(No Model.) 3 Sheets—Sheet 1.

F. S. BRADLEY.

STAPLING MACHINE.

No. 602,121. Patented Apr. 12, 1898.

Fig. 1.

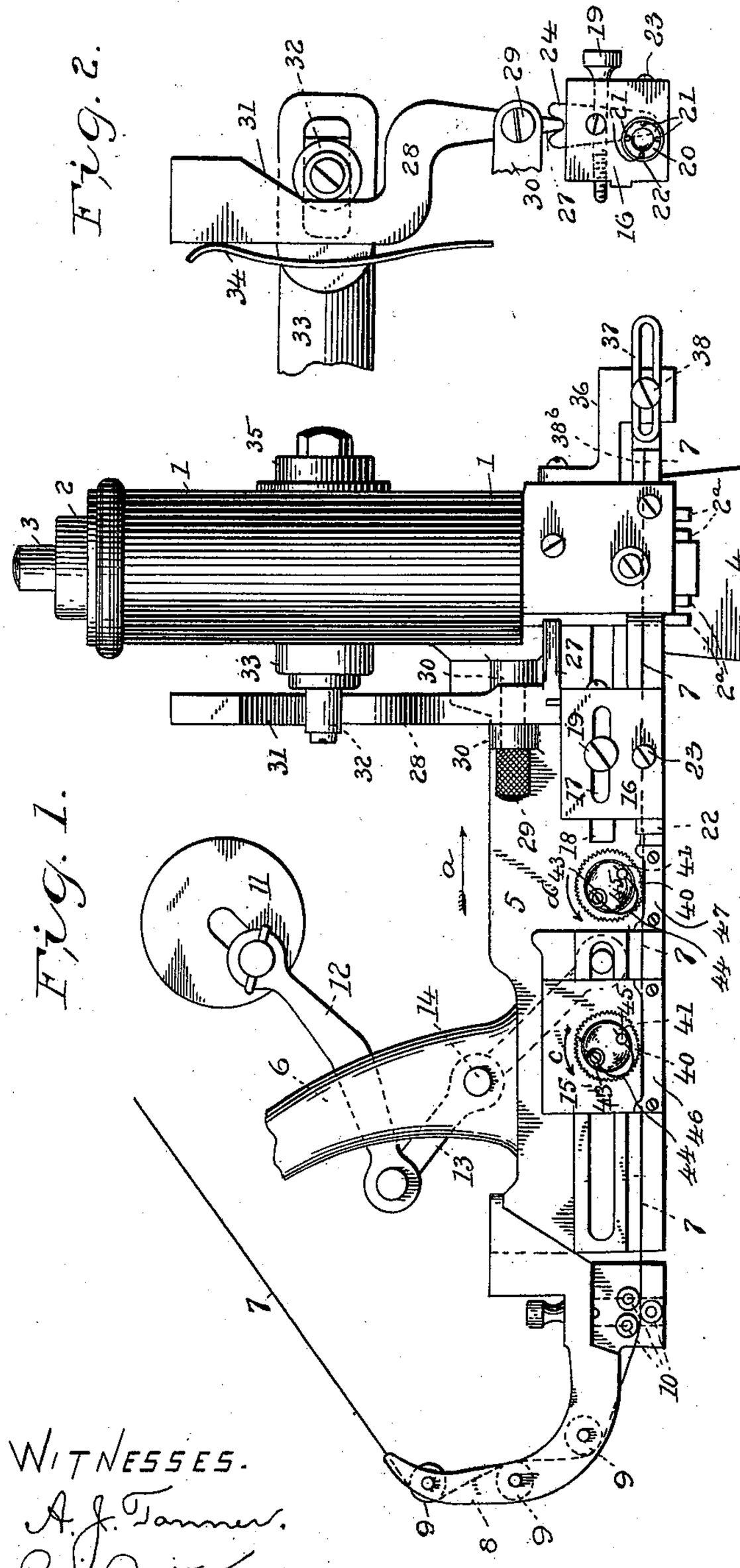
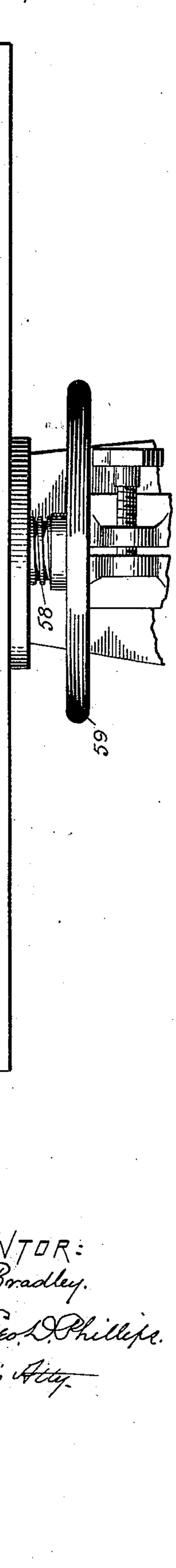


Fig. 2.



WITNESSES.

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INVENTOR:

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his Atty.

(No Model.)

3 Sheets—Sheet 2

F. S. BRADLEY.

STAPLING MACHINE.

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Fig. 3.

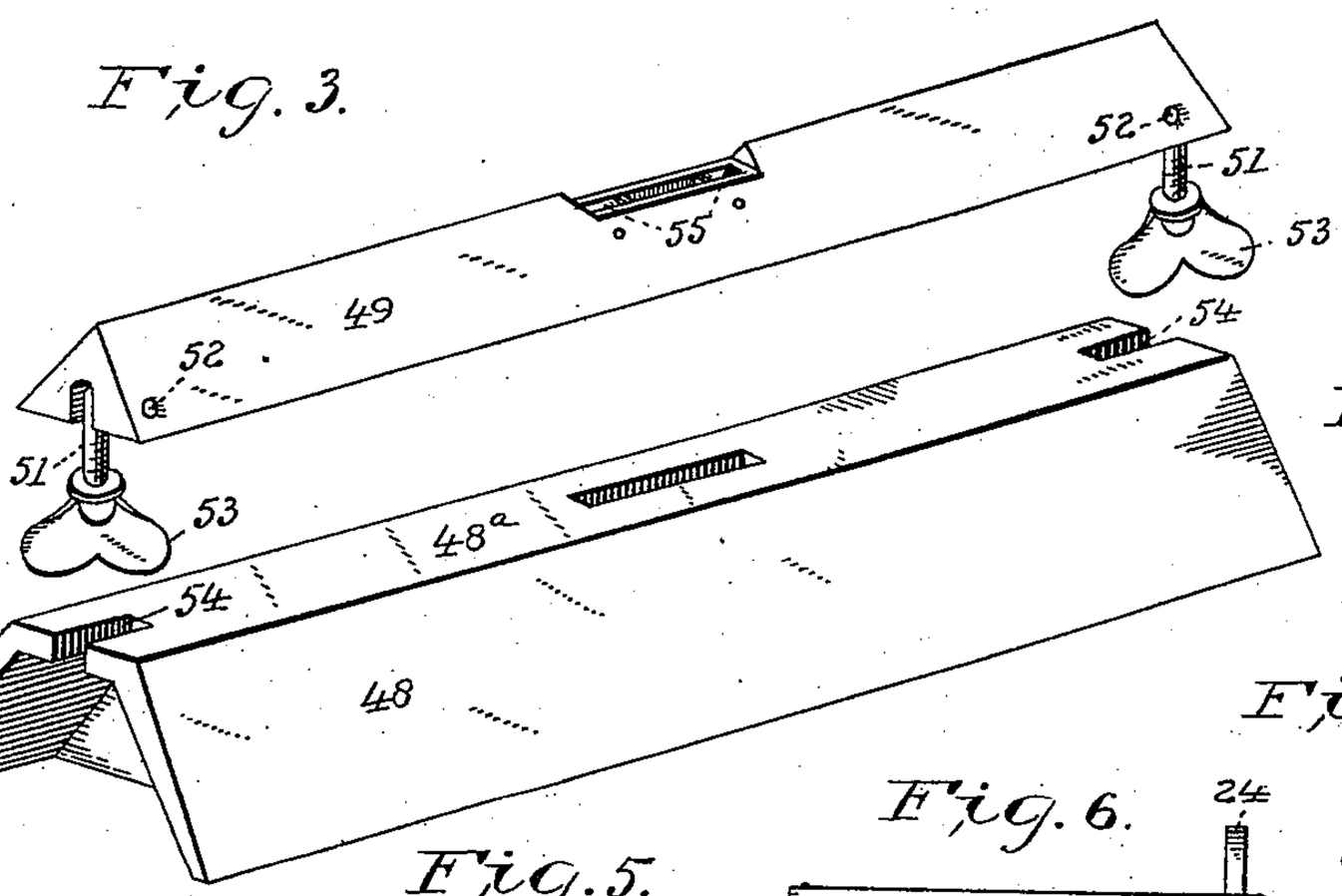


Fig. 4.

Fig. 7.

Fig. 5.

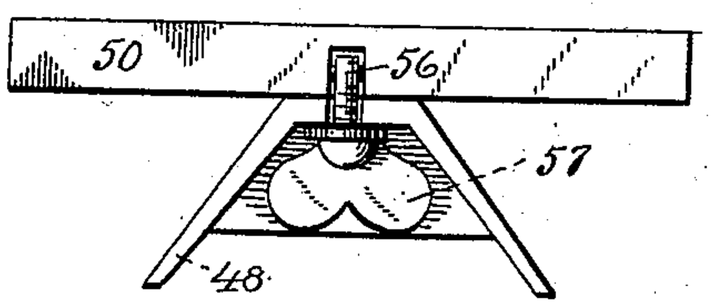
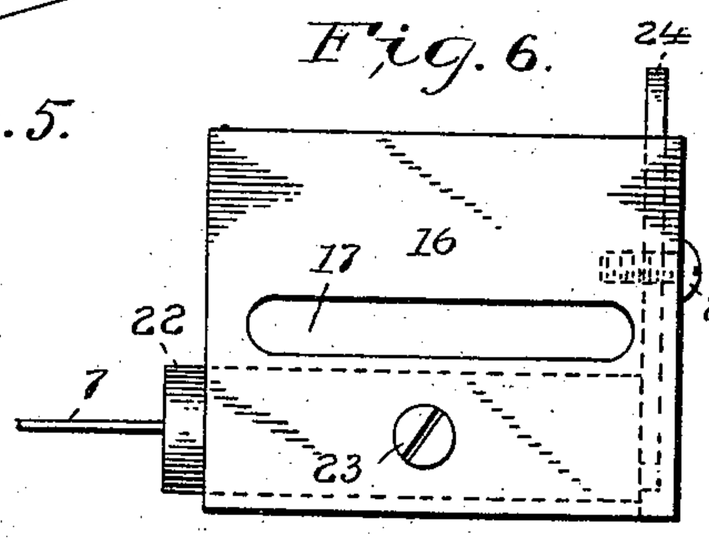


Fig. 6.



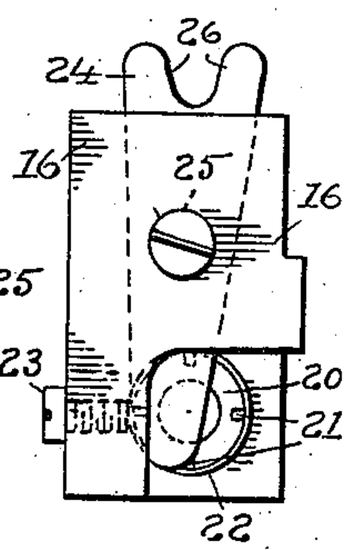


Fig. 8.

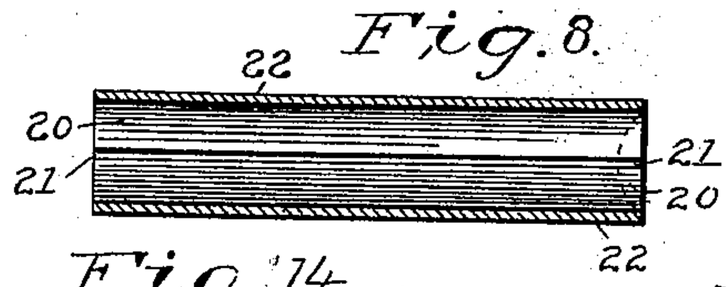


Fig. 9.

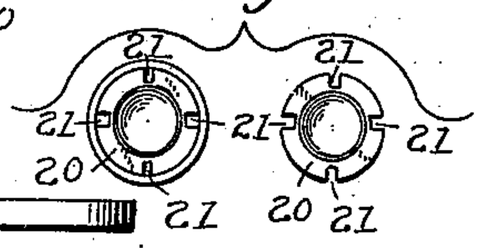


Fig. 10.

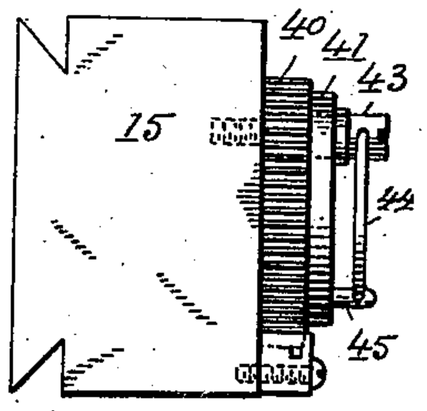


Fig. 14.

Fig. 11.

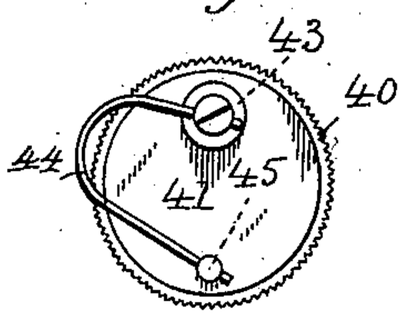


Fig. 12.

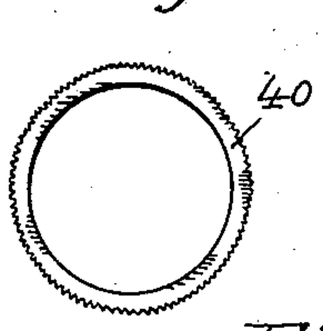
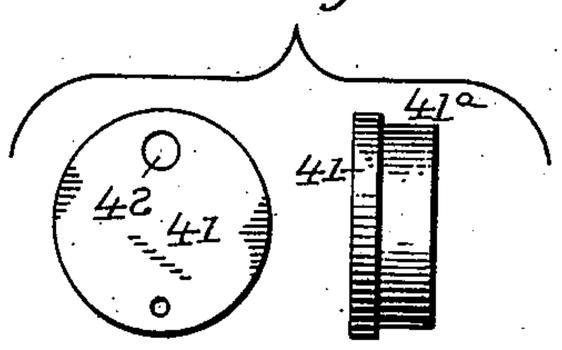


Fig. 15.

Fig. 13.



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(No Model.)

3 Sheets—Sheet 3.

F. S. BRADLEY.

STAPLING MACHINE.

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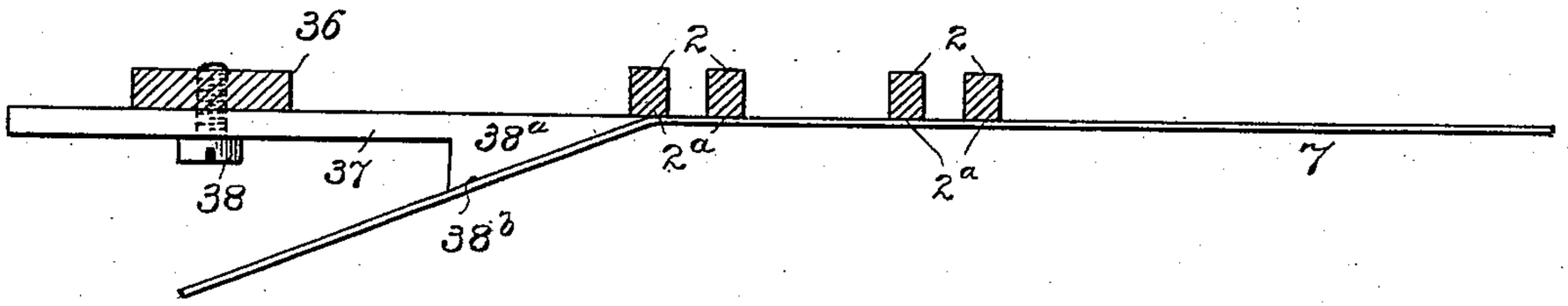
Fig. 16.



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his Attorney

UNITED STATES PATENT OFFICE.

FRANK S. BRADLEY, OF NEW HAVEN, CONNECTICUT.

STAPLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 602,121, dated April 12, 1898.

Application filed May 21, 1897. Serial No. 637,622. (No model.)

To all whom it may concern:

Be it known that I, FRANK S. BRADLEY, a citizen of the United States, and a resident of New Haven, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Staple-Stitching Machines, of which the following is a specification.

My invention relates to universal or staple-stitching machines, and is an improvement on the invention for which Letters Patent were granted to me April 27, 1897, No. 581,507.

To enable others to understand my invention, reference is had to the accompanying drawings, in which—

Figure 1 represents a detail front elevation of the staple-forming part of the machine, broken view of the angular stitching-table or saddle-support, and reel-supporting standard. Fig. 2 is a detail broken view of the driver-bar lever, side elevation of the wire-cutter-operating lever, broken view of the ears in which such lever is fulcrumed, broken view of the spring for keeping the said lever in engagement with a roll on the said driver-bar lever, and end view of the cutter-box looking in the direction of arrow *a*, Fig. 1. Fig. 3 is a detail perspective view of the V-block or detachable apex of the angular table or saddle-base. Fig. 4 is a detail perspective view of the table or saddle-base. Fig. 5 is a detail end elevation of the saddle-base, showing a flat table attached thereto. Fig. 6 is a detail side elevation of the cutter-box, cutter mounted therein, wire-guide, and a broken section of wire projecting from the rear thereof. Fig. 7 is a detail front elevation of the cutter-box, cutter, and wire-guide. Fig. 8 is a detail side elevation of the wire-guide and sectional view of the outer shell. Fig. 9 are detail front elevations of the wire-guide both with and without its shell. Fig. 10 is a detail rear end elevation of the wire-feed block, showing the friction feed-roll attached thereto. Fig. 11 is a detail front elevation of the friction feed-roll and its supporting-disk. Fig. 12 is a detail side elevation of the friction feed-roll. Fig. 13 is a detail front elevation and a side elevation of the friction-feed-roll disk. Fig. 14 is a detail upper plan view of a deflector for forming an outward set in the end of the staple-wire. Fig. 15 is a detail perspective view of a completed staple, showing an exaggerated set in the longer leg thereof. Fig. 16 is a detail plan view of the wire-deflector, sectional view of the bracket supporting it, and sectional view of lower end of the staple-forming bar and a section of the staple-wire.

Its construction and operation are as follows:

1 is the head, carrying forming-bar 2 and the driver-bar 3. As these parts are fully shown and described in the former application before referred to, it is not necessary to give a detailed description of them here.

The-driving mechanism supported on the upper end of the broken rear standard 4 is not shown, as the same construction is employed in the former application, and only such parts of the machine will be shown that will fully illustrate the nature and object of the new improved features.

5 is the arm projecting laterally from the head for supporting the wire-feeding mechanism.

6 is a broken view of the standard carrying a reel at its upper end, (not shown,) around which the wire 7 is supposed to be wound.

8 is the roll-support, carrying rolls 9, over which rolls the wire passes to the straightening-rolls 10.

11 is an end elevation of the eccentric plate, whose shaft (not shown) is driven by the operative part of the machine. 12 is a lever connected thereto, whose opposite end is pivotally supported to one end of the lever 13, which lever is pivotally supported on the pin 14 in the standard 6. The other end of this lever is operatively connected with the feed-block 15, so that by means of such connection the said block is reciprocated back and forth to carry the wire forward to the center of the machine, where the staple is formed.

16 is the cutter-box and is longitudinally adjustable on the face of the arm 5 to determine the proper length of wire for the staples by means of the slots 17 and 18 and the screw 19.

20 (see also Figs. 6, 7, 8, and 9) is the wire-guide, provided with the longitudinal grooves 21, preferably of different dimensions for different sizes of wire, and 22 is a steel tube or cutter-shell surrounding this guide, which shell, carrying said guide, is inserted in a hole

longitudinally formed in the cutter-box and is secured therein by means of the set-screw 23. A transverse slot is formed near the end of the cutter-box to receive the cutter 24, pivotally supported on the screw 25. The lower end of this cutter is adapted to operate across the end face of the said guide and shell to sever the wire for the proper length of the staple required. It will be observed that the end of the guide is slightly concave, so as to give a better cutting effect. The upper end of the cutter is provided with the forked opening 26 to receive the elongated foot 27 of the lever 28. (Shown at Figs. 1 and 2.)

The lever 28 is pivotally supported on the screw 29 and between the ears 30, projecting from the face of the arm 5. The upper end of this lever is provided with the incline 31, with which incline the roll 32, carried by the driver-bar lever 33 in its vertically-reciprocating movements, will impart to the wire-cutter a movement transverse to the feeding-line of the wire 7.

34 is a spring attached to the arm 5 to keep the lever 33 against the roll 32.

35 is a lever similar to lever 33 for vertically operating the forming-bar 2.

36, Fig. 1, is a bracket attached to the head 1, which bracket carries the longitudinally-adjustable wire-deflector 37, attached thereto by means of the screw 38. This deflector (see also Fig. 14) is provided with the head 38^a, having the incline face 38^b. The rear face of this deflector is placed on a line with the lower straight face 2^a of the forming-bar 2, which straight face is also represented by the dotted line *d* at Fig. 14. The object of this deflector is to throw a forward set in the leg 39 of the staple (shown at Fig. 15) to overcome the tendency of this leg to follow the inclination of its slightly-angular point due to the operation of cutter 24. In other words, the said cutter will not leave the end of the severed wire-section square, so that the long leg of the staple will not be driven vertically in the substance to which it is to be attached, and as the inclined end of the leg 39 is toward the machine the tendency would be to follow such inclination, and to overcome this tendency a slight opposite set is first put in, and this is done before the staple-section is cut from the body of the wire.

In Fig. 16 is clearly shown the position of the deflector with respect to the forming-bar and the wire. The said deflector is secured to the bracket 36, the outer face of such bracket being on a line with the outer face of the forming-bar, and the head 38^a of such bar being taper the end of the wire will pass up the incline or taper face 38^b of said head and give an outward inclination to the outer end of the wire, as shown.

40 (see Figs. 1, 10, 11, 12, and 13) is a combined wire feed and check roll and is used for both purposes. As a feed, it is mounted on the face of the feed-block 15, and as a check it is mounted on the face of the arm 5 between the said feed-block and cutter-box 16. The periphery of this roll is provided with fine teeth the better to produce friction on the wire. 41 is a disk having the reduced portion 41^a to serve as a bearing on which the said roll is journaled. 42 is a hole formed through the said disk whereby it is journaled on the body of the screw 43. 44 is a wire spring connected with the head of such screw and the post 45, whereby a tendency is imparted to the disk and wheel to swing to the left, and as the upper face of the projections or bed 46 and 47, over which the wire is fed, is nearer to the screw 43 or pivotal point of the disk than a line drawn diametrically from the center of such screw and the outer face of the toothed wheel the device will assume, when in operation, the angular position shown at Fig. 1 and exert a pressure on the staple-wire in its forward movement.

When the feed-block 15 is moved forward, the feed-roll carried thereon will, through the medium of its spring, be brought in contact with the staple-wire and grip it firmly, feeding the wire forward a predetermined distance toward the staple-forming mechanism. When the said block retreats, the roll thereon will simply rotate on its journaled support on the disk 41, thereby obviating any tendency to scratch or otherwise mar the wire, and the instant the forward movement of the said block begins the roll will cease to rotate and instantly grip the wire. If desired, more than one of these rolls may be used on the feed-block. When employed on the arm 5, as shown, it remains stationary and operates as a check to prevent the retreat of the staple-wire on the backward movement of the feed-block, and will, as a matter of course, rotate in the direction of arrow *d* when the said feed-block is on its forward stroke.

The stitching-table is readily convertible into an angular table or a flat one as follows: 48 (see Figs. 1, 4, and 5) is the base or frustum, whose narrow flat upper surface 48^a is adapted to support either the V-block 49 (shown at Fig. 3) or the flat table or platform 50. (Shown at Fig. 5.) The V-block when placed on the upper surface of the base 48 will form an angular stitching table or saddle whose sides have an inclination of forty-five degrees from the apex of the V-block to the bottom of the angular support. 51 are bolts pivotally supported on the pins 52 of the V-block, and they carry the thumb-nuts 53, and 54 are slots cut in the opposite ends of the support 48 to receive these bolts. When, therefore, it is desired to attach the V-block, the bolts are swung outward until the said block is in position, when the said bolts are released so as to drop into the slots 54, and the nuts are screwed against the under surface of the flat top 48^a to secure said block firmly in position, making, as before mentioned, a continuous angular stitching-table. This V-block carries the necessary clenchers 55. The flat table or platen, one end of which

is only shown at Fig. 5, is also equipped with its own clamping-bolts 56 and clamping-nuts 57, one only being shown, and, like the V-block, carries its own clenchers. This interchangeable feature just described is a great improvement over the former method employed in staple-stitching machines where no provision was made to change the form of the table, and it is a very desirable and an economical arrangement, as it widens the scope of the machine in rendering it capable of doing a great variety of work that could only be accomplished by employing duplicate machines.

58 is the table-elevating screw, and 59 the hand-wheel for the same, usually employed in machines of this character.

It will be readily understood that other forms of table can be applied to the supporting-base than those shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a staple-stitching machine, the combination with the stitching mechanism, of a separable work-supporting table comprising a base and a removable upper portion, said removable portion carrying the necessary clenchers and means whereby it is readily attached and detached from the lower portion or base, for the purpose set forth.

2. In a staple-stitching machine, a separable work-supporting table comprising a base having inclined sides and a flat top, a V-shaped block carrying the necessary clenchers adapted to be removably attached to said base, for the purpose set forth.

3. In the wire feeding and controlling mechamism of a staple-stitching machine, the combination with a wire-supporting bed, of an eccentrically-supported disk, a tension-spring therefor a serrated-faced ring operatively mounted thereon, said ring adapted to turn on its support and permit the wire to move freely in one direction and to firmly engage the wire to prevent its movement in the opposite direction, for the purpose set forth.

4. In a staple-stitching machine, the combination with the wire-feeding mechanism of a cutter-box adapted to have a longitudinal adjustment, a wire-guide mounted in said cutter-box, said guide having longitudinal grooves in its periphery for the wire and a shell to encircle such grooves, a cutter and means for operating said cutter, for severing the wire, substantially as set forth.

5. In a staple-stitching machine, the combination, with the wire-feeding and staple-forming mechanism, of a deflector having an inclined surface to engage that portion of the wire fed beyond the forming-bar, which portion forms one of the legs of the staple, and impart a forward set thereto so as to overcome its tendency to follow its angular-shaped end, produced by the cutting-off tool, when driven into the work, for the purpose set forth.

Signed at New Haven, in the county of New Haven and State of Connecticut, this 24th day of April, A. D. 1897.

FRANK S. BRADLEY.

Witnesses:
HERMAN E. SMITH,
C. S. CLARK.