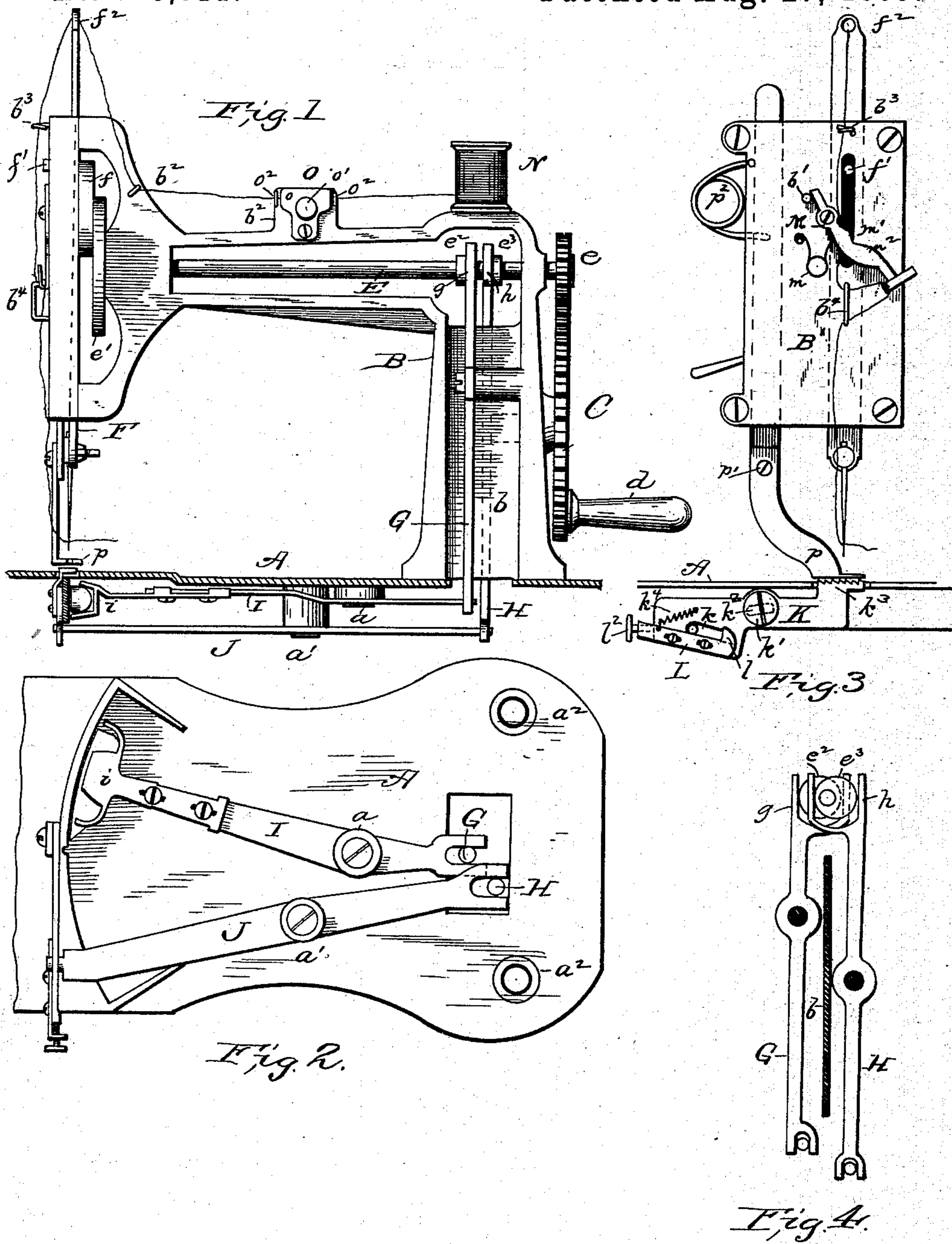


(No Model.)

S. O'CONNOR.
SEWING MACHINE.

No. 410,011.

Patented Aug. 27, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

STEPHEN O'CONNOR, OF BRIDGEPORT, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 410,011, dated August 27, 1889.

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To all whom it may concern:

Be it known that I, STEPHEN O'CONNOR, a citizen of the United States, residing at Bridgeport, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of my invention is to provide a sewing-machine which is adapted to be driven by the hand of the operator, and which, while it may be very cheaply constructed, will run very easily and will be capable of doing as good work as many of the high-priced machines now in use.

In the drawings, Figure 1 is a side elevation of my improved machine, partly in section. Fig. 2 is a bottom view of the same. Fig. 3 is a front end view, and Fig. 4 is a detail view of the mechanism for operating the shuttle and feed levers.

A denotes the bed-plate of the machine, and B the bracket-arm secured to or formed integral with the said plate, said arm and plate being preferably of cast metal, as is usual.

C is a driving gear-wheel, which turns on a stud fixed to the upright portion of the arm and is provided with a handle *d*, said driving-gear meshing with a smaller gear-wheel *e* on the rear end of the main shaft E, journaled in the upper part of the arm, and carrying at its front end a disk *e'*, having a pin working in an ordinary heart-cam *f*, secured to the needle-bar F. The shaft E carries two eccentrics *e² e³*, working in offsets or inwardly-projecting yokes *g* and *h* on the upper ends of the vertical levers G and H, pivoted on studs supported in bosses on the vertical portion of the arm B. To give the said arm the greatest possible strength consistent with proper lightness, I prefer to provide the vertical portion thereof with a central rib or diaphragm *b*, and to balance the machine properly, as well as to give the levers G and H sufficient room to work, the yokes *g* and *h* on the upper ends of said levers are arranged so that they both extend inwardly from opposite sides

of the machine to embrace their eccentrics. This construction and arrangement of the said yokes permits the said levers to be pivoted to the opposite outer sides of the vertical portion of the arm, so that they will not be interfered with by the said diaphragm.

I is the shuttle-lever, pivoted to a projection *a* on the under side of the bed-plate A, and provided at its front end with the shuttle-carrier *i*, the rear end of the said lever being engaged by the lower end of the vertical lever G.

The vertical lever H is connected at its lower end with the feed-lever J, pivoted to a projection *a'* on the lower side of the bed-plate. The forward end of said feed-lever enters an inclined slot *k* in the feed-bar K, carrying the feed-dog *k³*. Said feed-bar K is pivoted near its center on a pin or screw *k'*, passing through a slot *k²*, inclined slightly in a reverse direction to the slot *k*, as indicated by the dotted lines in Fig. 3, for the purpose of insuring firm grip by the dog throughout the feed movement.

To provide for a proper adjustment of the feed, the slot *k* may be lengthened or shortened by the adjusting-bar L, having a projection *l* extending across the said slot. The bar L is loosely attached to the feed-bar by screws passing through slots in the former-bar, said slots permitting adjustment of the bar L by the screw *l²*, tapped through an offset portion at the rear end thereof, and abutting against the feed-bar K. A spring *k⁴*, attached to the bars K and L, serves to hold the bar L in any position to which it may be adjusted, with the screw *l²* against the bar L.

M is the take-up or thread-controlling lever, pivoted to the face-plate B', and operated by a pin *f'* on the needle-bar and a coacting spring *m*, a stop-pin *b'* on the said face-plate serving to limit the take-up movement of the said lever. To give the proper timing to the lever M, so that it will yield the thread as may be required by the stitch-forming devices, it is provided with two cam portions *m'* and *m²*, formed by two bends in the upper side of said lever, against which the pin *f'* impinges as the needle-bar descends. The needle-thread passes from the spool N through

the tension device O to a guide-eye b^2 , and thence through an eye f^2 in the top of the needle-bar, whence it runs through a guide-eye b^3 and loop b^4 to the hook of the take-up lever, and thence back through the loop b^4 and to the needle.

The tension device O consists, preferably, of a tension-plate o , bearing against a smooth-faced projection b^2 , cast on the top of the arm B, said plate being secured in place by an adjusting-screw o' , thread-eyes o^2 being provided at the opposite ends of the plate o to guide the thread.

The presser-foot p is attached by a screw to the presser-bar P, and is pressed against the work by a spring p^2 . An ordinary lifting-lever may be employed for raising the presser-foot.

The bed-plate may be provided with legs a^2 to enable the machine to stand on a table, or said plate may have an ordinary clamping device for securing the machine to a table.

The operation of my machine is as follows: The driving gear-wheel being set in motion, the needle-bar will be reciprocated in the usual manner, with a "dip" at the lower end of its stroke to give the shuttle time to pass through the loops of needle-thread. The vertical levers G and H, operated by their respective eccentrics, will in turn impart vibratory motion to the shuttle and feed levers, the former carrying the shuttle back and forth, as is usual in machines having similar shuttle-operating mechanisms. The feed-lever working in the inclined slot k in the feed-bar first tilts the latter to lift the feed-dog against the work, and when the said lever has reached the end of said slot the bar is moved forward on its supporting fulcrum pin or screw k' , the tilting of said bar on said pin bringing the inclined slot k^2 to a horizontal position, so that the feeding movement of said bar will be truly horizontal. When the feeding movement is effected, the return movement of the feed-bar first causes the feed-dog to descend and the feed-bar is then returned to its first position. Thus a "four-motioned" feed, with all of the movements positive, is secured. The feed-lever has a uniform vibrating movement, and the throw of the feed-bar is varied by changing the position of the adjusting-bar L by the screw l^2 to lengthen or shorten the slot k , the feeding movements being increased as the said slot is shortened and decreased as the said slot is lengthened, to give more "lost" horizontal motion to the feed-lever in the said slot. As the needle-bar descends the pin f' , carried thereby, operates the take-up lever to slacken the thread, and as the said bar rises the spring m swings the said lever away from the loop b^4 and the stitch is tightened by the combined action of the take-up or thread-controlling lever and the take-up eye in the top of the needle-bar through which the thread

passes. The projections a and a' beneath the bed-plate are of different lengths, so that the shuttle and feed levers pivoted thereto vibrate in different horizontal planes, and do not therefore interfere with each other.

Having described my invention, what I claim is—

1. In a sewing-machine, the combination, with a bracket-arm the vertical portion of which is provided with a strengthening rib or diaphragm, of the main shaft journaled in the upper part of said arm, the eccentrics thereon, the vertical levers pivoted on either side of said diaphragm and having oppositely-arranged inwardly-extending yokes embracing said eccentrics, and the shuttle and feed levers operated by said vertical levers, substantially as set forth.

2. In a sewing-machine, the combination, with a bracket-arm the vertical portion of which is provided with a strengthening rib or diaphragm, of the main shaft journaled in the upper part of said arm and provided with a needle-bar-operating crank-disk, two eccentrics, and a gear-wheel, a needle-bar adapted to receive motion from said crank-disk, two vertical levers pivoted, one on either side of said diaphragm and having inwardly-extending yokes embracing said eccentrics, the shuttle and feed levers operated by said vertical levers, and a driving gear-wheel meshing with the said gear-wheel on the main shaft, substantially as set forth.

3. In a feed mechanism for sewing-machines, the combination of a feed-bar-operating lever vibrating in a horizontal plane, means, substantially as described, for imparting the vibrations to said lever from the driving-shaft, and a feed-bar sliding upon a fixed fulcrum between the feed-dog and the inclined slot in which said operating-lever works, as described.

4. In a sewing-machine, the combination of a feed-bar having an inclined slot sliding upon a fixed fulcrum between the feed-dog and said slot, an adjusting-bar carried by said feed-bar having a projection for shortening and lengthening said slot, an adjusting-screw for fixing said adjusting-bar in the desired position, a vibrating feed-bar-operating lever working in said slot, and means, substantially as described, for imparting the vibratory movements to said feed-bar-operating lever, as set forth.

5. In a sewing-machine, the combination of a feed-bar pivoted near its center and having an inclined slot through which its pivot-pin passes, and a second inclined slot, a vibrating feed-bar-operating lever working in said second inclined slot, and means, substantially as described, for imparting the vibratory movement to the said lever, as specified.

6. In a sewing-machine, the combination, with a pivoted and sliding feed-bar having an inclined slot, of an adjusting-bar loosely

attached to said feed-bar and having a pro-
jection extending across said slot, and an off-
set, an adjusting-screw tapped through said
offset and abutting against said feed-bar, a
5 spring for holding said screw in contact with
said feed-bar, and a vibrating feed-lever
working in said inclined slot, substantially
as described.

In testimony whereof I affix my signature in
presence of two witnesses.

STEPHEN O'CONNOR.

Witnesses:

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EDWD. B. PEARSALL.