2 Sheets—Sheet 1.

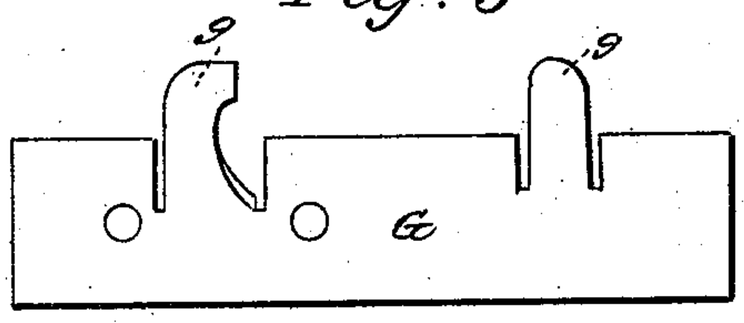
G. A. FAIRFIELD.

Sewing-Machine Feed.

No. 63,149. Patented March 26, 1867.

Fig. 1

Fig. 3



Witnesses:

Henry Watkinson

Theo. G Ellis.

Inventor:

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2 Sheets—Sheet 2.

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Fig. 2

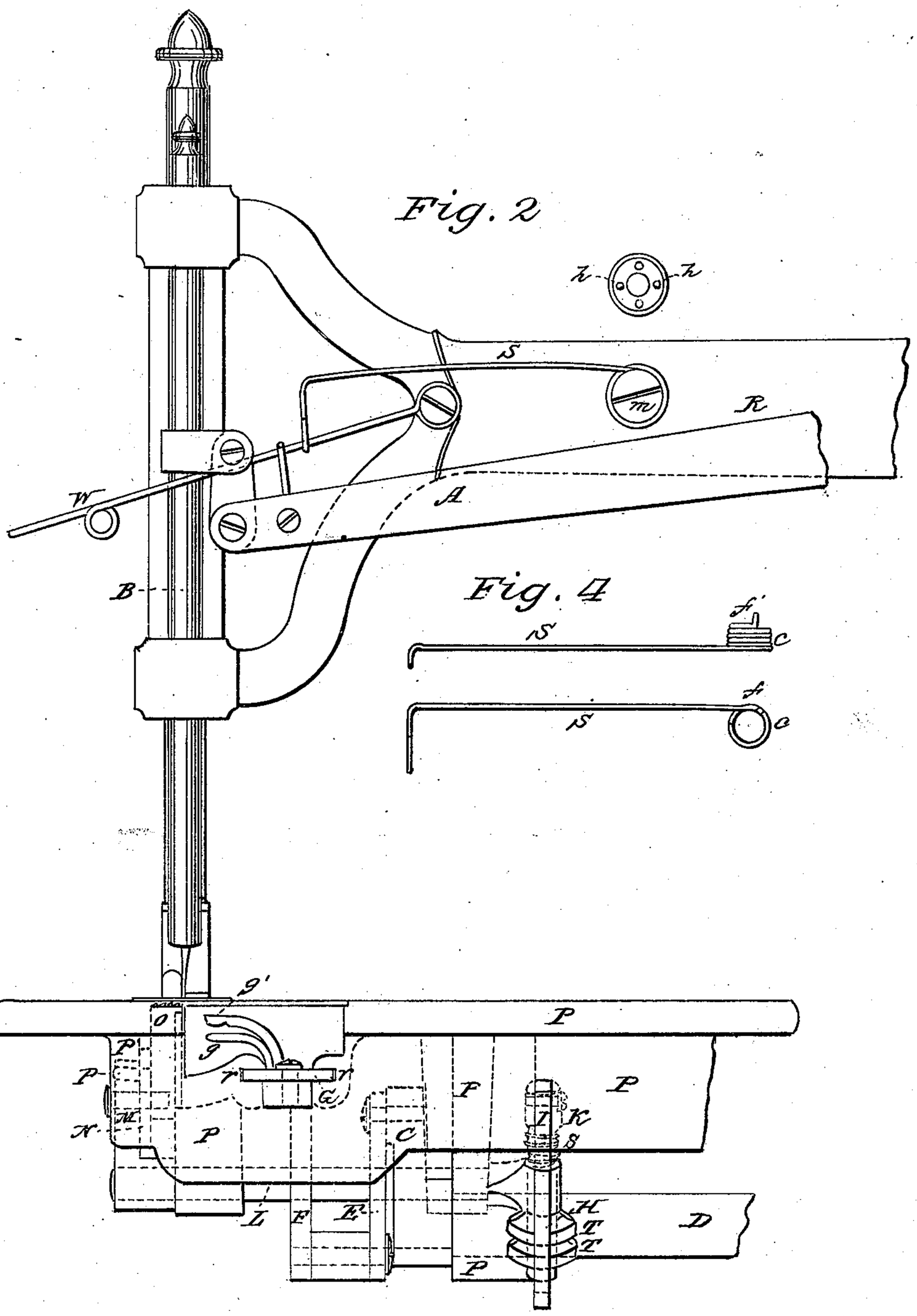

Fig. 4

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GEORGE A. FAIRFIELD, OF HARTFORD, CONNECTICUT.

Letters Patent No. 63,149; *dated March* 26, 1867.

IMPROVEMENT IN FEEDING MECHANISM FOR SEWING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE A. FAIRFIELD, of Hartford, in the county of Hartford, and State of Connecticut, have invented certain new and useful improvements in Sewing Machines; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

Figure 1 is a front elevation of the improved sewing machine, showing the several parts of the improved feed apparatus, as well as the parts for throwing the shuttle.

Figure 2 is a side elevation of the machine, showing the same parts as fig. 1, also the take-up wire and spring.

Figure 3 is a horizontal view of the shuttle-carrier detached.

Figure 4 shows a top and side view of the "take-up wire" spring.

P P is the plate to which the several parts of the machine are attached. A is the arm giving motion to the needle-bar B, and operating the "take-up wire" *w*. *s* is the "take-up wire" spring, held in its place by the screw *m*. R is part of the frame to which the above parts are attached. D is a rotating shaft carrying the crank C, which moves the shuttle-carrier G, by means of the connecting-rod E, and the arm F. H is an eccentric fixed upon the shaft D, acting by means of the eccentric-strap I, upon the lever K, which rocks the feed-shaft L. This shaft carries the feed-cam M, fixed upon its forward end. This cam is curved at the top eccentric to its centre of motion, having hooks at the ends, between which moves the pin *p*, attached to the feed-bar N. The feed-bar N is firmly connected to the feed-block O, and moves between slides P′ P′. At one end it has a slot, *d*, through which passes the screw-pin *n*, allowing a horizontal motion of the length of the slot. At the other end it rests, by means of the pin *p*, upon the curved upper surface of the cam M. *t* is a spring pressing the feed-bar N downward against its above-mentioned supports. The lever K passes through a socket or box in the shaft L, and is furnished at its lower end with two screw-nuts, T T, for lengthening or shortening that part of the lever above the shaft L. The upper nut is held against the box at the end of the feed-shaft by means of the spiral spring S, the lower nut serving to clamp the upper one when in the desired position. The parts of the machine not shown in the drawings may be of any ordinary construction that will produce the required up-and-down motion of the needle-bar B, and the rotary motion of the shaft D.

My invention consists, first, of the peculiar arrangement and construction of the parts producing the feed motion and regulating the length of the stitch.

The operation of the improved feed is as follows: In the drawings the position of the several parts shown is when the feed-bar N is drawn back to its fullest extent, and the feed is ready to rise and move forward for another stitch. The shaft D moving in the direction of the arrow, by means of the eccentric H and strap I, the top of the lever K is moved to the left, (fig. 1.) This acts, through the feed-shaft L, to move the curved upper surface of the cam M in the same direction. As the cam moves the pin *p* rises along its surface until it comes in contact with the hook *a*. By this motion the feed O is raised to the proper position for taking hold of the work being sewed by the machine. The cam M continuing its motion in the same direction, the hook *a* then takes hold of the pin *p* and carries it forward until the eccentric H has moved to a position opposite to that shown in the drawings, when the cam M has reached its farthest limit to the left. The feed O has then advanced the length of the stitch. The eccentric H continuing its revolution, now moves the top of the cam M to the right. The pin *p* leaves the hook *a* and moves downward, under the pressure of the spring *t*, along the curved upper surface of the cam M, which passes under it until it comes in contact with the hook *b*. This motion drops the feed-bar N and the feed O, and detaches it from the work. The cam M continuing its motion, the hook *b* then takes hold upon the pin *p* and carries it backward to the point of starting, in the position shown in the drawings. The length of the stitch is regulated by the screw-nuts T T, by which the length of the regulating lever K is adjusted. The shorter the arm of the lever is made, the greater will be the angular distance through which the cam M is moved by the revolution of the eccentric H. It will be observed that a certain definite part of the movement of the cam M is taken to raise and lower the feed-bar N. The rest of its motion controls the horizontal movement of the feed-bar N, and affects the length of the stitch. The shuttle-carrier G, which is attached to the arm F, and operated by the crank C, is constructed of one piece of metal punched out of a sheet of the proper thickness, and then struck up to the proper form by means of dies, instead of being cast or formed of two or more pieces, as is usually the case in other machines. It is attached by screws to the arm

F, after being completed. The form of the shuttle-carrier, with the parts *g g'*, for driving the shuttle, is shown in figs. 2 and 3. The shuttle is omitted in the drawings, to show the parts more clearly. The shuttle-race, *r r*, is cut through the plate of the machine from side to side, allowing the shuttle-carrier to be inserted and retained in the grooves without the aid of a gib or cap usually placed under the plate, and attached to it by screws lengthwise of the shuttle-race to retain the carrier in its place. The "hold-up wire" spring *s*, figs. 2 and 4, is constructed as follows: At the rear end of the spring, where it is attached to the frame of the machine, it is coiled into a spiral, *c*, having the end *f* turned out at right angles to form a pin for fixing the spring in position. This spiral part of the spring is inserted into a cavity formed to receive it in the arm R of the machine, and is held in its place by means of the screw *m*. The bottom of this cavity or receptacle has a number of small holes, *h h*, around its edge, to receive the pin *f* of the spring. The operation of the spring *s* is as follows: It is placed in the receptacle with the point *f* in one of the holes *h*; the screw *m* is then inserted and the spring hooked under the hold-up wire in the usual manner. Any required degree of stiffness of the spring can be given by placing the point *f* in the different holes *h*, in the bottom of the receptacle, so as to bend it down more or less before being hooked under the "hold-up wire," according as greater or less tension of the spring is desired.

Claim.

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

The combination of the eccentric H, operating upon a regulating lever K, rocking-shaft L, cam M, and feed-bar N, or their equivalents, to produce a four-motion feed, substantially as described.

I also claim the cam M, having an eccentric surface whereby the feed-bar is raised and dropped, and hooks or stops for producing a horizontal motion in the feed-bar.

G. A. FAIRFIELD.

Witnesses:

HENRY WATKINSON,

THEO. G. ELLIS.