H. WEBER AND G. L. RICHARDSON.

WIRE STITCHER.

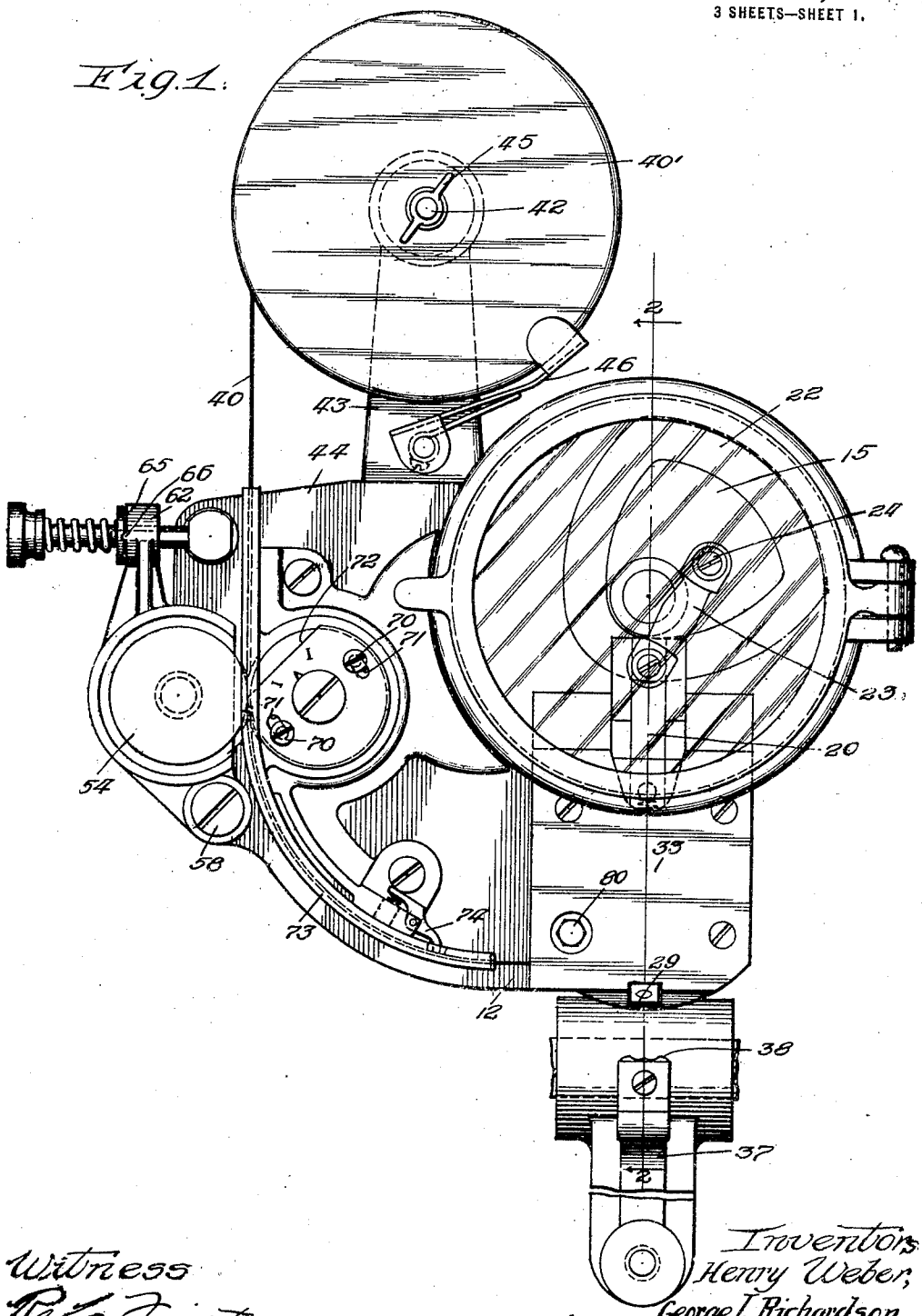
APPLICATION FILED FEB. 25, 1918.

1,357,752.

Patented Nov. 2, 1920.

3 SHEETS—SHEET 1.

Fig. 1.



Witness
F. C. Farrington

Inventors
Henry Weber,
George L. Richardson.
By Brown & Neal Attys.

H. WEBER AND G. L. RICHARDSON.

WIRE STITCHER.

APPLICATION FILED FEB. 25, 1918.

1,357,752.

Patented Nov. 2, 1920.

3 SHEETS—SHEET 2.

Fig. 2.

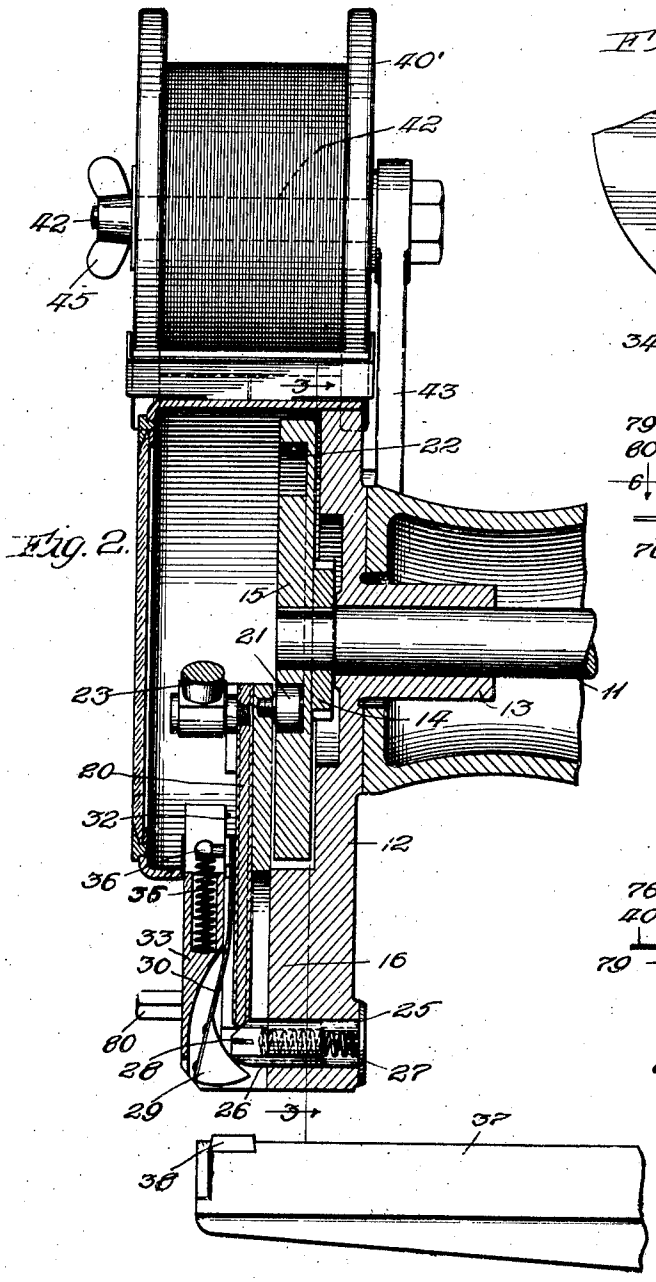


Fig. 5.

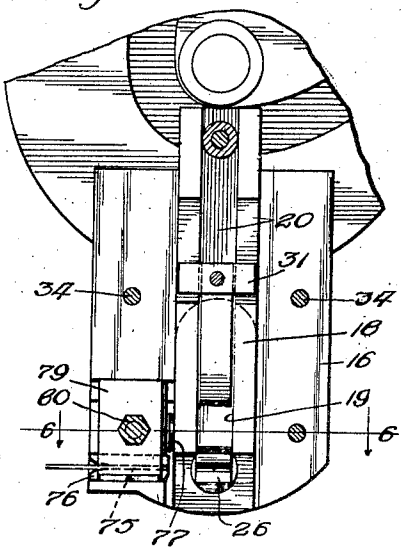
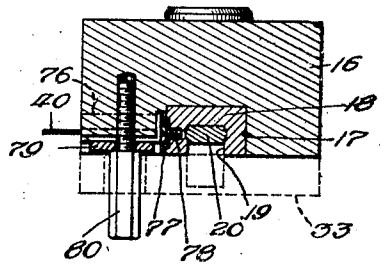


Fig. 6.



Witness:
R. L. Farrington

Inventors:
Henry Weber,
George L. Richardson.
By Brown & Dean Attys.

H. WEBER AND G. L. RICHARDSON.

WIRE STITCHER.

APPLICATION FILED FEB. 25, 1918.

1,357,752. **Patented Nov. 2, 1920.**

3 SHEETS—SHEET 3.

Fig. 3.

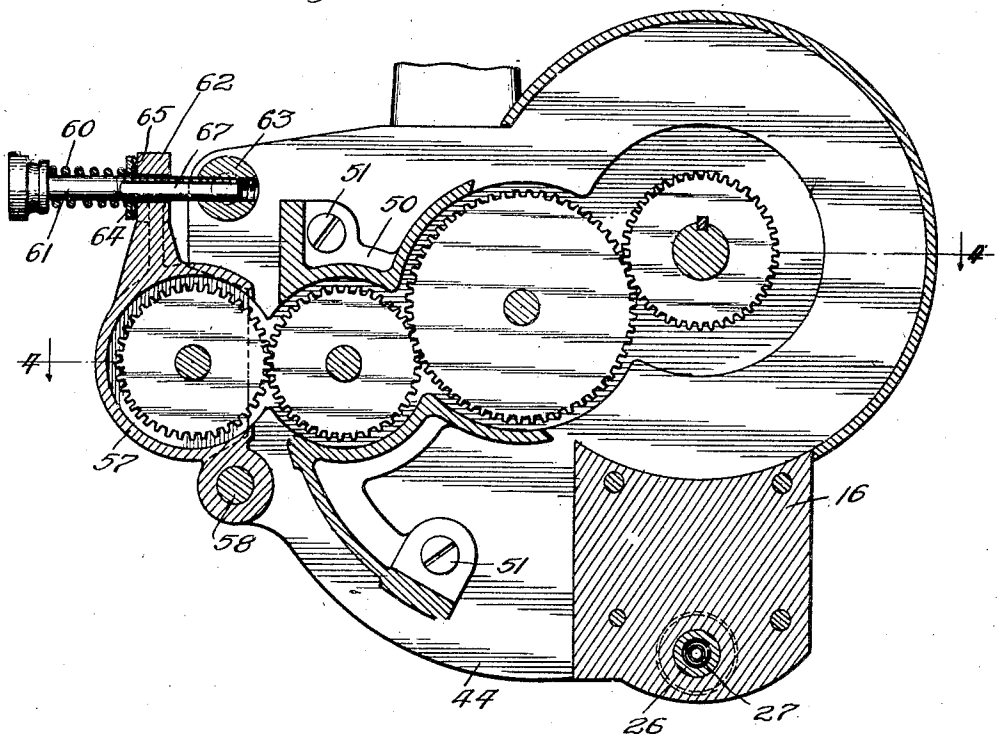
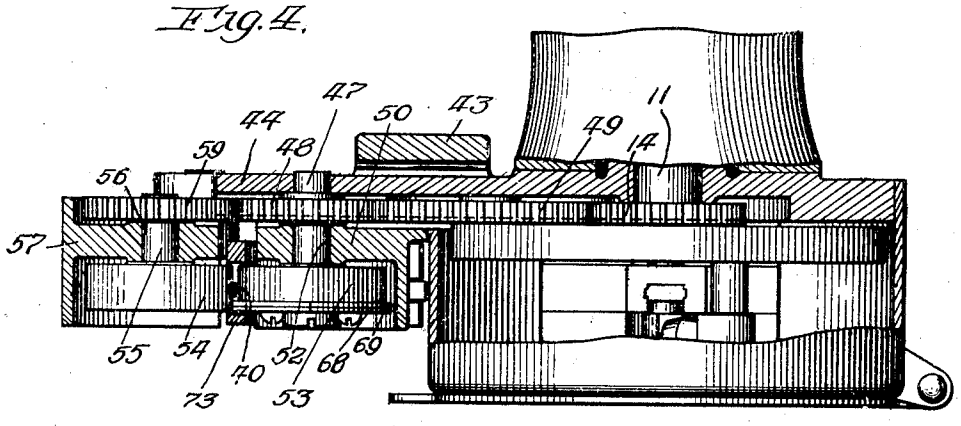


Fig. 4.



Witness:
H. L. Farrington

Inventors,
Henry Weber,
George L. Richardson.
By Brown & Mann Attys

UNITED STATES PATENT OFFICE.

HENRY WEBER AND GEORGE L. RICHARDSON, OF CHICAGO, ILLINOIS, ASSIGNORS TO LATHAM MACHINERY COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

WIRE-STITCHER.

1,357,752. Specification of Letters Patent. Patented Nov. 2, 1920.

Application filed February 25, 1918. Serial No. 218,988.

To all whom it may concern:

Be it known that we, HENRY WEBER and GEORGE L. RICHARDSON, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Wire-Stitchers, of which the following is a specification.

This invention has for its object the provision of a wire stitcher which shall be of improved construction and operation. The invention is exemplified in the combination and arrangement of parts shown in the accompanying drawings, and described in the following specification, and it is more particularly pointed out in the appended claims.

In the drawings—Figure 1 is a front elevation of a portion of a wire stitcher to which the present invention is applied; Fig. 2 is a vertical section on line 2—2 of Fig. 1; Fig. 3 is a vertical section on line 3—3 of Fig. 2; Fig. 4 is a horizontal section substantially on line 4—4 of Fig. 3; Fig. 5 is a fragmentary vertical sectional view of a portion of the machine showing details of construction; and Fig. 6 is a horizontal sectional view on line 6—6 of Fig. 5.

Wire stitching machines of the type to which the present invention is applied are well known in the art and only a sufficient portion of the machine is shown in the drawings to illustrate the present invention and its relation to other parts of the machine as it has been previously constructed. The numeral 10 designates the horizontal arm of the stitching machine which supports the stitcher head and the numeral 11 indicates the rotary shaft for driving the operating parts. Secured to the forward end of the arm 10 is a plate 12 upon which the operating parts for the stitcher head are mounted, and this plate has a rearwardly projecting bearing 13 in which the shaft 11 rotates. The portion of the shaft 11 which projects through the bearing 13 carries a spur gear 14 and an operating cam 15, both of which are rigidly held to the shaft. The lower portion of the plate 12, as shown in Figs. 2, 5 and 6, is shaped to form a block 16 having a groove 17 in its front face in which a staple former 18 is mounted for vertical sliding movement. The former 18 is provided with a groove 19 in which a staple driver 20 is slidably mounted and both the former 18 and the driver 20 are operated by the cam 15. The staple former is connected with the cam by a roller 21 at its upper end which operates in a cam groove 22, and the driver 20 is operated by a pitman 23 connected with the cam 15 by a pivot pin 24. The lower end of the block 12 is bored at 25 to receive an anvil 26 which slides back and forth in the opening 25 and which is resiliently held in its forward position by a spring 27. The anvil 26 has its front end slotted at 28 to receive the wire from which the staples are formed, and to hold the wire while it is being bent to form the staple. A staple supporter 29 is held by a leaf spring 30 in position to extend between the legs of the staple while it is being driven, and is connected by the spring 30 with a bar 31 mounted to slide in a guideway 32 formed on the inner face of a cover block 33 which is held by screws 34 in a position to inclose the staple forming and driving mechanism. A coil spring 35 engages a pin 36 carried by the sliding block 31 and normally holds the staple support 29 in its uppermost position. A work supporting arm 37 extends beneath the staple driving mechanism and carries a clencher block 38 in position to engage the ends of the staples as they are driven and bend them over to clench them in the work.

The operation of the parts thus far described is well known in the art and need not be explained in detail, but it will be sufficient to say that wire is fed into the slot 28 in the anvil 26 by mechanism to be described, and the ends of the wire protruding from the anvil are bent downwardly by the legs of the staple former 18 which move past the sides of the anvil, and after the staple has thus been formed, it is driven into the work by the downward movement of the staple driver 20.

The wire 40 from which the staples are formed is taken from a spool 40′ carried on a spindle 42 supported by an arm 43 extending upwardly from a web 44 which projects laterally from the plate 12. The spool 40′ is held on the spindle 42 by a wing nut 45 and the spool is held from accidental rotation by a spring pressed brake 46 which bears against the periphery of the spool and thus affords a fixed resistance to the unwinding of the wire from the spool.

As shown in Figs. 1, 3 and 4, the web plate 44 has a short shaft 47 rotatably mounted near its outer edge, and this shaft carries a spur gear 48 rigid therewith, which gear meshes with an idler 49, which in turn meshes with the spur gear 14 secured to the main drive shaft 11. A housing 50 is secured to the web 44 by screws 51 and partially covers the gears 48, 49 and provides a second bearing for the shaft 47 as shown at 52 in Fig. 4 of the drawings. Secured to the shaft 47 in front of the housing 50 is a wire feed roll 53 for engaging the wire 40 and feeding it forwardly toward the staple-forming and driving mechanism. The feed roll 53 coöperates with a second roll 54 which is carried by a shaft 55 journaled at 56 in a swinging bracket 57 pivoted at 58 to the web plate 44. The shaft 55 carries a spur gear 59 on the side of the bracket 57 opposite the feed roll 54 and in position to mesh with the spur gear 48 which drives the feed roll 53. It will thus be seen that the rolls 53 and 54 will be driven in unison with one another by means of the intermeshing gears 48 and 59. The roll 54 is resiliently pressed toward the roll 53 by a coil spring 60 surrounding a screw 61 which passes through an opening in an arm 62 extending upwardly from the bracket 57. The screw 61 is threaded into a head 63 swiveled on the plate 44. A washer 64 is interposed between the end of the spring 60 and the face of the arm 62 and is provided with a series of notches 65 which engage a projection 66 on the face of the arm 62 and which thus offer resistance to rotation of the washer. The screw 61 is held against accidental rotation by the washer 64 which is provided with a flattened portion on its inner periphery to engage a corresponding flattened portion 67 on the screw 61. This arrangement prevents accidental turning of the screw 61 and insures the maintenance of the degree of tension placed in the spring 60.

In order to accommodate the wire to the operation of the staple-forming and driving mechanism it is necessary to feed a length of wire into the mechanism at a definite period in the cycle of operation of the machine and to permit the wire to remain stationary during the remaining portion of the cycle of operation. It is apparent from the description of the feed rolls as thus far given that the wire 40 would be fed continuously between the rolls if means were not provided for preventing operation of the rolls when it is desired for the wire to remain stationary. This effect is secured by a pair of cam disks 68 and 69 which are secured to the front face of the feed roller 53 by means of screws 70 which pass through slots 71 in the cam disks 68 and 39, and which hold the cam disks in their adjusted positions upon the front face of the roller 53. As shown clearly in Fig. 4, the cam disks 68 and 69 are of a greater diameter than the feed roller 53 and bear against the periphery of the roller 54 and thus hold the roller 54 out of operative engagement with the wire 40. In order to permit the rollers to grip the wire when it is desired to feed the wire forwardly, the cams 68 and 69 have a portion cut away, as shown at 72, and it will be apparent that when the cut-away portions in the cams come opposite the roller 54, the spring tension upon this roller will cause it to grip the wire against the roller 53 and the two will cause the forward movement on the wire toward the stapling mechanism. The cams 68 and 69 are of just sufficient diameter to release the pressure upon the wire 40, but do not cause sufficient movement of the shaft 55 to disengage the teeth on the driving gears 48 and 59 which remain in mesh at all times. The effective length of the combined cam formed by the disks 68 and 69 may be adjusted by shifting the disks relative to one another. The greatest amount of feed will be secured when the cut-away portions 72 of the two disks exactly coincide with one another, but when the disks are shifted about their centers, it will be easily seen that the relative period when the two rollers are held out of engagement will be increased and the amount of wire fed forwardly will be correspondingly decreased. In this way the amount of wire for forming staples of different lengths can be regulated.

When the amount of wire fed to the stapling mechanism is changed, it is necessary to adjust also the position of the cut-off mechanism to correspond to the length of wire fed. The way in which this is accomplished is best illustrated in Figs. 5 and 6. The wire as it leaves the feed rolls passes through a curved guide 73 and beneath a spring detent 74 to prevent backward movement and to hold the wire stretched taut between the spool 40′ and the stapling mechanism. As the wire leaves the guide 73 it passes into a groove 75 cut in the edge of a rectangular block 76 which directs the end of the wire into the slot 28 in the anvil 26. A cutter 77 is fastened to the side of the staple former 18 by means of a screw 78 and moves up and down with the staple former. This cutter passes the inner end of the block 76 and severs the portion of wire projecting through the block at the beginning of the staple-forming operation. The block 76 is held in a recess formed for that purpose in the portion 16 of the support for the operating mechanism by means of a plate 79 held in place by a screw 80. When it is desired to change the length of wire fed to the mechanism to make the legs of the staple longer or shorter, the screw 80 is loosened and the block 76 is

slid toward or away from the anvil 26. In order that the cutter 77 may correspond with the new position of the block 76, a number of cutters of different thicknesses are provided, and the cutters are changed for the various positions of the block 76 so that the one used shall be of a proper thickness to pass in engagement with the end of the cutter block for each particular position of the block.

It will thus be seen that a wire feeding mechanism is provided which employs continuously driven rollers for moving the wire and which are made to feed the wire periodically in timed relation with the operating parts and which can be adjusted to vary the length of wire according to the requirements of the particular work to be performed. This is accomplished without the necessity of ratchet mechanism or reciprocating grippers, and the whole mechanism is exceedingly simple to operate and to adjust for the requirements of different work so that it may be easily cared for by the ordinary operator.

We claim:—

1. In combination, a pair of rollers for feeding wire, a movable support for one of said rollers, resilient means for pressing said rollers toward one another to cause them to grip a wire between their peripheries, a gear train for driving said rollers continuously, a cam for holding said rollers away from one another against the tension of said resilient means to cause a pause in the feeding operation of said rollers at a predetermined period, means for regulating the length of said pause to vary the amount of wire fed, means for severing the wire, and means for adjusting said severing means to correspond to the adjustment of said feeding mechanism.

2. In combination, a feed roller having a fixed axis of rotation, a second feed roller mounted adjacent said first roller, a swinging bracket for supporting said second roller, a pair of spur gears connected with said first-mentioned feed roller and meshing with one another to cause said rollers to rotate in unison with one another, means for driving said gears continuously, and spring tension mechanism for pressing said bracket and the roller carried thereby toward said first-mentioned roller, said mechanism comprising a screw for regulating the tension thereof and means for holding the screw in adjusted positions.

3. In combination, a drive shaft, a pair of rollers for feeding wire, gearing connected with said drive shaft for driving said rollers continuously, resilient means for pressing said rollers toward one another to cause them to grip a wire to be fed, means for adjusting the tension in said resilient means, a lock locking the tension adjusting means, an adjustable cam carried by one of said rollers for engaging the periphery of the other of said rollers to separate said rollers slightly during a portion of the rotation thereof to release the pressure of said rollers upon said wire, and an adjustable cut-off for the wire fed by said rollers.

4. In combination, a frame, a feed roller journaled in the frame, a support pivoted for oscillatory movement on the frame, a feed roller journaled in said support, a spring pressing on the support and tending to hold the feed rollers together, a cam disk secured on the end of one roller and engaging the periphery of the other roller to render said rollers inoperative, and means for driving the rollers continuously.

5. In combination, a frame, a feed roller journaled in the frame, a support pivoted for oscillatory movement on said frame, a feed roller journaled in said support, a spring pressing on the support and tending to hold the feed rollers together, two cam disks disposed side by side and secured against an end of one of said rollers and engaging the periphery of the other roller for rendering the feed rollers inoperative, means for adjusting one of the cams with respect to the other cam, and meshing gears connected with the rollers for continuously driving the latter.

6. Cut-off mechanism for a wire stapler comprising a support having a recess therein with one side open, a wire guide and support mounted in said recess and having an open slot therein for receiving the wire, a wire-holding clamp arranged to engage said support adjacent the open side of said recess and to close the slot in said support, and a wire cutter associated with said clamp and wire guide and support.

7. Cut-off mechanism for a stapling machine including a stapler former, said mechanism comprising a wire guide and support adjustable toward and away from said former, a cutter, and means for removably securing said cutter to said former, said cutter securing means being adapted for adjustment to accommodate cutters of varying thicknesses, one cutter at a time, to correspond to the different positions of said wire guide and support.

In testimony whereof we have signed our names to this specification on this 21st day of February, A. D. 1918.

HENRY WEBER.
GEORGE L. RICHARDSON.