

(No Model.)

3 Sheets—Sheet 2.

J. A. DAVIS, Dec'd.

W. A. DAVIS, Executor.

SEWING MACHINE.

No. 353,255.

Patented Nov. 23, 1886.

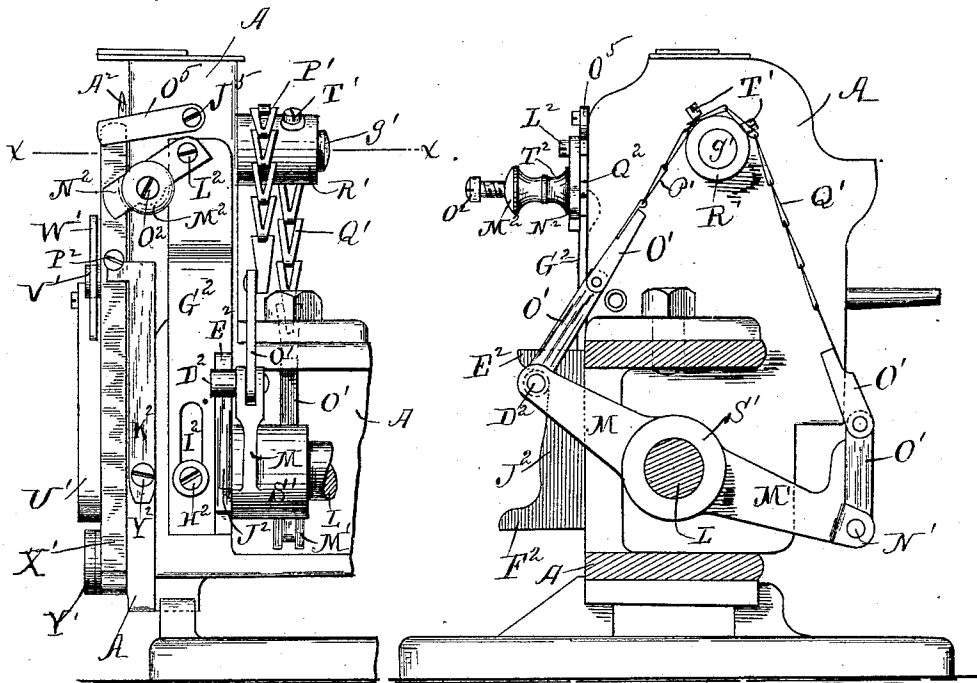


Fig. 3.

Fig. 5.

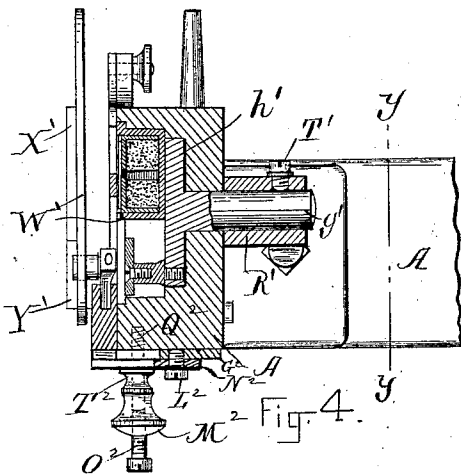


Fig. 4.

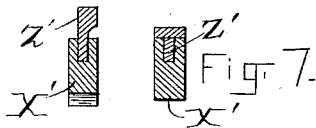


Fig. 6.

Fig. 7.

WITNESSES:

Chas. S. Gooding,
Robert Wallace.

INVENTOR:

Job A. Davis,
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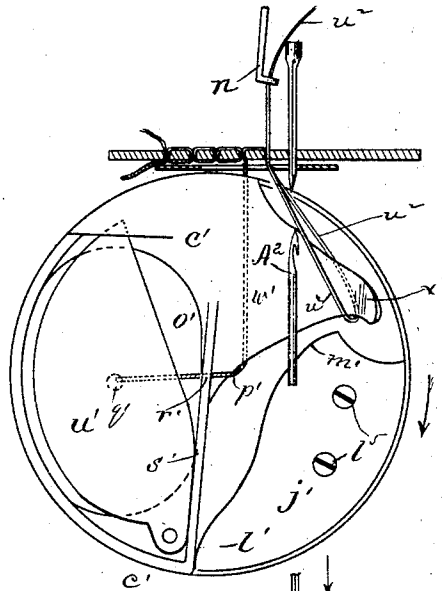
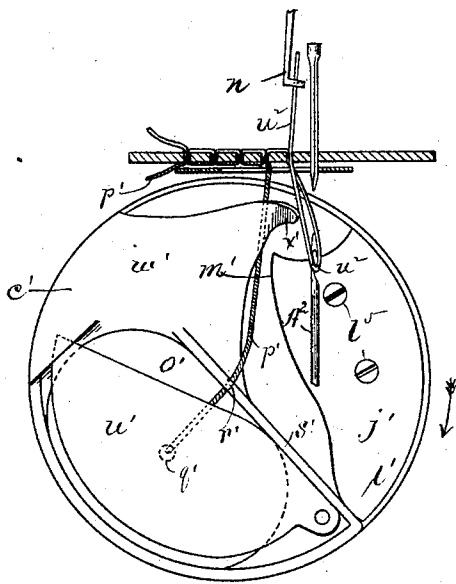


Fig. 8.

Fig. 9.



Fig. 12.

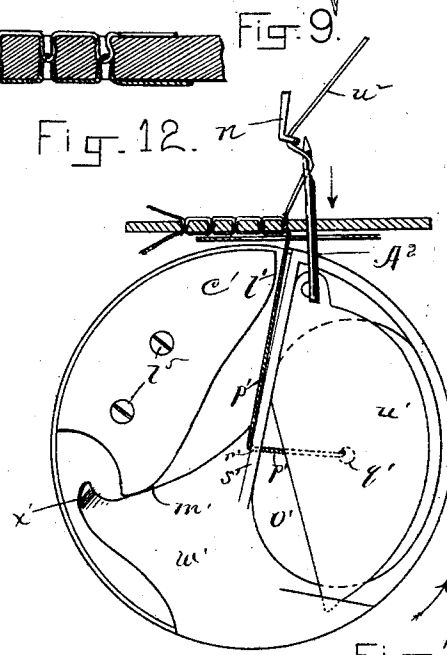
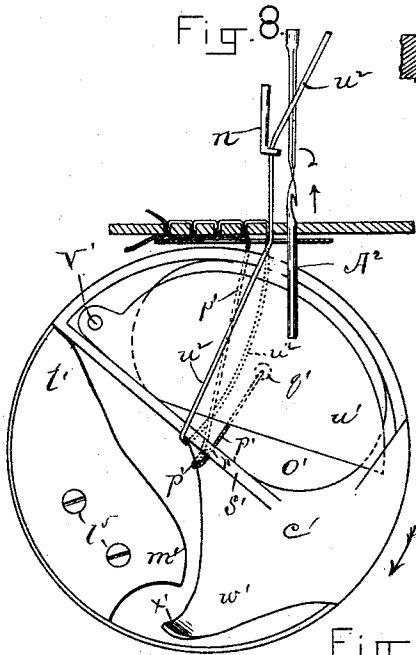


Fig. 10.

Fig. 11.

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UNITED STATES PATENT OFFICE.

JOB A. DAVIS, OF BOSTON, MASSACHUSETTS; WILLARD A. DAVIS (EXECUTOR OF SAID JOB A. DAVIS, DECEASED) ASSIGNOR OF ONE-HALF TO LEE E. MOORE, BOTH OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 353,255, dated November 23, 1886.

Application filed December 22, 1885. Serial No. 186,470. (No model.)

To all whom it may concern:

Be it known that I, JOB A. DAVIS, of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Sewing-Machines, of which

5 the following, taken in connection with the accompanying drawings, is a specification.

The object of this invention is to provide improved means for simultaneously actuating the shuttle, needle, and awl-bar of a wax-

10 thread sewing-machine and causing the needle to feed the goods forward.

The devices set forth form detail features of an organized machine, described and shown

15 generally in my application, Serial No. 186,467, for patent on wax-thread sewing-machines, filed simultaneously herewith, the same part in each case being designated by the same letter.

20 In the drawings hereto appended, Figure 1 is a front elevation of my improved machine, showing the relative arrangement of the several parts pertaining to the present invention. Fig. 2 is a detail elevation of the levers operated by the wrist-pin H. Fig. 3 is a side

25 elevation, showing especially the mechanism for operating the shuttle and needle. Fig. 4 is a horizontal section on line *xx* of Fig. 3. Fig. 5 is a rear elevation, the base and shaft in section on line *yy* of Fig. 4. Figs. 6 and 7 are transverse sections of the needle-bar and guide, taken, respectively, on the lines *w* and *z*, Fig. 1. Figs. 8 to 11 are diagrams illustrating the successive positions of the shuttle, awl,

30 needle, and thread-carrier in the formation of the stitch. Fig. 12 is an enlarged detail showing the character of the stitch.

The shuttle *c'* is oscillated in a circular recess in the frame A of the machine by a combination of devices, which will be first described.

40 Power is applied to a shaft on which the cylinder E is mounted for rotation. A wrist-pin, H, in the end of said cylinder (see Fig. 2) carries with it in its rotation the bell-crank lever F D', the upright arm F being pivoted at *a* to an arm, R, of the rocker-shaft S, which by another arm, T, and link *d* actuates the awl-bar, as is described in my said applica-

50 tion No. 186,467, filed simultaneously here-

with. The short arm D' of the bell-crank lever is slotted at F' to receive a bolt, E', connecting to said arm the lever G. This lever G is connected by a pivot, B', to a similar lever, J, which is pivoted to the end of the arm K, fixed by a screw, I', to the oscillating shaft L. This shaft has a hub, S', fixed upon it, with lateral arms M M', Figs. 3 and 5. These arms are connected to the collar R' on the short shaft *g'* by links O' O' and chains P' Q', said chains being kept from slipping on the collar R' by any suitable means, such as the pins or screws T', which may also hold the collar R' in place on its shaft *g'*. Now, since the shaft *g'* has a disk, *h'*, Fig. 4, which carries the shuttle *c'*, it is obvious that an oscillating movement will be imparted thereto by the vibration of the arms M M' and the action of the connected parts, as above set forth. For a detailed description of the shuttle itself reference may be made to my application, Serial No. 186,468, thereon, filed simultaneously herewith. The vertical reciprocation of the needle-bar *z'* is also effected by the oscillation of the shaft L, as will now be described. The reduced shouldered end of said shaft has fixed upon it a plate, U', Fig. 1, to which is secured a rother plate, W', in which is cut a cam-groove, C'. When the plate U' W' is vibrated by the motion of the shaft L, the cam-groove C' gives a rising-and-falling movement to a friction-roll, V', which turns on a stud projecting from the side of the needle-bar *z'*, so as to give to said bar and its needle the desired vertical motions. The needle-bar *z'* runs in guideways formed in a plate, X', as seen in Figs. 1, 6, and 7, when actuated as just stated.

In order to feed forward the material being operated upon by means of the needle, I pivot the guide-plate X' (in which the needle-bar works) to the frame A on a stud or screw, Y', Fig. 1, so that when this plate X' swings to the left on its pivot, while the needle A² is protruding upwardly through the work, the latter will be moved to the extent of the length of a single stitch. To effect this swinging movement at the exact moment required, I provide a friction-roll, D², on the end of the vibrating arm M, Figs. 3 and 5, which raises and lowers a plate, J², by means of the pro-

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jections E² and F², formed on said plate. This plate is formed in one with the plate G², Fig. 3, which is slotted at I² and guided in its vertical movement by a screw, H², through said slot. A spring, J², Fig. 1, has a bearing at one end in the plate G², and at the other on the head of the screw H², to hold said plate to its place.

A lever, N², pivoted on a stud, Q², Figs. 4 and 5, is connected with the upper end of the plate G² by the screw L². The opposite end of said lever has a protuberance, V², Fig. 1, which bears against a curved cam-surface, W², in the edge of the swinging plate X'. It will be seen that when the plate G² is lowered by the contact of the roller D² with the projection on F² of plate J², the lever N² will be vibrated on its pivot, bringing its protuberance V² up against the cam-surface W², and thus swinging the plate X' to the left in Fig. 1. This causes the needle to carry the goods forward, before it retreats drawing the upper thread down with it. When the plate X' is released by the lowering of the protuberance V², said plate is carried back with the needle into a vertical position by a spring, K². A stop, o², secured to the frame A by a screw, J⁵, checks this return movement at the proper point. The spring K² is fastened to the frame by a screw, Y², Fig. 3, its upper end being adjustably attached to the plate X' by the screw P².

The pivot Q² of lever N² is made solid in the frame of the machine, Figs. 4 and 5. By loosening the set-screw O² and thumb-nuts M² and T² the lever N² may be moved to the right, Fig. 3, and thus the plate X' will be moved a less distance by the action of the protuberance V². It is therefore evident that the extent of the feed-movement due to the lateral motion of the needle may be increased or diminished as desired. The relative movements of the needle and the shuttle may also be adjusted by varying the extent of oscillation of shaft L.

For this purpose I form lateral arms H³ and A' on the levers G and J, Fig. 2, and pass a stud or bolt, I, on the one through an arc-shaped slot, C', of the other. By throwing the pivoted levers G and J more or less out of direct line and fixing them in position by this slot-and-bolt arrangement the play of the arm K on the shaft L may be varied as desired, and the needle raised or lowered and adjusted to proper position with relation to the awl and shuttle. The throw of the needle and shuttle may also be increased or diminished by moving the bolt E' in the slot F' of arm D', as will be apparent.

What I claim is—

1. The combination, with the rotary cylinder E, having the wrist-pin H, of the bell-crank lever F'D', mounted on said pin, the oscillating or rocking shafts S and L, connected with said lever, the needle and awl bars, and connections between said bars and said shafts, substantially as set forth.

2. The rocker-shaft L, having arms M M', in combination with the shuttle-shaft g', provided with a shuttle-carrier, h', and the flexible connections extending from said arms to said shaft, whereby the vibration of said arms effects the oscillation of the shuttle, substantially as set forth.

3. The rocker-shaft L and the obliquely-slotted vibrating plate U' W', fixed thereon, in combination with the needle-bar Z', provided with a projecting stud and friction-roll V', engaging in the slot of said plate, whereby as the shaft L oscillates the needle is given a vertical reciprocation, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 13th day of November, A. D. 1885.

JOB A. DAVIS.

Witnesses:

MILAN F. STEVENS,
WILLARD A. DAVIS.