

No. 686,011.

Patented Nov. 5, 1901.

H. A. WEBSTER.
SHOE SEWING MACHINE.

(Application filed Nov. 18, 1898.)

(No Model.)

2 Sheets—Sheet 1.

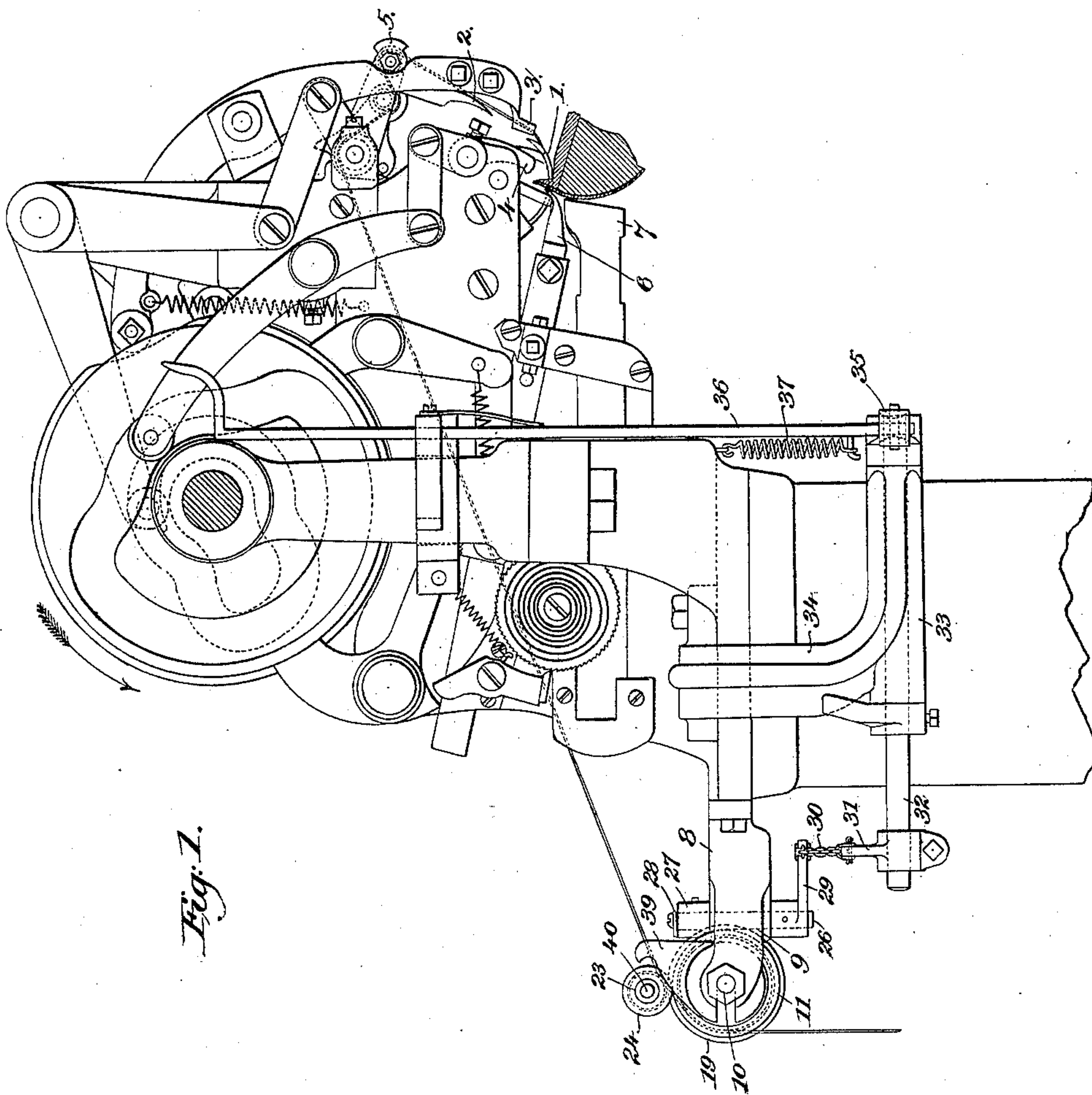


Fig. 1.

Witnesses:

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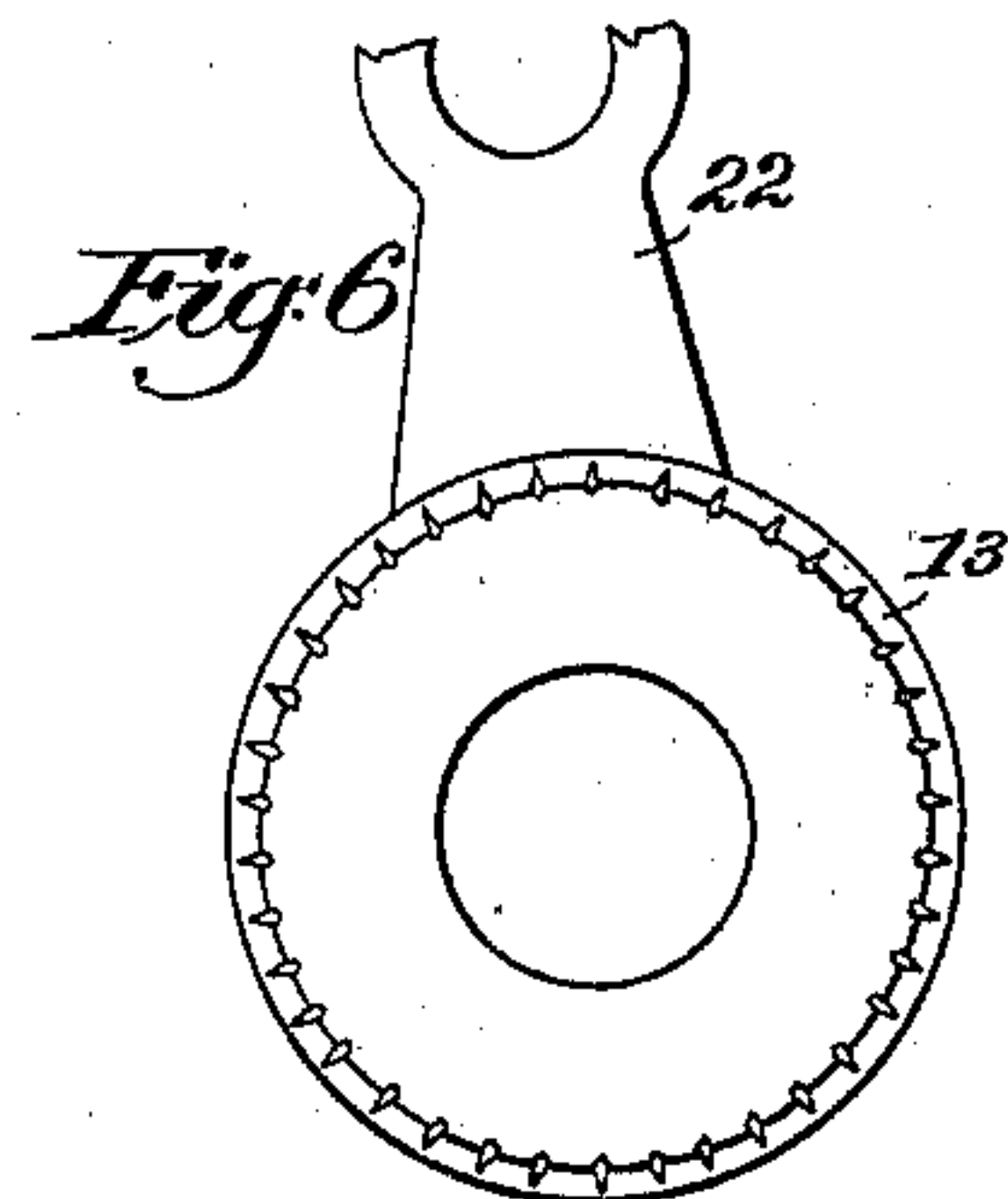
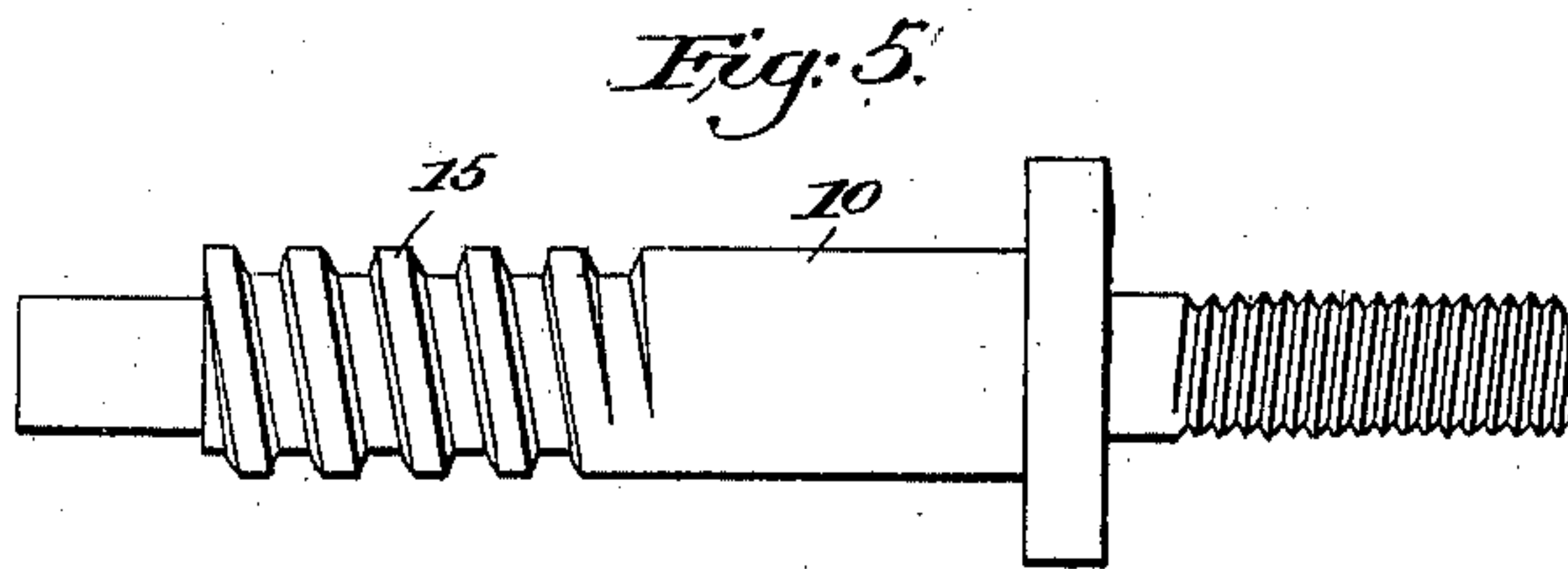
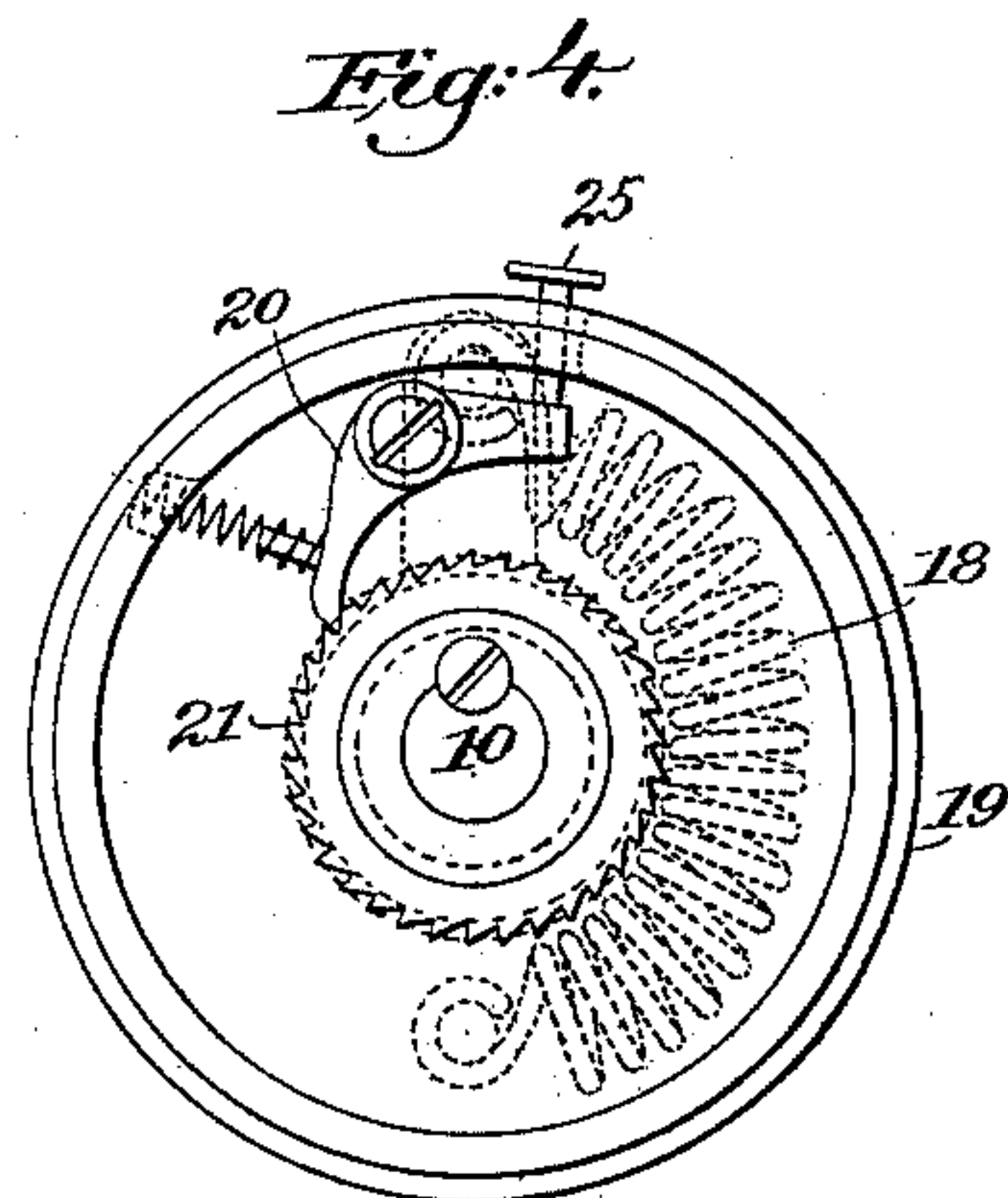
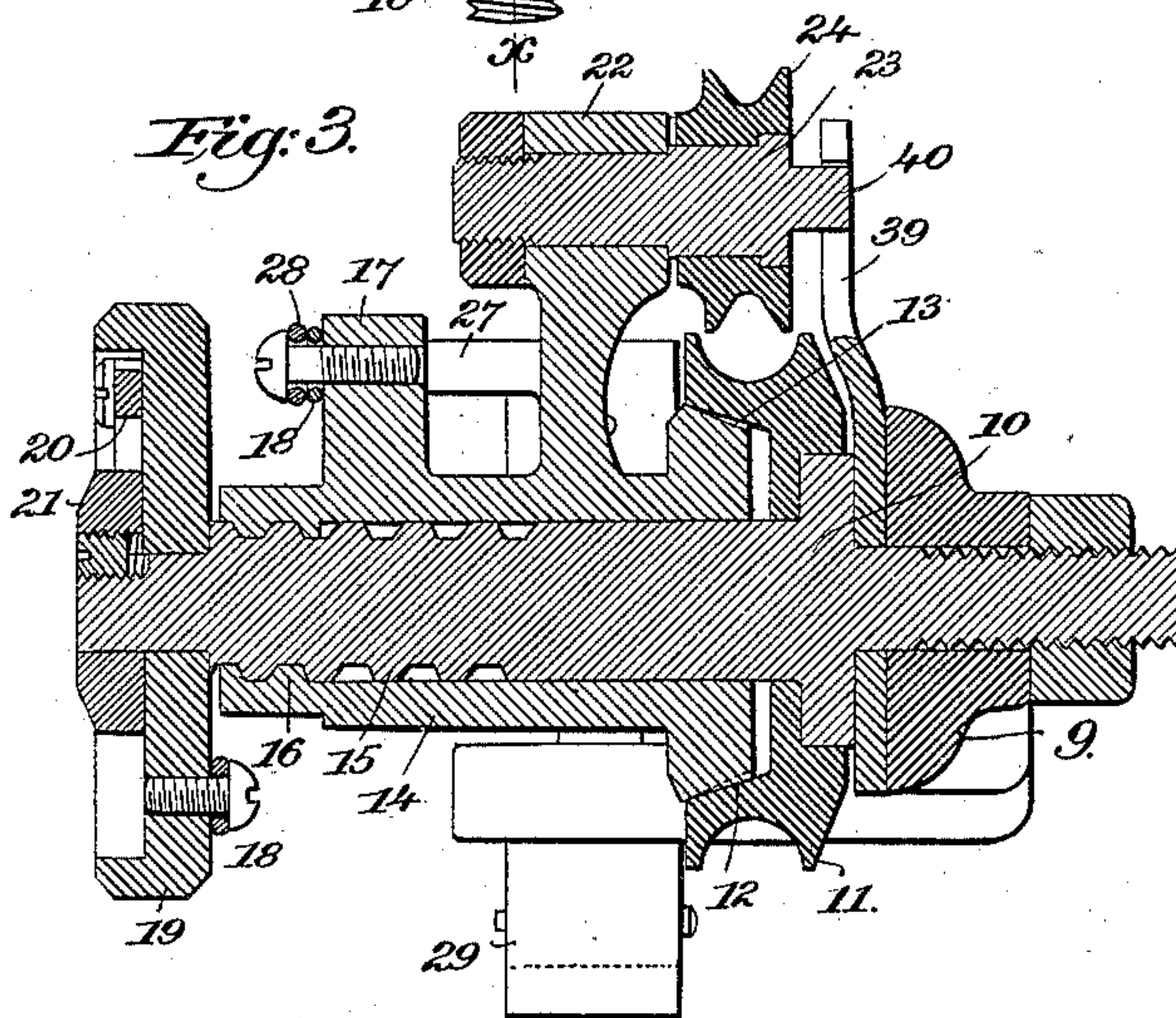
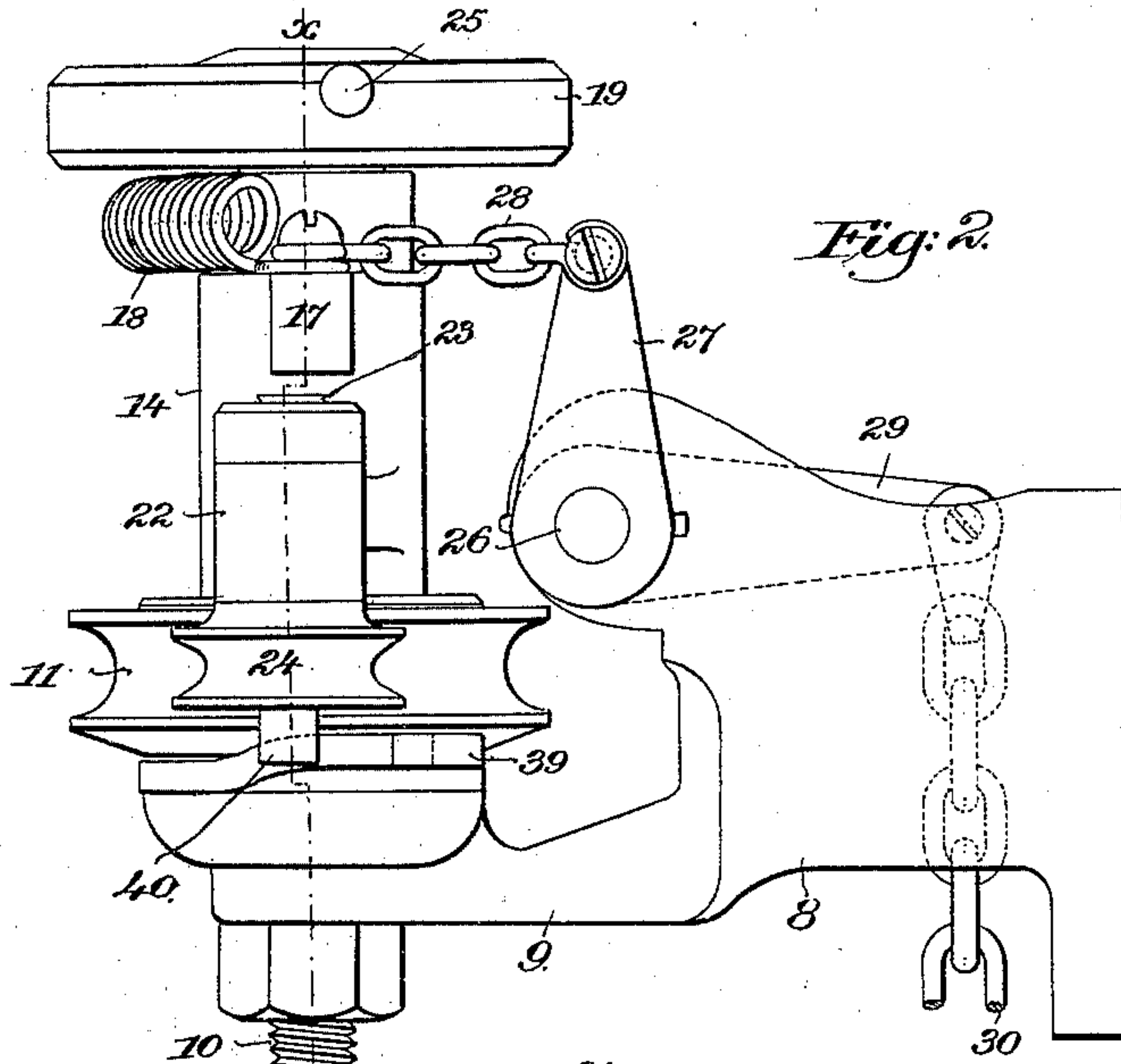
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Stanley A. Webster,
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SHOE SEWING MACHINE.
(Application filed Nov. 18, 1898.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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SHOE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 686,011, dated November 5, 1901.

Application filed November 18, 1898. Serial No. 696,812. (No model.)

To all whom it may concern:

Be it known that I, HAROLD A. WEBSTER, a citizen of the United States, residing at Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Shoe-Sewing Machines; 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.

The present invention relates to improvements in shoe-sewing machines, and more particularly to improvements in shoe-sewing machines of the chain-stitch type, of which the commercial welt and turn sewing-machine are examples. As these machines have been heretofore commonly constructed the thread for the next stitch is drawn from the tension either by a continuation of the loop-drawing stroke of the needle after the stitch has been set or by a continuation of the loop-drawing stroke of a take-up after the loop of thread has been drawn tight around the shank of the needle, and whether this pulling off of the thread be accomplished by the needle or the take-up it has always, in so far as I am advised of the state of the art, been effected against the full strain of the tension, so that while the thread is being drawn off for the next stitch an unnecessary strain is brought upon the between substance, which where a heavy tension is used, such as is required to sew a tight seam, the thread is apt and frequently does cut through or into the between substances, so as to materially weaken the holding power of the seam.

The object of the present invention is to obviate the difficulty above noted, and to this end it consists of an improved construction and organization of a shoe-sewing machine whereby the tension mechanism is brought into such relation with the stitch-setting or loop-tightening devices that when the stitch is set or the loop of thread tightened around the shank of the needle a further pull on the thread will release the tension, so that during the further movement of the needle or the take-up, while it draws off thread for the

next stitch, the thread is not under strain, but runs freely from the source of supply.

The present invention further consists of an improved tension mechanism and of the devices and combinations of devices herein-after more specifically set forth and claimed.

The present invention is illustrated in the accompanying drawings as embodied in the machine disclosed in United States Letters Patent to French and Meyer, No. 412,704, dated October 8, 1889, wherein the loop of thread is tightened around the shank of the needle by a loop-tightening take-up; but I desire to say in this connection that the present invention is not limited to its illustrated embodiment in said machine, but may be without substantial modification embodied in a machine having other forms of loop-tightening device or in which the stitch is set entirely by the loop-drawing pull of the needle.

In the drawings, Figure 1 shows in side elevation the machine of said French and Meyer patent with the driving-pulley removed and with the present invention embodied therein. Fig. 2 represents a top plan view of the improved tension mechanism removed from the machine. Fig. 3 represents a longitudinal section taken on the line *xx*, Fig. 2. Figs. 4, 5, and 6 show details to be referred to.

In the drawings, 1 is the needle, 2 the awl, 3 the looper, 4 the thread-finger, 5 the take-up, 6 the back gage, and 7 the back rest, all of which parts are or may be constructed and actuated as in the machine of the patent to French and Meyer, hereinbefore referred to.

The tension mechanism of the machine of the drawings consists of certain improvements on the device illustrated and described in an application filed by me the 20th day of July, 1898, Serial No. 686,422, which discloses means whereby a pull on the thread of a predetermined amount operates to release an increment of thread, and the present invention in the preferred form thereof illustrated in the accompanying drawings consists of the combination of such improved tension mechanism with the associate parts of the illustrated machine in such manner that the take-up will exert such predetermined pull on the

thread when it has drawn the loop of thread around the needle and the thread during the further movement, which is the pulling off movement of the take-up, will be released
5 and run freely from the supply.

The arrangement of the tension mechanism of the machine of the drawings is preferably as follows: A bracket 8, fixedly secured to the frame of the machine over the usual wax-pot,
10 (not shown,) carries an arm 9, which supports a horizontally-disposed shaft 10, upon which is mounted to freely turn a grooved thread-truck 11, around which the thread is wound as it leads from the wax-pot to the
15 stitch-forming devices. Like the device of the application above referred to, this thread-truck is normally held locked and prevented from turning on the shaft 10 and remains locked until the strain or pull on the thread
20 reaches a predetermined point, at which time the truck 11 will be unlocked and permitted to turn freely, releasing an increment of thread, after which it will be again locked, and this locking and unlocking of the truck
25 11 will be repeated during the continued operation of the machine, whether the machine be operated fast or slow.

The thread-truck 11 is provided upon one of its lateral faces with a tapering clutch-face
30 12, which is arranged to be engaged by a complementary tapering clutch-face 13, which is formed on a head or enlargement carried by a sleeve 14, mounted to turn on the shaft 10. In order to move the sleeve 14 toward
35 and away from the truck 11 for the purpose of throwing the complementary clutch-faces 12 and 13 into and out of engagement with each other, the shaft 10 and the sleeve 14 are provided with complementary inclined con-
40 tact-faces so disposed with relation to each other that a turning of the sleeve 14 on the shaft 10 in one direction will impart to said sleeve a slight longitudinal movement along said shaft to thereby disconnect the clutch-
45 faces 12 and 13 and permit a turning of the thread-truck 11, and a turning of the sleeve 14 on the shaft 10 in the opposite direction will impart to the sleeve 14 a longitudinal movement along the shaft to connect the
50 clutch-faces 12 and 13 to lock the thread-truck 11. In the machine of the drawings these complementary contact-faces on the shaft 10 and the sleeve 14 are formed by a coarse thread 15, formed on the end of the shaft 10,
55 and a corresponding thread 16 on the interior of the sleeve 14. The sleeve 14 is provided with an upwardly-extending arm 17, to which is connected one end of the spring 18, the opposite end of the spring 18 being
60 connected to a disk or wheel 19, mounted to turn freely on the outer end of the shaft 10 for a purpose to be hereinafter described. The wheel 19 is provided with a spring-actuated locking-pawl 20, arranged to engage the
65 teeth of a ratchet 21, fixedly secured to the outer end of the shaft 10, the arrangement

being such that the spring 18 acts to turn the sleeve 14 on the shaft 10 in such a direction that the complementary contact-faces 15 and 16 will impart to said sleeve 14 a movement
70 along the shaft 10 toward the thread-truck 11 to throw the clutch-faces 12 and 13 in contact with each other to lock the thread-truck against rotation. The sleeve 14 is turned in the opposite direction against the tension of
75 the spring 18 by the pull on the thread which is imparted thereto by the take-up 5 during the stitch-setting operation, and this is accomplished in the machine of the drawings by providing the sleeve 14 with an upwardly-ex-
80 tending arm 22, in which is supported a stud 23, carrying the thread-truck 24, over which the thread passes as it leads from the thread-truck 11 to the machine, the arrangement being such that a pull on the thread sufficient
85 to overcome the resistance of the spring 18 acts to turn the sleeve 14 on the shaft 10, and thus by means of the complementary contact-faces 15 and 16 move the sleeve 14 for a slight distance longitudinally of the shaft 10, dis-
90 connecting the clutch-faces 12 and 13 and releasing the thread-truck 11 to enable it to turn freely on the shaft 10, thus releasing the tension on the thread and allowing an increment of thread to be pulled off from the source
95 of supply. As soon as the increment of thread has been drawn from the source of supply the spring 18 acts immediately to turn the sleeve 14 in the opposite direction to again force the clutch-faces 12 and 13 in contact to lock the
100 thread-truck 11 against rotation.

In the present machine the resistance of the spring 18, and consequently the initial force required to overcome the tension and unlock the thread-truck 11, is arranged to be adjust-
105 ed, and this adjustment is secured by a rotation of the disk 19 about the shaft 10, and to secure such adjustment the spring-actuated pawl 20 is provided with a thumb-piece 25, which projects through the periphery of the
110 wheel 19, whereby the pawl 20 may be disconnected from the ratchet 21 and the disk 19 turned in either direction to increase or decrease the tension of the spring 18, and thereby adjust the initial resistance required to un-
115 lock the tension to release the increments of thread, as hereinbefore described.

It is desirable in these machines to enable the operator to unlock the tension when removing the work from the machine, and in
120 the machine of the drawings this is accomplished in the following manner: A short shaft 26, supported in the bracket 8, has affixed at its upper end an arm 27, which is connected to the arm 17 of the sleeve 14 by
125 means of a flexible chain 28, and the lower end of the shaft 26 carries an arm 29, which is connected, by means of a chain 30, to an arm 31, carried by a shaft 32, mounted to turn in a bearing 33 of a bracket 34, secured to the
130 head of the machine. On the opposite end of the shaft 32 is carried an arm 35, to which

is secured a vertically-disposed actuating-rod 36, a downward movement of which will act to rock the shaft 32, which in turn will cause a rocking of the shaft 26, and thus by means of the chain 28 turn the sleeve 14 to disconnect the clutch-faces 12 and 13, as hereinbefore described. A spring 37 is connected to the rod 36 and to a fixed part of the machine and acts to normally maintain the rod elevated and the parts in the position shown in Fig. 1, with the thread-truck 11 locked.

The machine is provided with a stop 39, positioned to engage a projection 40 on the stud 23, and thus limit the forward movement of the thread-truck 24 and the turning of the sleeve 14 in order to prevent the undue forward motion and turning of the sleeve 14 and to insure its quick return by the spring 18 after an increment of thread has been drawn from the source of supply.

The operation of the machine of the drawings is as follows: Motion being imparted to the driving mechanism of the stitch-forming devices, these devices perform their several functions in the same manner as in the machine of the patent to French and Meyer, hereinbefore set forth. During the upward throw of the take-up 5, at which time the needle is advanced through the work, the tension remains locked until the take-up has drawn up and tightened the loop of thread around the shank of the needle, as set forth in said patent. The continued movement of the take-up after it has tightened the loop of thread around the shank of the needle will exert a pull on that portion of the thread which extends from the take-up to the tension, and as soon as this pull reaches the predetermined amount, which has been previously determined by the adjustment of spring 18, it will pull forward the thread-truck 24, thus turning the sleeve 14 on the shaft 10 in a forward direction, which will cause the complementary contact-faces 15 and 16 on the shaft and sleeve to move the sleeve slightly toward the left as the device is shown in Fig. 3, disconnecting the clutch-faces 12 and 13 and permitting the thread-truck 11 to turn on the shaft 10, allowing the thread to run freely from the supply during the pull-off movement of the take-up, and thus preventing an undue strain on the between substance while the thread is being pulled off. As soon as this increment of thread shall have been drawn off from the supply the spring 18 acts to immediately turn the sleeve 14 in an opposite direction, thus throwing the clutch-faces 12 and 13 together, again locking the thread-truck 11 to prevent the thread from being drawn from the supply.

Having described the construction and mode of operation of the present invention, I claim as new and desire to secure by Letters Patent of the United States—

1. In a shoe-sewing machine, the combination with stitch-forming mechanism compris-

ing loop-tightening mechanism, of thread-holding mechanism acting positively until the loop has been tightened to prevent the thread being drawn from the supply, and actuated by the pull of the thread exerted by said loop-tightening mechanism, after the loop has been tightened, to set free the thread and allow it to be drawn from the supply.

2. In a shoe-sewing machine, the combination with stitch-forming mechanism comprising a take-up arranged to tighten the loop of thread around the shank of the needle, of mechanism acting to hold the thread against the pull of the take-up until the loop has been tightened, and actuated by the pull of the take-up on the thread after the loop has been tightened to release the thread, substantially as described.

3. In a shoe-sewing machine, the combination with a thread-truck, of a locking device therefor, a support for said locking device, and means controlled by a pull of the thread to move the locking device axially toward and away from the thread-truck, substantially as described.

4. In a shoe-sewing machine, the combination with a thread-truck, of a locking device therefor, a support for said locking device about which it is arranged to turn and complementary inclined contact-faces on the locking device and its support for moving the locking device toward or away from the thread-truck as said locking device is turned on its support, and means controlled by a pull of the thread for actuating the locking device, substantially as described.

5. In a shoe-sewing machine, the combination with a thread-truck, of a locking device therefor, a support for the locking device about which it is arranged to turn, said locking device and its support having provisions to move the locking device axially toward and away from the thread-truck upon a turning of said locking device on its support, a spring to turn said locking device in a direction to lock the thread-truck, said locking device being turned by a pull on the thread to release the thread-truck, substantially as described.

6. In a shoe-sewing machine, the combination with a thread-truck, of a locking device therefor, a support for the locking device about which it is arranged to turn, said locking device and support having provisions to move the locking device axially toward and away from the thread-truck upon a turning of said locking device on its support, a spring to turn said locking device in a direction to lock the thread-truck, said locking device being turned by a pull on the thread to release the thread-truck, and means for adjusting the tension of said spring, substantially as described.

7. In a shoe-sewing machine, the combination with a thread-truck, of a locking device therefor, a support for the locking device

about which it is arranged to turn, said support and locking device having provisions for moving the locking device axially toward and from the truck upon a rotation of the locking device, and means controlled by a pull of
5 the thread for rotating the locking device, substantially as described.

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

HAROLD A. WEBSTER.

Witnesses:

T. HART ANDERSON,
HORACE VAN EVEREN.