H. WEBER.
WIRE STAPLING MACHINE.
(Application filed Jan. 14, 1901.)

(No Model.)

4 Sheets—Sheet 2.

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H. WEBER.
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4 Sheets—Sheet 3.
To all whom it may concern:

Be it known that I, HENRY WEBER, a citizen 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-Stapling Machines, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to wire-stapling machines in which a number of sheets of material or leaves of a book are stapled together; and one of its objects is to provide improvements in such machinery by which staples of a peculiar form are made and driven into the book and clenched, one arm of the staple being longer than the other and only one arm being driven through the book, (the short arm,) and the free end of the long arm being bent respectively downward and upward and clenched at the back of the book and outside the same, so as to form the kind of staples illustrated in the drawings hereinafter referred to and forming a book in which the leaves may be thrown over so that the book remains open.

Another object of my invention is to provide means for engaging the wire as it is fed into the machine in such a way as to prevent the wire being bent or kinked by the backward stroke of the feeding devices.

Another object of my invention is to provide a new and improved staple-supporter and accompanying devices and means for operating the same.

My invention also relates to improvements in wire-stapling machines in sundry particulars hereinafter pointed out.

In the accompanying drawings, Figure 1 is a side elevation, partly in vertical section. Figure 2 is an enlarged detail, being a front view of a portion of the back plate of the machine and of the devices attached thereto. Figure 3 is an enlarged detail, being a vertical section on line 3-3 of Figure 2. Figure 4 is an enlarged detail, being a vertical section on line 4-4 of Figure 3. Figure 5 is an enlarged detail, being a vertical section on line 5-5 of Figure 3. Figure 6 is an enlarged detail, being a section on line 4-4 of Figure 3 and showing the staple former and driver in a lower position than shown in Figures 4 and 5. Figure 7 is an enlarged detail, being a top or plan view of the block through which the wire passes on its way to the staple forming and driving devices. Figure 8 is a cross-section on line 8-8 of Figure 4. Figure 9 is an enlarged detail, being an end view of the wire-holding device hereinafter described viewed from the left in Figure 2. Figure 10 is an enlarged detail, being a view of the cam for operating the clenching mechanism. Figures 11, 12, and 13 are enlarged details showing the clenching in several positions and the formation of the staple. Figure 14 is an enlarged detail, being an isometric view of a portion of the stapled book, showing the form of staple. Figure 15 is a modification of a staple-supporter and means for operating the same, being a vertical cross-section through the staple former and driver and a portion of the back plate. Figure 16 is a vertical section of the staple-supporter in another position. Figure 17 is a vertical section of the same parts shown in Figure 16, showing the staple-supporter in another and more elevated position. Figure 18 is a rear view of the parts shown in Figures 15, 16, and 17; and Figure 19 is a vertical section of a portion of the parts shown in Figure 15, showing the staple-supporter in its most elevated position and the anvil in position to form the staple.

Referring to the drawings, 15 indicates a hollow standard having hollow forward projecting necks 16 and 17, which are of the ordinary form. 18 indicates a shaft journaled in the upper portion of the standard and in the neck 16. 19 indicates a driving-pulley which is keyed to the shaft 18 and provided with any approved form of clutch mechanism, so that it may be thrown into or out of engagement. As this clutch mechanism may be of any well-known form, it is not necessary to describe it in detail here. The clutch mechanism is thrown into or out of engagement by means of a foot-treadle 20, secured to a lever 21, which is pivoted in the lower part of the standard 15 and is connected by a rod 22 with the clutch mechanism. 23 indicates a table which is supported...
upon the outer end of the neck 17 and serves to support the book to be stitched, as hereinafter described.

24 indicates a cam which is keyed or otherwise secured to the shaft 18 within the neck 16. The cam 24 is of the shape shown in Fig. 10 and is formed with a cam-like projection 24* upon its periphery, which has two bearing-surfaces 24* and 24†, as is best shown in Fig. 10.

25 indicates a rod which is slidingly mounted in suitable lugs 26 on the interior of the standard 15, so as to move freely vertically therein. The rod 25 is provided with a roller 27 at its upper end, which engages with the cam 24 as the same rotates.

28 indicates a lever which is pivoted in the neck 17, its inner end extending within the standard 15 and its outer end projecting for ward through the said neck 17, which is slotted to permit the movement of the lever 28.

29 indicates a block which is pivotally secured to the outer end of the lever 28 and is bored a suitable distance in its upper end to permit the insertion therein of a rod 30, which passes upward in suitable supports through the upper end of the neck 17 and is provided with a block 31, secured to its upper end, to operate a clenching device 32. The clenching device 32 is of the form best shown in Figs. 11, 12 and 13 and is connected with the block 31 and operates in the well-known manner, such as is described by me in Letters Patent to me, No. 545,081, of October 29, 1855. As the rod 30 is moved upward and downward in the neck 17 by the operation of the lever 28, the rod 25, and the cam 24 the clenching device assumes the several positions shown in Figs. 11, 12 and 13, as hereinafter described. As the connection of this clenching device with the operating rod and its operation are well known, it is not necessary to describe it more fully in detail here.

Referring particularly to Figs. 2, 14 indicates the back plate of a machine, and 35 indicates a cam which is keyed at the outer end of the shaft 18, with its back bearing against the back plate 34. The cam 35 bears on its outer periphery upon a roller 36, which is journaled in the upper end of a lever 37, which is pivoted to the back plate 34 in such a way that when the cam is rotated in the direction indicated by the arrow in Fig. 2 the upper end of the lever 37 is moved to the left in Fig. 2. The lever 37 may be of any approved form and construction and engages at its lower end with the wire-feeding devices hereinafter referred to. The lever 37 is also provided with a suitable spring, operating in any well-known manner, therefore not shown in the drawings, to normally force the upper end of the lever 37 to the right in Fig. 2 when free to act, so as to keep the roller 36 constantly in contact with the periphery of the cam 35.

The cam 35 is provided with a cam-groove 38, which engages with a roller 39 (best shown in Figs. 1 and 3,) mounted upon the upper and inner end of the staple former 40. The staple former 40 is slidingly mounted in a suitable recess formed in the face of a block 41, which is secured to the front of the back plate 34. The block 41 is preferably formed of two parts 41* and 41† (see Fig. 5) for convenience of construction and secured together in any appropriate manner. The staple former 40 is forked at its lower end in the usual manner, as is best shown in Fig. 5, whereby the two arms of the forked end of the staple former 40 as the same descends come down upon each side of the anvil and staple supporter hereinafter described. The staple former 40 is provided upon each side with slots 42, which extend part way through it, as is best shown in Figs. 4 and 6 and by dotted lines in Fig. 3.

43 indicates a bar which is slidingly mounted in the block 41 in front of the staple former 40 in such a way as to move freely up and down in said block 41. The bar 43 is provided at its upper portion with two inwardly-projecting lugs 44. (Best shown in Figs. 4, 6, and 8 and in dotted lines in Fig. 3.) The lugs 44 project into the slots 42 in the staple former 40 in such a way as to be engaged by the top or bottom of the slots 42, so that the bar 43 is moved up or down by the movement hereinafter described of the staple former 40.

45 indicates a staple supporter which is pivoted on the lower end of the bar 43, so as to swing in and out, as hereinafter described, in the recess 46, formed in the lower end of the block 41, as is best shown in Fig. 3. The staple supporter 45 is of the ordinary form of such staple-supporters, except that its upper surface is given a curved bevel, as is best shown in Figs. 4, 5, and 6. This curved beveled surface of the operative portion of the staple supporter 45 is highest at the right-hand side of Figs. 4, 5, and 6 and slopes downward on a curve toward the left, as is best shown in said figures, so as to form the peculiar form of staple shown in Figs. 11, 12, 13 and 14 and hereinafter described.

47 indicates a tube which projects outward and upward from the front surface of the block 41. 48 indicates a pin which moves longitudinally of itself in said tube 47 and bears at its inner end upon the outer surface of the staple supporter 45, being forced inward, so as to constantly and yieldingly bear upon said staple supporter 45, by means of a spring 49, located within said tube 47, as is best shown in Fig. 3.

50 indicates a tube which is formed on or secured to the back surface of the back plate 34.

51 indicates a pin which is mounted in a
suitable opening at the lower end of the back plate 54 and is provided with a stem 52. The pin 51 slides freely longitudinally of itself in its support.

53 indicates a spiral spring which is mounted in the tube 50 and is adapted to normally hold the pin 51 in the position shown in Fig. 3, but yields so that the pin 51 may move backward in the manner hereinafter described.

54 indicates an anvil which is formed on the outer end of the pin 50 and is provided on its front surface with a slot 55, in which the wire enters. The slot 55 in the front surface of the anvil 54 is formed in the shape best shown in Figs. 4, 5, and 6 and has its lower surface beveled on a curve downward and to the left in said figures, corresponding in general with the curved bevel on the staple-supporter 45. The upper surface of the anvil 54 is beveled downward and outward, so that when the anvil is engaged by the staple-driver, hereinafter described, it may be forced backward against the action of the spring 53.

55 indicates a cam which is journaled upon the outer end of the shaft 15 and is preferably formed integral with the cam 35, as is shown in Figs. 1 and 3. The cam 55 has two cam-surfaces 55a and 55b and has two portions of its periphery, 55c and 55d, formed on the axes of circles concentric with the shaft 15.

56 indicates a staple-driver which is slidably mounted in a suitable recess on the front surface of the staple-former 40, so that the said driver may move longitudinally of itself in said staple-former and independently thereof.

57 indicates a roller which is journaled upon the front surface of the staple-driver 57 at its outer end and engages with the periphery of the cam 55, so that when said cam 55 is rotated in the direction indicated by the arrow thereon the staple-driver 57 may be forced downward, as hereinafter described. The lower end of the staple-driver is also cut upon a curve corresponding with the bevel curve upon the upper surface of the operative portion of the staple-supporter 45, above described, as is best shown in Figs. 4 and 6. The staple-driver 57 is cut away upon its rear side at the lower end for a suitable distance, so as to form a shoulder 59, as is best shown in Fig. 3.

60 indicates a pin which is inserted in the staple-former 40 upon the side of the staple-former left free by the cutting away of the block 41 at its lower end, as is best shown in Fig. 5, and projecting inward toward the shoulder 59. The other end of the pin 60 projects outward into the recess formed by the cutting away of the lower portion of the block 41, so as to engage the knife, hereinafter described.

61 indicates a block which is secured to the back plate of the machine below and to the left of the recessed open lower end of the block 41 and projects somewhat within said recess.

62 indicates a tube which is preferably screwed into the block 61, as is shown in Fig. 4, and is of a size suitable to permit the passage through it of a wire 63.

64 indicates a knife with a cutting edge at its lower end, which is mounted in the block 61 in suitable slots therein, so as to slide longitudinally of itself or vertically in the said block 61. The cutting edge of the knife when the same is lowered just clears the delivery end of the tube 62, so as to sever the wire at that point. The knife is provided with a suitable opening at its upper end, through which the pin 60 above described projects, whereby the knife 64 is raised and lowered by the raising and lowering of the staple-former.

65 indicates a bracket which is secured to or formed integral with the block 61.

66 indicates a wire-holder which is formed with two arms 66a and 66b at right angles with each other. The wire-holder 66 is mounted upon the bracket 65 by means of pins 67 and 68. The pin 67 passes through a slot 69 in the arm 66b of the wire-holder 66 and through a suitable opening in the bracket 65. The pin 68 passes through a slot 70 in the bracket 65 into a suitable opening in the arm 66a, so as to permit a limited upward movement of the wire-holder 66. The wire-holder 66 is provided upon the lower end of the arm 66 with a head 71, the lower surface of which is provided with inclined teeth, as is shown in Fig. 4.

72 indicates a pin the lower end of which is provided with a suitable opening, through which the free end of the pin 68 extends and which passes at its upper end through a suitable opening in the free end of the pin 67.

73 indicates a spiral expansion spring 105 which is mounted upon the pin 72 between the free ends of the pins 67 and 68, so as to normally hold the wire-holder 66 down in its lowest position. The arm 66a of the wire-holder 66 projects over the top of the knife 64, as is best shown in Figs. 4 and 7, so as to be engaged by said knife when it rises at a point near the upward limit of the motion of said knife, so as to raise the wire-holder 66 against the action of the spring 73.

74 indicates a block which is secured to or formed integral with the bracket 65 immediately below the head 71 in such a position that when the wire 63 is in position, as shown in Fig. 4, and the spring 73 is free to act the toothed head 71 will be pressed by the engagement of the spring 73 downward against the wire 63, gripping the same between the said head 71 and the upper surface of the block 74, so as to prevent any backward motion of the wire 63. When the wire-holder 66 is raised by the lifting of the knife 64, as hereinafter described, the wire is freed from engagement between the head 71 and the block 74, so that it may be fed forward into the machine.

The knife 64 is so located with relation to the staple-former 40 that the left-hand end of the wire or the part of the wire to the left of the anvil 54 and the staple-supporter 45 will
be longer than the portion to the right of said parts, as is best shown in Fig. 4, in order that one arm of the staple may be longer than the other, the block 61 being movable in any well-known or approved manner in such machines toward or away from the staple forming and driving mechanism. This distance will of course depend upon the nature of the work to be done.

75 Indicating a wire-feeder, which may be of any approved form and construction, but is preferably like that shown and described in Letters Patent to me, No. 548,681, of October 29, 1895. The wire-feeder 75 slides to and fro horizontally upon rods 76 and 77 and is reciprocated on said rods by the lever 37. The said wire-feeder 75 operates and is reciprocated by the lever 37 in the manner shown and described by me in the Letters Patent last above described.

78 (see Figs. 1, 11, 12, 13, and 14) indicates the staple as the same is formed by the operation of the parts as hereinafter described.

79 Indicates a secondary clencher, which consists of three arms 80, 81, and 82 at approximately right angles with each other. The secondary clencher 79 is pivoted at 13 and is secured to the outer end of the arm 80 upon a pin 83, which is screwed into or otherwise secured to the back plate 34.

84 Indicates a spring, one end of which is coiled around the pin 53 at its outer end, as is best shown in Fig. 3, and the other end coiled around a pin 85, which is screwed or otherwise secured to the arm 80, as is best shown in Fig. 2. The operation of said spring 84 is to normally hold the secondary clencher 79 in the position shown in Fig. 2.

86 (see dotted lines in Fig. 2) indicates a roller which is mounted upon the inner side of the secondary clencher 79 and is adapted to contact with the cam portion 56 of the cam 56 as the same rotates. The lower arm 82 of the secondary clencher 79 extends to the left in Fig. 2 a suitable distance, so as to come near the end of the book to be stapled, as is best shown in Fig. 2, and in alinement with the driver 67, so as to come opposite the ends of the staple when the same are bent, as hereinafter described.

The operation of the above-described devices is as follows: The wire is fed into the machine from the reel 53 by the operation of the wire-feeder 75 in the manner shown and described in Letters Patent to me last above named and passes through the tube 62 when so fed. A suitable length of wire is fed below the staple forming and driving devices, the parts being in the position shown in Figs. 2, 3, and 4. At this moment by the operation of the cam-groove 38 upon the roller 39 the staple-former 40 descends, carrying with it the knife 64 by means of the engagement of the pin 60 with said knife, as above described, and the wire is severed by the knife 64 close to the inner end of the tube 63. As the knife 64 descends the arm 60 of the wire-holder 66 is freed from engagement with the top of the knife 64, and the spring 73 forces the said wire-holder down, so that the teeth on the end surface of the head 71 engage the wire between said head 71 and the upper surface of the block 72, holding the uncut portion of the wire between them, so that the wire-feeder 75, which at this moment begins its return stroke to the left, in case the parts should momentarily catch, cannot engage the wire and carry it backward, which would cause a kink or bend in the wire. The staple-former 40 continuing its descent by the operation of the cam-groove 38 bends the ends of the cut-off portion of the wire upon each side of the anvil into the form best shown in Fig. 6, the bending of the staple to the said form being assisted by the shape of the groove 65 in the anvil 54, above described. As the staple-former 40 descends the lugs 44 upon the sliding bar 43 contact with the shoulders at the upper ends of the grooves 42 in the former 40, and the bar 43 is carried down with the continued descent of the staple-former 40, carrying with it the staple-supporter 45 until the said staple-supporter 45 rests upon the paper to be stiched, the staple-supporter 45 being urged inward by the operation of the spring 47, and the end of the longer arm of the staple 78 also rests upon the paper. In the meanwhile and during this operation the cam portion 56 of the cam 56, engaging the roller 58 upon the driver 57, causes the driver to descend. When the lower end of the driver descends until it contacts with the beveled head of the anvil 54, it forces the said anvil to the right in Fig. 3, withdrawing the same from the staple, which drops and rests upon the staple-supporter 45. The driver 57 continuing its descent engages the top of the staple 78 and forces the long arm of the same through the paper, the staple-supporter 45 being forced backward by the action of the lower end of the driver 57 upon its upper sloped surface as the staple is driven through the paper until the staple-supporter moves back entirely out from under the wire. As the longer arm of the staple passes through the book it comes in contact with the clencher 32, which is in the position shown in Fig. 11, bending the longer arm of the staple, as is shown in Fig. 11. At this moment the cam portion 24 of the cam 24 contacts the roller 27, forcing the rod 25 downward and through the operation of the lever 28 and the rod 59 carrying the clencher 32 upward into the position shown in Fig. 12 and bending the longer arm of the staples still more. During this operation the circular portion 56 of the cam 56 bears upon the roller 58, and the driver 57 is temporarily held stationary. The cam portion 56 of the cam 56 then bears upon the roller 58, forcing the driver 57 farther down, and at the same time the cam portion 24 of the cam 24, bearing upon the roller 27, forces the clencher 32 still farther upward into the position shown at 23°.
The result of the combined operation of the driver 57, forcing the staple still farther downward and of the clencher 32 rising still farther, is to bend the longer arm of the staple still farther around into nearly the position shown in Fig. 13, bending it a little farther around than is shown in Fig. 12. The ends of the staple are opposite to and in line with the secondary clencher 79.

At this moment the cam portion 50 of the cam 56 engaging with the roller 80 forces the same downward, carrying the arm 82 of the secondary clencher 79 to the left to force the end of the arm 82 against the staple 78, so that the same are firmly pressed against the end of the book, and the staple is left in the form and in the position shown in Figs. 13 and 14. During the above-described movement of the driver and clencher the roller 39 is in the circular portion of the cam-groove 35, whereby the staple former and supporter remain stationary in their lowest position, the end surface of the staple-supporter resting and sliding upon the paper. When the operation of forming and clinching the staple has been completed, the roller 39 passes away from the circular portion of the cam-groove 35, and the rollers 58 and 86 are freed from the cam portion 50 of the cam 56. The roller 39 coming into the third portion of the cam-groove 35, the staple-former begins to rise, carrying with it the knife 94. When the knife 94 has nearly reached the upper limit of its motion, it engages the arm 66 of the wire-holder 66 and raises the head 71 from the wire. In the meanwhile the inner end of the pin 60 has engaged the shoulder 59 of the driver 57 and operates to lift the driver with the rising roller 39 and the cam portion 56, returning it to its original position. When the staple-former has ascended a sufficient distance, the shoulder at the lower end of the slots 42 contact the lugs 44 on the sliding bar 43, and as the upward motion of the staple-former continues the staple-supporter 43 is lifted from the paper back to its original position. During this time the roller 35, which has been upon the circular portion of the cam 56 during the staple forming and driving operation, passes away from the said circular portion, and the lever 37 swings in the other direction, moving the wire-feeder 75 backward into position to engage the wire. After the operation of driving and clinching the staple is completed and the parts lifted back to their original position the wire is again fed forward by the operation of the lever 37 and the wire-feeder 75, and the operation is repeated, the book being shifted to one side in proper position to receive the next staple.

As soon as the staple-clenching operation is completed it will of course be obvious that the roller 27 passes away from the cam portions 24 and 24' and the cam 24, and the clencher 38 is returned to its original position. As soon as the roller 86 is freed from the cam portion 50 and the cam 56 the spring 80 operates to return the secondary clencher 79 to its original position.

It is of course understood that in the above-described operation the book is inserted in the position shown in Fig. 2—that is to say, with its edge to be stitched at right angles with the plane of the staples—so that only the longer arm of the staple is driven through the book, as above described.

Referring to Figs. 15, 16, 17, 18, and 19, 34 indicates the back plate, which is cut away at its bottom portion behind the staple forming and driving devices, so as to form a slot 80. 88 indicates a block which is secured to the front of the back plate 34 and against which the staple-former slides as it is reciprocated. 89 indicates a staple-former of the ordinary form, provided with an arm or fork 85 at its lower extremity. The staple-former 89 is reciprocated in the well-known way by means of a roller 91, operating in the cam-groove 38 of the cam 35. 92 indicates a staple-supporter which is pivotally mounted at 90 its upper end between the forks of the staple-former 89, so as to be raised and lowered therewith. The staple-supporter 92 is provided with the usual beveled edge 93 upon its upper surface, and the lower portion, 95 which rests upon the paper, is cut in the arc of a circle whose radius is the distance from the pivot point to the lower edge. 94 indicates a plate which is secured to the back of the staple-supporter 92. I have shown it as formed of a separate piece and dovetailed to the staple-supporter. It may, however, be formed integral therewith. The plate 94 is provided with a projecting arm 95, which is beveled at its upper end and is adapted to enter into a recess 96, formed between the block 98 and the back of the staple-former 99. 97 indicates brackets, which are secured to the rear surface of the back plate and project rearwardly therefrom. 98 indicates a block 110 which is journaled in the outer ends of the brackets 97, so as to turn therein. 99 indicates a pin which passes freely through a suitable opening in the block 98, so as to slide longitudinally of itself in said block. The pin 99 is provided at its inner end with a head 100, which is pivotally connected with the staple-supporter 92. 101 indicates a spiral spring which surrounds the pin 99 between the block 98 and the head 100 and bearing against the block 98 and head 100 tends to force the pin 99 and the staple-supporter 92 inward into the position shown in Fig. 15. 102 indicates a driver of the usual form, which is mounted in a suitable recess in the front surface of the staple-former 89 and is operated in any appropriate way. As shown, it is operated by means of a roller 103, upon which the cam 56 bears, so as to reciprocate the driver 102. 104 indicates an anvil which is pivoted at its upper end between two lugs 105, which are secured to and project forward from the portion of the back plate upon each side of the slot in the back plate in which the
staple-supporter is mounted and moves. The slot being of the ordinary and well-known form is not illustrated here. Only one of the lugs is shown in the drawings. The anvil 104 is provided with the usual slot 106 at its lower or operative end and with the usual beveled surface 107, upon which the driver acts, as hereinafter described. 108 indicates the front or cover plate, which is secured to the back plate in the usual way and is provided with a recess 109, within which the anvil 104 and its accompanying parts move. 110 indicates a pin which is pivoted at its inner end to the anvil 104 a suitable distance above the lower end of the anvil. 111 indicates a thumbscrew which is screwed into the front or cover plate 108 and is provided with a suitable opening through it, through which the outer or free end of the pin 110 passes, so as to move therein, the said opening being somewhat larger than the pin 110 to allow sufficient play as said anvil is swung toward. 112 indicates a spiral spring which surrounds the pin 110 between the inner end of the thumbscrew 111 and the forward surface of the anvil 104, bearing upon the inner end of the thumbscrew and the forward surface of the anvil and tending to force the anvil inward to the position shown in Fig. 19. By the turning of the thumb-screw 111 in one direction or the other the tension upon the spring 112 may be varied in accordance with the work which is to be done.

The operation of the parts above described is as follows: The parts being in the position shown in Fig. 19, the wire 113 is fed into the machine in any well-known and approved way—such, for instance, as the apparatus shown and described above—and is severed into lengths in any appropriate manner. The wire then passes into the slot 108 of the anvil. Thereupon the staple-former 90 descends, bending the wire upon each side of the anvil in the usual well-known manner, the bending being completed before the arm 95 of the staple-supporter 92 is freed from the recess 96. As the staple is formed the driver 102, descending, contacts the beveled surface 107 of the anvil, forcing the anvil back.

The staple-former 90, continuing its descent, carries with it the staple-supporter 92 until the arm 95 is freed from the recess 96, whereupon the staple-supporter, by the operation of the spring 101, swings forward into the position shown in Fig. 15, and the anvil being forced out of the way into the position shown in Figs. 16, 17, and 18 by the operation of the driver the staple rests upon the upper surface 93 of the staple-supporter 92, and the driver, contacting the staple, drives it through the paper, the staple-supporter being forced backward as the driving continues by the contact of the lower end of the driver upon its upper beveled surface 93. When the operation of driving is completed, the staple-supporter and anvil are carried upward by the operation of the cam mechanism, the staple-supporter being held back against the action of the spring 101 by the contacting of the rear surface of the driver 102 upon its forward edge or point until, as is shown in Figs. 16 and 17, the arm 95 reaches the recess 96, the entrance of the arm 95 into the recess 96 being insured by the beveled edge of the arm 95 contacting the lower edge of the block 88. The staple-supporter 92 is thus by the action of the arm 95 in the slot 96 held in its rearward position against the action of the spring 101, allowing the driver to rise and holding the staple-supporter out of the way for the next operation of the parts. As the staple-supporter is carried up and down by the staple-former in which it is mounted, as above described, the block 98 will turn in its bearings in the bracket 97 to correspond with said motion of the staple-supporter, and the spring 101 will constantly bear upon the staple-supporter and will force it into position to receive the staple from the anvil when the staple-supporter is freed from the recess 96, as above described, the pin 97 sliding in and out of the surface of the anvil 104 or as the staple-supporter is forced back by the action of the hammer, as above described.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with mechanism adapted to form a staple having one long and one short arm, of a driver adapted to drive the long arm of said staple through a pile of sheets near one edge, means for bending the end of said long arm, after it has passed through the sheets, around the edge of the pile of sheets, and means for clenching both ends of said staple against the edge of the pile of sheets, substantially as described.

2. The combination with wire-feeding mechanism, means for severing the wire, and staple-forming mechanism, located to one side of the middle of the severed length of wire, whereby a staple will be formed having one long and one short arm, of a driver adapted to drive the long arm of said staple through a pile of sheets near one edge, means for bending the end of said long arm, after it has passed through the sheets, around the edge of the pile of sheets, and means for clenching both ends of said staple against the edge of the pile of sheets, substantially as described.

3. The combination with wire-feeding mechanism, a knife adapted to sever the wire into lengths, means for operating said knife, a staple-former, staple-supporter and anvil located to one side of the middle of the severed length of wire, whereby a staple will be formed with a long and a short arm, means for driving the long arm of said staple through a pile of sheets near one edge, means for bending the end of said long arm, after it has passed through the sheets, around the edge of the pile of sheets, and means for clenching both ends of said staple against the edge of the pile of sheets, substantially as described.
4. The combination with mechanism adapted to form a staple having a long and a short arm, of a driver adapted to drive the long arm of said staple through a pile of sheets near one edge, means for giving to said driver an intermittent driving movement, a clencher adapted to cooperate with said driver to bend the end of said long arm of said staple around the edge of said pile of sheets, means for operating said clencher, a secondary clencher adapted to force both arms of said staple against the edge of the pile of sheets after said long arm is bent, and means for operating said secondary clencher, substantially as described.

5. In a wire-stapling machine, the combination with wire-feeding mechanism, a knife adapted to sever said wire into suitable lengths, a staple-former connected with said knife, means for reciprocating said staple-former, a staple-supporter slidingly mounted on a suitable support having lugs adapted to engage suitable slots in said staple-former, whereby said staple-supporter may be raised and lowered by the movement of said staple-former, and an anvil, said staple-former, staple-supporter and anvil being located to one side of the middle of the severed length of wire, whereby a staple will be formed having a long and a short arm, of a driver slidingly mounted in said staple-former and adapted to drive the long arm of said staple through a pile of sheets near one edge, means for giving to said driver an intermittent driving motion and for raising it after the staple is driven, a clencher adapted to cooperate with said driver to bend the end of said long arm, after it is driven through the pile of sheets, around the edge of said pile in substantial alinement with the short arm of said staple, means for giving said clencher an intermittent operative action, a secondary clencher adapted to force the bent end of the long arm and the short arm of the staple against the edge of the pile of sheets, and means for operating said secondary clencher, substantially as described.

6. The combination with wire-feeding mechanism, a knife adapted to sever the wire into lengths, and mechanism to operate said knife, of a wire-holder consisting of a longitudinally-movable arm provided at its lower end with a roughened surface adapted to engage the wire between said knife and said wire-feeding mechanism, and a projecting arm adapted to be engaged by said knife as the latter is elevated, a block below said wire-holder, and a spring adapted normally to force said wire-holder against said block and engage the wire between said wire-holder and said block, substantially as described.

7. The combination with a staple-driver, a staple-former, mechanism for operating the same, and a block behind said staple-former having a recess at its lower end, of a staple-supporter pivoted in the forked end of said staple-former and having an arm secured thereto adapted to enter said recess in said block, a fixed bracket extending rearwardly from said support, a block pivoted in said bracket, a pin passing through said block and pivoted at the other end to said staple-supporter, and a spring bearing upon said block and said staple-supporter, substantially as described.

HENRY WEBER,

Witnesses:
C. E. PICKARD,
ALBERT H. ADAMS.