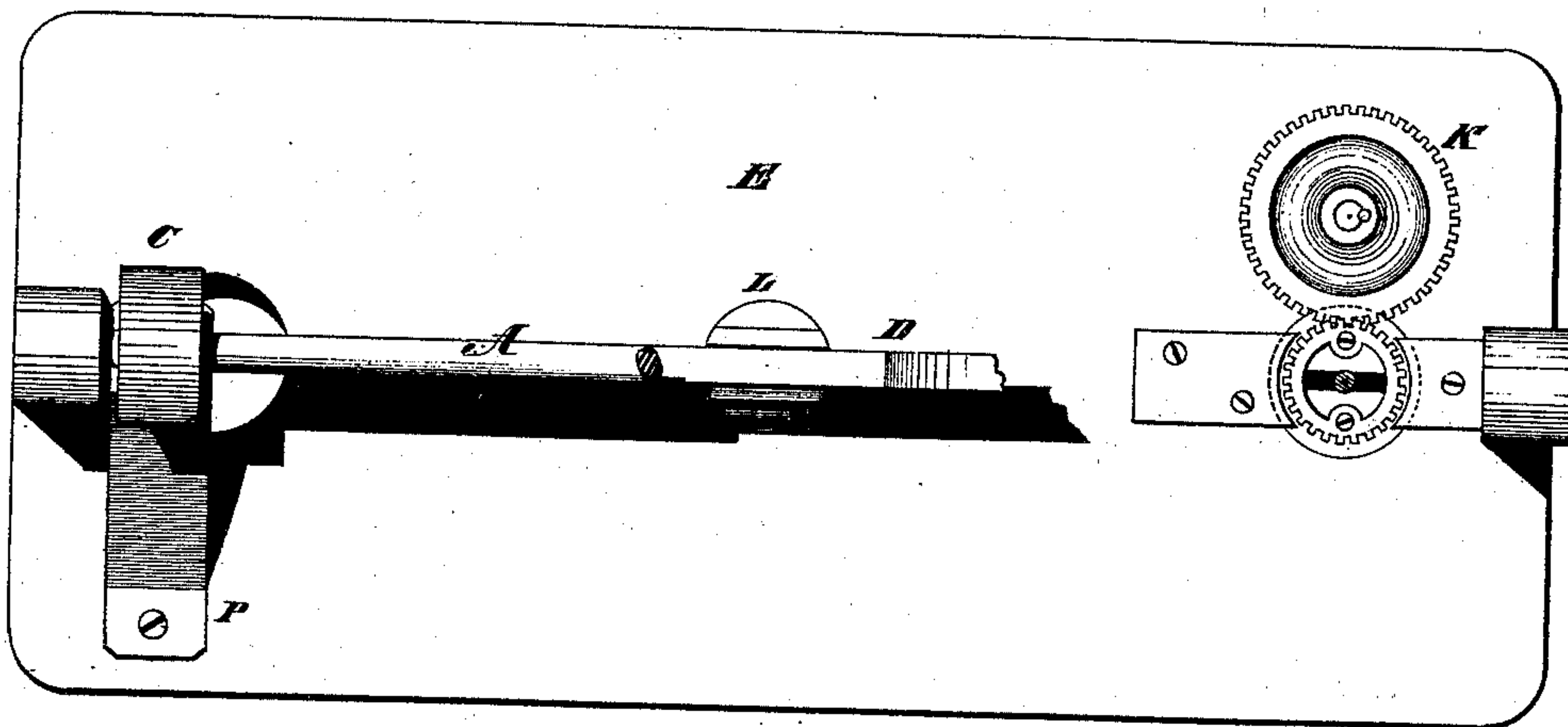
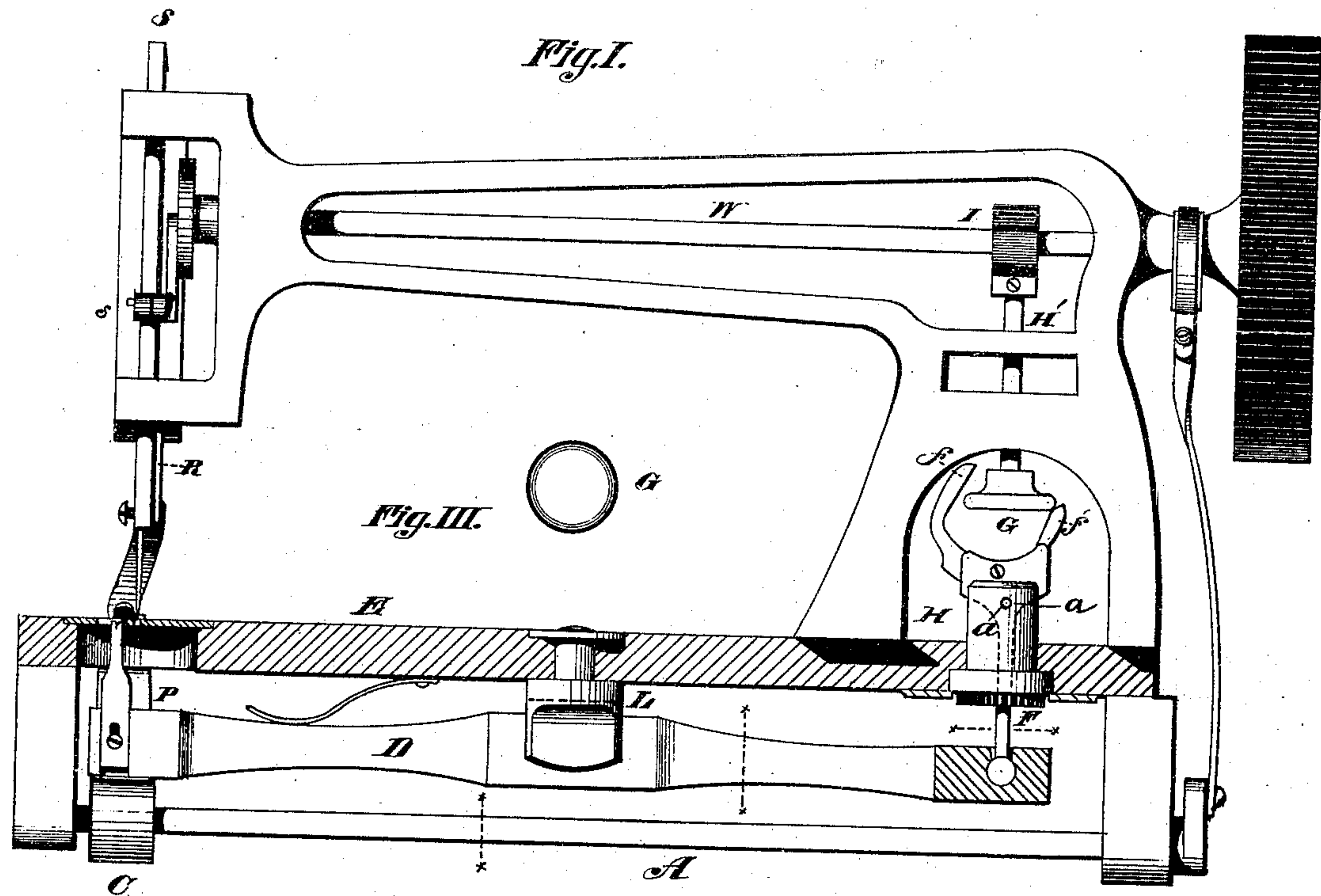


2 Sheets—Sheet 1.  
J. B. PRICE & C. E. BILLINGS.  
SEWING-MACHINE.

No. 173,665.

Patented Feb. 15, 1876.



Witness  
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Phelps Johnson

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by their atty  
R. P. Hyde

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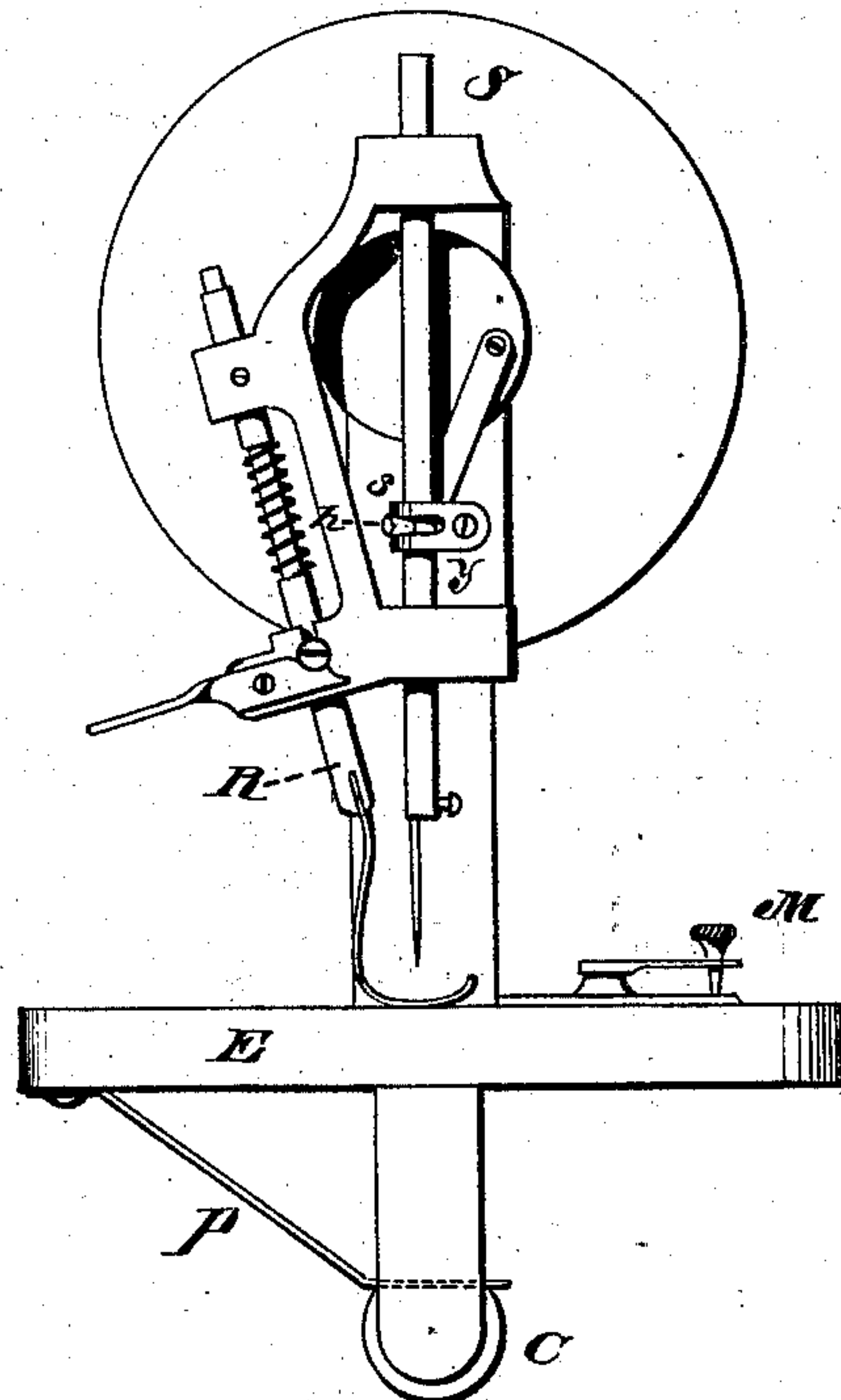


Fig IV,

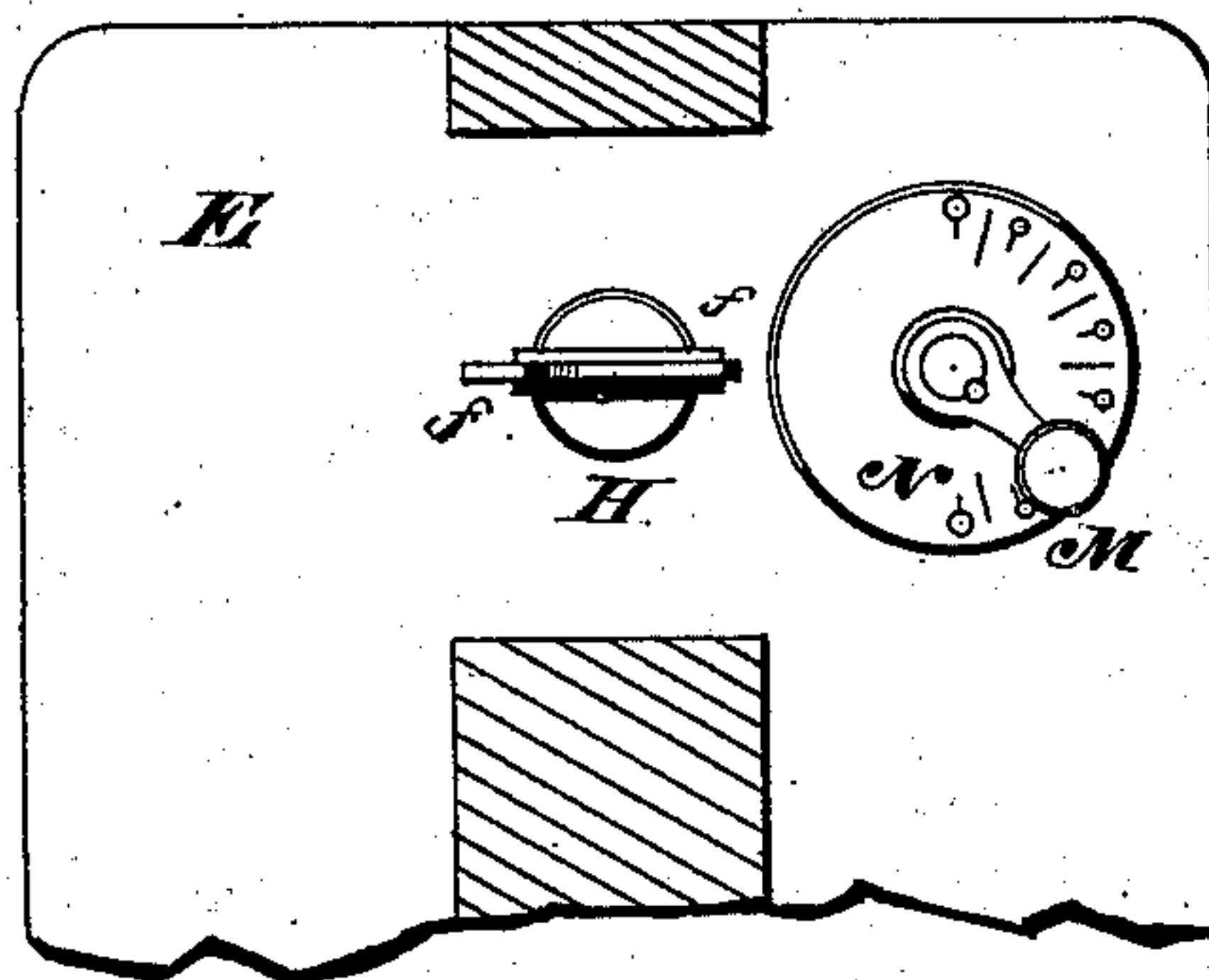


Fig V,

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# UNITED STATES PATENT OFFICE.

JOHN B. PRICE AND CHARLES E. BILLINGS, OF HARTFORD, CONNECTICUT.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **173,665**, dated February 15, 1876; application filed June 29, 1875.

*To all whom it may concern:*

Be it known that we, JOHN B. PRICE and CHARLES E. BILLINGS, both of Hartford, State of Connecticut, have invented certain and useful Improvements in Sewing-Machines, of which the following is a specification:

Our invention relates to the construction of a feed mechanism, which enables the direction of the feed to be instantly changed to any point upon the bed of the machine, at will.

In the drawings, Figure 1 is a partial longitudinal section of a machine having our improvements. Fig. 2 is a bottom view; Fig. 3, a detail view; Fig. 4, an end view; and Fig. 5, a detail view.

Passing from the end of the lever D through the bed E, and hinged to a bearing therefrom, is the vibrating lever F, which is formed above its bearing into the fingers  $f f'$ , against which alternately bears the disk G, to impart the vibrating movement to the lower end of the lever.

The disk G forms the head of the plunger H', which is operated by cam I on the driving-shaft W, so that every stroke of the plunger will, through the vibrations of lever F, impart the motion to the lever D necessary to form the feed.

The lever F is hinged at  $a$ , as shown in Fig. 1, to a hub, H, keyed or otherwise secured in the bed E so as to rotate freely therein on an axis coincident with the center of the disk-stem, and as the fingers  $f f'$  are on opposite sides of the disk G, their position relative to the disk will not be affected by the rotation of the hub H, and from the position of the fingers  $f f'$ , the motion of the end of the lever F with the end of lever D, to which it is connected, will always be in the vertical plane occupied by the fingers.

In Fig. 1, the disk G is shown commencing to descend upon finger  $f'$  to rock it, to impart the half of a reciprocating movement to the lever D, as well as to move the finger  $f$  in a position to be struck by the disk as it rises to complete the reciprocation of lever D, and as the plunger and disk G and rocker-cam C upon shaft A derive their motion from shaft W, and always move in the same relative time, by turning the hub H until the position

of the fingers is reversed, and the one  $f'$  where the one  $f$  is shown to be in the drawing, the direction of the feed will be reversed, for the reason that the lever D will be raised by the cam C at a different half of its reciprocation to engage with the fabric or work, and this reversal of direction of the feed will be produced by the semi-rotation of the hub H in any plane the fingers  $f f'$  may occupy.

When the lever F thus moves in the plane in which it is shown in the drawing, the lever D is only reciprocated; but in order that it may also at the same time vibrate to enable the lever F to swing in any vertical plane, and have the angle of its departure from the one in which the lever D is simply reciprocated transferred to the feed end of lever D, a guide, L, is arranged at or near the center of said lever, to, while permitting the lever to slide freely therein, become itself a fulcrum that turns freely with every vibration of the lever D; this is shown in Fig. 1, where the combined guide and fulcrum is shown secured to the under side of the bed.

In Fig. 1, the ends of levers F and D are shown connected by a ball-and-socket joint.

In Fig. 2, portions of lever D and shaft A are removed, to show the base of hub H, provided with gearing to enable it to be rotated easily by means of the wheel K, the axis of which is prolonged above the bed, to be provided with a handle, M, by means of which the rotation of the hub H is effected, and by means of the scale N beneath the handle the degree of said rotation is laid off, as shown in the drawing, the hub H is speeded up to enable the change of direction of feed to be at once accomplished; and it will be seen that, by the mechanism hereinbefore described, the work upon the bed may be compelled to move under the needle in any direction and subject to any change, at the will of the operator.

In order that the end of lever D resting upon the rocker C may play freely above the rocker, and be lifted at once by it at any point of its movement, and to provide an anti-friction surface for the end of the lever to bear upon, we bring from the under surface of the bed E a flexible metallic strip, P, to have its free end inserted between the rocker and the



superincumbent lever, and in the form of a plate that follows the rocker and transmits its movement at once to the lever.

Fig. 4 shows the presser-bar R, arranged in the head at an angle less than a right angle to the bed E, and having the presser-foot prolonged therefrom so formed as to rise over any folds, lumps, or inequalities in the cloth dragged beneath it, by diverting the force of such blow to the presser-bar itself in a direction coincident with its length, to thus, by sliding the bar R in its bearings, relieve it and them of the damaging strain that would otherwise result.

In Fig. 4, the needle is shown prolonged from the bar S eccentrically to its axis, and in the clamp s, that connects the bar to the crank-arm, is the slot y, in which plays the pin h from the bar S, when the bar is rotated, by which construction the bar is raised and lowered by the clamp, while free to be turned

within the clamp when it is desired to center a large needle within the race or bring a small one against its face, and by this adjustability of the position of the needle the side of any sized one can be brought always against the face of the race to prevent any stitches from being dropped.

Now, having described our invention, what we claim is—

The plunging disk G, lever F, provided with the fingers *f f'*, the hub H, adapted to rotation upon an axis coincident with that of the plunger, and the vibro-reciprocating lever D, combined and operating substantially in the manner and for the purpose set forth.

JOHN B. PRICE.

CHARLES E. BILLINGS.

Witnesses:

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