2 Sheets—Sheet 1.

H. A. GORN.

Feeding Device for Sewing-Machine.

No. 211,564. **Patented Jan. 21, 1879.**

FIG. 1.

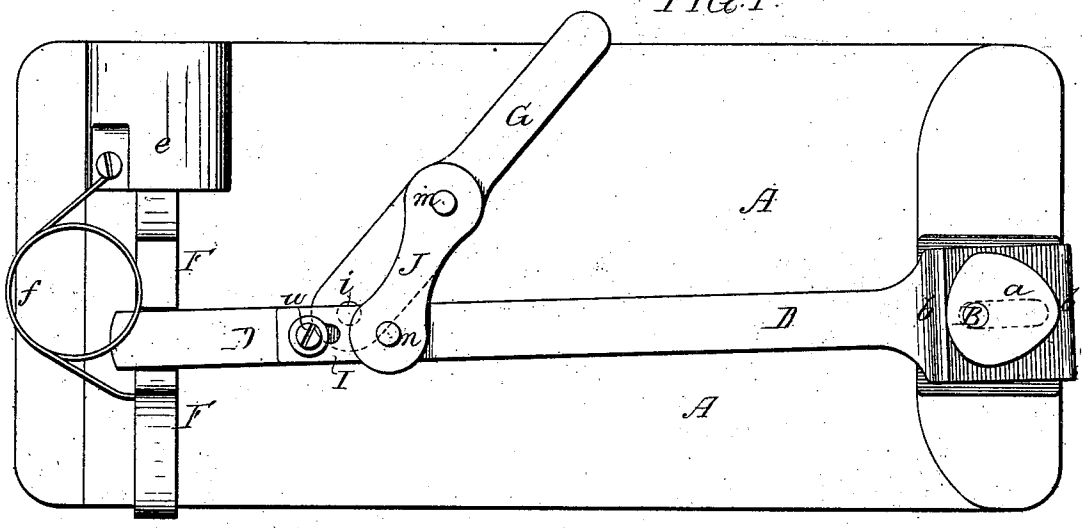


FIG. 2.

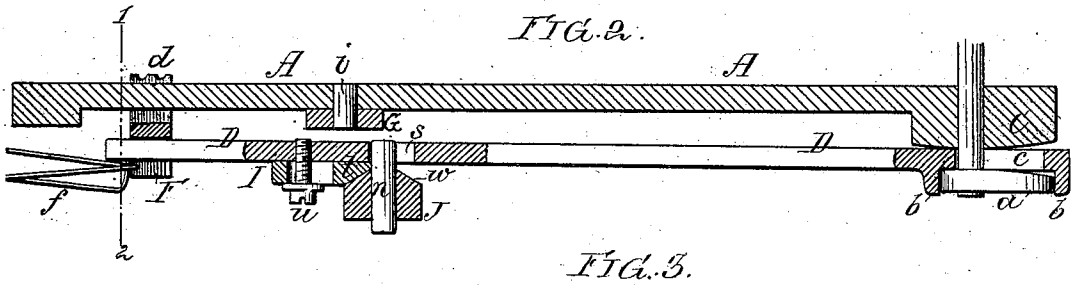


FIG. 3.

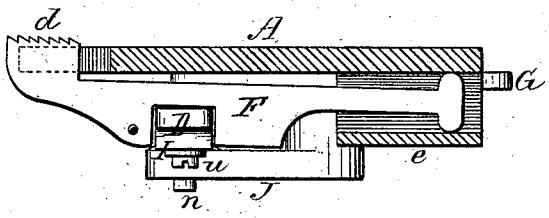


FIG. 4.

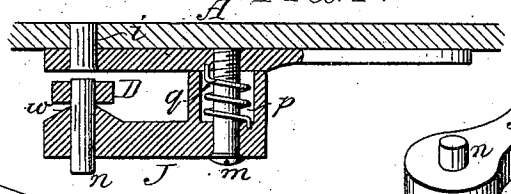


FIG. 5.

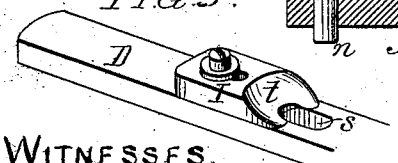
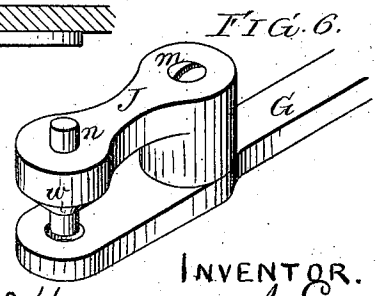


FIG. 6.



WITNESSES.

Henry Howson Jr.

Harry Smith

INVENTOR.

Hermann A. Gorn

by his attorneys,

Howson and Son

2 Sheets—Sheet 2.

H. A. GORN.

Feeding Device for Sewing-Machine.

No. 211,564. **Patented Jan. 21, 1879.**

FIG. 7.

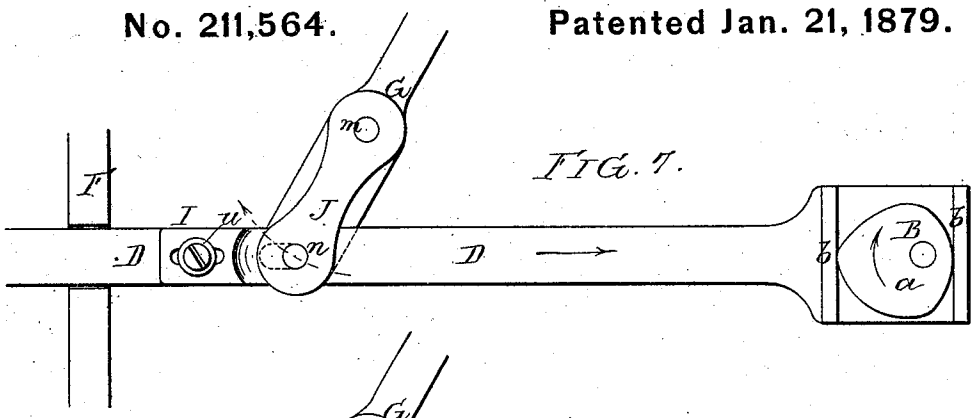


FIG. 8

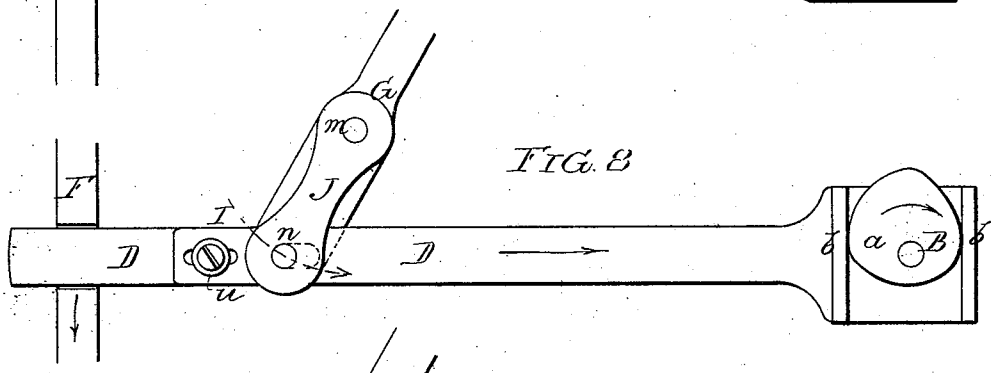


FIG. 9.

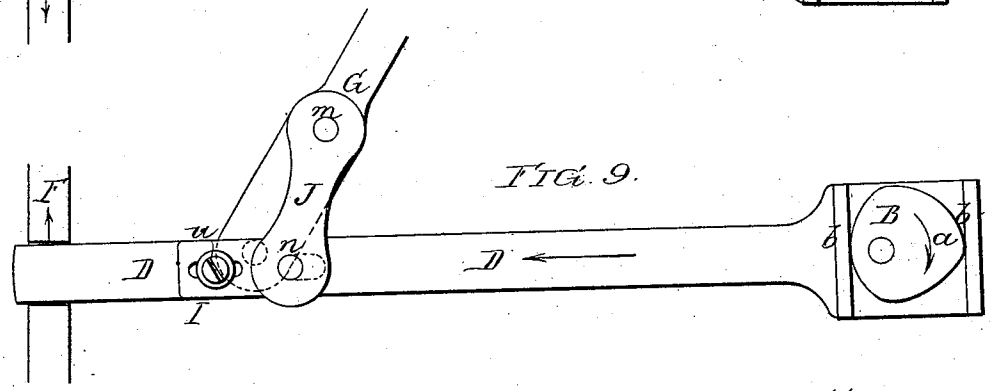


FIG. 10.

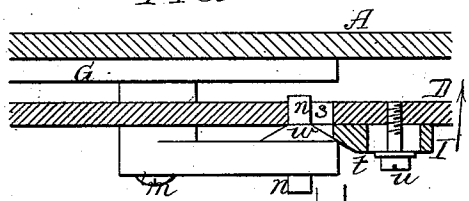


FIG. 11.

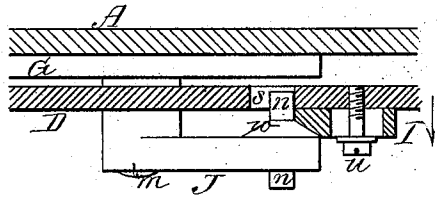
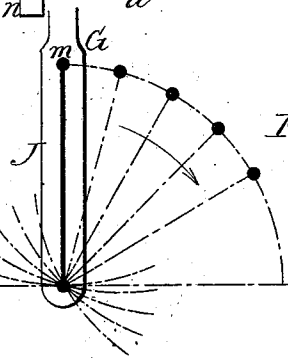


FIG. 12.



WITNESSES

Henry Howson Jr.

Harry Smith

INVENTOR

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by his attorneys

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UNITED STATES PATENT OFFICE.

HERMANN A. GORN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN FEEDING DEVICES FOR SEWING-MACHINES.

Specification forming part of Letters Patent No. **211,564**, dated January 21, 1879; application filed November 11, 1878.

To all whom it may concern:

Be it known that I, HERMANN A. GORN, of Philadelphia, Pennsylvania, have invented a new and useful Improvement in Feed-Motion and Stitch-Regulating Devices for Sewing-Machines, of which the following is a specification:

The main object of my invention is to operate a four-motion feed with a single rotating cam, a further object being to provide a simple device for regulating the throw of the feed, and consequently the length of stitch. These objects I attain in the following manner, reference being had to the accompanying drawings, in which—

Figure 1, Sheet 1, is an inverted plan view of a sewing-machine bed-plate, showing my improved feed-motion and stitch-regulating device; Fig. 2, a vertical section of the same; Fig. 3, a transverse section on line 1 2, Fig. 2; Figs. 4, 5, and 6, detached views of parts of the device; and Figs. 7, 8, 9, 10, 11, and 12, Sheet 2, diagrams illustrating the operation of the device.

A represents the bed-plate of a sewing-machine, to a suitable bearing, C, near one end of which is adapted the vertical driving-shaft B, the lower end of the latter carrying a cam, *a*, which acts on ribs *b b* on the enlarged rear end of a bar, D, so as to reciprocate the latter as the shaft B revolves, the end of the bar having a slot, *c*, formed in it, through which slot the shaft passes, as shown in Fig. 2.

The under side of the bearing C on the bed-plate A and the upper surface of the cam *a* are rounded, as shown in Fig. 2, so as to permit the vertical vibration of the front end of the bar D. This front end of the bar D is adapted to a slot in a feed-bar, F, which carries at one end the serrated feed-block *d*, and is provided at the other end with a T-head having rounded ends, this head being adapted to a box, *e*, on the under side of the bed-plate A, so as to permit the combined vibrating and reciprocating movement of the feed-bar F necessary in producing the four movements of the feed-block *d*. A spring, *f*, acts on the feed-bar F, so as to keep the base of the slot in the same constantly in contact with the upper edge of the bar D.

To the under side of the bed-plate A, at the point *i*, is pivoted an arm, G, and to the latter is hung by a pin, *m*, one end of a shorter arm, J, the opposite end of which carries a pin, *n*, adapted to a slot, *s*, in the bar D. This end of the arm J has a conical upper surface, *w*, which is arranged to act, as described hereinafter, on the inclined segmental end *t* of a block, I, the latter being secured to the bar D by a screw, *u*, the stem of which is adapted to a slot in the block, so as to permit the longitudinal adjustment of the latter, for the purpose rendered apparent hereinafter.

The pivoted end of the arm J has a chamber, *p*, formed therein, and within this chamber and surrounding the pivot-pin *m* is a spiral spring, *q*, the tendency of which is to so retain the arm J that an effort is required in order to effect the vibration of the same.

The operation of the device will be understood on reference to Figs. 7, 8, 9, 10, and 11, Sheet 2, Figs. 7, 8, and 9 being inverted plan views, and Figs. 10 and 11 vertical sections of parts of Figs. 7 and 8. When the parts are in the position shown in Figs. 7 and 10, the feeding-block *d*, at the end of the feed-bar F, is at the limit of its downward and rearward movement, and the pin *n* of the arm J rests against the rear end of the slot *s* in the bar D, the conical surface *w* of the end of the arm resting on the inclined segmental end of the block I at or near the base of the incline. As the cam *a* is rotated in the direction of the arrow, a rearward movement is imparted to the bar D, the first effect of this movement being the elevation of the front end of the feed-bar F, and consequently of the feed-block *d* on the feed-bar, owing to the action of the conical surface *w* of the arm J on the inclined segmental end *t* of the block I, while the pin *n* is traversing the slot *s* from the rear to the front end of the same. As soon as the front end of the slot comes into contact with the pin *n*, however, as shown in Fig. 11, the vertical movement of the bar D ceases, and its rearward movement is imparted to the arm J, which turns on its pin *m*, so that its free end moves in the arc of a circle, as shown by the arrow in Fig. 8. The effect of this movement is to impart a lateral vibration in the direction of the arrow to the bar D, and said lateral vibration is transmitted to the feed-bar F, caus-

ing the latter to reciprocate, so that its feed-block *d* moves the work forward. The rearward movement of the bar D is continued until the cam *a* reaches the position shown in Fig. 9, when, upon further rotation of the cam in the direction of the arrow, a forward movement of the bar takes place. The first effect of this movement is exactly the reverse of that which followed the commencement of the rearward movement of the bar—that is to say, the pin *n* traverses the slot *s* from front to rear, the inclined segmental end of the block I meantime sliding on the conical surface *w* of the arm J, so as to permit the outer end of the bar D to fall, the feed-bar F following the same, and thus lowering the feed-block *d*.

When the rear end of the slot comes into contact with the pin *n* the free end of the arm J is caused to move in the arc of a circle indicated by the dotted line in Fig. 7, thus imparting to the bar D a lateral vibration in a direction the reverse of that before imparted, the effect of this vibration being the rearward movement of the feed-bar F and the retraction of the feed-block *d* to its first position. The parts are now again in the position shown in Figs. 7 and 10, and on the further rotation of the cam *a* the above-described operations are repeated.

The object of the spring *q* at the pivot of the arm J is to prevent the swinging of the free end of said arm by the action of the end *t* of the block I at the first part of the rearward movement of the bar D, the spring serving to hold the arm J in position until a decided force is exerted upon the pin *n* by contact of the same with the end of the slot *s*.

The block I is, as before remarked, rendered adjustable on the bar D, so that the relation of the inclined end *t* of the block to the conical surface *w* of the arm J may be changed, in order to vary the extent of vertical vibration of the front end of the bar D, and thereby govern the extent to which the feed-block *d* of the feed-bar F is allowed to project above the surface of the bed-plate A. Thus, if the incline *t* is acted upon by the conical surface *w* during the time the pin *u* is traversing the entire length of the slot *s*, the bar D will be vibrated vertically to the full extent; but if the inclined surfaces act on each other during a less extent of movement the vibration of the bar will be less.

The extent of the lateral movement of the feed-block *d* of the feed-bar F, due to the lateral vibration of the bar D, is governed by the position of the pivot *m* of the arm J in respect to the longitudinal axis of the bar D.

As will be observed in the diagram, Fig. 12, when the pivot *m* of the arm J occupies a position at right angles, or thereabout, to the axial line *x* of the bar D, the arc in which the free end of the arm moves is almost in line with said axis, and consequently little or no vibration is imparted to the bar D by the vibration of the arm J. As the position of the pivot *m* is shifted in the direction of the arrow, however, the arc in which the end of the arm J moves assumes a more and more obtuse angle in respect to the line *x*, and the extent of vibration of the bar D, due to the vibration of the arm J, correspondingly increases.

As the pivot *m* of the arm J is carried by the pivoted arm G, it follows that the length of throw of the feed-block *d*, and consequently the length of the stitch, can be readily governed by the simple movement of said arm G.

It will be observed that the end of the bar D fits closely in the slot in the feed-bar F, so that there is no lost motion in the transmission of movement, the parts working evenly and without shock or jar.

I claim as my invention—

1. The combination of the feed-bar F and its feed-block *d*, the bar D, having a slot, *s*, and block I, with inclined end *t*, devices for reciprocating said bar, as described, and the pivoted arm J, having a pin, *n*, adapted to the slot *s*, and a conical surface, *w*, adapted to act on the inclined end of the block I, as set forth.

2. The combination of the bar D with the pivoted arm J, and with means whereby the pivot-pin of said arm can be adjusted to different positions in respect to the bar, all substantially as specified.

3. The combination of the bar D with the pivoted arm J and the pivoted arm G, carrying said arm J, as specified.

4. The combination of the bar D, having a slot, *s*, and cam-block I, the pivoted arm J, having a conical surface, *w*, and pin *n*, and the spring *q*, for acting on said arm J, as set forth.

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

HERMANN A. GORN.

Witnesses:
ALEX. PATTERSON,
HARRY SMITH.