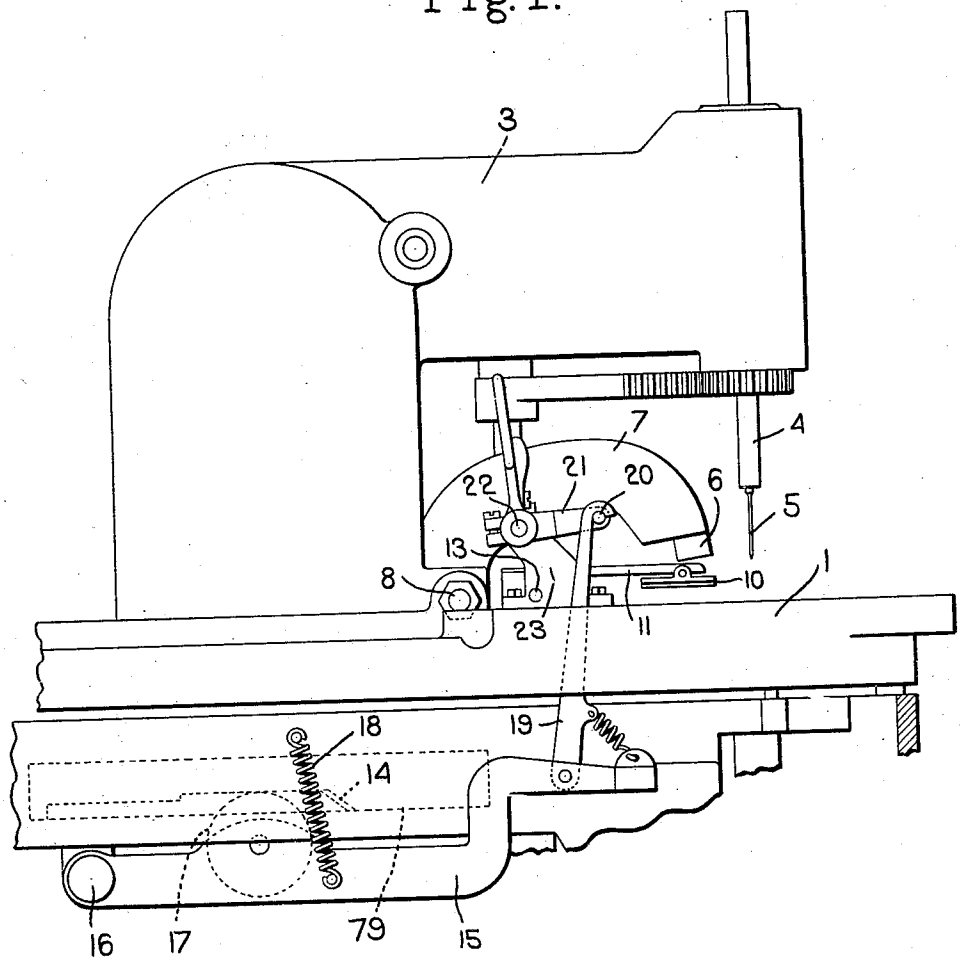
Jan. 5, 1932. B. FISHER 1,839,305

BUTTONHOLE SEWING MACHINE

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Fig. 1.



Inventor.
Benjamin Fisher
by Heard Smith & Tennant.
Attys.

Jan. 5, 1932. B. FISHER 1,839,305

BUTTONHOLE SEWING MACHINE

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Fig. 2.

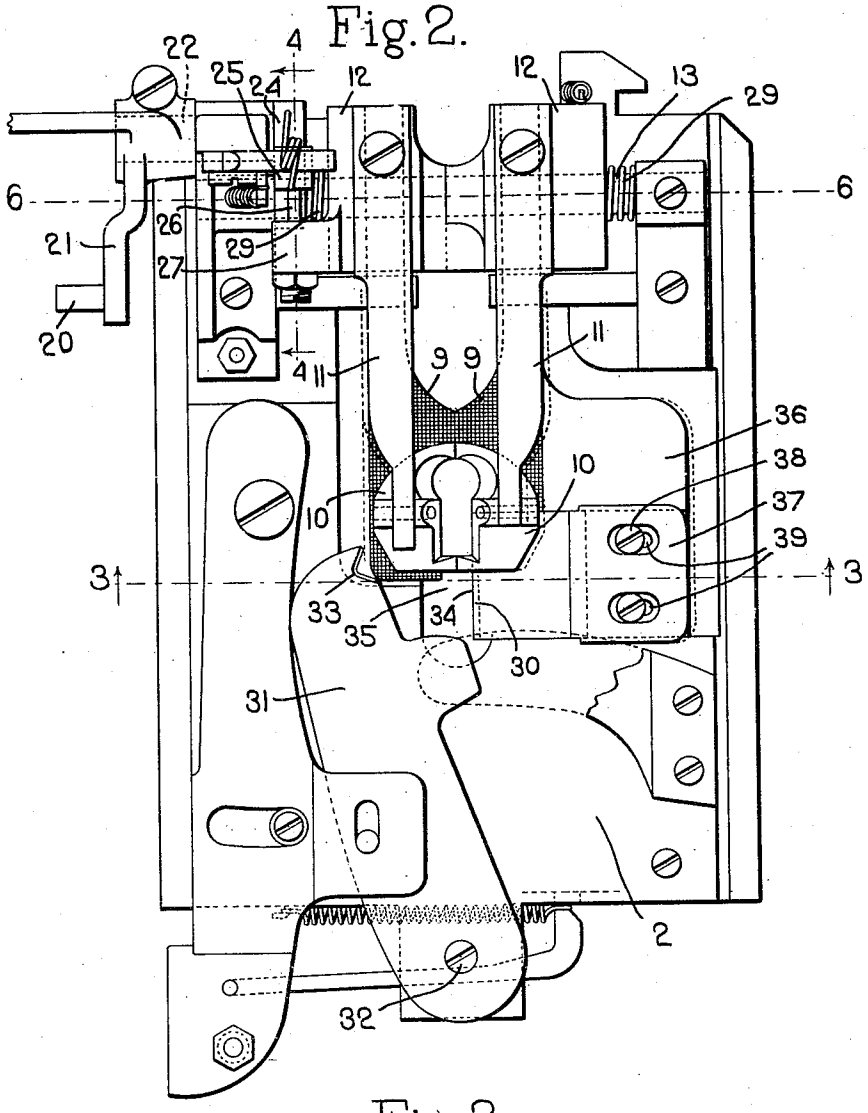
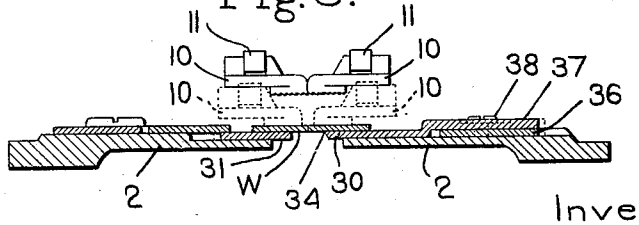


Fig. 3.



Inventor.
Benjamin Fisher
by Heard Smith & Tennant.
Attys.

Jan. 5, 1932. B. FISHER 1,839,305

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Fig. 4.

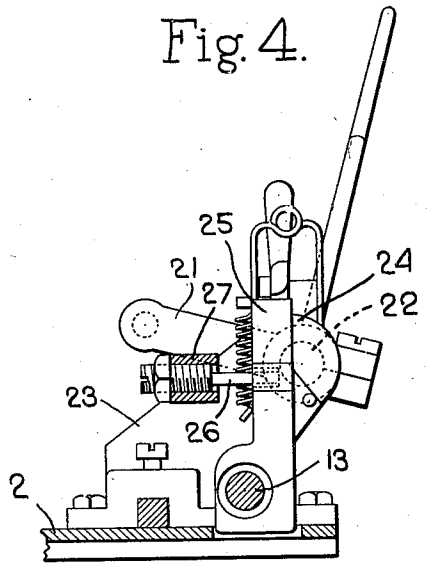


Fig. 5.

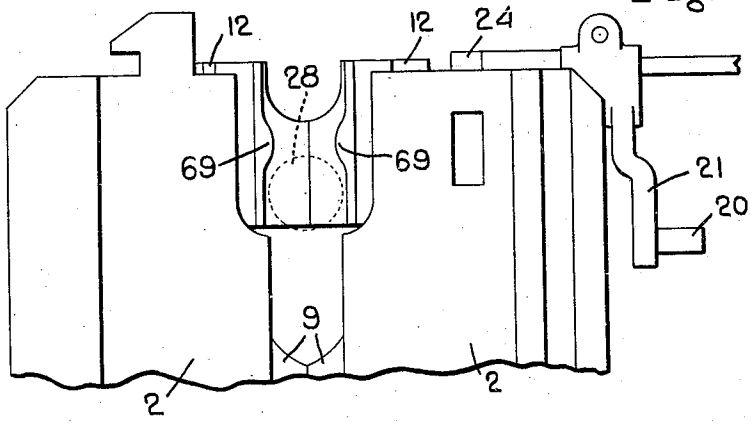
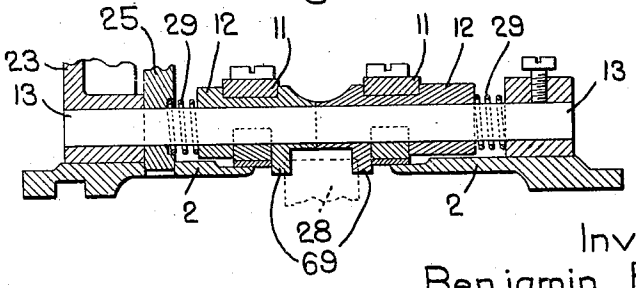


Fig. 6.



Inventor.
Benjamin Fisher
by Heard Smith & Tennant.

Patented Jan. 5, 1932 1,839,305

UNITED STATES PATENT OFFICE

BENJAMIN FISHER, OF SWAMPSCOTT, MASSACHUSETTS, ASSIGNOR TO THE REECE BUTTON HOLE MACHINE COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF MAINE

BUTTONHOLE SEWING MACHINE

Application filed October 2, 1930. Serial No. 485,961.

This invention relates to buttonhole sewing machines and particularly to that type of machine which is provided with means for spreading the work after it is clamped and before the buttonhole is cut and also with means for cutting the thread underneath the work at the end of the sewing operation.

One type of thread cutter which is commonly used in these buttonhole sewing machines comprises a swinging cutter member which during its thread-cutting movement passes between the work and the work-supporting plate and which co-operates with a fixed ledger blade situated beneath the work. A buttonhole sewing machine having a thread cutter of this type is illustrated in Connors Patent No. 1,542,764, dated June 16, 1925. In the sewing machine described in said patent the work is held by the two work-clamping elements each comprising an under clamp plate and an upper clamping member.

When the machine is started in operation the upper clamping members are carried down against the work to clamp the latter against the under clamping members and then the two clamping elements are separated slightly from each other to spread the work or place it under tension, this occurring before the stitching is performed on the buttonhole and also before the buttonhole slit is cut.

In the sewing machine such as shown in said patent the ledger blade with which the swinging thread cutting knife co-operates is fixed to the work-supporting plate and is situated directly beneath the work. With this construction the spreading of the work-clamping members by which the work is placed under tension drags the work over the cutting edge of the ledger blade. This has been found to be detrimental when operating on some classes of work because of the danger that the work will be marred by its sliding movement over the fixed ledger blade.

The object of my present invention is to provide a novel thread-cutting arrangement of the above type which is so constructed that the ledger blade is carried by one of the work-clamping elements and partakes of the movement of said element when the clamping elements are spread. The advantage of this is that there is no relative movement between the work and the ledger blade during the spreading of the clamp and hence the spreading action of the work-clamping elements can be accomplished without danger of injuring or marring the work in any way.

In order to give an understanding of the invention I have illustrated in the drawings a selected embodiment thereof which will now be described after which the novel features will be pointed out in the appended claims.

Fig. 1 is a side view of a buttonhole sewing machine embodying my invention;

Fig. 2 is a top plan view of the work-supporting plate showing the work-clamping elements mounted thereon;

Fig. 3 is a section on the line 3—3, Fig. 2;

Fig. 4 is a section on the line 4—4, Fig. 2;

Fig. 5 is a fragmentary under side view of the work-holding member;

Fig. 6 is a section on the line 6—6, Fig. 2.

In the sewing machine 1 indicates generally the bed frame on which is mounted the work-supporting plate 2 that carries the work-clamping elements and 3 is the head portion of the sewing machine in which is mounted the vertical reciprocating needle bar 4 carrying the upper needle 5. 6 represents the buttonhole cutter by which the buttonhole slit is cut, this being mounted on a cutter lever 7 pivoted to the head at 8 and being actuated in usual manner from the main cam 79 by which the operations of the sewing machine are controlled.

The work-holding means herein illustrated is, in its main features, similar to that now commonly used and also to that shown in the above-mentioned patent.

This work-holding means comprises two clamping elements, each of which includes in its construction an under clamping member 9 in the form of a plate having a roughened surface and an upper clamping member 10 carried by a clamp arm 11. The clamp arms 11 are pivotally mounted to enable the upper clamps 10 to move toward and from the work. Each clamp arm is secured at its rear end to

a block 12 which is pivotally mounted on a statonary shaft 13 that is carried by the work plate 2.

The clamps are closed onto the work when the sewing machine is started by the usual clamp-closing mechanism which is actuated by the cam surface 14 formed on the main cam 79. This clamp-closing mechanism comprises the usual lever 15 pivoted at 16 and which is given its downward clamp-closing movement by the engagement of the cam 14 with a roll 17 carried by the lever, said lever normally being held in elevated position by the spring 18. Secured to the end of the lever is a latch member 19 which is adapted to engage a pin 20 on an arm 21 rigid with the rock shaft 22 that is mounted in a supporting bracket 23. The rock shaft carries a cam 24 which is adapted to engage an arm 25 loosely mounted on the stationary shaft 13 and said arm abuts against a pin 26 carried by an arm 27 rigid with one of the blocks 12 so that when the lever 15 is depressed the rock shaft 22 will be turned and through the cam 24 and arms 25 and 27 the left hand block Fig. 2 will be turned to move the corresponding work clamp downwardly against the work.

The two blocks 12 are interlocked so that the depression of one will also cause the depression of the other. This mechanism for closing the clamps is such as is commonly found in buttonhole sewing machines of this type and forms no part of my present invention.

These sewing machines are also provided with means for spreading the work-clamping elements after the work is clamped in order to place the work under tension while the buttonhole stitch is being performed and the buttonhole is being cut.

The spreading of the work-clamping elements is accomplished by a spreading member 28 which engages the cam surfaces 69 formed on the under side of the blocks 12 during the relative movement between the work-holding means and stitch-forming mechanism by which the parts are carried from buttonhole cutting to stitching position and which occurs before the stitching operation commences. During this clamp spreading movement the blocks 12 have a sliding movement away from each other as shown by the full and dotted line position Fig. 2. The springs 29 tend normally to hold the work-clamping elements in the position shown in Fig. 2.

The machine herein shown also comprises thread-cutting mechanism by which the thread is cut beneath the work at the end of the sewing operation. This cutting mechanism comprises a ledger blade 30 and a swinging cutter member 31 pivoted at 32 to the work-supporting plate and having a cutting edge 33 which co-operates with the edge 34 of the ledger blade to cut the thread. The swinging movement of the member 31 is secured by any suitable or usual mechanism and it occurs after the work is unclamped.

At the end of the sewing operation when the work clamps 10 are raised the thread extending from the under side of the work passes down through the opening 35 and as the cutter member 31 is moved to the right Fig. 2 beneath the work such threads are caught between the concave cutting edge 33 of the cutter and the ledger blade 30 and are severed.

The parts thus far described are such as may be found in buttonhole sewing machines of this general type and form no part of my present invention.

As stated above in prior machines the ledger blade 30 has been mounted fixedly on the work-supporting plate 2. With this construction when the work clamps 10 are clamped against the work the latter will be pressed against the ledger blade and when the clamps are spread there is a tendency to drag the work over the stationary ledger blade with the result that the work is sometimes marred.

In my present invention I provide a construction wherein this ledger blade 30 is secured to one of the clamp plates 9 so that when the clamps are spread the ledger blade moves with the clamp and there is no relative moment between the work and the ledger blade.

The right hand clamp plate 9 in Fig. 2 is shown as formed with an extension 36 and the ledger blade 30 is provided with a shank portion 37 which overlies the forward end of the extension 36 and which is secured thereto by suitable screws 38. The shank 37 of the ledger blade is shown as having slots 39 through which the screws pass thus providing for a lateral adjustment of the ledger blade. Since the ledger blade is fixedly secured to one of the plates 9 and thus fixedly secured to one of the clamp elements said ledger blade will move with the clamping elements when the clamps are spread. This is illustrated in Fig. 3 wherein the full lines show the work clamps 10 in raised position and closed together with the ledger blade 30 in the corresponding position. After the clamps have been closed onto the work *w* then the clamps are spread as shown by dotted lines Fig. 3 and the spreading movement of the right hand block in Fig. 2 is conveyed to the extension 36 and thus to the ledger blade 30 so that said blade moves with the corresponding upper clamp 10.

I claim.

1. In a buttonhole sewing machine, the combination with a work-supporting plate, of two work-clamping elements carried thereby each comprising an under clamping plate and an upper clamping member, means

for closing the upper clamping members onto the under clamping plates, means for moving the clamping elements relative to the work-supporting plate and to each other to spread them, and a thread cutter comprising two cutting members, one of which is carried by one of the clamping plates.

2. In a buttonhole sewing machine, the combination with a work-supporting plate, of two work-clamping elements carried by said plate and each comprising an under clamping plate separate from the work-supporting plate and an upper clamping member, means for closing the upper clamping members onto the under clamping plates, means for spreading the clamping elements, and a thread cutter comprising a ledger blade carried by one of the under clamping plates, and a movable cutting member cooperating with the ledger blade.

3. In a buttonhole sewing machine, the combination with a work-supporting plate, of two work-clamping elements carried thereby, each clamping element comprising an under clamping plate separate from the work-supporting plate and an upper clamping member, means for closing the upper clamping members onto the under clamping plates, means for spreading the clamping elements, and a thread cutter comprising a ledger blade carried by and moving with one of the under clamping plates, and a cutting element pivotally mounted to the work-supporting plate.

In testimony whereof I have signed my name to this specification.

BENJAMIN FISHER.