June 18, 1929. G. P. BAUMANN 1,718,199

WIRE STITCHER

Filed Nov. 30, 1923 4 Sheets-Sheet 1

Fig. 1.

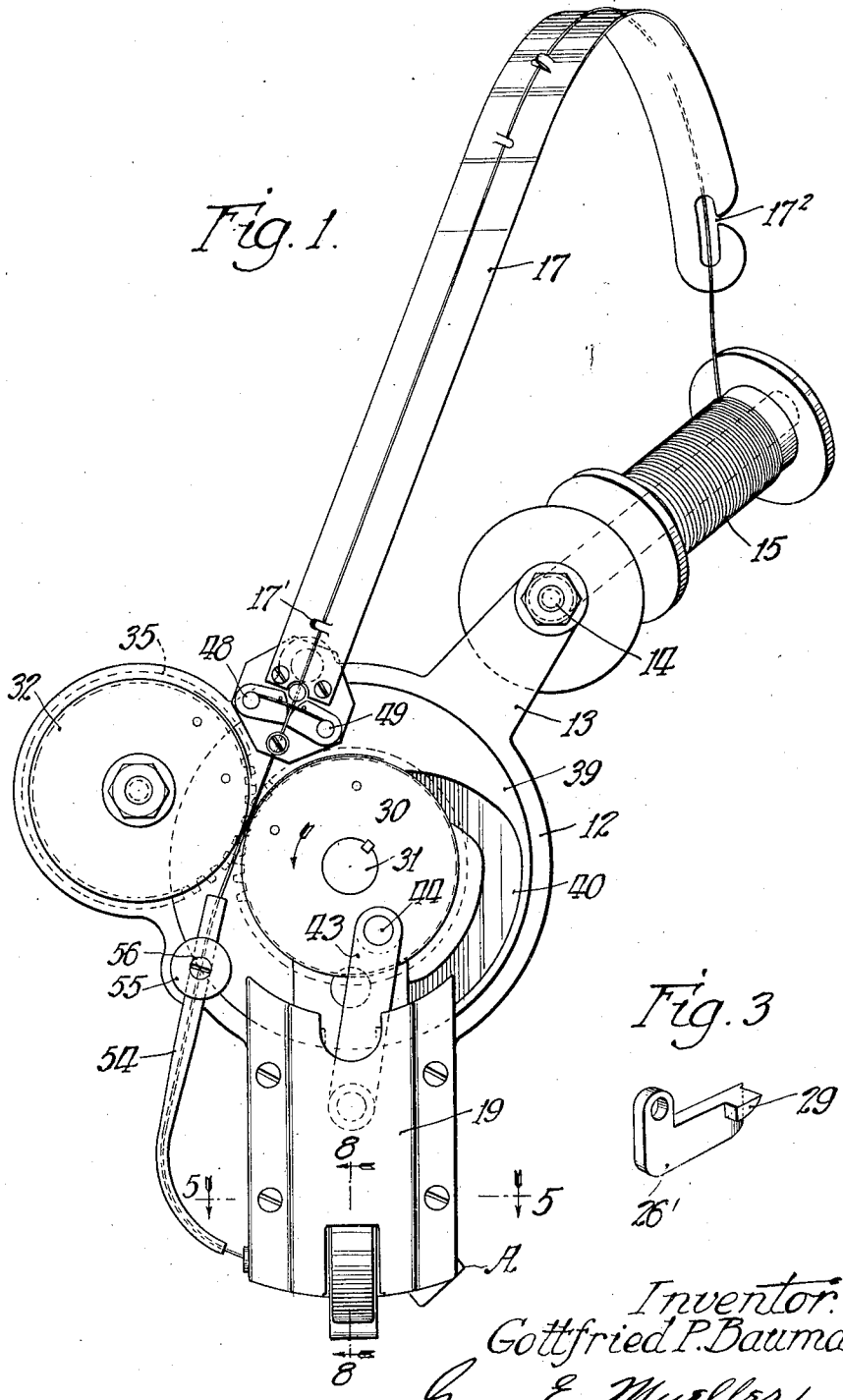


Fig. 3

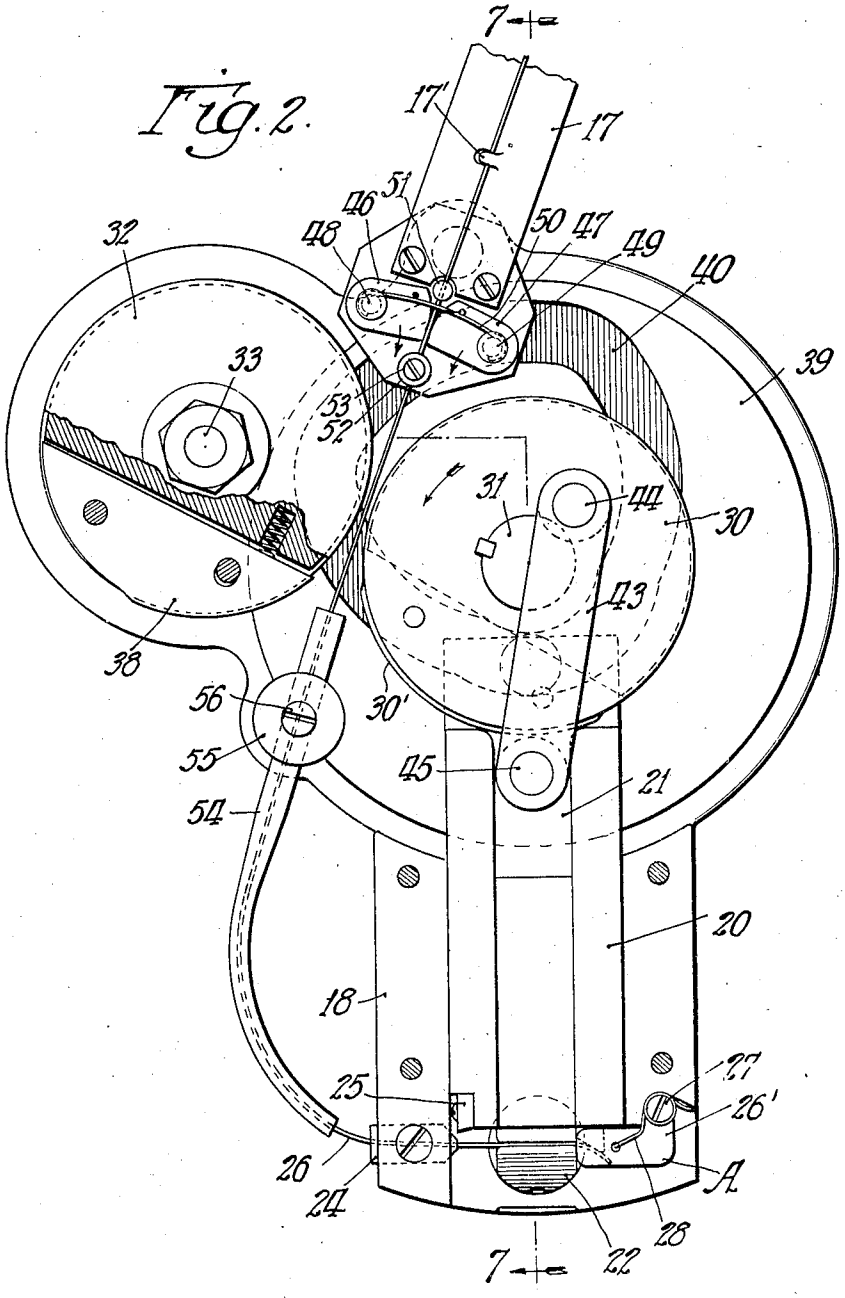
Inventor:
Gottfried P. Baumann.
Georg E. Mueller Atty.

June 18, 1929. G. P. BAUMANN 1,718,199

WIRE STITCHER

Filed Nov. 30, 1923 4 Sheets-Sheet 2

Fig. 2.



Inventor.
Gottfried P. Baumann
Georg E. Mueller Atty.

June 18, 1929. G. P. BAUMANN 1,718,199

WIRE STITCHER

Filed Nov. 30, 1923 4 Sheets-Sheet 3

Fig. 5.

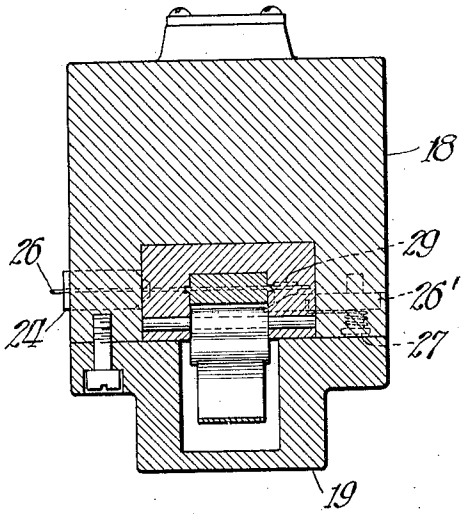


Fig. 6.

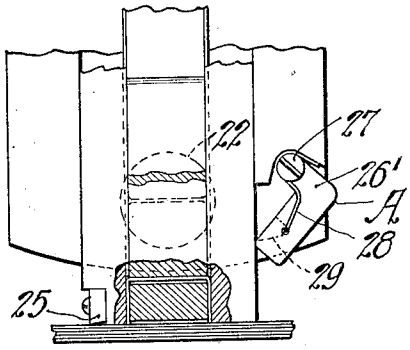
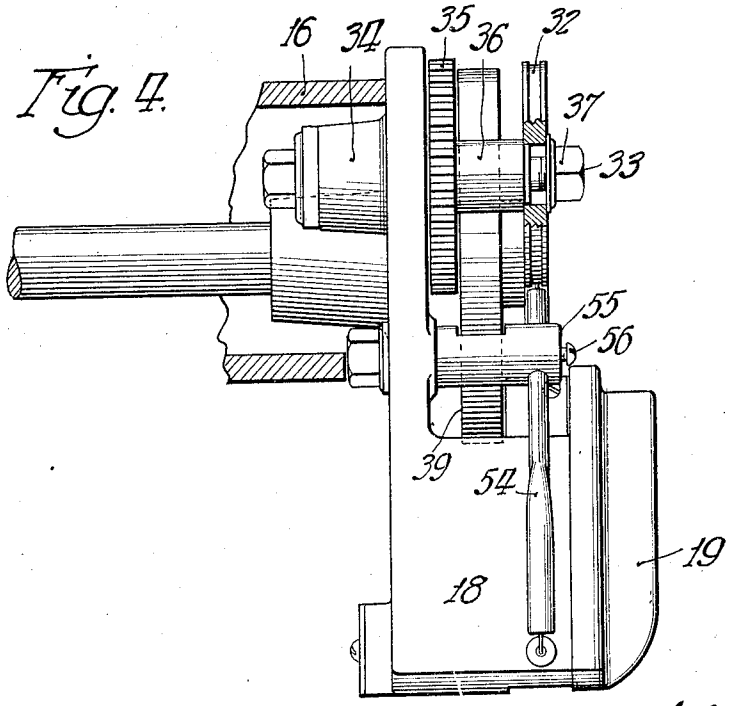


Fig. 4.



Inventor.
Gottfried P. Baumann
George E. Mueller Atty.

June 18, 1929. G. P. BAUMANN 1,718,199

WIRE STITCHER

Filed Nov. 30, 1923 4 Sheets-Sheet 4

Fig. 7.

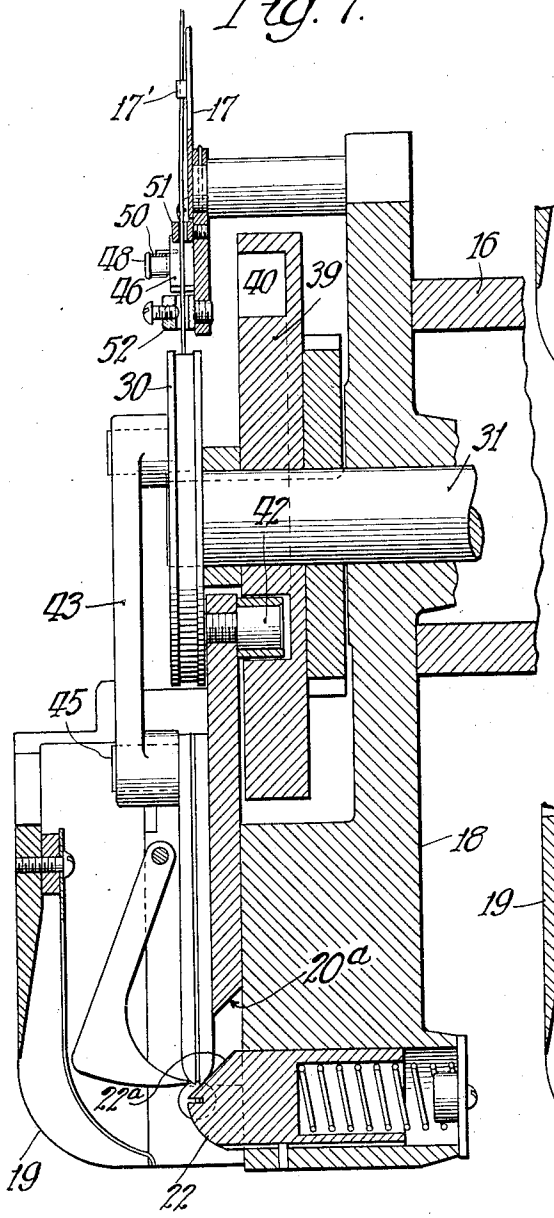


Fig. 9.

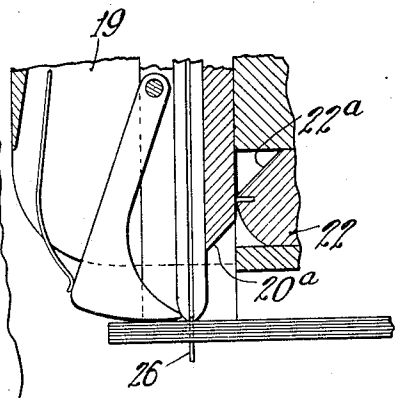
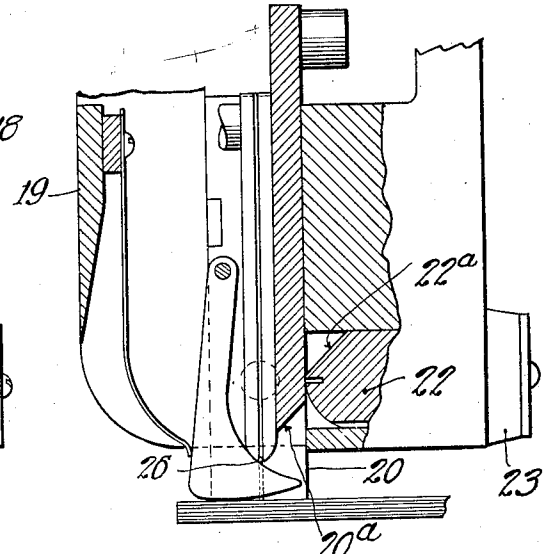


Fig. 8.



Inventor.
Gottfried P. Baumann.
George E. Mueller Atty.

Patented June 18, 1929. 1,718,199

UNITED STATES PATENT OFFICE.

GOTTFRIED P. BAUMANN, OF CHICAGO, ILLINOIS, ASSIGNOR TO IDEAL STITCHER & MANUFACTURING COMPANY, OF CHICAGO, ILLINOIS.

WIRE STITCHER.

Application filed November 30, 1923. Serial No. 677,720.

My invention relates to wire stitchers, and has to do more particularly with that type of machine ordinarily employed for stapling boxes, books, pamphlets, etc., an object being to provide new and improved features of construction whereby a more simple and compact machine is provided.

One of the features of my invention is the provision of an improved and simplified roll feed in which one of the feed rollers is carried directly by the main shaft, also operating in such a way that adjustment is provided to vary the length of the wire fed and thus the size of the staple. Another feature of my invention is the provision of a new and improved inside wire guide adapted to hold the fed wire in the anvil under tension and in registration with the former wire groove. In order to secure a more desirable operation of the machine, it is preferable that the wire be cut off before the forming commences. By my improved inside wire guide the cut off wire is held in proper position in the anvil until it is engaged by the former. This also permits more grindings of the cutter knife and does not require the close adjustment between the cutting off period and the commencement of the forming period.

Another feature of my invention is the provision of a new and improved check pawl construction, whereby the wire is more positively held, permits a ready feed thereof and prevents binding of the wire as in prior check pawls where the check pawl mechanism consisted of a pivoted check pawl and a stationary block.

There are other features of construction and combination which will hereinafter be pointed out more particularly in the ensuing part of the specification and appended claims.

For a better understanding of my invention, reference is to be had to the accompanying drawings, in which—

Fig. 1 is a face view of a stitcher head containing my improved construction;

Fig. 2 is an enlarged view of a portion of Fig. 1, showing the parts in normal position;

Fig. 3 is a detail view in perspective of the inside wire guide;

Fig. 4 is a left side view of the stitcher head portion of Fig. 1, with the check pawl and spool elements removed;

Fig. 5 is a cross sectional view along the line 5—5 of Fig. 1;

Fig. 6 is a view of the lower part of the slide block, former, driver, anvil and inside wire guide, with the parts positioned as in Fig. 1, that is, just as the staple is engaging the work;

Fig. 7 is a vertical cross sectional view along the line 7—7 of Fig. 2;

Fig. 8 is a vertical section along the line 8—8 of Fig. 1; and

Fig. 9 shows the parts of Fig. 8 in position, with the staple driven through the work.

Referring now more in detail to my invention as illustrated, I show a face plate 12 carrying an arm 13 having a rearwardly extending shaft 14 for rotatably supporting the wire spool 15. The shaft 14 and spool 15 are angularly disposed so as to clear the rearwardly extending head portion 16 usually employed and at the same time readily feed the wire to the spring guide 17.

A suitable slide block 18 is also carried by the face plate and has a slide block face plate 19 for holding the former 20 with its driver 21 in place. A suitable anvil 22 is provided, being slidably mounted and spring pressed in the hub 23 extending rearwardly from the face plate 12. An adjustable cutter tube 24 is carried in the slide block 18 and a cutter plate 25 attached to the former 20. Thus, as the former descends in its operation, the knife 25 cuts the wire 26 off, preferably slightly before the forming operation begins.

It will be apparent that with the staple portion of the wire severed before the former engages the wire, unless a very close adjustment is secured the severed portion of the wire may be moved to the right or to the left, or toward the front or back, thereby either causing unevenness in the length of the legs of the staple or allowing it to spring out of alignment with the forming slot in the former.

To overcome these troubles I provide an inside wire guide A. This inside wire guide A is preferably in the form of a yieldingly mounted element, so shaped as to hold and guide the severed portion of wire, and consists of a yieldingly mounted arm 26′ pivotally supported at 27 and having its free end pressed upwardly by the spring 28. This arm

carries at its free end a portion 29 having an inclined face against which the severed portion of the wire rides, to press it downwardly as indicated in Fig. 2, and thereby hold it in the anvil slot. This element A is also so arranged that it will not interfere with the forming of the staple, the former 20 as it moves downwardly striking the arm and pushing it to one side, as indicated in Fig. 6. Also to secure the proper functioning of this arm I preferably mount it so that it is movable in a plane parallel to the feeding travel of the wire, that is, so it will swing downwardly and to one side. The arm 26′ is also so constructed that the wire passes back of the arm and beneath the projection 29, thereby not only holding the wire under tension in the anvil, but also preventing the wire from moving out of the plane of, or registration with, the forming slot in the former.

A feature of my invention is the provision of operating means to move the driver to free the staple for engagement by the driver without strain upon the driver or driver wire rib. Heretofore, the driver has been used to force the anvil back to clear the staple. This placed a strain on the former wire-groove and driver rib, resulting in wearing of these parts and breaking of the ribs, especially at their lower ends. To overcome this I provide a cam face 20^a on the former cooperating with cam face 22^a on the anvil and so positioned on the former that it will push the anvil back to free the staple before the driver reaches the staple. After the staple has been driven and clinched in the usual manner, the driver moves upwardly followed by the former, thereby allowing the anvil to move out between the driver legs again to receive the next staple wire.

Now as to the feed roll mechanism of my invention, I preferably provide a pair of connected feed rollers one of which is directly supported on the main shaft, the construction used eliminating the intermediate gearing heretofore employed, thereby saving expense, simplifying the construction and making a more compact and positive device. Of the rollers employed, the main roller 30 is mounted directly upon the front end of the main shaft 31. The other roller of the pair, 32, is mounted upon a shaft 33 supported by the face plate and extending through the hub 34 thereof. The two rollers 30 and 32 are connected so as to travel together, and to this end I provide gears as 35, one being mounted upon the main shaft 31 so as to rotate with roll 30, and the companion gear being mounted to rotate with roller 32. This latter gearing is carried with a hub 36, all of the parts being supported by the shaft 33 and rotatable in the hub 34. The two rollers are preferably arranged so as to secure relative circular adjustment thereof to provide for different lengths of wire to form different sized staples, that is, staples with legs of varying lengths. To secure this circular adjustment roll 32 is circularly adjustable upon shaft 33 and may be clamped in any position by the nut 37, which may be loosened to permit adjustment of the roller 32. The roller 30 is preferably solid, but roller 32 is provided with a yielding segment 38 spring pressed outwardly so as to more intimately press the wire against the feeding section 30′ of the other roller. Thus during the rotation of the rollers the wire is fed intermittently and only while the peripheral faces of sections 30′ and 38 engage, and as one roller is circularly adjustable relative to the other, the feeding period will depend upon when the feeding faces come together to engage and feed the wire.

By this construction I am enabled to provide rollers continually operating at a constant speed during the operation of the machine and mounted upon fixed centers so as to secure the most positive operation with least vibration to the machine.

These rollers are, of course, timed so as to feed the wire at the proper time, that is, during the idle travel of the former between the driving and clinching of one staple and the forming of the next one.

Back of the roller 30 mounted upon the main shaft 31 is a cam 39 having a slot 40 for operating the former 20 by means of a roller 42 carried by the former and extending back into the slot, as indicated more clearly in Fig. 7. To operate the driver I extend a link 43 pivotally secured to the roll 30 at 44 and to the driver 21 at 45. These parts are, of course, timed so as to secure the proper sequence of operation of the various parts.

In order to bring about a proper functioning of the parts, I provide a check-pawl device of improved construction. This device is so arranged as to yieldingly grip the wire on opposite faces, thereby providing a more positive check and at the same time preventing sticking of the parts such as will occur where an immovable block and pivoted check-pawl are used. To this end I provide a pair of check-pawls 46, 47 oppositely disposed and pivoted at their outer ends 48, 49 and spring pressed by the spring element 50 so that the adjoining gripping faces grip and hold the wire against back movement. However, when the wire is drawn forwardly by the feed rolls it moves freely between the check-pawls, which are pulled in the directions of the arrows indicated thereon, to automatically free the wire. But as soon as the feed movement of the wire stops, the pawls are pressed against the wire to hold it against return movement. To guide the wire through the check-pawls I provide studs on opposite sides of the pawls, the stud 51 having an opening through which the wire

passes, and the stud 52 being similarly constructed but with an adjusting screw 53 in the end thereof extending into the hole to vary the size of the orifice according to the size of wire being used.

Leading from the check-pawls back to the wire spool 15 is the spring arm 17, having pressed out portions 17′ oppositely disposed so as to prevent side play of the wire. The wire passes through a slot 17^2 in the end of the arm 17 open at the side so as to permit insertion of the wire.

Between the feed rolls and the cutter tube 24 is a wire guide tube 54 longitudinally adjustably supported by a block 55 held by a screw 56 to permit said longitudinal adjustment.

What I claim as new and desire to secure by United States Letters Patent is:

1. A wire stitcher comprising a head having a main former and driver operating shaft rotatably supported therein, a pair of relatively fixed axis feed rollers one of which is directly supported on the main shaft, and means included in said rollers for operating upon wires of various thickness to feed the same.

2. A wire stitcher comprising a head having a main former and driver operating shaft rotatably supported therein, a pair of continuously rotatable relatively fixed axis feed rollers one of which is directly supported on the main shaft, and one of said rollers having a yielding peripheral feeding portion operable upon wires of various thickness.

3. In a wire stitcher including a former, a driver, a cutoff, and an anvil, an inside wire guide comprising an arm pivotally supported at one side and having a free end formed to receive an end of the wire to hold it in the anvil under tension for severance by the cutter, a resilient element urging the arm into engagement with the wire, the free ends of the arm being arranged in the path of the former and moveable in a plane parallel to the feed travel of the wire and operable with movement of the former to permit the forming operation.

4. In a wire stitcher including a former, a driver, a cut-off, and an anvil; an inside wire guide comprising an arm pivotally supported at one end and having a free end formed to receive an end of the wire to hold it in the anvil under tension before severance by the cutter, said arm being positioned in the path of the former, movable in a plane parallel to the feeding travel of the wire and operable with movement of the former to permit forming operation thereof.

5. In a wire stitcher including a former, a driver, a cut-off, and an anvil; an inside wire guide comprising an arm pivotally supported at one end and having a free end formed to receive an end of the wire to hold it in the anvil under tension before severance by the cutter and shaped to guide the wire in a path through the anvil to register with the former.

6. In a wire stitcher including a former, a driver, a cut-off, and an anvil; an inside wire guide comprising an arm pivotally supported at one end and having a free end formed to receive an end of the wire to hold it in the anvil under tension before severance by the cutter and shaped to guide the wire in a path through the anvil to register with the former, said arm being positioned in the path of the former, movable in a plane parallel to the feeding travel of the wire and operable with movement of the former to permit forming operation thereof.

In witness whereof, I hereunto subscribe my name this 31st day of October, 1923.

GOTTFRIED P. BAUMANN.