3 Sheets—Sheet 1.

C. B. RICHARDS.

Sewing Machine.

No. 31,625. Patented March 5, 1861.

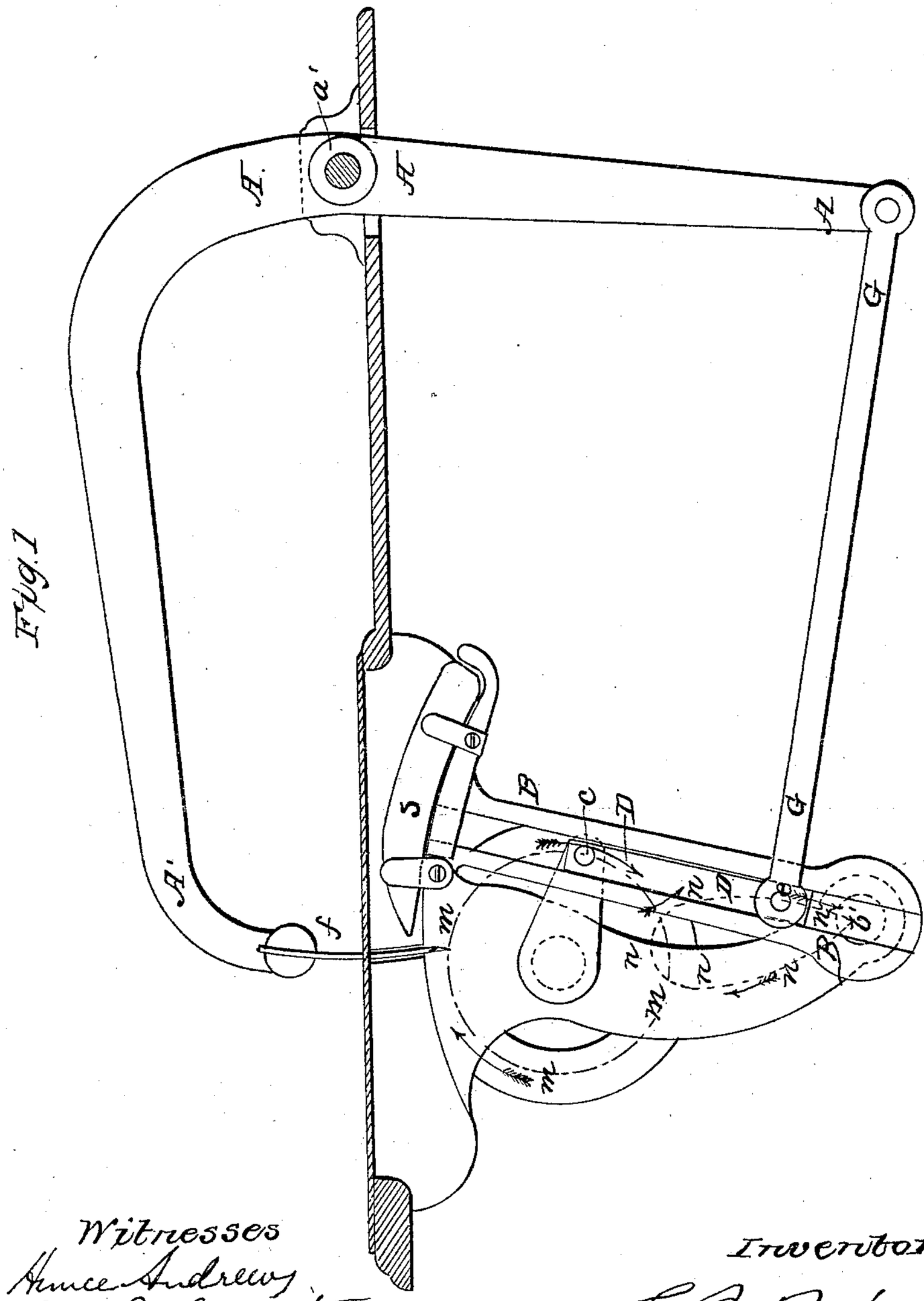

Fig. 1

Witnesses
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3 Sheets—Sheet 2.

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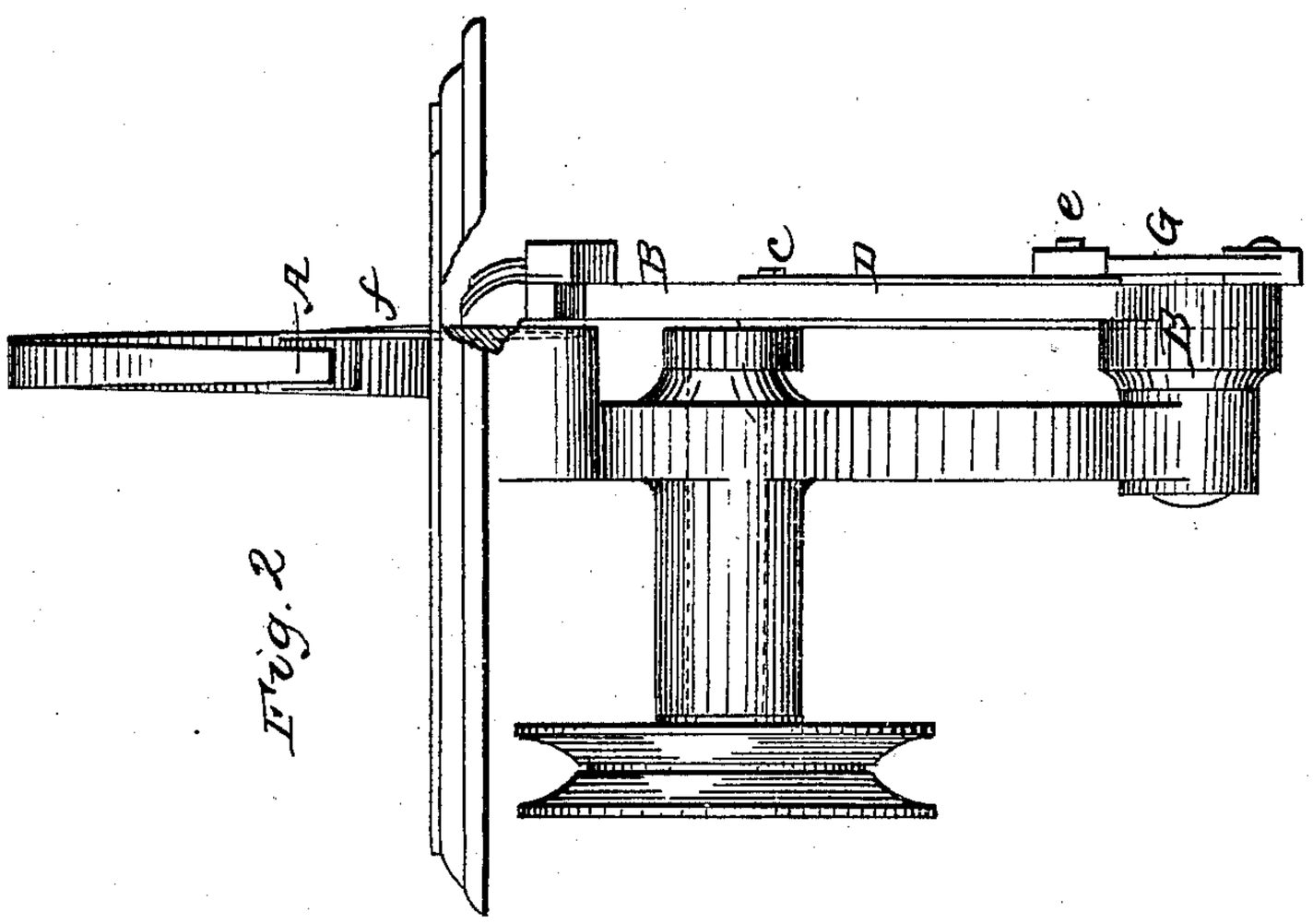

Fig. 2

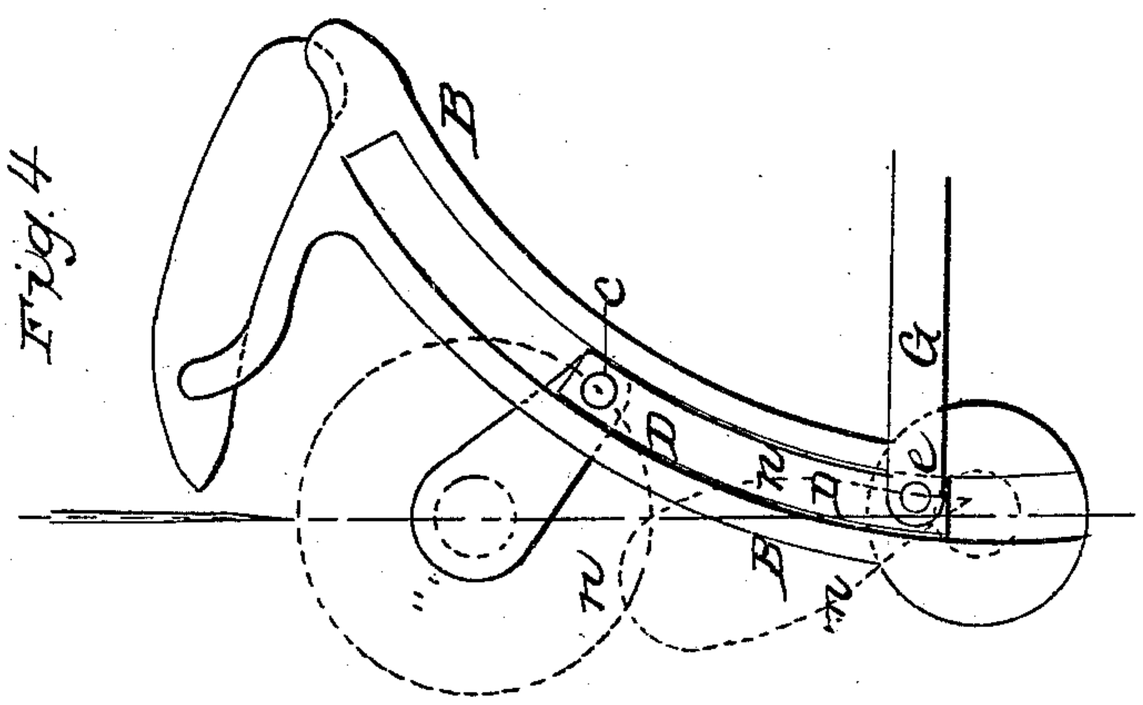

Fig. 4

Witnesses
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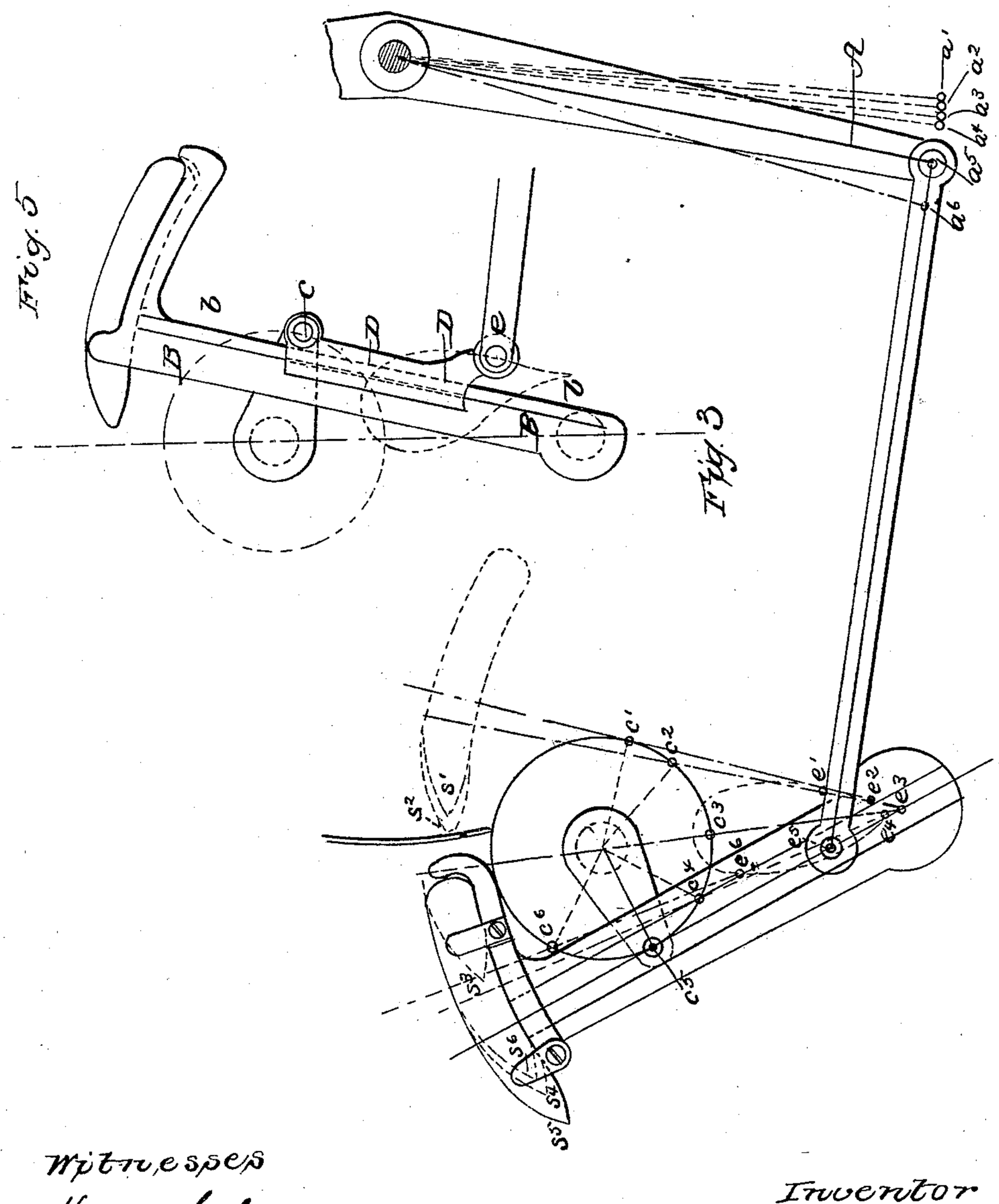
C. B. RICHARDS.

Sewing Machine.

3 Sheets—Sheet 3.

No. 31,625.

Patented March 5, 1861.



Witnesses

Hace Andrews

Geo D Sargeant

Inventor

C B Richards

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UNITED STATES PATENT OFFICE.

C. B. RICHARDS, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **31,625,** dated March 5, 1861.

To all whom it may concern:

Be it known that I, C. B. RICHARDS, of Brooklyn, in the county of Kings and State of New York, 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 same, reference being had to the accompanying drawings, forming part of this specification, and to the letters of reference marked thereon.

My invention relates to that kind of sewing-machines in which a reciprocating shuttle is used, and lies in a mode of imparting to the needle and shuttle their proper relative movements. To insure the correct working of such aforesaid sewing-machines, it is quite essential that the needle should pause or rise very slightly while the shuttle is passing through the loop of the upper thread, so that the said loop may not be made too large by their combined motion. It is also desirable that the shuttle should occupy but little time in passing through the needle's loop, in order that the needle may have longer time to complete its ascent and return. These results have hitherto been effected principally by the use of rotary cam-grooves, and also by crank-pins working in irregularly-shaped or cam grooves; but such use of grooves having irregular curvature is objectionable, on account of the unequal wear to which their differently-curved parts are subjected, and because of their consequent noisiness.

It is the object of my said invention to produce the correct movements of both needle and shuttle without the use of cams or their like, and by a simple device the parts of which may be so constructed that compensation can be made for their wear.

To these ends my said invention consists in the employment of a vibrating or rocking shuttle driving lever operated by a crank and slide, or their respective equivalents, in combination with a pin, or an equivalent therefor, which is carried by the said slide toward and away from the center of movement of the rocking shuttle-lever, when, in a manner hereinafter described, the needle derives from the said pin its motion, the characteristics of which are hereinafter clearly set forth.

To enable others skilled in the art to make and use my invention, I will proceed to a description thereof.

In the annexed drawings Figure 1 is a side elevation of a sewing-machine illustrating my invention. Fig. 2 shows a front view of the same.

Similar letters of reference denote the same part in both the aforesaid figures, to which figures the immediately following description exclusively refers, in which—

A′ is the needle-arm, which is pivoted at *a′* and extends below its fulcrum, forming the arm A. *f* is the needle.

B is a lever pivoted at *b′*, and bearing at its upper end the shuttle *s;* or it may drive the same in a raceway. This lever B receives a vibratory motion from a crank-pin, *c*, by means of a slide, D, in the upper end of which the crank-pin *c* has its bearing. The slide D is guided in a radial slot extending from end to end of the lever B. The circular path of the crank-pin *c* is indicated by the dot-line *m m* and its direction of motion by arrows. The slide D carries at its lower end a pin, *e*, and is of such length that when the crank-pin *c* is at that part of its path nearest the center of vibration *b* of the lever B, the position of the pin *e* will nearly coincide with the said center *b*. The path of the pin *e* is indicated by the blue line *n n* and the direction of its motion by arrows. From the pin *e* the needle *f* receives motion through a connecting-link, G, hinged to the extremity of the arm A.

When the shuttle-driving lever B is about to commence its forward motion (that being the position indicated by Figs. 1 and 2) the arm A is nearly parallel with B and the link G, forming nearly equal angles with A and B.

The positions of the parts being as indicated, the rotation of the crank-pin will cause the shuttle's point to approach the needle, which will rise slowly, throwing out a loop, through which the shuttle then shoots, during which time the needle rises very slowly, once nearly pausing, because the pin *e* is then pushed down into a slow moving part of the lever B, near which it lingers for some time, on account of the crank then being, as it were, "on its dead, center" relatively to the said pin *e*. After the shuttle has passed through the loop the needle rises quickly, (the pin *e* being then drawn up into a rapidly-moving part of lever B,) and it descends without retardation. The shuttle returns much more slowly than it moved forward, giving ample time for the needle to finish its rise and to descend.

Fig. 3 is a diagram, which will more clearly

explain the relative motions of the shuttle and needle, in which the same numerals denote corresponding positions of the crank-pin *c*, the shuttle's point *s*, and the end *a* of the needle-arm lever A.

Fig. 4 illustrates a modification of my invention, showing only the parts necessary for its explanation, wherein B is a shuttle-bearing lever driven by the crank-pin *c*, bearing in the slide D, which is in this case curved, its sliding surfaces being arcs of circles. The said slide carries a pin, *e*, the path of which is indicated by a blue line, *n n*. G is a link for transmitting motion to the needle-bar arm. By this latter arrangement more time is afforded for the needle to complete its ascent after the shuttle has passed the needle.

Fig. 5 illustrates a mode of forming and guiding the slide D, and of forming the bearings for the pins *c* and *e*. In this plan the relative motions of the parts do not vary essentially from the first-described arrangement; but it affords facilities for providing adjustments to "take up" the wear of the surfaces of the slide and the bearings of the pins *c* and *e*. The back edge of the slide is hooked over behind a flange, *b*, on the front edge of the shuttle-lever A, and is thus guided on the said lever.

In all the modifications of my invention herein described, the proportions and relative positions of the parts may be varied to some extent, and still a movement of the needle sufficiently correct for practical purposes will be obtained; but these modifications will come within the scope of my said invention so long as the pin *e*, from which the motion of the needle is derived, is at the proper time carried down into a part of the lever B, which moves so slowly that thereby a retardation of the needle's motion is effected after the said needle has commenced its ascent.

Having thus described my invention, I disclaim as new the driving the shuttle by a crank-pin operating a slotted lever when uncombined with substantially the means herein described for producing the specified movement of the needle; but

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

The employment of a rocking-shuttle driving-lever operated by a crank and slide, or their respective equivalents, in the manner set forth, in combination with a pin or its equivalent attached to said slide and driving the needle-arm, substantially in the manner hereinbefore described.

In testimony whereof I have hereunto set my hand this 19th day of December, 1860.

C. B. RICHARDS.

In presence of—

HORACE ANDREWS,

GEO. D. SARGEANT.