

W. J. STEWART.
Sewing-Machine.

No. 205,698.

Patented July 2, 1878.

Fig. 2.

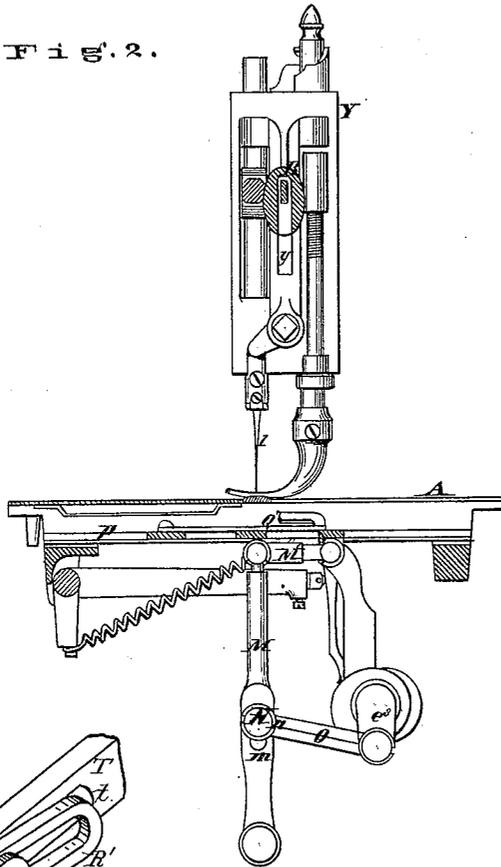


Fig 4

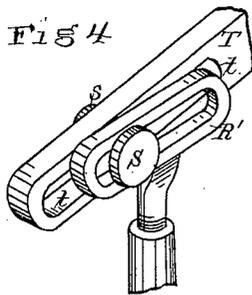


Fig. 3.

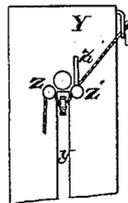
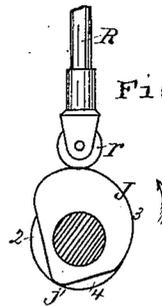


Fig 5



ATTEST.

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IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **205,698**, dated July 2, 1878; application filed October 10, 1876.

To all whom it may concern:

Be it known that I, WILLIAM J. STEWART, of the city and county of St. Louis, and State of Missouri, have invented a certain new and useful Improvement on Sewing-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My improvement is shown and described as applied to the Howe sewing-machine, but admits of application to other sewing-machines. It involves changes in the devices for driving the needle-lever and the shuttle, and provides a new take-up mechanism.

The needle-lever is oscillated by pitman-connection to a simple crank upon the crank-shaft. The shuttle-driver is actuated by pitman-connection to the upper end of a lever operated by adjustable pitman-connection to a crank upon the crank-shaft. The crank-shaft has a socket-coupling between these two cranks, so as to give means for time adjustment of the movements of the shuttle and needle relatively to each other.

The take-up of the thread is performed by positive movement of the take-up mechanism. This mechanism consists of a lever having at one end an eye, through which the thread passes, and having at the other end a slot receiving a movable screw-pin, which also passes through a slotted head of a pitman which is raised by a cam upon the crank-shaft. The weight of the pitman tends to keep it in contact with the cam, and it is also pressed down by a spring, which is connected to the rear end of the take-up lever to draw that end of the lever downward.

The main peculiarity of my improved sewing-machine mechanism is that, while the needle has the constant and regular motion imparted by a crank, the take-up movements are made irregular, in such manner as to accommodate the fullness of the thread to the requirements of the shuttle, needle, &c.

Figure 1 is a side elevation, showing my improvement as applied to a Howe sewing-machine, some parts being in section and others removed. Fig. 2 is an end elevation. Fig. 3 is a front elevation of part of the face-plate.

Fig. 4 is a perspective view, showing the adjustable connection of the pitman to the take-up lever. Fig. 5 is a side view of the take-up cam, showing the foot of the pitman.

A is the bed-plate, and B the fixed arm. C and D are brackets, in which the crank-shaft E E' has bearing. F is a hand-wheel, by which the crank-shaft may be started, and which also acts as a fly-wheel.

The crank-shaft is rotated, when running, by a belt on the pulley G. The shaft E has a crank, *e*, on which is a pitman, H, whose upper end is connected to the needle-lever by a ball-joint. The crank *e* is upon the portion E of the shaft, and this portion carries also the cam J, by which the take-up mechanism has its positive movements.

The inner end of the part E extends into a socket, *e*¹, in the portion E', and is held therein by a set-screw, *e*². Upon the part E' are the two feed-motion cams K K and a crank, by the latter of which motion is given to the shuttle. No novelty is claimed in the feed-motion, and no further allusion need be made to it.

The shuttle-driver Q' is of the usual form; but the preferred form of mechanism by which it is actuated is as follows, although no claim is here laid to such special construction in its entirety, as I may use any other well-known means: The driver Q' is connected by a rod, M', to the upper end of a lever, M, fulcrumed at its lower end to the bracket D, and slotted at *m* to receive a pin, N, connected by a rod, O, to the crank *e*³. The pin N is fixed in the slot *m* by a nut, *n*, which can be loosened to allow the pin to be adjusted in the slot endwise to the lever, to regulate the throw of the shuttle. The shuttle-race is shown at P.

I will now describe the thread-take-up mechanism: This is operated, to draw up the thread at the proper time, by a cam, J, which is shown most clearly in Fig. 5. Said cam acts against the under side of an anti-friction roller, *r*, at the lower end of the pitman-rod R, whose upper end has a slotted cross-bar, R', through which passes a pin, S, which also passes through the longitudinally-slotted end *t* of the take-up lever T, and is secured therein by a nut screwing on the end of

the pin. To change the throw of the take-up lever, the pin S is loosened by unscrewing the nut *s* upon it and moving the pin along the slots, the pin being moved toward the end of the lever to lessen the throw, and away from the end to lengthen the throw, of the lever. This end of the lever T is drawn downward by a spring, V, attached at one end to the lever, and at the other end to the fixed arm at *v*. This spring keeps the roller *r* in contact with cam J.

The pitman R passes through guides U, which confine it to a vertical or endwise movement, said movement being always through the same distance; hence the necessity of means of adjustment by the pin S, movable in slots in the pitman and lever, R and T. The take-up lever oscillates on a pivot-pin, W. The outer end of this lever projects through the face-plate Y, through a vertical slot, *y*, and has an eye, *t'*, at that end, through which the thread passes.

Projecting from the face-plate, at each side of the slot *y*, are thread-guide pins Z Z', over which the thread passes. Extending upward from the head of pin Z is a wire, *z*, to prevent the thread from flying off the pin. The thread passes over the pin Z to the needle 1. The arrangement is such that as the outer end of the take-up lever descends the thread is taken up, and as it ascends the thread is given out.

The cam J has the peculiarity of form necessary to give the required take-up movements to the lever T. The periphery or working-face of said cam J has projections at *j* and *j'*, and intermediate portions 2 and 3 4, the former of which is flattened. The part 3 is curved, and the part 4 consists of a small flattened spot. The cam turns in the direction indicated by the arrow, as shown in Fig. 7, and is in the position it occupies when the needle has just commenced its descent after having reached its utmost elevation. As the cam turns from this position the roller *r* passes over the portion 3, and as it reaches the part 4 (by the descent of the pitman) the thread is given out, and the needle has reached its lowest position. As the needle commences to rise, it throws out a loop on both the front and rear sides. The loop on the front side is to admit the shuttle; but the loop on the rear side performs

no useful office, but is detrimental to the working of the machine, because it causes the front loop to hang loosely, and consequently the loop is not taken by the shuttle in a perfect manner. To overcome this fault, I provide the small projection *j'* of the cam J to cause a slight take-up movement in the thread, so as to take up the slack at the back of the needle. Then, as the shuttle is passing through the loop, the projection *j'* passes from beneath the pitman-roller *r*, and the thread is again given out for formation of sufficient loop for the shuttle to pass through. While the shuttle is passing through the loop the roller *r* is passing over that part of face 2 in near proximity to the center of the cam, so that the thread is not taken up; and when the shuttle has passed through the loop, the thread is quickly taken up by the action of the projection *j* upon the pitman R.

It will be seen that the needle has the regular motion imparted by a common crank, and the needle mechanism proper has no action on the take-up mechanism, and that all irregularity of motion is confined to the take-up mechanism.

A special advantage claimed for this peculiar mode of operation is, that all the heavier parts of the mechanism, such as the parts operating the needle and shuttle, have regular motion, the irregularity being confined to the silent and lighter parts, such as the thread itself and its take-up mechanism, and consequently the machine will be noiseless and light-running, as compared with others in which the movements of the heavier parts are irregular.

I claim as my invention—

1. In combination with the lever T, provided with the slotted ends *t*, the pitmen R and R', movable pin S, cam J, and spring V, substantially as and for the purpose set forth.

2. The combination, in the shaft E E', of the needle-driving crank *e*, shuttle-driving crank *e'*, take-up driving-cam J, and adjustable coupling *e¹ e²*, substantially as and for the purpose set forth.

WILLIAM J. STEWART.

Witnesses:

SAML. KNIGHT,
CHARLES PICKLES.