

No. 741,518.

PATENTED OCT. 13, 1903.

W. A. MACKIE:
THREAD RETAINING BAR FOR TWISTING MACHINES.

APPLICATION FILED JUNE 27, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

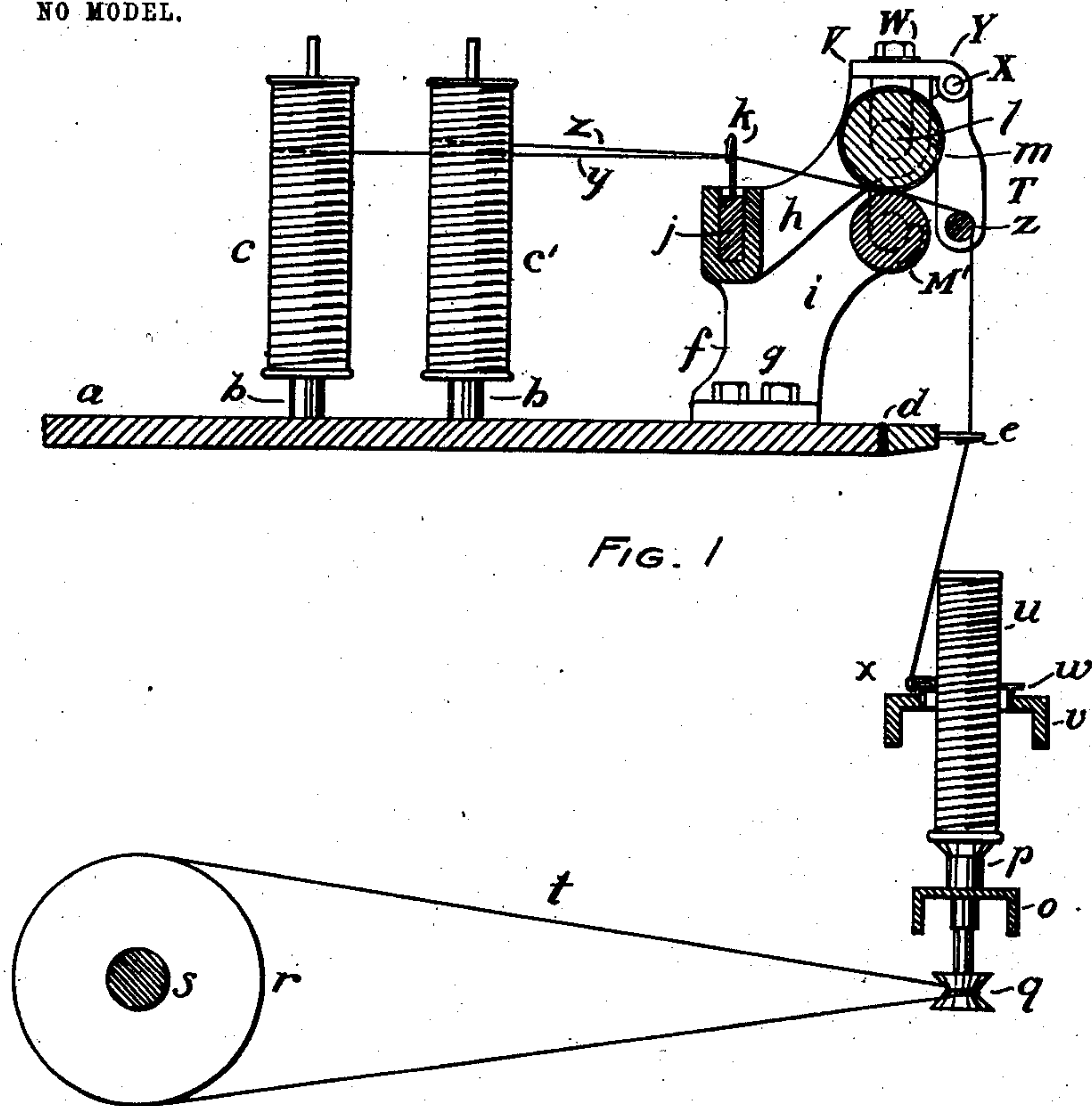


FIG. 1

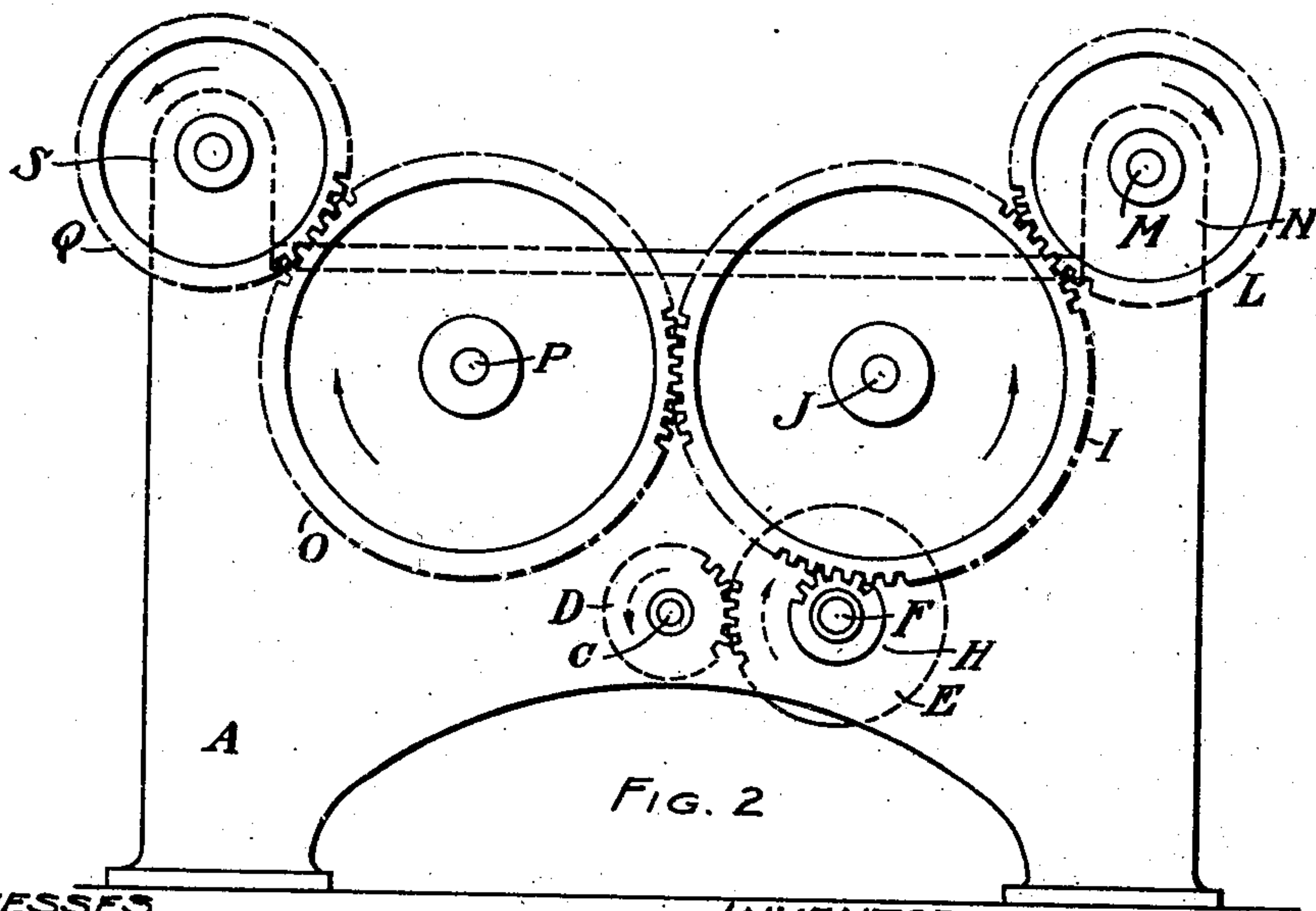


FIG. 2

WITNESSES

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ATT'Y

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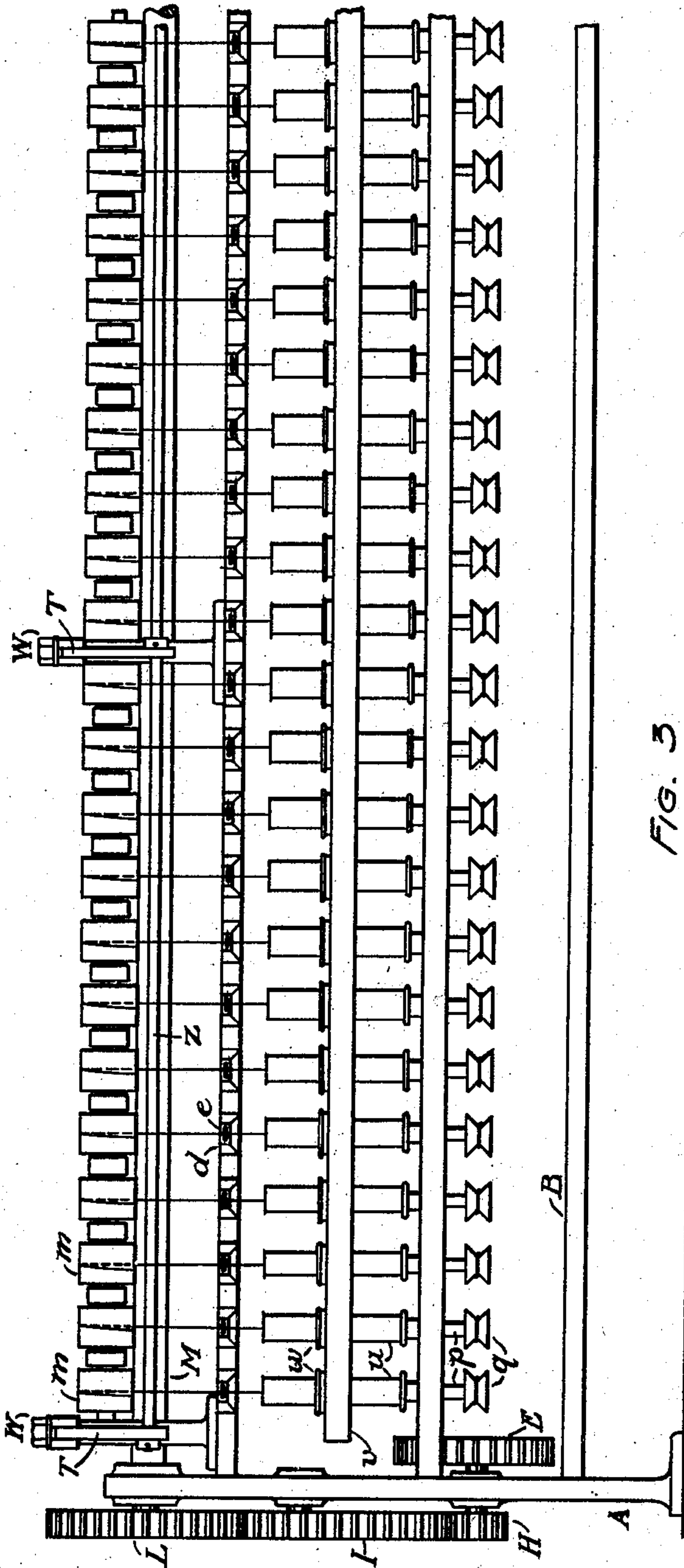


FIG. 3

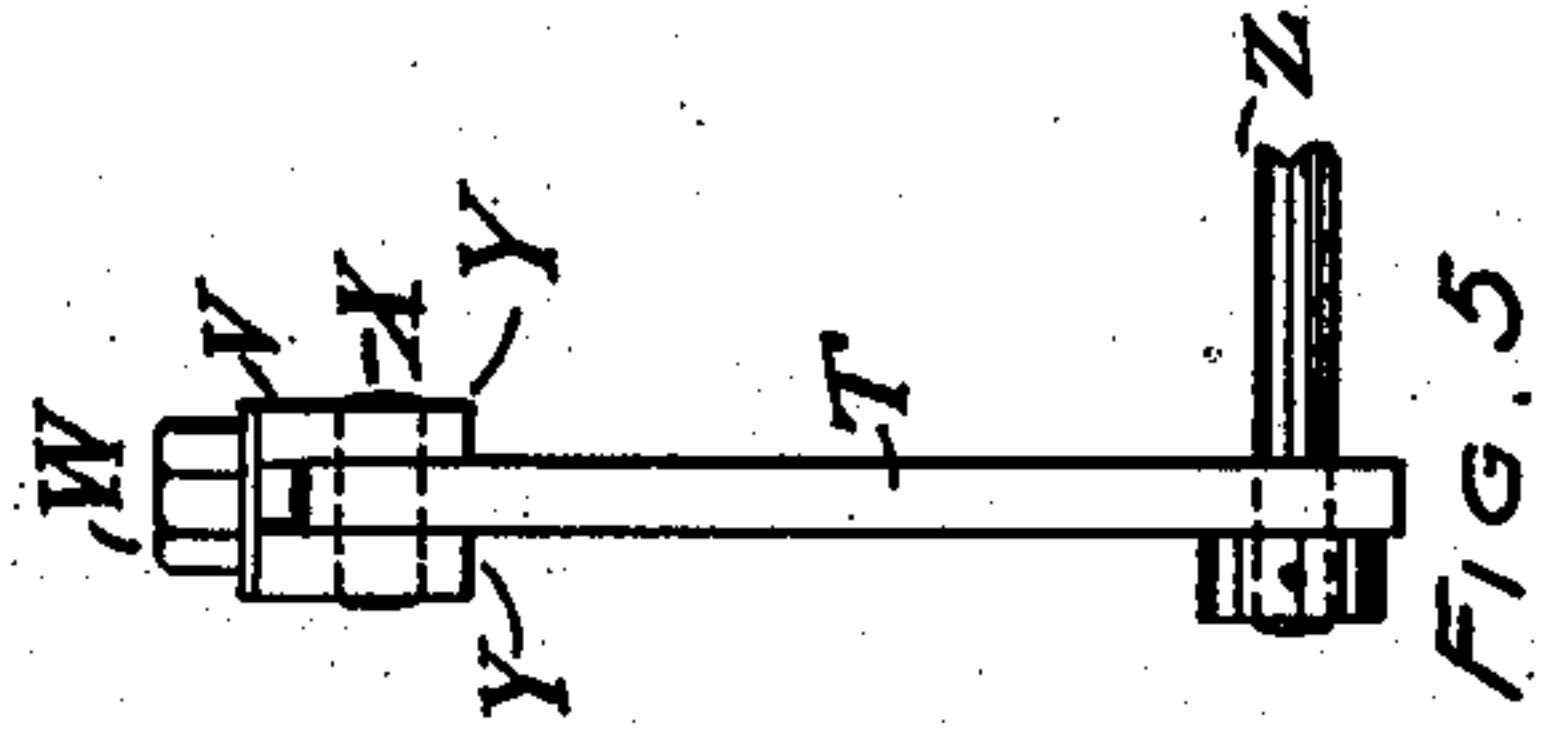


FIG. 5

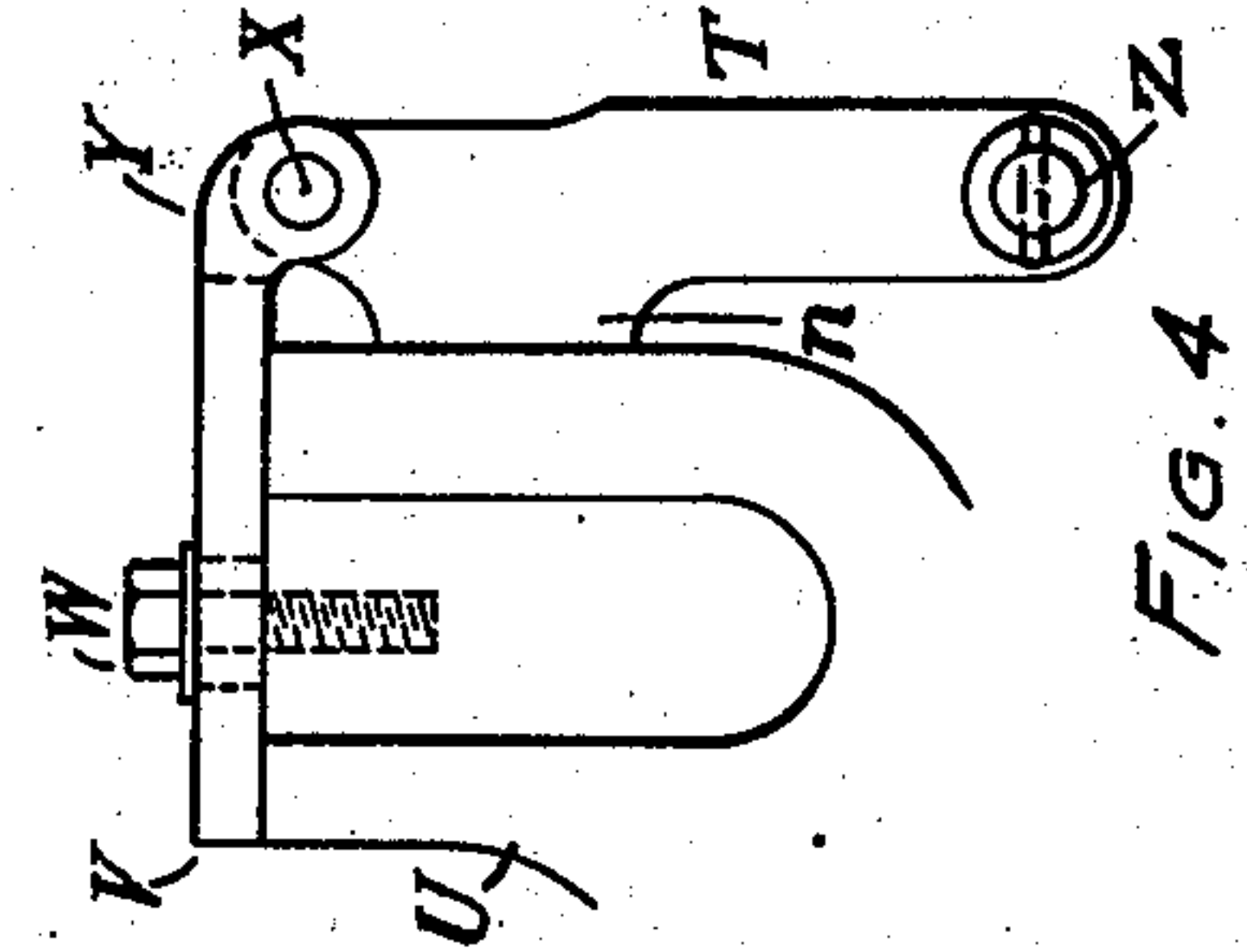


FIG. 4

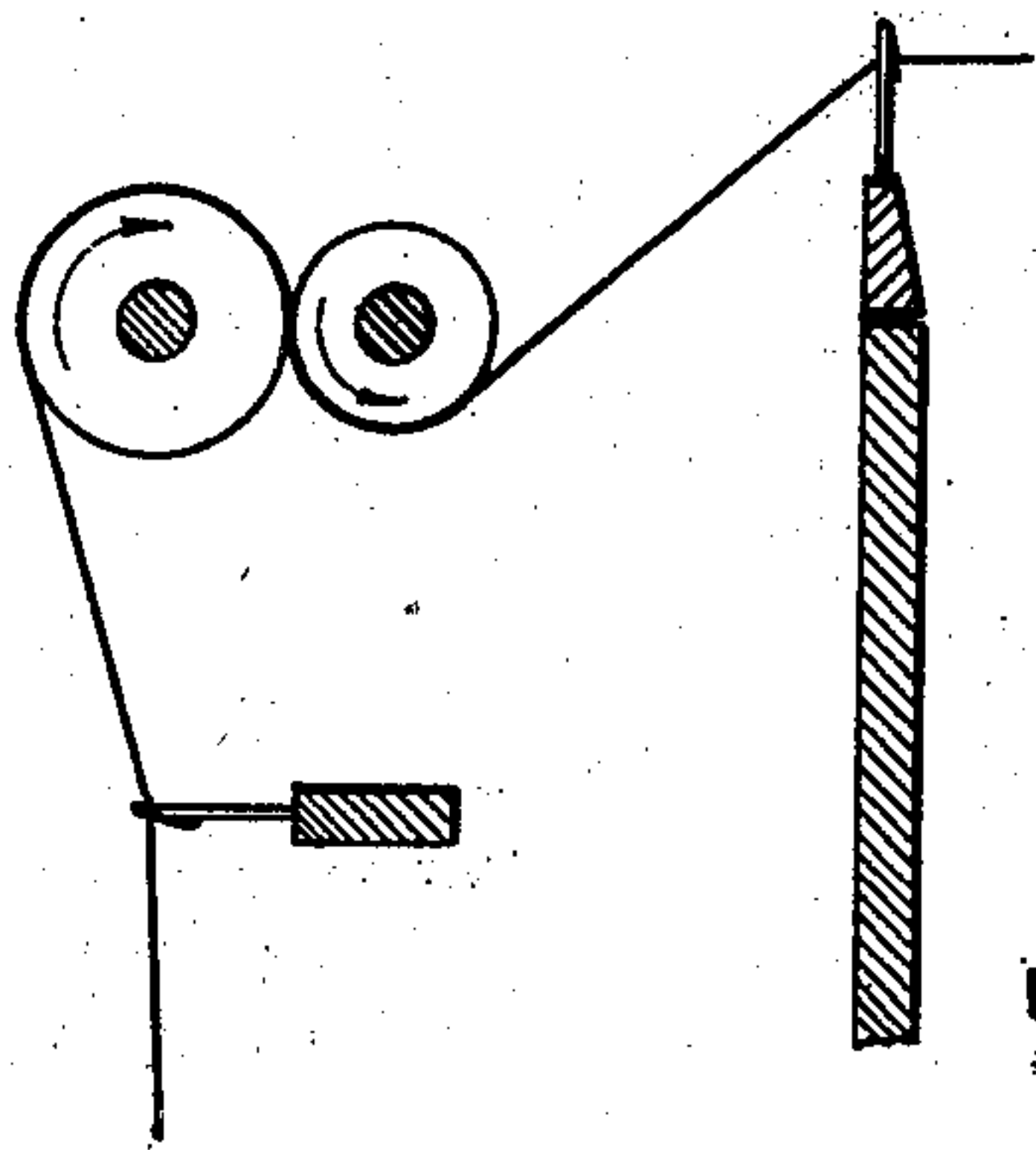


FIG. 6

WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM A. MACKIE, OF PROVIDENCE, RHODE ISLAND.

THREAD-RETAINING BAR FOR TWISTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 741,518, dated October 13, 1903.

Application filed June 27, 1903. Serial No. 163,383. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MACKIE, a citizen of the United States, residing at Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Thread-Retaining Bars, of which the following is a specification, reference being had therein to the accompanying drawings.

Like letters indicate like parts.

Figure 1 is a view of my invention as seen partly in side elevation and partly in cross-section. Fig. 2 is an end elevation of a yarn-twisting machine and illustrates the series of gears by which the power is communicated to the operative parts of the machine. Fig. 3 is a front elevation of a yarn-twisting machine to which my improved thread-retaining bar is applied. Fig. 4 is a side elevation of my improved retaining-bar for a yarn-twisting machine. Fig. 5 is a front elevation of the same. Fig. 6 illustrates the common construction of a yarn-twisting machine.

My invention is a device applicable to machines for twisting cotton or woolen yarns and constitutes a protecting device or retaining-bar by which when the yarn breaks its loose end is held and prevented from catching on another yarn or upon a roll where it does not belong.

Said invention consists of the novel construction and combination of the several parts, as hereinafter described, and specifically set forth in the claims.

In the drawings in Fig. 2 is shown an end elevation of a yarn-twisting machine, and in Fig. 3 a front elevation of the same. A B are parts of the frame of said machine. C is the main shaft, driven by power, and D is a driving-gear fastened on and rotating with the main shaft C. The driving-gear D meshes with the gear E, whose shaft F is rotatably mounted in a journal G in the frame A. The shaft F has said gear E fastened on it at one end, and on its outer end is fastened a pinion H. The pinion H engages with the gear I, which is mounted by its shaft J in a journal K of the frame A. The gear I engages with a gear L, fast upon a shaft M, which is rotatably mounted in journals in the standards N at both ends of the machine, said shaft M extending the entire length of the ma-

chine. The gear I also engages with a gear O of equal size with itself and having the same number of teeth. The gear O is mounted by its shaft P in a journal on the frame A and engages with a gear Q, fast upon a shaft R, which is mounted in standards S at both ends of the machine and extends the entire length of the machine. On the top *a* of the twisting-machine are creels *b b*, on which the spools *c c'* of yarn are rotatably mounted. On the front edge of the top *a* is pivotally mounted the usual thread-board *d*, having the guides *e*. A stand *f* is secured by bolts *g* or otherwise to the top *a* of the machine and has two angularly-projecting arms *h* and *i*, extending upwardly in front. The stand *f* is provided with a U-shaped socket in which the traverse-bar *j* is loosely mounted and movable as usual. The bar *j* supports the guides *k*. The arm *h* has a U-shaped socket in which, as a bearing, the shaft *l* of the top roll *m* is journaled. The bottom roll *M'* is rotatably mounted by its journals in the arm *i* of the stand *f* in a socket made for that purpose and shown in Fig. 1 in dotted lines. In the step-rail *o* a spindle *p* is rotatably mounted, which is provided with a whirl *q*. A pulley *r* on a shaft *s* is rotated by gearing, as usual, and a belt *t* from the pulley *r* passes around the whirl *q* and rotates the spindle *p*, together with the spool *u*, which is upon said spindle. The ring-rail is shown at *v* and the ring at *w*. On the ring *w* the ring-traveler *x* moves, as usual. From the spool *c* is unwound the yarn *y* and from the spool *c'* the yarn *z*, as represented in Fig. 1. The yarns *y* and *z* pass through the eye of the guide *k*, thence to the bottom of the top roll *m* and up and over said roll *m* once, and thence to the top of the bottom roll *M'* and passing between said rolls *m* and *M'* is drawn to the front. The top rolls *m* are separate and each is journaled in the bearings which are beside them, as usual; but the bottom roll *M'* is a single roll mounted fast on the shaft *M* and extending along the machine from end to end, as heretofore common in yarn-twisting machines. In my improved device the bottom roll *M'* rotates in a direction which is the reverse of the direction of its rotation heretofore common, and as the top roll *m* is rotated simply by its contact with the bottom roll *M'* its direction of rotation is the reverse of the

usual direction of rotation of such top rolls. This is caused by the gearing shown in Fig. 2, in which figure the direction of the rotation of each of the gears is indicated by an arrow thereon. The gear L rotates the shaft M, on which the roll M' is fastened, as seen in Fig. 2.

My improved thread-retaining bar consists of two downwardly-hanging arms T T, each having a circular aperture near the top and a circular aperture near the bottom. It also has a boss *n*, provided with a straight edge, as seen in Fig. 4. The top rolls *m* are in a series and usually divided into sections, and at both ends of each of these sections there is a standard U. A cap or plate V is supported on the top of the standard U and is longitudinally slotted, as indicated by dotted lines in Fig. 4. It is secured in position by a bolt W, which engages in a threaded hole tapped therefor in the frame. A pivot X passes through ears Y of the cap-piece V and through the upper hole or aperture in the hanging arms T. A rod or bar Z is mounted in the lower holes or apertures of the hanging arms T and is secured in position by nuts on the ends of the rod or bar Z, as illustrated in Figs. 4 and 5.

As is well known, it is a frequent occurrence in twisting yarns that either one or both of the yarns break in passing from the rolls to the spool, and the loose ends of the yarn or yarns so broken are liable to fly out and catch onto the yarn passing from the adjacent rolls to the spool thereto belonging or upon one of the adjacent top rolls, thus making these adjacent yarns three or four ply or else clogging the top rolls, thus resulting in waste and loss. The attendant cannot always quickly detect this breakage and consequent damage, and there is considerable loss of material thus occasioned. In Fig. 6 I have illustrated the usual manner of rotation of the top and bottom rolls and the course of the yarns in the operation as heretofore common. It is here seen that the yarn passes to the top of the top roll, thence down over the same in front, thence between the top and bottom rolls to the rear, and thence down back of the bottom roll to and through the guide, and so to the ring-traveler. In this manner the yarn cannot be wound once entirely around the top roll. This difficulty is prevented by my improved thread-retaining bar, which hangs loosely in front of the rolls *m* M' and takes the yarn or thread from the top of the roll M'. The practical effect of this device in operation is that the loose end of the broken yarn is caught up and wound around the top roll *m* to which it properly appertains and cannot catch onto the next adjacent roll nor onto the yarn of either next adjacent top roll. As a consequence there is no increase in the number of the plies of these adjacent yarns. The reason why the broken yarn is taken up by the top roll *m* to which it belongs is that yarns *y z* are wrapped once around said top roll *m* and the loose end of the broken yarn adheres

to the yarn which is wrapped around said top roll by capillary contact therewith if the break occurs at a place between the bottom roll M' and the cross-bar Z, or if the break occurs between the cross-bar Z and the ring-traveler *x* the loose end of the broken yarn is prevented by the cross-bar Z from coming into contact with the bottom roll M', as said cross-bar is at a sufficient distance in front of the bottom roll to protect the loose end from such capture.

My improved thread-retaining bar has several important advantages over previous devices for the same purpose. Many of those devices are complicated, expensive, and unreliable. Some of them are so heavy that they add several hundreds of pounds to the weight of each twisting-machine. Some of them occupy considerable space, preventing convenient access to the rolls and partially concealing the rolls and yarn, so that any improper working or condition of them is not readily discovered. Some of them require oiling and considerable care.

My improved thread-retaining bar is exceedingly simple, very cheap, and always reliable. It is very light and small, does not interfere with access to the rolls or yarn, and does not conceal or cover them. It does not require oiling or any care.

Whereas the common construction and operation of the rolls in yarn-twisting machines (illustrated in Fig. 6) results in an angular course of the yarn from the rear of the bottom roll to the guide on the thread-board, so causing the yarn to bend in passing through said guide and to drag in passing over the rear side of said guide, it is evident, as seen in Fig. 1, that the yarn in passing over on the front side of the cross-bar Z is exactly vertical and in line with the axial line of the spindle *p*. The result is that the expansion of the yarn as the ring-traveler moves on the ring *w* is uniform and the tension is invariable.

It is a common habit with operatives working on yarn-twisting machines like that illustrated in Fig. 6 to take up a large number of yarns at once and place them on the rolls, and this causes a considerable waste; but in the use of my said device the yarn can be put upon only one top roll at a time, and all loss from this cause is prevented.

In the common twisting-machine (shown in Fig. 6) it is evident that the yarn in passing between the rolls must be passed to the rear, and it goes from the back side of the lower roll to the guide on the thread-board. This is inconvenient, because the back of the roll is not visible to the operator and is less accessible than the front; but in my said device the end of the yarn in passing between the rolls comes to the front, and it also passes from the lower roll in the front of said roll, so that it is always accessible and visible.

In the use of the common twisting-machine (shown in Fig. 6) if a bit of dirt or foreign

substance or other obstacle is upon the yarn or gets between the rolls the top roll is lifted thereby as the same passes between the top and bottom rolls, and thus the yarn becomes
 5 slack while the top roll is so lifted and the proper tension is temporarily disturbed. In my said device this slackening of the yarn by this cause is prevented, as the yarn passes
 10 entirely around the top roll instead of passing only tangentially between the rolls, as in the prior machines, and thus the proper draft upon the yarn is maintained uniformly. The straight edge of the boss *n* of the hanging arm T, coming in contact with the straight
 15 vertical surface of the adjacent portion of the frame of the machine, insures the proper vertical direction of the arm T during the operation of the machine and the consequent movement of the yarn downward in a vertical
 20 line in the line of the spindle *p* to the spool *u* and the uniform expansion of the yarn by the ring-traveler in the twisting operation. By means of the slot in the cap-piece V the said piece is adjustable in position longitudinally and is held in its adjusted position
 25 by the bolt W. Whenever it is desired to have access to the bottom rolls, the pivotal mounting of the arms T T allow said arms to be swung up, thus elevating the cross-bar Z
 30 to a position much above the top rolls *m*.

I claim as a novel and useful invention and desire to secure by Letters Patent—

1. In a yarn-twisting machine having a top

roll and a bottom roll, the combination therewith of a cap piece or plate mounted on the
 35 frame of the machine in a horizontal plane above the top roll and provided with a longitudinal slot and two forwardly-projecting ears, a hanging arm pivotally connected at
 40 its top with said ears, a rod extending at a right angle from said hanging arm at the bottom thereof in front of said bottom roll, and a bolt passing through said slot into the frame, substantially as described.

2. In a yarn-twisting machine having a top
 45 roll and a bottom roll, the combination therewith of a cap piece or plate mounted on the frame of the machine in a horizontal plane above the top roll and provided with a longitudinal slot and two forwardly-projecting
 50 ears, a hanging arm pivotally connected at its top with said ears and having a rearwardly-extending boss which is provided with a straight edge adapted to contact with the vertical surface of a portion of said frame, a rod
 55 extending at a right angle from said hanging arm at the bottom thereof in front of said bottom roll, and a bolt passing through said slot into the frame, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM A. MACKIE.

Witnesses:

WILLIAM W. REYNOLDS,
 HOWARD A. LAMPREY.