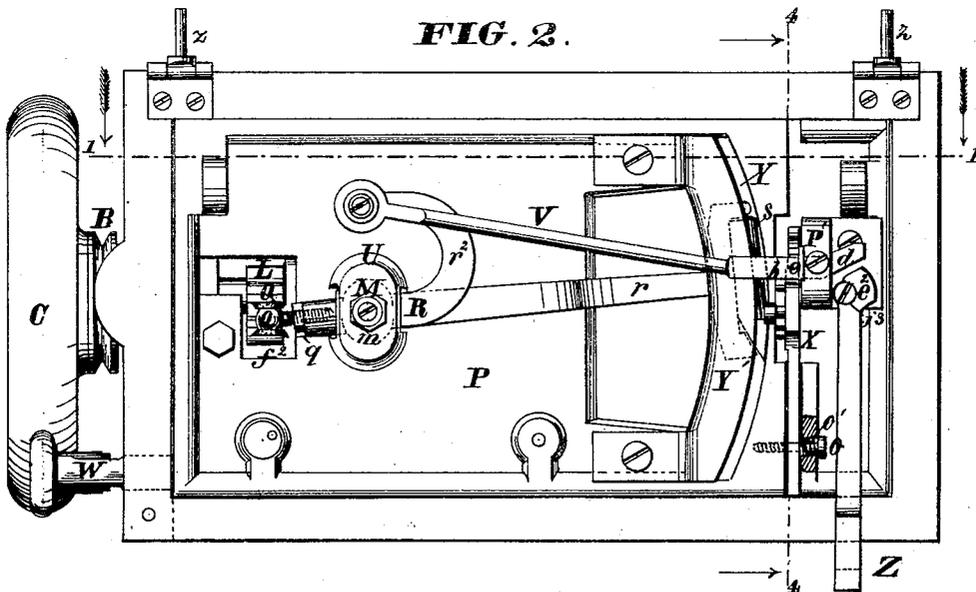
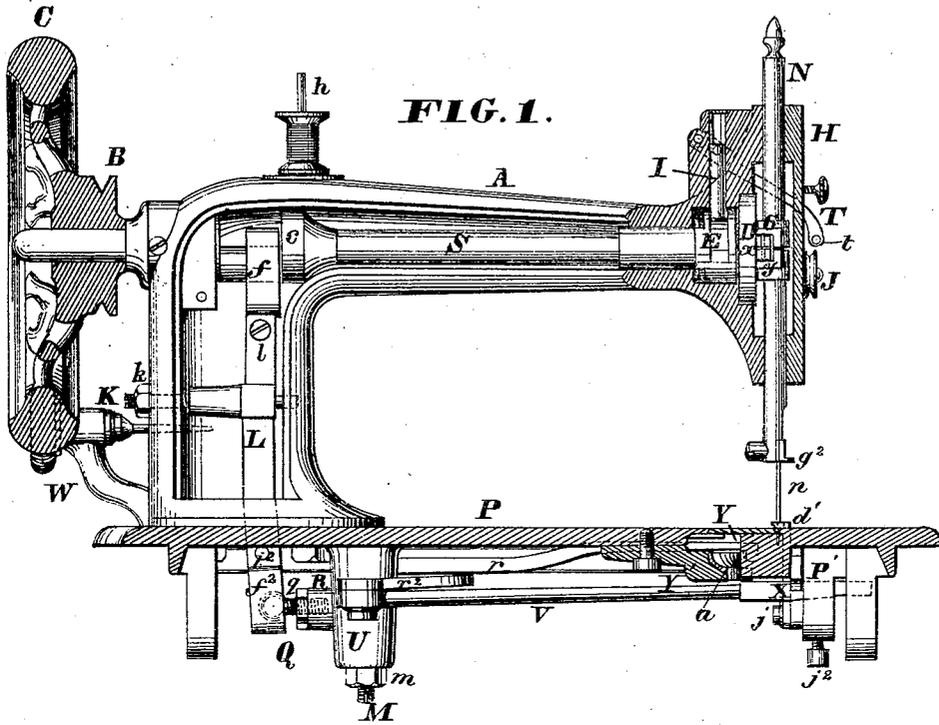


R. H. St. JOHN.
Sewing-Machines.

No. 155,120.

Patented Sept. 15, 1874.



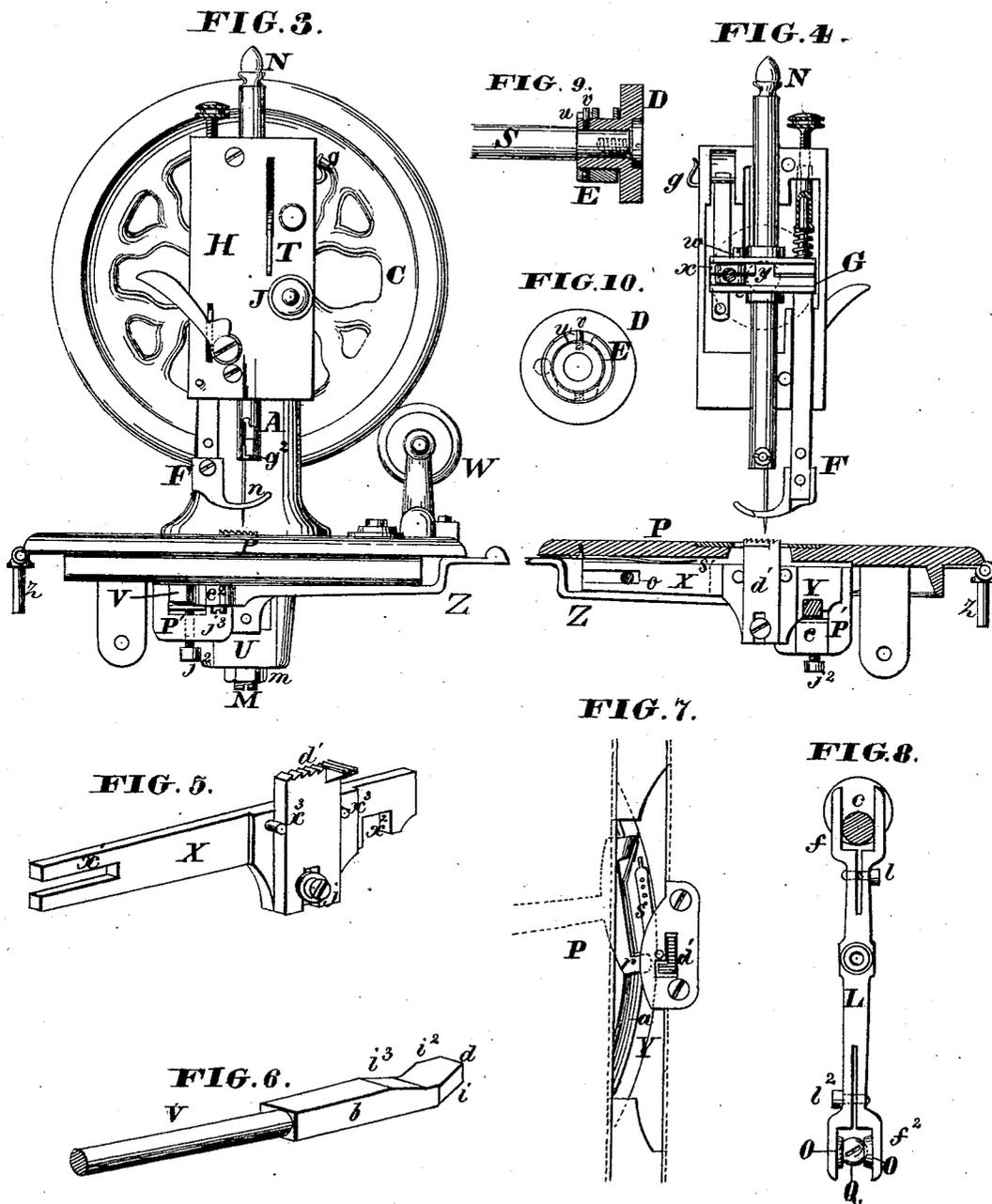
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UNITED STATES PATENT OFFICE.

ROSWELL H. ST. JOHN, OF BELLEFONTAINE, OHIO.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **155,120**, dated September 15, 1874; application filed March 10, 1874.

To all whom it may concern:

Be it known that I, ROSWELL H. ST. JOHN, of Bellefontaine, in the county of Logan, Ohio, have invented an Improved Sewing-Machine, of which the following is a specification:

This invention relates, as an improvement, to those lock-stitch sewing-machines which have reciprocating needles, reciprocating or oscillating shuttles and "take-ups," and the "four-motion" feed. It relates particularly to the sewing-machine described in United States Letters Patent No. 132,332, issued October 15, 1872, to the inventor of the present improvement.

In that machine a take-up is actuated independently of the needle-bar by a cam on the driving-shaft, so as to give the requisite rest or slack to the thread during the passage of the shuttle without the needle resting; and the shuttle-race is inlaid with rawhide, in transverse strips or blocks, to reduce the friction and noise at this point.

The present invention consists, first, in making the take-up cam, within the head, self-reversing, and in actuating the thread-resting take-up therefrom, in peculiar manner, with reference to the adaptation of the machine to sew perfectly with the driving-shaft turning either forward or backward.

The invention consists, secondly, in a peculiar construction of the needle-bar, cross-head, and crank-slide, to provide for taking up wear therein by means of a single screw.

The invention consists, thirdly, in a ball-headed screw, applied to the oscillating shuttle and feed-driver, as means for connecting the same to the aforesaid transmitting-lever, and for regulating the throw of the shuttle.

Figure 1 is a side elevation of a sewing-machine (unmounted) illustrating this invention, the cap-plate of the arm being removed, and other parts in vertical section in the plane of the driving-shaft and on the line 1 1, Fig. 2, as indicated. Fig. 2 is a bottom view of the same. Fig. 3 is an end view. Fig. 4 is a vertical transverse section in the plane of the needle-bar and on the line 4 4, Fig. 2. Figs. 5 and 6 are perspective views of parts of the feed mechanism, detached. Fig. 7 is a partial

plan view of the cloth-table, with the shuttle-race slides partially withdrawn, to expose the interior. Fig. 8 is a rear view of the transmitting-lever, with its appurtenances. Figs. 9 and 10 are, respectively, a longitudinal section and an end view of the crank-disk and sliding cam-collar, by which the needle-bar and take-up are actuated.

This improved sewing-machine, in the particular form represented as an illustration, is constructed as follows: A hollow arm, A, having the usual head H, and suitable bearings and recesses, is erected on a flat cloth-plate, P, having hinges *z* at one edge, for attaching it to the table, in customary manner. A rotary driving-shaft, S, is mounted longitudinally in the horizontal portion of the arm A, and provided, behind the same, with a grooved band-pulley, B, and a fly-wheel, C. Within the head H this shaft carries a crank-disk, D, with a collar, E, behind the same, for operating, respectively, the needle-bar N and the take-up T. The needle-bar slides in central vertical ways in the head, and a straight needle, *n*, is attached to its lower end, and receives a simple reciprocating movement. The take-up T has a transverse horizontal pivot at the back of the head H, and works through a vertical slot in the face-plate of the head, having an eye, *t*, in front of the latter, to receive the thread. It has an oscillating movement independent of the motion of the needle-bar, so as to give the requisite rest or slack to the thread during the passage of the shuttle without the needle resting. Within the head H a cross-head or T, G, having a deep horizontal groove, *y*, in its back, is formed on or attached to the needle-bar, to receive a slide, *x*, which embraces the wrist-pin of the crank-disk D. The cross-head G is divided horizontally, and its lower part is cast on the needle-bar. Its upper part has a collar to embrace the needle-bar, and is attached to the lower part by a screw, *w*. The slide *x* is similarly divided, its two parts being held in position relatively to each other by dowel-pins, and by tightening the single screw *w*, any wear in either or both parts may be taken up, and the fit thus rendered as tight as in the new machine.

The cam-collar E is mounted loosely on the hub of the crank-disk so as to slide, and is attached thereto by a screw, *v*, occupying a recess, *u*, which permits a limited movement of the collar, as illustrated in Figs. 9 and 10. It operates the take-up through the medium of a gravitating vertical slide, I, having a lateral pin at its upper end, which traverses a slot in the head and occupies a longitudinal slot in the take-up lever.

When the take-up is depressed, as seen in Fig. 1, the lower end of the slide occupies a slot or groove in the cam collar, at each end of which groove is an incline connecting it with the prominent cylindrical surface. The rear incline is stopped by the screw *v* in proper position relatively to the crank-wrist to elevate the take-up at the proper moment, and the other, following, lowers it at the proper moment.

If the driving-shaft be turned in a contrary direction, the collar will be reversed by the free motion of the shaft relatively to it, and will then operate in precisely the same manner, the incline, which before served to lower the take-up, serving now to lift it, and vice versa.

A presser-foot, F, and tension-disks J, with appurtenances applied to the head H, thread-guides *g* *g*², applied to the head and needle-bar, a spool-holder, *h*, applied to the top of the arm, and a bobbin-winder, W, applied to the cloth-plate, are represented as customary appurtenances, and these devices or their equivalents, of any preferred construction, may be employed.

Within the arm A, at its elbow, the shaft S is provided with a crank-wrist, *c*, which occupies a fork, *f*, at the upper end of a vertical transmitting-lever, L, the pivot of which is formed by a screw-rod, K, tapped into the vertical portion of the arm A, and secured by a jam-nut, *k*. A fork, *j*², at the lower end of this lever, embraces a pair of cheek-plates, O, applied to the ball-shaped head of a coupling-screw, Q, which is tapped into the rear end of a horizontal lever, R, and is locked by a jam-nut, *q*. Both ends of the lever L are split parallel to the forks, as represented in Fig. 8, and transverse screws *l* *l*² are tapped into the same, as means for tightening the forks to take up wear. The lever R has a pivot near its rear end formed by a vertical screw, M, in combination with a jam-nut, *m*, to lock the same, and with a hollow post, U, within which the pivot is formed. In front of this pivot the lever is bifurcated, a main arm, *r*, extending within the shuttle-race, Y, and a second arm, *r*², extending laterally to connect with a rod, V, by which the feed-bar X is actuated. The shuttle-carrying arm *r* is extended into the shuttle-race through a horizontal slot formed at the top of the casting Y', which forms the bottom of the shuttle-race. A vertical slot is formed at the lower edge of the

same for the escape of dust. The shuttle-carrier proper is adapted to the shuttle *s*, which, in the illustration, is one of peculiar construction, constituting the subject-matter of a separate invention.

By adjusting the ball-headed screw Q, the throw of the shuttle is regulated.

To reduce the friction, wear, and noise within the shuttle-race in a superior manner, a single strip, *a*, of raw-hide is applied in a longitudinal undercut groove in the top of the casting Y', as shown in Fig. 1.

The feed-rod V is constructed, as represented in Fig. 6, with a straight rectangular portion, *b*, at its effective end, and terminates in an oblique end, *d*, forming lateral inclines *i* *i*², and having also a higher bottom connected to the bottom of the portion *b* by an incline, *i*³, in the same line as the latter.

The feed-bar X, Fig. 5, slides in ways formed on the under side of the plate P, and is supported and guided at its front end by a screw, *o*, Figs. 2 and 4, occupying a deep notch or horizontal slot, *x*¹, and furnished with a friction-spring, *o*¹, as shown in Fig. 2. At its rear or inner end the feed-bar is furnished with a vertical notch, *x*², to receive the portion *b* of the rod V, and it is pressed downward upon the rod by a spring, *s*¹, Fig. 4. The feeding-dog *d*¹ is attached between studs *x*³ by a screw, *j*, occupying a vertical slot which provides for adjusting the dog in setting up the parts.

The rod V, extending through the notch *x*² in the feed-bar, is supported at its outer end on a vertical abutment, *e*, adjustable by means of a screw, *j*², in a hanger, P¹, formed on or attached to the bottom of the cloth-plate. The incline *i*³ on the feed-rod engages with this abutment to raise and lower the dog, and the incline *i*² engages with the rear wall of the hanger to impart the retreating horizontal stroke. The main or feeding stroke is imparted by the incline *i*, operating in combination with an abutment, *e*², in the form of an eccentric, adjustable by means of a hand-lever, Z, which projects at the front edge of the cloth-plate, and may be held by friction or by means of notches or other detents. The pivot of this lever is formed by a vertical screw, *j*³.

The feed will be operated in the same manner relatively to the motions of the shuttle and needle, whether the driving-shaft turn forward or backward, and, provision being made for the automatic adjustment of the cam for operating the take-up, as before described, this machine is adapted to feed in one direction, and to sew perfectly, with the driving-shaft turning in either direction, which is the primary object of this invention. At the same time provision is made for taking up wear at every point. The operating parts are simple and compact, and the changeable movements may all be readily regulated.

A sewing-machine adapted to sew continuously in one direction, with the shaft turning

either forward or backward, is not, broadly, claimed as new; but the means herein described for producing said effect in the peculiar manner set forth are claimed as new, as hereinafter stated. The broad idea of making provision for taking up wear at the needle-crank is likewise disclaimed as not my invention.

The longitudinal rawhide lining for the shuttle-race differs essentially from independent transverse strips, as described in my Letters Patent No. 132,332, in that the shuttle travels lengthwise thereon and crosses no joints. It consequently remains more securely in position and wears better, while it performs the same functions as the transverse strips.

The following is claimed herein as new:

1. The loose cam-collar E, with recess *u*, the stop-screw *v*, and the gravitating slide I, all arranged within the head of the machine, in combination with the pivoted take-up T, pro-

jecting through the face-plate of the head, and operated by said means, in the manner set forth.

2. The combination of the horizontally-divided straight cross-head G, the horizontally-divided crank-wrist slide *x*, and the single adjusting-screw, *w*, applied to the former for taking up wear in both, substantially as shown and described.

3. The ball-headed screw Q, applied to the horizontal feed and shuttle driver R, and constructed and operating substantially as described, for coupling said driver to the transmitting-lever I and regulating the throw of the shuttle, as set forth.

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Witnesses:

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