2 Sheets—Sheet 1.

J. O'NEIL.

SEWING-MACHINE.

No. 184,477. Patented Nov. 21, 1876.

Fig. 5.

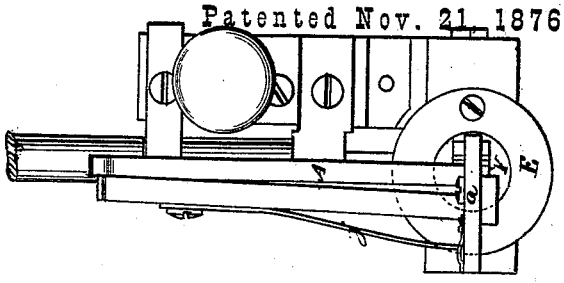


Fig. 2.

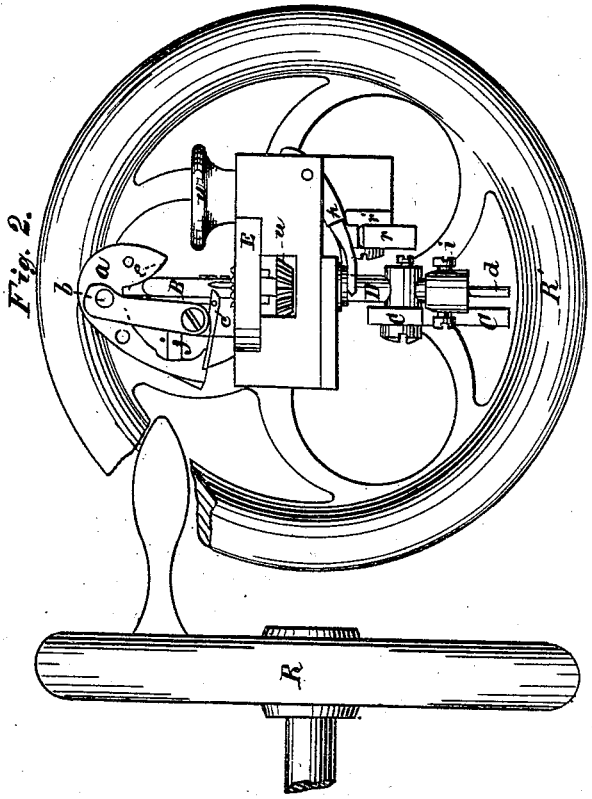


Fig. 8

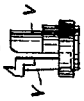


Fig. 10.

Fig. 12.

Fig. 9.

Fig. 11.

Fig. 4.

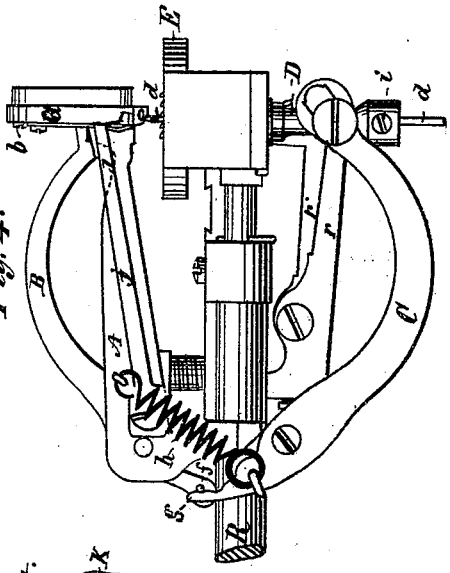


Fig. 1.

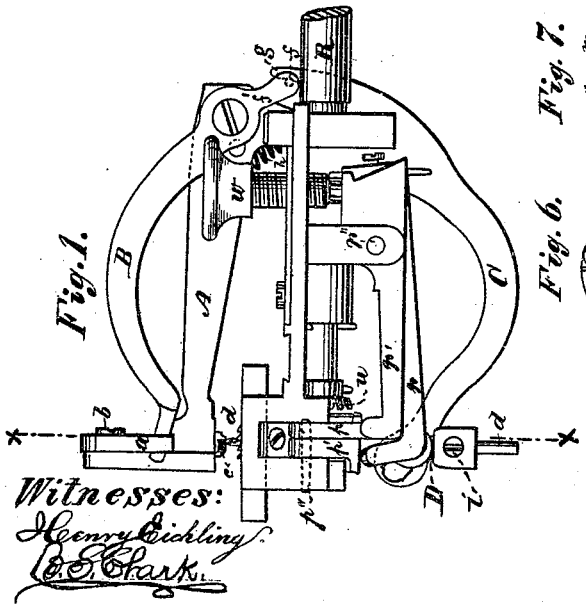


Fig. 7.

Fig. 14.

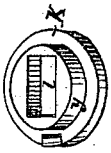
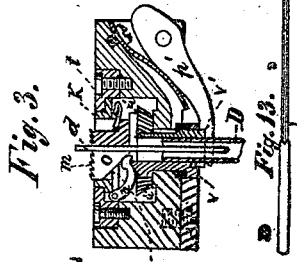


Fig. 6.

Fig. 3.



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2 Sheets—Sheet 2.

J. O'NEIL.

SEWING-MACHINE.

No. 184,477. Patented Nov. 21, 1876.

Fig. 16.

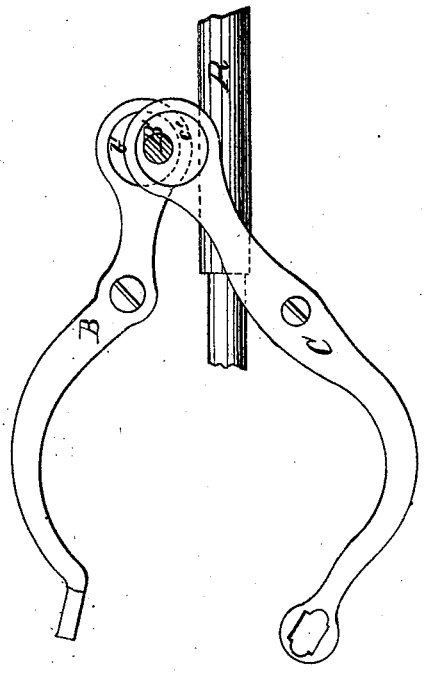


Fig. 17.

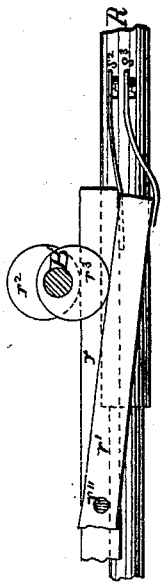
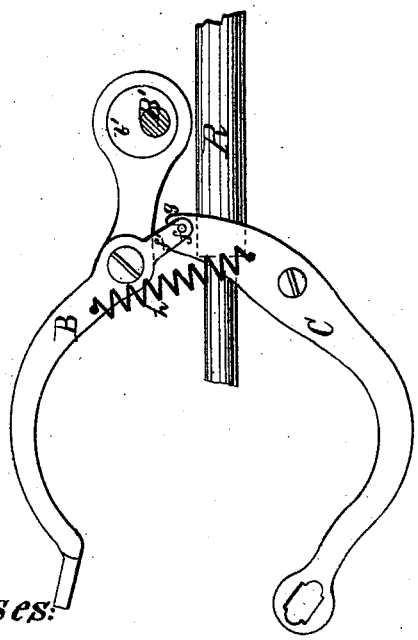


Fig. 18.



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UNITED STATES PATENT OFFICE.

JOHN O'NEIL, OF NEW YORK, N. Y.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **184,477**, dated November 21, 1876; application filed January 10, 1876.

To all whom it may concern:

Be it known that I, JOHN O'NEIL, of the city, county, and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof, in which—

Figure 1 is a side elevation of a machine embodying my invention. Fig. 2 is an end view of the same. Fig. 3 is a vertical section on line *x x*, Fig. 1. Fig. 4 is an elevation, showing the reverse side of Fig. 1. Fig. 5 is a plan of said machine. The figures from 6 to 14 (except Fig. 13) inclusive are detail views of the parts composing the feed mechanism, to be particularly described hereafter. Fig. 13 is a view of the needle. Figs. 15 and 16 are side elevations of the crochet-hook bar and needle-bar, and show mechanical devices which may be employed to operate the same. Fig. 17 is a similar view of the levers *r r'*, and shows a mechanical device by which said levers may be operated.

My invention relates to a machine designed for sewing and crocheting, in which the needle and needle-bar work underneath the cloth, the needle being thrust through the cloth from below, in conjunction with a vibrating crochet-hook operating above to form a crochet-stitch on the upper surface of the cloth; and consists of the combination of the devices hereinafter claimed.

The several moving parts are mounted upon the ordinary sewing-machine frame A. B is a vibrating bar, which gives motion to the crochet-hook cam *e*, and may also be made to actuate the needle-bar C. To this bar B motion may be given from the driving-shaft B', which has bearing in the frame and at right angles to and above the hereinafter-described rotating shaft R, as seen in Fig. 15. Upon the driving-shaft is fixed an eccentric, *b'*, to which the end of the bar is yoked, as shown. It is pivoted at *b* in the head of the frame, and is rocked on its pivot by the bar B acting upon the curved surface *e*, so as to swing the hook *c* toward the point of the needle *d*. It is rocked in the opposite direction by a spring, *j*. Motion is given to the needle-bar C by means of a pin, *f*, in the short arm *f'* of the bar B acting on the short arm *g* of said bar C in conjunction with the spiral spring *h*. I prefer, however, in constructing my machine, to operate both the bar B and bar C by a positive motion, as shown in Fig. 16, the end of each bar being yoked to an eccentric, *b'* and *c'*, respectively, on the driving-shaft B', the rear ends of the bars B and C being, of course, extended backward over the frame of the machine to the said driving-shaft, and not arranged as shown in other parts of the drawings. The needle *d* is carried in the shaft D, to which a reciprocating motion is given by the bar C. This shaft is hollow, the needle extending through it, and is held by a set-screw, *i*. K is the feed-carrier. The under surface is shown in perspective in Fig. 6, and its upper surface in Fig. 14. It consists of a metallic disk, having an oblong opening, *l*, through it. At one end of the opening is a short curved lever, *n*, pivoted near the periphery of the disk upon which it swings within said opening. *m* is the feed-bar, which has the peculiar shape. (Shown plainly in Fig. 7.) The body *o* of this feed-bar is placed in the opening *l* in the carrier K, and works back and forth in it to give the feed, as seen in Fig. 3, it being thrown forward by the action of the lever *n* against the inclined face *s* of the bar, and in the opposite direction by the spring *t*. The bar is thrown upward to engage the cloth, and the lever *n* is forced against the inclined surface *s* to push the bar forward in the act of feeding by means of a sectional sleeve. (Shown in detail in Figs. 8 to 12, inclusive.) It consists of two sections, *v v'*. The base of each is a ring, that on *v'* being made to fit into *v*, and the stem that rises from each ring being the segment of a hollow cylinder. They are put together, as seen in Fig. 8, and placed on the upper end of the shaft D, as seen in section in Fig. 3. They extend upward, so that the upper end of *v'* is in contact with the under face of the bar *m*, and that of *v* with the under side of the lever *n*. *p p'* are two levers, pivoted in the frame of the machine at *p''*. A side view of one of these levers is shown in Fig. 3; the other lies immediately behind it. The end of one of these levers rests against the under surface of the ring on section *v*, and the other against that on section *v'* of the sectional sleeve. *r r'* are

two levers, pivoted at r'', by which the levers $p\ p'$ are actuated. Motion may be given to these levers $r\ r'$ from the main shaft of the machine, or from the needle-bar in any suitable way, so as to actuate the feed in conjunction with the other movements of the machine. I prefer to give motion to these levers $r\ r^1$ by means of the eccentrics r^2 and r^3, respectively, fixed on the driving-shaft B′, which engage the rear ends of the levers, and against which the levers are held by springs s^2 and s^3 secured to the frame of the machine, as shown in Fig. 17. The ends of the levers are, of course, extended backward within the frame under or in line with the said driving-shaft, in furtherance of this construction, and not as shown in other parts of the drawings. w is a set-screw, by which the range of vibration of the levers r^1 is limited, and thereby the feed regulated.

R is a rotary shaft, having its bearings in the frame of the machine. On the inner end is fixed a beveled gear, u, which works into the bevel-gear w'. The latter is placed loosely upon the upper end of the sectional sleeve $v\ v'$, so that the said sleeve may slide vertically in said gear, but must revolve with it. The feed-bar m rests upon the upper face of this gear w', and a short stud or pin projecting therefrom, by the side of the said bar, causes it, and with it the feed-carrier K, to revolve with said gear. R′ is a hand-wheel fixed on the shaft R, by which it may be conveniently rotated. The circular projection y on the upper face of the feed-carrier fits loosely into a circular opening in the face-plate E, as seen in Fig. 5, permitting the former to rotate freely.

By this arrangement, it is evident that the direction of the feed may be changed at the pleasure of the operator, by rotating the shaft R, whereby a complete revolution, or any desired part of a revolution, may be given to the carrier K, and with it the several conjoined parts by which the feed is effected. The needle which I employ in the machine (shown in Fig. 13) has a longitudinal groove extending its entire length, thus permitting the thread to be passed up from its lower end by its side through the shaft D, and run freely in said groove.

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

1. The combination, in a sewing-machine, of the feed-carrier K, the feed-bar m, the lever n, the spring t, the shaft D, the sectional sleeve v and v', and levers $p\ p'$, constructed to operate as and for the purpose described.

2. The combination, in a sewing-machine, of the feed-bar m, sleeve v, levers r^1 and p, and set-screw w, as and for the purpose described.

3. The combination of the vibrating bars C and B, the shaft D, the cam-lever b, and the crochet-needle c, as and for the purpose described.

4. The combination of the hollow shaft D and the needle d, provided with a longitudinal groove extending its entire length, as and for the purpose described.

5. The combination, in a sewing-machine, of the feed-bar m, feed-carrier K, bent lever n, sleeve v, and levers $r^1\ p$, as and for the purpose described.

In witness whereof I have hereunto set my hand this 27th day of December, 1875.

JOHN O'NEIL.

Witnesses:
B. S. CLARK,
HENRY EICHLING.