

J. THORNE.  
Sewing Machine.

No. 26,536.

Patented Dec. 20, 1859.

Fig. 1

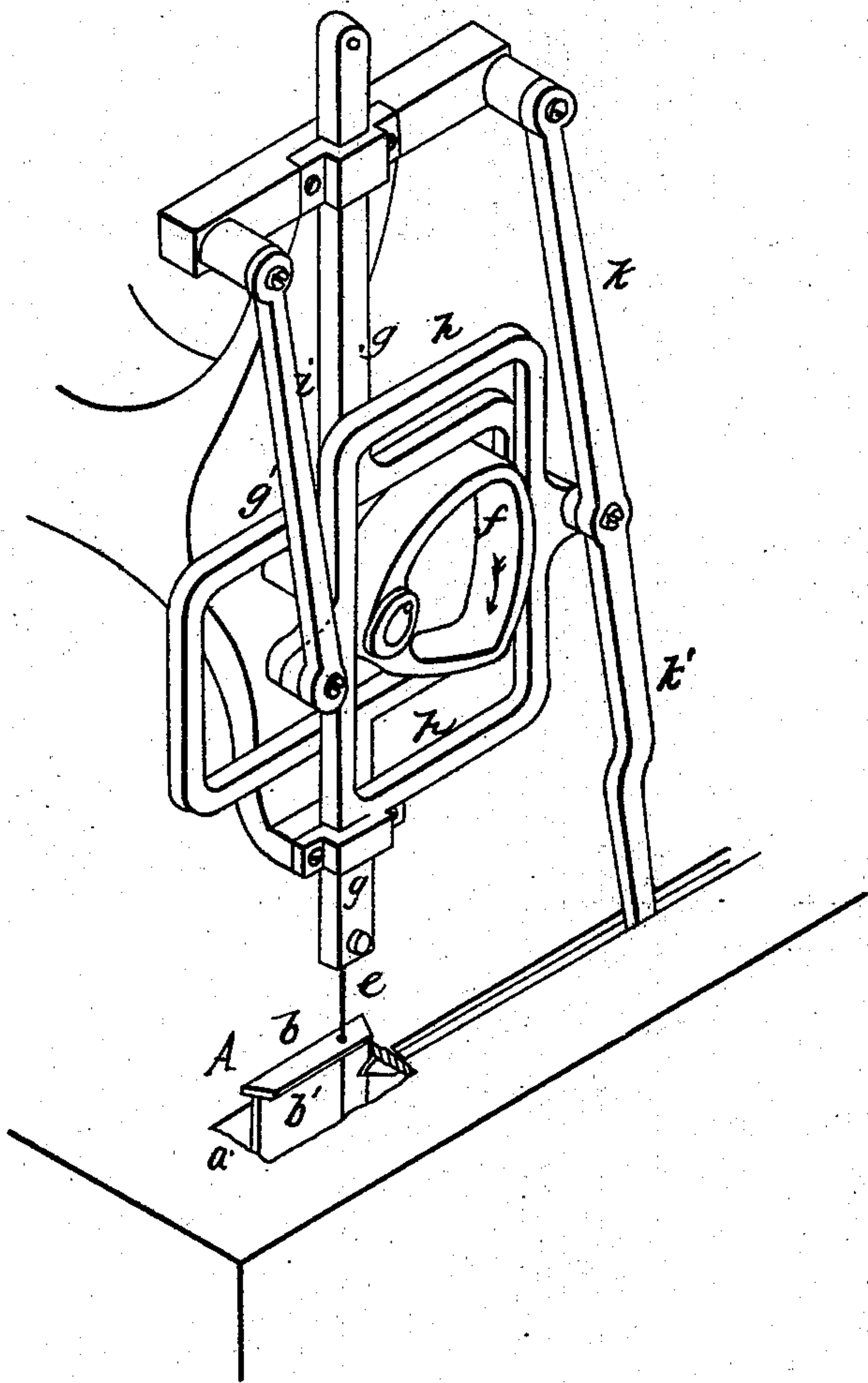


Fig. 2

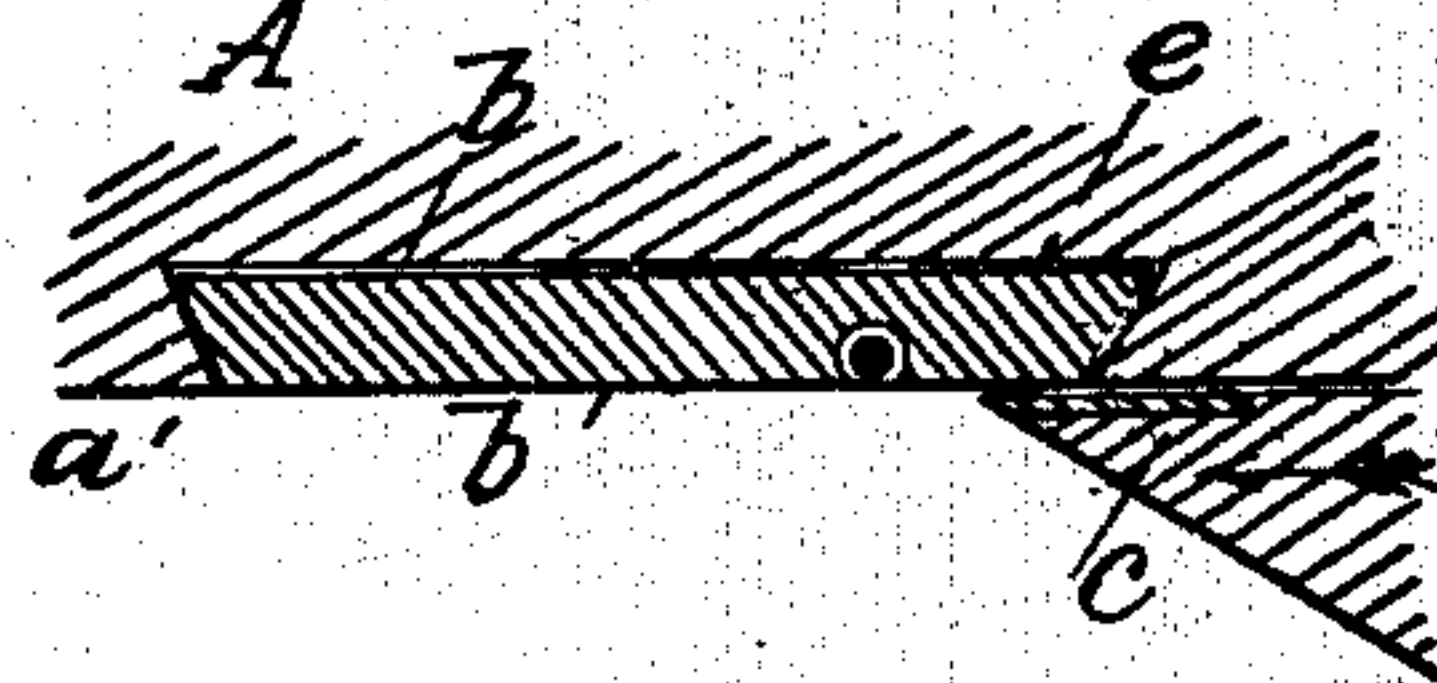
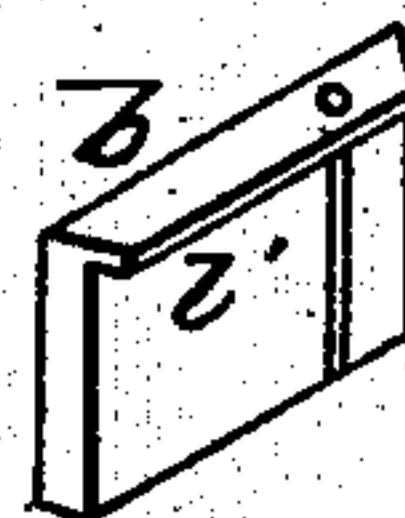


Fig. 3





# UNITED STATES PATENT OFFICE.

JOSEPH THORNE, OF NEW YORK, N. Y.

## IMPROVEMENT IN SEWING-MACHINES.

Specification forming part of Letters Patent No. 26,536, dated December 20, 1859.

*To all whom it may concern:*

Be it known that I, JOSEPH THORNE, of New York, county of New York, and State of New York, have invented certain new and useful Improvements in Sewing-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawings, making a part of this specification, which are fully described herein, and in which similar letters indicate similar parts throughout.

My invention consists in the arrangement of the parts for giving the motions to the needle-bar, and also to the bar which drives the shuttle, whereby extreme simplicity of construction is attained and the liability to become deranged in action is greatly lessened.

The construction will be as follows: In Figure I is shown only so much of my machine as is necessary for the purposes of this description, the feeding, stripping, and other devices being omitted, as those may be such as are common to sewing-machines. At the place where the needle is to pass into the bed A, I insert a piece of steel or other suitable metal, *b*, of the form generally as shown in Fig. III, being a die which may be readily removed when required. This die is so set that its front side, *b'*, forms a portion of the face *a'* upon which the shuttle travels, as shown in Fig. II, which is a horizontal section, enlarged, through the body part of the die, the bed, and the shuttle, the point of the latter being seen at *c* as just ready to pass along and take upon it the needle-thread. In the die *b* a hole is drilled from the top downward for the needle to pass in, and of such size that the needle will play easily but closely in it. The central line of this hole is situated so near to the side *b'* of the die that, when finished, a narrow slot will be made along that side of the die by planing down the metal of that side until the hole is just discovered; and, hence, when a needle is inserted which will properly fit the hole, as at *e*, Fig. II, the line along the front side of that needle will be level with, or very slightly project beyond, the general level of the face along which the shuttle passes, as shown in that figure. The upper end of the hole is made slightly funnel-shaped, so as to guide the needle properly to an entrance. The needle has the usual groove along its reverse side, and thus when it enters the hole the

thread lies in that groove, and as the eye is set at a right angle to the path of the shuttle the thread on the front side is in contact with the needle, but projecting through the slot and passing along that slot as the needle goes down. The thread will then be always above the surface of the side *b'* of the die, and consequently in the path of the shuttle. The motions of the needle-bar and the shuttle-driver are given by placing a single triangular cam, as at *f*, upon the main shaft, and arranging a rectangle about this cam for the needle-bar, and a little in front of that another for the shuttle-driver. The needle-bar *g* is fixed in suitable guides attached to the main frame of the machine, as shown, and the play of the cam *f* within the rectangular frame *g'* gives the vertical play to that bar. A similar frame, *h*, having its line of motion generally at a right angle to that of the frame *g'*, is placed upon the same cam for the shuttle-driver, although this one is not affixed in guides, but is hung by suspending-links *i* and *k* from the main frame above, as shown. The prolongation of the link *k* and *k'* forms the driving-bar, and extends to the shuttle-driver below the bed.

In operation, the thread of the needle being projected beyond the face *b'* is, as before stated, directly in the path of the shuttle, and as that is kept bearing against the face *a'* by the usual spring or its equivalent, and is also pointed in the manner shown, the thread is, as it were, planed off by the forward movement of the shuttle. This, however, would not be effected were the needle much smaller than the hole in the die, for then the thread would be likely to lie below the surface of *b'*, and in the slot, whereby the point of the shuttle would pass over without taking it up. For this reason the die is made so as to be removed, and when a larger or a smaller needle is to be used, another die, made to suit that peculiar-sized needle, is to be substituted. Thus as many dies will be required for each machine as there are sizes of needles to be used with it; and it will be obvious that by this means the shuttle need never miss taking the thread from the needle. The needle itself cannot escape the hole, for the countersink in the top of that is large enough to embrace all the vibrations which can take place of the needle, and it also extends far enough down in the top plate of the die to permit the thread



on the forward side of the needle to pass in. The hole embraces so much of the circumference of the needle that it cannot be carried away by the shuttle if the thread is kinked, and therefore, in such case, thread, being the weakest part, would be all that would be broken. As by this method of securing the needle it is not necessary that it should retreat to throw out a loop, the only motions necessary for the needle-bar are simply one upward and one downward for each stitch, and the same is true of the shuttle; but two distinct movements are required for that. The needle-bar is necessarily fixed in guides to insure the requisite exactness of position; but the rect-

angle  $h$ , which gives the motions to the shuttle-driver, is very simply suspended by links, one of which is the shuttle-bar itself, thus giving it the greatest freedom of play and with the least possible friction.

I claim—

The specific arrangement of parts herein described, for giving the appropriate motions to the needle-bar and to the shuttle-driver.

In witness whereof I have hereunto subscribed my name.

JOSEPH THORNE.

In presence of—

J. P. PIRSSON.

S. H. MAYNARD.