position. The forward end of the rod 66 is pivoted at 70 to a knife blade 71, which is mounted on the rod 72 extending from the standard 21.

73 designates the knife blade which is adjustably mounted on the rod 72.

74 designates a spring interposed between the knife blade 71 and the support of the rod 72, whereby the knife blade 71 is always maintained in engagement with the knife blade 73.

75 designates a spring, one end of which is fastened around the shaft 50, the other end thereof being secured to the pivot 60 of the lever 61, whereby the deflected end 63 is normally maintained in its forward position by the tension of said spring.

76 designates a rod, one end of which is eccentrically connected at 77 to the shaft 50, the other end thereof being secured at 78 to the bracket 24, which carries the feed lever 28. As seen in Fig. 1, the connection of the rod 76 with the shaft 50 and crank arm 24 are such that the reciprocation of the thread guide will not subject this rod to undue strain.

79 designates a spring, one end of which is suitably secured to the base, the other end thereof being deflected and adapted to engage with a pin or lug 80 carried by the shaft 43, at a suitable time, and prevents improper movement of the shaft 43 and its adjuncts.

81 designates a standard carried by the base 1, to which is pivoted an elbow lever 82 with the enlarged end 83 of which is adapted to engage at a certain time a cam block 84 mounted on the shaft 43. The upper end of of the lever 82 is apertured or slotted, as seen at 85, and with this slot is adapted to engage a pin 86 secured to a discharge rod or arm 87, which is journaled in the standard 21 and an extension from one of the standards 2. The lever 82 and the arm 87 are maintained in their normal position by means of a spring 88, one end of which is fastened to the pin 86, the other end thereof being suitably fastened to the standard 2. The outer end of the discharge arm 87 is deflected and apertured as seen at 89, in order that it may be guided on the needle or bobbin spindle 35. As seen in Fig. 1, 90 designates a bobbin which has already been wound and 91 designates the bobbin which is being wound.

The operation of my novel construction of bobbin winding machine will now be readily understood:—The driving shaft 3 is driven by any suitable type of motor or engine. Assuming that the parts are in the position seen in Figs. 1 to 3, inclusive, it will be apparent that owing to the employment of the friction disks 5 and 33 that the shaft 32 which carries the bobbin spindle or needle 35 will be rotated. As the disk 5 rotates, owing to the provision of the lever

7, rock shaft 8, crank arm 10, connecting rod 13, sleeve 14 and pivot pin 15, the arm or bracket 18 to which said pin is secured will be oscillated and since the pin 22 carried by said bracket is in engagement at this time with the recess or seat 23 of the bracket 24, said bracket 24 will be oscillated and thereby oscillate the feeding lever or arm 28 which will cause the thread, which passes through the slot 30 in the end of said lever 28, to be wound upon the needle 35 which may be either polygonal as seen in Fig. 1 or round as seen in Fig. 8, and which, it is to be understood, is continually rotating when the machine is in operation. The worm 36 on the driving shaft 3 drives the gear on the shaft 38 and since the two clutch members 40 and 41 are at this time in engagement with each other, the cam member 42 will be rotated. As soon, however, as the release face 44 of the cam 42 engages the side of the cam 48, said cam 42 and clutch member 41 will be moved away from and out of engagement with the clutch member 40, owing to the provision of the spring 46. The machine is so constructed and the parts so proportioned that at this time the bobbin occupying the position of the bobbin 91, seen in Fig. 1, owing to the predetermined size which has now been reached, will cause the extension 63 of the member 61 to move rearwardly, thereby rocking said lever 61 and causing the deflected end 57 of the lever 58 to be disengaged from the stop 56 of the flange 55 and owing to the employment of the torsional spring 51 the cam block 52 and the shaft 50 will be rotated until the stop 53 engages with the upper end of the arm 54. Owing to the provision of the crank 64 to which the connecting rod 66 is mounted, the blade 71 will be opened, the parts now assuming the position seen in Fig. 8.

When the clutch member 41 is out of engagement with the clutch member 40 the deflected end of the spring 79 engaging with the pin 80 carried by the shaft 43 will prevent said shaft and the cam and clutch member mounted thereon from any improper movement, as will be evident. As the shaft 50 is partially rotated by the spring 51 the cam 49 is moved into engagement with the portion 92 formed by the cutting away of the flange 47 of the cam member 42, so that the clutch member 41 is moved into engagement with the clutch member 40 and the shaft 43 will rotate in unison with the shaft 38. As the shaft 43 rotates the operating portion of the cam block 84 engages the end 83 of the elbow lever 82 and causes said lever to be rocked and owing to the provision of the pin 86 and the slot 85 the discharge rod or arm 87 will be moved forwardly so that the end thereof which is loosely mounted on the spindle or bobbin support 35 will advance the bobbin, which occupies the position of the bobbin 91 and move the same into the position of the bobbin seen at 90, it being understood that there are always two bobbins on the bobbin support or spindle 35, one finished ready to be cut off, and the other being wound. As soon as the cam 84 passes out of engagement with the end 83 of the lever 82, the discharge arm 87 will be returned to its normal position owing to the provision of the spring 88, as will be evident.

I wish to call special attention to the manner in which the feeding lever 28 is maintained in a stationary position during a predetermined time. It will be seen that as the shaft 50 is rocked, thereby causing the knife blades 71 to move away from the knife blade 73, the connection 76, one end of which is secured to the crank 24, will cause said crank 24 to be moved so that the pin 22 will not engage with the recess 23 but the stationary pin 26 will engage with the seat 25 therefor in the crank 24 and maintain the same in a stationary position so that the feeding lever is not reciprocated, and while the bobbin just completed is being moved towards the end of the spindle 35 the thread or yarn will not be wound in a spiral manner but will be wound straight around the bobbin so as to serve as a binder or fastener and prevent the same being unwound after it is discharged from the machine. The manner in which this thread is wound around the bobbin may be readily understood from the bobbin 90 seen in Fig. 1. The finished bobbin 90 as the discharge arm 87 is advanced will be moved outwardly and drop from the spindle 35 between the knife blades 71 and 73 and the thread between the two bobbins will be severed. The knife blade 71 is moved from the position seen in Fig. 8 to the position seen in Figs. 1 and 2 and 3, respectively, in the following manner: The leading face 45 now engages with the cam face 49 of the block 48 and the shaft 43 continues to rotate, thereby rotating the cam 42 and the shaft 50 will be rocked rearwardly, and thus owing to the provision of the actuating rod 66 the knife blade 71 will be closed against the knife blade 73 and the completed bobbin be separated from the contiguous bobbin, and drops into any suitable receptacle. As the rock shaft 50 returns to its normal position, the connection 76 will cause the crank 24 to be moved out of engagement with the stop 26 and into engagement with the stop 22, whereby the feeding arm 28 will be reciprocated as before, and a new bobbin will be wound upon the spindle 35. As the knife blades close, the stop 53 is moved out of engagement with the stop 54 and the deflected end 57 of the lever 58 is moved into engagement with the stop 56.

I wish to call special attention to the fact that the knife blades close in a very gradual manner and that owing to the employment

of the spring 69, yielding means are provided for actuating the knife blade 71. The lever arm 58 in the present instance is provided at its outer end with a slot 93 in which if desired, the end of the lever 61 may be pivoted, thus adapting the machine for bobbins of a larger size.

It will now be apparent from the foregoing that I have devised a novel and useful construction of a bobbin winder which embodies the features of advantage enumerated as desirable in the statement of invention and the above description, and while in the present instance I have shown and described the preferred embodiment thereof which I have found in practice to give satisfactory and reliable results, it is to be understood that it is susceptible of modification in various particulars without departing from the spirit and scope of the invention or sacrificing any of its advantages.

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

1. In a bobbin winder, a driving shaft, a spindle driven thereby, an oscillatory thread feeding arm driven by said driving shaft, a cutting mechanism, means for operating the same, and means controlled by the cutting mechanism operating means for maintaining the feeding arm stationary at predetermined intervals.

2. In a bobbin winder, a driving shaft, a driven spindle, a feeding arm actuated by said shaft, cutting mechanism actuated by said shaft, means controlled by the movement of the cutting mechanism for maintaining the feeding arm stationary at predetermined intervals, and means for automatically discharging a completed bobbin from said spindle.

3. In a bobbin winder, a driving shaft, a driven spindle, a feeding arm actuated by said shaft, cutting mechanism actuated by said shaft, means controlled by the movement of the cutting mechanism for maintaining the feeding arm stationary at predetermined intervals, and means controlled by the size of the bobbin being wound for automatically discharging a completed bobbin from said spindle.

4. In a bobbin winder, a driving shaft, a driven spindle, a feeding arm oscillated by said shaft in proximity to said spindle, a bobbin discharging mechanism engaging said spindle and driven by said shaft, knife blades between which a completed bobbin is discharged, means for actuating said blades, and means operating in conjunction therewith for maintaining the feeding arm stationary as the blades are opened.

5. In a bobbin winder, a driving shaft, a driven spindle, a feeding arm oscillated by said shaft in proximity to said spindle, a bobbin discharging mechanism engaging said spindle and driven by said shaft, knife blades between which a completed bobbin is discharged, means for yieldingly actuating said blades, and means operating in conjunction therewith for maintaining the feeding arm stationary as the blades are opened.

6. In a bobbin winder, a driving shaft, a driven spindle, a driven shaft, a clutch member thereon, a third shaft, a combined clutch and cam member thereon adapted to coact with said first clutch member, a fourth shaft, a cam member thereon with which said first cam member coacts to rock said fourth shaft, a torsion spring for said fourth shaft, means for feeding thread to said spindle, a cutting mechanism actuated by said fourth shaft, and means actuated by said fourth shaft simultaneously with the cutting mechanism for maintaining the feeding means stationary.

7. In a bobbin winder, a driving shaft, a driven spindle, a driven shaft, a clutch member thereon, a third shaft, a combined clutch and cam member thereon adapted to co-act with said first clutch member, a fourth shaft, a cam member thereon with which said first cam member co-acts to rock said fourth shaft, a torsion spring for said fourth shaft, means for feeding thread to said spindle, bobbin discharging mechanism actuated by said third shaft, and cutting mechanism actuated by said fourth shaft.

8. In a bobbin winder, a driving shaft, a disk thereon, a driven shaft, a friction disk thereon, a spindle carried by said driven shaft, a crank actuated by said first disk, an arm operatively connected with said crank and oscillated thereby, a rod on which said arm is mounted, a crank loosely mounted on said rod, said crank and arm having interlocking means common thereto, a feeding arm carried by said crank, cutting mechanism and means operating in conjunction with said cutting mechanism for automatically maintaining said crank and arm stationary at predetermined intervals, while the bobbin is being moved toward the end of the spindle.

9. In a bobbin winder, a driving shaft, a spindle driven thereby, means for feeding thread to said spindle, means controlled by the size of a bobbin for discharging a completed bobbin from said spindle, means for maintaining the feeding means stationary at predetermined intervals, and means operating in conjunction with said last named means for cutting off the discharged bobbin.

10. In a bobbin winder, a driving shaft, a spindle driven thereby, a discharging lever mounted on said spindle, yielding means for maintaining said lever normally inoperative, cam actuated means controlled by the size of the bobbin being wound for actuating said discharge lever, a rocking shaft, means actuated by said driving shaft for feeding thread to said spindle and means actuated by said rocking shaft for maintaining the

feeding means stationary at predetermined intervals.

11. In a bobbin winder, a driving shaft, a shaft driven thereby, a clutch thereon, a third shaft, a combined clutch and cam member keyed thereon and co-acting with said first clutch member, a spring between said members, a cam actuated by said first cam member, a rock shaft on which said cam is mounted, a torsion spring for said rock shaft, cutting mechanism actuated by said rock shaft, a spindle rotated by said driving shaft, means for feeding thread to said spindle and means operated by said rocking shaft for maintaining the feeding means stationary at predetermined intervals.

12. In a bobbin winder, a driving shaft, a friction disk thereon, a co-acting friction disk, a driven shaft on which said second disk is mounted, a spindle carried by said driven shaft, a crank carried by said first disk, an arm oscillated by said crank, a rod on which said arm is mounted, a crank loosely mounted on said rod, a feeding member carried by said crank, a stationary set collar mounted on said rod, and means for causing said crank to interlock with either said arm or said set collar.

13. In a bobbin winder, a driving shaft, a driven shaft, a clutch member on the latter, a third shaft, a clutch member keyed thereon, a spring intermediate said clutch members, a cam member keyed on said third shaft and having a portion of its side cut away, a rock shaft, a cam thereon co-acting with said side, a torsion spring for said rock shaft, a rod eccentrically connected with said rock shaft, a spindle driven by said driving shaft, a stationary rod, a crank arm loosely mounted thereon to which said rod is secured, a feeding arm carried by said crank arm, a lever loosely mounted on said rod and having a lug adapted to engage with said first crank arm, a set collar having a lug adapted to engage with said first crank arm, said eccentric rod forming means for causing one of said lugs to engage with said first crank arm.

14. In a bobbin winder, a driving shaft, a spindle driven thereby, a feeding lever oscillated by said driving shaft, means controlled by the size of the bobbin being wound, cutting mechanism actuated by said shaft, means controlled by the movement of the cutting mechanism for maintaining the feeding lever stationary at intervals, a bell crank lever, a bobbin-discharging mechanism actuated by said lever, and means acting directly on said bell crank lever and disconnected from said bobbin-discharging mechanism for retracting the latter.

15. In a bobbin winder, a driving shaft, a spindle driven thereby, a driven shaft, a clutch member mounted thereon, a third shaft, a clutch member keyed thereto, a cam mounted on said third shaft, an elbow lever pivotally supported with one end of which said cam co-acts, the other end of said lever being slotted, a pin engaging with said slot, a discharge arm to which said pin is secured, a spring for said pin for normally maintaining said arm in its rearmost position, and means embodying a device actuated by contact of the bobbin being wound controlled by the size of the bobbin for controlling the rotation of said third shaft.

16. In a bobbin winder, a driving shaft, a spindle rotated thereby, thread feeding means for said spindle, a driven shaft, a clutch member thereon, a third shaft, a combined clutch and cam member keyed thereon, a device intermediate said members, a rock shaft, a cam thereon co-acting with the cam on said third shaft to control the engagement of said clutch members, a set collar mounted on said rock shaft and having a plurality of stops, a lever having a deflected end engaging with one of said stops, a second lever pivoted to said first lever on the opposite side of its fulcrum, said second lever being pivoted intermediate its ends to a fixed point, a spring for said second lever, the end of the latter being deflected parallel with the spindle, and a stationary stop co-acting with the second stop on said set collar to prevent movement of the rock shaft during a predetermined interval.

17. In a bobbin winder, a driving shaft, a spindle rotated thereby, a driven shaft, a clutch member thereon, a third shaft, a combined clutch and cam member keyed thereon, a device intermediate said members, a rock shaft, a cam thereon co-acting with the cam on said third shaft for controlling the engagement of said clutch members, a set collar mounted on said rock shaft and having a plurality of stops, a lever having a deflected end engaging with one of said stops, a second lever pivoted to said first lever on the opposite side of its fulcrum, said second lever being pivoted intermediate its ends to a fixed point, a spring for said second lever, the end of the latter being deflected parallel with the spindle, a stationary stop co-acting with the second stop on said set collar to prevent movement of the latter during a predetermined time, and cutting mechanism actuated by said rock shaft.

18. In a bobbin winder, a driving shaft, a spindle rotated thereby, a driven shaft, a clutch member thereon, a third shaft, a combined clutch and cam member keyed thereon, a spring intermediate said members, a rock shaft, a cam thereon co-acting with the cam on said third shaft to control the engagement of said clutch members, a set collar mounted on said rock shaft and having a plurality of stops, a lever having a deflected end engaging with one of said stops, a second lever pivoted to said first lever on the opposite side of its

fulcrum, said second lever being pivoted intermediate its ends to a fixed point, a spring for said second lever, the end of the latter being deflected parallel with the spindle, a stationary stop co-acting with the second stop on said set collar to prevent movement of the rock shaft during a predetermined time, feeding means cutting mechanism actuated by said rock shaft, and means actuated by said rock shaft for holding said feeding means stationary as the bobbin is discharged from said spindle.

19. In a bobbin winder, driving means, a driven spindle, a driving shaft, a clutch member thereon, a second shaft, a combined clutch and cam keyed thereto, a spring intermediate said members, said cam member having a leading, side and release cam face, a spring for preventing movement of said second shaft when said clutch members are disengaged, a rock shaft, a spring therefor, a cam carried by said rock shaft and co-acting with the cam on said second shaft, cutting mechanism actuated by said rock shaft, means actuated by the bobbin being wound co-acting with said rock shaft to cause the cam member carried thereby to force the clutch members into engagement, a second cam mounted on said first shaft, and a bobbin discharging mechanism actuated by said last named cam.

EMIL WALDER.

Witnesses:
ALBERT GREINER,
HERBERT S. FAIRBANKS.