

F. BAUM.  
AUTOMATIC WINDING FRAME.  
APPLICATION FILED JULY 8, 1907.

918,116.

Patented Apr. 13, 1909.  
2 SHEETS—SHEET 1.

Fig. 1

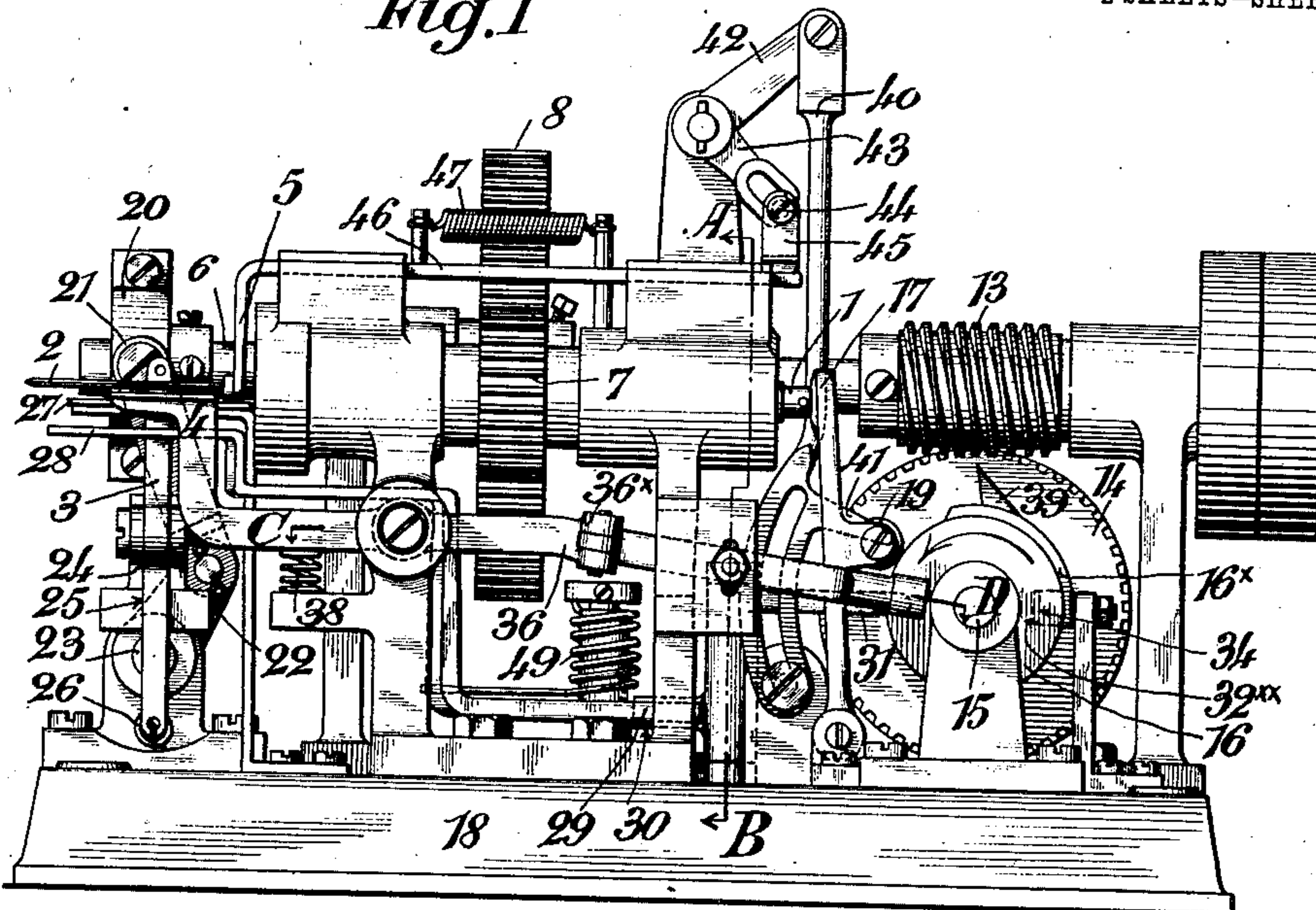
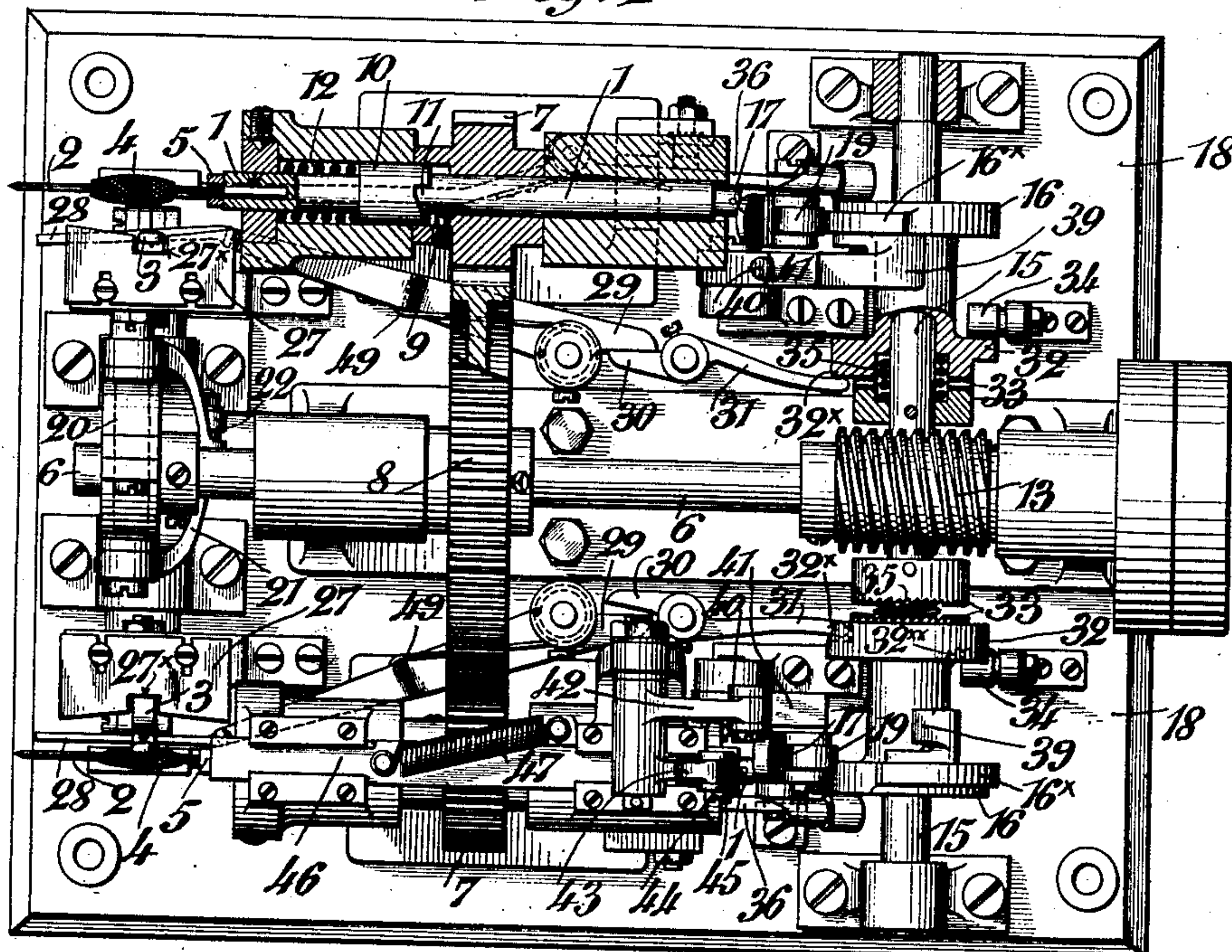


Fig. 2



Witnesses:

Jesse N. Lutton.  
O. Rommers

Inventor:

Fritz Baum  
by Henry Orth  
att.

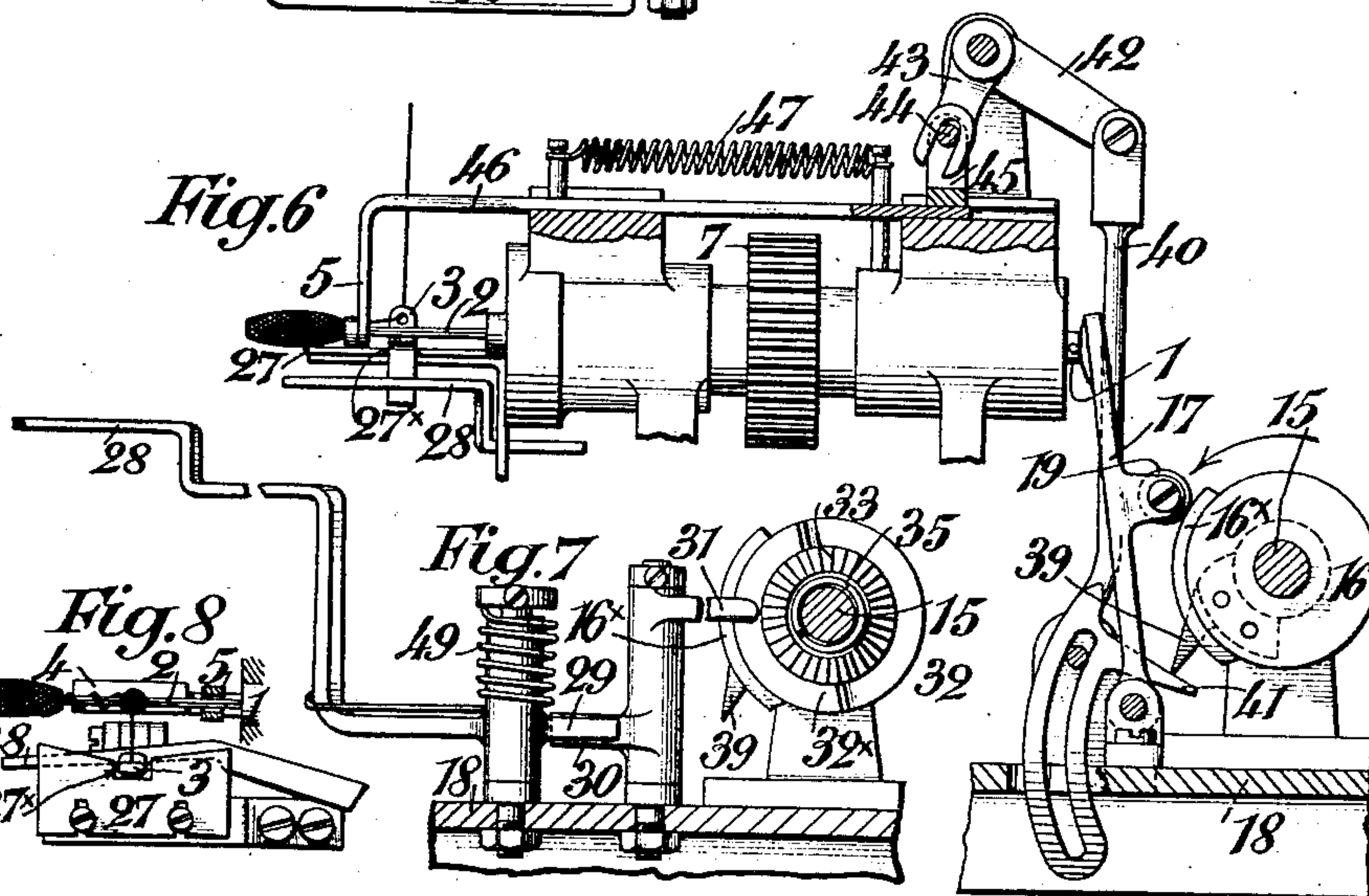
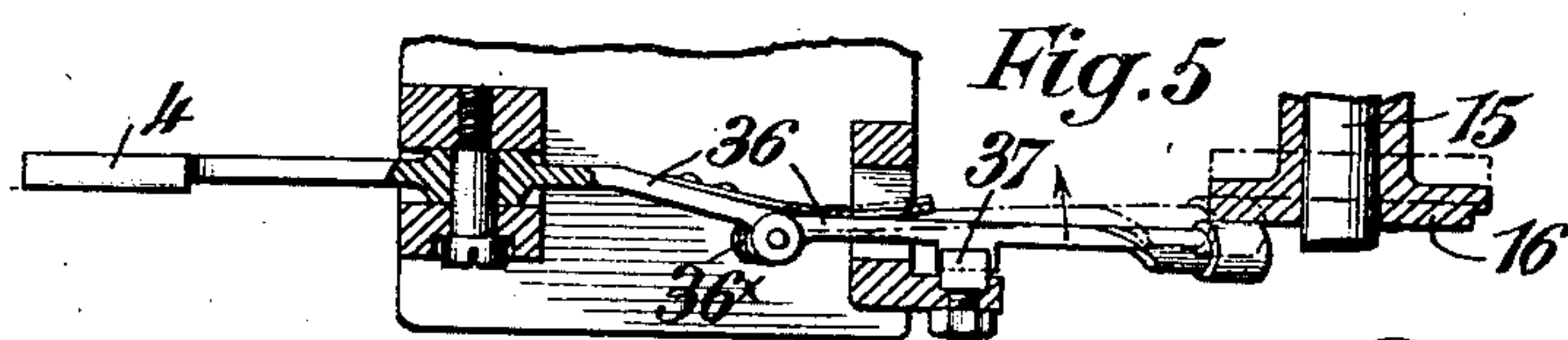
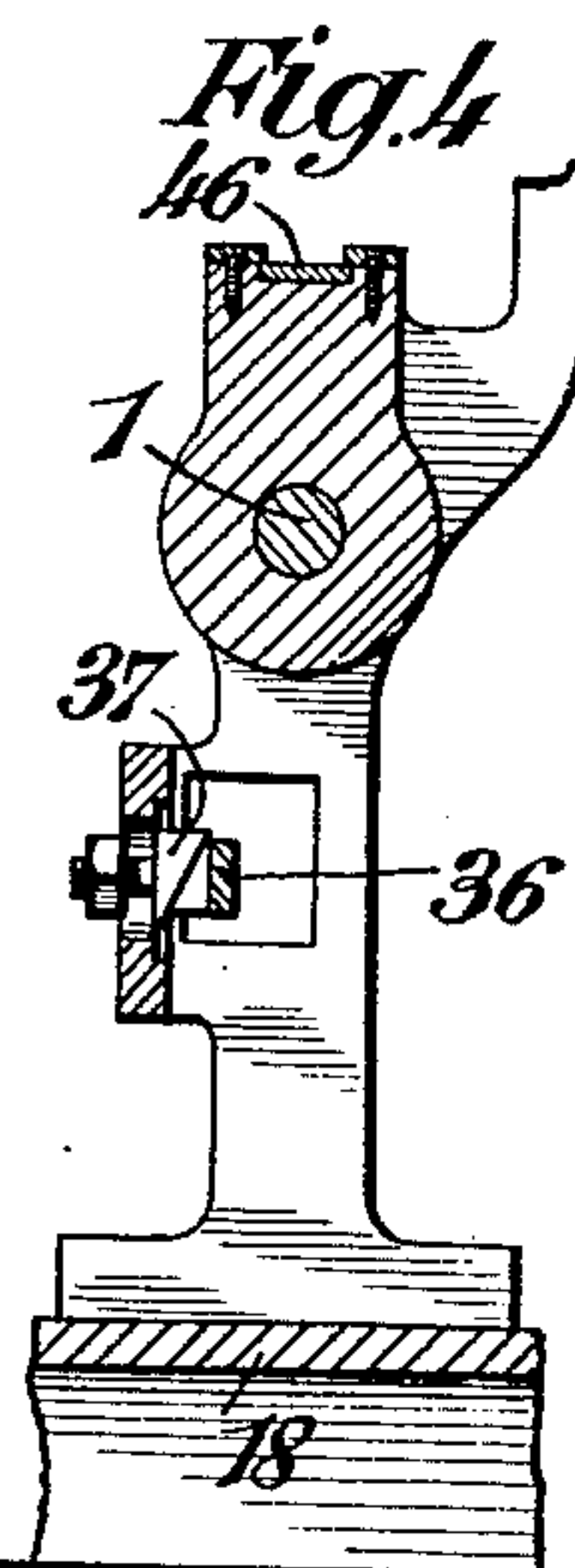
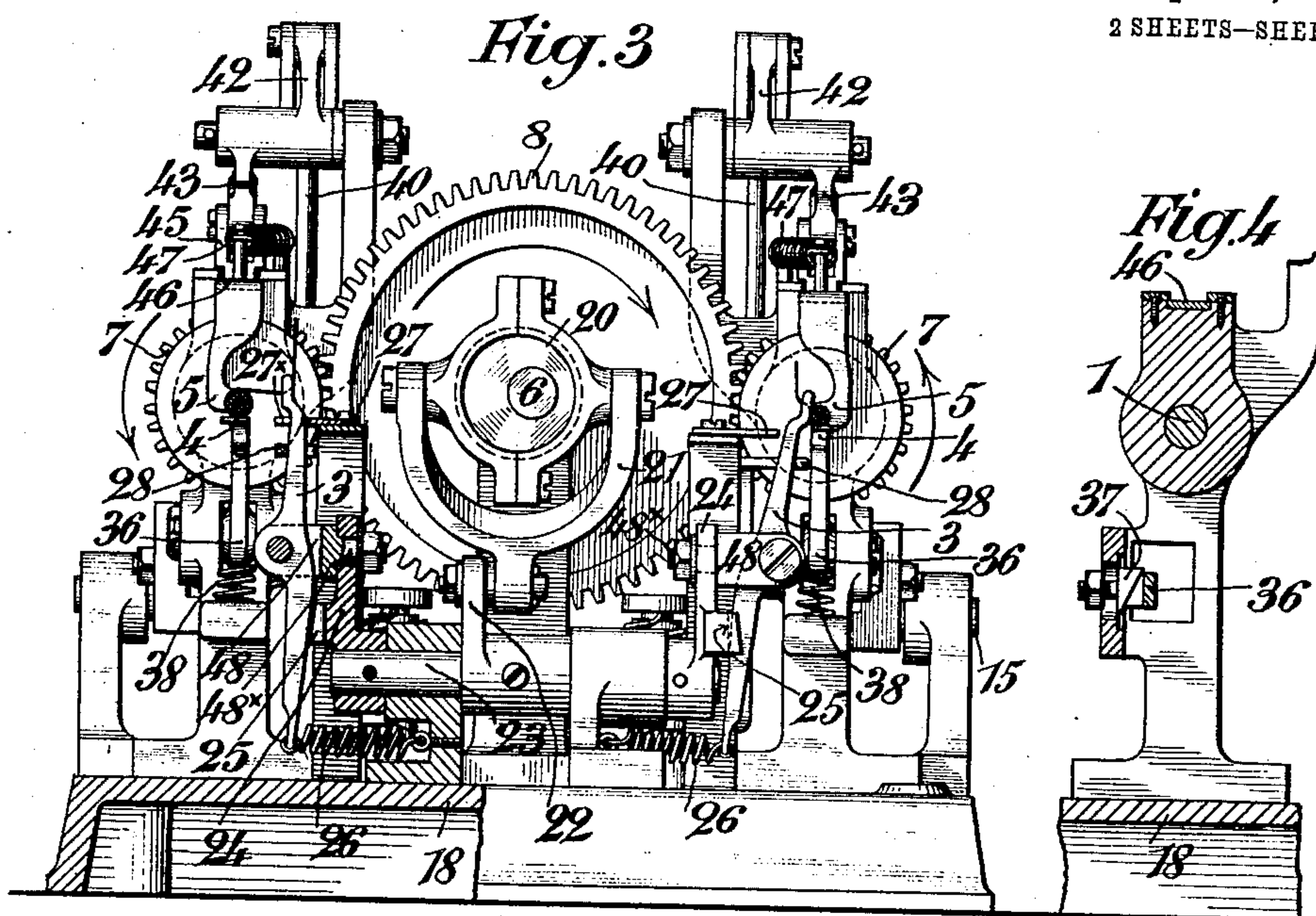


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Jesse N. Lutton.  
P. Hommers

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Fritz Baum  
by Henry Orth

Att'y-



# UNITED STATES PATENT OFFICE.

FRITZ BAUM, OF RORSCHACH, SWITZERLAND, ASSIGNOR TO THE FIRM OF FRITZ BAUM & CO.,  
OF RORSCHACH, SWITZERLAND.

## AUTOMATIC WINDING-FRAME.

No. 918,116.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed July 8, 1907. Serial No. 382,709.

*To all whom it may concern:*

Be it known that I, FRITZ BAUM, a citizen of the Republic of Switzerland, residing at Rorschach, Switzerland, have invented certain new and useful Improvements in Automatic Winding-Frames; and I do hereby declare the following to be 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, reference being had to the accompanying drawings, and to figures of reference marked thereon, which form a part of this specification.

This invention has for its object an automatic winding frame, which consists in the movement of the thread guide being diminished toward the finish of the winding of a pirn (bobbin or cop) and the commencement of the winding of the next one, in such a way that, on the finished wound pirn or cop the ordinary central binding is produced and for the next pirn or cop to be wound a foundation is wound serving as the core for the pirn or cop. The object of the latter winding is to enable the thread, when the pirn or cop is unwound, to be drawn off uniformly from the commencement to the end and thereby to avoid the thread breaking, such as takes place in machines with pirns or cops made on frames the thread guides of which have a constant movement, the foundation of the pirn or cop not being wound regularly but merely in an irregular confusion. This winding frame also consists in an arrangement by which the pirn or cop tube is rendered stationary by its being pushed forward by means of a device acting against the rear end of the pirn or cop tube shaft.

A form of construction of the objects of the invention is shown as an example in the accompanying drawings, in which,

Figure 1 is a side view; Fig. 2, a plan view with parts in horizontal section; Fig. 3, a front view with parts in vertical section; Fig. 4, a vertical section on the line A—B of Fig. 1; Fig. 5, a section on the line C—D of Fig. 1, and Figs. 6, 7 and 8 are detailed views of the main features of the invention.

The drawings show a double winding frame. This has two longitudinally displaceable pirn or cop tube shafts 1 arranged parallel to one another and lying near together, which shafts carry the tubes 2 on

which the pirns or cops are wound; also thread guides 3 which lay the threads in coils; feelers 4, which on the desired thickness of the pirn or cop being obtained couple up a mechanism which influences the thread guides, so that the foundations are laid round the pirns or cops and after the finished pirns or cops have been displaced to the ends of the pirn or cop tubes by doffers or scraping off devices 5 operated by this mechanism, foundations are wound on the pirn or cop tubes for the fresh pirn or cops to be wound.

The means for operating the above mentioned main parts will now be hereinafter described. The pirn tube shafts are operated from the main driving shaft 6. For this object on the pirn tube shafts loosely revoluble but undisplaceably arranged toothed wheels 7 are mounted in engagement with a toothed wheel 8 mounted on the main driving shaft, and for each pirn tube shaft a releasable key coupling is provided between said shafts and the toothed wheels loosely revolubly mounted on them. Of these couplings the one for the left hand pirn tube shaft is shown in the drawings. This coupling consists of a pin 9 (Fig. 2) inserted in the hub of the toothed wheel 7 arranged on the shaft, a sleeve 10 with a recess or notch 11 on the shaft and a spiral spring 12. Now at the moment at which a pirn is to be drawn off, the coupling of the pirn tube shaft on which the pirn is mounted, is disengaged. This is effected by pushing forward this pirn tube shaft, whereby the pin 9 of the toothed wheel arranged thereon escapes from the notch 11 and the toothed wheel turns loosely on the shaft. Cam disks 16 are arranged on an auxiliary shaft 15 operated by a worm gear 13, 14, from the main driving shaft of the machine, for this pushing forward of the pirn tube shafts, which cam disks act on upright levers 17 by the intermediary of rollers 19 (Figs. 1 and 6) bearing against the periphery of the cam disks 16, which levers are pivoted on the bed-plate or foundation 18 of the machine and bear with their upper ends against the rear ends of the pirn tube shafts. The cam disks have a raised part 16<sup>x</sup> which, as soon as it acts on the roller 19 of the respective lever 17, pushes the pirn tube shaft forward, while as soon as the raised parts of the cam disks pass the rollers the spiral springs 12 of



the coupling hereinbefore described, push the pirn tube shafts back again into their initial position.

The thread guide 3 is operated from the main driving shaft 6 of the machine. For this object an eccentric 20 is arranged on this shaft, the eccentric rod 21 (Fig. 3) of which is connected with a lever 22 which is firmly mounted on and oscillates a shaft 23 lying at right angles to the pirn tube shafts. On the ends of this shaft 23 vertical arms 24 are mounted, on the ends of which the thread guides 3 are mounted as double armed levers by the intermediary of support pieces 48. The supporting pieces are pivotally mounted in the arms 24 on bolts 48<sup>x</sup> (Fig. 3). Beneath these support pieces notches 25 are provided on the arms 24; into which notches the lower arms of the thread guides may be drawn by means of spiral springs 26 engaging thereon (Fig. 3 shows the thread guide of the right hand pirn tube shaft in this position). When the thread guide 3 is in notch 25, as shown at the right of Fig. 3, arm 24 and thread guide 3 are rigidly locked together, and the eye in the thread guide oscillates in a long arc whose center is that of shaft 23, but when the guide 3 is disengaged from notch 25 and enters notch 27<sup>x</sup>, the thread guide and its supporting piece 48 is free to turn with bolt 48<sup>x</sup>, however, the upper end of the guide is held in notch 27<sup>x</sup> which acts as a fulcrum, so that the eye of the thread guide will describe a much shorter arc of oscillation whose center is the notch 27<sup>x</sup>. At the level of the upper end piece of each thread guide, a horizontal fixed plate 27 is arranged on the arm 24, on the opposite side of the thread guide to the pirn tube, which plate has at the edge next to the thread guide a notch or slot 27<sup>x</sup> (Figs. 2 and 8). Into these notches the upper end parts of the thread guides may be moved by means of arms 28 double armed levers 28, 29, mounted on the bed-plate and adapted to pivot horizontally (Fig. 3 shows the thread guide of the left hand pirn shaft in this condition); the other arm 29 of this lever lies within reach of the arm 30 of double-armed levers 30, 31, also mounted on the bed-plate and adapted to pivot horizontally. The other arms 31 of these levers lie within reach of the action of cam disks 32 which are loosely revolvably arranged on an auxiliary shaft 15 and form one piece with the cam disks 16; these cam disks 32 have a projecting part 32<sup>x</sup> (Figs. 2 and 7) and a notch 32<sup>xx</sup>; they form the one (loosely revolvable) half of clutch couplings 33 arranged on the auxiliary shaft. Rollers 34 fixed near to the cam disks 32 may drop into the notches 32<sup>xx</sup>, as may be seen in the lower part of Fig. 2. 35 are springs which tend to keep the halves of the couplings 33 apart.

Now when a cop or pirn has been wound to the desired thickness, the clutch coupling

33 belonging to the shaft of the tube on which this pirn is wound is brought into action in a manner hereinafter described by means of the feeler. By this means the disks 32 and 16 forming one piece with one half of this clutch coupling are turned by the auxiliary shaft and the raised part 32<sup>x</sup> of the disk 32 acts on the respective arm 31, whereby the levers 30, 31 and 28, 29 are displaced (Fig. 7) and the arm 28 moves the thread guide belonging to the before mentioned pirn tube shaft into the slot 27<sup>x</sup> of the plate 27 belonging to this thread guide (Fig. 2 above and Fig. 3 left hand side). The lower arm of the thread guide is thereby drawn out of the notch 25 of the arm 24 carrying the thread guide. In this position of the thread guide it no longer makes the full movement with the arm 24, by which the thread guide was previously swung out to the entire length of the pirn or cop, but only makes a small movement, its upper part being retained or held by the plate 27, so that the thread guide can only swing on this caught part; it is also carried along with the support piece 48, the pin 48<sup>x</sup> of which turns to and fro in the arm 24. This comparatively small movement of the thread guide causes the central winding of the pirn and later, after the finished pirn has been suitably displaced to the end of the pirn tube by the doffer 46, the winding of the foundation for the new pirn which is to be wound (Fig. 8). When the arm 31 is released from the projecting part 32<sup>x</sup>, the levers 30, 31, and 28, 29, return to their former position by the action of the spring 49 and the thread guide is caused, by the spring 26 to disengage from the notch 27<sup>x</sup> of the plate 27 and to be again coupled with the arm 24. The cam disk 32 turns farther until its notch 32<sup>xx</sup> faces the roller 34. At this moment, by means of the spring 35 belonging to the respective clutch coupling, the half coupling which is displaceable and revoluble on the auxiliary shaft is pushed back into its initial position, in which it is secured by the engagement of the roller 34 in the notch 32<sup>xx</sup>; during the turning of the cam disk the roller 34 insures the engagement of the coupling by bearing against the back of the cam disk.

The engagement of the couplings arranged on the auxiliary shaft is operated from the feelers 4. These form one arm of double armed levers pivotal on horizontal axes, the other arm 36 (Fig. 5) of which has at 36<sup>x</sup> a spring hinge and extends laterally to near the disks 16. For each of these double armed levers an inclined plane 37 (Figs. 4 and 5) is provided against which the arms 36 bear. During the winding the feeler which bears from beneath against the pirn is pressed downward by the increasing size of the latter, the arms 36 being moved upward on the inclined plane, the consequence of



which is, that the parts of the arms which are connected by hinges are moved not only upward but also sidewise, in such a way that thereby these parts of the arms operate the displacement of the half couplings for the purpose of bringing the couplings into engagement (Fig. 5). The double armed levers forming the feelers are, after the removal of the pirns, again returned to their initial position by springs 38.

The operation of removing the pirns takes place again from the auxiliary shaft. For this object slide projections 39 (see particularly Fig. 6) are mounted on the cam disks 16, which projections act in conjunction with vertical draw-bars 40; these are guided at their lower parts by means of pins passing through guides and have projections 41 against which the slide projections 39 strike on the rotation of the cam disks. The upper ends of the drawbars 40 are connected with one arm 42 of elbow levers, the other arms 43 of which are forked. With these forks the arms 43 engage pins 44, which are supported by pieces 45 and carried by bars 46 arranged over the pirn tube shafts and displaceable in their directions. These bars have at their front ends doffers 5. For operating the doffers for the purpose of doffing the pirns, the slide projections 39 rotating with the disks 16 encounter the projections 41 and draw the drawbars 40 downward, while gradually slipping off the projections. The elbow levers 42, 43, are thereby displaced and by means of the parts 44, 45, the bars 46 together with the doffers 5, are pushed forward, whereby the pirns are doffed. When this has been done, the projections 39 slip down from the projections 41, whereupon the rails together with the doffers are again returned by the springs 47.

As the separate parts of this improved winding machine have been hereinbefore described as regards their form and method of working, this machine will now be further described in conjunction with a continuous method of working. When a pirn on a winding tube has reached the desired thickness, the movement of the thread guide is so diminished from the auxiliary shaft (here only one half of the machine is taken into consideration), that a central winding on the pirn is made. Then the pirn tube shaft is pushed forward and thereby it is disconnected from its operating mechanism and also the doffer is operated, which displaces the last wound cop or pirn so far toward the end of the pirn tube that a fresh pirn may be wound on the pirn tube. The pirn tube shaft is now again pushed back, whereby it is again coupled with its operating mechanism. As, however, the thread guide still continues to make its diminished movement, a foundation is wound on the pirn or cop tube as a core for the new cop or pirn. The

swing or movement of the thread guide is now brought back to its normal size which is then retained until the pirn has reached the desired thickness, whereupon the operation hereinbefore described is again repeated.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:

1. In an automatic winding frame, a pirn tube, means for rotating the same, a thread guide and means for moving the same to-and-fro along the pirn tube, in combination with a fixed, slotted plate arranged level with the top of the thread-guiding end of the thread guide, and means for bringing the thread-guiding end of the thread guide into engagement with the slot in the plate, substantially as described.

2. In an automatic winding frame, a pirn tube, a shaft carrying at its front end the pirn tube, a toothed wheel loosely mounted on said shaft for rotating the pirn tube, means for driving said toothed wheel and a coupling between the toothed wheel and the shaft, in connection with means engaging the rear end of the pirn tube shaft to throw it forward and release the coupling, substantially as described.

3. In an automatic winding frame, a pirn tube carried by the front end of a shaft, a toothed wheel loosely mounted on the pirn tube shaft, and means for rotating said toothed wheel, in combination with a pin coupling between the toothed wheel and pirn tube shaft, and means acting on the rear end of the shaft to throw it forward and release the pin coupling, substantially as described.

4. In an automatic winding frame, a pirn tube shaft, a pirn tube carried by the front end of said shaft, a toothed wheel mounted on the pirn tube shaft, mechanism to drive said wheel, a coupling between the toothed wheel and the pirn tube shaft, an auxiliary shaft, a feeler, and means for throwing into action the auxiliary shaft from the feeler, in combination with an arm bearing against the rear end of the pirn tube shaft, and a cam disk arranged on the auxiliary shaft and acting on the arm, substantially as described.

5. In an automatic winding frame, a pirn tube shaft a pirn tube carried on the front end of said shaft, a toothed wheel mounted on the pirn tube shaft, mechanism to rotate said wheel, a coupling between the toothed wheel and pirn tube shaft, an auxiliary shaft, a feeler with means for throwing the auxiliary shaft into action therefrom, and a doffer for the finished pirns; in combination with a cam disk, having a projection, arranged on the auxiliary shaft, an arm bearing against the rear end of the pirn tube shaft and acting in conjunction with the cam disk,



and a draw-bar acting in conjunction with the projection, and lever mechanism connecting the draw-bar with the doffer, substantially as described.

- 5 6. In an automatic winding frame, the combination with a rotatable pirn support; of an oscillating member, a thread guide movably connected to said member, means to lock the thread guide to said oscillating  
10 member to move therewith as a unit, means to unlock the thread guide and means cooperating with the thread guide in its unlocked position to change the center of oscillation of the guide.
- 15 7. In an automatic winding frame, the combination with a rotatable pirn support; of an oscillating arm having a notch, a thread guide connected to the arm pivoted to move in two directions, means to normally hold the  
20 thread guide in the notch to prevent its movement on its pivots, means to disengage the guide from its notch, and a notched plate into engagement with which the thread guide is moved when disengaged from the notch  
25 in the arm.

8. In an automatic winding frame, the combination with an axially movable pirn shaft, means to rotate the same, and coupling means to connect the shaft and its rotating means; of a lever controlled from the  
30 pirn to axially move the shaft to uncouple it.

9. In an automatic winding frame, the combination with a pirn shaft, a coupling sleeve thereon having a notch, a gear wheel loose on the shaft having a pin capable of  
35 entering the notch, a spring to urge the shaft and sleeve toward the pin, a lever arm to engage the end of the shaft, mechanism to operate said lever arm, and devices controlled by the pirn to operate said mechan-  
40 ism and cause said arm to axially move the shaft to uncouple the same.

In testimony that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

FRITZ BAUM.

Witnesses:

ED. OFFILAIL,  
HANS BAUR.