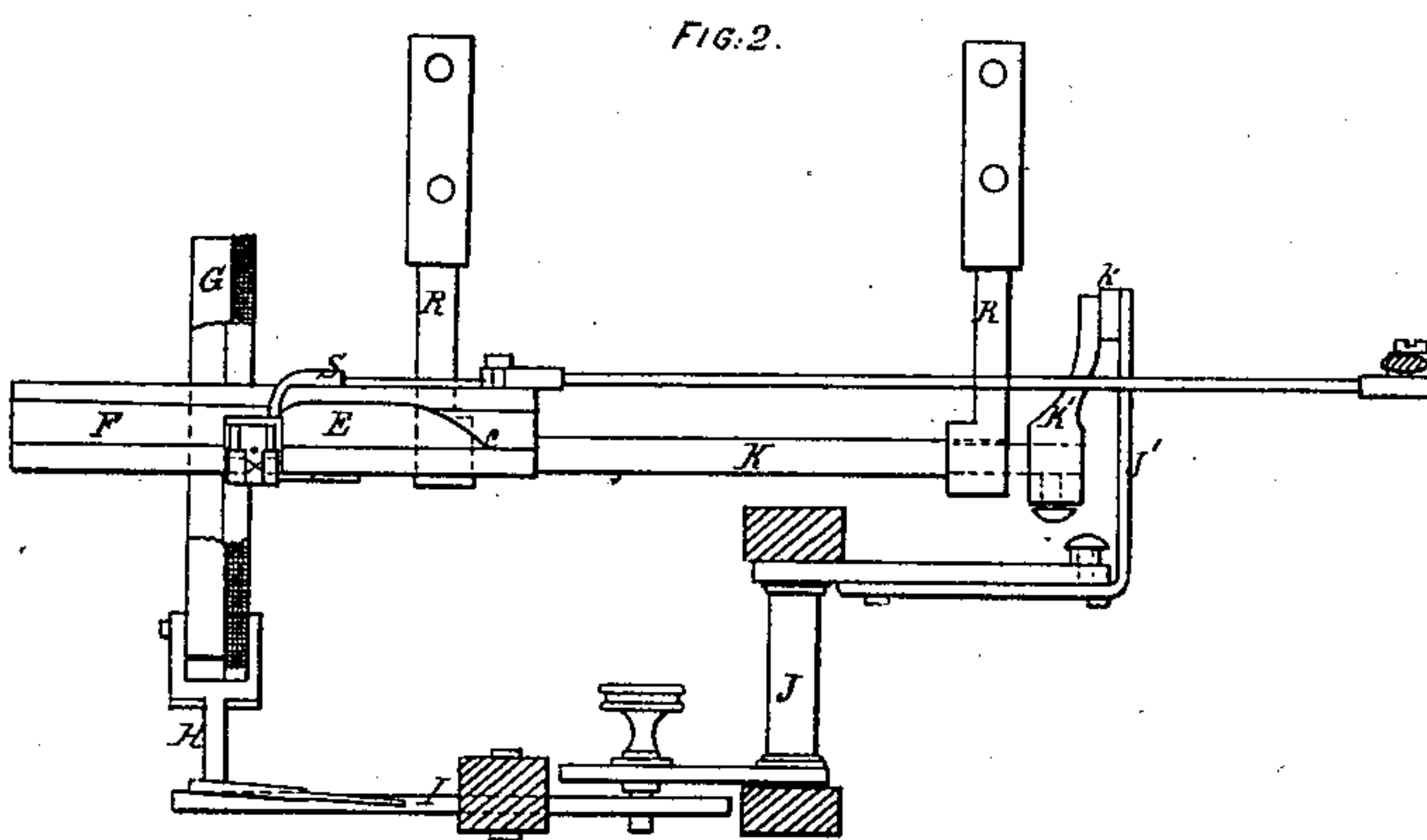
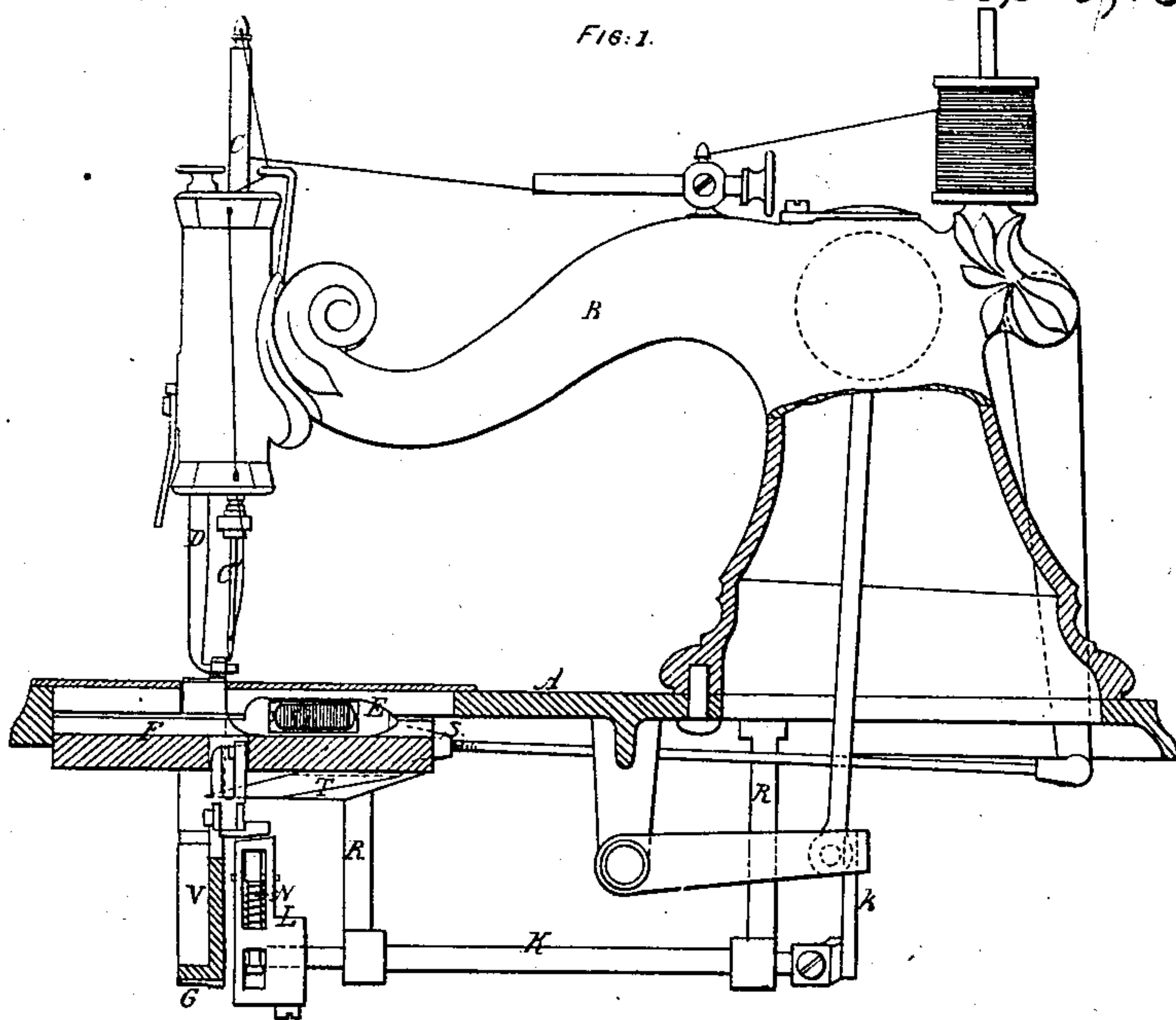


Sheet 1-2 Sheets.

B. Atwater.
Sewing Machine.
N^o 44063 *Patented Sep. 6, 1864.*



Witnesses

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Henry T. Hill

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Bryan Atwater

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FIG. 3.

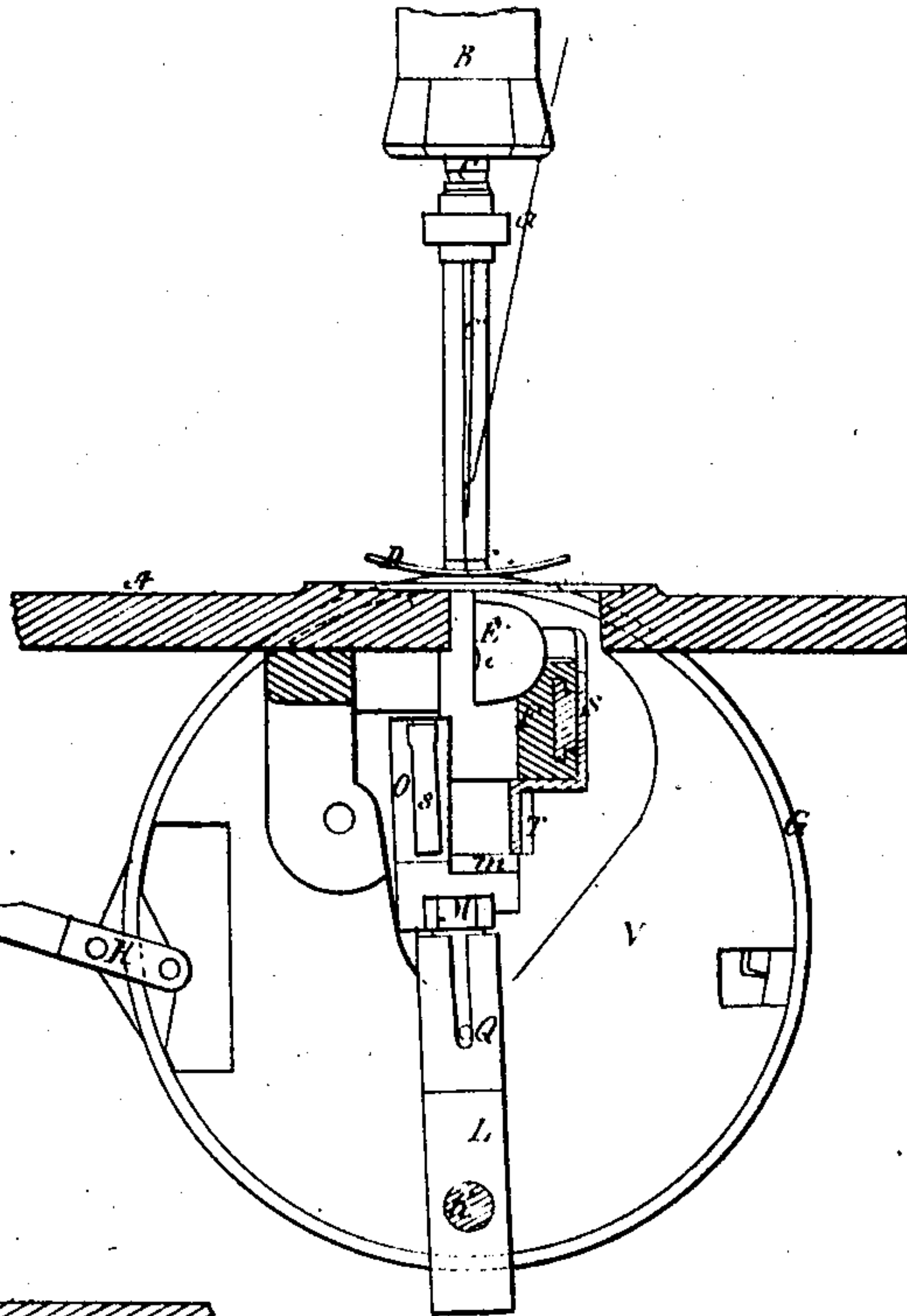


FIG. 4.

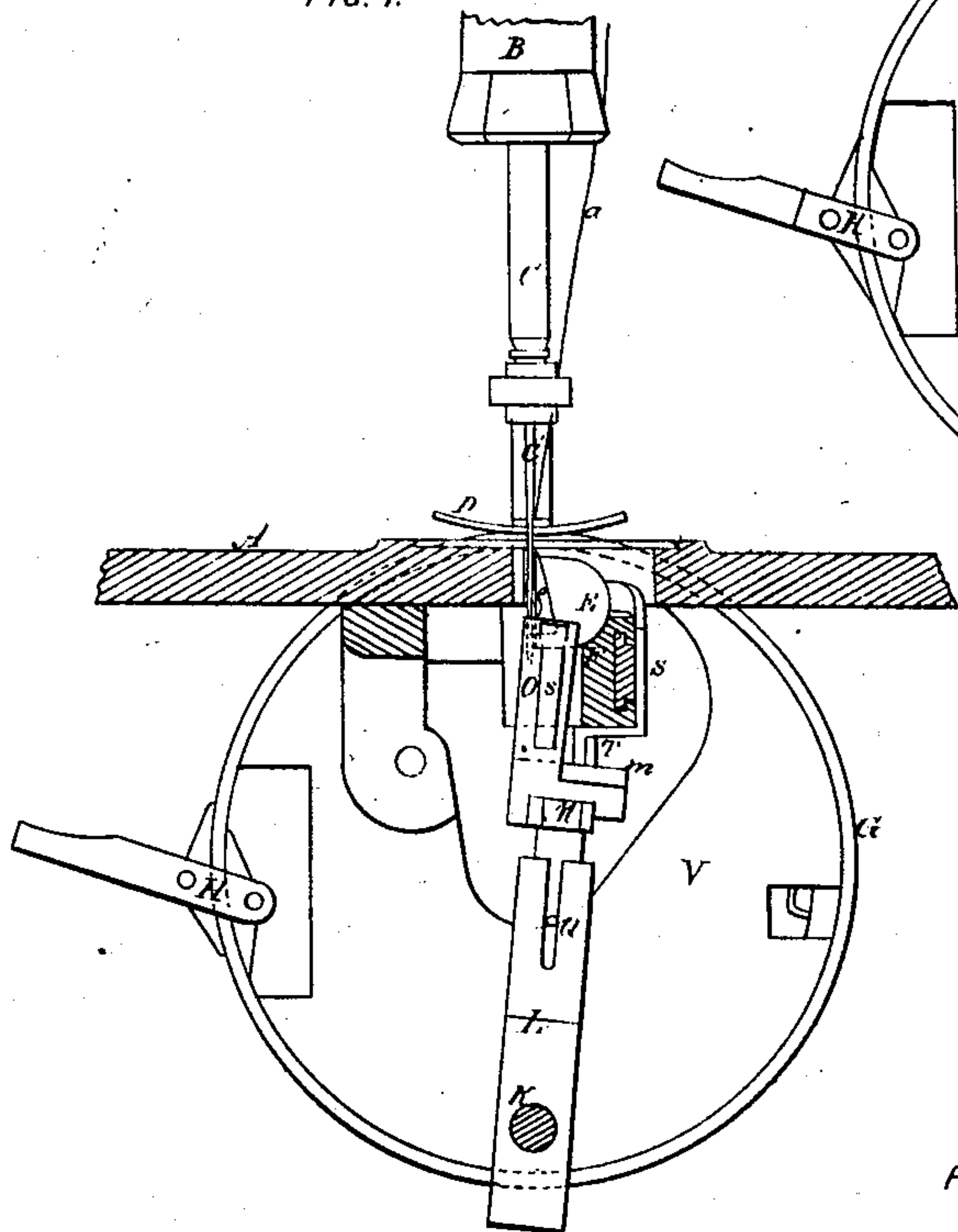


FIG. 5.

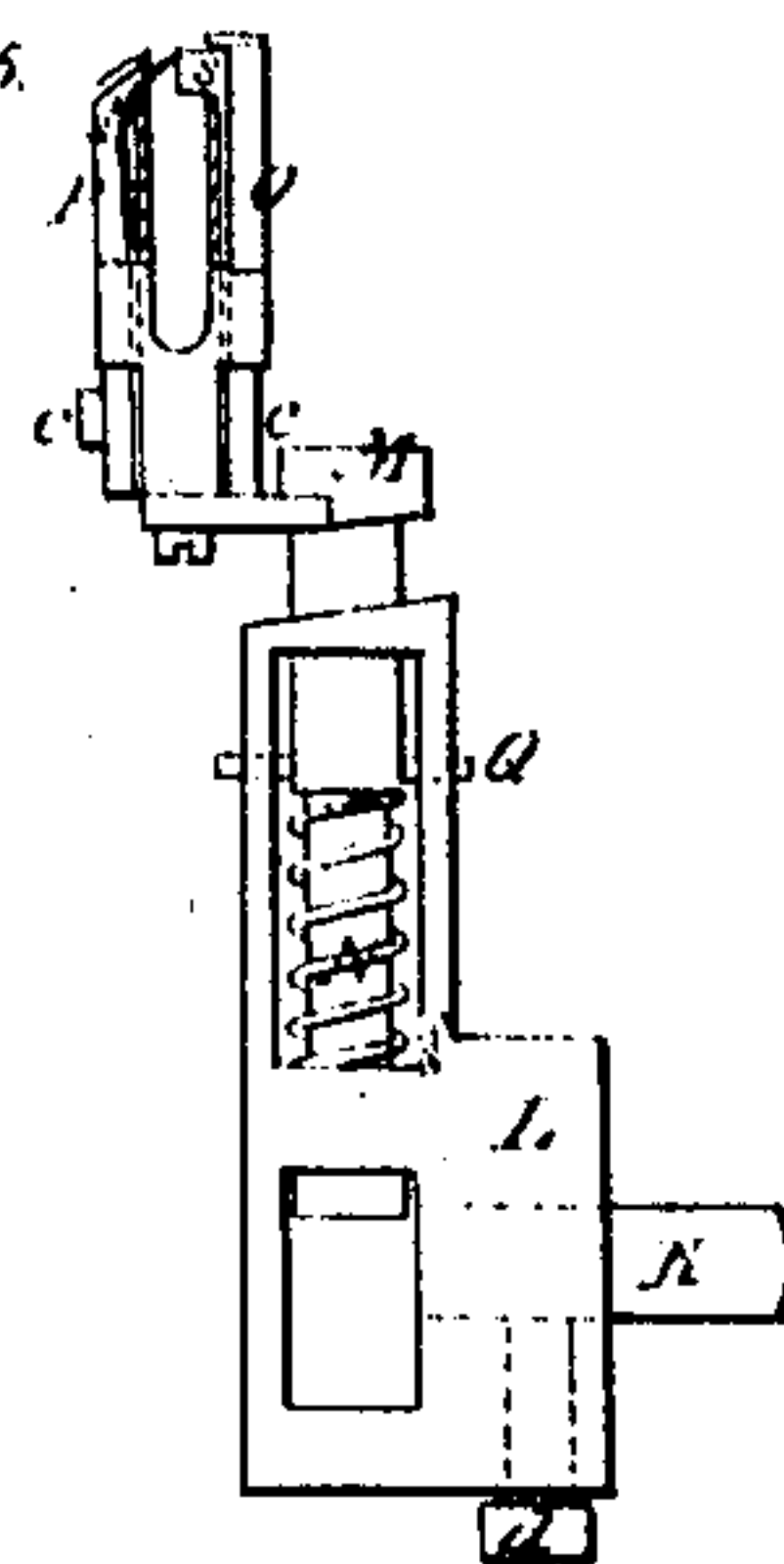


FIG. 6.



Witnesses

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UNITED STATES PATENT OFFICE.

BRYAN ATWATER, OF BERLIN, CONNECTICUT.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 44,063, dated September 6, 1864.

To all whom it may concern:

Be it known that I, BRYAN ATWATER, of Berlin, in the county of Hartford and State of Connecticut, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation thereof, taken in connection with the accompanying drawings, making a part of this specification, in which my improvement is represented as applied to one of the forms of sewing-machines in common use.

Figure 1 represents a side elevation of a sewing-machine with the bed-plate in section on a line with the shuttle-race. Fig. 2 is a plan of the parts below the bed-plate. Fig. 3 is a transverse sectional elevation of the parts near the needle, showing their relative position when the needle is up. Fig. 4 is a sectional elevation of the same parts, showing their relative position when the needle is down; and Figs. 5 and 6 are details which will be referred to in the description.

The subject-matter of my invention relates to the mechanism employed in connection with the sewing-machine for the purpose of insuring the opening of the loop of the needle-thread when the needle is inserted, so that the thread that binds the loop may enter it with certainty, whether a shuttle or other device be employed for the purpose and however rapidly the machine may be run, and is an improvement in the mechanism employed to carry out the mode of operation described in Letters Patent of the United States granted to Daniel T. Ward, January 2, 1855.

The first feature of my improvement consists in setting the fork or device which opens and guides the loop vertically instead of horizontally—that is, parallel to the motion of the needle instead of transversely thereto—by which the possibility of its being entangled in the needle-thread is avoided, and it is also better adapted to work in combination with the shuttle or other device for carrying the second thread.

The second feature of my improvement consists in placing the springs, which form a part of the aforesaid device, and serve to seize the loop of the needle-thread in recesses in the arms of the fork to protect them from injury and to insure their proper co-operation with each other and with the needle and its thread, as will be described.

The third feature of my improvement consists in giving to the fork or its equivalent a vertical reciprocating movement or movement nearly parallel with the needle, in combination with the horizontal reciprocating movement by which the loop of the needle-thread is opened, for the purpose of moving the fork out of the way of the shuttle or its equivalent in its passage through the loop.

The fourth feature of my improvement consists in forming the point of the shuttle, upon the side thereof next to the needle, with a small bevel, when used in combination with the fork to prevent breaking the needle, as will be described.

In the drawings the letters refer to like parts in all the figures.

A is the bed plate of the machine. B is the goose-neck. C is the needle-bar. C' is the needle. D is the presser. E is the shuttle. F is the shuttle-race. G is the feeding band or wheel, working upon the bracket V, attached to the bed-plate. H is the clamp that moves the feeding-band, and I and J are the levers by which the feeding movement is communicated to the clamp from the main shaft of the machine. These parts of the machine operate in the usual manner and require no further description, and many other parts of the machine are omitted in the drawings which do not have any immediate relation to my improvements. K is a rocking shaft, which is supported by the hangers R R, which are attached to the under side of the bed-plate, as is shown. It receives a reciprocating motion from the lever J of the feeding mechanism by means of the arm J', which is attached to it, and the connecting-rod k and rocker-arm K' upon the shaft. Upon the opposite end of the shaft K, and below the shuttle-race, is another arm, L, of the form shown in the drawings. In the upper part of this arm is a socket, in which the shank of the forked device M works up and down. The shank is retained in its socket by the pin Q, and is constantly forced upward by the spring N. The upper part of the piece M is formed with two upright arms, O and P, between which the needle passes when it descends. In the outer sides of these arms are formed recesses, in which are placed the thin steel leaf-springs s and s', which are fastened in place at their lower ends by the clamping-plates c c, and their upper ends project through mortises in the upper part of the

recesses, and meet in the middle of the space between the arms O P, as is shown in Fig. 6. These recesses in the arms O and P serve to protect the springs from dirt or accident, and also to guide their movements and keep them in a proper position to co-operate with each other and with the needle and its thread. The upper extremities of the springs are made wedge-formed or pointed, as is shown in plan in Fig. 6. The spring *s* has a broad face vertically, as is shown in Fig. 5; but the extremity of the spring *s'* is made thin. They are so placed in relation to the needle that when it is down and has retracted so much as to open the loop of the needle-thread the needle will be in the angle between the upper ends of the springs, and upon that side thereof toward which the lateral movement is to be made, as is shown in Fig. 6. While the needle is in this position the vibration of the device to the position shown in Fig. 4 causes the springs to carry that part of the thread upon the side of the needle next to them against the needle and into the groove in its side, and then, meeting with the needle at some distance above its eye, they are pressed asunder by it, and after passing it they close again between it and its loop, and carry the loop forward to the position shown in Fig. 4, across the path of the shuttle, so that the point of the shuttle will with certainty enter the space between the thread and the needle; but if this device were to remain in the position shown in Fig. 4 it would obstruct the passage of the shuttle, and to avoid this the piece M is depressed sufficiently to be out of its way by means of a cam or incline, T, which is attached to the lower part of the shuttle-driver S, as shown, which, acting upon the shoulder *m* of the piece M, depresses it before the shuttle comes in contact with it. After the shuttle has entered the loop the arm L is vibrated back to the position shown in Fig. 3, and when the shuttle returns the arm T passes off from the piece M, when the helical spring N restores it to its first position and ready to repeat the operation.

The mechanism shown in the drawings is one that I have adapted to a machine in common use in the market, and the manner in which I have constructed the same has been in a measure controlled by the arrangement of the other parts of the machine, and in this respect it may be said that the form of the mechanism that gives the motions of the device M would have to be varied to conform to the different styles of machines in common use, the essential characteristics being that the springs *s s'* and the arms that hold them shall stand vertically or nearly parallel to the motion of the needle, and that the inclined ends of the springs shall be made to embrace the needle centrally and pass by it above the eye, closing within the loop when the needle has retreated sufficiently to open the loop and to move out of the way of the shuttle or other device by

which the binding-thread is carried through the loop of the needle-thread, and then return to its first position; nor is it important that the exact manner of constructing and applying the device M, with its springs, shall be followed, as its construction may be considerably varied, and yet co-operate with the needle and its thread in the same manner substantially; but the form herein shown has been used by me with perfect success and fully embodies this part of my improvement.

In the construction of machines which sew with a needle and shuttle it is usual to have the shuttle pass close to the side of the needle, and to have its point made sharp and in a line with the side of it next to the needle to insure the entrance of the shuttle into the loop of the needle-thread. In sewing with a small needle it is liable to be slightly bent out of its true position by the resistance of piercing the material or other cause, and if it projects for one-half of its diameter beyond the line of the shuttle-race it will be caught by the point of the shuttle and broken. To avoid this I make upon the side of the point of the shuttle next to the needle a small incline or bevel sufficient to compensate for the springing of the needle, which will enable the shuttle to pass by it without injury. This mode of construction is rendered practicable by the employment, in combination with the needle and shuttle, of an extraneous device for opening the loop of the needle-thread for the entrance of the shuttle. The bevel upon the point of the shuttle is seen most distinctly at *e* in Fig. 2.

Having thus described my invention, what I claim is—

1. Placing the arms of the forked device M, with its springs *s s'*, or the equivalent thereof, vertically and in relation to the needle and its thread, substantially in the manner and for the purpose described.

2. Placing the springs *s s'* in recesses in the arms of the forked device M, or guiding and controlling their movement by some other equivalent means, so that they will properly co-operate with the needle, substantially as described.

3. Giving to the forked device M a reciprocating movement in a vertical direction, in combination with the movement in a horizontal direction, to enable it to co-operate with the shuttle or other device which carries the binding-thread into the loop of the needle-thread, substantially as described.

4. The employment of a small bevel upon the point of the shuttle, upon the side thereof next to the needle, in combination with the forked device for opening the loop of the needle-thread, substantially as described.

Executed at Boston this 27th day of May, A. D. 1864.

BRYAN ATWATER.

In presence of—

ALANSON LONG,
HENRY F. GILL.