J. N. TARBOX.
Sewing-Machine.

No. 213,146 Patented Mar. 11, 1879.

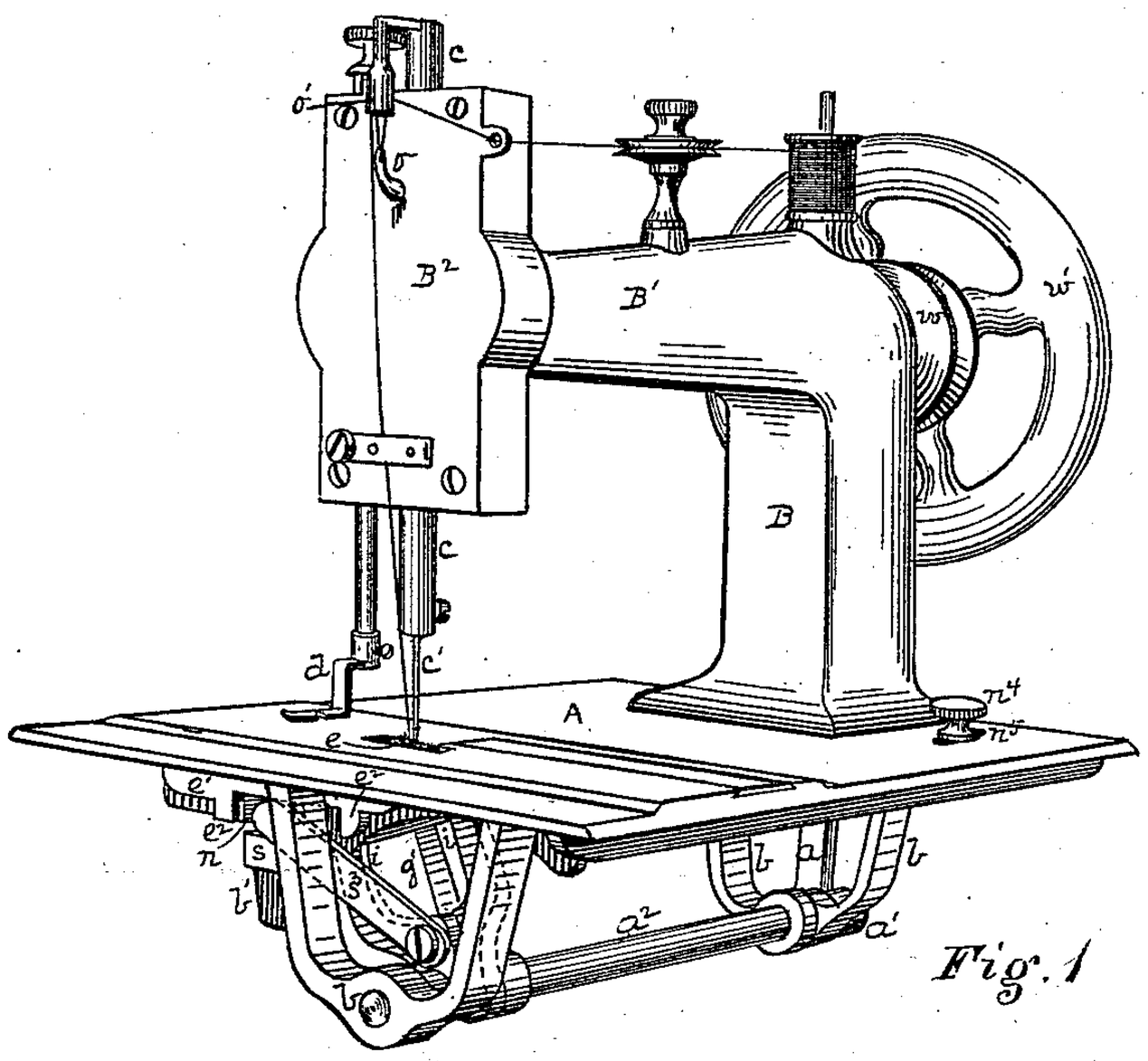

Fig. 1

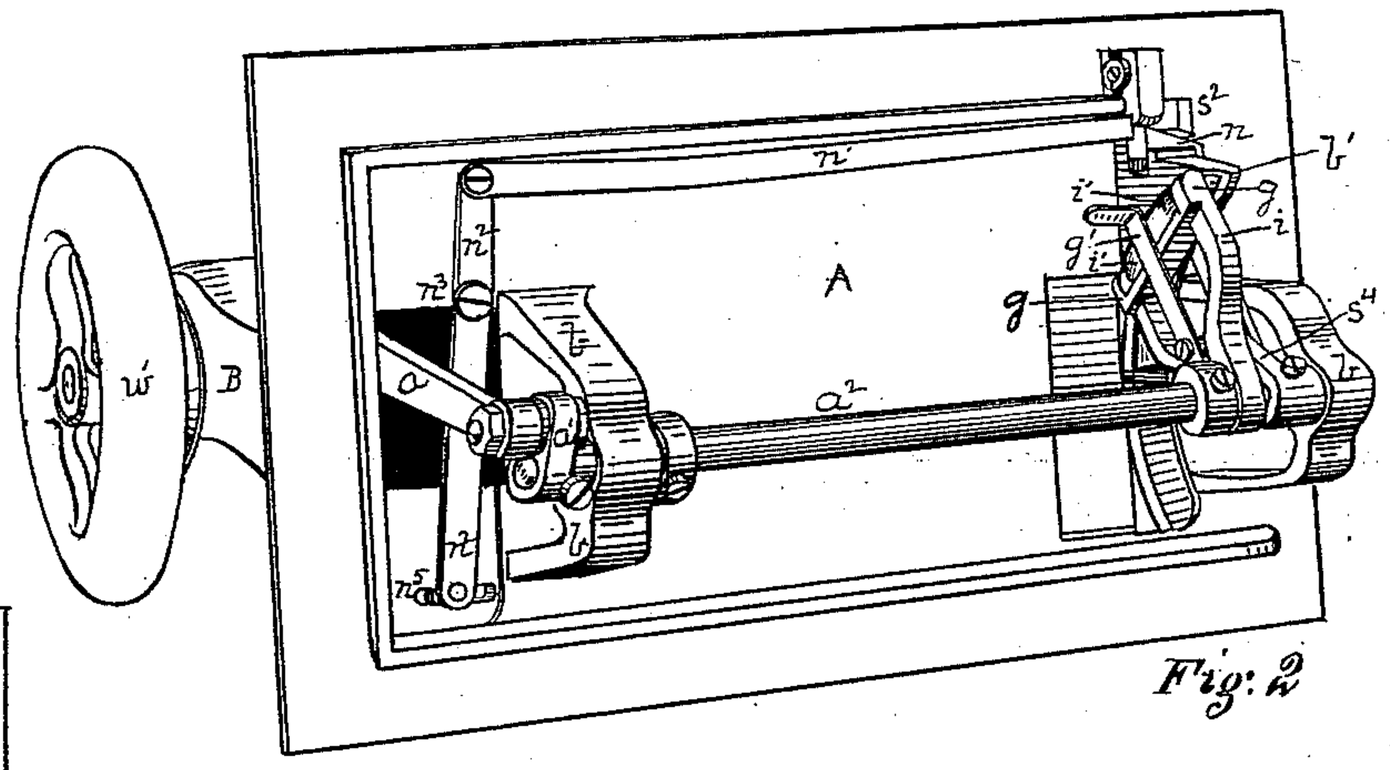

Fig. 2

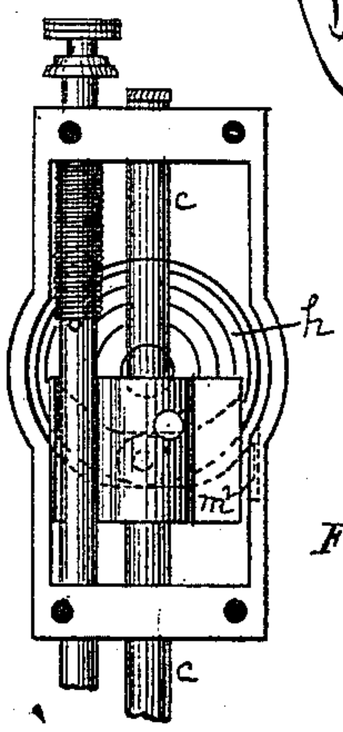

Fig. 4.

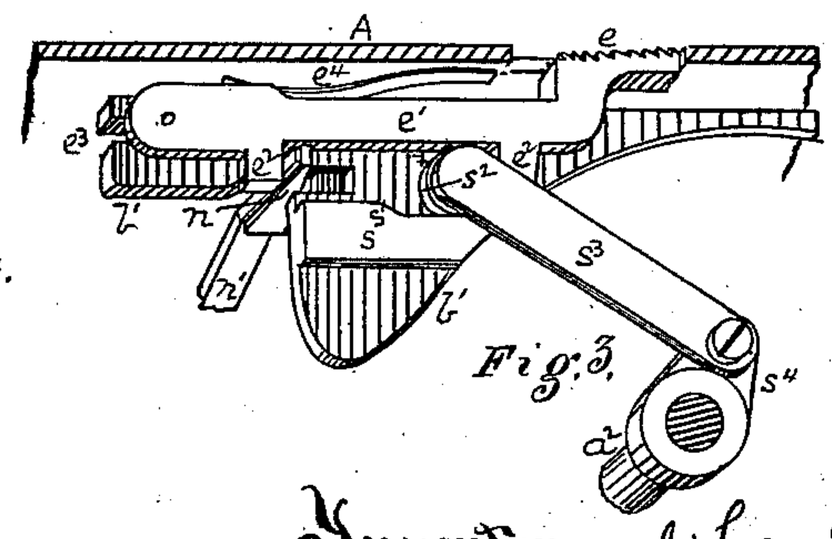

Fig. 3.

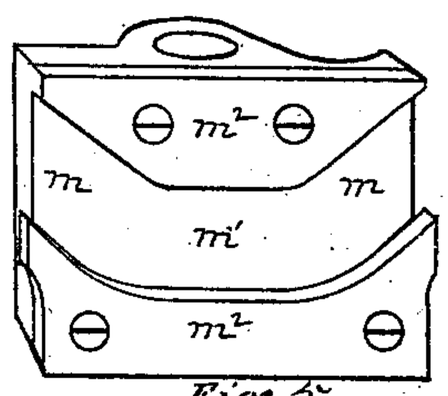

Fig. 5.

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JOHN N. TARBOX, OF HAMILTON, ONTARIO, CANADA.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **213,146,** dated March 11, 1879; application filed July 12, 1878.

To all whom it may concern:

Be it known that I, JOHN N. TARBOX, of Hamilton, Province of Ontario, Dominion of Canada, have invented or discovered certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—like letters indicating like parts—

Figure 1 is a perspective view of so much of a sewing-machine incorporating my invention as is necessary to illustrate the same. Fig. 2 is a view in perspective of the same devices from the under side, and Figs. 3, 4, and 5 are detached views of some of the operative parts of the same more fully illustrative of their construction and operation.

The ordinary working-table of a sewing-machine is represented at A, and the bracket and arm which carries the upper working parts are represented at B B′. Both are made hollow, and the ordinary driving-shaft is arranged in the arm B′ in the usual or any known or desired way, and with the band-wheel *w* and fly-wheel *w′* thereon. A crank-arm, *a*, operated by the usual bent crank in this driving-shaft, plays in the hollow of the bracket B, and extending through the table A by a suitably-proportioned crank-connection, a^1, gives to the shaft a^2 an oscillatory or rocking as distinguished from a rotary motion. This shaft is supported in suitable hangers or bearings *b* on the under side of the table.

In proper position with reference to the needle-bar *c*, needle *c′*, and presser-foot *d*, I arrange the roughened feed-plate *e*. This latter plate is attached to or made as a part of the feed-bar e^1, and on the latter are two stops, e^2. These two stops, Fig. 3, and the intermediate lower edge of the feed-bar constitute three sides of a box or slot, and the fourth side is formed by a guide-rib, *s*, fixed in position on a lug, *b′*, which projects down from the table. This guide-rib *s* has an incline, s^1. The box or slot thus formed has a wrist, s^2, preferably in the form of a friction-roller, playing therein, the same being attached to the end of a link, s^3, which latter receives a reciprocating motion by a crank-connection, s^4, with the oscillatory or rock shaft a^2.

A friction-roller on the outer end of the feed-bar e^1 plays in a slot, e^3, made for the purpose in the lug *b′*, so as to allow the feed-plate *e* to rise and fall, turning on such roller in the slot e^3 as a pivoting-point, and also so as to allow the entire feed to move longitudinally, and thereby move the cloth along as the stitches are formed in succession. The parts thus designated are so proportioned and arranged that as the wrist s^2 moves forward it shall ride up the incline s^1, and thereby raise the feed-plate *e* into a sufficiently close engagement with the cloth, and, continuing its stroke, shall come against the forward stops, (or some interposed device, as presently to be described,) and pushing the stops along shall cause the feed to advance the length of one stitch. On its return stroke it rides down the incline s^1. A spring, e^4, causes the feed *e* to drop clear of the cloth, and the wrist s^2, engaging the other stop, moves the feed backward the length of a stitch preparatory to taking a new bite on the cloth. It is important, however, in such machines to vary the length of the stitch. This I provide for by the use of a wedge, *n*, which is arranged to pass through a slot in the lug *b′*, so that its taper sides or point shall come between the wrist s^2 and one of the stops e^2, preferably the forward one, as shown. This wedge *n*, for convenience in adjustment, I attach to the end of a bar, n^1, and pivot the opposite end of this bar to a lever, n^2, fulcrumed at n^3, Fig. 2, and to the opposite end of this lever I attach a knob or handle, n^4, Fig. 1, which is on top of the table, in convenient position to be manipulated by the operator. The stem of the knob n^4 plays in a short slot, n^5, Fig. 2, which gives the desired range of motion. By shifting the knob n^4 the operator can cause the wedge *n* to advance or recede inside the stop, and by the greater or less thickness thus brought between the stop and the wrist s^2 increase or decrease at pleasure the length of motion or throw of the feed, and as a consequence lengthen or shorten the stitch; but in this part of my invention I especially include other equivalent mechanical means for effect-

ing the same result, such as an adjustable stop or a set-screw through the stop, or other known means suitable for lengthening or shortening the distance between the stops, and thereby lengthening or shortening the stitch. The oscillating or rock shaft a^2 also has affixed thereon a shuttle-carrier, *i*, which carries the shuttle *i'* in the shuttle-head *g*, and causes it to move in the arc of a circle and in proper relationship to the other operative parts. The shuttle is placed in the head *g* laterally, or from the side shown in Fig. 2, and it is held therein by a spring, *g'*. This spring has sufficient rigidity, or may be held by side stops, so as to retain its place while the machine is running; but it may also be sprung back and turned to one side on its point of attachment, as a pivot, so as to permit of the easy insertion and removal of the shuttle.

Another feature of my invention relates to a modification of the heart-motion, so called, by means of which I am enabled to run the machine with equal facility in either direction, or to reverse it at any or almost any point without interfering with the continuity or regularity of the work. For this purpose, instead of making the groove in the heart-motion in the form of a **V**, as has heretofore been usual, I flatten the middle part of the **V**, or make it horizontal, as shown in Figs. 4 and 5. The usual cranked disk *h* is made on the end of the driving-shaft. The heart-motion block m^2 is secured on the needle-bar *c* in the usual way, so that the crank-wrist (previously fitted with a friction-roller) shall play in the groove $m\ m^1$. The ends of this groove are inclined, as at *m*, at about the angle usual in like known devices; but such inclined grooves terminate in and are connected by a groove, m^1, straight and horizontal, or nearly so. The result of this construction is that the needle will move slowly at the beginning of its upstroke in forming the loop, and no great accuracy of adjustment will be required.

In the **V**-motion the point or apex of the **V**, which determines the beginning of the upward stroke, must be adjusted with such accuracy, in order that the machine may run in either direction, that such result cannot be attained by the ordinary user.

With the apex flattened, as in my improvement, any point at or near the middle of the flattened or horizontal part m^1 may determine the beginning of the upstroke, and within the limits of ordinary adjustment it is not material which point of the horizontal groove m^1 it be, since the result in forming the loop will be the same whichever way the machine moves. Likewise, the reversal of the machine at any time prior to the completion of the stitch and the beginning of the forward stroke of the feed will not interfere with the regular formation of stitches.

It is not essential, however, that the end grooves, *m*, be made with straight sides, nor at any particular angle, since the angle may be varied, or the top and bottom edges of such grooves may be made slightly curved, the parallelism of adjacent sides being, however, substantially preserved. Also, the middle part, m^1, may vary slightly from being straight without any substantial departure from the scope of my invention, and without destroying the reversing capacity of the machine.

As a device for governing the slack of the thread I employ the perforated recessed bar and pin shown in Fig. 1. The pin *o* is attached to the cover or front plate, B^2, and the recessed bar *o'* depends by a bent arm from the upper projecting end of the needle-bar. Both are perforated horizontally, so that when the needle is at the lowest point of its stroke the perforations or eyes in the pin and recessed bar will be in line with each other. This facilitates materially the insertion of the thread.

I claim herein as my invention—

1. A reciprocating arm, s^3, having a crank-connection with an oscillatory or rock shaft, a^2, in combination with a feed-bar having stops thereon, fixed or adjustable, and with a guide-rib, *s*, having an incline, s^1, thereon, whereby the feed-arm will raise the feed-bar, and give it the proper reciprocating motion, substantially as set forth.

2. An adjustable wedge, *n*, or its described equivalent, in combination with feed-bar, stops, and reciprocating feed-link, to lengthen or shorten the free space through which the wrist of the feed-link moves before communicating motion to the feed-bar, substantially as set forth.

3. The combination, with the main driving-shaft of a sewing-machine and the shuttle-actuating and feeding devices connected therewith, of the needle-bar provided with a cam-block, m^2, having a groove, m^1, horizontal or nearly so, which is interposed between and connects the inclined grooves *m*, and a crank carried by said driving-shaft, whereby the machine may be operated to form stitches when the driving-shaft is rotated in either direction, substantially as set forth.

In testimony whereof I have hereunto set my hand.

JOHN N. TARBOX.

Witnesses:

J. J. McCORMICK,

CLAUDIUS L. PARKER.