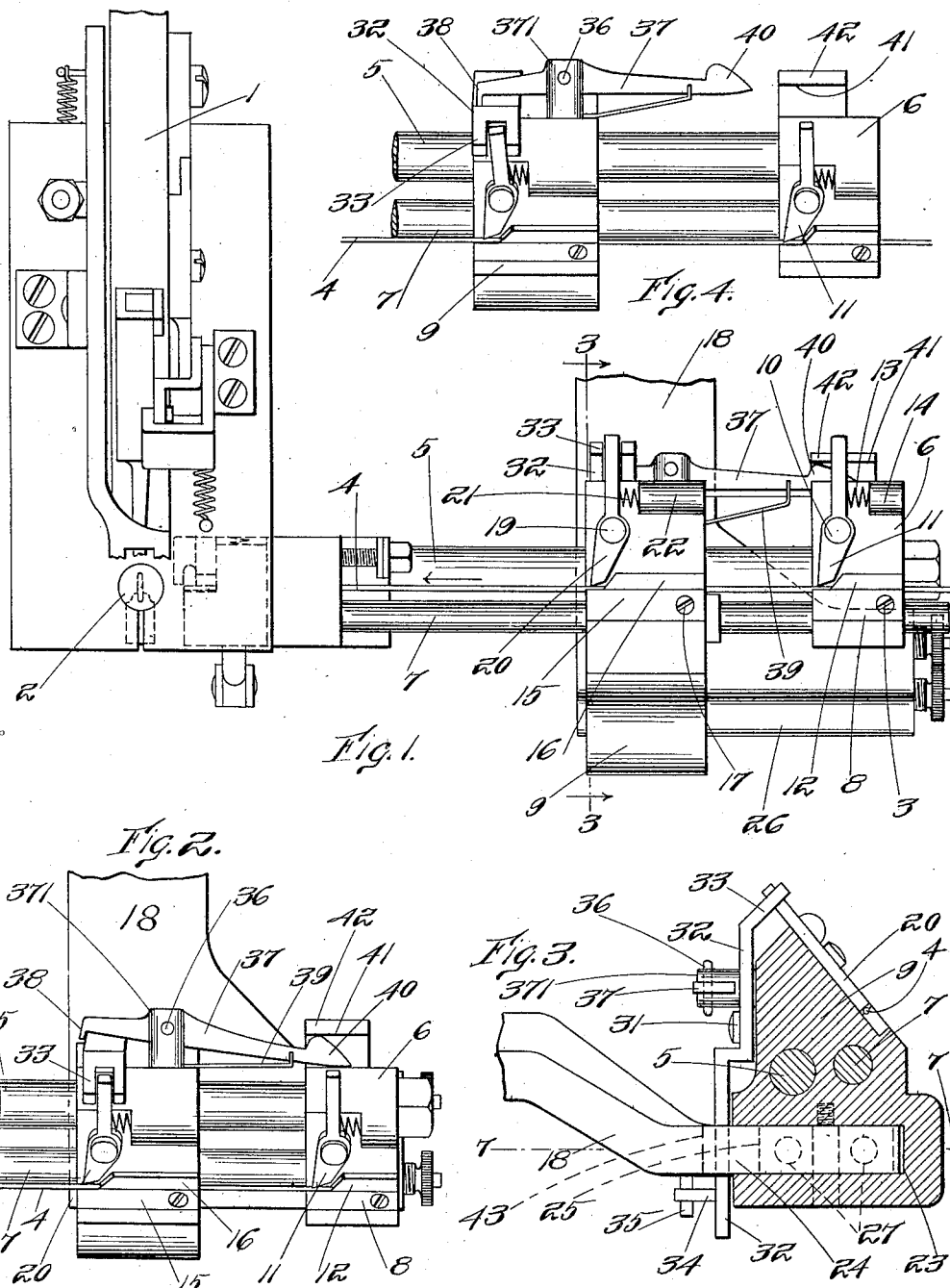


G. W. PERKINS.
WIRE FEED DEVICE.
APPLICATION FILED OCT. 26, 1912.

Patented Mar. 18, 1913.

1,056,444.

2 SHEETS-SHEET 1.



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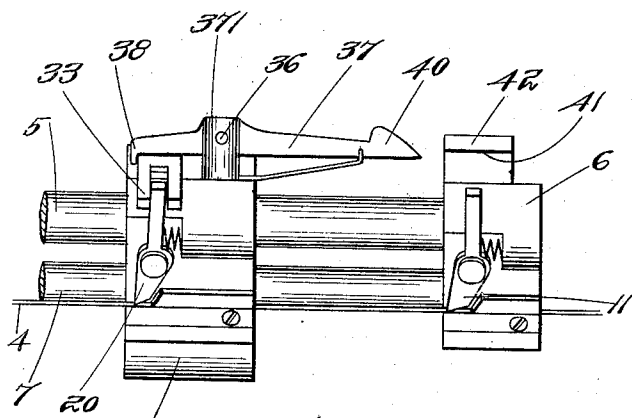


Fig. 5.

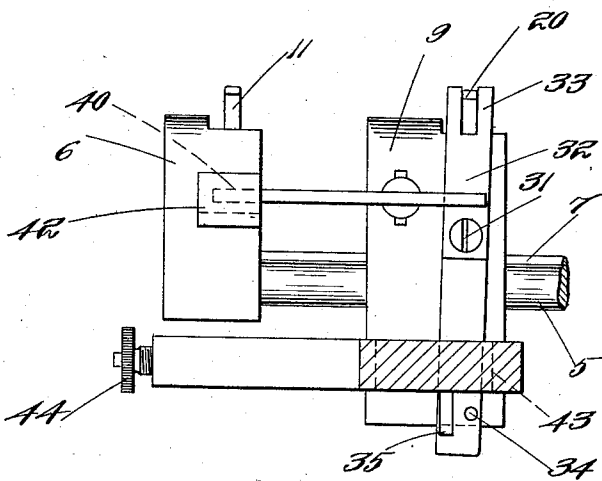


Fig. 6.

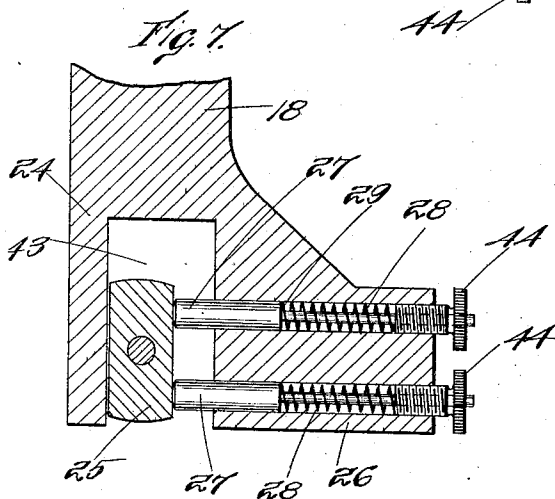


Fig. 7.

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UNITED STATES PATENT OFFICE.

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WIRE-FEED DEVICE.

1,056,444.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed October 26, 1912. Serial No. 727,850.

To all whom it may concern:

Be it known that I, GEORGE W. PERKINS, citizen of the United States, residing at Boston, county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Wire-Feed Devices, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention is especially intended for application to a machine for forming metallic fasteners from a wire which is fed through the eye of a button for the purpose of attaching a button to a shoe or other article but it is not limited to that particular use. For convenience of description, the invention is shown as embodied in a machine for making metallic fasteners for attaching buttons to boots and shoes. In machines of this character the wire is fed from a roll through suitable guides by a step-by-step movement, the wire being advanced at each period a distance equal to the length required for a blank to form a single fastener and at the same time threading the wire through the eye of a button. After it has been threaded the wire is cut off and the fastener is formed and carried with the button to the shoe to which it is to be attached. If the button is not properly positioned for the wire to pass through the eye, so that the eye is not in alinement with the axis of the wire, the wire in feeding is liable to strike against the shank of the button or against some other obstruction and be bent so that time is required to cut out the bent portion and reset the parts properly for starting for a new feed.

The object of the present invention is to provide a safety device whereby if there is any obstruction in the path of the moving wire during its feeding movement the travel of the wire will immediately cease before it bends and the several parts will be self-adjusted before the next feed movement.

The invention will be fully understood from the following description taken in connection with the accompanying drawings, and the novel features thereof will be pointed out and clearly defined in the claims at the close of this specification.

In the drawings, Figure 1 is a front elevation of a portion of a button raceway, wire feed mechanism and connected parts

embodying the invention. Fig. 2 is a plan of the wire feed mechanism shown in Fig. 1. Fig. 3 is a section on line 3—3 of Fig. 1. Fig. 4 is a view similar to Fig. 2 but with the parts in the position that they will assume after the feed block has commenced its forward movement. Fig. 5 is a view of the parts shown in Fig. 4 showing them in the position when the wire meets with an obstruction and the gripping dog on the feed block has been released and held out of engagement with the wire. Fig. 6 is a view of the parts shown in Fig. 3 as taken from the left of Fig. 3. Fig. 7 is a section on line 7—7 of Fig. 3.

Referring now to the drawings,—1 represents a cover of a raceway beneath which the buttons travel in the raceway down to the position where the eye of the button lies in position to receive a wire 4 from which the fastener blank is cut and which is formed into the fastener. The mechanism for cutting the wire and forming a fastener is not shown in the drawings as that forms no part of the present invention. One form of mechanism for performing that operation is fully shown and described in Patent No. 982,440, dated January 24, 1911, granted on my application.

The wire 4 may be run from a reel in well known manner, not necessary to show or describe. Mounted fast on a rod 5 is a block 6 which is termed the wire end block, and passing loosely through said block 6 is a rod 7 which serves as a guide. The wire 4 passes through a guideway in the wire end block 6, this guideway preferably being formed by means of a grooved rest block 8 secured to the block 6 as by a screw 3, the wire being retained in the groove by a ledge 12 which extends over the top of the wire. Fulcrumed at 10 to said block 6 is a dog 11 whose pointed lower end engages the upper side of the wire 4. The ledge 12 which serves as a guard to prevent the wire from jumping out of the groove in the rest block 8 also prevents the dog from being turned too far back on its pivot. A spring 13 seated at its rear end in a recess in a projection 14 on the block 6 presses against the rear side of the upper arm of the dog 11, and normally holds said dog in a position so that the point of the dog will engage the wire 4, as shown in Fig. 1. The spring

yields sufficiently to allow the wire to be fed forward beneath it, but prevents the wire from being drawn backward.

Loosely mounted on the rod 5 is a block 9 which is termed the feed block. Said block 9 has a guideway for the wire 4. This guideway may be similar to the guideway in block 6 consisting of a grooved rest block 15 mounted in a recess in the side of the feed block 9 and having a longitudinal groove in one face which coöperates with a groove in a ledge 16 projecting from the block 9. The said rest block 15 is secured to the feed block 9 by a screw 17 so that it may be removed if desired. Said block 9 is also slidable on the rod 7.

The feed block 9 is held and carried by a reciprocable lever 18 which is actuated in any suitable manner so as to give a reciprocating movement in a straight line to the feed block 9. Fulcrumed at 19 on the side of the block 9 is a dog 20 whose pointed lower end engages with the wire. A spring 21 mounted in a recess in a lug 22 on the block 9 projects out of said recess and engages with the upper arm of the dog 20 to hold the lower end of the dog in yielding engagement with the wire. When the feed block moves forward, that is, to the left, as shown in Fig. 1, the said dog grips the wire and feeds the wire forward, but on the return movement of the feed block the said spring 21 will yield so that the said dog will loosen its grip on the wire to allow the block to ride back without buckling the wire, the wire itself being prevented from rearward movement, as already explained, by the dog 11.

Means are provided whereby if on the forward stroke of the lever 18 the end of the wire which is supposed to thread through the button meets with any obstruction before the end of its stroke the feed block will be restrained from advancing, although the lever 18 continues its stroke. The means whereby this is accomplished is to mount the feed block 9 upon the carrying lever 18 by a yielding tension connection which will be sufficiently strong so that the feed block will be carried by the lever 18 under normal conditions, but when resistance is offered, such as occasioned by the wire being obstructed while the wire is gripped to the feed block by the dog 20, the said tension connection will yield and the feed block will stand still temporarily while the lever 18 continues its forward movement until the said dog is tripped from its engagement with the wire so that the said feed block can then be carried to the end of its stroke free from gripping engagement with the wire. The means whereby this is accomplished is as follows: The outer end of the lever 18 is formed with a flatted portion 24, and the block 9 is formed with a recess 23 in its under side

which receives the flatted end portion 24 of said lever 18. Said flatted end portion of the lever 18 is bifurcated or formed with a vertical recess 43 of somewhat less width than the width of the block 9 so that the block 9 bridges the recess 43 and is supported on the said flatted portion of the lever 18. The block 9 is provided with a tongue 25 which lies in the horizontal recess 23 in said block. The said tongue 25 is of less width than the width of the recess 43 in the lever 18 so as to allow a possible relative movement of said lever and the block 9 in a direction parallel with the wire so that if the block is restrained from movement the lever may still continue to move to the end of its stroke. Projecting laterally from the flatted portion 24 of the lever 18 is an extension 26 formed with holes which extend transversely through said extension from the outer edge thereof and opening into the recess 43 in the said lever 18. Inserted loosely in each of the holes in said lug 26 is a pin or spindle 27 whose inner end impinges against the tongue 25 in the recess in said feed block. A portion of said spindle 27 has a reduced diameter on which is mounted a spring 28 whose inner end abuts against a shoulder 29 on the said spindle formed at the junction of the larger and smaller diameters of the spindle. Mounted loosely on each spindle 27 is an adjusting screw 44 which is apertured longitudinally to receive the spindle. Each of said screws is externally threaded and screws into the threaded outer portion of the hole which receives said spindle 27. The inner ends of said screws bear against the outer ends of the springs 28 so that by setting up said screws the said springs may be held in position and their tension regulated. The said springs will hold the said spindles in yielding engagement with the tongue 25 and under normal conditions will press the said tongue against the wall of the recess 43 in said lever on the advance side thereof, so that the feed block will be carried along with the movement of the lever, but when the wire meets with an obstruction, as previously described, the grip of the dog 20 on the wire will be sufficient so that while the lever continues to move, the resistance to the onward movement of the feed block will overcome the tension of the springs 28 and hold the block temporarily against movement. Means are provided, however, so that when the lever 18 has moved a short distance after the feed block has become restrained from movement the dog 20 will be tripped from engagement with the wire and thus leave the feed block free to move. The tension of the springs 28 will then thrust the feed block forward without moving the wire and then the feed block will continue to the end of its forward stroke with the lever 18.

The tripping means shown are as follows: Pivoted at 31 to the block 9 is a lever 32 whose upper portion 33 is bifurcated and straddles the upper arm of the dog 20 so that by oscillating said lever 32 on its pivot the said dog may be turned on its pivot and released from engagement with the wire 4. The lower arm of said lever 32 extends down through the recess 43 in the flatted portion of the lever 18. The lower portion of the downwardly extending arm of said lever 32 has projecting therefrom a pin 34, and a pin 35 projects downwardly from the under side of the flatted portion 24 of the lever 18.

When the lever 18 continues its movement after the feed block is restrained said pin 35 on the lever 18 will engage the said pin 34 on lever 32 and thereby turn the said lever 32 on its pivot and thus rock the dog 20 in a direction to lift the lower end of the dog out of engagement with the wire. Pivoted at 36 in a slotted post 371 projecting from the block 9 is a latch lever 37 which is formed with a hook or latch 38 on one end which is adapted to be snapped down into engagement with the lever 32 when the said lever 32 has been turned back to release the dog from the wire as already explained and thereby hold the said dog disengaged. Normally the said hook 38 will rest against the back face of the lever 32 leaving the lever 32 unlocked but when the lever 32 is turned on its pivot in the manner previously described it will turn said lever far enough to carry the back face of said lever out of engagement with the hook 38 and a spring 39 will immediately throw the lever 37 so as to snap the hook down against the outer edge of the lever 32 to latch the said lever 32 in its backward position. It is desirable that the said latch shall be released so that the dog 20 will be again in position to grip the wire for a feed movement after the feed block has been moved its backward stroke. To accomplish this the rear end of said lever 37 is formed with a cam portion 40 which, before the feed block carried by the lever 18 reaches the end of its backward stroke, will engage with the face 41 of a projection 42 on the end block 6, thereby turning the said latch lever 37 on its pivot in a direction to release the hook 38 from the lever 32 and allow the spring 21 to turn the dog 20 again into gripping engagement with the wire.

It is understood that if the wire is obstructed after a partial feed of the wire, as above explained, that portion of the wire which has been projected into the path of the cutter will be cut off by the movement of the cutter in the same manner that the full length of the wire would have been cut off if the wire had been fed its full normal distance so that at the next forward feed of the wire a proper length will be advanced.

In the ordinary use of the machine if

there is no obstruction to the proper feed of the wire the feed block 9 will continue to the full end of its forward stroke with the carrier lever 18 without any checking of the movement of the feed block with relation to the carrier lever and without any tripping of the dog 20, and on the backward stroke of the carrier lever the feed block will also move with the carrier and the dog 20 will trail back over the wire 4 as permitted by the inclined toe of the dog, and at the end of its backward stroke the dog will be already in gripping relation with the wire ready for the forward feed.

What I claim is:

1. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire, a reciprocable actuating member which moves said feed block, a yielding tension connection between said actuating mechanism and said feed block which yields to resistance to the onward movement of the feed block and permits the continued movement of the said actuating mechanism.

2. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire, a reciprocable actuating member which moves said feed block, a yielding tension connection between said actuating mechanism and said feed block which yields to resistance to the onward movement of the feed block and permits the continued movement of the said actuating mechanism, and tripping mechanism which is actuated by the said continued movement of the actuating mechanism to release from the wire the grip of said gripping mechanism.

3. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire, a reciprocable actuating member which moves said feed block, a yielding tension connection between said actuating mechanism and said feed block which yields to resistance to the onward movement of the feed block and permits the continued movement of the said actuating mechanism, tripping mechanism which is actuated by the said continued movement of the actuating mechanism to release the grip of said gripping mechanism on the wire, and means for holding said gripping mechanism out of gripping engagement with the wire.

4. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire, a reciprocable actuating member which moves said feed block, a yielding tension connection between said actuating mechanism and said feed block which yields to resistance to the onward movement of the feed block and permits the continued movement of the said actuating mechanism, tripping mechanism which is

actuated by the said continued movement of the actuating mechanism to release the grip of said gripping mechanism on the wire, means for holding said gripping mechanism released from the wire, and means whereby the said detent of the gripping mechanism will be released by the retrograde movement of the feed block.

5. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire on the forward stroke, a reciprocable carrier which moves said feed block, means for preventing the backward movement of the wire during the retrograde movement of the said feed block, a mount for said feed block on said reciprocable carrier, said carrier being movable a limited distance with relation to said feed block, and tension mechanism which normally causes said feed block to move with the carrier and which yields to resistance offered to the onward movement of the feed block thereby allowing the carrier to move a limited distance while the feed block is restrained.

6. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire on the forward stroke, a reciprocable carrier which moves said feed block, means for preventing the backward movement of the wire during the retrograde movement of the said feed block, a mount for said feed block on said reciprocable carrier, said carrier being movable a limited distance with relation to said feed block, tension mechanism which normally causes said feed block to move with the carrier and which yields to resistance offered to the onward movement of the feed block, thereby allowing the carrier to move a limited distance while the feed block is restrained, and means actuated by the onward movement of said carrier after the feed block is restrained which releases the gripping mechanism from the wire.

7. In a wire feed device, a reciprocable feed block having mechanism which grips and feeds the wire on the forward stroke, a reciprocable carrier which moves said feed block, means for preventing the backward movement of the wire during the retrograde movement of the said feed block, a mount for said feed block on said reciprocable carrier, said carrier being movable a limited distance with relation to said feed block, tension mechanism which normally causes said feed block to move with the carrier and which yields to resistance offered to the onward movement of the feed block, thereby allowing the carrier to move a limited distance while the feed block is restrained, means actuated by the onward movement of said carrier after the feed block is restrained which releases the gripping mechanism from the wire, and means for locking the said gripping mechanism in its released position.

8. In a wire feed device, a reciprocable carrier, a feed block mounted on said carrier and having a tongue and slot connection therewith, the slot being of such size with relation to the tongue that there is a possible travel of the carrier with relation to the block, means for gripping the wire to the block so that the forward movement of the block will normally feed the wire, tension mechanism which normally retains the said block in such engagement with the carrier that the carrier and block will travel together and which yields to unusual resistance so that the carrier may travel a limited distance without travel of the feed block.

9. In a wire feed device, a reciprocable carrier, a feed block mounted on said carrier and having a tongue and slot connection therewith, the slot being of such size with relation to the tongue that there is a possible travel of the carrier with relation to the block, means for gripping the wire to the block so that the forward movement of the block will normally feed the wire, tension mechanism which normally retains the said block in such engagement with the carrier that the carrier and block will travel together and which yields to unusual resistance so that the carrier may travel a limited distance without travel of the feed block, and means actuated by the said additional movement of the carrier to release the grip of the wire to the feed block.

10. In a wire feed device, a reciprocable carrier, a feed block mounted on said carrier and having a tongue and slot connection therewith, the slot being of such size with relation to the tongue that there is a possible travel of the carrier with relation to the block, means for gripping the wire to the block so that the forward movement of the block will normally feed the wire, tension mechanism which normally retains the said block in such engagement with the carrier that the carrier and block will travel together and which yields to unusual resistance so that the carrier may travel a limited distance without travel of the feed block, means actuated by the said additional movement of the carrier to release the grip of the wire on the feed block, and means whereby on the retrograde movement of the carrier and feed block the gripping mechanism again becomes operative.

11. In a wire feed device, a reciprocable feed member having mechanism which grips and feeds the wire during the movement in one direction, means for actuating said feed member, a yielding connection between said actuating mechanism and said feed member, and means controlled by abnormal resistance to the wire for checking the onward movement of the feed member.

12. In a wire feed device, a reciprocable

feed member having mechanism which grips
and feeds the wire during the movement in
one direction, means for actuating said feed
member, a yielding connection between said
5 actuating mechanism and said feed member,
means controlled by abnormal resistance to
the wire for checking the onward movement
of the feed member, and means controlled
by the said actuating mechanism for releas-
10 ing the grip of the feed member on the wire

after the checking of the forward movement
of the feed member and before the retro-
grade movement.

In testimony whereof I affix my signature,
in presence of two witnesses.

GEORGE W. PERKINS.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents,
Washington, D. C."
