2 Sheets--Sheet 1

G. W. BAKER.

Sewing-Machine.

No. 130,005. Patented July 30, 1872.

Fig. 1.

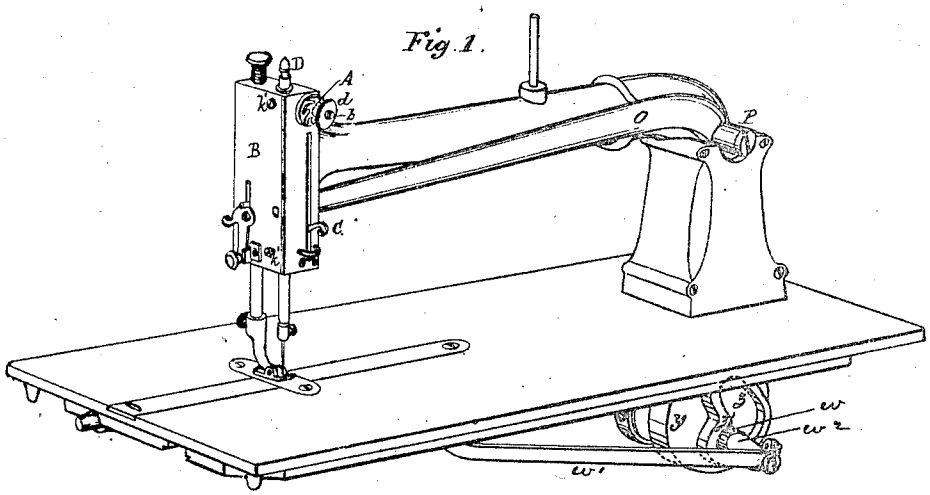


Fig. 2.

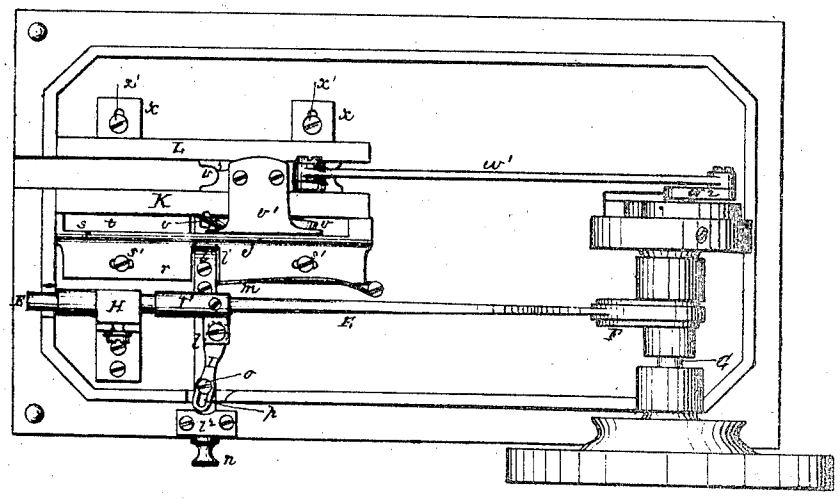


Fig. 3.

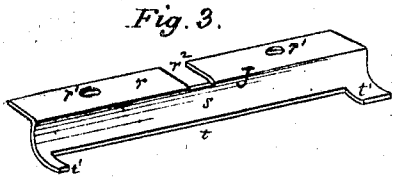
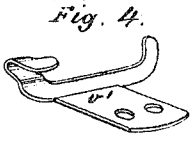


Fig. 4.



Witnesses.

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2 Sheets--Sheet 2.

G. W. BAKER.

Sewing-Machine.

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Fig. 5

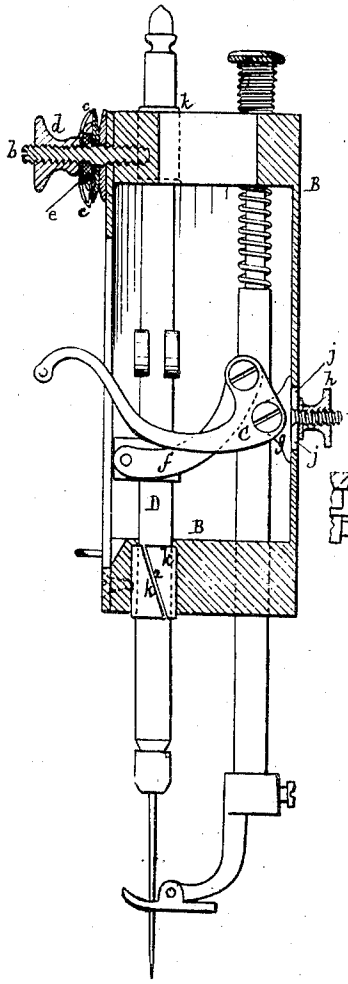

Fig 6.

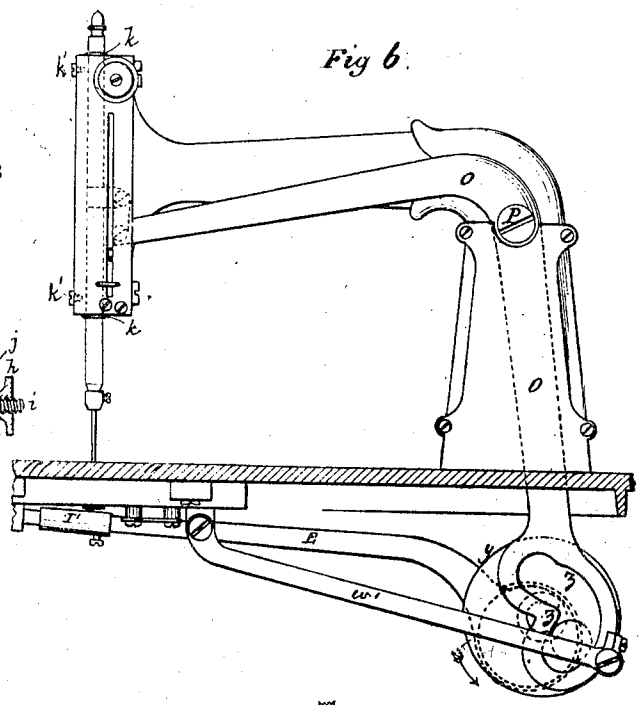

Fig. 7.

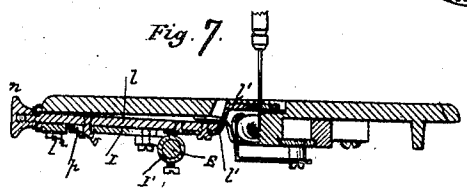

Fig 8

Witnesses.

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UNITED STATES PATENT OFFICE.

GEORGE W. BAKER, OF CLEVELAND, OHIO, ASSIGNOR TO WILSON SEWING-MACHINE COMPANY AND WHITE MANUFACTURING COMPANY, OF SAME PLACE.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 130,005, dated July 30, 1872.

To whom it may concern:

Be it known that I, GEORGE W. BAKER, of Cleveland, Cuyahoga county, Ohio, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification:

This invention consists of certain improvements in the tension, take-up, feed mechanism, shuttle-race, and mechanism for driving the needle-arm and shuttle, which will be described in the order named.

In the accompanying drawing, Figure 1 is a perspective view of a machine made in accordance with my invention. Fig. 2 is a plan of the under side of the same. Fig. 3 is a view of the shuttle-race detached. Fig. 4 is a like view of the shuttle carrier or driver. Fig. 5 is a front view of the head of the goose-neck with the face-plate removed. Fig. 6 is an elevation of the machine. Fig. 7 is a vertical section of a portion of the cloth-plate, through the feed, and in a plane in the line of feed. Fig. 8 is a plan view of the tension-spring detached.

The improvement in the tension relates to the pressure-spring. In lieu of using a spiral, volute, or other ordinary form of spring, I employ a disk, A, Figs. 1, 5, 8, made of spring metal, with a hole, *a*, in its center for the passage of the screw-stem *b* of the tension, and with long spring-fingers *c*, formed by cutting in the disk eccentric slits or slots, extending from the exterior of the disk toward the central hole *a*. These fingers are bent down so that when the spring is in place their tips will rest on the tension, as shown in Fig. 5. The form of these fingers may be somewhat varied; but, as seen in the drawing, they should all start from near the central opening *a*, and then follow a curved path, so as to obtain considerable length, in order to have the necessary spring action without making the device too large. They should preferably taper toward their outer ends. A spring thus made possesses considerable advantages. It is very compact and admits of the pressure being evenly applied. As the adjusting-nut *d* bears upon the spring at a point within the compass of the spring-fingers, the latter, at the points where they bear upon the tension, are enabled to operate equally and to the best advantage. I prefer to interpose a cloth, rubber, or other suitable washer, *e*, between the spring and the tension sheave or plate, although this washer is not indispensable.

The improvement in the take-up consists principally in the instrumentalities for holding and adjusting it in order to take up more or less slack thread, as required for thin or thick goods. The devices are shown clearly in Figs. 1 and 5. They are for the greater part inclosed within the head B of the machine—the only parts projecting being the end of the take-up lever and the adjusting and holding nut. The take-up lever consists of an angle or bell-crank lever, C, the longer arm of which, provided at the end with a thread-eye, partly projects from the side of the head, and is arranged to work up and down in a vertical slot formed in the same. The shorter arm of the lever is connected with the reciprocating needle-bar D by a link, *f*, by means of which connection the proper movements of the take-up at the proper times are imparted from the needle-bar. The take-up lever, at its angle, is pivoted to a block, *g*, the face of which is held tightly against the inner face of the side of the head B by means of a nut, *h*, screwing from the outside of the head onto a screw-stem, *i*, attached to the block, and projecting through the head. To allow the adjustment of the take-up so as to adapt it to draw up more or less thread, as desired, a vertical slot, *j*, is formed in the head B, through which the stem *i* passes, and the block *g* can, by loosening the nut *h*, be adjusted up or down to any point within the limits determined by the length of the slot, and can there be held by tightening up the nut. Raising the block increases the length of movement of the take-up; lowering it decreases the range of movement.

This arrangement is compact and simple; all the parts of the take-up, excepting only those actually required to be exposed, are concealed, and the same device serves not only to support and hold, but also to adjust the take-up lever.

The needle-bar D plays up and down through spirally-slotted bushings *k* at the top and bottom of the head B. These bushings, which are both removable and adjustable, are inserted in cylindrical openings in the head, and are combined with set-screws k^1 in the face-plate of the head, which are arranged to have their points in contact with the bushings. The slots k^2, which split or divide the bushings on one side, extend from top to bottom of the same, and instead of being vertical are inclined or pursue a spiral course partly around the bushings. The object of the bushings is to prevent the needle-bar from wearing the hole in the head through which it passes, and, owing to the slots k^2, if either the needle-bar or the bushings wear, the screws k^1 can be set up so as to compress the bushings, bringing the edges of the slots closer together, and thus tighten the bushings so as to take up all wear. By making the slots of the bushings spiral there is no danger of raising a fin or rib on the needle-bar, which is liable to occur when the slots are made straight up and down.

It has been my object in the feed mechanism to simplify it and to employ as few parts as possible. It consists of a feed-bar, *l*, to which the feed-surface l^1 is attached. The arrangement of this bar is shown in Fig. 7. It is held to the under side of the cloth-plate by a yoke or strap, l^2, at one end, while the feed-surface at the other end is in a recess formed for it in the top of the cloth-plate. A spring, *m*, is employed to give the back-and-down motions to the feed. An adjusting-screw, *n*, on the end of the feed-bar serves to regulate the extent to which the spring shall retract the bar, thus determining the length of the feed. The up movement of the feed, to project the feed-surface above the cloth-plate, is caused by the rod E, which is connected by a strap with the eccentric F on the driving-shaft G, and has its other end supported in a rocker-bearing, H, through which it freely slides. The eccentric revolves in the direction indicated by arrow in Fig. 6, and when its most eccentric portion is above the shaft, in the position it occupies when the feed is just about to move forward, the connecting-rod E will be drawn up toward the cloth-plate, so as to press upward on the feed-bar and force the feed-surface above the cloth. This pressure of the rod upon the bar continues until the feed has taken place, at which time the most eccentric portion of the eccentric begins to come below the shaft G, and the rod E, is consequently lowered, so as to permit the spring *m* to draw down the feed-surface. The forward movement of the feed is effected by a link, I, jointed to a sleeve, I', fixed on the connecting-rod, (which sleeve is the part of the rod that bears on the feed-bar to move it upward,) and provided at its outer end with a slot, *p*, in which is received a pin, *o*, on the feed-bar. The forward movement of the rod E will cause the link to advance, and the end of the slot *p* nearest the connecting-rod is brought, sooner or later, in contact with the pin *o*, according to the adjustment of the nut *n*. If the nut is adjusted for a long feed, the link operates upon the pin sooner than it would in case the adjustment were for a short feed. In lieu of casting the shuttle-race and of permanently uniting it with the under side of the cloth-plates, I strike it up out of metal, as shown at J, Fig. 3, with a flange, *r*, to attach it to the cloth-plate, slotted at r^2 for the passage of the feed-bar, a concave portion, *s*, to receive the shuttle and shuttle-driver, and a slot, *t*, so that it may be always kept free of dirt and refuse, which can escape at once through the slot. The holes r^1, through which the holding-screws s' pass, are elongated, so as to permit the adjustment lengthwise of the race whenever desired. At the ends of the slot are fingers or projections t', which bear against the way or ledge K on the under side of the bed-plate, this ledge closing the shuttle-race on the flat side of the shuttle. The race is set against the side of one of the two ways K in which the shuttle-driver slide moves, and is there held by means of the screws s', which pass through the flange *r* into the cloth-plate. The shuttle is shown at *v*, the shuttle-driver at v^1, and also separately in Fig. 4, and the shuttle-driver slide at v^2. This slide is connected with an arm, w^2, on crank-pin *w* of shaft G, by a rod, w^1. Of the two ways or grooved pieces K L, between which the shuttle-driver slide v^2 moves, the outer one L is removable and adjustable nearer to or further from the other, this being effected by providing it with ears *x*, slotted transversely to the length of the piece, through which holding-screws x' pass into the cloth-plate. By reason of this arrangement the piece L can be set up toward the other, K, so as to take up all wear and cause the slide to move evenly and without noise or lateral movement, while it admits also of the parts being taken apart to clean this portion of the machine with greater facility. The mechanism for driving the needle-arm consists of the crank-pin *w* fixed on a disk, *y*, attached to shaft G, and the heart-shaped cam *z* formed in the lower end of the vertical portion of the angle-lever needle-arm O, which arm is pivoted at its angle P to the standard of the machine. The crank moves in the direction of the arrow, and the arrangement of parts is such that the descent of the needle is effected during that portion of the movement when the crank-pin is passing from the point z' through the lower portion of the cam-slot. The advantage of this arrangement is, that the descent of the needle to pierce the cloth takes place at a time when the operative length of the vertical arm of the lever O is continually increasing, so that the descent is slower and more gradual, and more power is obtained than would be the case were the shaft or crank to revolve in an opposite direction, and consequently the needle to descend when the operative length of the vertical arm of lever O was continually decreasing, for this would cause a more rapid,

but proportionately less powerful, descent. This arrangement of the mechanism requires the shuttle *v* to be pointed outward or away from the driving-shaft G instead of toward it, as has hitherto been the practice in the machine—the Wilson sewing-machine—to which these improvements are represented as applied.

Having now described my invention and the manner in which the same is or may be carried into effect, what I claim, and desire to secure by Letters Patent, is—

1. A spring for sewing-machine tensions, consisting of a disk with eccentrically-curved and downwardly-bent spring-fingers, the whole being constructed substantially as shown and described.

2. The take-up lever operated from the needle-bar, as specified, and pivoted to a movable block within the head of the machine, in combination with a screw-stem extending through a vertical slot in the head and an adjusting and clamping nut on the exterior of the head, under the arrangement shown and described, so that the said nut and stem may serve as a means both of moving the block up and down and of clamping it in position.

3. The slotted link, intermediate between and connected and operating in conjunction with the feed-bar, and the reciprocating rod E, substantially as shown and set forth.

4. The shuttle-race, struck up from metal and formed, as herein described, with a concave bed to receive the shuttle, a holding-flange slotted to permit the passage of the feed-bar, and with elongated pin or screw holes to permit its being fastened to and adjusted lengthwise on the bed-plate of the machine, a slot for escape of refuse and dirt from the bed, and projections or bearings *t'*, substantially as shown and described.

5. In combination with the needle-arm, its heart-shaped cam groove or slot, and the crank-pin of the driving-shaft, operating together as specified, so that the descent of the needle takes place when the crank-pin traverses the lower portion of the slot, I claim an outwardly-pointed shuttle, arranged and operated from said crank-pin, substantially as herein shown and set forth.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

GEORGE W. BAKER.

Witnesses:

A. ZEHRING,

T. B. LINDSAY.