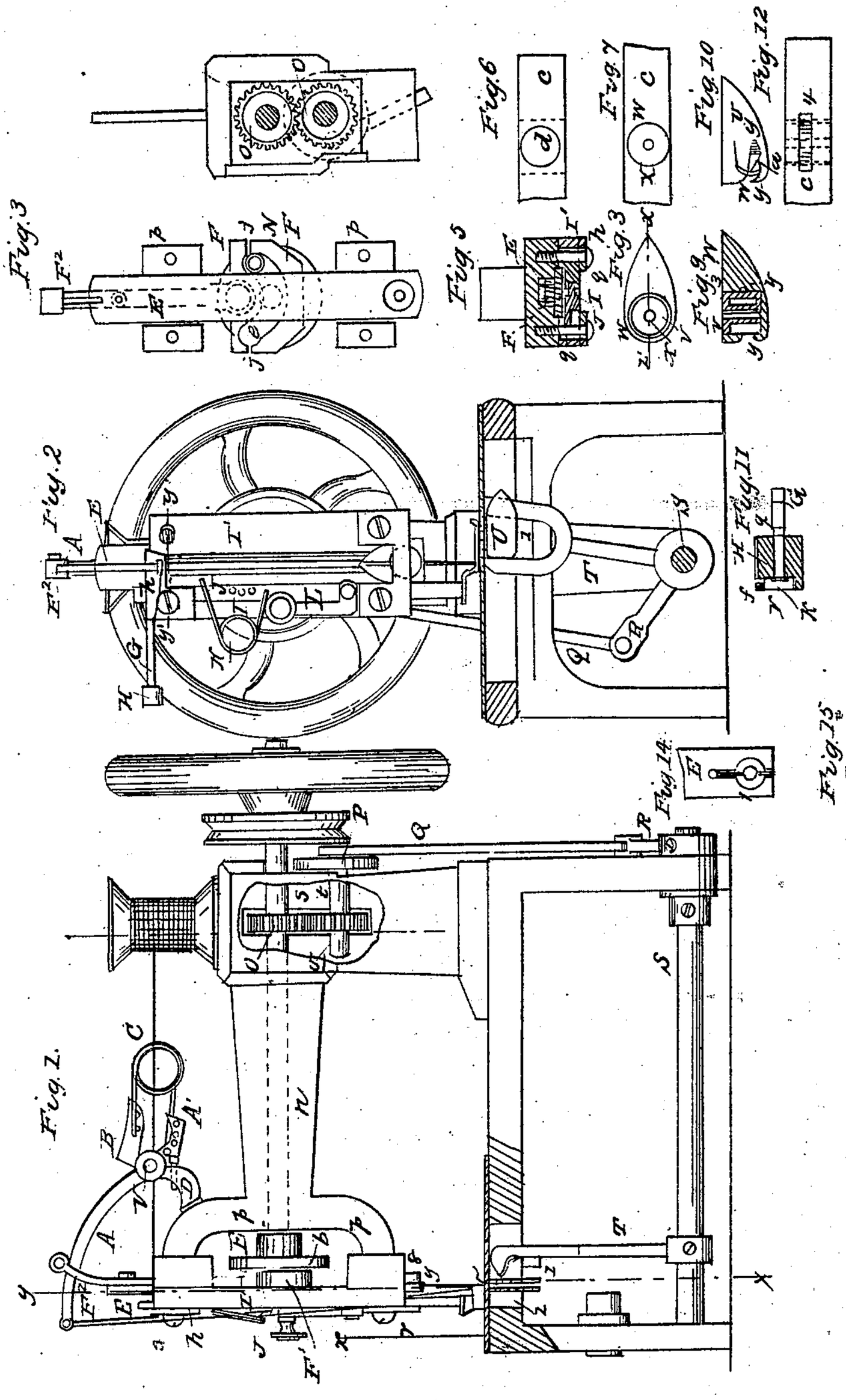
J. HANLON.

Sewing Machine.

No. 52,847. Patented Feb. 27, 1866.



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JOHN HANLON, OF NEWARK, NEW JERSEY.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **52,847**, dated February 27, 1866.

To all whom it may concern:

Be it known that I, JOHN HANLON, of Newark, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation, partly in section, of a sewing-machine made according to my invention. Fig. 2 is a front view, partly in section, as following the bent line *x* of Fig. 1. Fig. 3 is a separate view of the needle-bar and cam-grooves, by which motion is given to it following the line *y* of Fig. 1. Fig. 4 is a separate view of the gears by means of which motion is communicated from the needle-shaft to the shuttle-shaft, taken on the sectional line *z* of Fig. 1. Fig. 5 is a cross-section of the face-plate and needle-bar taken on the line *y'* of Fig. 2. Figs. 6 and 7 are detailed views, which illustrate the mode of making the shuttle. Fig. 8 is a face view of the shuttle. Fig. 9 is a longitudinal axial section of the shuttle, taken on the line *z'* of Fig. 8. Fig. 10 is a side view of the shuttle. Fig. 11 is a longitudinal sectional view of the tension device.

Similar letters of reference indicate like parts.

This improvement in sewing-machines consists of several particulars, one of which relates to the take-up; another relates to means for communicating motion to the shuttle-driving shaft; another relates to the construction of the face-plate which holds the needle-bar; another relates to the cam-groove on the needle-bar, by means of which it receives motion; another relates to the shuttle.

The machine which I have here represented, and by the aid of which I propose to illustrate my invention, is of the sort known as a shuttle-machine; but the several features of my invention, with the exception of the shuttle and the means for driving it, can be applied to machines of other kinds.

E designates the needle-bar. It receives its reciprocating motions from a crank-pin, N, on the disk *b*, working in a cam-groove, *e*, formed on its inner face. Hitherto this groove has been made from a solid piece of metal, and when it became worn it followed that there would be more or less loss of motion both in its ascent and its descent, and also an increase of noise and jar, because in proportion as the width of the groove increased beyond the width required to receive the crank-pin, in the same proportion would it cease to work smoothly and easily. I have provided for this difficulty by making the groove adjustable, so as to enable the operator to make compensation for its wear. I have accomplished this part of my invention in the example here given by making the bottom and top of the groove in separate parts or pieces separately secured to the needle-bar.

F designates the top part, and F′ the bottom part, the letter *j* designating the space which separates their edges. The shape of the groove *e* is formed by the shapes which are given to the upper side of the part F′ and the lower side of the part F. As those sides, or the periphery of the crank-pin, are worn away such wear is compensated for by bringing the said parts nearer to each other until the space *j* is taken up, when the adjustment may be still further continued by filing off the opposing edges of the parts. To enable this adjustment to be made the parts F F′ should be secured to the needle-bar by screws passing through elongated holes cut in the parts F F′. The part F is continued upward above the top of the needle-bar, where a loop, F^2, is made in it to receive the lever A of the take-up, which is thus drawn down by each descent of the needle-bar. This arm A is hinged at *l* to the top of a standard, D, which rises from the upper bracket, *p*, of the needle-shaft arm *n*.

A′ is the short arm of the take-up lever. It is pierced with numerous holes to receive one end of a coiled spring, C, whose other end is held in one of the holes of a fixed arm, B, which extends from the standard D backward and parallel with the plane of the arm A′.

When the lever A is pulled down by the descent of the needle-bar the arm A′ is raised toward the level of the fixed arm B, and thereby tension is put on the spring C. When the lever A is released by the rising of the needle-bar the tension of the spring operates to raise the lever to the top of the loop F^2. The action or strength of the spring is increased and

diminished according as its ends are placed in the outer or inner holes of the arms A′ and B.

The needle-bar is held to its place against the ends of the brackets *p p* by plates I I′, which are set outside of the needle-bar and secured to the ends of said brackets by screws which pass through holes in said plates elongated horizontally to permit them to be moved toward and away from each other, as may be desired. This elongation of the holes for the screws is seen in Fig. 5.

The letters *h i* designate clamps which are interposed between the plates and the heads of the screws, one being placed at the top and the other at the bottom of the plates. These clamps may be dispensed with, if desired, and the screws be applied directly to the plate. These plates are joined to each other by a tongue and groove, (see Fig. 5,) the object of which is to enable the operator to make compensation for the wearing away of the plates by the needle-bar by moving the plates laterally toward each other, and also to provide a more convenient way than has heretofore been used for securing the needle-bar in its place. It will be observed that the needle-bar, (see Fig. 5 and also Fig. 3,) is partially sunk into the ends of the brackets *p p*, and that shoulders *q q* are made on the inner faces of the plates, between which that portion of the needle-bar which is not sunk in the brackets is confined. The plates I I′ thus form an adjustable holder for the needle-bar, whereby the bar can be properly secured with ease, and whereby as it wears loose it can be easily and quickly adjusted without the necessity of removing any of the parts.

It will be observed that the pressure-bar J is sunk within the face of the plate I. It is elevated so as to bring its foot off from the cloth-bed by means of a lever, L, pivoted to the plate I, and it is brought and held down by a coiled spring, K, one of whose ends is fixed in the plate and the other in one of a series of holes in the pressure-bar.

G is a tension-arm fixed to the clamp *h* and extending sidewise therefrom toward the left. It may, however, be fixed to any other adjacent part of the machine instead. A button, *k*, is formed on its end, and the arm is reduced in diameter near its end for a little distance up to the place *g*, which designates a taper that swells until it coincides with the diameter of the rest of the arm.

The outer and smaller end of the arm G carries a cap, H, through the center of which the arm passes. The cap is held upon the arm by means of the button *k*, which is received in a countersink, *r*, through one side of which is a perforation, *f*, for the passage of the thread. A groove is carried along the outside of the cap from the said perforation to its right-hand end, to receive the strand which comes through the perforation on its way to the needle. The right-hand end of the central opening in the cap through which the arm G passes is slightly countersunk, so as to fit the taper or swell *g* on said arm, which swell is at such a distance from the button *k* as to allow the cap to revolve on the arm without coming in contact with the swell. When, however, the cap is moved toward the right hand it strikes the swell and becomes fast by reason of frictional contact. When it is desired to put increased tension on the thread the cap is drawn toward the left away from the swell *g* and then rotated until the thread has been wound as often as is desired about the arm G, and then pushed toward the right until it engages again with the swell and becomes fast on the arm.

The driving pulley or crank is applied to the needle-shaft *s*, which revolves within the arm *n*, and is extended through and beyond the stand *m* to enable the driving-power to be applied to it. The stand *m* also contains a short shaft, *t*, placed directly beneath the needle-shaft *s* and driven by it through the agency of gear-wheels O O,′ fixed on said shafts. The hinder end of shaft *t* projects beyond the stand and carries a crank-wheel, P, to a pin on which the pitman Q is attached. The lower end of the pitman is connected to the end of an arm, R, fixed to the rock-shaft S, which is below the cloth-bed, and extends beneath it toward the front of the machine. The arm R is longer than the radius of the crank-wheel P, and therefore it receives a vibrating motion from the revolution of said wheel.

The shuttle-driver T is fixed to the rock-shaft S, its upper part being formed with two arms of a shape suitable to hold the heel and shoulder of the shuttle between them, so as to be able to drive it back and forth, the shuttle being sustained upon a bar, 1, along the outside of which the driver T moves.

Fig. 2 designates a plate set vertically across the machine, and which separates the feeding-devices (not here shown) from the shuttle. The face of the shuttle moves along the said plate 2.

The construction of the parts here shown for driving the shuttle secures simplicity of construction and operation, and the shuttle receives only so much motion as is necessary to bring it through the loop of the needle-thread when moving in one direction and to clear the path of the needle on its return.

The shuttle U contains a bobbin, V, which is free to revolve on an axle, X, placed horizontally in the shuttle. This axle extends upward from the bottom of a socket, W. (Seen in Figs. 8 and 9.) The thread from the bobbin is passed out through a hole, *a*, in the wall of the socket W, whence it goes through the opening *y* in the shuttle directly to the seam, or else it is carried around the sides of the socket W once or more if tension is to be put upon the shuttle-thread. The opening *y* in the shuttle is in the nature of a circumferential passage about the walls of the socket, as indicated in Figs. 9 and 10. The manner of making the

shuttle is illustrated in Figs. 6, 7, and 12, where the letter *c* designates a block of metal through which a hole, *d*, is drilled. This hole is intersected by a slot, 4, the length of the slot being greater than the diameter of the said hole. This slot is shown in Fig. 12, and in Fig. 6 it is seen in dotted outline. This slot may be in a horizontal plane or in a plane slightly oblique to the face of the shuttle, as seen in Fig. 10, where the letter *y* designates the line of the slot. A cup which is to form the socket W, and having a pin therein to form the axle X, is next driven into the hole *d*. The block *c* may then be shaped and finished to the form to be given to the shuttle, the heel and sides of the shuttle being made to intersect the slot 4, whereby that slot is exposed on three sides; but it remains covered over on the side toward the toe. The letter *y* designates the passage around the socket or bobbin-holder W, which is formed by means of the slot 4. The periphery of one of the heads of the bobbin is provided with a spring which protrudes from a peripherical groove made in said head and bears against the inside of the socket W, thereby producing friction for the purpose of holding the bobbin still while there is no strain on its thread, so as to prevent the unwinding and delivery of its thread until it is needed. This spring will also have a tendency to keep the bobbin from slipping endwise out of its socket.

The bobbin is also kept from moving endwise by reason of the direction in which its thread is drawn away from it, the delivery-aperture *a* being opposite to the highest part of the bobbin and opening into that part of the groove *y* which is farthest from the face of the shuttle. It is evident that the effect of this arrangement will be to draw the bobbin constantly up in the socket W while there is any strain on its thread.

The needle is secured to its bar in a novel manner, which will be next described. A screw-bolt, 7, which passes through the lower end of the needle-bar, has a hole through its body, such hole being in line with grooves 5 on the inner face of the head of the screw. The head of the screw 7 is received in a countersink, 6, in the needle-bar when its body is passed through the needle-bar, so that its outside is flush with the bar. Grooves 5′ are cut in the needle-bar above and below the countersink, said grooves being coincident with the grooves in the head of the screw. When the screw is passed through the needle-bar a needle may be passed upward along the grooves 5′ and through the body of the screw, and be clamped between the head of the screw and the needle-bar by means of a nut, 8. The needle is thus fixed securely in the grooves and released therefrom merely by tightening and loosening the nut 8.

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

1. The arrangement of the lever A, having its perforated short arm A′ behind the fulcrum *l*, the fixed perforated arm B, the spring C, and standard D, as herein described and represented.

2. The described arrangement of the needle-bar E, parts F F′, for forming the adjustable groove *e*, the disk *b*, crank-pin N, and driving-shaft *s*.

3. Securing the needle-bar in place by means of plates whose adjacent faces are joined by a tongue and groove, the needle-bar being guided partly by recesses made in the end of the brackets *p p* and partly by shoulders on the said plates, substantially as shown.

4. The manner here shown of driving the shuttle rock-shaft, to wit, by means of the gear-wheels O O′, short shaft *t*, crank-wheel P, pitman Q, and vibrating arm R, as described.

5. The combination of the shuttle U, bobbin V, socket W, axle X, and opening or groove *y*, said parts being constructed in the manner and for the purpose herein specified.

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Witnesses:
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