2 Sheets—Sheet 1.

J. N. McLEAN.

SEWING MACHINE.

No. 105,961. Patented Aug. 2, 1870.

Fig. 1

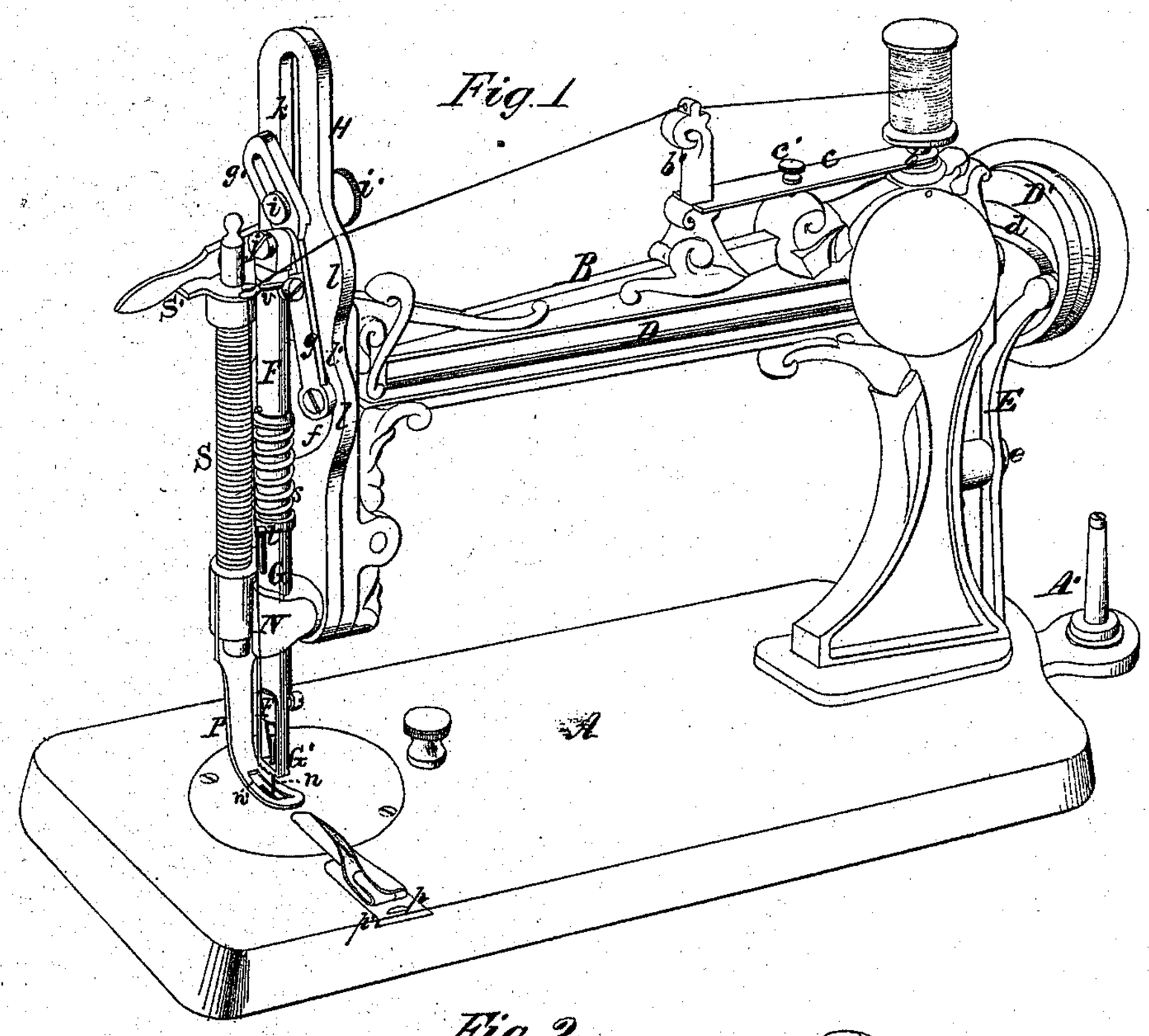


Fig. 2

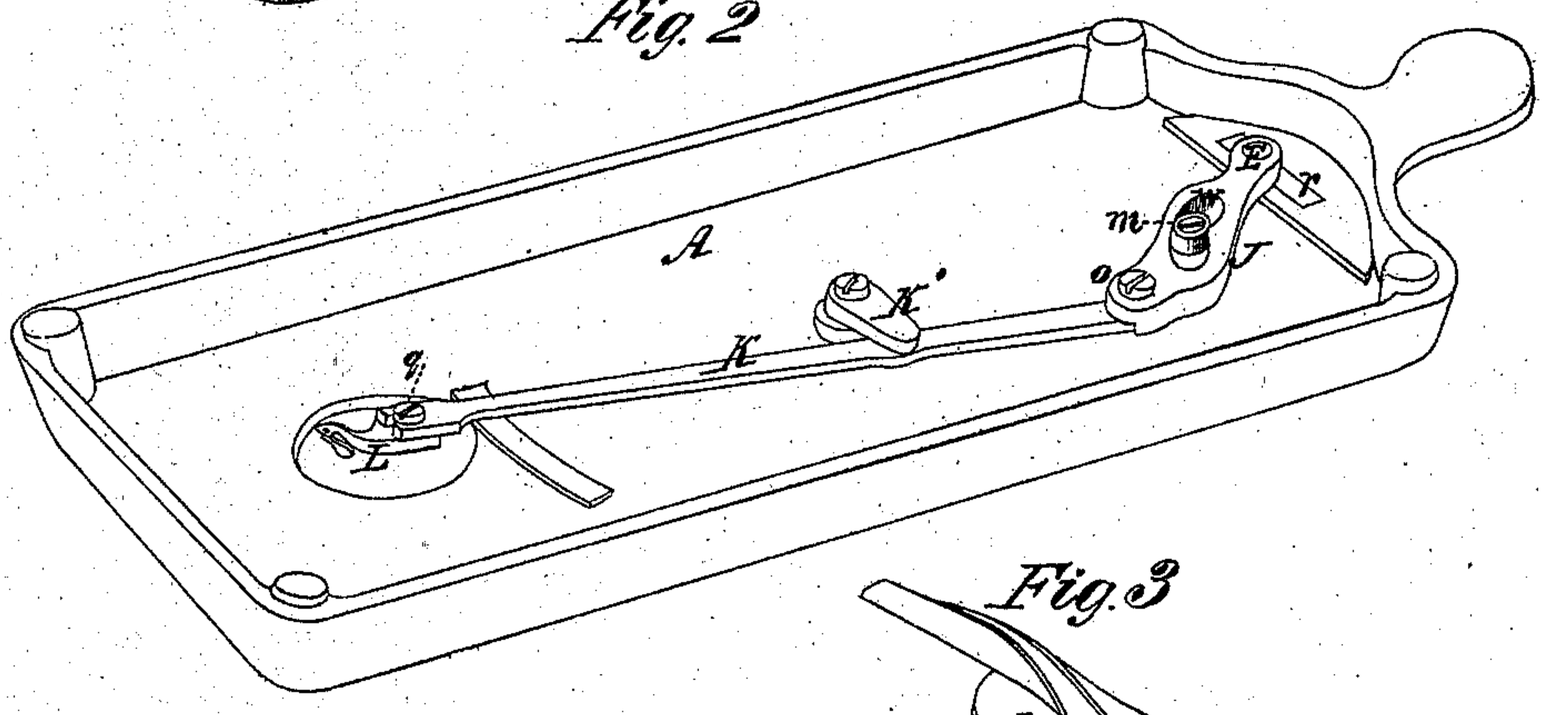
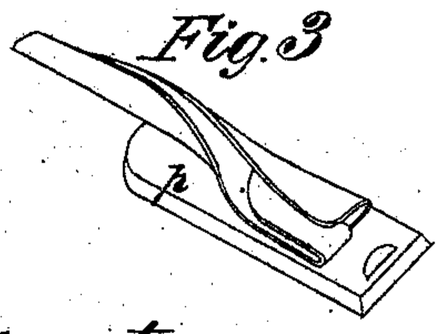


Fig. 3



Witnesses
R. Campbell
J. R. Campbell

Inventor
John N. McLean
by
Munn & Fennwick & Lawrence

2 Sheets—Sheet 2.

J. N. McLEAN.

SEWING MACHINE.

No. 105,961. Patented Aug. 2, 1870.

Fig 4

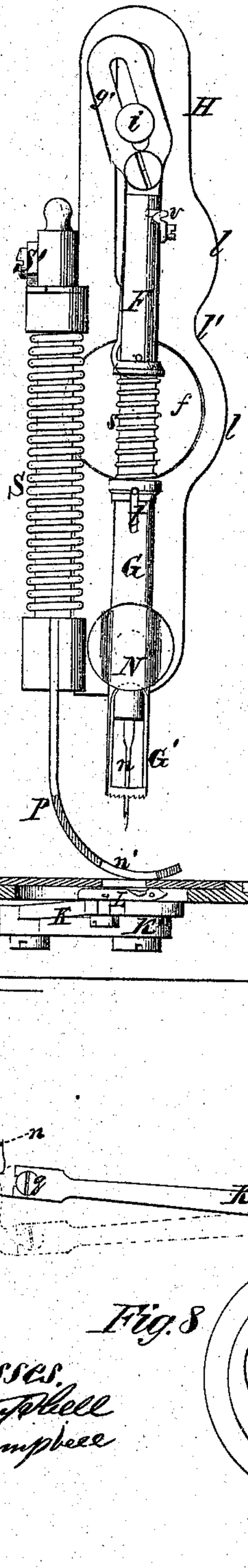


Fig 5

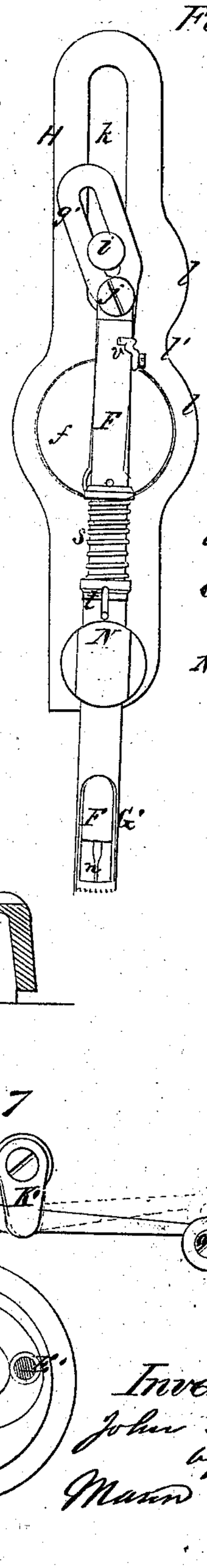


Fig. 6

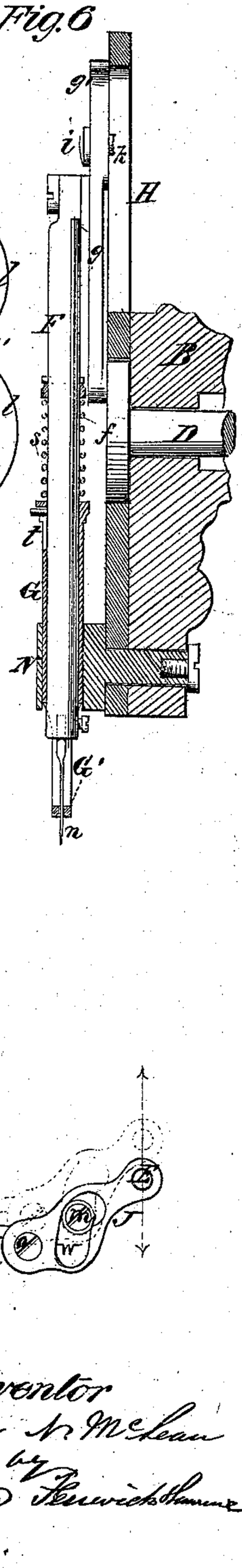


Fig. 7

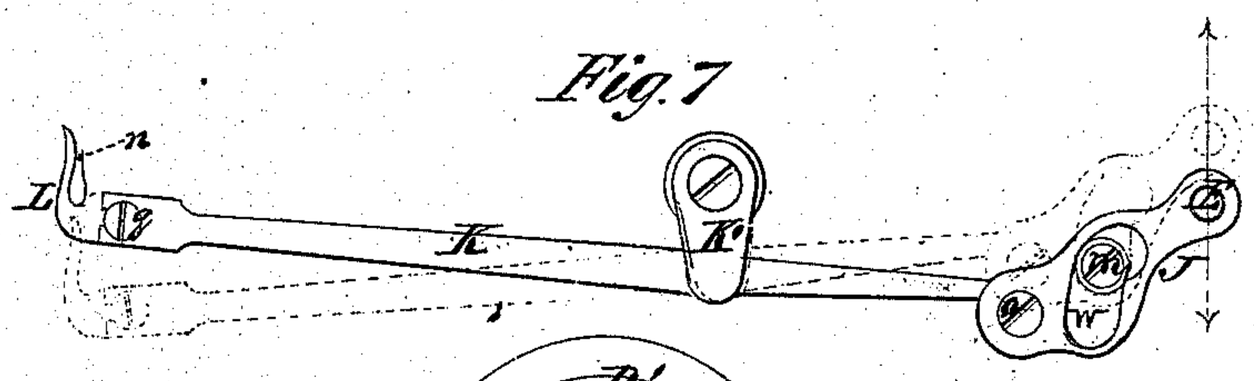
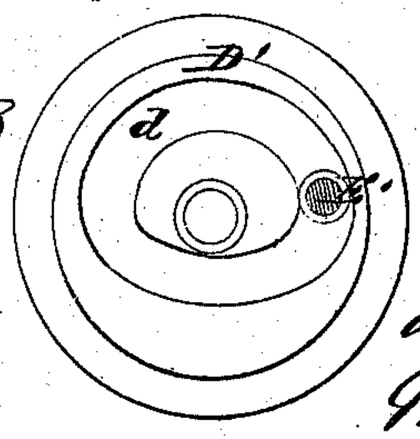


Fig. 8



Witnesses.
R. H. Mountfield
J. R. Campbell

Inventor
John N. McLean
by
Munn & Howick Hammer

UNITED STATES PATENT OFFICE.

JOHN N. McLEAN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **105,961**, dated August 2, 1870.

To all whom it may concern:

Be it known that I, JOHN N. McLEAN, of the city and county of Philadelphia, in the State of Pennsylvania, have invented certain new and useful Improvements in Sewing Machinery; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1, Plate, 1, is a perspective view of the improved machine complete, showing a hemmer attached to the bed. Fig. 2, Plate 1, is a view of the bottom side of the bed-plate, showing the mechanism for operating the looper. Fig. 3, Plate 1, is a perspective view of a hemmer applied to a dovetail base. Fig. 4, Plate 2, is a front view of the upper portion of the machine and a section taken transversely and vertically through the bed-plate, indicating the needle-bar and its pressure-pad elevated. Fig. 5, Plate 2, shows the needle-bar and its pressure-pad depressed. Fig. 6, Plate 2, is a vertical section through Fig. 4. Fig. 7 is a bottom view of the mechanism beneath the bed-plate. Fig. 8 shows the cam which actuates the looper mechanism.

Similar letters of reference indicate corresponding parts in the several figures.

This invention relates mainly to that class of sewing machinery in which the stitches are formed by the interlacement of two separate threads taken directly from the spools or bobbins of commerce; and my invention consists, first, in a convex riding swell for the needle-thread, which swell is formed or applied on one edge of the face-plate, between a guiding-eye on the needle-bar and a corresponding eye on the frame of the machine, so that the thread will be taken up and the tensional strain applied at the proper times in the formation of the stitches, as will be hereinafter explained; second, in the combination, substantially as hereinafter specified, of a tubular or sleeve presser-pad, with a needle-bar, which has a vibrating or oscillating motion in a vertical plane, and also a similar motion lateral thereto, the combination being such that the presser-pad periodically acts independently of the motion of the needle-bar notwithstanding it is fitted around the same; but at all other times said pad works in concert with it and makes all the motions that the needle-bar does, as will be hereinafter described; third, in effecting the required movements of the looper beneath the bed-plate by means of a link interposed between the looper-carrier and a vibrating lever, which is actuated by a cam on the driving-shaft, said link being slotted and guided by a stud in such a manner as to transmit a compound motion to the looper-carrier and afford great accuracy and freedom of action to the movements of the looper, as will be hereinafter explained.

To enable others skilled in the art to understand my invention, I will explain its construction and operation.

A represents the bed-plate of the machine, and B overhanging frame or bracket, carrying on one end the vertical face-plate H, and having applied to it, in suitable bearings, the horizontal driving-shaft D.

D′ is a cam-pulley, over which the driving-belt passes and into the face of which an eccentric cam-groove, *d*, is formed, of an elliptical form, as shown in Fig. 8.

In the groove *d* works the anti-friction wrist-pin E′ of a vibrating lever, E, which latter has its fulcrum at *e* and passes down through a slot made through the bed-plate and is connected to one end of a slotted link beneath such plate, as will be hereinafter explained.

On the end of shaft D opposite that carrying the cam D′ a crank, *f*, is applied, whose outer surface is flush with the corresponding surface of the vertical face-plate H, as shown in Fig. 6. Eccentrically to this plate *f* the lower end of a pitman, *g*, is pivoted. The upper portion, *g′*, is slotted and connected, by a fulcrum-pin, *i*, and set-screw *i′*, to the face-plate H. The pin *i* is passed through the slotted portion *g′* and plays up and down in the vertical slot *k* in the upper portion of the face-plate. By loosening the set-screw or thumb-nut *i′* the length of vibrating stroke or feed given to the needle-bar can be regulated.

The upper end of the needle-bar F is pivoted at *j* to the pitman *g*, and guided beneath this point by an oscillating guide, N.

To the lower or needle end of the needle-bar F is fitted a tubular sleeve, G, which plays up and down through the oscillating guide N, and which is constructed with a serrated pad, G′, on its lower open end, through the center of which is a perforation or slot through which the needle *u* passes when in place in the lower

end of the needle-bar, as shown in the drawings.

Around the needle-bar is coiled a spring, *s*, which is compressed between a shoulder thereon and the upper end of the tubular sleeve, which is slotted vertically at *t* and receives through this slot a pin on the needle-bar. The pin prevents the sleeve from turning, and the slot *t* allows it vertical play on the needle-bar.

During the descending stroke of the needle-bar the pad G′ will be brought to act upon the material being sewed and to press upon it with a yielding pressure, which will be continued during the latter part of the descending stroke and the beginning of the ascending stroke of the needle-bar. The needle-bar is caused to vibrate, so as to afford a needle-feed, the feed and the pad G′ also to act to assist the needle.

It will be seen that the needle-bar and pad both descend together until the latter is arrested by pressure upon the work, when the needle-bar and needle will continue to descend alone to make a stitch. Then, as the needle-bar rises the pad will keep the work down on the cloth-plate until the completion of the stitch and the withdrawal of the needle from the work.

The pressure-pad performs a double function, to wit: it assists the needle in feeding the work, and it also holds down the work during part of the ascending stroke of the needle.

By reference to Figs. 1, 4, and 5, it will be seen that one edge of the face-plate H is curved so as to form a convexity or swell, *l*, which I shall term the "riding swell," for the needle-thread. The needle-thread is carried from the bobbin *b* through an eye, *b′*, which is so placed relatively to the eye *v* on the needle-bar F that the thread will decline toward this bar at an angle of about one hundred and fifty degrees. The riding-swell *l*, which is between the two eyes *b′* and *v*, is so arranged relatively to the eye *v* that when the needle-bar is fully raised the thread will cross the edge of plate H at the commencement of the swell *l*, and when the needle-bar has descended far enough to carry the eye of the needle through the work the thread will cross the swell at its highest part, after which, as the needle further descends, the thread is eased off in such manner as to accommodate the strain on the thread taken up in forming a stitch. By this arrangement, as the needle-bar descends from its highest point the thread is drawn backward through the eye *v* and the eye of the needle about, say, three-sixteenth of an inch, in consequence of the change of angle of the thread, and as the needle-bar continues to descend the thread is still further drawn back by riding upon the swell *l*, and as the eye of the needle passes through the work the thread will be drawn over the lower receding part of the swell, and there let off to supply the stitch being formed. By this means the thread will be controlled in a manner to produce the requisite degree of tension and take-up to the proper formation of the stitches.

The lower extremity of the vibrating lever E enters a hole made through one end of the link J, so that during the operation of the machine a lateral motion will be transmitted to this link. In Fig. 7 I have indicated, by the aid of the full and dotted lines, the compound movements imparted to the looper L through the medium of said link and a vibrating arm or crank, K′. The looper-lever K is pivoted to the link J at *o*, and is pivoted to the vibrating arm K′ between the looper and said link. The link J has an obtuse angular slot, *w*, through it, through which is a fixed anti-friction stud, *m*, which latter serves as the fulcrum and also a guide about which the link is moved.

It will be seen that the vibrating motion of lever E will impart a vibrating motion to the link J. At the same time the stud *m* and slot *w* will cause the link to move forward and backward bodily, thus giving a combined vibrating and endwise motion to the looper-lever and looper. The arm K′ affords a movable or accommodating fulcrum to the looper-lever K.

In Figs. 1 and 3, *p* represents a flat plate with a thumb-notch in its surface near one end, and with its side edges beveled, so as to make what is known as a "dovetail slide." This slide has fastened to it, in any suitable manner, a hemmer; but instead of this hemmer a feller or any other cloth guide or device necessary to be used to assist in controlling the work may be fastened to plate *p*. The surface of the bed-plate A is cut out at *p′*, so as to form a dovetail groove adapted to receive and hold down in place the slide *p*.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A convex riding-swell arranged between the guiding-eyes *b′ v*, so as to operate on the thread substantially as described.

2. The arrangement within a pivoted oscillating or vibrating guide of the tubular sleeve-presser G and needle-bar when operating to feed the material being sewed, substantially as described.

3. The slotted link J, interposed between the lever E and the looper-lever K, and adapted to operate substantially as described.

JNO. N. McLEAN.

Witnesses:
STOCKTON BATES,
WM. M. HOOPER.