

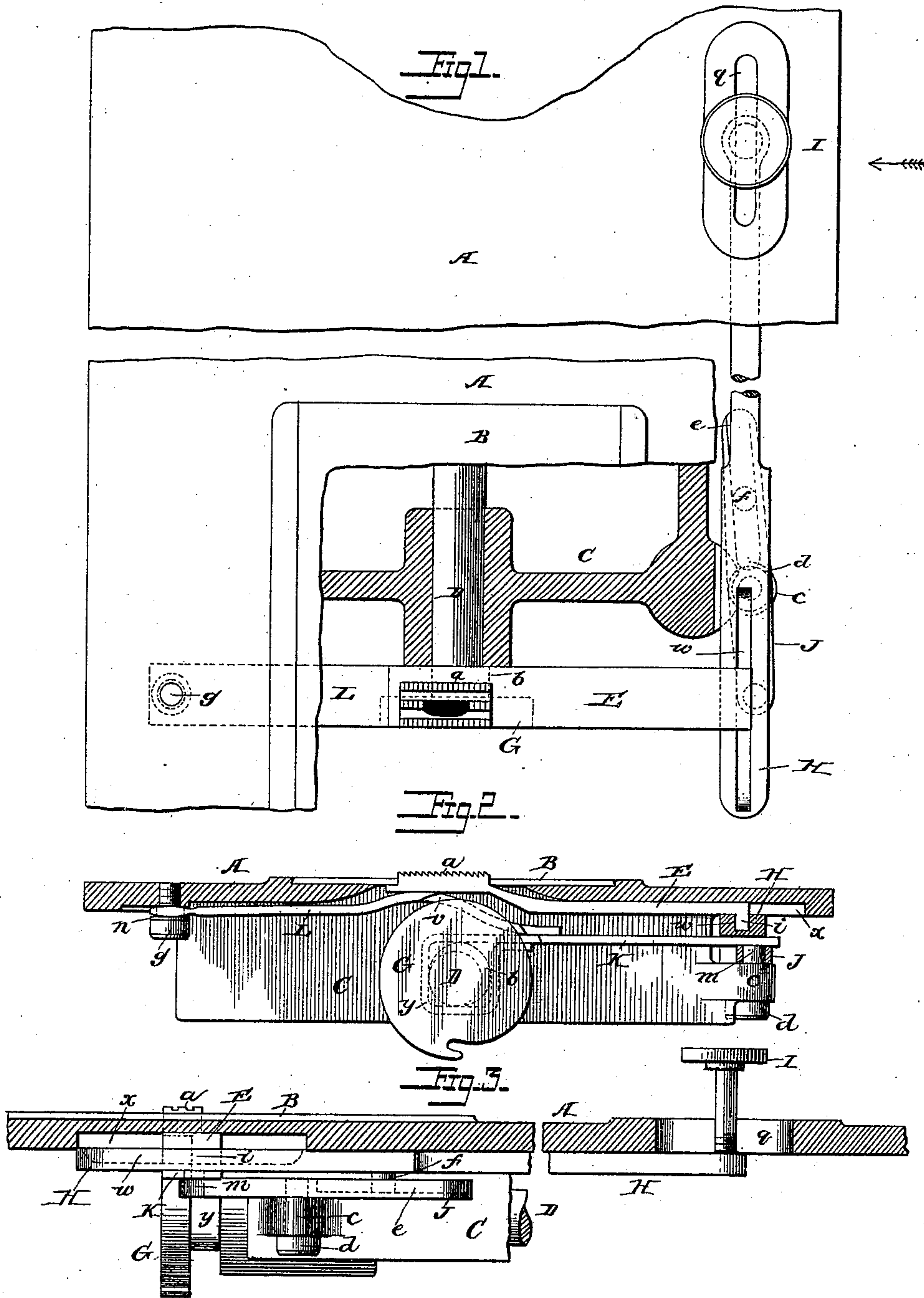
(No Model.)

S. W. WARDWELL, Jr.

FEEDING MECHANISM FOR SEWING MACHINES.

No. 355,735.

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# UNITED STATES PATENT OFFICE.

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## FEEDING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 355,735, dated January 11, 1887.

Application filed March 3, 1886. Serial No. 193,898. (No model.)

*To all whom it may concern:*

Be it known that I, SIMON W. WARDWELL, Jr., a citizen of the United States, residing at Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Feeding Mechanisms for Sewing-Machines, of which the following is a specification.

My invention is a feed device for sewing-machines in which both the vertical and longitudinal reciprocating movements of the feed-bar are imparted by a revolving cam; and my invention consists in interposing a lever between the driving-bar and feed-bar, so that while the longitudinal movement effected by the cam is of that extended character which is desirable in this class of devices, the vertical movement imparted by the same cam is greatly reduced.

My invention further consists in the arrangement of levers for transmitting motion from the driving-bar to the feed-bar.

In the drawings, Figure 1 is a part sectional plan of sufficient of a sewing-machine to illustrate my invention. Fig. 2 is a transverse section on the line 1 2, Fig. 1. Fig. 3 is a side view looking in the direction of the arrow, Fig. 1.

My improved feed may be used in connection with any form of sewing-machine. For the purpose of illustration, I have shown it in connection with the bed of a "Wheeler & Wilson" machine, A representing the bed of the machine, having a recess to receive the work-plate B, and below the bed is a cross web or flange, C, through which extends the shaft D, carrying at the forward end the usual revolving hook, G. The feed-dog *a* is carried by a horizontal bar, E, lying below the bed, in groove *x* thereof, the dog projecting through slots in the work-plate, and at the rear of the revolving hook G, upon the shaft D, is a cam, *b*, which imparts all the movements to the feed-dog. The bar E derives its longitudinal movement from a lever, H, pivoted at the rear end to a screw-stud, I, adjustable in a slot, *q*, in the bed of the machine, and having at the front end a groove or slot, *w*, which receives a pin, *i*, extending downward from the bar E.

To an ear, *c*, projecting from the plate A is pivoted by a pin, *d*, a lever, J, having at its

inner end a slot, *e*, to receive a pin, *f*, at the under side of the lever H, and at the outer end of the lever J is a hole to receive a pin, *m*, extending from a bar, K, having at the inner end a square frame or yoke, *h*, receiving the cam *b*.

The vertical movement of the feed-dog is imparted by the cam *b* through the medium of the driving-bar K and an intermediate lever, L, rocking at one end on a bearing-pin, *g*, bearing at the other end on the driving-bar K at a point between the cam and the pin *m*, and bent upward to form a bearing for the extreme end of the feed-dog. As the cam *b* revolves in the direction of its arrow it reciprocates the driving-bar K longitudinally, and thereby vibrates the levers J-H and reciprocates the feed-bar E, and it also reciprocates the lever L vertically, and thereby lifts and lowers the feed-dog.

To change the length of the horizontal movement of the feed-dog, the fulcrum of the levers may be changed. I prefer, however, the arrangement shown, where, by moving the screw-stud I in the slot *q*, the pin *f* is moved nearer to or farther from the fulcrum of the lever J.

It is most desirable in sewing-machines to have the needle as short as possible—and this depends on the length of its movement, which is governed by the operative distance of the hook or other thing which catches the needle-thread below the top of the plate—determined by the thickness of the plate and the thickness and vertical motion of the feed-dog. It therefore becomes desirable to reduce this motion and the thickness of the plate as much as possible and bring the hook as close as possible to the top of the work-plate. It is also desirable to use an operative cam for imparting the longitudinal motion which will give an extended throw, so as to lessen disparity of leverage and prevent multiplying play incident to wear; but when the cam is extended to impart such extended motion, and is also used directly, as usual, to impart the vertical movement, it is not possible to bring the latter movement within the limits required to lessen the length of the needle, as desired.

By the construction shown I secure all the movement required for the driving-bar with a minimum of vertical play for the feed-dog, yet use only a single driving-cam. Thus the cam *b* is constructed to give an extended throw



to the driving-bar K; but a much-diminished vertical movement (to the extent of one-half) is imparted to the feed-dog, owing to the arrangement of the lever L with its end bearing between the ends of the bar K and the bearing 5 between its ends for the end of the dog. The dog is thus brought as close to the revolving hook G as is possible to leave room for the vertical play of the dog, the intervention of 10 the lever L requiring no allowance for space, as the lever has a slot, *v*, for the passage of the hook.

The extent to which the feed-dog is projected above the work-plate may be regulated 15 by adjusting the lever L, which adjustment may be effected by turning the screw *g* to raise or lower the outer end of the lever, washers *n* being placed above or below the lever upon the screw to hold it in the position required.

20 The extent of the vertical movement of the dog may be varied by shifting the lever L longitudinally to change the points of its bearing upon the driving-bar and the dog. To effect this longitudinal adjustment, the screw *g* may 25 be adjustable in a slot, *x*, in the bed-plate.

I do not limit myself to the precise arrangement of levers H J shown in connection with the other features of the device, as these features may be used in connection with other intervening mechanism. 30

I claim—

1. The combination, in a sewing-machine, of a feed cam, a driving-bar bearing upon said cam and reciprocated longitudinally and vertically thereby, a feed-bar and lever connections 35 between the latter and the driving-bar, and a lever interposed between the feed-bar and driving-bar, and bearing upon each to reduce the vertical movement of the feed-dog, 40 substantially as set forth.

2. The combination, with the feed-bar and driving-bar and cam operating the latter to move it longitudinally and vertically, of a lever pivoted at one end, bearing with the 45 other end upon the driving-bar between the ends thereof, and having a bearing between

its ends for the feed-bar, substantially as set forth.

3. The combination of the feed-cam, driving-bar operated longitudinally and vertically 50 thereby, feed-bar and lever connections between the latter and the driving-bar for communicating longitudinal movements from one to the other, and a lever secured to an adjustable bearing at its outer end, having a bearing 55 between its ends for the feed-bar, and bearing upon the driving-bar between the ends thereof, substantially as set forth.

4. The combination of the feed-cam, driving-bar operated longitudinally and vertically 60 thereby, a lever, J, pivoted between its ends and connected to the driving-bar at one end, a feed-bar arranged above the driving-bar, and a lever, H, pivoted at the rear end, having a bearing upon the feed-bar and upon the lever 65 J, and adjustable longitudinally, substantially as set forth.

5. The combination, with the driving-bar and feed bar of a sewing-machine, of a lever, H, adjustable longitudinally and having a 70 bearing upon the feed-bar, and a lever, J, pivoted between its ends, connected at the outer end to the driving-bar, and having an elongated bearing at its inner end for a pin upon the lever H, substantially as set forth. 75

6. The combination, with the driving-bar and cam imparting both longitudinal and vertical reciprocating motions thereto, and with the feed-bar and connections between the same and the driving-bar, of a lever interposed between the feed-bar and driving-bar and bearing 80 upon each to reduce the vertical movement imparted by the cam to the feed-bar, substantially as set forth.

In testimony whereof I have signed my name 85 to this specification in the presence of two subscribing witnesses.

SIMON W. WARDWELL, JR.

Witnesses:

ROBERT MILLER,  
CHAS. H. REEVES.