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Patented Apr. 1, 1902.

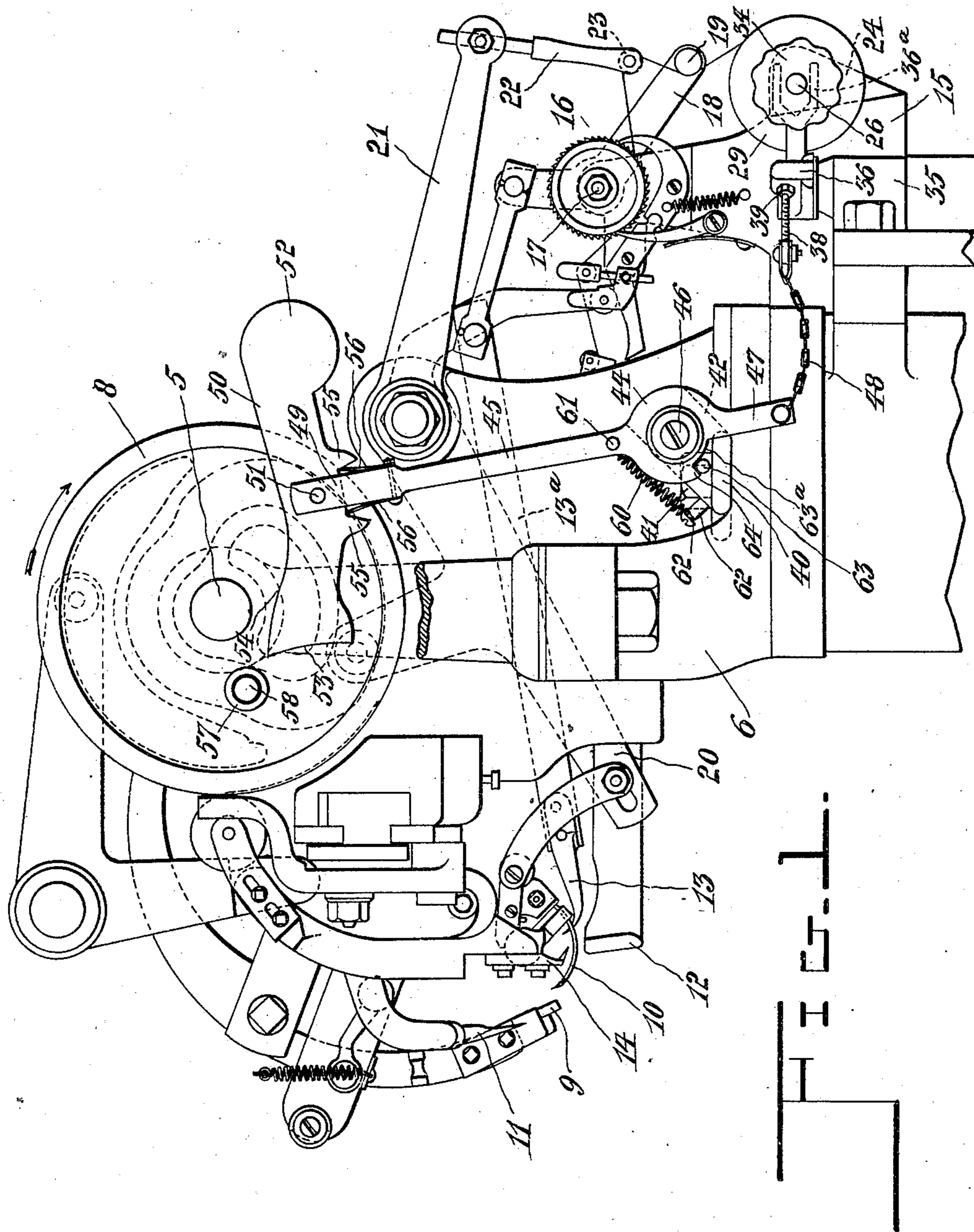
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TENSION MECHANISM FOR SEWING MACHINES.

(Application filed Nov. 14, 1901.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

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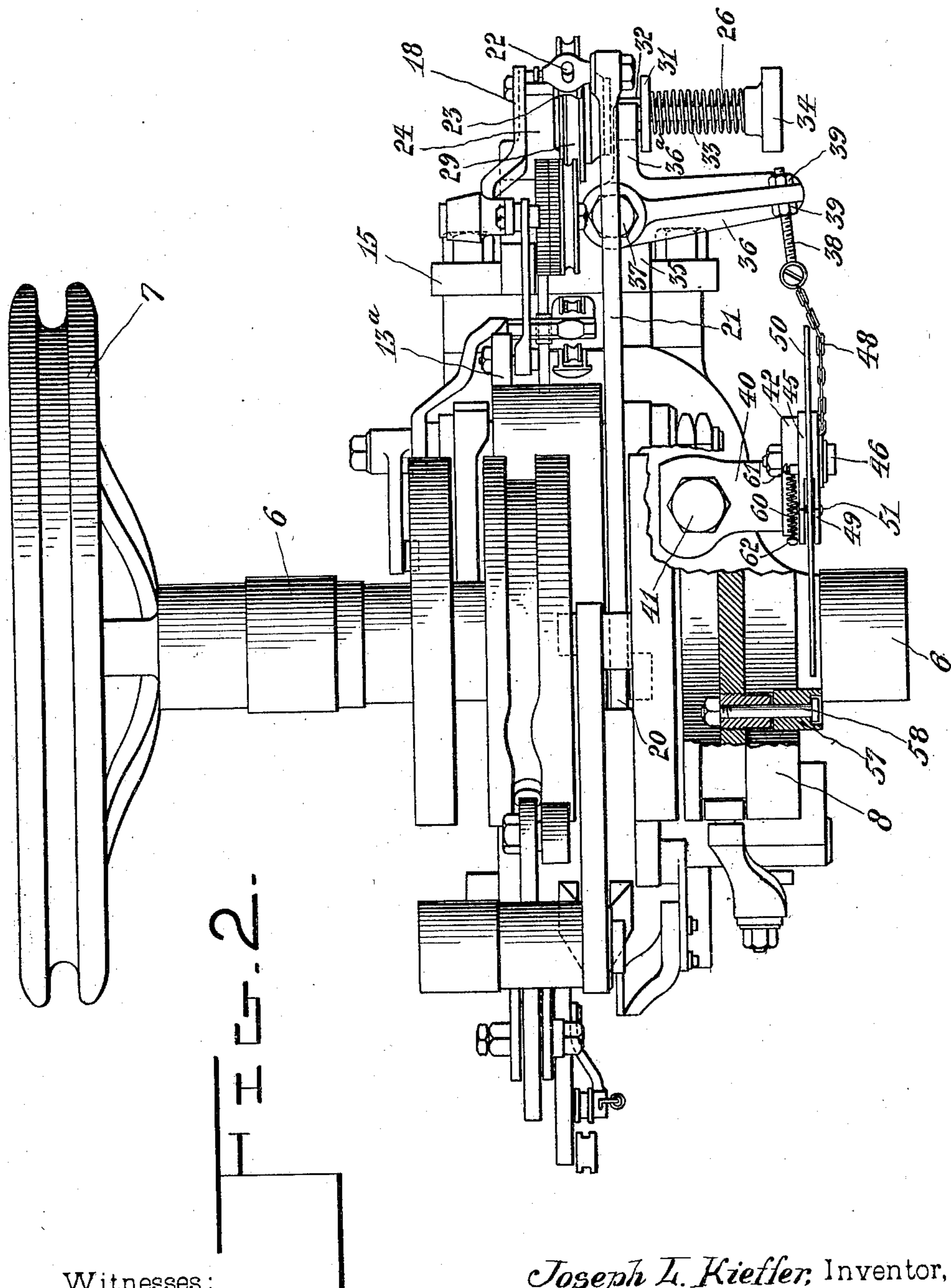
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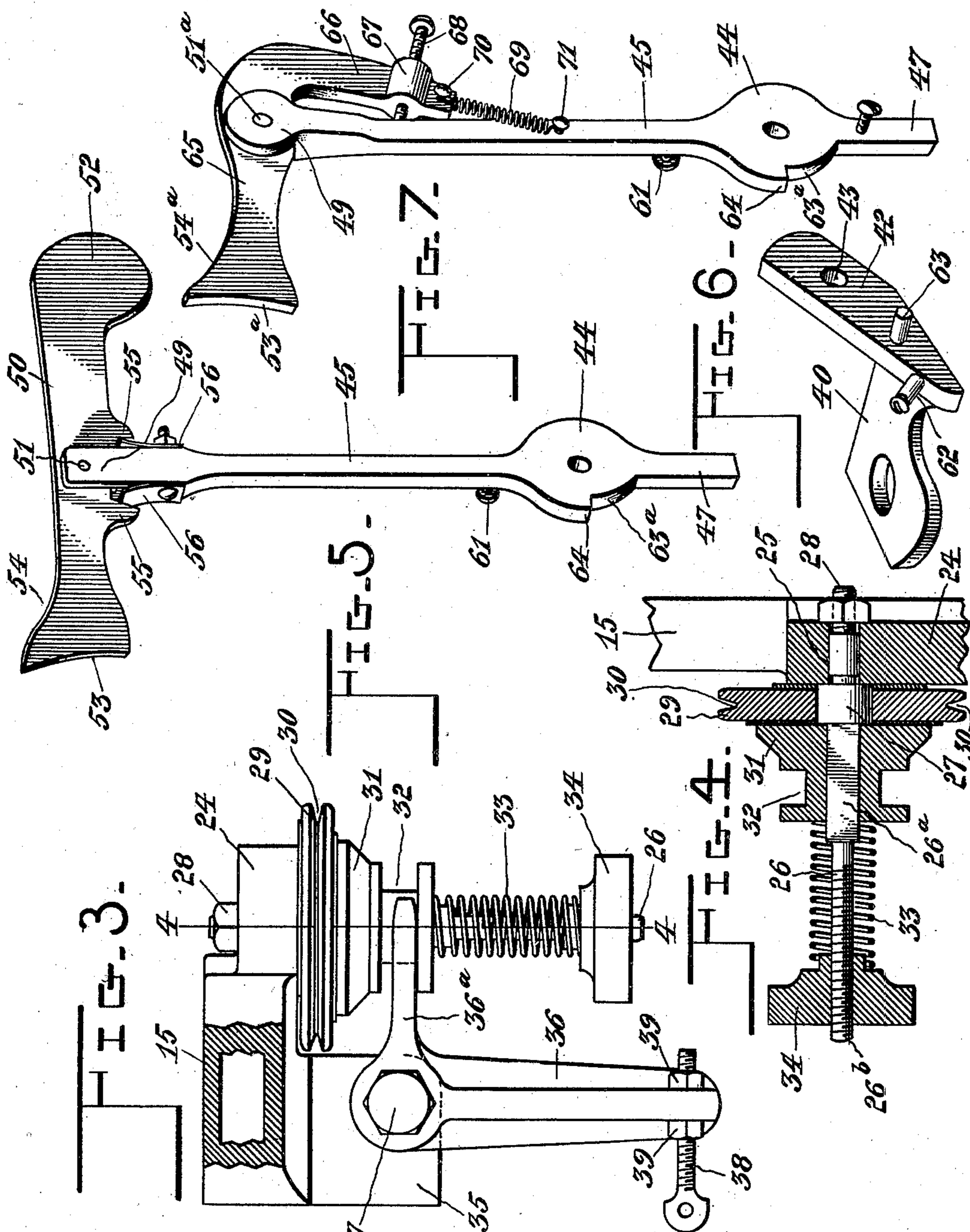
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3 Sheets—Sheet 3.



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UNITED STATES PATENT OFFICE.

JOSEPH LOUIS KIEFFER, OF MONTREAL, CANADA.

TENSION MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 696,872, dated April 1, 1902.

Original application filed August 24, 1901, Serial No. 73,201. Divided and this application filed November 14, 1901. Serial No. 82,289. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH LOUIS KIEFFER, a subject of His Majesty the King of Great Britain, residing in the city and district of Montreal, Province of Quebec, Canada, have invented certain new and useful Improvements in Tension Mechanisms for Sewing-Machines; and I do hereby declare that the following is 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.

My invention relates to improvements in tension mechanisms for sewing-machines of the class disclosed by an earlier application for Letters Patent filed by me in the United States Patent Office on August 24, 1901, Serial No. 73,201.

Machines for sewing boots or shoes adapted to use a waxed thread are usually equipped with a tension mechanism which is active normally to exert a strong tension on the waxed thread, so that it requires the expenditure of considerable force in order to draw the thread through the tension device and from the melting-pot. The stitch-forming mechanism and the thread drawing or feeding devices usually embodied in such sewing-machines are effective in drawing the waxed thread through the tension devices.

The object of the present invention is the provision of simple means for releasing the tension device, so that the waxed thread may easily be drawn therefrom; but this release of the tension device is not possible when the sewing-machine is in operation, and it can only be accomplished by stopping the machine and reversing one of the parts thereof by hand. This is ordinarily done after the sewing of the boot or shoe shall have been completed, and the free drawing of the waxed thread through the tension device and other parts of the machine is accomplished when the completely-sewed shoe or boot is to be removed from the machine.

With these ends in view the invention consists in the novel construction, combination, and arrangement of parts, which will be hereinafter fully described and claimed.

In the drawings hereto annexed, forming a

part of this specification, Figure 1 is a side elevation of a shoe-sewing machine having my improved tension mechanism incorporated as a part thereof. Fig. 2 is a plan view of the machine with a part of one of the cams broken away and illustrating my improvements in connection with the machine. Fig. 3 is an enlarged plan view with a part of one of the brackets broken away and showing a part of the tension mechanism. Fig. 4 is a section on the line 4 4 of Fig. 3. Fig. 5 is a detail perspective view of the releasing-lever and the tappet-arm mounted thereon. Fig. 6 is a detail perspective view of a bracket for holding the tappet-lever. Fig. 7 is a perspective view of another embodiment of the invention.

The same numerals of reference denote like parts in all the figures of the drawings.

5 designates the cam-shaft, journaled in suitable bearings on the frame 6, and this shaft is equipped with a pulley 7 and a series of cams, one of which is indicated at 8. The ordinary looper 9 lies adjacent to the curved and hook-shaped needle 10. 11 is the awl, 12 is the work-gage, 13 is the presser-foot, and 14 is the channel-guide, all of said parts being well-known to those skilled in the art.

At the rear side of the machine is provided a bracket 15, which serves to support the take-up mechanism that is indicated in its entirety by the numeral 16, and on an arbor 17 of this tension mechanism is fulcrumed a measuring-lever 18, which is operatively connected with the presser-foot bar 13^a in a manner disclosed in another application, Serial No. 82,287, filed by me even date herewith, said measuring-lever having a stud or roller 19. This needle-actuating lever 20 is provided with a rearwardly-extending arm 21, from which depends a fork 22, that carries a stud 23, and around the studs 19 and 23 and through the take-up mechanism 16 passes the waxed thread that is adapted to be drawn through a melting-pot of any usual construction and as will be understood by those skilled in the art.

The bracket 15 is provided with an outstanding lug 24, having a transverse opening

25, as shown by Fig. 4, and in this opening is fitted one end of a horizontal spindle 26, the latter having a cylindrical collar 27 and adapted to receive a nut 28, whereby the spindle 26 may be clamped securely to the bracket. On the collar 27 of the spindle is loosely mounted a revoluble tension-wheel 29, that is provided with a peripheral groove 30, around which is adapted to be wrapped or coiled any desired number of times the waxed thread which is adapted to be drawn from the melting-pot. The tension-wheel 29 is situated between the melting-pot and the stud 19 on the measuring-lever 18, which forms one element of the pull-off mechanism, so that the thread will pass from the melting-pot around the tension-wheel 29, thence to the stud 19 of the measuring-lever, up to and around the stud 23 of the pull-off lever, thence to and around a revoluble element of the take-up mechanism 16, and thence through the machine to the looper 9 and the needle 10.

The spindle 26 is provided with a square or polygonal section 26^a and with a threaded extremity 26^b, and on this square or polygonal section is slidably fitted a friction-disk 31, that is adapted to have engagement laterally with the tension-wheel 29, said friction-disk being provided with an annular groove 32. A powerful coiled spring 33 bears against the friction-disk, and the tension of this spring is regulated by the adjustment of a hand-wheel 34, that is screwed upon the threaded extremity 26^b of the horizontal fixed spindle 26.

The bracket 15 is provided with the outstanding lug 35, upon which is fitted a bell-crank lever 36, the latter being supported on said lug of the bracket by a bolt 37.

The lever 36 is provided with a forked arm 36^a, which is adapted to engage with the groove 32 in the spring-pressed friction-disk 31, and the other arm of the lever is equipped with an adjusting-screw 38, which is adjustably attached to the lever by means of the nuts 39.

40 designates a bracket which is fitted to the machine-frame 6 and is secured thereto by a bolt 41. (See Fig. 2.) The bracket is provided at its outer end with an outstanding member 42, having a perforation 43, as shown by Fig. 6, and against this upstanding member is fitted the enlarged part 44 of a releasing-lever 45, said releasing-lever being fulcrumed on the bracket by means of a bolt 46, which passes through a perforation in the enlarged part 44 of the lever and the perforation 43 in the upstanding member 42 of the bracket. The releasing-lever 45 is disposed in a vertical position, as shown by Fig. 1, so that its upper end lies adjacent to the cam 8 on the shaft 5, and the lower end of this releasing-lever is provided with a short arm 47, to which is attached a chain or other flexible connection 48, which is operatively attached to the adjustable screw 38 of the bell-crank lever 36.

In the embodiment of the invention shown by Figs. 1, 2, and 5 the upper end of the releasing-lever 45 is forked or bifurcated, as indicated at 49, in order to receive a tappet-arm 50, said tappet arm being pivotally supported by a pin or bolt 51 in the forked end of the releasing-lever. The tappet-arm is furnished at its heel with an enlarged part, forming a counterpoise 52; but the other end of the tappet-lever is enlarged and rounded to form a curved nose 53, the upper edge of the tappet-lever being rounded or curved, as at 54. On its under side the tappet-arm is provided with the depending lugs 55, which are disposed on opposite sides of the releasing-lever 45 and are engaged by the check-springs 56, that are secured to the releasing-lever, said check-spring serving to absorb some of the vibration of the pivoted tappet-arm and to lessen the noise made by the movement of the tappet-arm on the lever.

The cam 8 is provided with a tappet-stud 57, which is secured to the cam by means of the bolt 58, as shown by Fig. 2, and when the machine is engaged in the operation of sewing a boot or shoe the cam 8 turns in the direction indicated by the arrow in Fig. 1, so that the tappet-stud will ride upon the curved edge 54 of the tappet-arm, thereby moving the latter on its pivot 51 in a manner not to affect or move the releasing-lever 45 on its fulcrum 46, such operation of the parts having no effect on the tension-wheel 29, which remains under the control of the friction-disk 31 and the spring 33.

The releasing-lever 45 is held in its normal operative position by the employment of a spring 60, one end of which is attached to a stud or screw 61, that is provided on the lever above its fulcrum 46, the other end of said spring being secured to a stud or screw 62, provided on the upstanding member 42 of the bracket 40. The movement of the lever 45 under the action of the tappet-stud 57 is limited by a stop-pin 63, which is made fast with the bracket member 42 and is adapted to play in a segmental recess 63^a, that is provided in the flattened portion 44 of said releasing-lever. This recess 63^a terminates at one end in a stop-shoulder 64 and at its other end in the depending short arm 47, and the spring 60 is operative to normally hold the releasing-lever 45 in the position shown by Fig. 1, so that the stop-pin 63 will engage with the shoulder 64.

After the operation of sewing the boot or shoe shall have been completed in a manner well understood by those skilled in the art it is necessary to release the tension mechanism, so that the thread can be drawn freely around the tension-wheel 29 before removing the boot or shoe from the machine. This is accomplished by stopping the machine through the usual clutch mechanism, (not shown,) and the operator then turns the cam-shaft in a reverse direction, which is effected

by turning the pulley 7 backwardly by hand. This reverses the rotation of the cam 8 and brings the tappet-stud 57 into engagement with the curved nose 53 of the tappet-arm 50, thus pressing the tappet-arm and the releasing-lever backward within the limit permitted by the stop-pin 63, which plays in the segmental recess 63^a of the lever 45, the spring 60 being distended. This movement of the releasing-lever under the action of the tappet-arm draws on the chain 48 and turns the bell-crank lever 36 in a manner to move the friction-disk 31 against the resistance of the spring 33, thereby making the tension-wheel 29 practically free from the friction-disk. The waxed thread may now be drawn freely from the tension-wheel 29, so that the work can easily be removed from the machine, the thread being cut at the proper place and at the proper time.

The tension mechanism and the releasing device therefor, as heretofore described, are the same as disclosed in a prior application filed by me on August 24, 1901, Serial No. 73,201; but in Fig. 7 I have illustrated another embodiment of the invention, which, however, is substantially the same as the devices heretofore described, except that the tappet-arm is modified somewhat. The releasing-lever 45 is similar in construction, the method of mounting, and its operative position to the tension mechanism and the sewing-machine as heretofore described, and the upper end of this releasing-lever is also forked or bifurcated at 49 to receive the tappet-arm 65, the latter having the curved nose 53^a and the curved top edge 54^a. This tappet-arm 65 is pivoted to the releasing-lever, as at 51^a, and the modification in the tappet-arm consists in forming the latter with the downwardly-extending heel 66. This heel is enlarged to form of a boss 67, in which is mounted an adjusting-screw 68, that is adapted to engage with the lever 45. To the extension-heel of the tappet-arm is connected one end of a check-spring 69 by means of the stud or screw 70, and the other end of this spring is fastened by the stud or screw 71 to the releasing-lever, as clearly shown by Fig. 7.

The pull-off mechanism herein shown has been described and claimed by me in my co-pending application, filed of even date herewith, Serial No. 82,288.

Changes within the scope of the appended claims may be made in the form and proportion of some of the parts, while their essential features are retained and the spirit of the invention is embodied. Hence I do not desire to be limited to the precise form of all the parts as shown, reserving the right to vary therefrom.

Having thus described my invention, what I claim as new is—

1. In a tension mechanism for sewing-machines, the combination with a tension-wheel, means for normally retarding the rotation thereof, and a lever which controls the retard-

ing means, of a tappet-stud carried by a rotary part of the sewing-machine, a releasing-lever having operative connection with said controlling-lever, and a tappet-arm yieldably supported by the releasing-lever in a position to be engaged by the tappet-stud to actuate said levers when said tappet-stud is turning in a backward direction but to ride over said tappet-stud without being engaged by the same in the normal forward operation of the machine.

2. In a tension mechanism for sewing-machines, the combination with a tension-wheel, a spring-pressed friction-disk and a controlling-lever engaging with said disk, of a tappet-stud carried by a rotary part of the sewing-machine, a releasing-lever having operative connection with the controlling-lever, and a tappet-arm yieldably mounted on the releasing-lever and disposed in a position for engagement by the tappet-stud, as set forth.

3. In a tension mechanism for sewing-machines, the combination with a tension-wheel, a spring-pressed friction-disk and a controlling-lever engaging with said friction-disk, of a releasing-lever having operative connection with said controlling-lever, means for limiting the movement of the releasing-lever, a spring to normally hold the releasing-lever in one position, and a tappet-arm yieldably supported on the releasing-lever and disposed in the path of the tappet-stud, as set forth.

4. In a tension mechanism for sewing-machines, the combination with a tension-wheel, a spring-pressed friction-disk for restraining its motion, and a controlling-lever engaging with said friction-disk, of a releasing-lever having operative connection with said controlling-lever, means for yieldably retaining said releasing-lever in one position, a shaft having a hand-wheel thereon, a disk carried by said wheel and having a stud projecting laterally therefrom, and a pawl or detent yieldably supported upon the end of the releasing-lever and disposed in the path of said stud in such manner as to be engaged by said stud to throw back the releasing-lever and the controlling-lever to release the tension mechanism when said hand-wheel is given a partial backward rotation but to permit said stud to pass over said detent without operating said lever in the normal forward operation of the machine.

5. In a tension mechanism for sewing-machines, the combination of a shaft having a hand-wheel thereon, a stud projecting laterally from said shaft at one end and eccentrically thereof, a releasing-lever having a yieldingly-supported pawl or tappet-arm extending into the path of said stud and having an abrupt face, whereby the normal forward operation of said shaft causes the stud simply to depress said pawl without operating the lever but a partial backward rotation of the same causes the stud to engage said abrupt shoulder to turn the lever about its axis, a tension-wheel, retarding means en-

gaging the same to put tension on the thread,
and a two-armed lever connected at one end
to said releasing-lever and at the opposite
end to said retarding means, whereby the op-
5 eration of said lever in the manner aforesaid
causes said retarding means to be drawn back
to release said tension-wheel, substantially
as described.

In witness whereof I have hereunto set my
hand in the presence of two witnesses.

JOSEPH LOUIS KIEFFER.

Witnesses:

J. A. MARION,
J. ED PAGE.