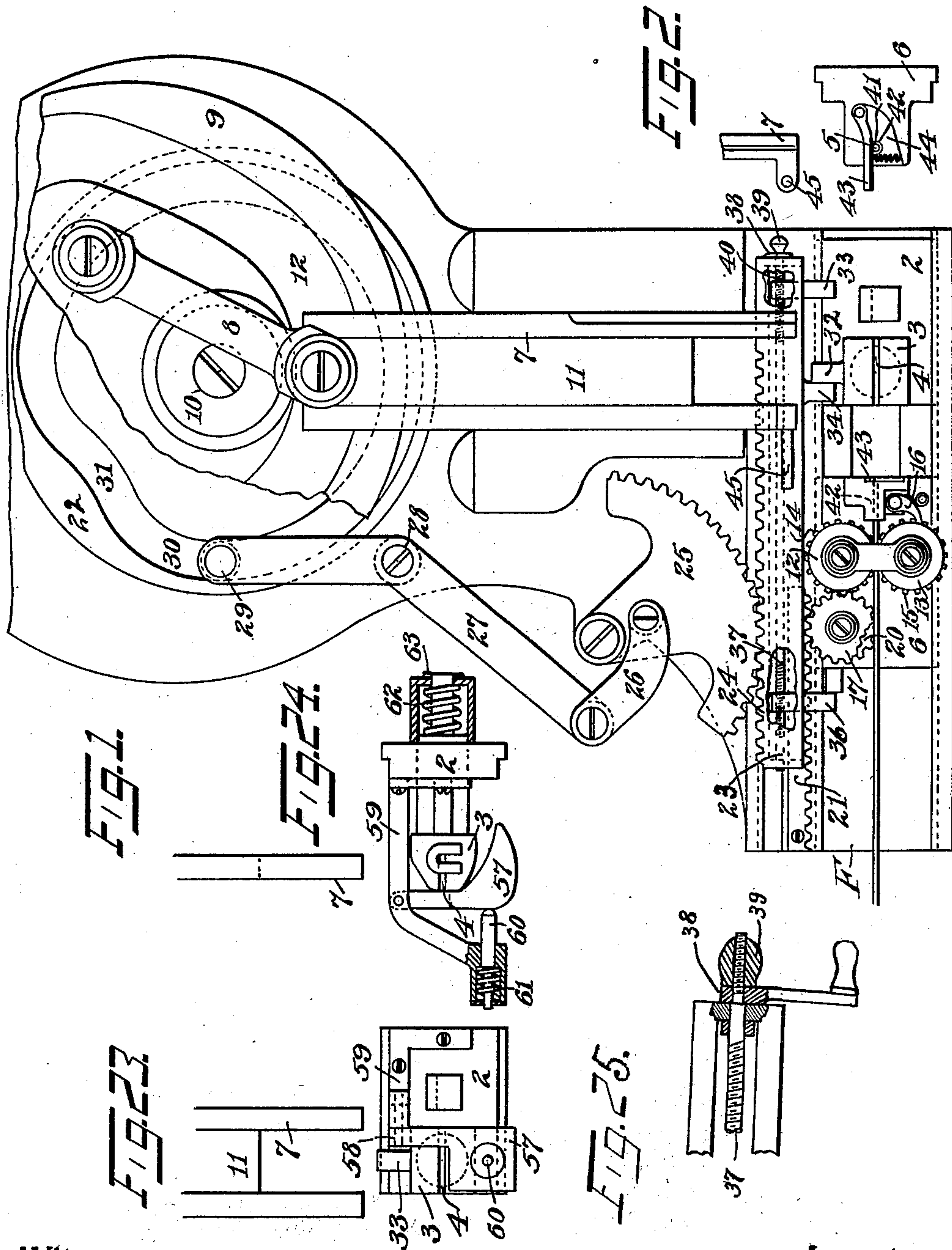


H. A. OLSSON.
WIRE STITCHER.
APPLICATION FILED APR. 14, 1908.

914,668.

Patented Mar. 9, 1909.

3 SHEETS—SHEET 1.



Witnesses:

H. G. Lucas.
H. D. Penney

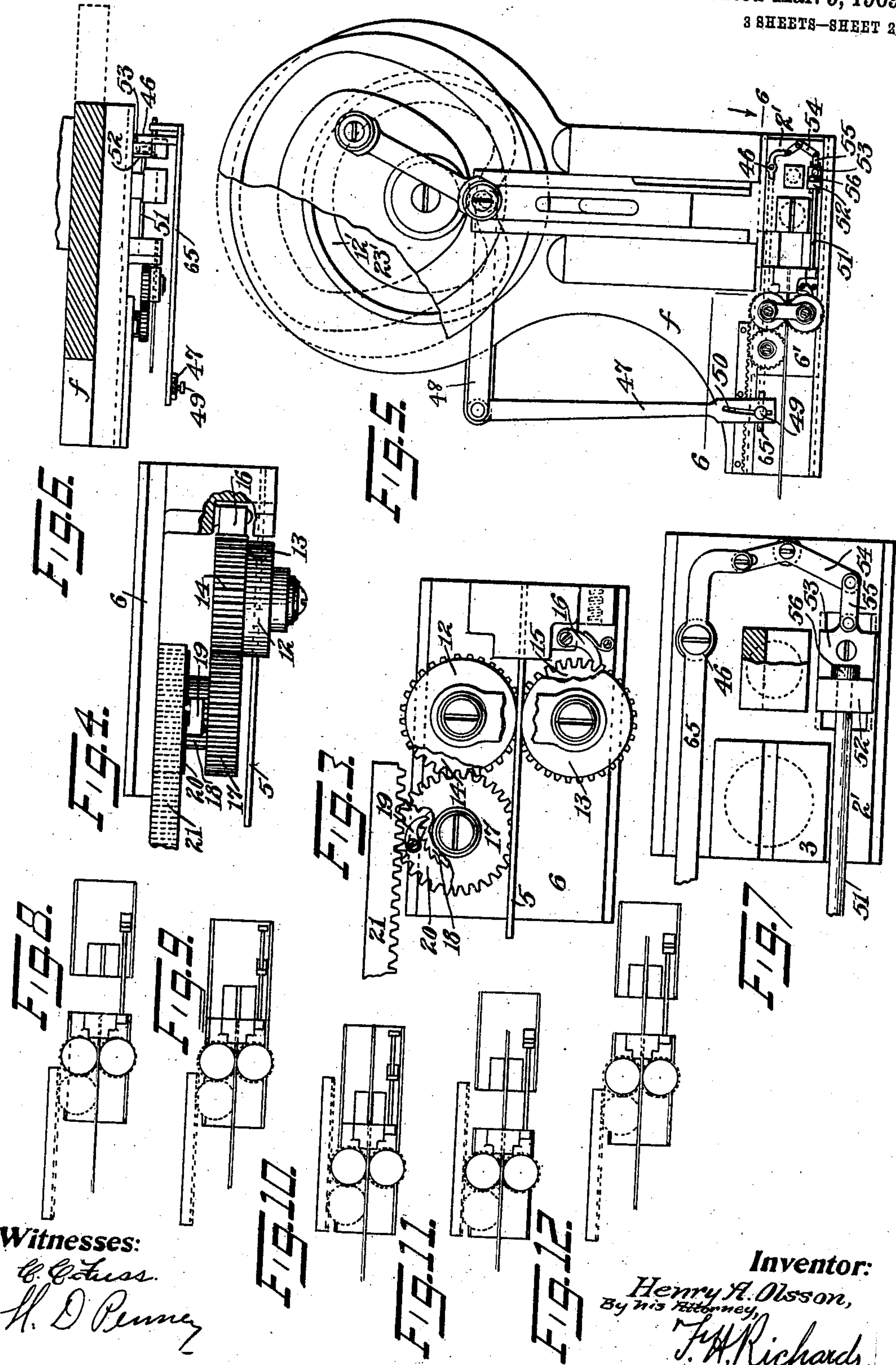
Inventor:

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By his Attorney,
J. H. Richards

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3 SHEETS—SHEET 2.



Witnesses:
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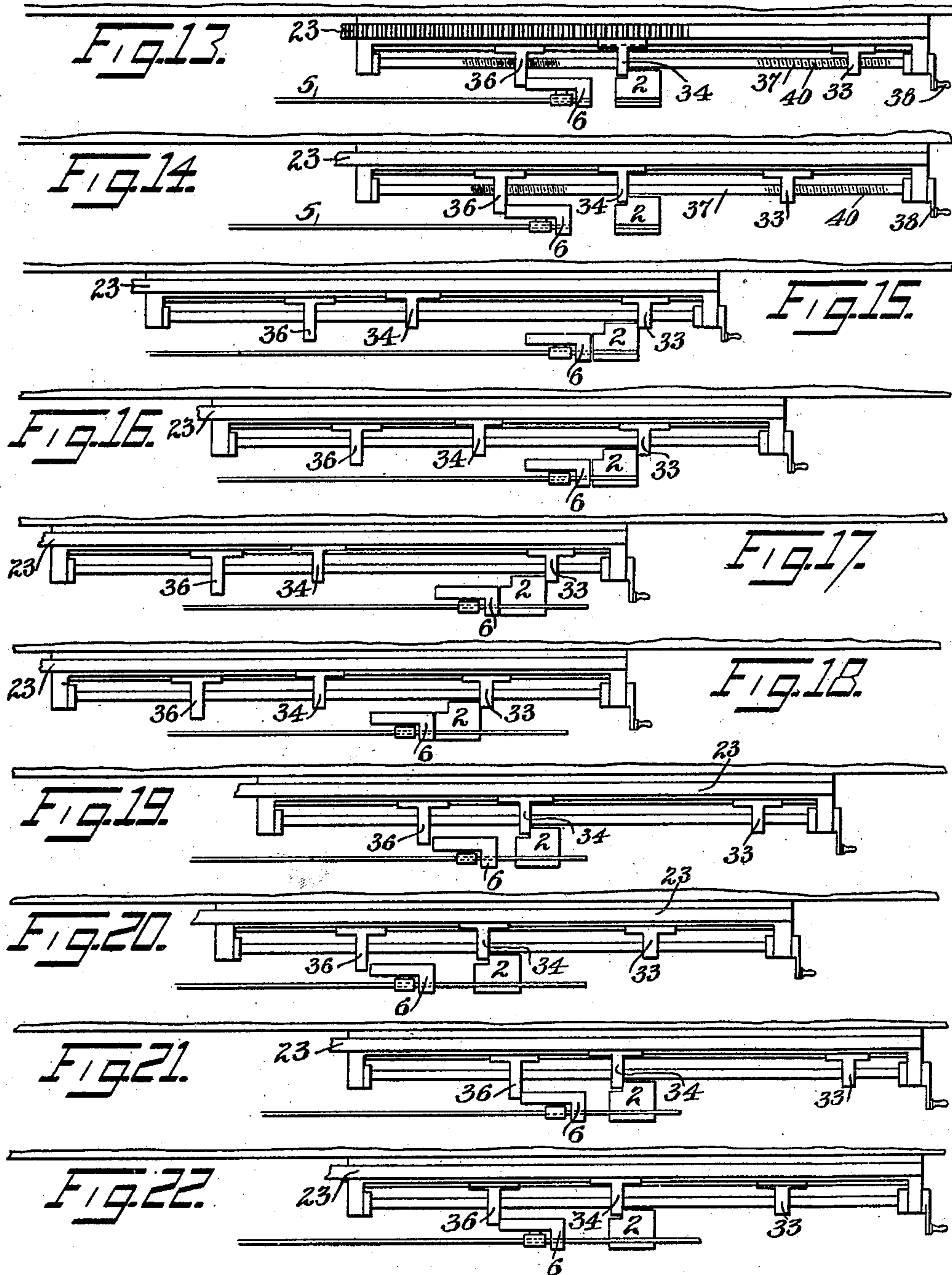
WIRE STITCHER.

APPLICATION FILED APR. 14, 1908.

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3 SHEETS—SHEET 3.

914,668.



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UNITED STATES PATENT OFFICE.

HENRY A. OLSSON, OF BROOKLYN, NEW YORK.

WIRE-STITCHER.

No. 914,668.

Specification of Letters Patent.

Patented March 9, 1909.

Application filed April 14, 1908. Serial No. 426,949.

To all whom it may concern:

Be it known that I, HENRY A. OLSSON, a citizen of the United States, residing in Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Wire - Stitchers, of which the following is a specification.

This invention relates to machines generally known as wire stitchers or stapling machines in which a length of wire is drawn from a reel or supply, cut-off, bent to form a staple, and then driven through the article and generally clenched on the opposite side.

The object of the present invention is to provide means for causing the wire end portion that is passed into the slot of an anvil member and then cut off, to have the two end portions bent to form the legs of a staple, to be brought into the anvil slot by the act of advancing the anvil in the plane of its slot along the wire that is held stationary; and thereupon while the anvil is being returned to its normal position for forming and driving the staple, the feeding operation takes place, whereby the wire advances along with the anvil and therefore remains in the slot.

A further object is to provide a feeding member having a guide, and through which member and guide the wire passes, and to arrange the feed member whereby the anvil will be brought over to the feed member and then both members will retreat while the wire is held stationary, causing it to pass into the anvil slot; and then while the anvil is returned to normal position the feed member is also returned to advance the wire and retain it in the anvil.

A further object of the invention is to provide a shiftable feed member with means whereby when it is moved rearward away from the normal forming position of the anvil, it will engage the wire and prevent its rearward movement, while the same wire engaging means will grip the wire on the return stroke of the feed member and advance the wire.

A further object of the invention is to provide means for adjusting the reciprocating mechanisms of the anvil member and also of the feed member, in order to provide for different lengths of staple.

A further object is to provide a member that will divide a single member whose adjustment will automatically vary the move-

ment of the anvil member and of the feed member in the proper proportions to provide for different lengths of staple.

A further object is to provide cutting means carried by the feed member and which are operated in the various positions of adjustment without adjusting the operating means.

In the accompanying drawings representing embodiments of my invention, Figure 1 is a front elevation of certain parts of a stitcher, Fig. 2 is an end view of the feed member, showing a portion of the former, illustrating the wire cutting device and its operating means, Fig. 3 shows in front elevation enlarged, the feed member, and a portion of the engaging rack for the feed rolls. Fig. 4 is a plan view of the parts shown in Fig. 3. Fig. 5 shows in front elevation a modified form of stitcher. Fig. 6 is a section on the line 6—6 indicated in Fig. 5. Fig. 7 is a front elevation enlarged of the anvil member as shown in Fig. 5. Figs. 8 to 12 inclusive show diagrammatically successive positions of the anvil member and feed member with the engaging rack, on reduced scale. Figs. 13 to 22 inclusive show diagrammatically consecutive positions of the anvil and feed member with the operating actuator, as arranged for two adjustments. Figs. 23 and 24 show in side and end elevations respectively details of the supporting tongue for the staple, and connected parts; and Fig. 25 shows in section details of the locking mechanism for the screw rod.

In the construction shown in Fig. 1, on a suitable frame F is mounted an anvil member 2 carrying an anvil 3 having the usual slot 4. The member 2 is guided to reciprocate in the path of the feed of the wire 5. A feed member 6 is arranged to reciprocate in the same path. The normal position of the anvil as shown in Fig. 1 permits it to be straddled by a former 7 reciprocated by pitman 8 from a crank disk 9 carried by shaft 10. A driver 11 may be reciprocated from a cam slot 12 in the cam member in the usual manner.

The feed member carries gripping means arranged to grip the wire on the return movement of the member toward the anvil; also carries means for engaging the wire to prevent its rearward movement when the feed member is moved rearward away from the anvil,

thereby causing the wire to be held stationary during such rearward movement. And both of such means are shown combined in one pair of rolls carried by the feed member that are caused to rotate in a direction to advance the wire through the feed member when the feed member is moved backwardly, and at equal speed, which results in the wire being held stationary and prevented from moving backward on the rearward movement of the feed member; while the same rollers are locked against movement in the opposite direction, and hence on the return movement of the feed member these rollers will grip the wire and carry it forward along with the feed member.

The anvil member and the feed member both being shiftable, and the feed member being provided with the wire engaging means as just described, means are provided for reciprocating both of these members, and preferably one of the members is advanced to engage the other member and thereupon both members are advanced together in the same direction that the other member has been moving, for a distance equal to the length of the staple to be cut. Thereupon the anvil member is returned to its normal forming position, and the feed member is also returned to its former position. Furthermore, means are provided for varying the movements of these two members to give a different length of staple as desired, and for equal legs of the staple the two members must have a corresponding ratio of movement in every adjustment. Means are provided whereby the movement of one member will vary the reciprocating movements of the two said members in the proper relation and by the proper timing thereof.

In the arrangements shown in Fig. 1 and elsewhere, the feed member is provided with a pair of rollers 12 and 13 pivoted on the feed member 6 to engage the wire 5 therebetween, and carry gears 14 and 15 whereby they rotate together at equal speeds. A pawl 16 engages the gear 15 to prevent the rotation of the gears in one direction that would permit the wire to pass rearward, but allowing their rotation in the opposite direction. A gear 17 meshes with gear 14, and gear 17 has secured to it a ratchet wheel 18 engaged by pawl 19 carried by a gear 20 mounted concentric with the gear 17 but loose on its spindle. A rack 21 is fixed on the frame in position to engage the gear 20 and rotate it upon reciprocation of the feed member 6. Therefore gear 20 will rotate in opposite directions as the member 6 reciprocates. But when the member moves forward the pawl 19 will ride free over the ratchet wheel 20 and will not serve to rotate the gears on the rolls 12 and 13. But when the feed member moves rearward, the pawl 19 will be carried around on the gear 20 to

engage its ratchet wheel 18 and rotating gear 17, the gears 14 and 15 will rotate and the rollers also. But the peripheral speed of these rollers is equal to the speed of movement of the feed member 6; and being in the forward direction where engaging the wire, the wire will be fed forward at precisely the same speed that the feed member itself is moving rearward, which will have the effect of holding the wire stationary relative to the frame and the rack 21; while the return movement of the feed member will draw the wire forward by the pawl 16 preventing rotation of the wheels 12 and 13 that would permit the wire to pass rearward through the feed member.

In the arrangement for reciprocating the feed member and the anvil member shown in Fig. 1, and also that shown in Fig. 5, the anvil member is advanced rearward to the feed member, and thereupon both members advance in the same direction for a distance equal to the staple length to be cut from the wire. Thereupon both members are returned to normal position. In the construction shown in Fig. 1, the anvil member is advanced until it abuts the feed member, and thereupon the movement of the anvil member is continued, it serving to push the feed member along with it the proper distance. Then the anvil member is engaged and returned forward for a distance equal to the distance it was removed from the feed member in their former normal positions at which time the feed member is engaged, and then both members move at the same speed and the same distance apart through the same space until returned to their former positions. The actuating means shown in Fig. 1 comprise an actuator bar 23 slidable parallel with the path of movement of the feed and anvil members. Suitable means are provided for reciprocating this bar, it being shown as having a rack 24 engaged by a toothed sector 25 that is swung by a link 26 pivoted to one end of a lever 27 pivoted to the frame at 28. The pin 29 on the other end of the lever rides in a race way 30 in the cam member 22 that is concentric for a large portion of its length, but contains an offset at 31 that will reciprocate the actuator, holding it stationary at other parts of the cycle of the driving shaft. A lug 33 on the actuator bar 23 engages the anvil 4, preferably by a lug 32 thereon, when the bar has moved rearward a certain distance, and advances the anvil to abut the feed member 6. The continued movement of the bar and anvil will cause the anvil to move the feed member along with it for the length of the stroke of the actuator; that is not shown adjustable. When the actuator bar begins its return movement the lug 32 will move away from the anvil lug and would not thereby return the anvil member. A second lug 34 is fixed

on the actuator bar in position to engage the opposite side of the lug 32 when the anvil and bar are in normal positions. When the bar advances, this lug 34 will leave the anvil.

5 Hence on the return movement of the actuator bar the lug 34 will engage the anvil lug after the bar has returned a certain distance, and when the bar returns to its former position the anvil will be returned to its former
10 or normal position.

In order to return the feed member to its normal position, that is separated from the anvil the distance of one leg of the staple, a
15 lug 36 is provided on the actuator bar to engage the opposite side of the feed member, and this lug is spaced so that it will not engage the feed member until the bar has started on its return stroke for a distance equal to the distance the two members are separated in
20 normal position. Therefore when the bar returns to normal position, it will return the feed member to its normal position.

When it is desired to make a longer staple, the feed member must be shifted so that its
25 normal position is a greater distance from the anvil. This can be effected by shifting the lug 33 on the actuator bar the same distance away from the anvil member. In other words, the feed member and lug are together
30 shifted away from the anvil the additional length of each leg of the staple, or a distance equal to one half of the additional length of the staple. Now, the feed member must always move rearward a distance equal to the
35 length of the staple to be cut off, and as it is moved rearward by the travel of the anvil member, such member must have a greater travel rearward. Furthermore, the feed member being removed a greater distance
40 from the anvil in its normal position, for the greater length of the staple, the anvil member must first travel the additional distance the feed member has been adjusted, to abut the feed member; and must then travel a
45 greater distance than before adjusted equal to the additional length of the staple. Consequently, the length of travel of the anvil for the longer staple must be three-halves of the additional length of the staple; whereas
50 the lug 36 is shifted rearward one-half of the additional length of the staple or the additional length of one leg of the staple. Therefore, the lug 32 is shifted rearward three-halves of the additional length of staple,
55 while the lug 36 is adjusted rearward one-half of the additional length of the staple, or in a ratio of three to one. This movement is effected simultaneously by a single member. One form of such means is shown as comprising a screw rod 37 carried by the actuator
60 bar 23 and prevented from endwise movement, being rotated by a handle 38, and clamped by a threaded head 39 when adjusted on the screw abutting the end of the
65 bar. The handle 38 slides on the screw rod

but is prevented from turning therewith. The lug 33 has a screw-threaded bore engaged by a threaded portion 40 at one end of the spindle or rod 37 whereby it is shifted on turning the rod. The other lug 36 has a
70 screw-threaded bore engaging a threaded portion of the rod, but the latter threaded portions are formed to advance the lugs in the ratio of three to one; that is, for one turn of the rod or spindle, the lug 33 will move
75 three times the distance that the lug 36 is shifted.

It will be obvious that the lug 34 does not require any adjustment for different length of staple for the reason that it simply returns
80 the anvil to forming position and this is always constant being in alinement with the former by which it is straddled to bend the staple. After the length of wire has been fed to form the staple, it must be cut off and this
85 is usually done at the end of the feed member, that is sometimes termed the guide tube, being represented by an aperture 41 in a plug 42 on the guide member 6. When the feed member is adjusted for a different length of
90 staple, the position at which the wire is cut will be shifted. Therefore it is desirable to attach the cutting member to the shiftable feed member, and in Fig. 2 is shown a cutting knife 43 pivoted in a recess 44 in the end
95 of the feed member 6. The projecting end of the knife 43 is engaged by a pin 45 carried by the former in its descent.

Another modification is shown in Figs. 5, 6 and 7 in which the same form of feed member
100 as just described, and as shown in detail in Figs. 3 and 4 is provided; but the actuating mechanism is different. In this view the anvil member 2' has a lever 65 pivoted thereto at 46 which lever is pivoted to a bent lever
105 47 pivoted on an arm 48 from the frame *f*. This bent lever has an extension at one end engaging a slot 12' in the cam member of the machine. The lever 65 has its pivot pin 49 adjustable in a slot 50 in the lever 47 where-
110 by this connection can be moved to and from the axis of the bent lever and therefore vary the reciprocation of the anvil member 2'. The feed member 6' has a rod 51 secured thereto and passing through an apertured
115 lug 52 carried by slide 53 in the anvil member a pivoted bent arm 54 connects lever 65 with this slide by a link 55. As the anvil moves back and forth the lug 52 will travel with it but the rod 51 slides in the bore of the
120 lug and the lug 52 has a certain free movement limited by a head 56 on the rod 51 at one end and by the engagement of the anvil and feed member at the other limit. When the bent lever 47 swings outward, it will
125 move the anvil rearward that will shift to engage the feed member and then advance the feed member along with it. During such movement the wire will be held stationary by reason of the rotation of the feed rolls
130

from the stationary rack as has been described. This movement is such that the anvil will advance the feed member the distance of a staple length. Upon the bent lever swinging in the opposite direction the anvil will be returned to its former normal position. When it starts back the apertured lug will slide along the rod until it engages the head on the end of the rod, and during rest of the movement, the anvil will pull the bar and feed member back with it. Now, the length of this bar is such that when the anvil and feed member are in their returned positions the head of the bar will engage the lug. Therefore, the anvil will advance on its return movement the distance between the feed member and anvil at their normal positions before the anvil begins to return the feed member. Now, when the lever 65 has its pivotal connection with the lever 47 moved upward to give a shorter stroke to the anvil the apertured lug 52 will be shifted away from the feed member and engaging the head of the rod will draw the feed member toward the anvil, automatically adjusting for a shorter staple length. Obviously an adjustment of the levers in the opposite direction will correspondingly shift the lug in the other direction for a longer staple. This operation is shown diagrammatically in Figs. 8 to 12. Fig. 8 represents the normal position while in Fig. 9 the anvil is shifted over to abut the feed member. The further advance of the anvil member will carry the feed member along with it as shown in Fig. 10 while the rod 51 will pass through the bore of the lug. The return movement of the anvil member will cause the rod to pass through the lug in the opposite direction until its head engages as shown in Fig. 11 in which the relative position of the anvil and feed member is similar to that shown in Fig. 8. The return of the anvil to normal position will draw the feed member back with it as indicated in Fig. 12.

Referring now to the diagrams, in Figs. 13-22, Fig. 13 shows in plan the actuator bar 23 carrying the lugs 33, 34 and 36, and the feed member 6, and anvil member 2, in their normal positions, and also the adjusting spindle or rod 37, and the wire 5. Fig. 14 shows the same parts, but with the lugs 33 and 36 shifted by turning the handle 38 of the spindle, the lug 33 being shifted three times the distance the lug 36 is shifted. The feed member 6 is shown as shifted rearward the same distance that the lug 36 is shifted rearward, because on the return stroke it will be engaged later and returned a less distance. Fig. 15 shows the parts as adjusted in Fig. 13, with the bar 23 advanced until the lug 33 has engaged the anvil member 2 and advanced it to abut the feed member 6. Fig. 17 shows a continuation of the movement indicated in

Fig. 15, the advance of the bar 23 causing lug 33 to still further shift the anvil member and feed member. And the wire being prevented from rearward movement, will be caused to pass through the anvil member 2 as shown in this view. Fig. 19 shows the bar 23 started on its return movement, and the lug 34 has shifted the anvil member 2 rearward for a certain distance, until the lug 36 abuts the feed member 6. The full return movement of the bar 23 will cause the lugs 34 and 36 to return the members 2 and 6 to their normal positions. In Fig. 16, the bar 23 is shown advanced until the anvil member 2 abuts the feed member 6. The further advance of the bar will advance the feed member and anvil members as shown in Fig. 18, according to this adjustment of the lugs 33 and 36. In Fig. 20, the bar 23 is shown as returned until the lug 36 abuts the feed member 6, and the lug 34 engages the anvil 2. And in Fig. 22 the parts according to this adjustment are returned to their normal positions. Comparing the two positions of adjustment, it will be seen that the lug 36 must be shifted rearward for a greater length of staple, and forward for a shorter staple, for a distance equal to the additional length of one staple leg, or one-half of the additional length of the staple itself. And it will be further seen that the lug 33 must be shifted for a greater length of staple a distance equal to the greater distance that the anvil must travel to abut the feed member, plus the greater distance that the anvil member must travel to cause the length of wire to be fed on its return movement. Therefore, this total distance of adjustment of the lug 33 must be the increase of length of the staple wire, plus the increase of the length of one leg of the staple, in other words three-halves of the additional length of staple. But the lug 36 was shifted one-half of the additional length of staple. Hence these lugs must be advanced a relative distance of three to one, and in the same direction.

It is customary in stapling machines to provide a supporting member or tongue that is caused to pass between the legs of the former below the anvil to support the staple legs in the usual grooves in the opposite faces of the former; and which supporting tongue treats as the driver descends to force the staple into the article. Heretofore this supporting member has been carried by the former member. But in this invention the support is shown as carried by the anvil member and comprises a supporting tongue 57 pivoted at 58 on a bracket 59 secured to the anvil member 2. A plunger 60 is caused by spring 61 to press the tongue toward the anvil, the anvil being pressed outward by a spring 62, whose motion is limited by stop 63. The tongue 57 abuts the anvil member that limits its inward movement.

Having thus described my invention, I claim:

1. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed member and anvil member to normal positions, and means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position.

2. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed member and anvil member to normal positions, means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, and means for holding the wire stationary during the said rearward movement of said members.

3. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed member and anvil member to normal positions, means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, and means carried by the feed member for preventing rearward movement of the wire during the rearward movement of the feed member.

4. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, and means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, means for varying the travel of the feed member.

5. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming po-

sition over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, and means for varying the travel of the anvil member.

6. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, and means for varying the travel of the anvil member, and means for varying the travel of the feed member.

7. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, means for varying the travel of the anvil member, and means for varying the travel of the feed member, and a single adjustment device arranged to control both latter varying means.

8. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, and means on the feed member causing the wire to be advanced therewith during its return movement and thereby retained in the anvil when returned to forming position.

9. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed

member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, means on the feed member to
 5 cause the wire to be advanced therewith during its return movement and thereby retained in the anvil when returned to forming position, and means for holding the wire stationary during the said rearward move-
 10 ment of said members.

10. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming
 15 position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed member and anvil member to normal
 20 positions, means on the feed member to cause the wire to be advanced therewith during its return movement and thereby retained in the anvil when returned to forming position, and means for causing said latter means to
 25 hold the wire stationary during the said rearward movement of said members.

11. In a stitcher, the combination with a staple former of an anvil member shiftable laterally, a movable feed member, means for
 30 shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the
 35 feed member and anvil member to normal position, rollers on the feed member to engage the wire, and means for preventing rotation of the rollers during the return movement of the feed member to grip the wire
 40 and carry it along with the feed member during return movement.

12. In a stitcher, the combination with a staple former of an anvil member shiftable laterally, a movable feed member, means for
 45 shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed mem-
 50 ber and anvil member to normal position, rollers on the feed member to engage the wire, means for preventing rotation of the rollers during the return movement of the feed member to grip the wire and carry it along
 55 with the feed member during return movement, means to rotate the rollers during the rearward movement of the feed member at a surface speed equal to the speed of the feed member whereby the wire will be held sta-
 60 tionary and caused to pass through the traveling feed member and anvil during rearward movement thereof.

13. In a stitcher, the combination with a staple former of an anvil member shiftable
 65 laterally, a movable feed member, means for

shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the
 70 feed member and anvil member to normal position, a pair of rollers on the feed member, a gear on the feed member, a stationary rack engaged by said gear during the travel of the feed member, a gear on one of said
 75 rollers, a pawl and ratchet connection between the said two gears causing rotation of the feed rollers during the rearward movement only of the feed member in a direction and at a speed relative to the moving feed
 80 member whereby the wire is held stationary, and means for locking said rollers against movement in the opposite direction whereby the wire is gripped by the rollers on the return movement of the feed member.
 85

14. In a stitcher, the combination with a staple former of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming
 90 position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed member and anvil member to normal
 95 position, a pair of rollers on the feed member, a gear on the feed member, a stationary rack engaged by said gear during the travel of the feed member, a gear on one of said rollers, a pawl and ratchet connection be-
 100 tween the said two gears causing rotation of the feed rollers during the rearward movement only of the feed member in a direction and at a speed relative to the moving feed member whereby the wire is held stationary,
 105 a ratchet wheel on one of the rollers, and a pawl on the feed member engaging said latter ratchet wheel to prevent rotation of the rollers during return movement of the feed member.

15. In a stitcher, the combination with a
 110 staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming
 115 position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug
 120 on the actuator for returning the feed member to its former position, and means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when re-
 125 turned to forming position.

16. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable
 130 actuator, means for reciprocating the actu-

ator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, and means for holding the wire stationary during the rearward movement of the feed member.

17. In a stitcher, the combination with a staple former of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, means for adjusting the anvil advancing lug, and means for adjusting the feed member returning lug.

18. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, and means for simultaneously adjusting the anvil advancing lug and the feed member returning lug.

19. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member

to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, means for simultaneously adjusting the anvil advancing lug and the feed member returning lug in the same direction predetermined unequal distances.

20. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, a rotatable spindle on the actuator prevented from endwise movement thereon and having two portions differently screw threaded, the anvil advancing lug having a threaded bore engaging one of said portions, and the feed member returning lug having a threaded bore engaging the other threaded portion of the spindle whereby the lugs are unequally shifted by turning the spindle.

21. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, and means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, a rotatable spindle on the actuator prevented from endwise movement thereon and having two portions differently screw threaded, the anvil advancing lug having a threaded bore engaging one of said portions, the feed member returning lug having a threaded bore engaging the other threaded portion of the spindle whereby the lugs are unequally shifted by turning the spindle, and means for locking the spindle against rotation.

22. In a stitcher, the combination with a staple former of an anvil member shiftable laterally, a feed member shiftable in the same path, a main shaft, an actuator mounted to

reciprocate in proximity to said two members, a cam member on the main shaft of the stitcher having a race way therein, a movable arm having a portion engaging the walls of the race way to rock the arm, a toothed segment rocked by said arm, a rack on the actuator engaging the segment to be reciprocated thereby, a lug on the actuator positioned to engage the anvil member to shift it from forming position over to engage the feed member and then advance both members rearward to cause the wire to pass through both members, a lug on the actuator to return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil member when returned to former position, and means on the feed member for holding the wire stationary during the rearward movement of the feed member.

23. In a stitcher, the combination with a staple former of an anvil member shiftable laterally, a feed member shiftable in the same path, a main shaft, an actuator mounted to reciprocate in proximity to said two members, a cam member on the main shaft of the stitcher having a race way therein, a movable arm having a portion engaging the walls of the race way to rock the arm, a toothed segment rocked by said arm, a rack on the actuator engaging the segment to be reciprocated thereby, a lug on the actuator positioned to engage the anvil member to shift it from forming position over to engage the feed member and then advance both members rearward to cause the wire to pass through both members, a lug on the actuator to return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil member when returned to former position, and means on the feed member for holding the wire stationary during the rearward movement of the feed member, a rotatable spindle on the actuator prevented from endwise movement thereon and having two portions differently screw threaded, the anvil advancing lug having a threaded bore engaging one of said portions, and the feed member returning lug having a threaded bore engaging the other threaded portion of the spindle whereby the lugs are unequally shifted by turning the spindle.

24. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position

over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, rollers on the feed member to engage the wire, and means for preventing rotation of the rollers during the return movement of the feed member to grip the wire and carry it along with the feed member during such movement.

25. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, a pair of rollers on the feed member, a gear on the feed member, a stationary rack engaged by said gear during the travel of the feed member, a gear on one of said rollers, a pawl and ratchet connection between the said two gears causing rotation of the feed rollers during the rearward movement only of the feed member in a direction and at a speed relative to the moving feed member whereby the wire is held stationary, and means for locking said rollers against movement in the opposite direction whereby the wire is gripped by the rollers on the return movement of the feed member.

26. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the anvil member, means for returning the feed member and anvil member to normal positions, and means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, a cutting device carried by the movable feed member, and means for operating the cutting device.

27. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to thread the wire through the an-

vil member, means for returning the feed member and anvil member to normal positions, means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, means for varying the travel of the feed member, a wire cutting device carried by the feed member, and means for actuating the cutting device in the different adjusted normal positions of the feed member.

28. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, a movable actuator, means for reciprocating the actuator, a lug on the actuator arranged to engage the anvil to shift it from forming position over to abut the feed member and then advance both members rearward whereby the wire will pass through both members, a lug on the actuator to engage and return the anvil member to normal position, a lug on the actuator for returning the feed member to its former position, means on the feed member for gripping the wire during the return movement only of the feed member to retain the wire in the anvil when returned to forming position, means for adjusting the anvil advancing lug, means for adjusting the feed member returning lug, a wire cutting device carried by the feed member, and means for actuating the cutting device in the different adjusted normal positions of the feed member.

29. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting the anvil member from forming position over to the feed member and to further advance the anvil member and feed member rearward to pass the wire through the anvil member, means for returning the feed member and anvil member to normal positions, and means on one of said movable members causing the wire to be advanced during said return movement and thereby retained in the anvil when returned to forming position, means for varying the travel of the feed member, a wire cutting device carried by the feed member, and means for actuating the cutting device in the different adjusted normal positions of the feed member from the staple former.

30. In a stitcher, the combination with the anvil and a staple former, of a movable feed member, a wire guide on the feed member, rollers on the feed member to engage the wire therebetween, means for preventing rotation of the rollers during the return movement of the feed member toward the anvil to grip the wire and advance it during such movement, means to positively rotate the rollers during the rearward movement of the feed member at a peripheral speed equal to the speed of the feed member and in the op-

posite direction where engaging the wire to hold the wire stationary and cause it to pass through the feed member during its rearward movement without the wire itself being advanced, a cutting device on the feed member, and means for actuating the cutting device after return of the feed member to normal position.

31. In a stitcher, the combination with the anvil and a staple former, of a movable feed member, a wire guide on the feed member, rollers on the feed member to engage the wire therebetween, means for preventing rotation of the rollers during the return movement of the feed member toward the anvil to grip the wire and advance it during such movement, means to positively rotate the rollers during the rearward movement of the feed member at a peripheral speed equal to the speed of the feed member and in the opposite direction where engaging the wire to hold the wire stationary and cause it to pass through the feed member during its rearward movement without the wire itself being advanced, a cutting device on the feed member, and means for actuating the cutting device from the movement of the staple former after return of the feed member to normal position.

32. In a stitcher, the combination with the anvil and a staple former, of a movable feed member, a wire guide on the feed member, rollers on the feed member to engage the wire therebetween, means for preventing rotation of the rollers during the return movement of the feed member toward the anvil to grip the wire and advance it during such movement, means to positively rotate the rollers during the rearward movement of the feed member at a peripheral speed equal to the speed of the feed member and in the opposite direction where engaging the wire to hold the wire stationary and cause it to pass through the feed member during its rearward movement without the wire itself being advanced, a cutting device on the feed member, and means for actuating the cutting device after return of the feed member to normal position, in the several positions of adjustment and from the movement of the stitcher.

33. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally from the forming position, a shiftable member, means for shifting one of said members over to abut the other member and to advance both said members, means for returning said members to normal positions, wire engaging means on one of said members arranged to grip the wire to advance it along with it when the member moves in one direction, and when the member moves in the opposite direction to engage the wire to advance it relative to the member at the same speed that the member is moving but in the

opposite direction whereby the wire itself is held stationary during such movement.

34. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting one of said members over to the other member and to then advance both members, means for returning both members to normal positions, means on the feed member for gripping the wire when the member is moved in one direction to carry it along with the member, and means on the feed member for advancing the wire at the same speed the member is moving but in the opposite direction to thereby hold the wire stationary when the member is moved in the opposite direction.

35. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally, a movable feed member, means for shifting one of said members over to the other member and to then advance both members, means for returning both members to normal positions, means on the feed member for gripping the wire when the member is moved in one direction to carry it along with the member, and means on the feed member for advancing the wire at the same speed the member is moving but in the opposite direction to thereby hold the wire stationary when the member is moved in the opposite direction, and means for varying the travel of both said members.

36. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally from forming position, a movable feed member, means for advancing one of said members over to the other member and to advance both members in the same direction, means for returning said members to normal position, rollers on the feed member to engage the wire therebetween, means for preventing rotation of the rollers during one movement of the feed member to grip the wire and advance it, and means to positively rotate the rollers during the opposite movement of the feed member to advance the wire through the feed member at the same speed that the feed member is moving but in the opposite direction whereby the wire is held stationary during such movement of the feed member.

37. In a stitcher, the combination with a staple former, of an anvil member, a movable feed member, means for shifting one of said members over to the other member to further advance both members in the same direction, means for returning said members to

normal position, a pair of rollers on the feed member to engage the wire therebetween, a gear on the feed member, a stationary rack engaged by said gear during the travel of the feed member, a gear on one of said rollers, a pawl and ratchet connection between said two gears causing rotation of the feed rollers during the movement of the feed member in one direction only and at a speed relative to the feed member and in a direction whereby the wire is held stationary during such movement of the feed member, and means for locking said rollers against movement in the opposite direction whereby the wire is gripped by the rollers and advanced during the movement of the feed member in the opposite direction.

38. In a stitcher, the combination with a staple former, of an anvil member shiftable laterally from forming position, a movable feed member, means for advancing one of said members over to the other member and to advance both members in the same direction, means for returning said members to normal position, rollers on the feed member to engage the wire therebetween, means for preventing rotation of the rollers during one movement of the feed member to grip the wire and advance it, means to positively rotate the rollers during the opposite movement of the feed member to advance the wire through the feed member at the same speed that the feed member is moving but in the opposite direction whereby the wire is held stationary during such movement of the feed member, and means for varying the movements of the feed member and anvil member.

39. In a stitcher, the combination with an anvil member arranged to be shifted laterally, of a staple supporting member shiftable to and from the anvil member and connected with the anvil member to be shifted thereby upon lateral movement of the anvil member.

40. In a stitcher, the combination of an anvil member, an anvil mounted on the member and movable longitudinally thereon, the anvil member being shiftable transversely to the direction of movement of the anvil, and a staple supporting member mounted on the anvil member to be movable thereon to cooperate with the anvil but bodily shifted upon movement of the anvil member.

HENRY A. OLSSON.

Witnesses:

WILLIAM H. REID,
F. E. BOYCE.