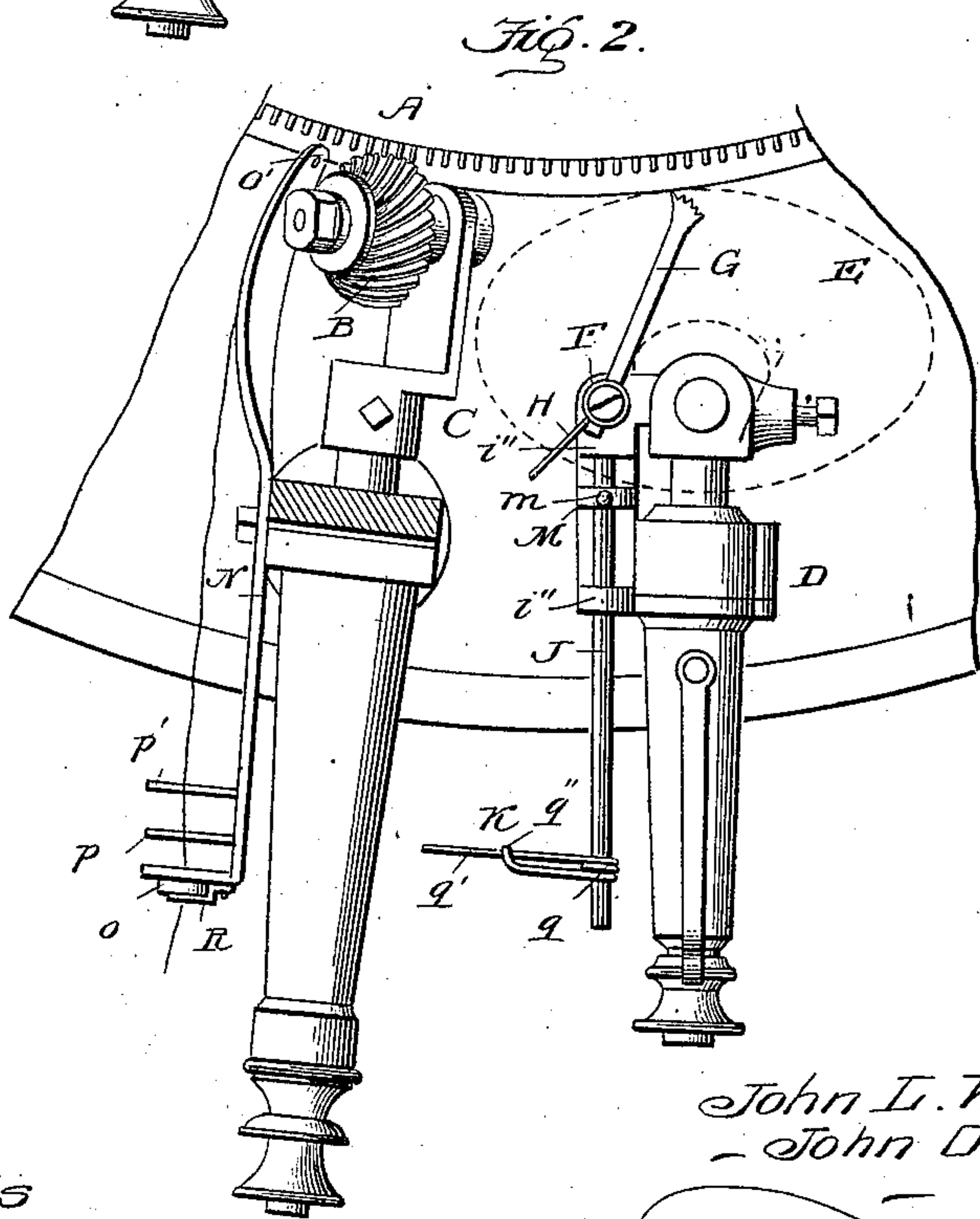
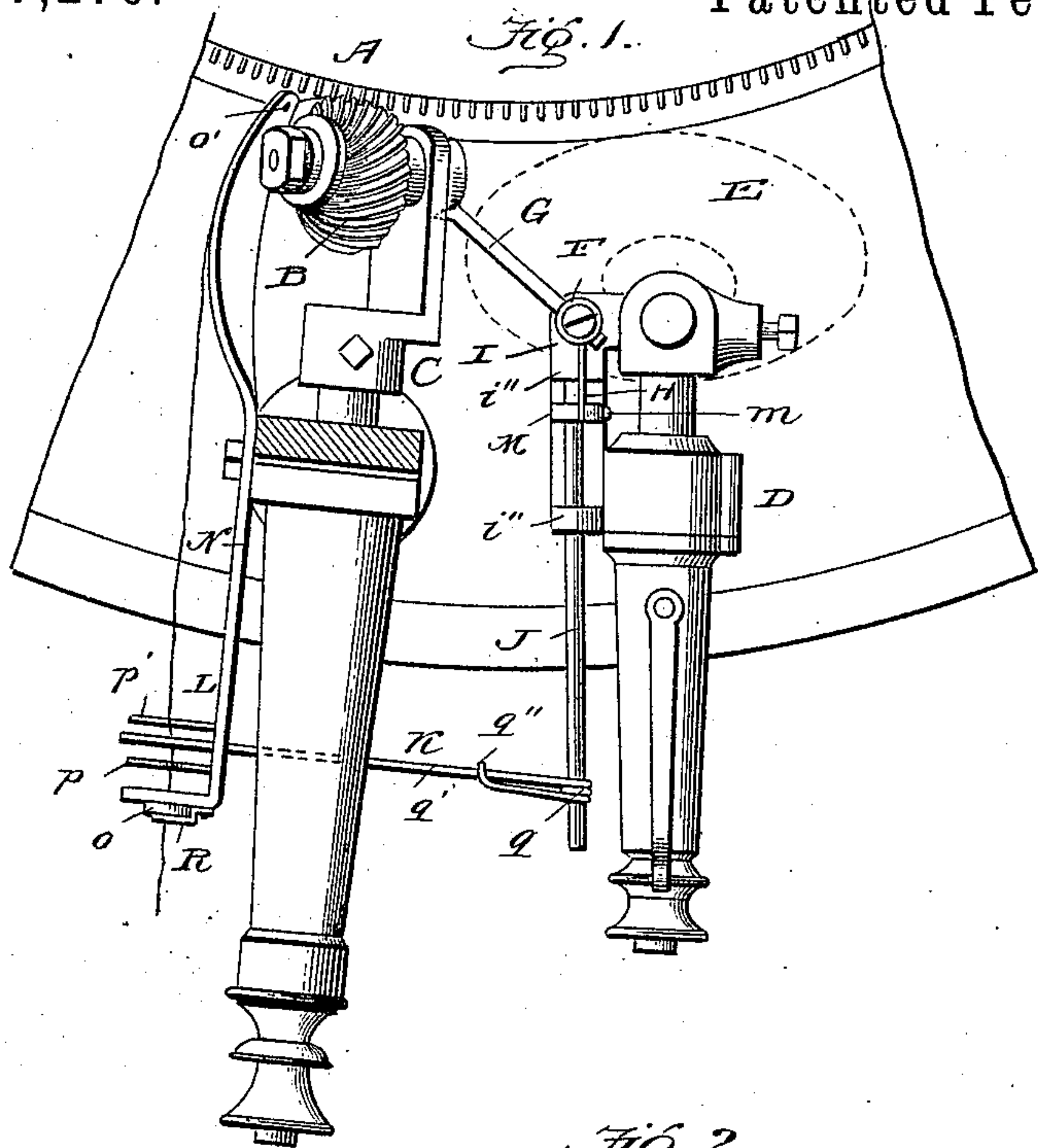


(No Model.)

2 Sheets—Sheet 1.

J. L. WENTWORTH & J. DEMPSTER.
QUARTER SAVER MECHANISM FOR KNITTING MACHINES.
No. 577,276. Patented Feb. 16, 1897.



Witnesses

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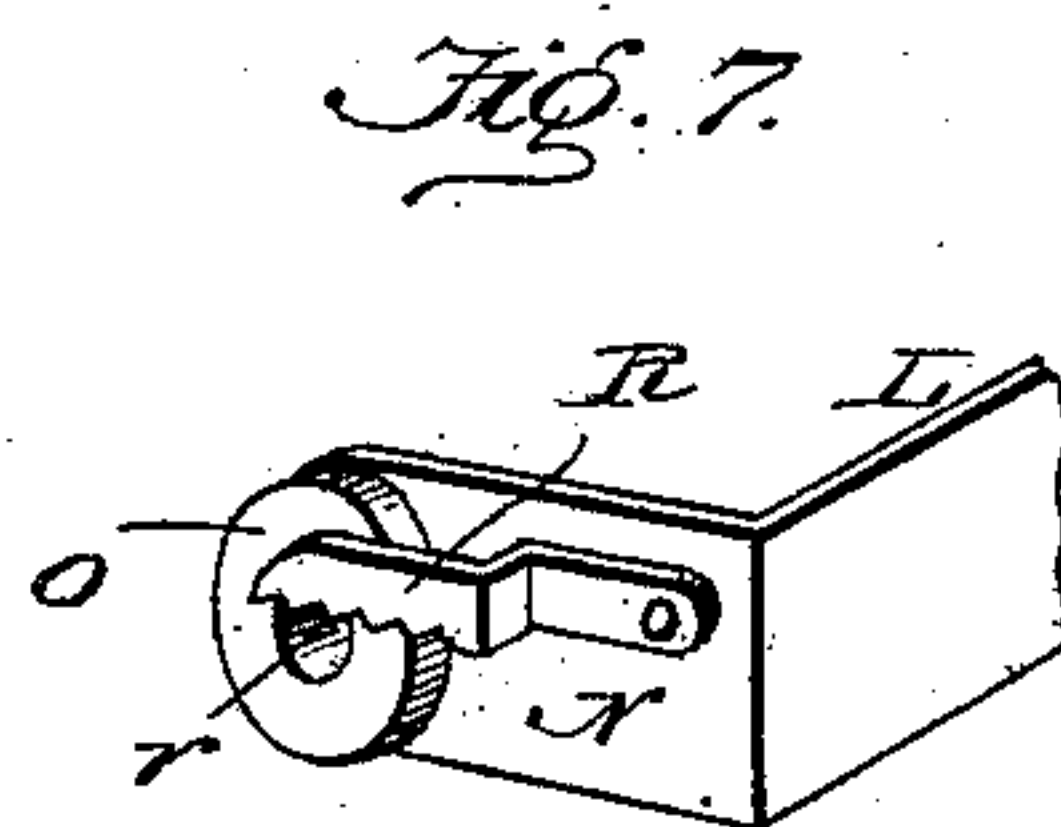
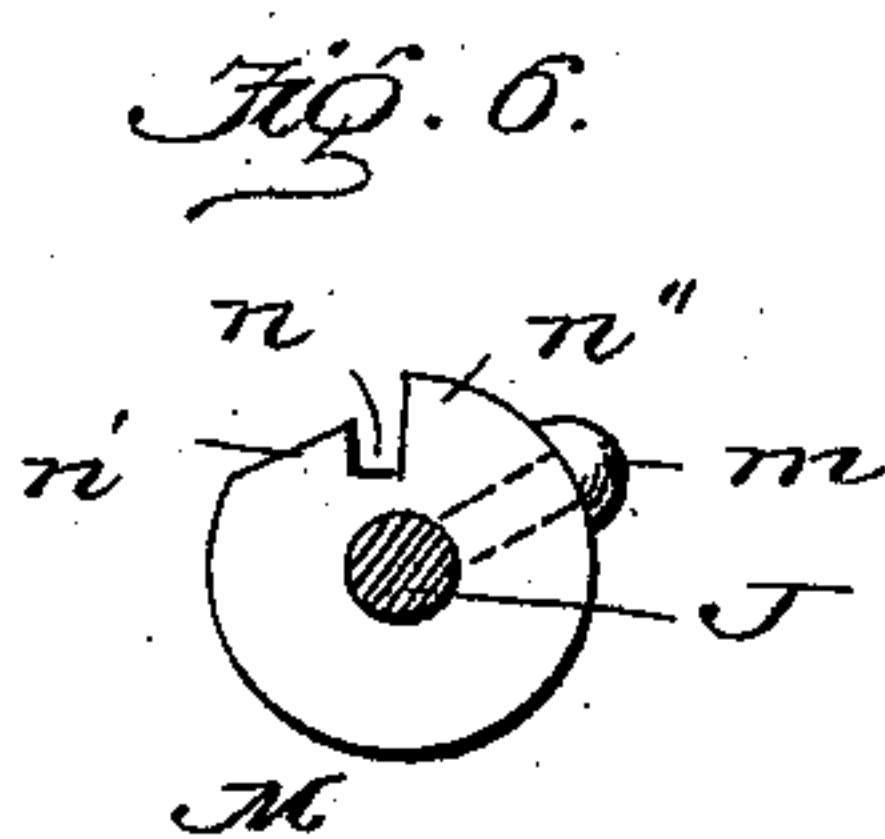
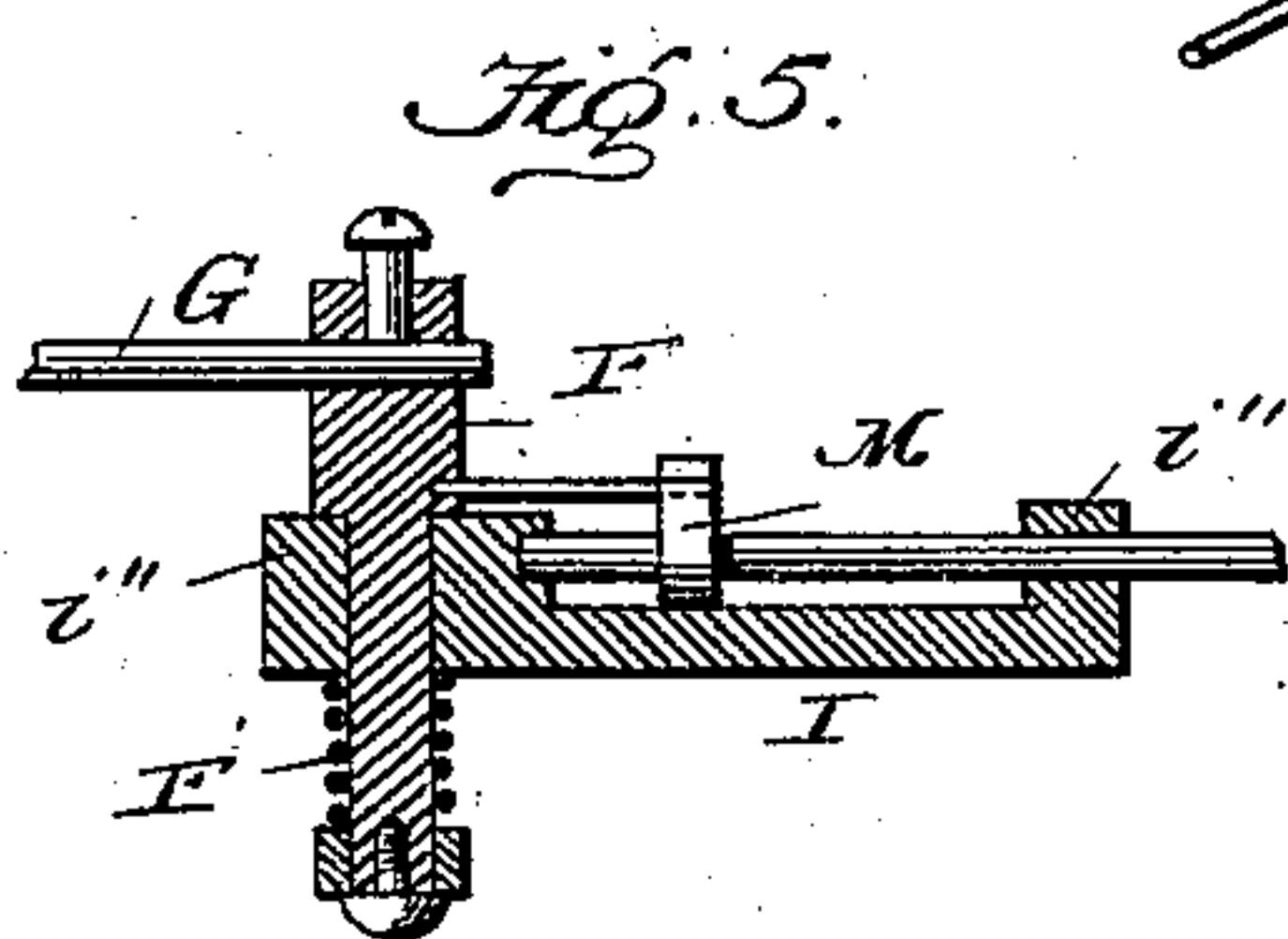
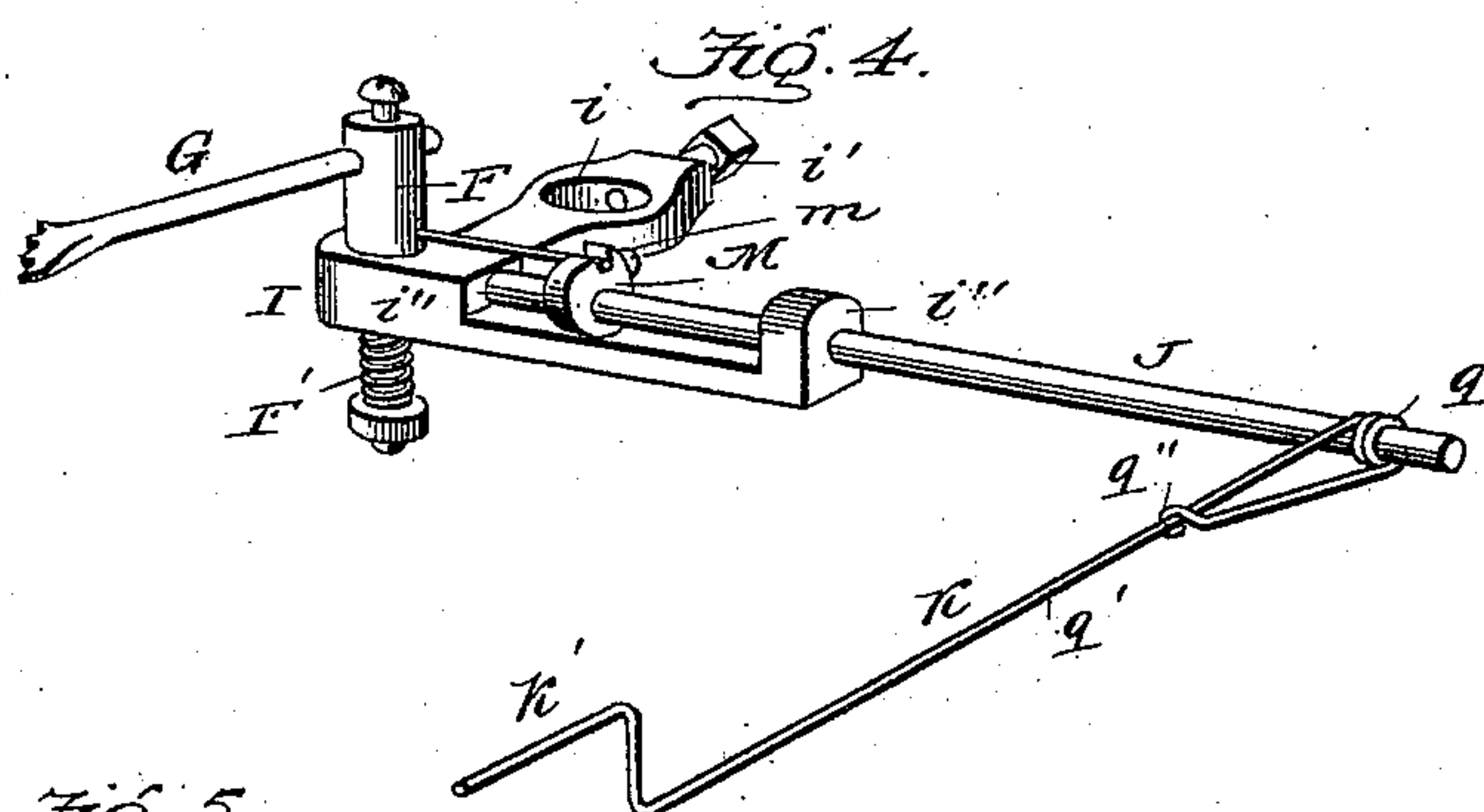
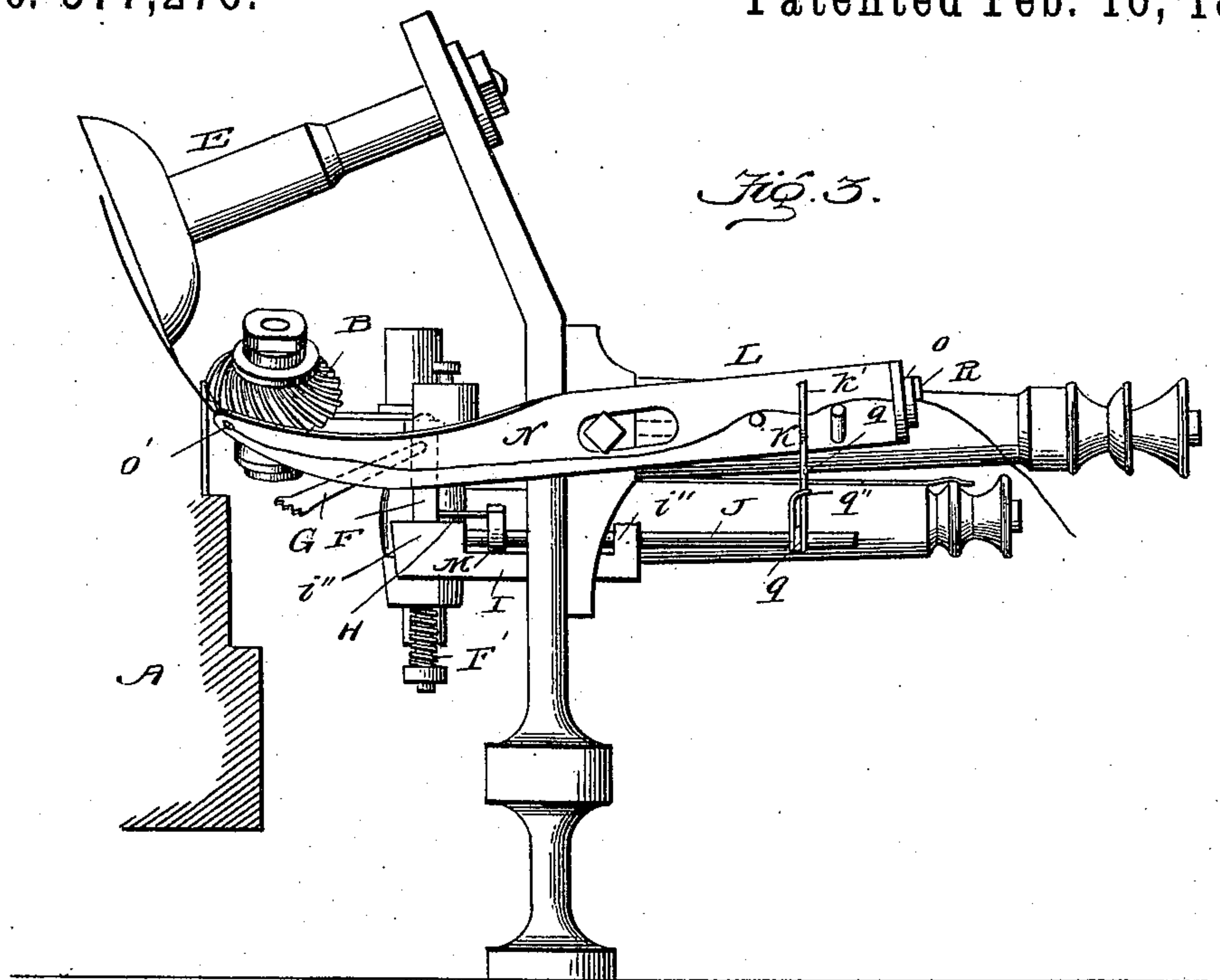
(No Model.)

2 Sheets—Sheet 2

J. L. WENTWORTH & J. DEMPSTER.
QUARTER SAVER MECHANISM FOR KNITTING MACHINES.

No. 577,276.

Patented Feb. 16, 1897.



Witnesses.

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Att'y.

UNITED STATES PATENT OFFICE.

JOHN L. WENTWORTH AND JOHN DEMPSTER, OF LITTLE FALLS, NEW YORK.

QUARTER-SAVER MECHANISM FOR KNITTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 577,276, dated February 16, 1897.

Application filed July 20, 1896. Serial No. 599,936. (No model.)

To all whom it may concern:

Be it known that we, JOHN L. WENTWORTH and JOHN DEMPSTER, citizens of the United States, residing at Little Falls, in the county of Herkimer and State of New York, have invented certain new and useful Improvements in Quarter-Saver Mechanism for Knitting-Machines; and we 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.

Our invention relates to a quarter-saver mechanism for knitting-machines which produce tubular fabrics; and the object of our invention is to improve the stop mechanism which operates to stop the process of knitting upon breakage or failure of the supply-yarn in a way to secure a number of practical advantages to be hereinafter fully pointed out.

In knitting tubular cloth upon circular-knitting machines there is considerable delay and annoyance and consequent loss caused by the breaking of the yarn while being fed to or passed from the supply bobbin or spool to the sinker or looper wheel. The present invention, however, relates to improvements in that class of devices for automatically stopping the knitting at the quarter or heading where the thread or yarn parts, which is effected by withdrawing the needle-barb presser, which presses down the barbs of the needles, thereby allowing the remaining headings to continue the process of knitting the fabric while the heading or quarter thus operated upon runs as an idler until the attendant stops the knitting, replaces the broken yarns, and readjusts the needle-barb presser, when the cylinder is again set in motion. An example of a quarter-saver of this general description is exhibited in United States Letters Patent issued June 14, 1887, to R. B. Muirhead, No. 364,726, and the mechanism therein shown and described embraces a cloth-stand upon which is supported the shaft which carries the loop-wheel or stitch-bur that coöperates with the needles of the circular cylinder and a guide-bar having at its ends suitable guide-apertures for the passage of the yarn to the loop-wheel or stitch-bur. At one side of the cloth-stand is arranged the presser-stand, in a bearing of which is fitted a shaft

that supports the presser-wheel, which acts to press the fabric upon the needles of the cylinder. This stand also carries a bracket in which is mounted a vertical spindle provided with an arm or dog and with a trip-finger, the latter being normally held by a stop-pin on the head of a drop-wire that is sustained by the yarn in order to hold the dog free from contact with the bed of the cylinder and allow the presser-wheel to bear against the fabric; but when the yarn breaks this wire drops, thereby releasing the trip-finger, which is thrown around by a spring to bring the dog into contact with the cylinder-bed and force the presser-wheel out of contact with the fabric to arrest the operation of knitting at the quarter of the machine.

In devices of the general class hereinbefore referred to the drop-wire is arranged with relation to the trip mechanism so that the dog does not begin its motion until the drop-wire shall have moved to a position for the trip-stud to entirely release the finger and allow the dog to begin its play, thus occasioning loss of time in arresting the stoppage of the cylinder, and, furthermore, the drop-wire is arranged in a position not easily accessible to the operator and not without danger to the operator's hands, because the drop-wire extends from the presser-stand below the stitch-bur or loop-wheel, in order to reach which wire, in readjusting it upon the yarn, the operator must insert the hand below and in proximity to the stitch wheel or bur and heads of needle-clamp bolts.

The object of our invention is to overcome these difficulties by the provision of a simple, efficient, and cheap construction.

In our improved quarter-saver for circular-knitting machines we have so constructed the parts that the dog instantly begins its movement toward the cylinder-bed when the drop-wire begins its descent, thereby moving the dog almost instantly into engagement with the cylinder on the breakage or exhaustion of the yarn-supply and reducing to a minimum the extent of defective work; and we have also arranged the drop-wire in such relation to the loop-wheel or stitch-bur that the drop-wire may be automatically readjusted with readjustment of dog in bracket with ease and practically without danger of exposure of the

hands to injury from contact with said stitch-bur or loop-wheel. We also aim to provide an improved construction of the drop-wire by which the wire may clamp and hold itself in position on the rock-shaft of the quarter-saver mechanism, thereby preventing the drop-wire from turning axially out of position and from binding against the guide-bar or the yarn-supporting finger.

With these ends in view and such others as will be more fully pointed out our invention consists in the novel combination of devices and in the construction and arrangement of parts, which will be hereinafter fully described and claimed.

To enable others to understand our invention, we have illustrated the preferred embodiment thereof in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a plan view of a portion or "quarter" of a knitting-machine, showing our quarter-saver applied thereto and with the drop-wire in operative relation to the thread of yarn. Fig. 2 is a view similar to Fig. 1, but illustrating the drop-wire and other parts in position when the wire has been released by breakage or exhaustion of the yarn-supply. Fig. 3 is an elevation of the mechanism adjusted as in Fig. 1. Fig. 4 is an enlarged detail perspective view of our improved construction. Fig. 5 is a vertical sectional view through the device shown by Fig. 4, and Fig. 6 is a detail view of the notched cam-collar. Fig. 7 is an enlarged detail view of the adjustable yarn-detent.

Like letters of reference denote corresponding parts in all the figures of the drawings, referring to which—

A designates the cylinder of an ordinary circular-knitting machine; B is the loop-wheel or stitch-bur; C is the cloth-stand, in which the shaft of the loop-wheel is mounted; D is the presser-stand, and the presser-wheel E is indicated in a conventional way by dotted lines, all these elements being of the usual construction familiar to those skilled in the art to which our invention relates.

As hereinbefore stated, our invention is an improvement upon the quarter-saver of that class which employs a vertical spindle F, which carries the dog G and the trip-finger H. This spindle is usually mounted for turning in a horizontal plane in a bracket or arm I, having a socket *i* and a set-screw *i'*, whereby the bracket may be fitted on and clamped to a post on the presser-stand D. Instead of arranging the bracket and the drop-wire closely adjacent to the loop-wheel or stitch-bur (which arrangement is objectionable because of the liability of injury to the operator's hands when they are passed below the loop-wheel in adjusting the drop-wire into engagement with the yarn) we construct our bracket or arm I of angular form, provide a rock-shaft J on said bracket, and place the drop-wire K at the rear end of the rock-shaft, so that it

will extend beneath the yarn-guide L at a point some distance in rear of the loop-wheel or stitch-bur, as clearly shown by Figs. 1, 2, and 3 of the drawings. This bracket or arm which we employ is of right-angular form, in one of the arms of which are provided the socket and clamp for holding the bracket on the presser-stand, while the other arm of said bracket is provided with aligned bearings *i''*, in which is journaled the rock-shaft. This bracket is arranged on the presser-stand to lie between the presser-stand and the cloth-stand, as shown by Figs. 1 and 2, so that the rock-shaft lies alongside of the barrel or bearing on the presser-shaft that supports the shaft of the presser-wheel. At the juncture of the right-angled arms of the bracket is provided the vertical aperture in which is fitted the vertical spindle F. We arrange this spindle in the bracket in a way to give to it a limited vertical play, as well as a horizontal turning movement, and this spindle is held depressed and given a turning movement by the action of the spiral spring F', fitted on the lower end of the spindle, and connected at its ends to the bracket and to a head on the spindle, respectively. As is usual, this spindle carries the dog G to be thrown against the bed of the cylinder, and the trip-finger H to be restrained by the detent mechanism until the yarn breaks or is exhausted to allow the drop-wire to descend. This trip-finger coacts with the notched cam M, which is shown as clamped to the rock-shaft between the bearings thereof on the angular bracket by means of the set-screw *m*. This collar is cut away on one side to form the notch or seat *n* for the free end of the trip-finger, and on one side of this seat the collar is formed with an incline or cam surface *n'*, while on the other side of the notch-like seat rises the abutment *n''*, against which is adapted to strike the finger when the spindle is turned to adjust the trip-finger in the seat of the collar on the rock-shaft.

When the drop-wire is engaged with or rests upon the yarn, the spindle is turned to have its trip-finger engaged with the seat in the collar M, whereby the finger will be held by the collar, shaft, and drop-wire in position for the spindle to hold the dog out of engagement with the bed of the cylinder. When the yarn-supply is exhausted or the yarn is broken, the drop-wire descends, thereby turning the rock-shaft and causing the abutment to move the trip-finger, turn the spindle, and throw the dog toward the bed of the cylinder, whereby the incipient movement of the dog toward the cylinder is made positive by the action of the rock-shaft and collar and the dog is moved simultaneously with the descent of the drop-wire, such positive movement of the dog and the action of the coiled spring tending to give to the dog a quick motion in synchronism with the descent of the drop-wire. It will thus be seen that the movement of the dog toward the cylinder is not wholly

dependent upon the action of the spring, and that the dog begins its movement before the drop-wire has descended some distance as in other quarter-savers, whereby the presser-wheel is more quickly thrown out of engagement with the needles of the cylinder and the extent of imperfections in the work due to the feeding of yarn of inferior quality is reduced to a minimum.

In setting the device after the yarn has been properly adjusted through the guides the operator lifts the drop-wire to rest upon the yarn and turns the dog and spindle to move the finger H toward the collar or cam M, during which movement of the trip-finger its free end rides on the incline or cam n' to raise the spindle, finger, and dog slightly, in order that the free end of the finger may ride upon the cam until it reaches the seat, whereupon the spring pulls down the spindle and forces the finger into the seat, the swinging movement of the finger being arrested by the abutment on the collar or cam.

It is evident that the quarter-saver may be quickly and easily adjusted without danger to the operator's hand coming in contact with the loop-wheel or stitch-bur, because the drop-wire is not in such close juxtaposition to the loop-wheel as to make it necessary to pass the hand close to the loop-wheel in adjusting the drop-wire. In fact, the drop-wire may be adjusted simply by turning the spindle and dog back to their normal position, (shown by Fig. 1,) in which case the finger will ride against the abutment n'' on the collar, so as to turn the shaft and raise the drop-wire.

N designates the yarn-guide, which is of the usual or any preferred construction. The yarn-guide shown in the accompanying drawings consists of a bar attached to the cloth-stand, which bar is provided in its angular end with a smooth porcelain or other eye o , while the other end of the guide adjacent the stitch-bur has an eye o' . To the end of the guide-bar adjacent to the eye o are attached the yarn-supporting fingers $p p'$, which extend from the bar in the path of the yarn for the latter to rest upon the fingers, and the finger p nearest the guide o is bent or angular to support the end of the yarn in case it breaks after passing through the guide o . The drop-wire K is arranged to have its free or unconfined end occupy a position between the two yarn-fingers $p p'$, and said free end of the drop-wire is bent or turned upwardly and then forwardly, as at k' , in order that the drop-wire may rest upon the yarn for the purpose of holding the drop-wire in its raised position. The opposite end of the drop-wire is formed or bent to provide a clamp for self-attachment to the rear end of the rock-shaft, thereby dispensing with separate means for attaching the drop-wire to the rock-shaft. This is effected by coiling the drop-wire upon itself to form the coiled eye q and the spring-arm q' , which has a hook q'' , adapt-

ed to fit around the straight length of the drop-wire. The eye of the drop-wire is fitted on the rock-shaft, after which the hook of the arm q' is fitted around the drop-wire, thereby holding the drop-wire attached to the rock-shaft. This construction provides means whereby the drop-wire may be easily removed and replaced by another wire of similar construction in the event of breakage or damage to the wire, and it also serves to hold said wire so firmly in position on the rock-shaft that the drop-wire cannot turn or become displaced to such an extent that its angular-bent free end will bind against the guide N to interfere with the free movement or play of the quarter-saver.

It is well known that yarn has irregularities and imperfections therein which sometimes cause the yarn-guides to become clogged up, and that the yarn is sometimes kinky and knotted when fed to the guide or the looper-wheel. We propose to prevent yarn when in this condition from clogging up the yarn-eyes $o o'$ and from being fed to the machine by providing a detent R, consisting of a plate adjustably clamped by a set-screw to the angular end of the guide-bar N, and this detent is provided with a toothed or serrated jaw r , arranged in the path of the yarn and closely adjacent to the eye o , through which the yarn passes on its way to the loop-wheel. In case yarn of an imperfect character or in a kinky condition is fed to the machine it must first pass the serrated jaw of the detent. If the yarn is kinky, the jaw straightens out the yarn, and if it is so imperfect that it will be caught by the teeth of the jaw the feed will be arrested and the yarn broken, thereupon stopping the knitting on said head or quarter until the imperfect section is removed and the yarn tied up to resume operations.

By having the presser-wheel controlled by a dog which acts instantly on the descent of the drop-wire we are enabled to stop the mechanism so quickly that breakage or exhaustion of the yarn or imperfect yarn will not have an opportunity to be worked into the fabric before the presser-wheel is disengaged from the needles of the cylinder. The action of the dog is accelerated by the weight of the drop-wire in its descent assisting the recoil action of the spring.

Our improved construction enables the knitting-cylinder to be run at increased speed, effects an almost instantaneous stoppage of the quarter or heading on the exhaustion or breakage of the yarn, and reduces to a minimum the liability of derangement and breakage of the parts of the quarter-saver.

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

1. In a quarter-saver for circular-knitting machines, the combination with a cylinder, a presser-stand, a cloth-stand and a presser, of a bracket, a spring-controlled spindle fitted

therein to have a turning movement and a limited vertical play, a dog, a trip-finger, a rock-shaft journaled in the bracket and extending back from the spindle, a collar carried by the rock-shaft and provided with a seat and with an incline or cam for the trip-finger to ride against, and a drop-wire having one end coiled around said shaft to hold it in a proper position thereon.

2. In a quarter-saver for knitting-machines, the combination with a spindle carrying a dog for engagement with a cylinder, and a trip-finger, of a rock-shaft extending back from said spindle, a drop-wire carried by the rock-shaft, and positive connections between the rock-shaft and the trip-finger whereby the dog is made to instantly respond to the descent of the drop-wire, as and for the purposes described.

3. In a quarter-saver for knitting-machines, the combination with a spindle carrying a dog and a trip-finger, of a rock-shaft extending back from said spindle, a collar provided with a seat and with an abutment for the trip-finger, and a drop-wire attached to the rear end of said rock-shaft, as and for the purposes described.

4. In a quarter-saver for knitting-ma-

chines, the combination with an angular bracket, of a spring-controlled spindle fitted therein to have a turning movement and a limited vertical play, a dog, a trip-finger, a rock-shaft journaled in the bracket and extending back from the spindle, a collar carried by the rock-shaft and provided with a seat and with an incline or cam for the trip-finger to ride against, and a drop-wire attached to the shaft, as and for the purposes described.

5. In a quarter-saver for knitting-machines, the combination with an arm or bracket, and a spindle carrying a dog and trip-finger, of a rock-shaft, positive connections between the rock-shaft and finger, and a drop-wire having a clamp made integral therewith and adapted to engage with the rock-shaft to hold said wire rigidly thereon, as and for the purposes described.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN L. WENTWORTH.
JOHN DEMPSTER.

Witnesses:

DELANO A. CHAMPION,
S. H. NEWBERRY.