March 29, 1932. A. B. EDE 1,851,621

STAPLING MACHINE

Filed Oct. 11, 1929 4 Sheets-Sheet 1

FIG. 1

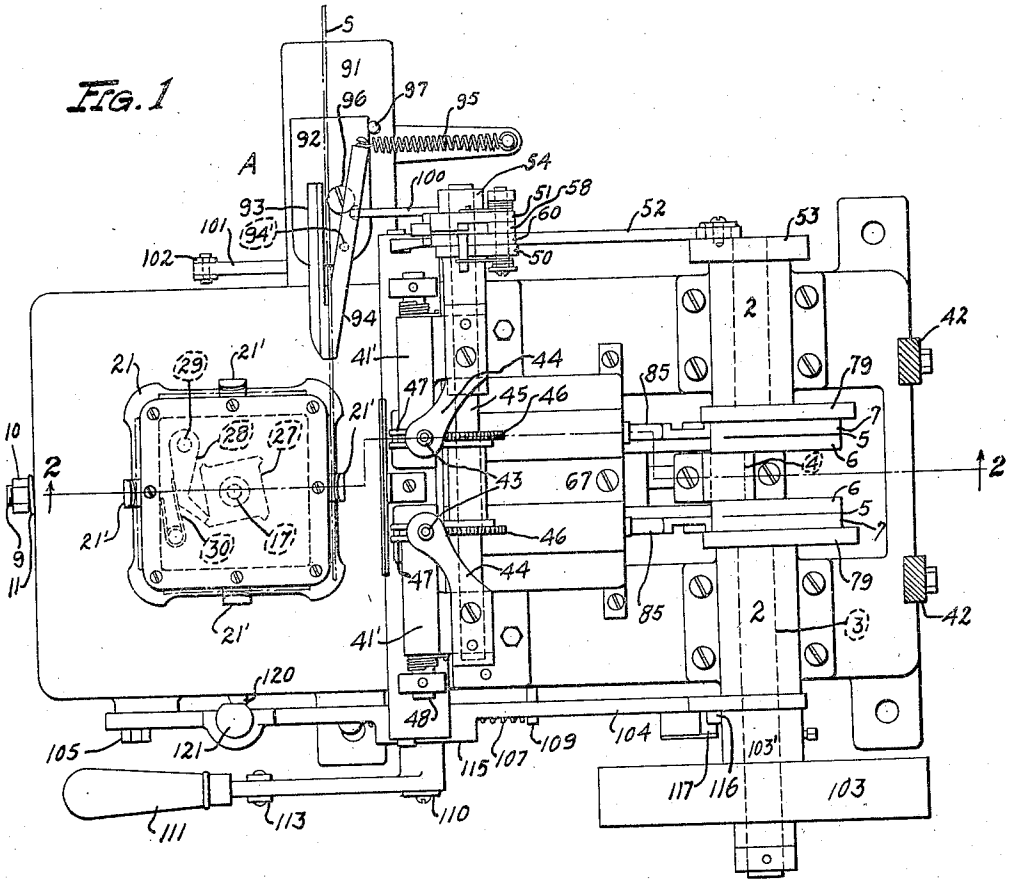
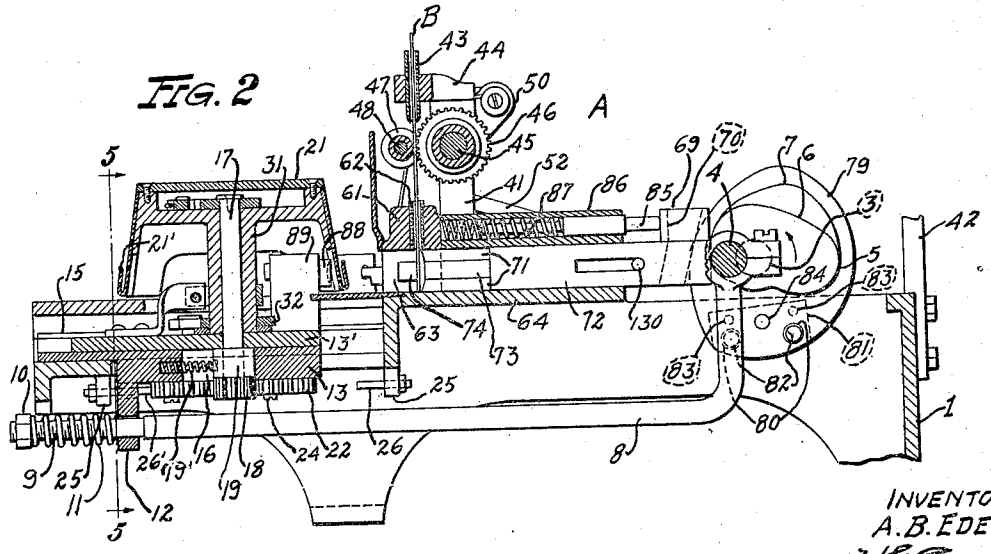


FIG. 2



INVENTOR
A. B. EDE
BY J. H. Cook
ATTORNEY

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STAPLING MACHINE

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FIG. 3

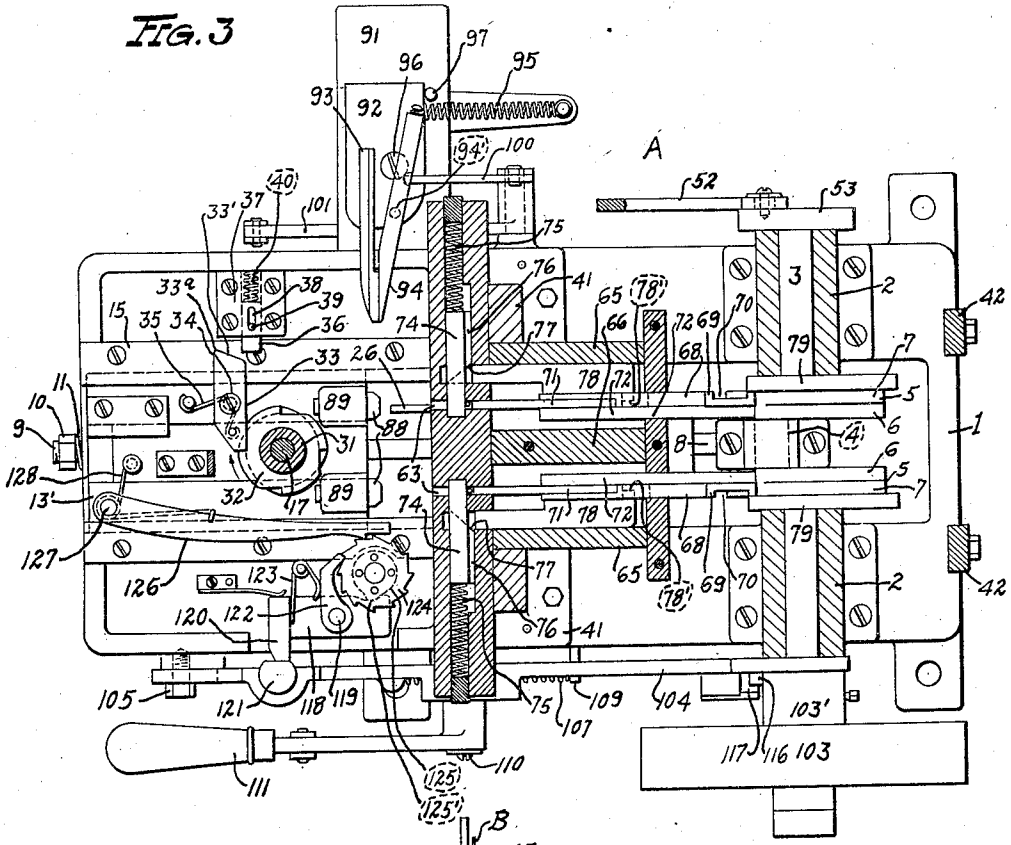
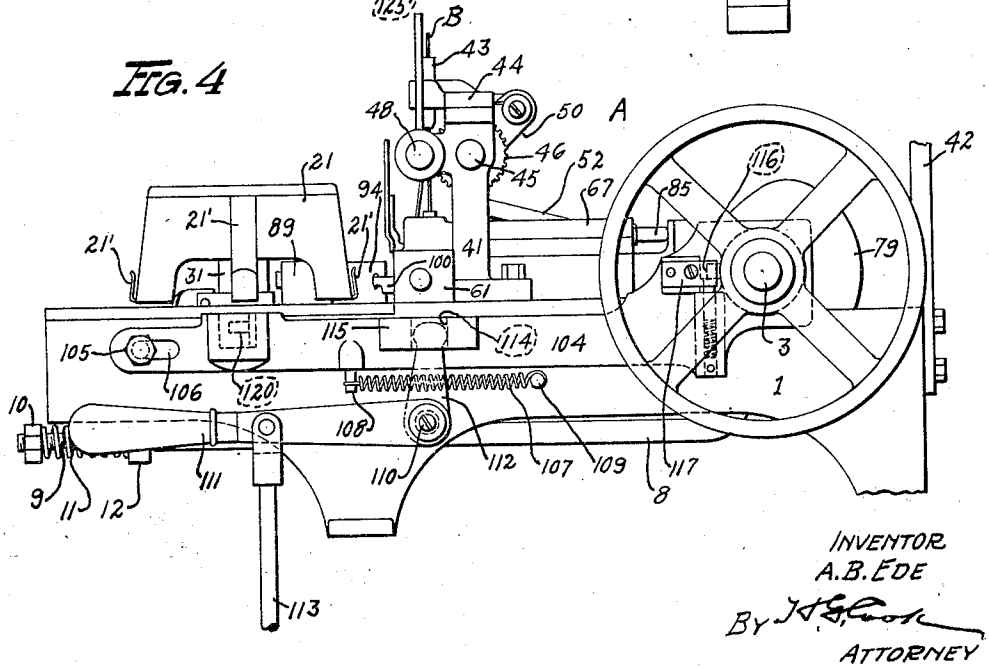


FIG. 4



INVENTOR
A. B. EDE
BY J. F. Cook
ATTORNEY

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STAPLING MACHINE

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FIG. 5

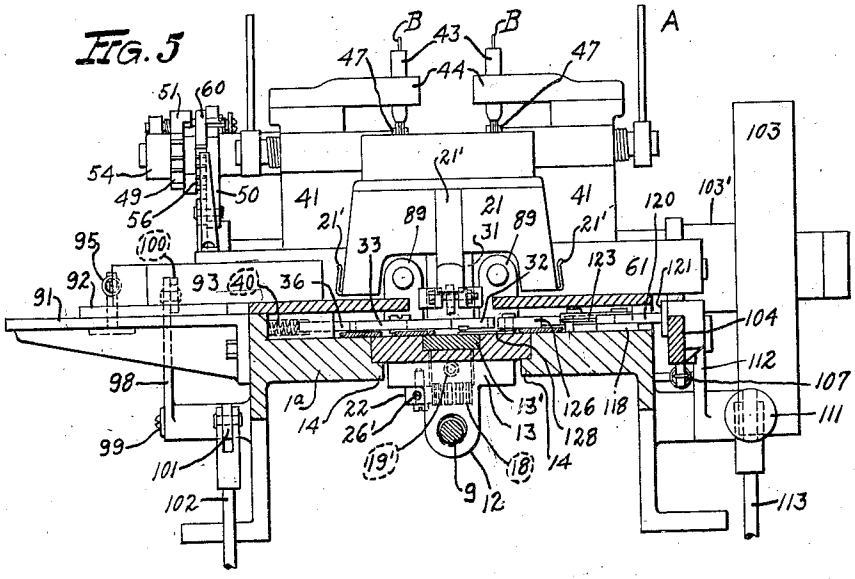


FIG. 6

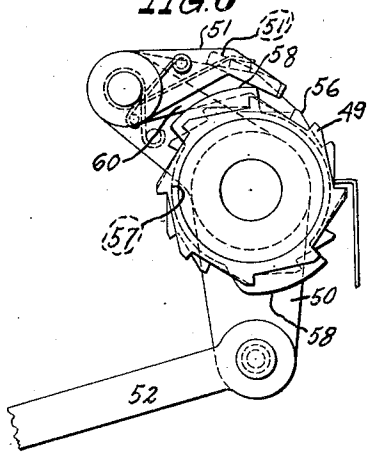


FIG. 7

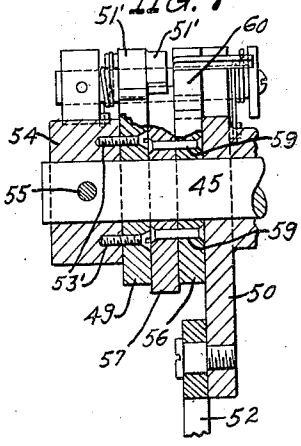
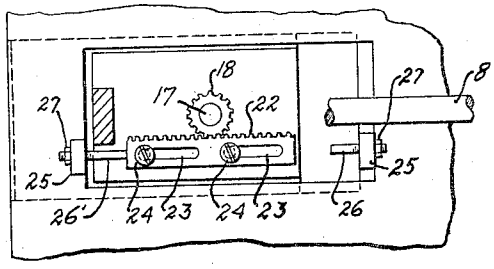


FIG. 8



INVENTOR
A. B. EDE
BY H. G. Cook
ATTORNEY

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STAPLING MACHINE

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Fig. 9

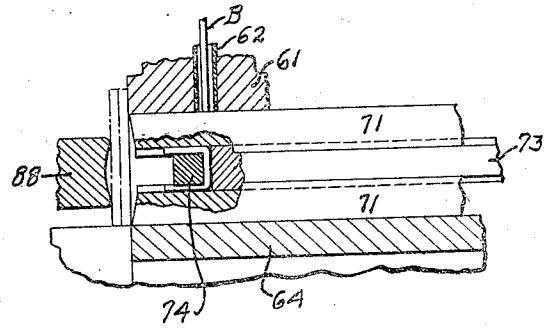


Fig. 11

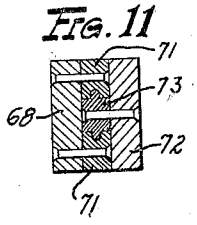
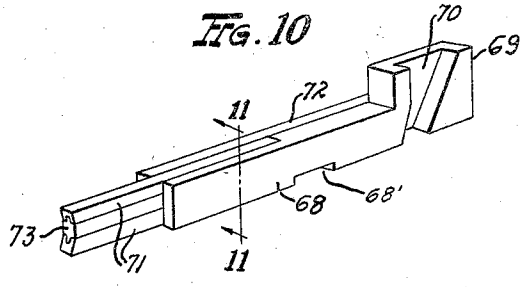


Fig. 10



INVENTOR
A. B. EDE
BY H. E. Cook
ATTORNEY

Patented Mar. 29, 1932 1,851,621

UNITED STATES PATENT OFFICE

ALBERT B. EDE, OF COBDEN, ILLINOIS

STAPLING MACHINE

Application filed October 11, 1929. Serial No. 398,827.

This invention relates to improvements in stapling machines, and particularly to the class of stapling machines used for forming and driving staples in the manufacture of veneer baskets, the predominant object of the invention being to produce a machine of this type which is an improvement on the stapling machine disclosed in United States Letters Patent No. 1,411,007, granted on March 28, 1922, to George A. Ede.

The stapling machine disclosed in the patent referred to above included a basket form which received the folded material from which a basket was to be produced, and in the operation of this machine the basket form was rotated by hand to present the various faces thereof to the stapling driving mechanism of the machine so the material on the basket form might be stapled. It has been found that the manual rotation of the basket form materially reduced the speed of operation of the machine, and I have therefore devised the improved machine disclosed in the present application, which, briefly stated, includes means whereby the basket form of the machine may be automatically rotated during operation of the machine.

The machine disclosed in the present application also includes means whereby certain strips of veneer, forming parts of the baskets produced with the aid of my improved machine, are supported while being applied to baskets in the course of production, and in addition to this my machine is provided with improved means for interrupting the feeding of the material from which the staples are formed at predetermined times during the stapling of the baskets.

Fig. 1 is a plan view of my improved stapling machine.

Fig. 2 is a longitudinal section on line 2—2 of Fig. 1.

Fig. 3 is a horizontal sectional view through the machine illustrated in Figs. 1 and 2.

Fig. 4 is a side elevation of my improved stapling machine.

Fig. 5 is a cross-section taken on line 5—5 of Fig. 2.

Fig. 6 is a fragmentary enlarged view illustrating the mechanism for temporarily interrupting the feed of the material from which the staples are formed.

Fig. 7 is a vertical section through the mechanism illustrated in Fig. 6.

Fig. 8 is a fragmentary detail illustrating part of the mechanism for automatically imparting rotary motion to the basket form of the machine.

Fig. 9 is an enlarged section showing part of the mechanism for forming and driving the staples.

Fig. 10 is a perspective view of one of the staple cutting and driving devices.

Fig. 11 is a section on line 11—11 of Fig. 10.

In the drawings, wherein is shown for the purpose of illustration, merely, one embodiment of the invention, A designates my improved machine, which includes a frame 1 upon the rear portion of which are mounted bearing boxes 2 in which the main shaft 3 of the machine is mounted for rotation. This shaft is provided with a crank 4 at each side of which is a cam member 5 provided with cam faces 6 and 7 (Figs. 1 and 3). 8 designates a reciprocating rod having its rear end journaled to the crank 4 of the main shaft 3 (Fig. 2), and having its forward end reduced to a stem 9 at the outer end of which is a nut 10 that confines an expansion spring 11. The stem 9 of the reciprocating rod 8 is loosely disposed in an aperture formed through a leg 12 of a reciprocating carrier 13, which rides upon guides 14 of the table 1^a of the machine frame and is confined by bars 15 (Fig. 3). The leg 12 of the carrier 13 is held normally projected in a rearward direction by the spring 11 on the stem 9. The carrier 13 includes a slidable plate 13′, and said carrier is provided with a longitudinal slot 16 (Fig. 2).

17 designates a post, the lower end portion of which is extended through the slidable plate 13′ and the longitudinal slot 16 in the carrier 13. At the extreme lower end thereof the post 17 has a pinion 18 fixed thereto (Fig. 2), and interposed between the upper face of said pinion and the lower face of a slidable plate 13′ forming a part of the carrier 13 is a sleeve 19, which surrounds said post. 19′ designates a coil spring which tends to

move the post toward the rear end of the machine. The post 17 supports a basket form 21 that is rotatably mounted thereon, said basket form being adapted to receive the basket to be stapled, and is operable to move each of its sides into a position facing the stapling mechanism to be hereinafter described.

Slidingly supported by the carrier 13 at the lower face thereof is a rack 22 (Figs. 2, 5, and 8), the teeth of said rack being arranged in mesh with teeth of the pinion 18 at the lower end of the post 17, and said rack being provided with elongated openings 23 through which fastening devices 24, by which said rack is secured to said carrier 13, pass, whereby said rack is arranged for sliding movement with respect to said carrier. Extended downwardly from the frame 1 of the machine is a pair of oppositely disposed lugs 25, which support inwardly extended pins 26 and 26′ (Figs. 2 and 5), said pins being alined longitudinally with the rack 22 and being each provided with a lock nut 27, whereby said pins may be adjusted longitudinally of their major axes. Secured to the post 17 at the upper end thereof is a ratchet wheel 27 provided with four teeth, and 28 designates a pawl which is pivotally secured to the basket form 21 at the point designated by the reference character 29. 30 designates a spring associated with the pawl 28, said spring serving to force the outer end of the pawl in a direction toward the ratchet wheel 27.

The basket form 21 includes a vertically disposed sleeve 31 which surrounds the post 17, and fixed to the sleeve at the lower end thereof is a ratchet wheel 32 (Figs. 2 and 3). The ratchet wheel 32 is provided with four teeth, and 33 designates a trigger, pivoted at 34, one end of which is adapted to successively engage said teeth as the basket form is rotated. The trigger 33 has associated with it a spring 35 which serves to force the teeth engaging end of said trigger toward the ratchet wheel 32. 36 designates a spring-pressed plunger which is supported in a suitable retaining housing 37 fixed to a stationary part of the frame of the machine, said retaining housing having a slot 38 formed therein through which a pin 39, carried by the plunger 36, extends. 40 designates an expansible coil spring which is disposed behind the plunger 36 and tends to move same outwardly. The function of the ratchet wheel 32 and the trigger 33 is to prevent accidental rotation of the basket form 21 in the direction indicated by the arrow in Fig. 3, it being plain that when the trigger is in engagement with one of the teeth of said ratchet wheel, as shown in Fig. 3, such rotation of said basket form is prevented.

41 designates the standards mounted upon the frame of the machine by which the staple wire delivery and feed mechanism is supported. The staple wires B (Figs. 2, 3, and 4) are arranged preferably on reels (not shown), which may be supported by arms 42 extending upwardly from the rear portion of the machine frame. There are preferably two of the reels from each of which a wire is conducted to one of the guide tubes 43 supported by arms 44, which in turn are supported by the standards 41. The wires on passing through said tubes are directed downwardly, as seen in Fig. 2.

45 designates a feed wheel shaft journaled in the standards 41 and bearing wire feeding wheels 46 that are located beneath the exit ends of the wire guide tubes 43. The feed wheels are opposed by rollers 47 mounted upon rods 48 loosely positioned in the standard arms 41′. The feed wheel shaft is rotated through the medium of a ratchet wheel 49 fixed thereto and a rocker arm 50 that carries a spring controlled pawl 51 for engagement with said ratchet wheel 49. The rocker arm 50 is loosely mounted on the feed wheel shaft 45 (Figs. 6 and 7), and is united to the main shaft 3 of the machine by a connecting rod 52 fitted to a crank disk 53 (Fig. 1) carried by said main shaft. The ratchet wheel 49 is secured by means of fastening devices 53′ to a collar 54, which is fixed to the feed wheel shaft 45 by a pin 55 (Fig. 7), hence, as rotary motion is imparted to the ratchet wheel 49 by the pawl 51, the shaft 45 is subjected to like rotary movement.

Loosely mounted on the feed wheel shaft 45 adjacent to the rocker arm 50 (Fig. 7) is a second ratchet wheel 56, and interposed between the ratchet wheel 56 and the ratchet wheel 49 is a disk 57 having cam faces 58. The disk 57 is loosely mounted on the feed wheel shaft 45, and said disk is secured to the ratchet wheel 56 by means of suitable fastening devices 59, so that said disk and said ratchet wheel 56 rotate as a unit independently of the feed wheel shaft 45. 60 designates a second spring urged pawl which is carried by the rocker arm 50, said pawl 60 being adapted to engage the teeth of the ratchet wheel 56 for the purpose of feeding the ratchet wheel 56 and the disk 57 about the feed wheel shaft 45. The pawl 51 is provided with a portion 51′ which overlies the disk 57 as shown clearly in Fig. 7, and in the operating of the wire feeding mechanism the cam faces 58 in the disk 57 will engage said portion 51′ as the disk is rotated by the pawl 60, with the result that the pawl 51 will be raised to a position where it will not engage the teeth of the ratchet wheel 49. By this arrangement feeding of the staple wire is interrupted at predetermined periods during basket making operations of the machine for a purpose to be hereinafter set forth.

61 designates a cross-bar extending transversely of the machine immediately beneath the staple wire delivery and feed mechanism,

in which cross-bar are seated vertical wire guide tubes 62 into which the wires B enter as they are fed downwardly from the feed wheels 46. The guide tubes 62 lead to channels 63 formed through the cross-bar 61, and the cross-bar 61 is mounted on a table 64 (Fig. 2) that is surmounted by outer guides 65 and a central portion 66 (Fig. 3) located at the rear of the cross-bar 61. 67 designates a cap plate (Fig. 1) mounted on said guides and central portion.

68 designates staple forming bars mounted for reciprocation on the table 64 between the guides 65 and the central portion 66, each bar being provided at its rear end with an upstanding portion 69 having a cam groove 70, the utility of which will be hereinafter pointed out. A pair of forming fingers 71 is rigidly secured to each forming bar 68, and the ends of these forming fingers are provided with wire cutting edges.

72 designates driving bars positioned alongside of the staple forming bars 68, which driving bars are provided with drive fingers 73 positioned intermediate of the forming fingers 71 between which they operate, as shown most clearly in Figs. 9, 10, and 11. The bars 68 and 72 are united to each other by tongue and groove connections, as illustrated in Fig. 11.

74 designates staple form fingers (Figs. 2, 3, and 9) reciprocally positioned longitudinally of the cross-bar 61 and adapted for movement across the channels 63. These fingers are normally projected across said channels by springs 75 located at the rear of the fingers. The form fingers are provided with cams 76 having beveled faces 77 (Fig. 3). 78 designates retracting slides for withdrawing the form fingers against the action of the springs 75. The retracting slides are positioned against the guides 65, and each thereof is provided with a leg 78′ that enters a notch 68′ in the forming bar 68.

79 designates a pair of disks which are mounted on the main shaft 3 of the machine and are preferably formed integral with the cam members 5, each of said disks being provided with a pair of apertures 80 (Fig. 2). Located on each of said disks adjacent to said apertures is a plate 81 which supports pins on each of which a roller 82 is supported, said rollers being extended through the apertures 80 in the disk 79. Supported by each plate 81 is a pair of dowels 83, which extend into recesses in the disk 79, and 84 designates a screw which passes through a central opening in each of the plates 81 and screws into the associated disk 79, whereby the plate is secured to the disk.

It is apparent that in the event of the rollers 82 becoming worn by continued use, the plates 81 and said rollers may be removed by the removal of a single screw, that indicated by the reference character 84, and that because of the use of the dowels 83 the plates 81 are very securely fastened in place on the disks 79.

85 designates return bolts (Figs. 1 and 2) slidably mounted in housings 86 forming parts of the cap plate 67. These bolts are located above the staple forming and driving bars, and their rear ends project from said housings 86 toward the upstanding portion 69 of the staple forming bars 68. Each of the return bolts is backed by an expansion spring 87 that holds the bolt normally projected in a rearward direction to bear against the upstanding portions 69 of the staple forming bars, as seen in Fig. 2.

88 designates dies (Figs. 2, 3, and 9) mounted on uprights 89 on the carrier 13 in positions to place said dies directly in advance of the channels 63 in the cross-bar 61, so that when the parts of the stapling mechanism are moved the forming fingers 71 and driving fingers 73 will approach the dies as suggested in Fig. 9.

Arranged at one side of the machine, as shown in Figs. 1, 3, and 5, is a horizontally disposed plate 91 which is secured to the frame of the machine, and 92 designates a plate which is fixed to said plate 91. The plate 92 has rigidly fixed thereto an arm 93, and also said plate 92 has pivoted thereto a second arm 94, the forward end of which contacts with the forward end of the arm 93, as shown in Figs. 1 and 3, the pivot of said arm 94 being designated by the reference character 94′. At the rear end of the arm 94 same has a contractile coil spring 95 attached thereto which tends to maintain the forward end of said arm in contact with the forward end of the arm 93. The plate 92 is secured to the plate 91 by a single fastening device 96, and the rear end of said plate 92 bears against a stop pin 97 supported by the plate 91. In view of this arrangement, the plate 92 is capable of slight pivotal movement about the fastening device 96 so as to permit the forward ends of the arms 93 and 94 to swing with the plate 92 in a direction toward the rear end of the machine.

98 designates a bell-crank lever, which is pivoted at 99 to the frame of the machine (Fig. 5), said bell-crank lever having a link 100 pivoted to an upwardly extended leg thereof, which link bears against the arm 94, as shown in Figs. 1 and 3. Pivotally attached to a horizontally disposed leg 101 of the bell-crank lever 98 is a connector 102 (Fig. 5), which is attached at its lower end to a suitable foot pedal (not shown).

The operator of the machine in the use thereof may depress the foot pedal to draw the connector 102 downwardly, and this will rock the bell-crank lever so that the link 100 will move the arm 94 about its pivot 94′ in a manner to separate the forward end of said arm 94 from the forward end of the arm 93.

This will permit the operator to introduce a strip which constitutes a part of a basket being made between the forward ends of the arms 93 and 94, and when the forward end of the arm 94 is again permitted to move toward the forward end of the arm 93, said strip will be guided by said arms.

Loosely mounted on the main shaft 3 of the machine is a pulley 103 over which a drive belt (not shown) will normally operate. The pulley 103 has a clutch 103′ of ordinary construction associated therewith, through the instrumentality of which the pulley may be rigidly fixed to the main shaft 3. 104 designates a bar which is mounted for sliding movement on the frame of the machine, said bar being supported at one end thereof by a bolt 105 which passes through a slot 106 in the bar, and said bar at its opposite end being slidably supported by the main shaft 3 of the machine. 107 designates a coil spring which is attached at one of its ends to a pin 108 mounted on the bar 107 and at its opposite end to a pin 109 fixed to the frame of the machine. The coil spring 107 tends to move the bar 104 in a direction toward the rear of the machine. Pivoted at 110 to the frame of the machine is an operating lever 111 (Figs. 3 and 4), which is provided with an upwardly extended portion 112, said operating lever having a connector 113 pivotally attached thereto, which connector is preferably connected to a suitable pedal (not shown). The upper end of the portion 112 of the operating lever 111 is disposed within a recess 114 formed in a lug 115 arranged on the bar 104, and by depressing the operating lever, either by hand or with the aid of the pedal associated with the connector 113, the bar 104 may be moved forwardly of the machine against the action of the coil spring 107.

The clutch 103 includes a finger 116 which extends through a slot (not shown) formed in the housing of the clutch, and when this finger is positioned as shown in Fig. 3, the clutch 103′ is disengaged, while when said finger is moved toward the pulley 103 said clutch is engaged so as to connect the pulley 103 to the main shaft 3. The bar 104 is provided with a member 117 which is adapted to engage the finger 116 when the bar 104 is in its rearward position and move said finger from its engaged position to its disengaged position.

118 designates a plate (Fig. 3) which is pivoted at 119 to the frame of the machine, said plate having an upwardly and outwardly extended portion 120, which is adapted to engage a portion 121 formed on the bar 104. The plate 118 has pivoted thereto a detent pawl 122, the outer end of which is urged by a spring 123 toward a ratchet wheel 124. Mounted on the shaft to which the ratchet wheel 124 is fixed is a cam 125 having a high portion 125′. 126 designates a feeding pawl which is pivoted at 127 to the carrier 13, said feeding pawl being arranged to engage the teeth of the ratchet wheel 124 and rotate said ratchet wheel as said pawl moves forwardly with the carrier. The outer end of the feeding pawl is maintained in contact with the ratchet wheel 124 by a spring 128.

In the practical use of this machine the stock from which the basket is to be produced is placed over the basket form 21 in a folded condition, so that the rim of the basket will be at the rear of the dies 88 when the form is rotated on its post. The strip S, which forms a part of the basket and which is arranged at the edge of the basket, is then arranged between the forward ends of the arms 93 and 94, as suggested by dotted lines in Fig. 1, said forward ends of said arms being separated in the manner already described. The operating lever 111 (Fig. 4) is then depressed to draw the bar 104 forwardly of the machine, thus permitting the clutch finger 116 to move in a direction to cause the pulley 103 to be fixed to the main shaft 3, and as said pulley is being rotated by a suitable source of power said main shaft 3 will be subjected to axial rotation.

The first action of the main shaft 3 is to move the rod 8 in a rearward direction. On such movement of said rod 8, the carrier 13 is moved rearwardly toward the cross-bar 61, and when rearward movement of the rod 8 has progressed sufficiently the rear end of the rack 22 will contact with the forward face of the pin 26 (Fig. 2), whereby said rack will be moved forwardly with relation to the carrier 13, with the result that the pinion 18, which meshes with the rack 22, will be rotated. The pinion 18 is fixed to the shaft 17, which shaft in turn has the ratchet wheel 27 fixed to the upper end thereof, and rotation of the pinion as described will cause the shaft 17 and the ratchet wheel 27 to be rotated in an anticlockwise direction, said ratchet wheel rotating idly under the pawl 28 without imparting movement to the form 21. When the form is returned by the rod 8 to its forward position, as shown in Fig. 2, the forward face of the rack 22 moves into contact with the rearmost face of the pin 26′, and as a result of such contact the rack 22 is moved rearwardly with relation to the carrier 13. This movement of the rack results in the pinion 18, shaft 17, and ratchet wheel 27 being rotated in a clockwise direction, whereby said ratchet wheel 27 will engage the pawl 28 in a manner to cause the form 21 to which the pawl is pivotally attached to be rotated with said ratchet wheel. At the time clockwise movement is imparted to the shaft 17 as described by rotation of the pinion 18, the trigger 33 is disengaged from the ratchet wheel 32 to permit such movement of said shaft.

The material of which the basket is to be formed being arranged in a folded condition on the form 21, and the strip S being arranged at the edge of said basket material as suggested by dotted lines in Fig. 1, the operating lever 111 will be depressed as already described to place the machine in operation. During the first two movements of the basket form 21, each of which is a fourth of a revolution, one of the cam faces 58 on the disk 57 (Figs. 6 and 7) will be in contact with the portion 51′ on the pawl 51, hence said pawl will be maintained out of contact with the teeth of the ratchet wheel 49, and therefore said ratchet wheel will remain stationary. The ratchet wheel 49 is fixed to the feed wheel shaft to which the wire feeding wheels 46 are secured, and therefore during the period in which the ratchet wheel 49 is stationary the wire feeding wheels will likewise be stationary, and hence no wire will be fed during these first two movements of the basket form.

The form 21 has hooks 21′ secured thereto, and the free end of the strip S is supported by one of these hooks so that it may not draw away from the form. During the first two movements of the form 21 the operator merely shapes the strip S about the form, and as the third movement is transmitted to the form the cam face 58, which was passing beneath the portion 51′ of the pawl and thus held said pawl out of contact with the teeth of the ratchet wheel 49, moves out of contact with said portion 51′ and the outer end of the pawl 51 is permitted to move into contact with the teeth of said ratchet wheel 49. Movement is then transmitted to the wire feeding wheels 46, and the wires B are fed downwardly into the recesses 63 in the cross-bar 61.

The cam face 7 of each cam member 5 comes into contact with the rear end of a forming bar 68 moving the fingers 71 of said bar into one of the channels 63 of the cross-bar 61, and the foreward cutting edges of said fingers act to sever sections of the stapling wire B which projects downwardly into said channel at the rear of the form bar 74 which is normally projected across said channel. Continued movement of the forming fingers 71 results in the formation of a staple which is produced on the form bar 74 between the forming fingers 71, as seen in Fig. 9. As soon as the staples have been produced the movement of the forming slide bars results in the retracting slides 78 engaging the beveled faces 77 of the cams 76 on the form bars 74. When the retracting slides 78 engage said cams 76, the form bars 74 are retracted out of the channels 63, thereby moving them to positions entirely beyond the staples. The driver fingers 73 of the driving bars 72 are then carried forward under the action of the cams 6, and said driver fingers 73 push the previously formed staples forwardly from their positions between the forming fingers 71 and force them through the basket on the basket form 21, and their ends are clenched by coming in contact with the dies 88 which were previously moved forwardly to the positions shown in Fig. 9.

A complete rotation of the main shaft will form and drive a pair of staples and will return the basket form 21 to its forward position, and because of the spring-pressed return bolts 85 exerting a rearward pressure against the upstanding portions 69 of the staple forming bars 68 (Fig. 2), said staple forming bars 68 will be forced against the cam members 5, and as the extended portions of said cam members 5 rotate away from the rear ends of said staple forming bars, these bars will be moved rearwardly by the action of said spring pressed bolts 85.

To insure the return movement of the staple forming bars 68, even though the springs 66 should fail to function properly I provide each of the staple forming bars 68 with a cam groove 70 (Figs. 1, 2, and 10) which is located adjacent to the rear end of said staple forming bar. The disks 79 are each provided as has been explained with a pair of projecting rollers 82. Assuming now that the springs 87 fail to function properly, the disks 79 will carry their projecting rollers around and said rollers will enter the cam slide 70 in the staple forming bars 68, and because of the inclined faces within said slides with which said projecting rollers successively contact, said staple forming bars will be positively returned to their rearward positions.

The staple forming bars 68 and the driver bars 72 are arranged to move independently under the actuation of the cams that strike them to move them forward, but inasmuch as only the staple forming bars are engaged by the return bolts 85 and the projecting rollers 82 to move them rearwardly after they have been actuated in a forward direction, it is necessary to provide connection between the bars for the return of the driver bars. This connection I provide by the application of pins 130 to the forming bars which project into longitudinal slots in the driver bars, and which engage the driver bars in said slots as seen in Fig. 2 to unite said bars 68 and 72 so that they will travel together on their return stroke.

Under ordinary conditions the spring pressed bolts 85 will return the staple forming bars 68 in engagement with the rotary cams 5, so the spring pressed bolts will ordinarily restore said bar 68 after the staple forming operations. This is a desirable restoring means, for the springs noiselessly perform their functions without causing destructive hammer blows in the restoring means. However, actual experience has shown that a crooked piece of wire, or an im-

properly formed staple, will occasionally be caught in the machine so as to retard the fingers 71 and 73, and in this event the spring pressed bolts 85 will not restore the staple forming and driving bars. It is therefore an advantage to combine with the yielding restoring means a positive restoring means, whereby the forming and driving bars are positively restored when the springs fail to perform their functions. This positive restoring means includes the rollers 82 which normally pass idly through the cam grooves 70 in the rear ends of the bars 68, without transmitting motion to said bars, but when a restoring spring 87 fails to restore its bar 68, the rollers 82 associated with said bar will enter the cam groove 70 and engage its inclined wall so as to positively restore the bar 68. The slot and pin connection at 130 in Fig. 2 will cause the staple driving bar 72 to return with the forming bar 68.

During a complete operation of making a basket the form 21 is moved six times, each movement being one-fourth of a revolution, and during these six movements, the first two of which are idle movements in the sense that no stapling is done during same, the strip S is secured to the four walls of the basket at the edge thereof. On each rearward movement of the form 21 the pawl 126 feeds the twelve tooth ratchet wheel 124 a distance equivalent to two teeth, or one sixth of a revolution. The bar 104 is maintained in its forward position by the portion 120 of the plate 118, this engagement taking place when the operating lever 111 is depressed to start the machine, and as the ratchet wheel 124 is moved one-sixth of a revolution on each rearward movement of the form 21, said ratchet wheel will make one complete revolution during the stapling of a basket. As the sixth rearward movement of the form takes place, the high portion 125′ on the cam 125 depresses the rearmost end of the plate 118, whereby the portion 120 of said plate is disengaged from the portion 121 of the bar 104, thus permitting the spring 107 to move said bar rearwardly of the machine to disengage the clutch 103′ and free the pulley 103 from the main shaft 3 of the machine.

When the basket form 21 moves forwardly during operation of the machine the trigger 33 engages the ratchet wheel 32 in a manner to prevent rotary movement of said form in the direction indicated by the arrow in Fig. 3, and during such forward movement the inclined face 33′ of the trigger contacts with the outer face of the plunger 36 whereby said plunger is moved inwardly into the housing 37 by which it is supported. On rearward movement of the basket form, however, the extended corner 33ª of the trigger 33 will be engaged by the plunger 36 whereby the opposite end of said trigger will be disengaged from the ratchet wheel 32 and said ratchet wheel will be permitted to be rotated until the end of the trigger at which the angular face 33′ is located is freed from engagement with the plunger, when the ratchet wheel engaging end of the trigger will again engage the ratchet wheel 32 to prevent same from accidental rotation in the direction indicated above.

The spring 19′ permits the dies 88 to move forwardly until they meet the staple ends after the form contacts with the cross-bar 61. After the stapling operation the spring 19′ permits the form to clear the dies as said form is rotated.

While the features of the present invention are described as being particularly adapted for use with a machine of the type disclosed in United States Letters Patent 1,411,007, granted on March 28, 1922, to George A. Ede, it is to be understood that the features of my invention are applicable to other stapling machines, and therefore I do not wish to be limited, in placing my invention in use, to the use of a stapling machine of the type referred to in the patent mentioned above.

I claim:

1. A stapling machine comprising staple forming and driving mechanism, a form adapted to receive the work to be stapled, means for moving said form toward and from said staple forming and driving mechanism, and means for subjecting said form to rotary movement to present different portions of the work thereon to the staple driving mechanism, said means including a rack movable with said form toward and from said staple forming and driving mechanism, a post on which said form is mounted, a pinion on said post and arranged in mesh with said rack, and stop means with which said rack contacts for causing relative movement between said form and said rack.

2. A stapling machine comprising staple forming and driving mechanism, a form adapted to receive the work to be stapled, a post on which said form is mounted, means for moving said form toward and from said staple forming and driving mechanism, means for periodically subjecting said form to designed rotary movement in one direction to present different portions of the work thereon to the staple driving mechanism, means for locking said form to prevent undesigned movement thereof in said direction, the last mentioned means including a toothed element fixed to said form, and a trigger arranged to engage the teeth of said toothed element, and means with which said trigger cooperates for rendering said trigger inoperative during designed rotary movement of said form.

3. A stapling machine comprising staple forming and driving mechanism, a form adapted to receive the work to be stapled,

a post on which said form is mounted, means for moving said form toward and from said staple forming and driving mechanism, means for periodically subjecting said form to designed rotary movement in one direction to present different portions of the work thereon to the staple driving mechanism, means for locking said form to prevent undesigned movement thereof in said direction, the last mentioned means including a toothed element fixed to said form, and a trigger arranged to engage the teeth of said toothed element, and means including a spring pressed plunger with which said trigger cooperates for rendering said trigger inoperative during designed rotary movement of said form.

4. A stapling machine comprising staple forming and driving mechanism, a form adapted to receive the work to be stapled, means for moving said form toward and from said staple forming and driving mechanism, means for subjecting said form to rotary movement to present different portions of the work thereon to the staple driving mechanism, a main shaft, a clutch for operatively connecting said main shaft to a source of power, manually operated means for placing said clutch in the engaged position, and means arranged in cooperation with said form for automatically disengaging said clutch after a predetermined number of movements of said form, the last mentioned means including a movable clutch operating bar, a pivoted member arranged to engage said bar and retain same in a position where the clutch is in engagement, and means movable with the form for actuating said member to release said bar.

5. A stapling machine comprising staple forming and driving mechanism, a form adapted to receive the work to be stapled, means for moving said form toward and from said staple forming and driving mechanism, means for subjecting said form to rotary movement to present different portions of the work thereon to the staple driving mechanism, a main shaft, a clutch for operatively connecting said main shaft to a source of power, manually operated means for placing said clutch in the engaged position, and means arranged in cooperation with said form for automatically disengaging said clutch after a predetermined number of movements of said form, the last mentioned means including a movable clutch operating bar, a member arranged to engage said bar and retain same in a position where the clutch is in engagement, and means including a ratchet wheel engaged by a pawl movable with the form for actuating said member to release said bar.

6. A stapling machine comprising a staple-forming and driving mechanism, a form adapted to receive the work to be stapled, means for moving said form toward and from said staple-forming and driving mechanism, means for subjecting said form to rotary movement in a clockwise direction to present different portions of the work thereon to the staple-driving mechanism, said means including a rack movable with said form toward and from the staple-forming and driving mechanism, a post on which said form is mounted, a pinion on said post arranged in mesh with said rack, stop means with which said rack contacts for causing said post to move with respect to said rack, whereby designed rotary movement is imparted to said post in a clockwise direction, and means for locking said post against undesigned clockwise movement.

7. A stapling machine comprising a staple-forming and driving mechanism, a form adapted to receive the work to be stapled, means for moving said form toward and from said staple-forming and driving mechanism, means for subjecting said form to rotary movement in a clockwise direction to present different portions of the work thereon to the staple-driving mechanism, said means including a rack movable with said form toward and from the staple-forming and driving mechanism, a post on which said form is mounted, a pinion on said post arranged in mesh with said rack, stop means with which said rack contacts for causing said post to move with respect to said rack, whereby designed rotary movement is imparted to said post in a clockwise direction, and means for locking said post against undesigned clockwise movement, the last-mentioned means including a toothed element rotatable with said form, and a trigger arranged to engage the teeth of said toothed element.

8. A stapling machine comprising a staple-forming and driving mechanism, a form adapted to receive the work to be stapled, means for moving said form toward and from said staple-forming and driving mechanism, means for subjecting said form to rotary movement in a clockwise direction to present different portions of the work thereon to the staple-driving mechanism, said means including a rack movable with said form toward and from the staple-forming and driving mechanism, a post on which said form is mounted, a pinion on said post arranged in mesh with said rack, stop means with which said rack contacts for causing said post to move with respect to said rack, whereby designed rotary movement is imparted to said post in a clockwise direction, and means for locking said post against undesigned clockwise movement, the last-mentioned means including a ratchet wheel rotatable with said form, and a trigger arranged to engage the teeth of said toothed element.

In testimony that I claim the foregoing I hereunto affix my signature.

ALBERT B. EDE.