(Model.) 2 Sheets—Sheet 1.

A. J. HURTU.

SEWING MACHINE.

No. 258,761. Patented May 30, 1882.

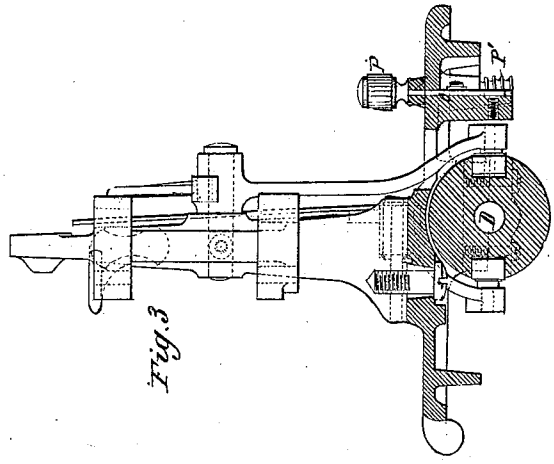


Fig. 3.

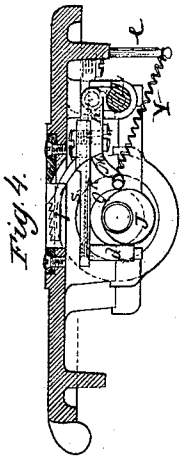


Fig. 4.

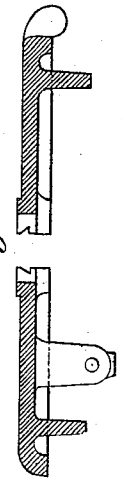


Fig. 5.

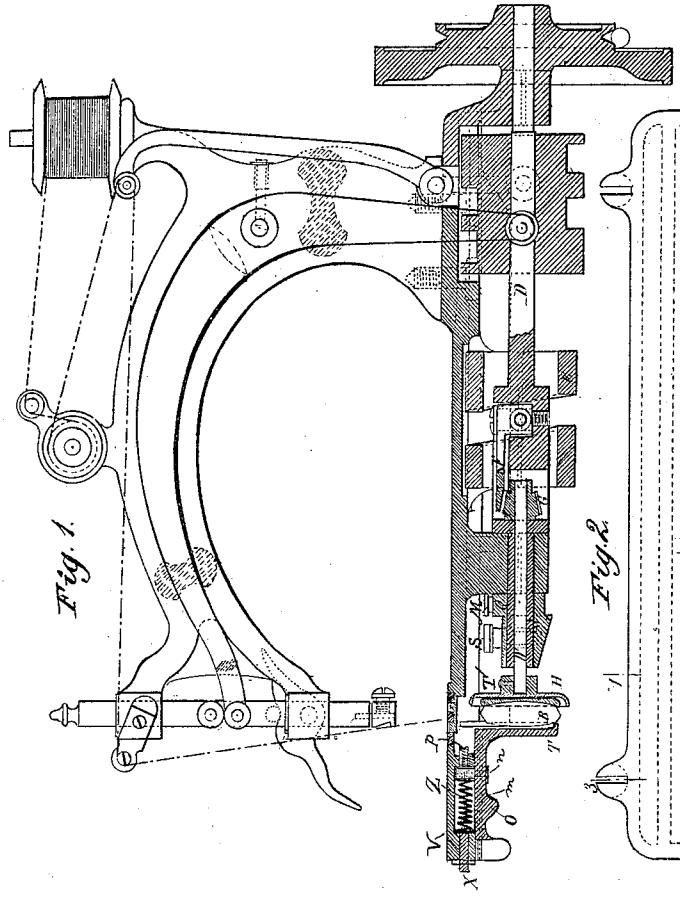


Fig. 1.

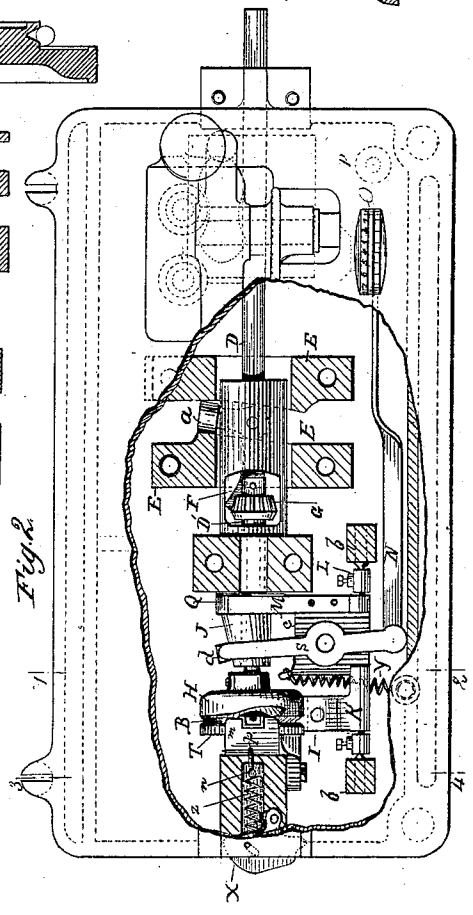


Fig. 2.

Witnesses:

1. Robt. M. Hurtu

2. Jean Baptiste Rolland

Inventor

Auguste Jacques Hurtu

(Model.) 2 Sheets—Sheet 2.

A. J. HURTU.

SEWING MACHINE.

No. 258,761. Patented May 30, 1882.

Fig. 6.

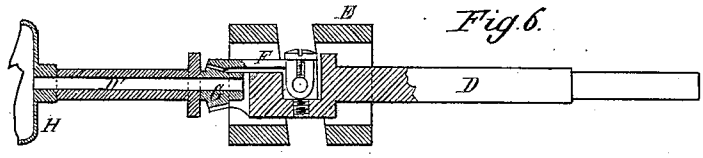


Fig. 8.

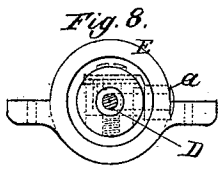


Fig. 7.

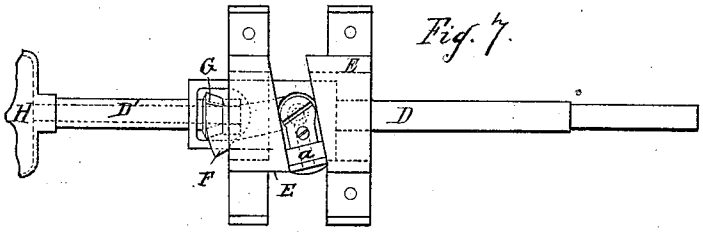


Fig. 10.

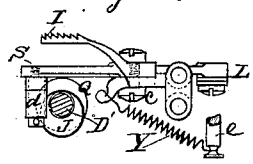


Fig. 17.

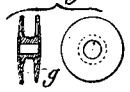


Fig. 9.

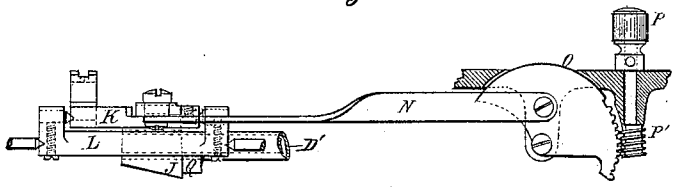


Fig. 11.

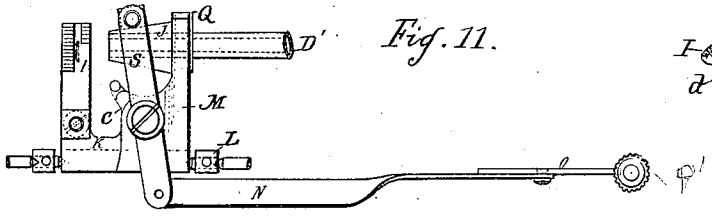


Fig. 11a

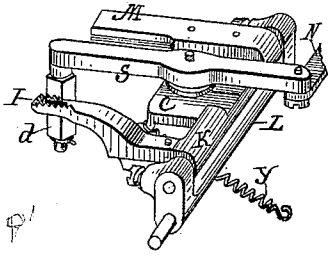


Fig. 13.

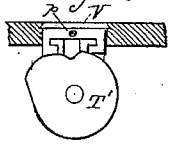


Fig. 12.

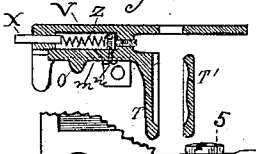


Fig. 13a.

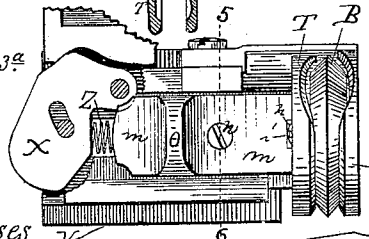


Fig. 15.

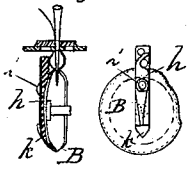
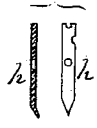


Fig. 16.

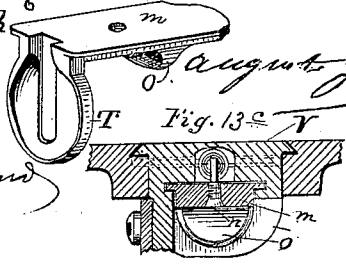


Witnesses

1 [illegible]

2 Jean Baptiste Rolland

Fig. 13b.



Inventor:

Augustus Jacques Hurtu

Fig. 13c.

UNITED STATES PATENT OFFICE.

AUGUSTE JACQUES HURTU, OF PARIS, FRANCE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 258,761, dated May 30, 1882.

Application filed August 24, 1881. (Model.) Patented in France September 4, 1879, No. 132,585; in Belgium January 29, 1881, No. 53,716, and in England February 2, 1881, No. 450.

To all whom it may concern:

Be it known that I, AUGUSTE JACQUES HURTU, engineer, of Paris, France, have invented an Improved Sewing-Machine; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed sheets of drawings, making a part of the same.

This is an improvement in the class of sewing-machines in which a circular stationary shuttle and rotary hook are employed, and in which accelerated motion is imparted to such hook during part of its revolution. I make the shaft carrying the hook in two parts, connected together by gearing so constructed that while the part hereinafter distinguished as the "main shaft" receives continuous uniform rotary motion the other, which carries the hook, receives, during part of each revolution, a slower or faster motion than the first, as may be required, in order that the needle-thread shall be thrown rapidly off the shuttle.

The improvement further relates to the combination and arrangement of parts, as hereinafter described, whereby the bobbin-case is held in place and may be released at will; also, whereby the plate to which the devices for holding the shuttle are attached may be locked in or released from a slot in the bed-plate of the machine.

In the accompanying drawings, (two sheets,) Figure 1 is a central longitudinal vertical section of my machine. Fig. 2 is a plan with bed-plate broken out and some working parts shown in section. Fig. 3 is a transverse section of same, taken through the cam which operates the needle-bar. Fig. 4 is a section of the bed-plate, taken on the line 1 2, Fig. 2; and Fig. 5 is a transverse section of the bed-plate alone on line 3 4, Fig. 2. Figs. 6, 7, and 8 show, respectively, a longitudinal section, plan, and end view of the mechanism whereby a variable motion is imparted to the rotary hook. Figs. 9, 10, and 11 are, respectively, a side view, plan, and end view of the mechanism for regulating the length of stitch. Fig. 11^a is a perspective view of a part of the feed mechanism. Figs. 12 and 13 are sectional views of the shuttle-holding devices. Fig. 13^a is a plan view of the shuttle-holding devices and the plate (part seen broken away) to which they are attached inverted, together with the notched portion of the bed-plate with which the pivoted catch locks. Fig. 13^b is a perspective view of one of the devices for holding the bobbin-case. Fig. 13^c is a cross-section on line 5 6, Fig. 13^a. Figs. 15, 16, 17 represent the shuttle, thread-tension device, and bobbin.

B is the case containing the spool.

D is the main shaft, upon which is mounted the cam for operating the needle-bar. The inner end of the shaft D is made hollow, and through it passes another shaft, D′, carrying at its outer end the rotary hook H, by which the thread is passed over the bobbin-case B. A bevel-pinion, G, is fixed on the other end of shaft D′, which gears with a toothed segment, F, provided with an arm carrying a friction-roller, *a*, Figs. 2, 7, that works in the groove of cam E, by which arrangement of parts a variable circular motion is imparted to the rotary hook H, as will be hereinafter described. This cam E is formed in two parts, which are adapted for adjustment toward each other, in order to compensate for wear and prevent backlash, while allowing free motion of the roller *a*.

I is the feed-claw, Figs. 4, 10, 11^a, whose arm is attached to a shaft, K, that is pivoted on centers between the arms of an auxiliary bar, L, which is similarly pivoted in lugs *b*, pendent from the bed-plate of the machine. The oscillation of this swinging bar L permits the required horizontal motion of the said feed-claw.

The shaft K is also provided with a lateral arm, M, whose free end, Fig. 1, rests upon the circular cam Q, formed on the shaft D′. As the latter rotates it is obvious that the feed-claw will be oscillated vertically. The to and-from or horizontal motion of the claw is produced by a cam, J, formed on shaft D′ contiguous to the aforesaid cam Q. The cam is tapered, and acts on a lever, S, which is pivoted to a lug, *c*, of shaft K, so that it may be adjusted in a horizontal plane for the purpose of changing the position of its free end on the cam J for the purpose of varying the throw of the feeder I, and thereby making the stitch shorter or longer, as required. The lever S has a pin fixed in its free end, on which is pivoted a block, *d*, Figs. 10, 11^a, that bears against the side of the cam

J, Figs. 2, 4, 11. The lever S and arm M are held down or in contact with their respective cams, J Q, by means of the spiral spring Y, Fig. 4, which is connected at one end with the lug *c* and at the other with a fixed arm, *e*, pendent from the bed-plate. Said spring thereby exerts tension in a diagonal direction, so as not only to hold the lever S and arm M in contact with their respective cams, J and Q, but also to hold the block *d* pressed back against the side of the cam J, which position is necessary to the required operation of the feed I.

For varying the throw of the feed-claw I, I employ the following mechanism: A spring or elastic bar, N, Figs. 2, 9, 11, 11ª, is pivoted to the rear end of lever S, Figs. 1, 9, and at its other end to a segment, O, that is pivoted centrally in arms or lugs pendent from the bed-plate, but which projects through a slot in the latter, Fig. 9, so that a portion of its circular edge is always visible above the same. A portion of the rear edge of the segment O is toothed, and meshes with a worm, P′, which is arranged vertically and provided with a milled head, P, Figs. 3, 9. By rotating the latter the segment P′ is moved around its axis, and the bar N thereby caused to shift the lever S on its fulcrum *c*, so as to move the free end of a lever which carries the pivoted block *d* toward one end or the other of the tapered cam J, thus varying the motion of the feed-claw I as required—that is to say, if the lever S be moved toward the larger end of cam J the to-and-fro motion of the feed-claw I will be greater, and, vice versa, the reverse movement of the lever S diminishes the throw of said feed-claw. The up-and-down motion of the latter is not materially varied, since that is determined by co-operation of the cam Q and arm M. For determining more precisely the change in the throw of the lever S and the consequent variation of the stitch, the upper edge of the segment O is arranged to work in a slotted piece, which, like the segment, is provided with numbered graduations, Fig. 2.

One side of the bobbin-case B has a circular opening of sufficient size to receive the spool or bobbin *g*, Fig. 17. On the other or closed side of the bobbin-case is a fixed vertical arm, Fig. 15, which fits in a slot in the clip T, and thus serves to prevent the bobbin-case from turning. On this arm is attached a spring, *h*, which serves as a tension device for the under thread. The pressure of such spring and the consequent tension on the thread is regulated by the attaching-screw *i*.

The thread passes through guide-holes, Fig. 15, in the arm of the bobbin-case. The lower end of spring *h* is pointed, and fits in a pocket, *k*, formed on the side of the bobbin-case. The spring *h* is therefore held vertical by the screw *i* and pocket *k*.

The bobbin-case is held between two concave disks or clips, T T′, Figs. 12 and 13, one of which, T, is movable. The other, T′, is rigidly attached by means of an arm, *l*, to an oblong rectangular plate or block, V, whose side edges are beveled to adapt them to fit in corresponding grooves in the sides of a slot in the bed-plate, Fig. 13ᶜ. For locking such plate in the slot I provide an elbow-shaped catch, X, which is pivoted to the block at its inner end, so that its angle projects into a notch, Figs. 2, 13ᵃ, in the edge of the slot in the bed-plate. The catch is held thrown out in this position by means of the same spring, Z, which acts on the arm of clip T′—that is to say, the spring acts in opposite directions on the catch X and clip-arm *m*. By pressing on the projecting end of the catch X, the spring Z is compressed and the angle of the catch drawn inward, so that the plate, with its attachment, may be removed from the bed-plate.

The inner end of the spring Z bears against the screw *n*, which is inserted through the arm *m* of clip T. This arrangement is shown in Figs. 1, 2, and 12. Said clip-arm *m* slides in lateral grooves in the under side of plate, and is provided with a thumb-piece, *o*, for use in drawing back the clip T for the purpose of releasing the shuttle.

The screw *p*, Figs. 1, 12, serves as an adjustable stop to prevent undue pressure on the shuttle by reason of the action of the spring Z.

When by the rotation of the pulley on the outer end of shaft D the friction-roller *a* is carried around in the concentric portion of the groove of cam E, the two parts D D′ of the shaft turn together at the same speed; but immediately the roller *a* enters the part of the cam-groove of different radius the segment F will be shifted, and acting on the pinion G rotates it in one or the other direction, thus imparting to part D′ of the shaft, and consequently to the hook H, either a faster or slower motion than that of part D of said shaft, which enables the thread to be released and quickly thrown off the shuttle. Thus while the part D of the main shaft rotates continuously at the same rate of speed, it transmits through the cam E, segment F, and pinion G, a variable motion to the other part, D′—that is to say, the latter has an accelerated motion in one part of its rotation and a retarded motion during the remainder.

What I claim is—

1. The combination, with the shaft D D′ and rotary hook H, of the toothed segment F, bevel-pinion G, and cam E, substantially as and for the purpose set forth.

2. The spring Y, arranged as described, the feed-claw I, the lever S, and arm M, having common pivotal points in the swinging lever L, cams J and Q, and shaft D, all said parts being combined substantially as and for the purpose set forth.

3. The combination, with a shuttle having an arm attached on one side, of the tension-spring *h*, entering, at its lower end, a recess, *i*, of said shuttle, substantially as described.

4. The combination, with the bed-plate, having a slot one side of which is notched, as

shown, of the plate V, having a device for holding the shuttle attached, and the pivotal catch X, and spring Z acting thereon, as and for the purpose specified.

5. The combination of the elastic bar N, with segment O, worm P, and knob P′, the lever S, pivoted to adapt it for adjustment in a horizontal plane, and carrying at its inner end a journaled block, *d*, the lever L, swinging in a vertical plane, and the tapered cam J, shaft D D′, and hook H, all as set forth and described, for use in varying the length of stitch.

AUGUSTE JACQUES HURTU.

Witnesses:

ROBT. M. HOOPER,

JEAN BAPTISTE ROLLAND.