

(No Model.)

2 Sheets—Sheet 1.

F. P. CANFIELD.
Quilting Machine.

No. 238,760.

Patented March 15, 1881.

Fig. 1.

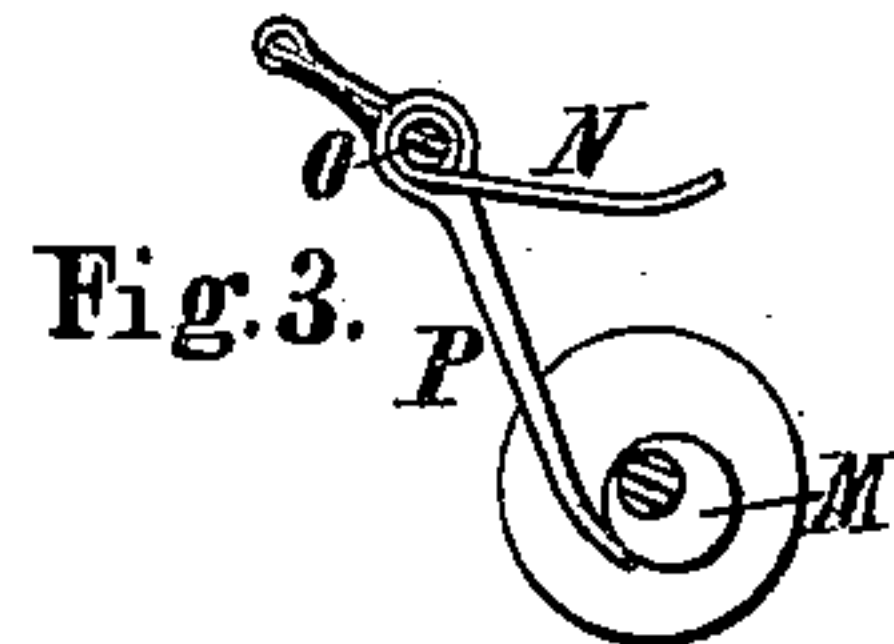
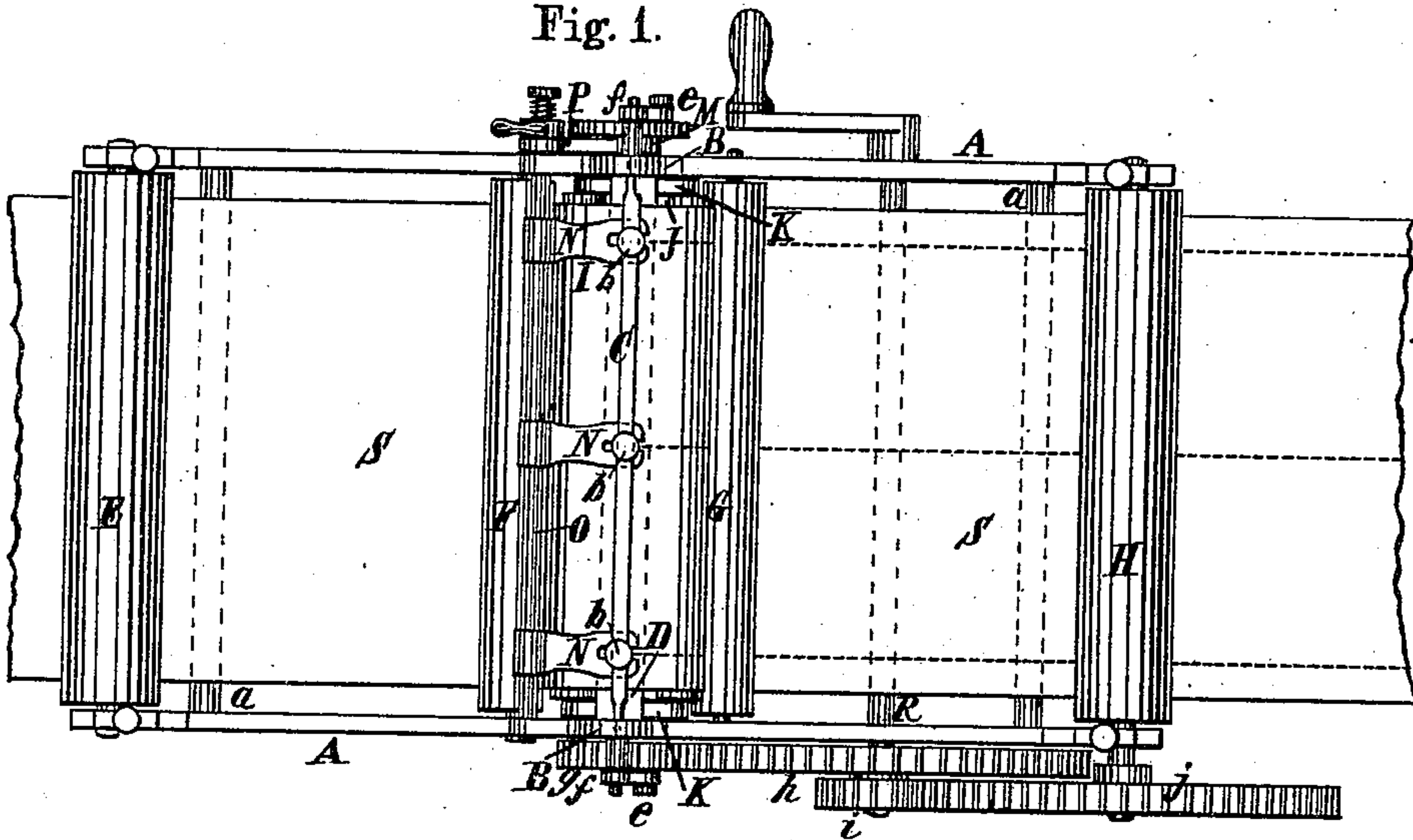
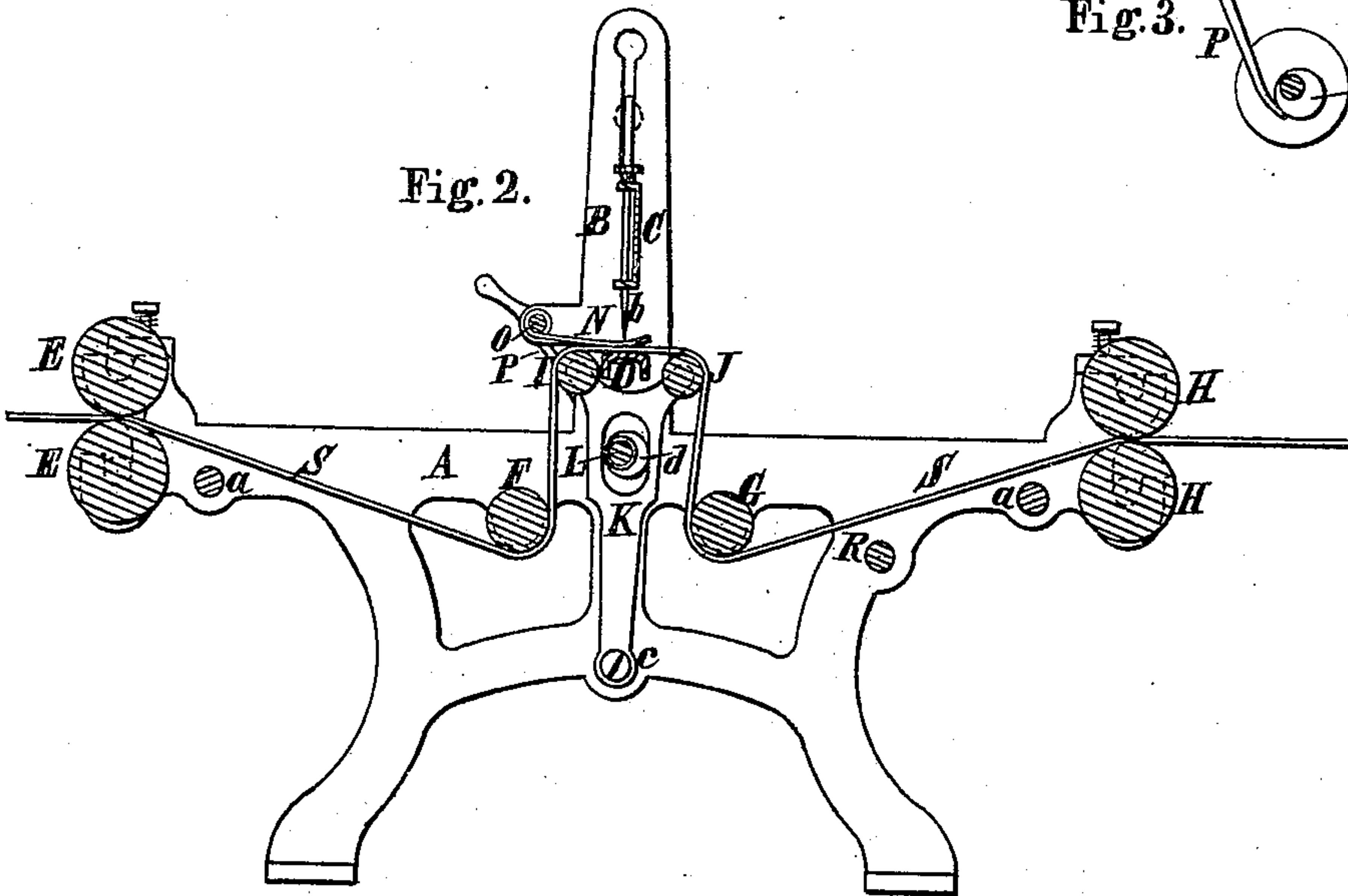


Fig. 2.



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Fig. 4.

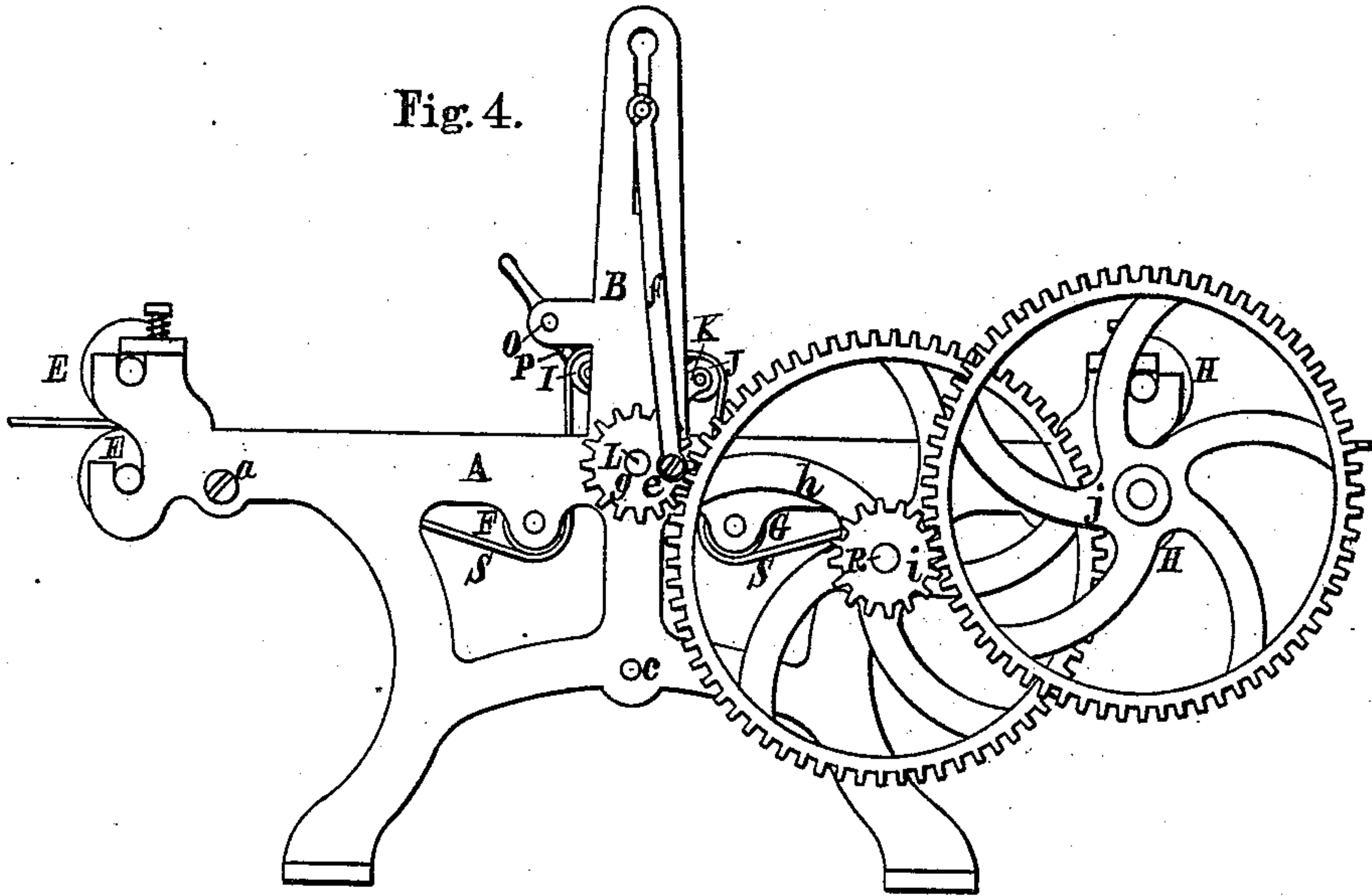
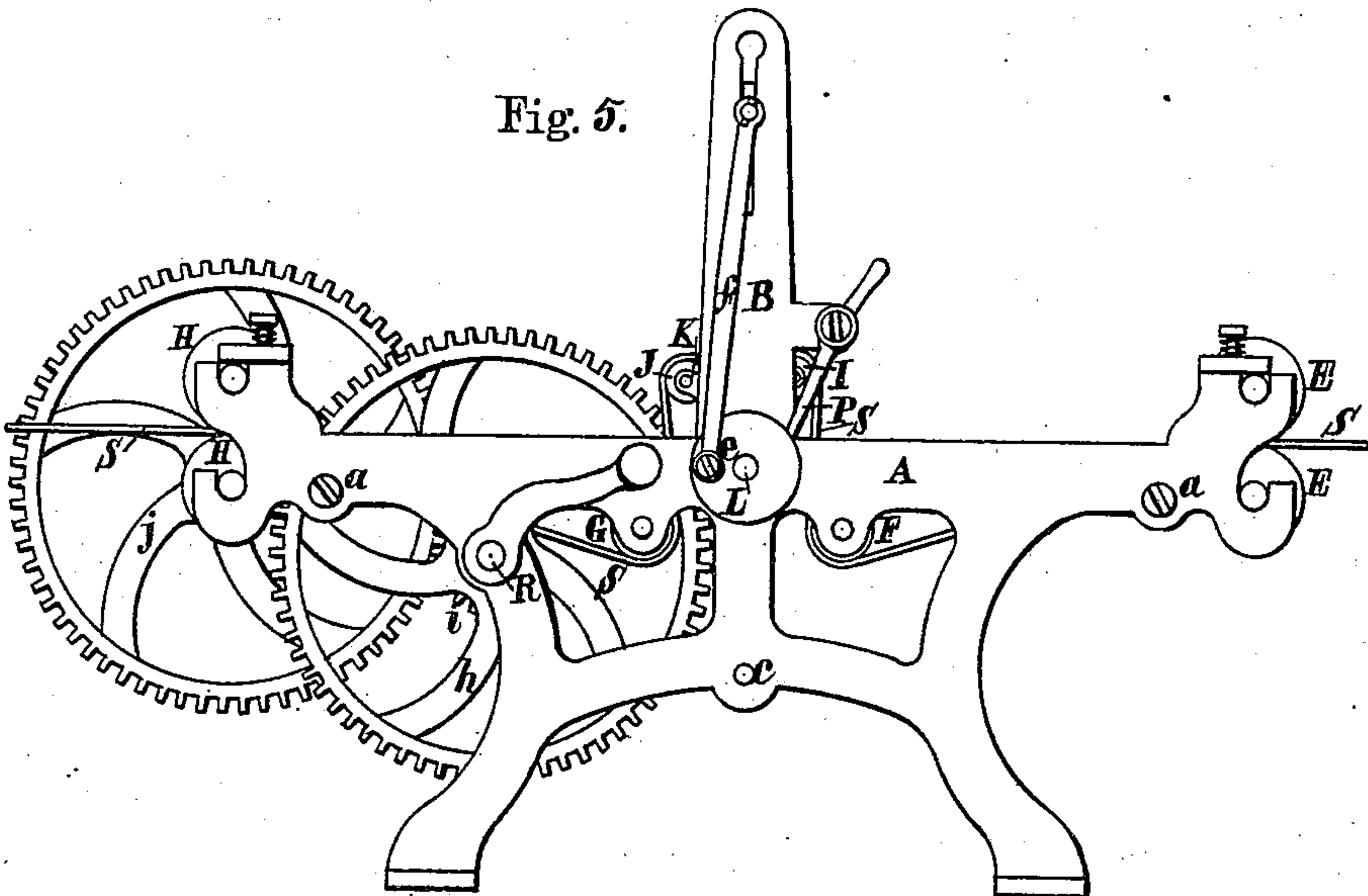


Fig. 5.



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UNITED STATES PATENT OFFICE.

FELIX P. CANFIELD, OF BOSTON, MASSACHUSETTS.

QUILTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 238,760, dated March 15, 1881.

Application filed May 3, 1880. (No model.)

To all whom it may concern:

Be it known that I, FELIX P. CANFIELD, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Quilting-Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved feeding device for sewing-machines when the said machines are designed to operate on long and comparatively heavy material, and when, owing to the rapid movement of such a heavy body, it is desirable to keep up a continuous movement of the same as a whole.

My invention consists in an improved method of feeding the material to the needle or needles of a sewing-machine, and also in a novel construction of parts for carrying out said method, as hereinafter set forth; and it further consists in an improved manner of arranging and operating the required presser-feet, as hereinafter described.

In the drawings, (two sheets,) Fig. 1 is a plan view of a sewing-machine embodying my invention. Fig. 2 is a vertical longitudinal section through the same. Fig. 3 shows details of mechanism for operating the presser-feet. Fig. 4 is an elevation of one side of the machine, and Fig. 5 is an elevation of the other side.

The sides A A, held together by the cross-rods *a a*, together with the standards B B, form the frame of the machine. The standards B B support a suitable set of sewing mechanism composed of needles, presser-feet, bed-plate, and looper, all arranged as usual in this class of machines. A needle-carrier, C, extends across the machine, through and outside of the standards B B, and has the needles *b b b*, as many as are required, secured in position to said carrier.

The bed-plate D is a narrow table extending across the machine and fixed to the sides thereof, over which the material to be sewed passes, and which is of suitable construction to support beneath it the looping device, or shuttles and mechanism for operating the same. (Not shown in the drawings.)

There are a pair of guide-rolls, E E, at the front of the machine, to receive and guide the material as it is led to the sewing mechanism,

two rolls, F and G, to guide the material while in the machine, and a pair of drawing-rolls, H H, at the rear of the machine, to draw and deliver the material as it is sewed, all having fixed bearings in the frame of the machine.

There are two small rolls, I and J, extending nearly across the machine, and supported on vibrating arms K K. These arms are pivoted to the frame of the machine at *c c*, and are slotted near their upper part for the eccentrics *d d*, which are secured to and turn with a shaft, L. This shaft carries at each end, and outside of its bearings in the frame of the machine, a crank-pin, *e*, for operating the needle-carrier C. Pitman-rods *f f* connect the crank-pins *e e* with the projecting ends of the needle-carrier. The shaft L also carries at one outer end a pinion, *g*, which meshes into a gear, *h*, and at the other end an eccentric or cam, M, to operate the presser-feet N N N, which are secured to a shaft, O, extending across and working in fixed bearings in the machine.

An arm, P, preferably somewhat elastic, is attached to shaft O outside of the frame, and reaches down by and near to the eccentric or cam M. This cam is so set or adjusted as to operate on the arm P, and, through the shaft O, on the presser-feet at the proper time—namely, when the needles are down in the material and the loop is being formed. When the needles are in this position the cam M presses against the arm P, and thus the presser-feet are caused to press on the material while the vibrating rolls have the backward movement; but when the vibrating rolls have the forward movement and the needles are raised above the material the arm P is relieved of pressure by the cam M, and hence the presser-feet lie loosely on the material, which is thus free to be moved forward.

A shaft, R, carries the gear *h* and a pinion, *i*, which meshes into a gear, *j*, on the outer end of the shaft of the lower one of the drawing-rolls H.

The material S to be sewed is led between the guide-rolls E, then below the guide-roll F, then up over the small vibrating roll I, then underneath the presser-feet N, across the table or bed-plate D, then over the vibrating roll J, then down under the guide-roll G, and then between the drawing-rolls H.

The operation of the machine is as follows:

Power being applied to shaft R, the drawing-rolls H will move the material continuously, except the short section reaching from vibrating roll I to vibrating roll J. This short section will have, while the rolls I and J swing in the direction of the movement of the main body of the material, an accelerated motion made up of the motion given to it by the continuous draft by the rolls H H and the motion imparted by such swinging of the rolls I and J; hence said short section will thus have moved farther in the same time than the remainder of the material. In vibrating back to their first position the rolls I and J will turn against the under surface of the material, and in so turning will yield to the drawing-rolls H just what the previous forward motion had gained by acceleration, thus producing a perfect rest of the material presented to the needles for a time equal to the time of one vibration backward. This motion backward of the vibrating rolls also takes up the material that has passed in by the guide-rolls E at the last movement of said vibrating rolls forward, thus keeping up the continuous motion of drawing-rolls H and the opposite ones or guide-rolls, E. This operation of the vibrating rolls I and J produces the necessary feed at the right time—namely, when the needles are reaching the limit of their upward movement—and also produces the proper rest of the material for the needles to pass down into and up out of the same before it moves. The length of vibration of vibrating rolls, together with speed of draft-rolls, gage the length of stitch, which may be made such as is desired.

It is plain that the relative position of either of the rolls I and J to the table D, or to either of the guide-rolls F and G, may be varied, provided the desired result of feed and rest of a portion of the material is produced, substantially as set forth; also, that other ways of moving the rolls I and J than by swinging them may be employed—as, for instance, by sliding their bearings on ways or guides. My purpose is that the roll J shall so bear on the material as, in its movement one way, to give a motion to a portion of the material, in addition to the motion given by the drawing-rolls H or their equivalent, and by its reverse movement to give out the material as the continued draft takes it up, and that the roll I shall have a similar action, in connection with the guide-rolls E or their equivalent, to make their movement continuous, and also that the two rolls I and J should so act in unison that a portion of the material shall have an alternate feed and rest, while the material, as a whole, shall have a continuous motion, and

may be kept drawn quite tight in the machine. 60

Of course, instead of rolls I and J, F and G, fixed bars with rounded corners, but having similar relative position and vibrating movement, might be used; but I prefer to use rolls to diminish friction on the material and the drawing mechanism; also, instead of the drawing-rolls H and the guide-rolls E, may be used rolls of the material, which are wound and unwound in a continuous manner. 70

It will be seen that the important feature of my invention is, by taking advantage of the flexible nature of the material, to so guide the material out of a direct path that a portion only (which may be a very small part of its length) need have the alternate motion and rest, while the material as a whole may have a continuous movement. 75

I claim as my invention—

1. The improvement in the art of feeding fabrics to the needle or needles of a sewing-machine, consisting in giving to a certain length of the material an intermittent forward movement while the remainder of the material is passing continuously through the machine, substantially as set forth. 80 85

2. The combination, with mechanism for drawing the material into and out of the machine continuously, of the rolls I, J, F, and G, arranged in reference to each other substantially as specified, and mechanism for supporting and reciprocating the rolls I and J, whereby a certain length of the material has an accelerated motion and is at rest alternately, and the whole material may be kept drawn tight, substantially as set forth. 90 95

3. The combination, with the guide-rolls E, drawing-rolls H H, and mechanism for imparting to the latter a continuous rotary motion, of the guide-rolls F and G, the rolls I and J, and means for supporting the latter above the said rolls F and G, and imparting to the same a forward and backward movement, whereby a certain length of the material shall have an intermittent forward movement imparted to it, while the remainder of the same is passing continuously through the machine, substantially as described. 100 105

4. The combination, with the presser-feet N, shaft O, and lever P, of the cam M, and means for operating said cam, whereby the said presser-feet are caused to press intermittently upon the material, substantially as described. 110

FELIX P. CANFIELD.

Witnesses:

EDW. DUMMER,
HENRY F. SHAW.