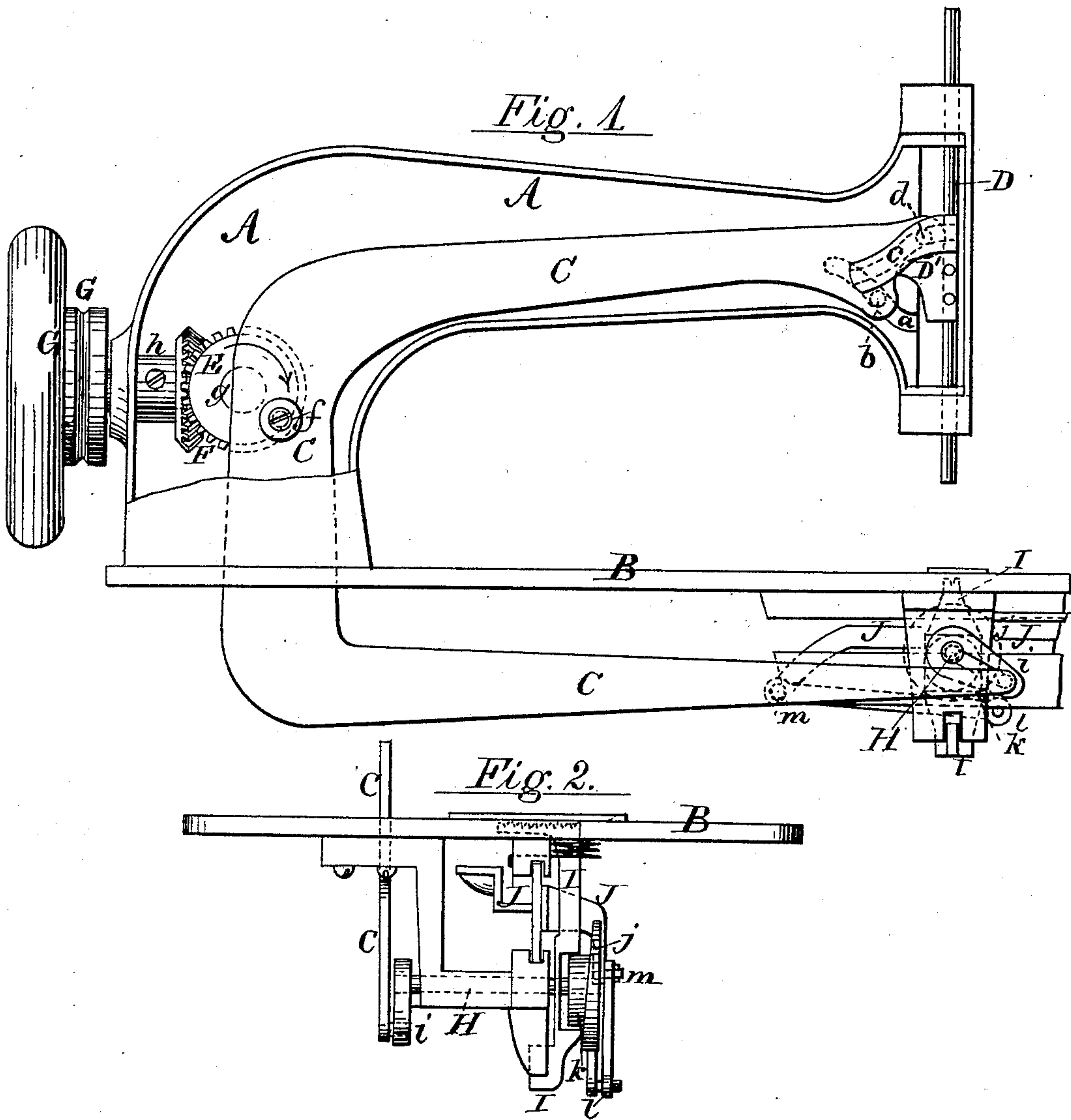


G. W. HUNTER.
Sewing-Machine.

No. 223,229.

Patented Jan. 6, 1880.



Witnesses:

Georgio
Henry Lafont

Inventor:

Geo. W. Hunter,
by *H. Bailey*
his Attorney.

UNITED STATES PATENT OFFICE.

GEORGE W. HUNTER, OF WASHINGTON, D. C., ASSIGNOR TO HIMSELF, HENRY M. BAKER, AND JAMES H. VERMILYA, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 223,229, dated January 6, 1880.

Application filed June 14, 1879.

To all whom it may concern:

Be it known that I, GEORGE W. HUNTER, of Washington, District of Columbia, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention is directed to means for imparting movement to the feed and the different members of the stitch-forming mechanism of a sewing-machine.

My object is to simplify the construction of the machine, to reduce the number of parts, and consequently the cost of manufacture, without detracting from the efficiency of the working parts.

The principal member of the movement-imparting mechanism is what I term the "driving-arm"—an arm, bar, or rod which has a movement of longitudinal reciprocation, and is connected at or near its front end to the machine-frame by a pin and slot or groove connection, which determines the path or course of the front end of said longitudinally-reciprocating arm. This driving-arm may be used to actuate the needle-bar, or the feed, or the shuttle, or other under member of the stitch-forming mechanism; or it may be used to actuate any two of said parts, or all of them, as desired.

When used to actuate the needle-bar, its movement of longitudinal reciprocation can be obtained in any suitable known way and by any suitable known means.

When used to actuate the feed or shuttle, it is necessary that its reciprocatory movement should be of a peculiar character, such as would result from a crank-connection with the frame at its rear end in conjunction with the pin-and-slot connection at its front, this being requisite in order to impart to the end of the arm back of or below said crank-connection a movement of vibration in addition to bodily back-and-forth movement, thus obtaining a compound movement which can be utilized to revolve a shaft below the bed-plate of the machine.

The nature of my invention and the manner in which the same is or may be carried into effect can, however, best be explained

and understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of so much of a sewing-machine as is needed to illustrate my improvements, with the side of the goose-neck removed in order to expose to view the working parts contained therein. Fig. 2 is a front elevation of the shuttle-driving and feed devices.

The machine shown in the drawings is a shuttle-machine, and the driving-arm is there represented as arranged to actuate the needle-bar and the shuttle-driving and feed-operating devices.

A is the goose-neck, and B is the cloth-plate, of the machine. In the goose-neck is the driving-arm, hereinbefore referred to, (marked C.) At or near its front end it is connected with the frame or goose-neck by a guide-pin and slot or groove connection, the groove *a* being, in this instance, formed in the frame, while the pin or roller-stud *b* is carried by the arm and projects into the groove.

The inclination and shape of the groove will determine the path of movement of the front end of the arm when said arm by proper means is moved back and forth longitudinally.

The arm, when used to actuate the needle-bar D, is connected with said bar by a pin and slot or groove connection also, the groove *c*, in this instance, being formed in a rearwardly-projecting piece, D', fast to the needle-bar, while the pin or roller-stud *d* for that groove is attached to and projects from the arm.

When the grooves *a c* are arranged with relation to one another as shown, and when the arm is reciprocated longitudinally, it will be seen that the back-and-forth movement of the pins *b d* in their respective grooves will cause the vertical reciprocation of the needle-bar, and that the extent of said movement will be determined by the inclination of both grooves, (or of either groove, supposing only one to be inclined,) in conjunction with the length of longitudinal reciprocation of the arm.

I prefer to arrange the grooves converging to the rear, as shown, and it is manifest that they may be so formed as to give to the needle-bar the proper dip, and such other charac-

teristics of movement as may be found necessary.

As hereinbefore stated, the longitudinal reciprocation of the driving-arm, so far as concerns its action on the needle-bar, may be effected by any suitable means. Inasmuch, however, as I use said arm to transmit motion to the moving parts below the cloth-plate, I mount it at its rear on a crank-pin, *f*, or its equivalent, such as an eccentric. The crank-pin may be mounted on any proper revolving body. In this instance it is a wrist-pin upon the face of a miter-gear, *E*, mounted on a stud, *g*, attached to the standard or goose-neck at right angles to the short driving-shaft *h*, which is driven by belting connected with the pulley and fly-wheel *G*, and has keyed to it a miter-gear, *F*, which meshes with gear *E*. When, therefore, the crank revolves, the rear end of the driving-arm will have an up-and-down as well as back-and-forth movement. It is held, indeed, by the crank *f* at one end and the pin *b* at the other, these points constituting what may be called "fulera," neither of which is stationary or at rest when the machine is in operation. I thus obtain for that part of the driving-arm back of or below the crank-pin an oscillatory or vibratory motion, which can be availed of to actuate the feed or the shuttle operating devices beneath the cloth-plate. This I prefer to accomplish by making the arm solid and in one piece, of yoke form, continuing it from the crank-connection vertically down below the bed-plate, and thence horizontally, or nearly so, thereunder, extending it far enough forward to connect with a crank-arm, *i*, on a cross-shaft, *H*, secured in proper bearings on the under side of the cloth-plate, and carrying on its opposite end the face-cam *j* and eccentric or peripheral cam *k*, for giving the up and forward movements to the feed-dog *I*.

To a radial extension on the face-cam *j* is jointed a connecting-rod, *l*, jointed at its other end to the reciprocating shuttle-carrier *J* at *m*.

It is not necessary to enter into the details of the construction and arrangement of the shuttle-carrier or the feed-dog and its operating devices, these being of the usual and well-known character.

The lower front end of the yoke-shaped driving-arm is provided with a laterally-projecting pin or roller-stud, *n*, which enters a slot in the crank-arm *i*.

When the machine is in motion, the crank *f* revolving in the direction of the arrow, it will be seen that the under branch of the yoke-shaped arm will have a combined up-and-down and longitudinal to-and-fro movement, which will cause its front end to move in an approxi-

mately-circular path, the shape of its orbit or path of movement being determined by the relative position of the points *f* and *b*, which vary constantly during each revolution of the driving-crank. By reason of this movement the arm is caused to revolve the crank-arm *i*, and consequently the shaft *H*. I thus, through the instrumentality of the one driving-arm, actuate both the needle-bar and the active members of the sewing mechanism, which are beneath the cloth-plate.

Having now described my improvements, what I claim, and desire to secure by Letters Patent, is as follows:

1. In combination with the needle-bar, the longitudinally-reciprocatory driving-arm connected at its front end with the goose-neck or frame and the needle-bar by pin and slot or groove connections, positioned with respect to one another substantially as set forth, whereby the traversing movement of the pins in their respective grooves due to the longitudinal reciprocation of the arm shall effect the vertical reciprocation of the needle-bar.

2. In combination with the driving-crank or its equivalent and the goose-neck or frame, the driving-arm mounted at its rear end on said crank and connected at its front end with said goose-neck by a pin and slot or groove connection, said crank and pin constituting the movable fulera of said arm, substantially as set forth.

3. The driving-arm mounted on movable fulera, as described, in combination with the vertically-movable needle-bar and the pin and slot or groove connection between said bar and arm, substantially as and for the purposes set forth.

4. The yoke-shaped driving-arm mounted on movable fulera, as described, in combination with the shuttle or feed, or both shuttle and feed, operating shaft connected with and rotated by the lower branch of said driving-arm, substantially as set forth.

5. The yoke-shaped driving-arm mounted on movable fulera, as described, in combination with the needle-bar, connected with the upper branch of said driving-arm by a pin and slot or groove connection, and the shuttle or feed, or both shuttle and feed, operating shaft connected with and rotated by the lower branch of said driving-arm, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEO. W. HUNTER.

Witnesses:

J. M. R. JERMON,
J. W. JERMON.