

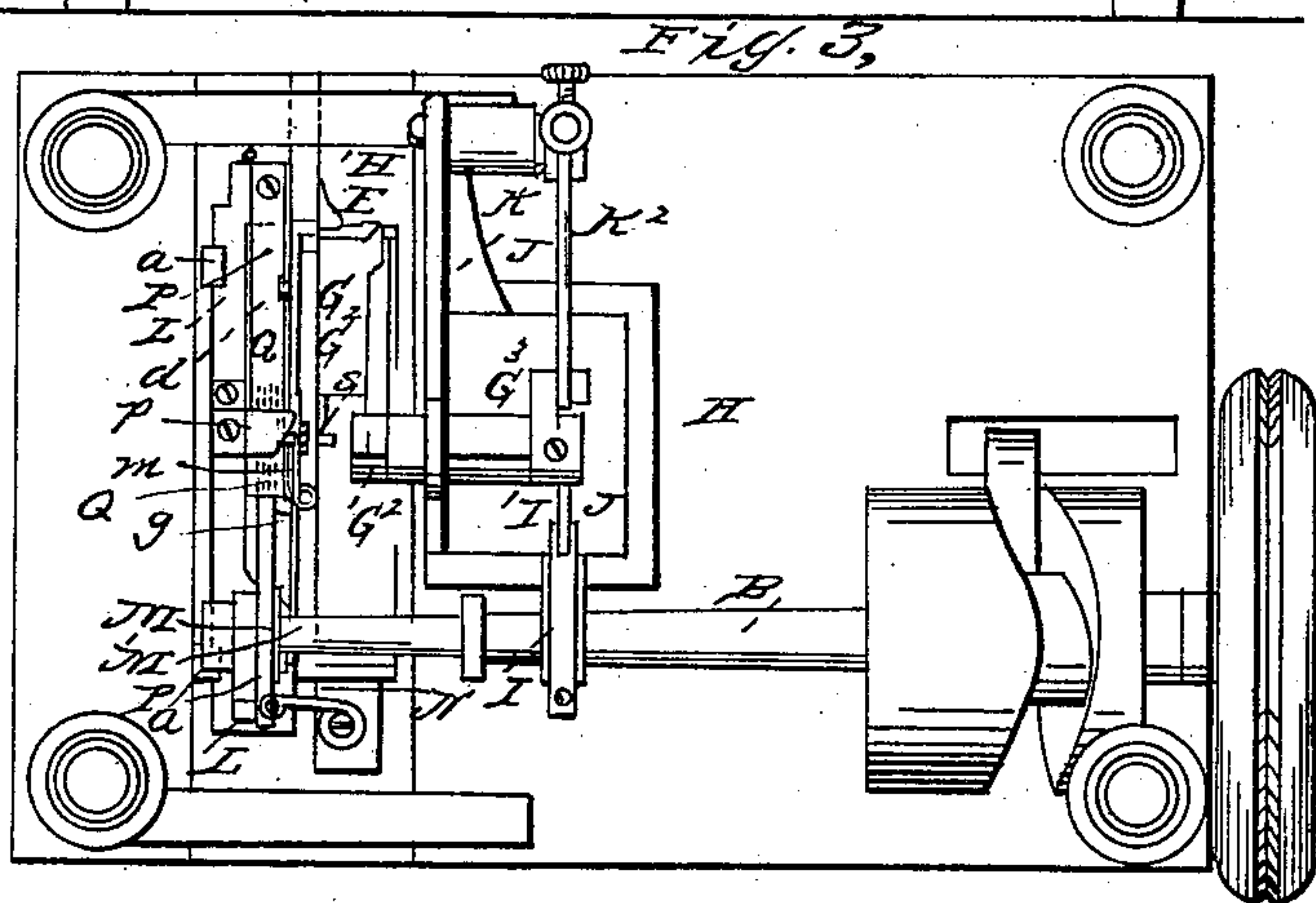
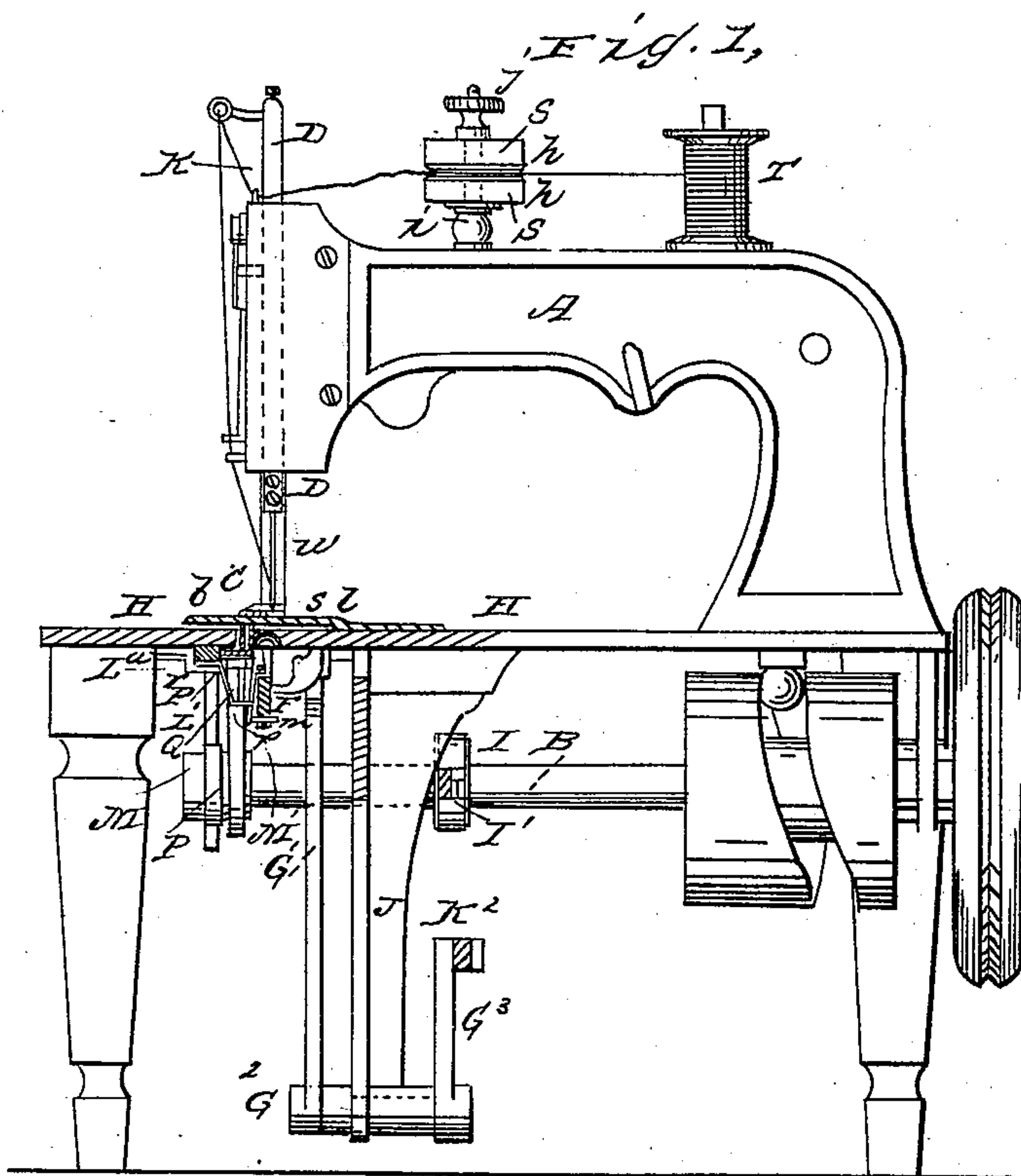
SCHOFIELD & RICE.

2 Sheets—Sheet 1.

Sewing Machine.

No. 28,610.

Patented June 5, 1860.



Witnesses:  
Henry C. Brown  
J. M. Corns

Inventor:  
Charles Rice  
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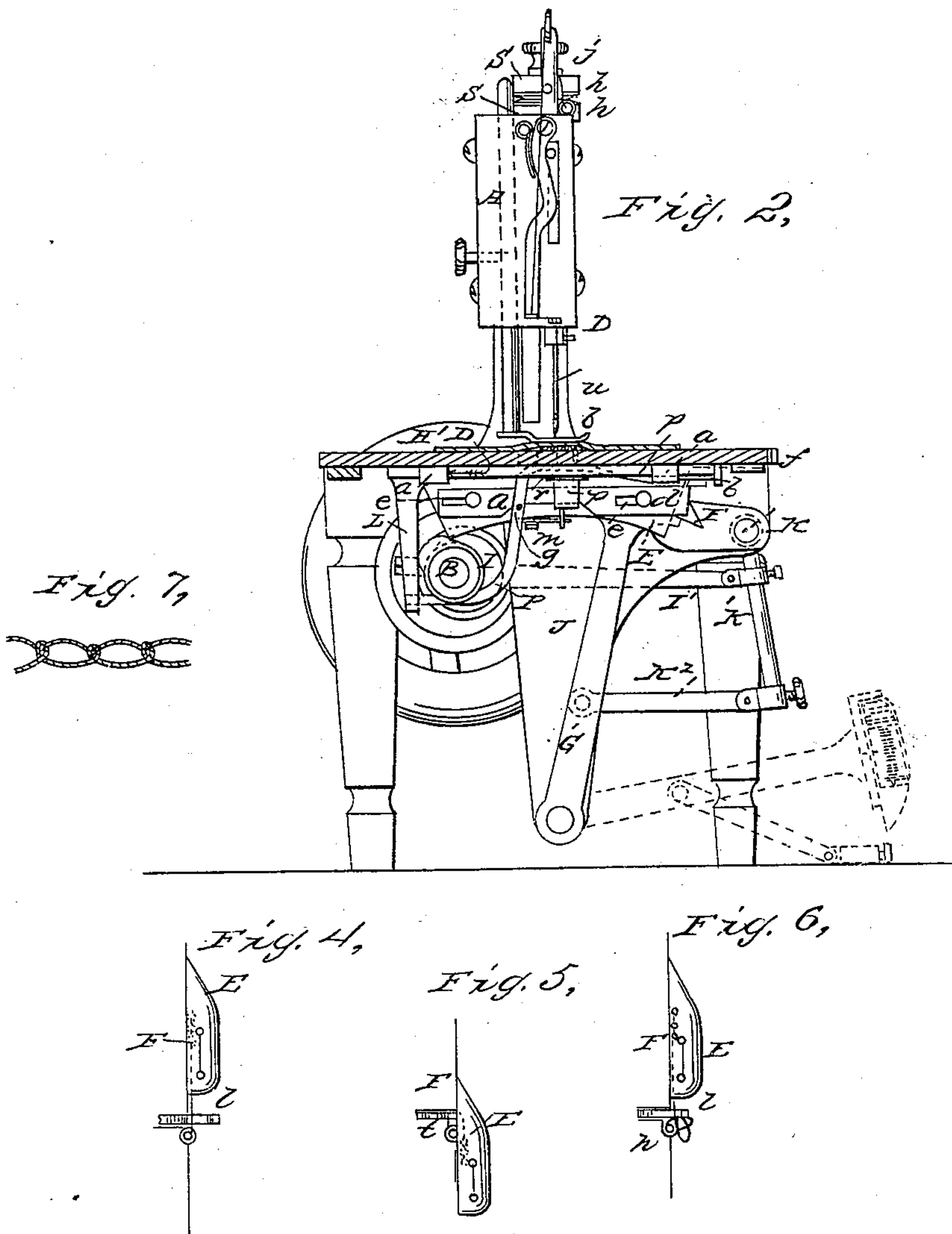
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# UNITED STATES PATENT OFFICE.

CHARLES SCOFIELD, OF ADAMS, AND CLARKE RICE, OF WATERTOWN, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 28,610, dated June 5, 1860.

*To all whom it may concern:*

Be it known that we, CHARLES SCOFIELD, of Adams, in the county of Jefferson and State of New York, and CLARKE RICE, of Watertown, in the county of Jefferson and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and we 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, in which—

Figure 1 is a front elevation of a machine with our improvements partly in section. Fig. 2 is a side view of the same with part of the cloth plate and stand removed to expose the feeding apparatus to view. Fig. 3 is an inverted plan of the same. Figs. 4, 5, and 6 are views of the stitch-making apparatus, illustrating the method of making a knot-stitch. Fig. 7 represents the knot-stitch made by this machine.

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

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

In applying our several improvements the pressure-pad C and needle-bar D are or may be fitted to the frame A of the machine and operated in the usual manner.

The main shaft B is represented in the drawings as arranged farther back than usual; but this is only to suit the peculiar mode therein represented of applying and driving the shuttle E, which is that patented by C. Parham in 1854, and not claimed as our invention.

F is the fixed guide-plate against which the shuttle works, corresponding with the flat side or face of the raceway in other shuttle-machines.

G is the shuttle carrier and driver, attached by a long arm, G', to a rock-shaft, G<sup>2</sup>, working in a bearing in the bottom of a hanger, J, below the work-plate or bed H.

I is an eccentric on the main shaft for working the shuttle driver and carrier G, said eccentric being connected by the rod I' with the arm K' of a rock-shaft, K, which works in bearings in the hanger J. The arm K' is connected by a rod, K<sup>2</sup>, with an arm, G<sup>3</sup>, on the rock-shaft G<sup>2</sup>. None of our improvements require this mode of applying and operating the

shuttle, though we have employed it in the machine represented; and we have only described the shuttle mechanism so fully to prevent its confusion with other parts of the machine.

L is the feeding-slide, fitted to work in guides *a a*, close under a plate, H', which constitutes, practically, a portion of the work-plate or bed H, but which is made movable for the convenience of taking out the feeding apparatus. This plate L has a downward projection, L', which is acted upon by a cam, M, on the main shaft B, and by a spring, N, secured to the work-plate, to produce the feeding movement, the cam moving it in the direction in which the cloth is to move and the spring moving it back again.

b is the feeding-dog, attached to or made in the same piece with the spring P, one end of which is attached to the slide L by a screw, *c*, and the other end is situated below a cam, M', which is arranged on the shaft B, close to the cam M. The elasticity of this spring tends to raise the teeth of the dog *b* above the face of the bed; but the force exerted on the dog by the said spring should be slightly less than the force with which the pressure-pad is pressed downward. At the time when the cam M acts upon the downward projection L' of the slide L to move the said slide in the direction in which the material is to be fed, (indicated by an arrow on the said slide in Fig. 2,) the cam M' leaves the spring P free and permits the teeth of the dog *b* to project upward above the surface of the bed and bite the material under the pressure-pad; but after this movement of the slide is completed, and before the said cam permits the spring N to return to return it, the cam M' comes into operation on the spring P and presses it down far enough to withdraw the teeth of the dog below the surface of the bed. After the slide has been returned, and before it receives another movement in the direction of the arrow, the cam M' leaves the spring P free to rise again and produce a new bite of the teeth of the dog on the material.

The principal advantages of employing a spring to force the teeth of the dog into the material and a cam to withdraw them, as compared with the use of the cam to force the teeth into the material, are as follows: first, that provided the spring is of proper strength—



that is to say, exerts a less pressure than the pad—the material cannot be raised up from the surface of the bed, and hence the vertical distance between the eye of the needle and the under surface of the material is, at the time of tightening the stitch, always the same, whatever the thickness of the material, and the tension of the thread is not so much affected by changes in the thickness of the material; second, that the teeth enter into the material just so far as and no farther than its thickness may require; and, third, that provision may be made for withdrawing from the material at pleasure at any time, and thus leaving the material free to be turned or moved upon the smooth surface of the bed, as may be desired.

To provide for the withdrawal of the teeth within or below the surface of the bed, we employ the sliding wedge *Q*, which is attached to the shuttle guide-plate *F* by two screws, *d d*, passing through slots *e e* in the said wedge and screwing into the said plate, which is in one piece with the plate *H'*. The wedge *Q* is furnished with a thumb-piece, *f*, (see Fig. 2,) which projects in front of the plate *H'* to permit it to be laid hold of to draw it forward and bring it into operation on a pin or projection, *g*, on one side of the spring *P* for the purpose of depressing the said spring, and thus drawing down the dog. The dog may be thus withdrawn within the bed previously to the introduction of the work to the machine, to facilitate its adjustment to the needle, or at any time during the operation of the machine. By pushing the wedge back again the dog is allowed to rise above the surface of the bed.

*S S* are the two pieces of india-rubber, and *h h* the plates of metal constituting the friction-clamp for producing the necessary tension on the needle-threads, fitted loosely on a squared stud, *i*, so as to prevent their turning around, the said stud being secured on the top of the frame *A*, and compressed together by means of a nut, *j*, fitted to a screw-thread on the upper part of the said stud, the plates *h h*, which face each other, and have the india-rubber behind them, being made of sheet-brass or other sheet metal which has a smooth surface and is thin enough to possess a considerable degree of flexibility, and being made flat or having corresponding surfaces in their normal condition. This clamp is so arranged between the spool *T*, which supplies the needle-thread, and a guide *k*, or between two guides, that the thread on its way from the said spool to the needle passes between the faces of the plates *h h*, the direct line between the spool and guide or the two guides passing close to or very near the stud *i*. The nut *j* is adjusted to produce the necessary pressure to give the required degree of friction and tension on the thread. The advantage of thus combining india-rubber and flexible-metal plates in the clamp over the use of india-rubber or rigid-metal plates separately is that, while the metal presents a smooth surface, both the rubber and metal yield to any un-

evenness in the thread, and the larger portions of the latter are permitted to work their way out toward the margin of the plates, where the latter yield more readily to let it pass; but the smaller portions work their way in toward the center of the plates; and hence the friction, which is perfectly controllable by the nut *j*, is rendered uniform and a uniform tension is preserved. The same apparatus may be applied to the locking-thread between the looper and the spool, which supplies the thread in machines in which a looper is employed.

*l* is the hook, operating in combination with the needle and shuttle to tie the half-knot with the shuttle-thread. This hook constitutes part of a lever, as is best shown in Fig. 1, which works through the shuttle-guide plate *F* on a fulcrum-pin, *n*, secured in the said plate *F*, and the said hook works in a recess, *s*, provided for it in the bottom of the plate *H'*, above the path of the shuttle *E*.

*m* is a spring attached to the shuttle-guide plate, and pressing against the lower part of the lever in such manner as to tend to keep the hook across the path of the shuttle.

*p* is a wedge-like cam, attached to the feeding-slide *L* by two screws, *r r*, in such a position that as the said slide moves to effect the feed, and the shuttle commences its retreat after having passed through the loop of the needle-thread, it (the cam *p*) operates upon the lever to draw the hook *l* aside from the path of the shuttle, by which means the said hook is caused to catch the shuttle-thread and draw it aside into the recess *s* in such a manner that the needle, in passing down through the material and the plate *H'*, is caused to pass between the thread thus drawn aside and the shuttle. The effect produced by the needle thus passing between the shuttle and its thread is that as the shuttle continues its retreat and the thread is liberated by the hook *l*, being permitted by the return of the feeding-slide to be moved back by the spring *m* across the path of the shuttle, the shuttle-thread is left around the needle, and the forward movement of the shuttle into the next loop of the needle-thread leaves the shuttle-thread in the form of a half-knot around the needle-thread, as illustrated in Fig. 7, where the shuttle-thread is represented in red color and the needle-thread in blue.

The above-described operation is illustrated in the inverted plan views, Figs. 4, 5, and 6, of which Fig. 4 represents the shuttle as having completed its advance, and the hook as not having yet moved across its path. Fig. 5 represents the hook as having drawn aside the shuttle-thread, the shuttle, as returning, and the needle as descending between the shuttle and its thread; and Fig. 6 represents the hook as having liberated the shuttle-thread and the shuttle as having just passed through the next loop of the needle-thread.

By taking away the spring *m* or moving it out of its operative position, the operation of the hook *l* may be caused to cease, and the



machine will make the ordinary shuttle-stitch. Other means of throwing the hook out of operation may be employed.

We do not claim the combination of a spring and cam to elevate and depress the feeding-dog when operating otherwise than substantially as herein described; nor do we claim, separately, the use of two pieces of india-rubber or two metal plates to clamp and produce friction upon the needle-thread; neither do we claim tying a half-knot in the shuttle-thread when effected by any other system or arrangement of mechanism than that substantially as herein described; but

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, in the manner herein

shown and described, of the spring feeding-dog P, the slide L, and cams M M', for the purpose set forth.

2. The combination of the sliding wedge Q with the spring feeding-dog P, slide L, and cams M M', as and for the purpose herein shown and described.

3. The combination of the pivoted lever-hook l with the guide-plate F, plate H', spring m, and cam p, as and for the purpose herein shown and described.

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