

C. CADWELL.  
Sewing Machine.

No. 45,972.

Patented Jan'y 24, 1865.

Fig. 1.

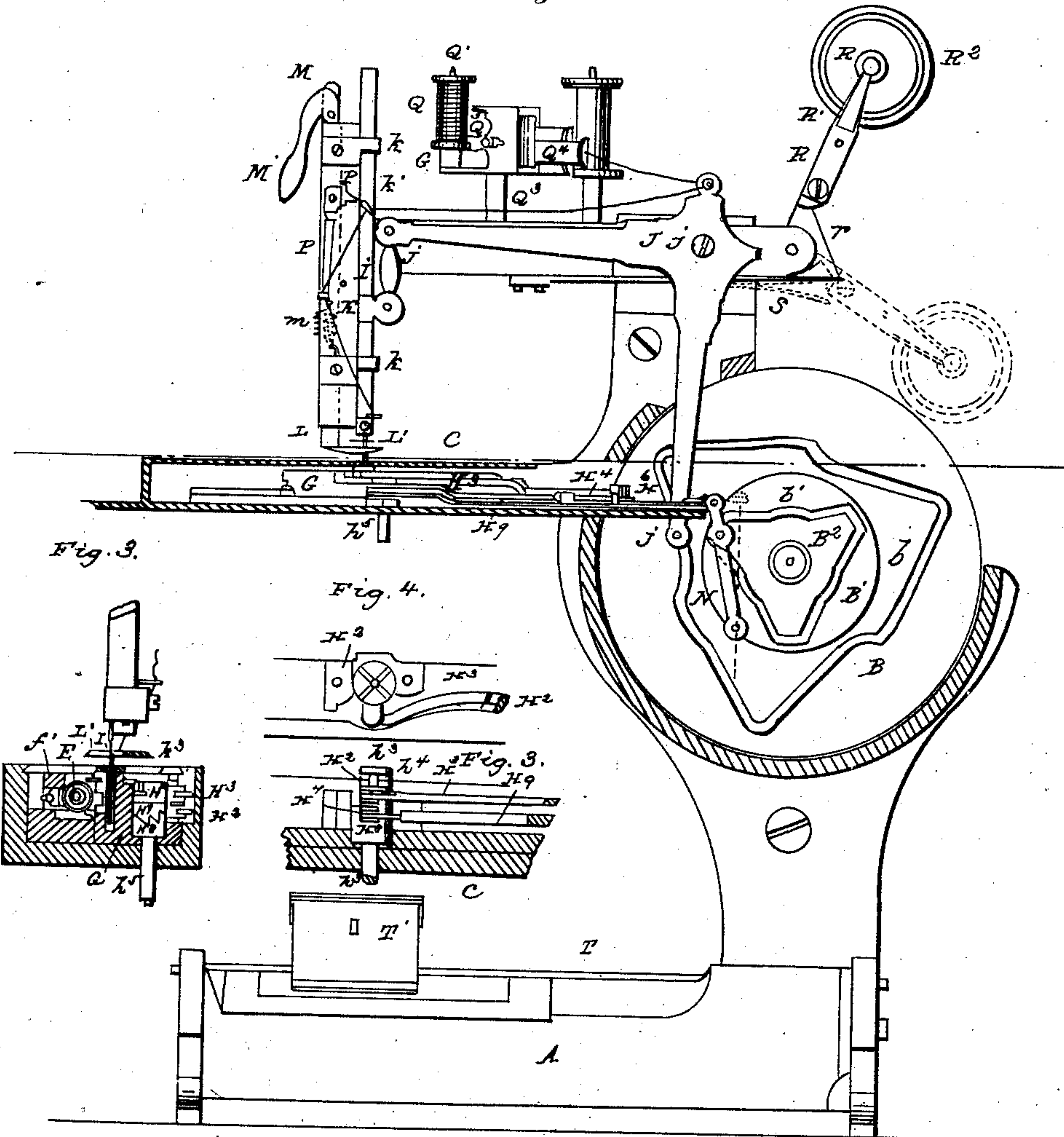


Fig. 3.

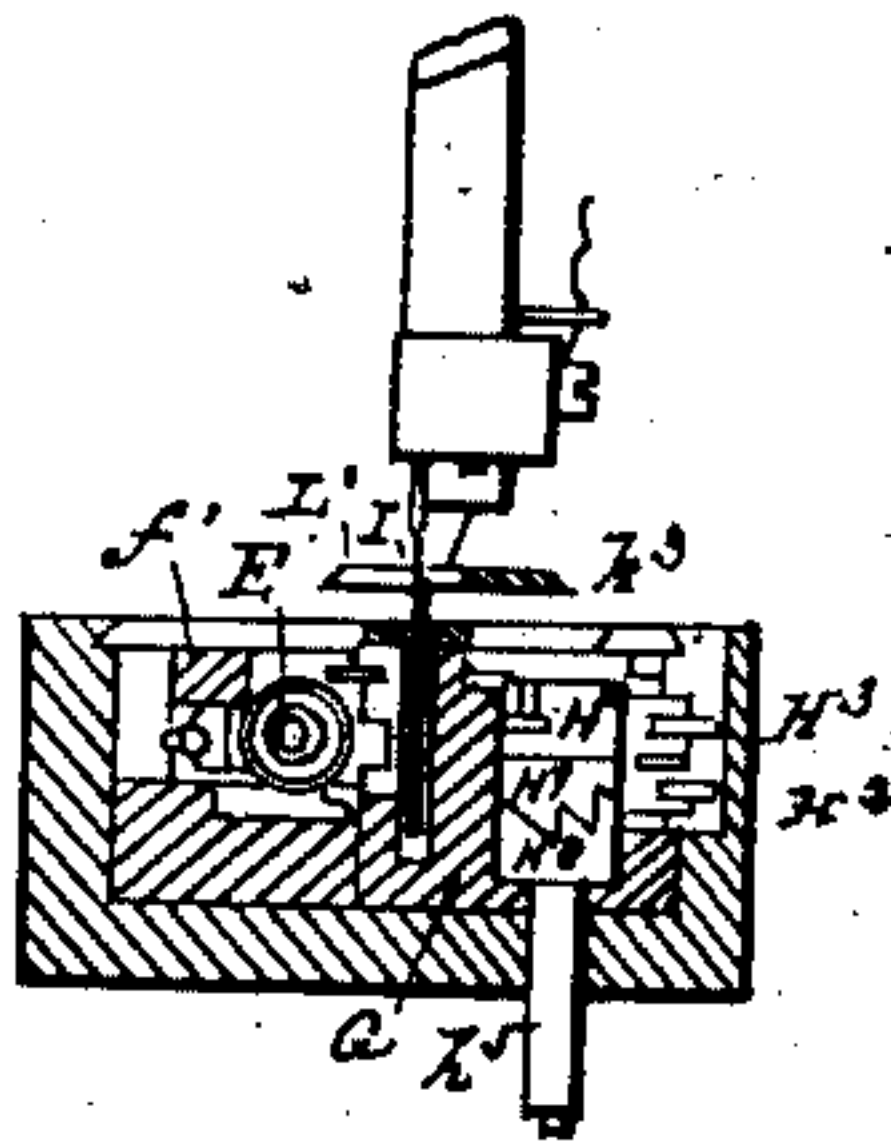


Fig. 4.

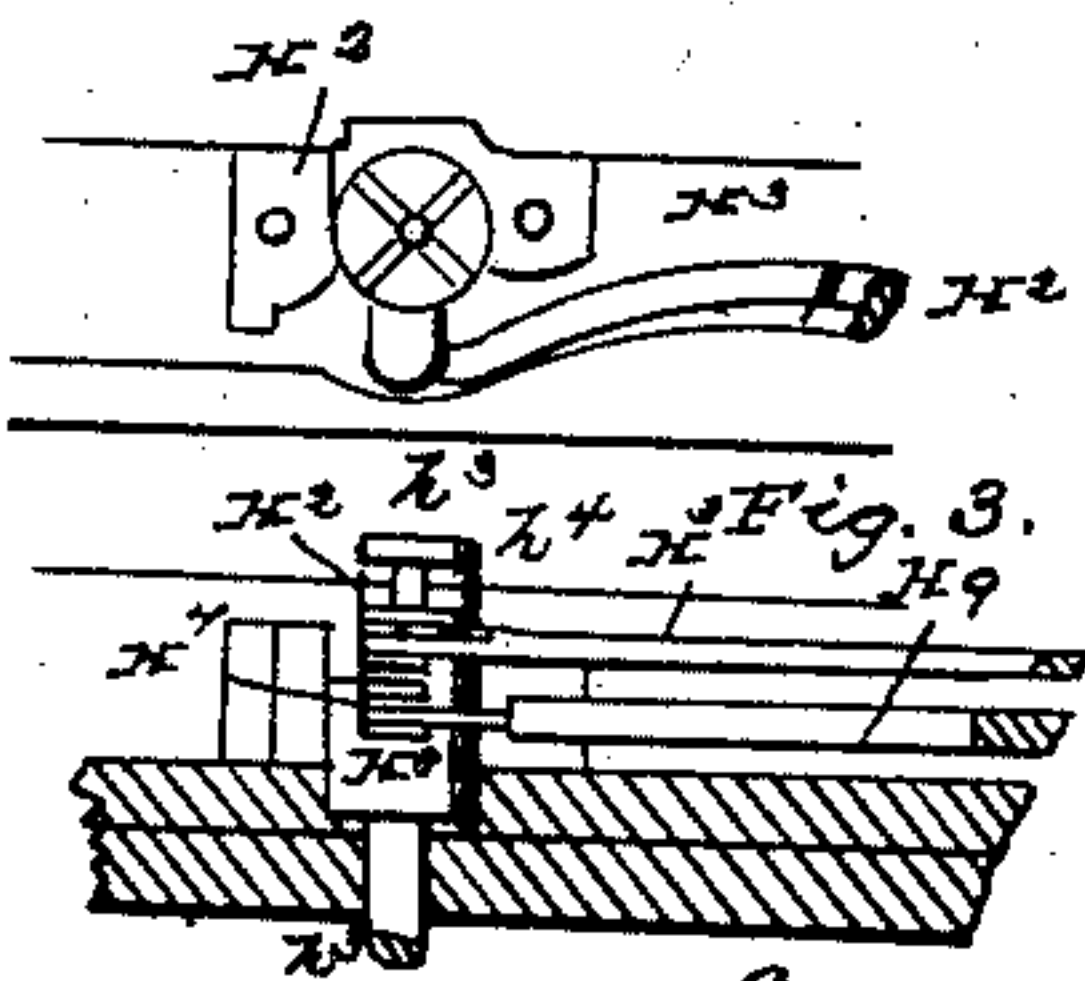
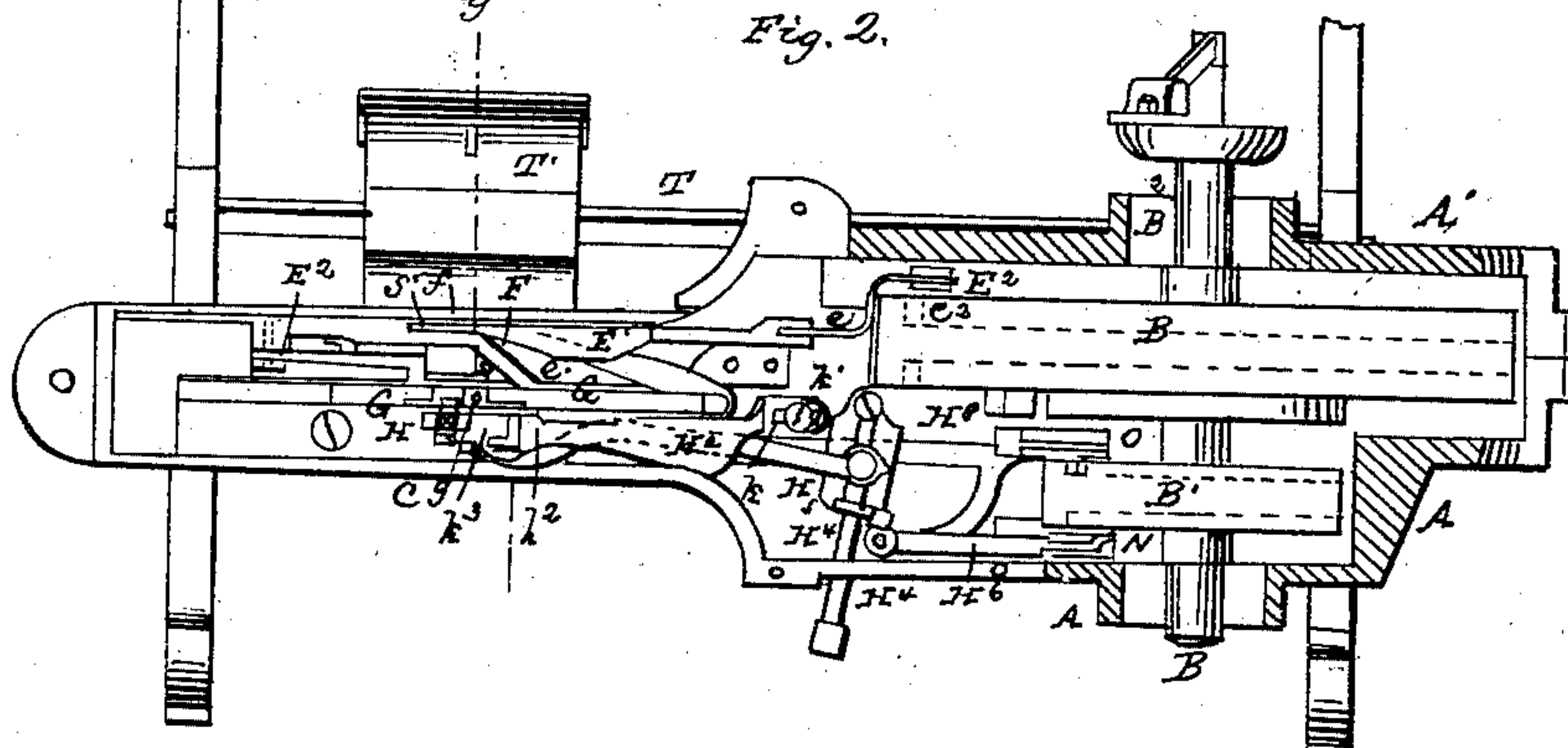


Fig. 2.



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# UNITED STATES PATENT OFFICE.

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## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 45,972, dated January 24, 1865.

*To all whom it may concern:*

Be it known that I, CALEB CADWELL, of Waukegan, in the county of Lake and State of Illinois, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a sectional elevation of a sewing-machine embodying my invention. Fig. 2 is a horizontal section of the same in the line *x*, Fig. 1. Fig. 3 is a section in the line *y y*. Figs. 4 and 5 illustrate by detached views the feed apparatus.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates to a sewing-machine embracing novel mechanism adapted to perform its work in a very efficient and rapid manner, the details of its construction and operation being hereinafter laid down.

In order that others skilled in the art to which my invention appertains may be enabled to fully understand and use the same, I will proceed to describe its construction and operation.

In the accompanying drawings, A represents the pedestal or foot-support, at one end of which is a strong frame, A', composed of two or more pieces, and made hollow for the reception of the driving-wheels B B', both of which are keyed upon a horizontal shaft, B<sup>2</sup>, having its journals in the sides of the frame A'.

C is the working-table, and D an upper arm or support, which are rigidly secured to and project in the same direction from the frame A'.

The frame A' may cover all the driving mechanism, with the exception of the main driving-wheel B, a portion of which is exposed and made to project slightly for the purpose of turning it by hand to initiate the operation of the machine.

The working-table C constitutes a casing to contain the shuttle E, the mechanism for operating the same, the thread-catcher F, the loop-former, and needle-protector G, and the mechanism for operating the feed-surface H. The shuttle E is moved forth and back longitudinally within the working-table C by a slide, E', which, through the medium of a crank-shaped link, *e*, is connected to an arm, E<sup>2</sup>, inclosed within the frame A', and provided with

a pin, *e*<sup>2</sup>, which, circulating in a cam-groove formed in the front face of the driving-wheel B, actuates the arm E<sup>2</sup> in such a way as to produce the requisite reciprocatory movement of the slide E'.

The manner in which the shuttle performs its function, being well understood, need not be particularly adverted to, and the construction and means for operating the bar or thread-catcher F being the feature of novelty, in connection with the devices for locking the stitch, I will limit my description thereto. The office of the bar F is to catch the loop of the needle-thread the moment the shuttle E commences its passage through the same and guide it around the front side of the shuttle to cause the latter to pass properly through, and for this purpose the extremity of the bar F is formed with a finger, *f*, which retains the loop-thread, and at the same time moves in a groove, *e*<sup>3</sup>, formed in the shuttle.

On the end of the bar F is an upwardly-projecting pin, *f*', which is actuated by the sides of a groove, *e*', in the slide E', which groove is so formed that the pin *f*', moving therein, carries the catch or finger *f* of the bar F along the oblique part of the shuttle E, the catch and shuttle moving in opposite directions. When during the advance motion of the shuttle the pin *f*' reaches the outer terminus of the groove *e*' the catch *f* of the bar F has traversed the oblique part of the shuttle, and has arrived at the straight front side thereof, at which stage the pin *f*' and thread-catcher F become stationary, in order that the latter may retain the loop-thread in an immovable position while the shuttle is passed through the loop. The loop is drawn up after the passage of the shuttle in customary manner. When the shuttle is retracted the groove actuates the pin *f*' in such a way that the catch *f* of the bar F is made to assume a position at the point of the shuttle, so as to again catch and guide a loop in the manner described, and thus the operation continues. The shuttle E is held in proper position by a bar, E<sup>2</sup>, which is pivoted to the slide E', and may be turned up to admit of the removal of the shuttle for a supply of thread, the top of the table C being detachable to render the operating parts accessible.

The bar G, against which the shuttle moves, contains the eye *g*, in which the needle I works, and also a niche or narrow recess, *g*', (see Fig.



3,) which extends from the eye *g* to the shuttle side of the bar *G*, and is of proper length vertically to permit the loop to form therein. As the eye *g* is only large enough to contain the needle at the part where the recess *g'* occurs, the thread enters the said recess as the needle descends, and as the needle ascends and the thread slackens the inevitable result is the formation of a loop within the recess *g'*. The loop is partly projected beyond the shuttle-surface of the bar *G*, so that the shuttle will pass through it with the locking-thread in the manner described. The bar *G* is of such thickness that when the needle is in the eye *g* it is effectually protected against any accidental strain.

The needle-bar *I'* has a vertical reciprocatory motion given it by a crank-arm, *J*, pivoted to the arm *D* at *j*, and provided at its lower extremity with a pin, *j'*, which traverses a cam-groove, *b*, in the rear face of the driving-wheel *B*, so that as this wheel revolves the crank-arm *J* will be vibrated in such a way as to actuate the needle at proper intervals, the connection between the crank-arm *J* and needle-bar *I'* being made by means of a jointed rod, *J'*, and a lug, *I*<sup>2</sup>. The needle-bar *I'* moves in guides *k k* on a vertical frame, *K*, which is secured to the end of the arm *D*, and supported by the latter.

*L* is a bar held in vertical position against the frame *K* by suitable guide-straps, and carrying at its lower end a plate, *L'*, between which and the feed-surface *H* the cloth is held to the action of the needle. By means of a pivoted cam, *M*, formed in one piece with a lever, *M'*, and working on the top of the frame *K*, the bar *L*, with the plate *L'*, may be adjusted vertically to suit the work. A spiral spring, *m*, hooked at one end to the frame *k* and at the other to the bar *L*, retains the plate *L'* in proper position to hold the work, but allows the plate to yield to the requisite degree. The feed-surface *H* is on the end of a bar, *H'*, having a slot, *h*, through which passes a screw, *h'*, whereby the bar *H'* is pivoted to the under side of the table *C* in such a way that the feed-surface may be moved in any required direction. The motion of the feed-surface is governed by the position of a block, *h*<sup>3</sup>, within the aperture *h*<sup>2</sup>, which is formed with a series of notches, any two of which, located at opposite sides of the aperture, may be occupied by corresponding projections on the block *h*<sup>3</sup>. By adjusting the block *h*<sup>3</sup> the requisite motion may be imparted to the feed to enable the user to quilt in squares or diamonds. A circular motion is imparted to the block *h*<sup>3</sup> by a circular block, *H*<sup>2</sup>, in the upper face of which are formed notches disposed in the form of a cross, (see Fig. 4,) and occupied by a projection, *h*<sup>4</sup>, on the under side of the block *h*<sup>3</sup>, which latter is adjusted upon the circular block *H*<sup>2</sup>, according to its position within the aperture *h*<sup>2</sup>.

A reciprocating rotary movement is imparted to the circular block *H*<sup>2</sup> by a rod, *H*<sup>3</sup>, connected by means of a vibrating screw, *H*<sup>4</sup>, and frame

*H*<sup>5</sup> to a bar, *H*<sup>6</sup>, which is driven by a bar, *N*, working in a cam-groove, *b'*, in the rear face of the wheel *B'*. A vertical movement is given the circular block *H*<sup>2</sup> by a rotating circular block, *H*<sup>7</sup>, moving upon a similar stationary circular block, *H*<sup>8</sup>, the contiguous faces of the two blocks *H*<sup>7</sup> *H*<sup>8</sup> being matched in such a way that as the block *H*<sup>7</sup> is turned by the reciprocating bar *H*<sup>9</sup> it is caused to alternately assume a higher and lower position. The form of the blocks *H*<sup>7</sup> *H*<sup>8</sup> and the manner in which they operate are clearly shown in Figs. 3 and 4. The reciprocating bar *H*<sup>9</sup> is jointed to a rod, *O*, which is moved by a cam-groove in the front face of the wheel *B'*. By the screw *H*<sup>4</sup> the end of the bar *H*<sup>3</sup> may be adjusted so as to vary the extent of rotation of the circular block *H*<sup>2</sup>, and thus regulate the length of the stitches. The feed-bar *H'* rests directly upon the circular block *H*<sup>2</sup>, and thus receives its vertical movement.

The block *h*<sup>3</sup> may be adjusted in the aperture *h*<sup>2</sup> by means of a shaft, *h*<sup>5</sup>, projecting downward through the circular blocks *H*<sup>2</sup> *H*<sup>7</sup> *H*<sup>8</sup>, and through the bottom of the working-table *C*.

*P* is a pivoted bar, having at its lower end an eye through which the thread passes from the spool *Q* to the needle. Upon the same pivot with the bar *P* is a "flipper," *P'*, which is struck by a projection, *k'*, during the upward and downward movement of the needle-bar *I'*. The upward stroke of the projection *k'* raises the flipper without stirring the bar *P*; but when the flipper is struck by the projection *k'* in its downward movement the lower end of the bar *P* is thrown out, so as to take up the slack thread. The spool *Q* is placed upon a spindle, *Q'*, and, with the latter, is supported on a tension-frame, *Q*<sup>2</sup>, which is mounted upon a post or spindle, *Q*<sup>3</sup>, inserted into the arm *D*.

*Q*<sup>4</sup> is a spring, adjustable within the frame *Q*<sup>2</sup> by a set-screw, *Q*<sup>5</sup>, and employed to regulate the tension of the thread. The tension-frame, with its appurtenances, may be slipped off and on the spindle *Q*<sup>3</sup> with facility.

*R* is an arm pivoted upon the end of the arm *D*, which projects over the driving-wheel *B*, and having attached to it a frame, *R'*, which is provided with a friction-wheel, *R*<sup>2</sup>, secured upon a spindle-shaft, and also with a thumb-screw, *R*<sup>3</sup>. The arm *R* may be turned down to the position indicated by red lines in Fig. 1, so as to bring the wheel *R*<sup>2</sup> in contact with the periphery of the wheel *B*.

A spring, *S*, acting upon the projecting part *r* of the arm *R*, holds the wheel *R* against the driving-wheel *B* with sufficient force to insure the rotation of the former simultaneously with that of the latter. After the thread has been wound upon the spool the winding apparatus is turned up out of contact with the driving-wheel *B*, the spring *S* retaining said apparatus in its upper as well as in its working position.

The driving-shaft *B*<sup>2</sup> of the wheels *B* *B'* is rotated by a suitable crank-connection with the



bar T, upon which the treadle or foot-piece T' is secured.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. The slide E', having a groove e' to actuate the pin f' on the thread-catcher F f, which guides the thread around the shuttle, substantially as described.

2. The pivoted bar P, for taking up the slack thread when operating, in combination with the flipper P' and projection k', in the manner herein set forth.

3. The tension device Q<sup>2</sup> Q<sup>4</sup> Q<sup>5</sup> and the pin Q' for the spool, all mounted upon the spindle Q<sup>3</sup> on the arm D, so that they may be removed and replaced at will.

4. The adjustable block h<sup>3</sup> and circular block

H<sup>2</sup>, in combination with the notched aperture for imparting a variable movement to the feed-surface H, the whole being operated by means substantially as herein described.

5. The combination of the circular blocks H<sup>7</sup> H<sup>8</sup>, the former, H<sup>7</sup>, being moved vertically by turning on the latter, H<sup>8</sup>, so as to raise and lower the feed-surface in the manner and for the purpose set forth.

6. The thread-winding apparatus R R' R<sup>2</sup> R<sup>3</sup> r, operating in connection with a spring, S, whereby it is held down to work in connection with the driving-wheel B, or retained out of contact therewith, as stated.

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