W. O. GROVER.

SEWING MACHINE.

No. 21,671. Patented Oct. 5, 1858.

Fig. 1.

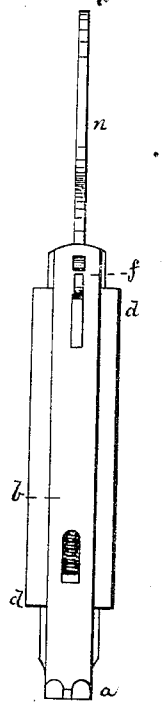



Fig. 2.

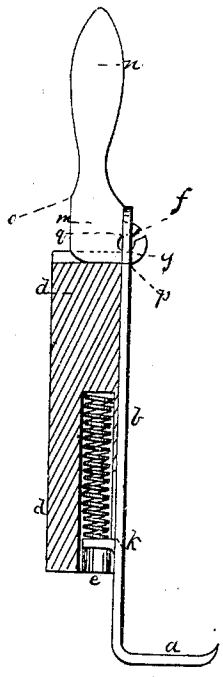



Fig. 4.

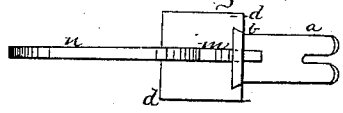
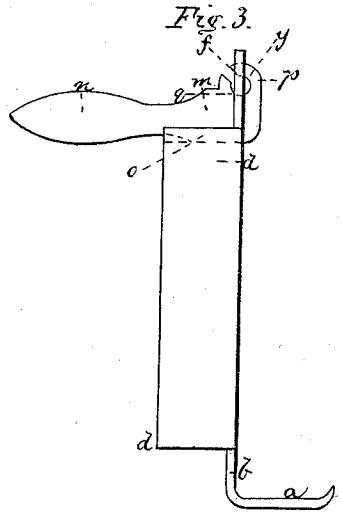



Fig. 3.



# UNITED STATES PATENT OFFICE.

W. O. GROVER, OF BOSTON, MASSACHUSETTS.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. **21,671**, dated October 5, 1858.

*To all whom it may concern:*

Be it known that I, WILLIAM O. GROVER, of the city of Boston, in the State of Massachusetts, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following specification, taken in connection with the drawings, is a full, clear, and exact description thereof.

In the drawings, Figure 1 is a front elevation of the presser-foot of a sewing-machine, with the appendages or attachments for giving and permitting its motion. Fig. 2 is a vertical section through the same. Fig. 3 is a side elevation thereof, and Fig. 4 is a top view.

The same letters refer to the same parts in all the figures.

My present invention has for its object the simplification and cheapening of the manufacture of the parts or appendages connected with the presser-foot, by means of which it can be moved away from the material to be sewed or permitted to press thereon, and is applicable to all classes of sewing-machines, and may be used in connection with various kinds of feed motion, either constituting a part thereof or acting only to prevent the cloth from being lifted out of place by the rise of the needle.

In sewing-machines as at present constructed the feed is usually obtained by the action of two surfaces, between which the cloth is gripped, and one of these surfaces, in addition to its function as a part of the feed, serves to hold the cloth so that it cannot be lifted from the bed-plate of the machine by the needle on its upward stroke. In other species of feed, where the cloth is clamped, attached, or hung upon a bar, a surface is often employed to perform this latter duty of stripping the cloth off of the needle, and this surface, whether part of the feed apparatus or not, is usually termed a "presser-foot" or "foot," and must be held to the cloth by a yielding pressure, to admit of the passsage of seams or accommodate various thicknesses of cloth, while at the same time it must be capable of removal to some distance from the cloth, in order to permit of the withdrawal or insertion of pieces sewed, or to be sewed, and should further be furnished with means for holding it in this latter position during the pleasure of the operator. It is in the construction and combination of these appendages that my invention consists.

In the drawings the presser-foot itself, having, as usual, a rounded surface to come in contact with the cloth, is shown at *a*, making part of or attached to a slide, *b*, which is free to play in proper ways or guides in a block, *d d*, attached to some convenient part of the machine. This slide or rod is furnished at or near its upper end with a bar, *f*, either making part of the slide or secured to it by brazing or otherwise, the precise function of this bar being to rest upon a cam, hereinafter described, and transmit motion to the slide. This slide is further furnished at or near its lower end with a bracket, *k*, making part of the slide and formed by cutting partially around a portion of the slide, and bending such portion at right angles to the face of the slide, or nearly so. This bracket, when the slide is in place, projects into a recess, *e*, (see Fig. 2,) and in this recess is located a coiled spring, one end of which bears against the top of the recess in the block and the other against the bracket just described. This spring performs its usual duty in combination with a presser-foot—namely, holding the foot upon the cloth by a yielding pressure, permitting the slide and foot to be removed from the cloth, and throwing the foot down upon the cloth when the slide is released by the stop that holds it up—but in the combination which I have invented it performs the additional office or has the function of retaining the lifting and releasing cam in position and proper working connection with the bar or its equivalent on the slide, holding this cam pinched between the bar and the block. On top of the block lies a cam, *m*, with a handle, *n*, the term "cam" being not strictly correct, but used for convenience, as the device is more properly a bent lever with a constantly-changing fulcrum or a rolling wedge. This cam is shaped on its periphery, substantially as shown in the drawings, to produce the desired effect—namely, that part of it from *o* to *p* to act against the top of the block when the handle is lifted or depressed, so that the slide may be lifted against the force of the spring and held lifted, as in Fig. 3, or be permitted to descend to a proper distance, being forced

by the spring, as represented in Fig. 4—that portion of the periphery of the cam from *q* to *y* being so shaped that the bar shall bear upon it in all working positions of the presser-foot. This cam in all working positions prevents the slide from being thrown out of the guides by the force of the spring, and its shape on other portions of the periphery is immaterial so long as not so formed as to impede the proper action of the slide. The function of the cam is therefore to lift the slide or lower it, and to hold it lifted by acting between the bar and the top of the block, where it is held grasped in place by the force of the spring. In the top of the block is a slot or groove (clearly shown in the drawings) in which the cam rests to prevent sidewise motion; but this end may be attained by making either the cam itself thicker or by increasing the thickness of the slide from front to rear or in other ways.

In putting these appendages of the foot in working position, the spring is first inserted in its recess, the slide is then entered at the bottom of the guides and shoved upward, compressing the spring so far that the cam can be placed under the bar. When this is done, the spring bears the cam down on top of the block, pinching it between the bar and the block, and all parts are held in working position by their mutual effect, one on the other, without any hinges or any actual attachment of the slide to the cam, the bar or its equivalent merely resting on the cam.

It will be obvious to those acquainted with the art of sewing by machinery that this apparatus is simpler and much less expensive than those now used for the purpose of controlling the positions of the foot, and also that it is easy to place in position and easy to remove for adjustment or repair.

The forms of the cam and bar may be changed without departing from my invention so long as they produce substantially the same results—namely, the cam that of lowering the slide or lifting it and holding it lifted and carrying the bar, and the bar those of transferring the motion of the cam to the slide by resting upon the cam (there being no absolute attachment between the bar and the cam) and of holding the cam in working position, grasped between the bar and the block. The spring, moreover, may be changed in form or relative arrangement so long as it holds the cam in proper working position and connection with the slide, and prevents their displacement from a working position, while the cam is moved only through such distance as is necessary to lift and lower the foot to perform its proper office in the machine. The plane of motion of the cam may also be changed so long as it produces the described effects, and is held in place substantially in the manner specified.

I wish it distinctly understood that I am aware of the fact that there are now in common use a variety of devices for giving and permitting the motion of presser-foot slides, and that among them is a bent lever attached by a hinge to a slide, which is pressed upon by a coiled spring.

I therefore claim as of my own invention

The combination of a spring, a bar attached to or making part of a slide and resting upon a cam, and a cam shaped, substantially as specified, when these parts are held in working position and connection by the spring, and there is no attachment between the bar and the cam, all these parts being substantially such as are hereinbefore described, and acting severally and in combination, substantially in the manner and for the purposes hereinbefore specified.

In testimony whereof I have hereunto subscribed my name, in the city of Boston, on the 11th day of January, A. D. 1858.

W. O. GROVER.

In presence of—
S. J. GORDON,
JAS. H. BROWN.