(No Model.) 2 Sheets—Sheet 1.

C. W. DAVIS.

SEWING MACHINE.

No. 291,309. Patented Jan. 1, 1884.

Fig. 1.

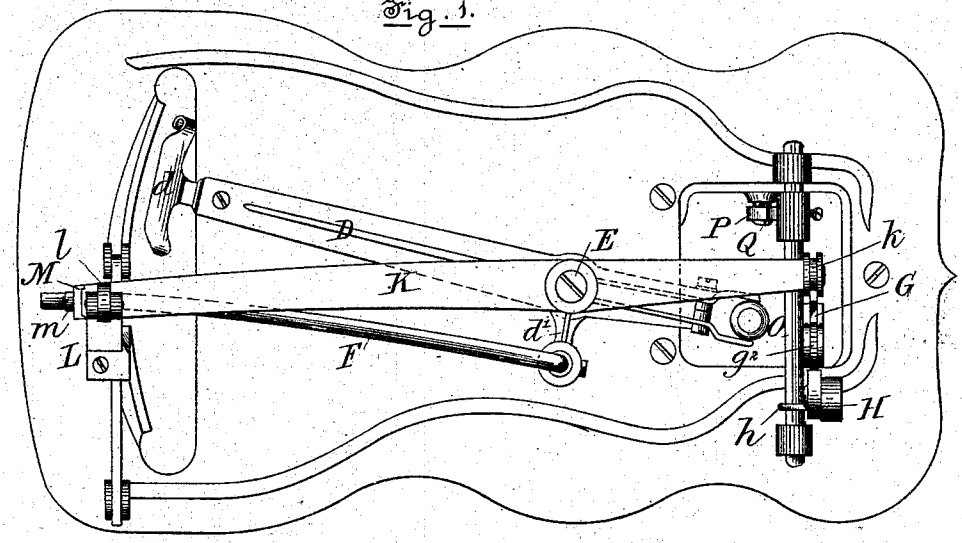


Fig. 2.

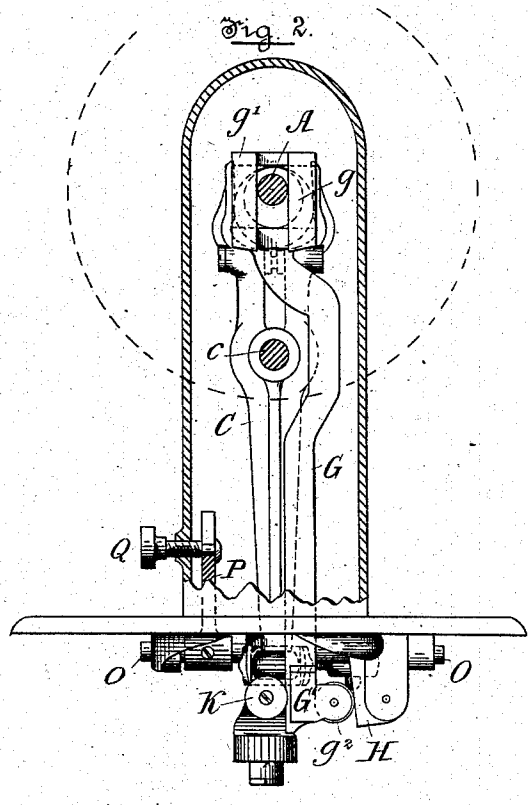


Fig. 4.

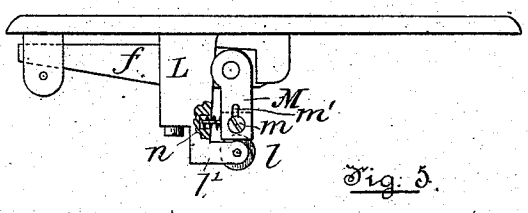
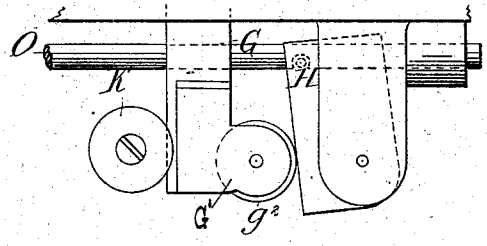


Fig. 5.



Witnesses:

J. A. Kennedy

H. G. Morey

Inventor

Charles Wesley Davis,

Per: R. A. Kellogg.

Atty.

(No Model.) 2 Sheets—Sheet 2.

C. W. DAVIS.

SEWING MACHINE.

No. 291,309. Patented Jan. 1, 1884.

Fig. 3.

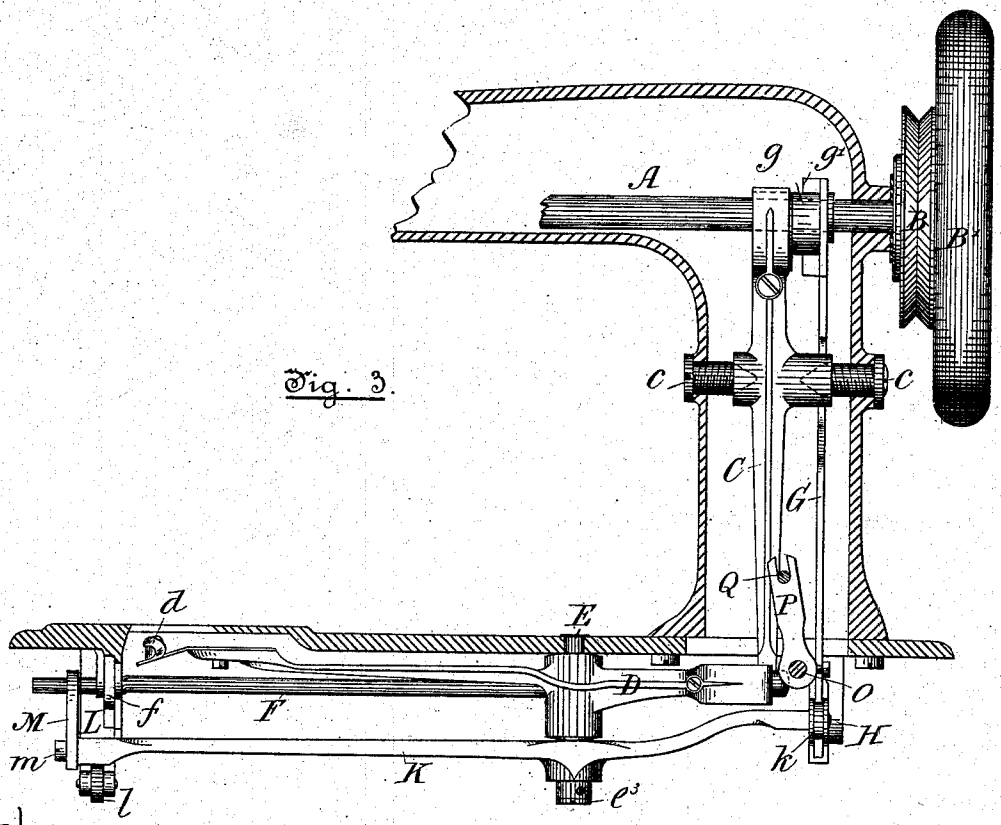


Fig. 6.

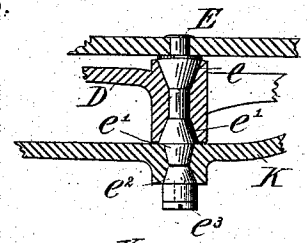


Fig. 7

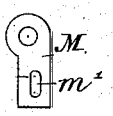


Fig. 8.

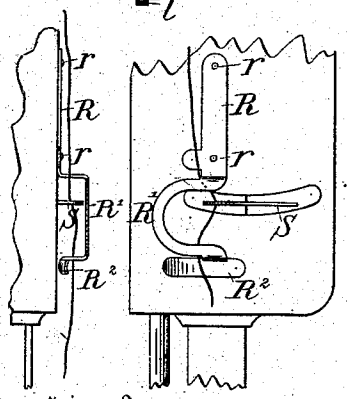
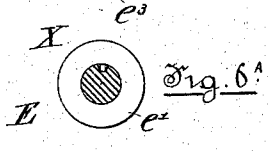


Fig. 9.

Fig. 6A



Witnesses
H. Kennie
F. C. Morey

Inventor
Charles Wesley Davis
Per. R. A. Kellam.
Atty

UNITED STATES PATENT OFFICE.

CHARLES W. DAVIS, OF MONTREAL, QUEBEC, CANADA, ASSIGNOR TO THE C. W. WILLIAMS MANUFACTURING COMPANY, OF SAME PLACE AND ROUSE'S POINT, NEW YORK.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 291,809, dated January 1, 1884.

Application filed December 19, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES WESLEY DAVIS, of the city of Montreal, in the district of Montreal and Province of Quebec, in the Dominion of Canada, 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 same.

My invention relates, mainly, to improvements in the mechanism used in sewing-machines to operate the feed, and in the means for regulating the length of stitch; but it also includes devices for insuring the easy running of the machine, and an improved self-threading attachment to be used in connection with the take-up.

For full comprehension of my improvements, reference must be had to the accompanying drawings, in which letters similar to those used in the following description indicate like parts, and where—

Figure 1 is a plan looking at under side of bed-plate of a sewing-machine embodying my improvements; Fig. 2, an end view, partly in section, and with balance-wheel removed; Fig. 3, a longitudinal sectional elevation; Fig. 4, a detail view of support-block, also showing push-spring; Fig. 5, an enlarged detail view, showing connection of regulating-shaft and inclined plane; Figs. 6 and 6^{A}, sectional detail views of axis or bearing for shuttle and feed levers; Fig. 7, a detail of adjustable link, Figs. 8 and 9, views of my self-threading device.

A is the main or driving shaft of the machine, B the driving-pulley, and B′ the balance-wheel, all arranged in the usual way.

C is a lever operated by a cam or eccentric on the driving-shaft, pivoted or hung on centers *c c*, and by means of a ball and fork, as at present, serving to give motion to the shuttle-lever D, which is pivoted at E to the bed-plate, as will be hereinafter more particularly described. (The shuttle-lever D is shown with only the usual shuttle-carrier, *d*, the shuttle having been omitted for the sake of clearness).

F is the push-rod, pivoted to a short arm, *d′*, on the shuttle-lever D, and bent at the other end, so that when it is pushed forward through its slot in the feed-bar *f* it raises same, and when it recedes the feed is drawn downward.

I lay no claim to any of the devices thus far described, as I am aware that they possess no novelty.

In addition to the lever C, I operate from the driving-shaft A, by means of a cam or eccentric, *g*, a pendent lever, G, provided at its upper end with a slot or cross-head, *g′*, for the cam *g* to work in, and the lower end of this lever G is enlarged, and provided with a pair of eyes, G′, in which a small roller, g^2, is journaled. This roller g^2 works upon an inclined plane, H, which is made adjustable by the means to be hereinafter described, for the purpose of regulating the length of stitch.

Upon the outer end of the axis or bearing E, carrying the shuttle-lever D, I mount a horizontal lever, K, which is actuated by the pendent or vertical lever G, to give the forward and backward motion to the feed, their connection being made by a grooved roller, *k*, secured to the end of the horizontal lever K, and impinged upon by the edge of the pendent lever G at its lower end, or immediately behind the eyes which carry the roller g^2, acting on the inclined plane H. My object in forming the roller *k* with a groove is to prevent the displacement of the vertical lever G and obviate lateral motion, and the roller in itself is intended to overcome the friction of contact. On the bed-plate is secured a support-block, L, having an arm, *l′*, in which is journaled an anti-friction roller, *l*. Upon this roller bears the forward end of the lever K. The lever K is connected to the push-rod by means of a link, M, (shown separately in Fig. 7,) which has a slot, *m′*. The end of the lever K is attached to the link by a screw, *m*, which is adjustable in the slot *m′*. The end of the rod F passes through a perforation in the upper end of the link M, and the motion of the lever is thus communicated thereto and to the push-rod, to which the feed-bar is connected, as before described, and as shown in Fig. 3. This link M is, as shown in Fig. 7, provided with an elongated slot, *m′*,

through which the set-screw *m* passes into the end of the horizontal lever K, a tongue and groove being preferably used in the connection of M and K. The function of the link is, first, to convey the motion (forward and receding) to feed from lever K; second, to produce the rise-and-drop motion in conjunction with rod F, and, third, to secure the vertical adjustment of the feed-dog by means of the slot *m'* and set-screw *m* above described.

In a recess formed in the support-block L, I place a spiral push-spring, *n*, (either with or without a spindle,) which bears against the end of the horizontal lever K, and serves to bring it back to position as the vertical lever G falls. The roller *l* allows the horizontal lever to move easily back and forth, but prevents all possibility of its springing downward, since it is placed directly underneath the feed. By this device I am enabled to insure certainty and regularity in the forward and receding motion of the feed; and it also provides, with the mechanism about to be described, easy and accurate means for regulating length of stitch.

Upon the inclined plane H, I form a projection or pin, *h*, which fits in a groove (or is attached in any similar way) made in a sliding bar, O, carried transversely in the frame or bed-plate and journaled therein. On this bar O, I mount rigidly an arm, P, projecting upward at right angles to O, and having its upper end bifurcated or slotted, so as to allow the grooved end of a regulating-screw, Q, to connect thereto, as shown particularly in Fig. 2. As will be seen by this arrangement, the regulating-screw Q can be placed so as to project through the arm, within convenient reach of the hand, on that side of the machine from which the operator generally works, and as it is turned in one direction or the other it acts through the arm P, bar O, inclined plane H, lower end of pendent lever G, grooved roller *k*, horizontal lever K, and the feed devices, to alter the length of stitch at will.

The axis or pivot E, upon which the shuttle-lever D and feed-lever K oscillate, is shown in detail in Figs. 6 and 6^A, where, upon the central pivot or spindle, which is grooved for some portion of its length, as shown at X, I form solid thereon a conical bearing, *e*, for the shuttle-lever D, which is then slipped on, after which I slip over the shaft a double cone, *e'*, its upper part serving as a bearing for the lower part of the lever D, and the lower half passing inside the hub or eye of the lever K, which is then put in place. Another cone, *e²*, is then slipped on, and the whole secured by a screw, *e³*. These cones are prevented from turning by means of projections or pins formed on same, which fit into the groove X in the spindle or shaft E, as shown in Fig. 6^A. The bearings or eyes in the two levers are of course turned to a section to correspond with the cones. By this arrangement I insure the easy and independent working or vibrating of each of the levers while mounted on the same axis and secured by one adjustment, all but a very small percentage of friction being entirely avoided, and the running of the machine rendered lighter in consequence.

My improved self-threading device is shown in Figs. 8 and 9, and may be thus described: Instead of the ordinary devices used for the thread before it passes over the take-up lever, I use a flat metal plate or wire of the shape shown, and fasten its upper part, R, to the face-plate of the machine by pins or screws *r r*, its middle part being curved, as shown at R', and made to stand out somewhat from the face-plate, its lower part, R², being again turned in close enough to the face-plate to just allow a thread to pass under it.

S represents the ordinary take-up lever, projecting through a slot in the face-plate. The thread is first brought down close to the left edge of the upper part, R, and passed underneath the lower projection, R², is then taken over the hooked end of the take-up lever S, back again under R², and then under the hook R' to the position shown in the drawings.

What I claim, and desire to secure by Letters Patent, is as follows:

1. In a sewing-machine, the combination of the shuttle-lever and push-rod and the pivoted lever K, operated independently from the driving-shaft and connected to the push-rod.

2. The combination of the driving-shaft and the pendent lever G with the incline H and the sliding bar O.

3. The combination of the pendent lever, the incline H, having the pin, the bar O, the arm P, and screw Q.

4. The combination, with the lever K, and with the pendent lever and connecting devices for giving said lever a horizontal oscillating movement, of the slotted link M, the set-screw, and the push-rod F.

5. The combination, in a sewing-machine, of the vertical reciprocating lever G, operated from the driving-shaft, and provided at its lower end with roller g^2, working on inclined plane H, with the horizontal vibrating lever K, mounted on the same axis as shuttle-lever D, provided with grooved roller *k*, impinging on vertical lever G at back end, and attached to link M, connected with feed devices at front end, said lever K being controlled by roller-support L and acted upon by push-spring *n*, the whole being capable of adjustment to regulate the length of stitch by means of bar O, operated through arm P by regulating-screw Q, substantially as described.

6. The combination of the plate R, having the curved offset R' and the free end foot R², elevated above the face-plate, with the take-up lever S, substantially as described.

C. W. DAVIS.

Witnesses:
R. A. KELLOND,
J. A. RENNIE.