2 Sheets--Sheet 1.

G. W. HOFFMAN.
Sewing-Machine.

No. 162,288. Patented April 20, 1875.

Fig. 1.

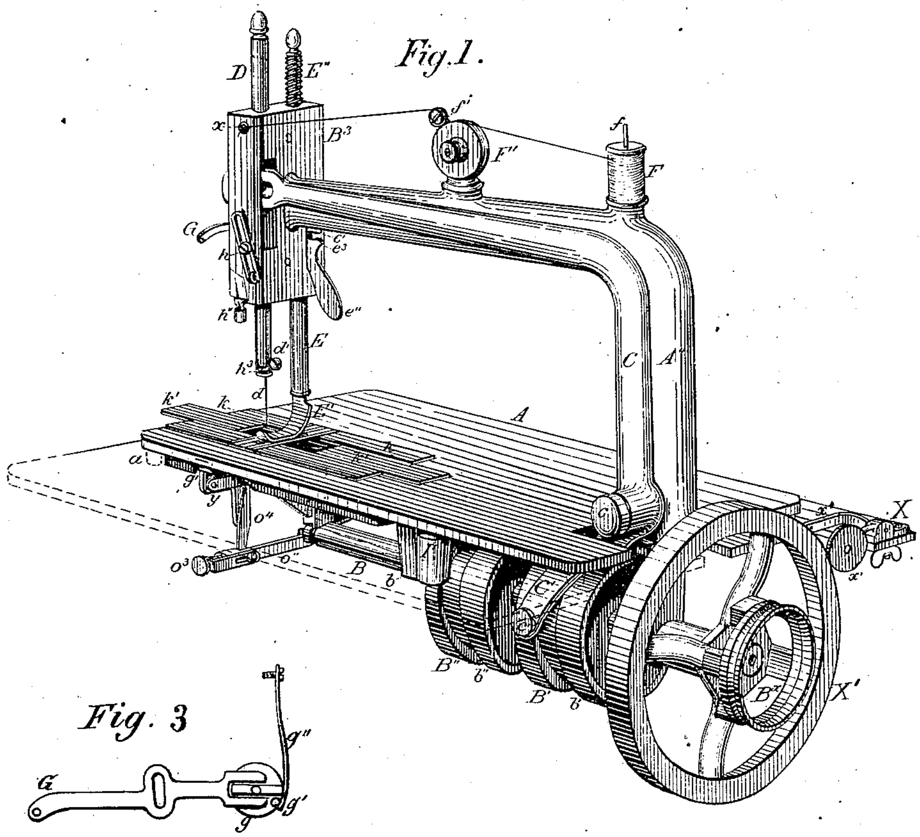

Fig. 3

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2 Sheets--Sheet 2.

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Fig 2.

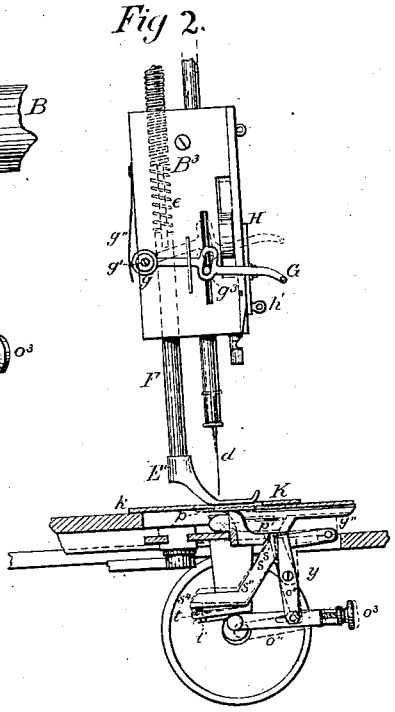


Fig. 3.

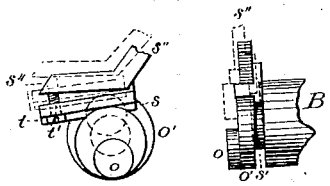
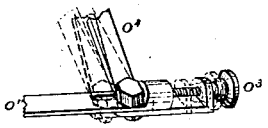


Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE W. HOFFMAN, OF MONROE CENTRE, ILLINOIS.

IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **162,288**, dated April 20, 1875; application filed September 17, 1874.

To all whom it may concern:

Be it known that I, GEORGE W. HOFFMAN, of Monroe Centre, in the county of Ogle and State of Illinois, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, in which—

Figure 1 represents a perspective view of the improved machine. Fig. 2 is a front elevation of the same. Figs. 3 and 4 represent details of construction.

Similar letters of reference denote corresponding parts wherever used.

The invention relates to a novel arrangement of devices for actuating the feed dog or slide, and to the construction and arrangement of the take-up and the devices for actuating the same; and will be understood from the following description, with reference to the drawings.

The machine, in its general construction and arrangement, is similar to others in common use, and the description, therefore, except in so far as it becomes necessary to describe other parts, in order to show the relation and arrangement of those believed to be new, will be confined to the latter.

The main driving or cam shaft B of the machine is provided at its inner end with a double eccentric, *o o'*, the former of which, serving as a crank-wrist, imparts the vibratory or reciprocating movements, and the latter the rising and falling movements, of the feed-slide through connecting devices, as follows: The feed-slide *p* (see Fig. 2) moves in suitable ways underneath the cloth-plate, and is provided on one side with pins or shoulders, with which the upper end of vertical lever o^4 engages alternately, said lever o^4, at its lower end, being connected by a link, *o''*, with the crank-wrist *o*, by the rotation of which a reciprocating movement is imparted to the feed-slide. S is a lever, made in the angular form shown in Fig. 2, and pivoted at its upper forward end to a fixed point in the frame-work of the machine. The upper arm of this lever S lies underneath the feed-slide, in a plane nearly coincident with the lower face of said slide, while the lower or rear arm or end s^4 droops downward to, and rests upon, a pivoted adjustable shoe-piece, *t*, resting upon, and vibrated vertically by, the cam or eccentric *o'*, imparting a rising and falling movement to the vibrating end of said lever S, and thence, through the upper arm of said lever, to the feed-slide.

These movements are so timed by the relative arrangement of the cams *o o'* that the backward or feed movement of the feed-slide is given after the feed-slide is raised into the proper position for feeding the material operated upon, while the movement retracting the feed-slide takes place when the lower end of the lever S is depressed, and the feed-slide is withdrawn below the surface of the cloth-plate.

By this arrangement it will be seen that the feed-slide is disconnected from its lifting-lever, simply resting upon, and rising and falling with the vibrations of, said lever, as described; and, being raised by said lever just in advance of the feed-movement of the slide, a positive feed is given to the full extent of the throw of the slide.

The shoe-piece *t*, which is pivoted to the bent lever S, is provided at its rear end with a set-screw, *t'*, by which the distance apart of the heel ends of said shoe-piece and bent lever may be adjusted, for regulating the throw of the feed-slide vertically, relative to the surface of the cloth-plate, as the character of the material operated upon may require. The lower end of the lever o^4 is connected with the link *o''* by a pin passing through a longitudinal slot in said link; and the extent of throw or vibration of the lever o^4, and consequently of the feed-slide, is regulated by the extent of freedom of play or movement of this connecting-pin in the slot. This play is regulated by means of a slotted plate, o^5, lying parallel with the link or connecting-rod *o''*, and through which the connecting-pin also passes. The outer end of this plate o^5 is bent at a right angle over the end of the link *o''*, and is perforated to receive a thumb-screw, o^3, which passes through said angular end of the plate or strap o^5, and engages with a nut or female screw formed on the end of link *o''*, and by means of which the plate o^5 may be adjusted relatively to the link *o''*, in such manner as to cause the respective slots in the link and plate

to coincide with each other, permitting the connecting-pin between the lever o^4 and link o'' to play back and forth the full length of the slot, thus greatly diminishing the throw of the lever o^4 and of the feed-slide operated thereby; or the plate o^5 may be adjusted until the connecting-pin is drawn against the outer end of the slot in the link o'', and there held, for giving to the lever o^4 and feed-slide the full throw of the crank o; or the plate o^5 may be adjusted to any intermediate point for regulating the feed, as desired.

The take-up is shown in face view, Fig. 2, and in reverse view in Fig. 3, consisting of a lever-arm, G, pivoted at its rear end to the head or face plate B^3 by means of a screw passing through a cap-piece or disk, g, and through a slot in the end of the lever G. The disk g is provided on its inner face with a rib, g^4, which enters the slot in the lever, and holds the lever in a position parallel with the rib g^4. Below the rib g^4, and also below the plane of the pivot on which the lever and disk vibrate, the disk is provided with a pin, g', against which the free end of a spring, g'', rests, which, by its tension, serves to give the upward throw to the end of the lever through which the thread passes. The lever passes through a guiding-loop, g^4, on the face of the needle-bar head B^3, and is provided, at or near midway of its length, with a vertical loop, g^3, having a vertical slot, through which a pin on the needle-bar passes, giving the lever the required downward vibration, the slot being sufficiently elongated to give the take-up lever a short period of rest at the end of its upward throw, which is limited by the guide-loop g^4. The vertical slot in the lever G is of sufficient width to compensate for the varying distance of the pin actuating the lever from the pivotal center of said lever; or, if preferred, an end movement of the lever, permitted by the open slot at its pivoted end, may be made to accomplish the same result.

Having now described such parts of the machine as I believe to be new, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the feed-slide p, of the pivoted elbow-lever S, for giving the vertical movements, and the lever o^4, for giving the reciprocating movements, to said slide, all arranged and operating as described.

2. The slotted take-up lever G, constructed as described, in combination with the ribbed pivoting-disk g and spring g'', arranged and operating as set forth.

GEORGE W. HOFFMAN.

Witnesses:

EDWIN DAY,

WM. G. KING.