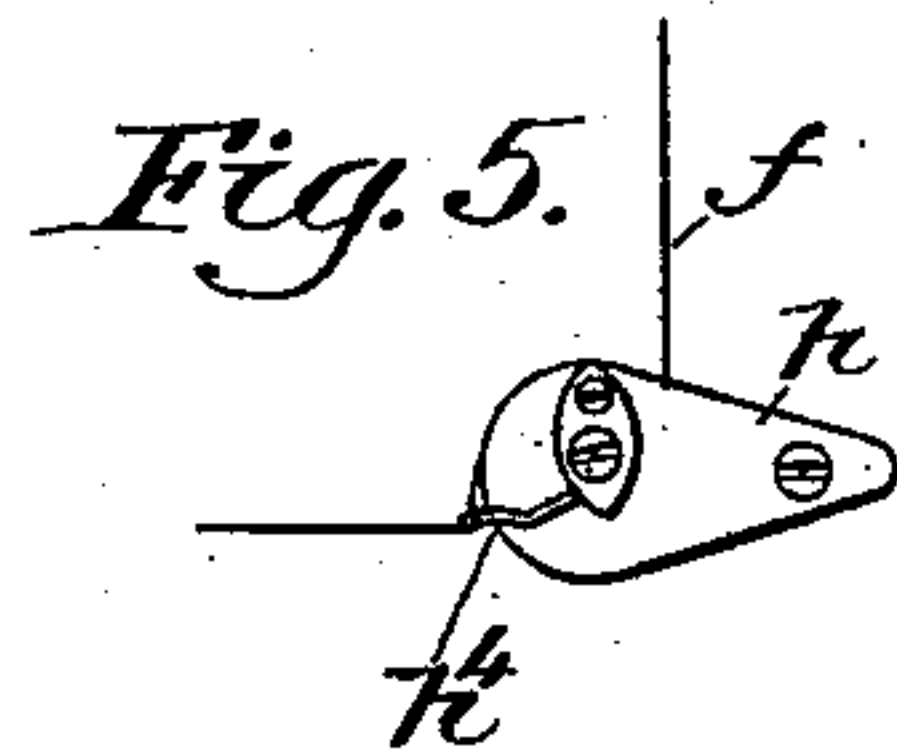
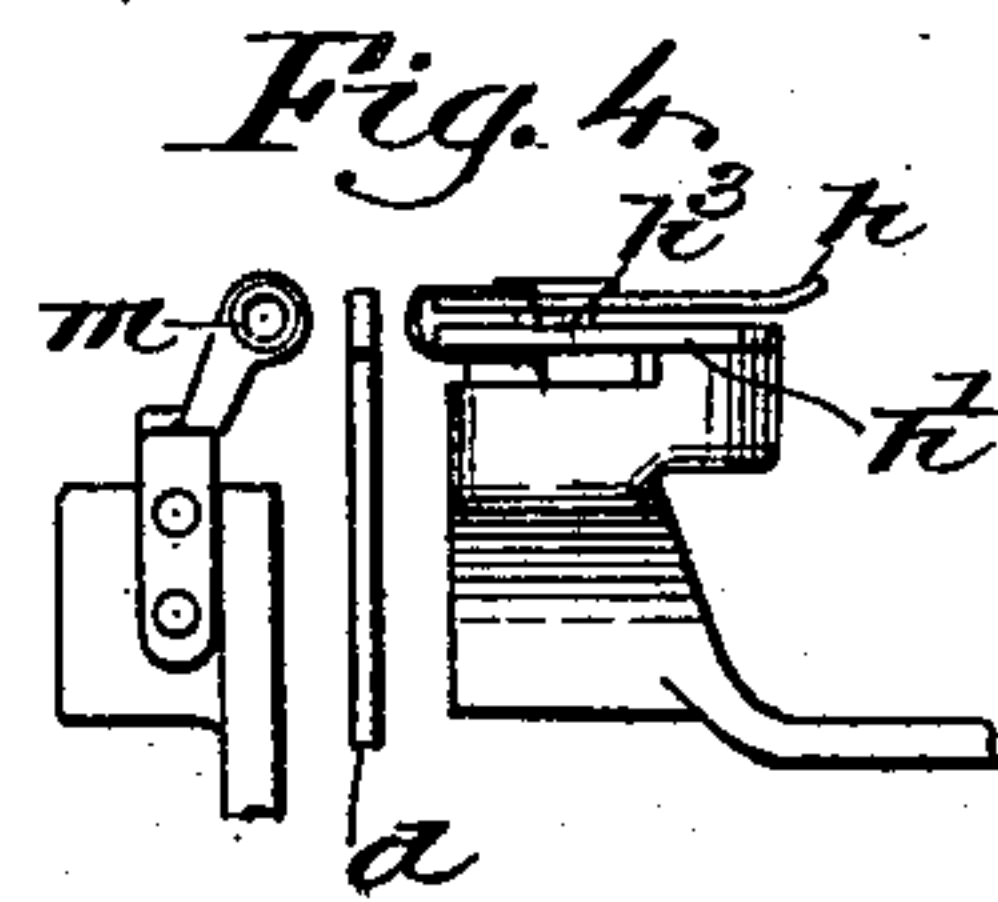
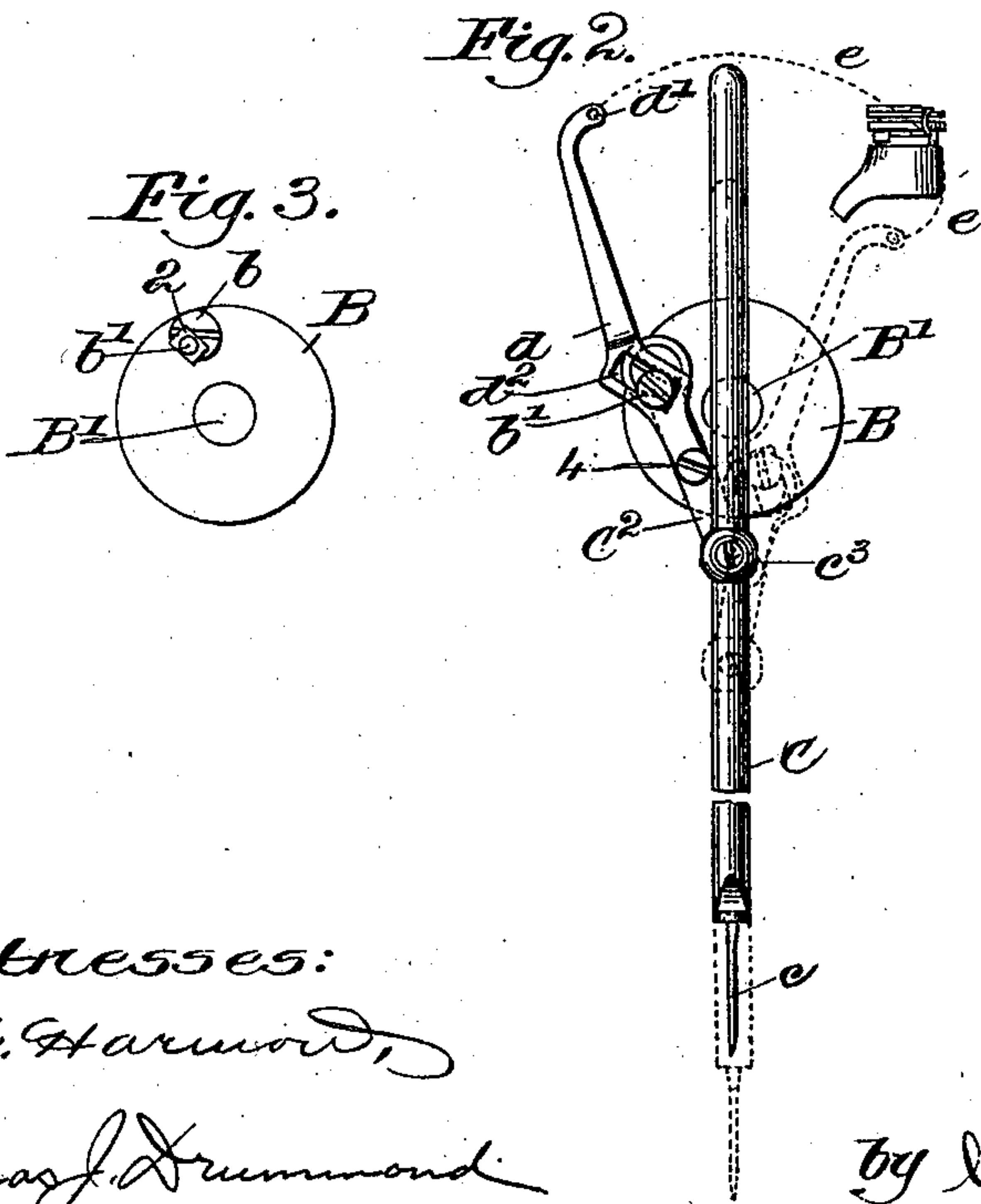
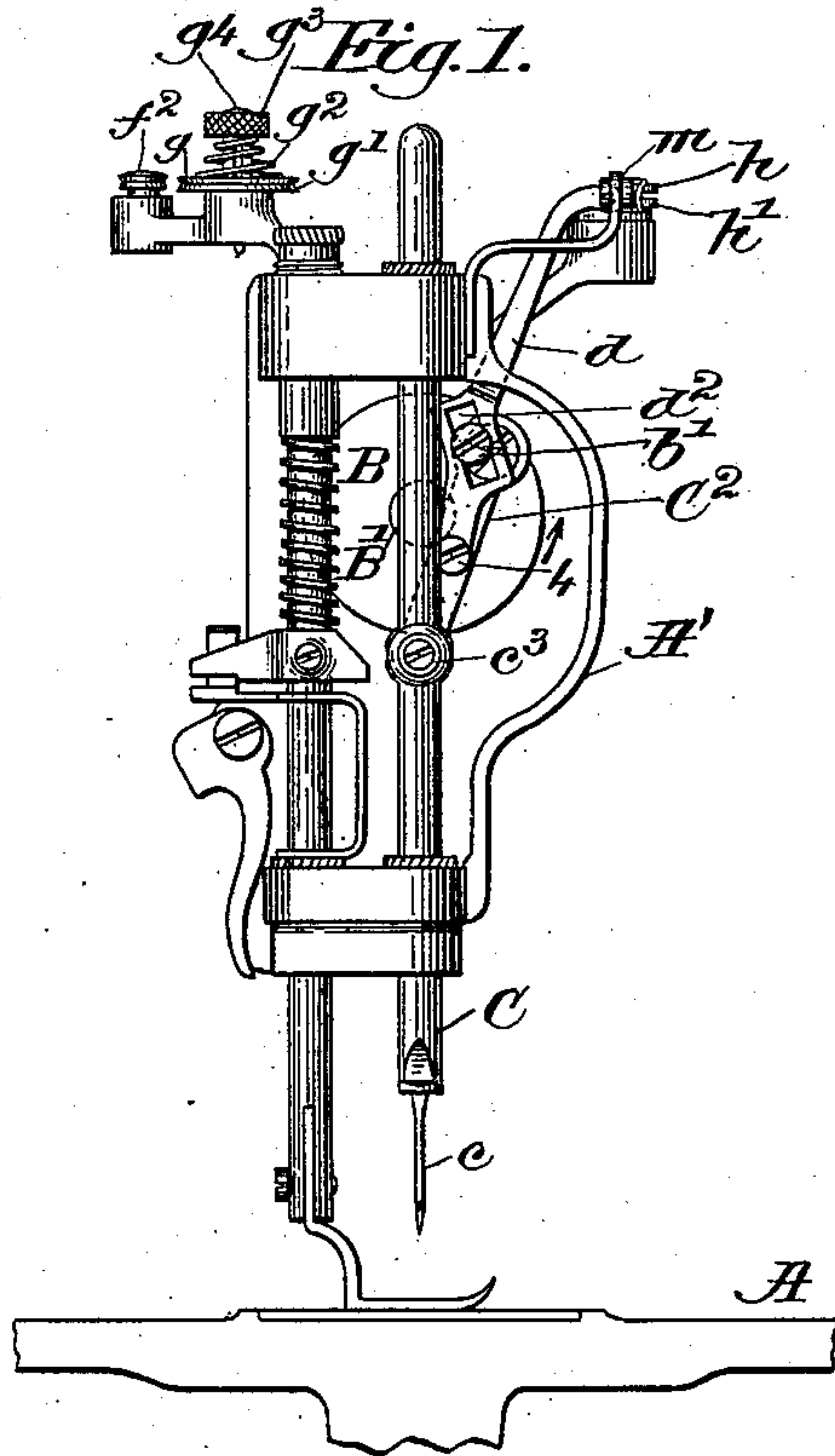


(No Model.)

W. F. DIAL & G. H. DIMOND.
TAKE-UP FOR SEWING MACHINES.

No. 599,894.

Patented Mar. 1, 1898.



Witnesses:

Al. Harmon,
Thomas J. Drummond

Inventors:

Wilbur F. Dial,
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UNITED STATES PATENT OFFICE.

WILBUR F. DIAL AND GEORGE H. DIMOND, OF BRIDGEPORT, CONNECTICUT,
ASSIGNORS TO THE WHEELER & WILSON MANUFACTURING COMPANY, OF
SAME PLACE.

TAKE-UP FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 599,894, dated March 1, 1898.

Application filed February 2, 1897. Serial No. 621,678. (No model.)

To all whom it may concern:

Be it known that we, WILBUR F. DIAL and GEORGE H. DIMOND, of Bridgeport, county of Fairfield, and State of Connecticut, have invented an Improvement in Take-Ups for Sewing-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

In many modern two-thread sewing-machines the take-up is operated by a cam-hub attached to the needle-bar-actuating shaft. This form of take-up is well adapted for all general work; but for some special work when excessively high speed is required it has been thought that the cam in its action tends to limit somewhat the speed, and hence we have devised a novel take-up mechanism in which the said cam-hub is dispensed with and the power required to actuate the take-up is reduced to the minimum.

In accordance with our invention we have utilized the usual link connecting the needle-bar and the crank-pin for operating the needle-bar as the actuator for the take-up, and we have located this take-up behind the plane in which the needle-bar works and have located the eye of the take-up above the needle-bar-actuating shaft, it acting on the needle-thread between two guides.

In our invention the take-up, whose eye is exposed above the needle-bar-actuating shaft, is so made and operated that in its operation of taking up the loop of needle-thread discharged from the loop-taker it not only rises and falls with the needle-bar-actuating link, but it is also moved in a vertical plane, so that the said take-up, together with its eye through which the thread is passed, moves transverse to and fully crosses the center of rotation of said needle-bar-actuating shaft, and in this way it becomes possible to give a great range of motion to said take-up, the motions being all easy and substantially without shock. In addition to this movement imparted to the take-up due to its being actuated by the needle-bar link referred to we have also shown, as we prefer, the said take-up as having combined with it a device for imparting to said take-up at portions of its cycle of movement additional extra motion,

its motion being accelerated at one portion of its cycle and decreased at another portion of its cycle. The means or devices which in this present embodiment of our invention we have chosen by which to produce this extra or variable motion is a stud extended from the crank-pin for actuating said link, said stud extending from said crank-pin at one side of or eccentric to its center, the said stud working in a slot in the take-up lever.

Locating the take-up, as described, behind the needle-bar and between it and the crank-pin, so that its upper end vibrates laterally across the face of the said crank, insures a compact arrangement of the parts and puts the take-up in a position where it cannot be injured, bent, or disturbed by accident.

Figure 1 in front elevation shows a sufficient portion of a sewing-machine with our improvements added to enable our invention to be understood, the take-up being in position to just commence the taking up of the loop of needle-thread. Fig. 2 shows the take-up and needle-bar in their position when the take-up has fully taken up the said loop, the dotted lines showing the said take-up in the position it occupies when the point of the usual loop-taker is about to enter the loop of thread carried by the needle. Fig. 3 shows the disk and crank-pin, with the stud *b'* in section, and its block; Fig. 4, a partial detail showing the thread-guides with the end of the take-up between them, and Fig. 5 a top view of one of the thread-guides.

The bed-plate *A*, the overhanging arm or head *A'*, the disk *B* at the front end of the needle-bar-actuating shaft *B'*, the needle-bar *C* in suitable bearings, its attached needle *o*, and the link *C'* for actuating said needle-bar, its lower end surrounding a stud on a collar *o'*, fixed to the needle-bar, are and may be all as usual in the well-known Wheeler & Wilson machine.

The disk *B* has a crank-pin *b*, which, as usual, enters an eye in the upper end of the link *C'*; but herein the crank-pin has been provided (see Fig. 3) with a stud *b'*, which projects forwardly therefrom at one side of or eccentric to the center of said crank-pin.

Our improved take-up *d* is herein shown as an arm or lever having at its upper end an

eye d' for the needle-thread, and the stud b' referred to passes through said lever, the latter having, as shown in this embodiment of our invention, a slot d^2 , in which enters an antifriction block or roll 2 (see Fig. 3) loose on said stud. The end of the take-up lever opposite the said eye d' is mounted to turn for a limited distance on or about a fulcrum 4, herein shown as a stud-screw entering said link.

In operation the crank-pin b , carried by the disk, causes said link to impart to the needle-bar its usual reciprocations, the stud b' , extended from said crank-pin at one side of its center, acting in the slot d^2 , causing the said take-up to have imparted to it, in addition to its movements in unison with the said link as it is carried about by the crank, an extra or additional movement, which movement would not be imparted to said take-up if fixed rigidly on or with relation to said link, the said take-up having its movement retarded as it is acting to draw up the loop of needle-thread and having its movement accelerated after having taken up the loop and while it is acting to deliver to the needle slack thread to be used in the formation of the next loop. The needle-thread f , taken from a suitable spool or cop, (not shown,) is led about a thread-check f^2 , thence about a tension device composed, as herein shown, of two disks g g' , one of which is acted upon by a suitable spring g^2 , the force of which is regulated by a suitable nut g^3 on a screw-stud g^4 . The thread from the tension device is led between the two plates h h' of a thread-guide and partially about a roller on a stud h^3 , and, emerging from between said plates, it crosses a spring h^4 , which acts as a slack-thread controller to control the slack in the thread due to any variations in thickness of work—as, for instance, when crossing seams—and thence through the eye of the take-up, and then through a second thread-guide m and to and through the eye of the needle in usual manner.

In operation, assuming that the disk travels in the direction of the arrow, Fig. 1, and with the take-up eye in the position shown in Fig. 1, it having through it the needle-thread stretched between the thread-guides h h' and m , said take-up, the needle-bar, and needle then rising starts to the left (see Fig. 1) with its retarded movement and completes its retarded movement as it reaches the position shown by full lines, Fig. 2, the loop of needle-thread at such time having been fully taken up and the needle-bar having completed its rising movement and having started somewhat on its downward movement. While moving from the position shown in full lines, Fig. 2, into the position shown by dotted lines, same figure, the take-up travels at its fastest or accelerated speed, and during such time the needle continues to descend and the loop-taker enters the loop, and the needle is just about ready to or has just started to rise, and as the take-up moves from the dotted-line

position, Fig. 2, into the full-line position, Fig. 1, the eye on the take-up lever travels in the dotted line e , the needle-bar during this operation rising, the needle-bar completing its rising movement as the said eye in the movement of the said take-up passes the needle-bar in moving from the position Figs. 1 to 2.

This invention is not to be limited to the exact means shown for accelerating and retarding the movements of the take-up derived from the stud of the crank-pin, for the reason that it will be obvious to those skilled in the art that various devices might be devised for effecting this acceleration and retardation of the movement of the take-up with the exercise of only the skill of the mechanic. Nor is this invention limited to the particular tension device or thread-guides or to the use of any particular number of thread-guides, as these things may be variously modified to suit the needs of the particular machine to which the take-up is applied.

We have not herein illustrated the stitching-forming mechanism below the bed-plate to cooperate with the needle; but the same is and may be substantially such as shown in United States Patent No. 578,136, dated March 2, 1897, granted to us, the loop-taker being rotated in a horizontal plane.

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

1. A needle-bar, a needle-bar-actuating shaft having a crank-pin and a link to connect it with the needle-bar, combined with a take-up carried by and partaking of all the movements of said link by or from said crank-pin, said take-up being located and movable in a vertical plane substantially at right angles to and across the axial center of said shaft behind said needle-bar, substantially as described.
2. A needle-bar, a needle-bar-actuating shaft having a crank-pin, and a link between said crank-pin and said needle-bar to actuate the latter, combined with a take-up having an eye at its upper end and carried with said link in its movements by said crank-pin, said take-up taking up the loop of needle-thread while the needle is rising in the latter part of its ascent and the first part of its descent, the take-up at such time crossing the vertical plane in which the needle-bar works, substantially as described.
3. In a sewing-machine, a needle-bar-actuating shaft provided with a crank-pin, a needle-bar, and a link connecting said bar and crank-pin, combined with a take-up lever carried by and movable with said link as the same is actuated by said crank-pin, and with means to impart to said take-up lever, in addition to its regular movement with said link, a variable movement of acceleration and retardation, substantially as described.
4. In a sewing-machine, a needle-bar-actuating shaft provided with a crank-pin having an eccentrically-placed stud extended from

one end thereof, a needle-bar, and a link connecting said bar and crank-pin, combined with a take-up lever pivoted at or near one end on said link and engaged between its 5 ends by said eccentric stud, it serving to swing said lever on its fulcrum, substantially as described.

10 5. A needle-bar, a needle-bar-actuating shaft provided with a crank-pin and a link to connect it with the needle-bar, combined with a take-up pivotally mounted on said link and having its eyed end extended above said crank-pin, said take-up partaking of all of the movements of the said link, and means

between said crank-pin and said take-up lever to impart to the take-up lever during its movements with the said link a variable movement of acceleration and retardation, substantially as described. 15

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses. 20

WILBUR F. DIAL.

GEORGE H. DIMOND.

Witnesses:

ISAAC HOLDEN,

GEO. CORNWELL.