

L. B. GIRARD.

MACHINE FOR FASTENING AND WINDING SHADES ON ROLLERS.

APPLICATION FILED AUG. 2, 1909.

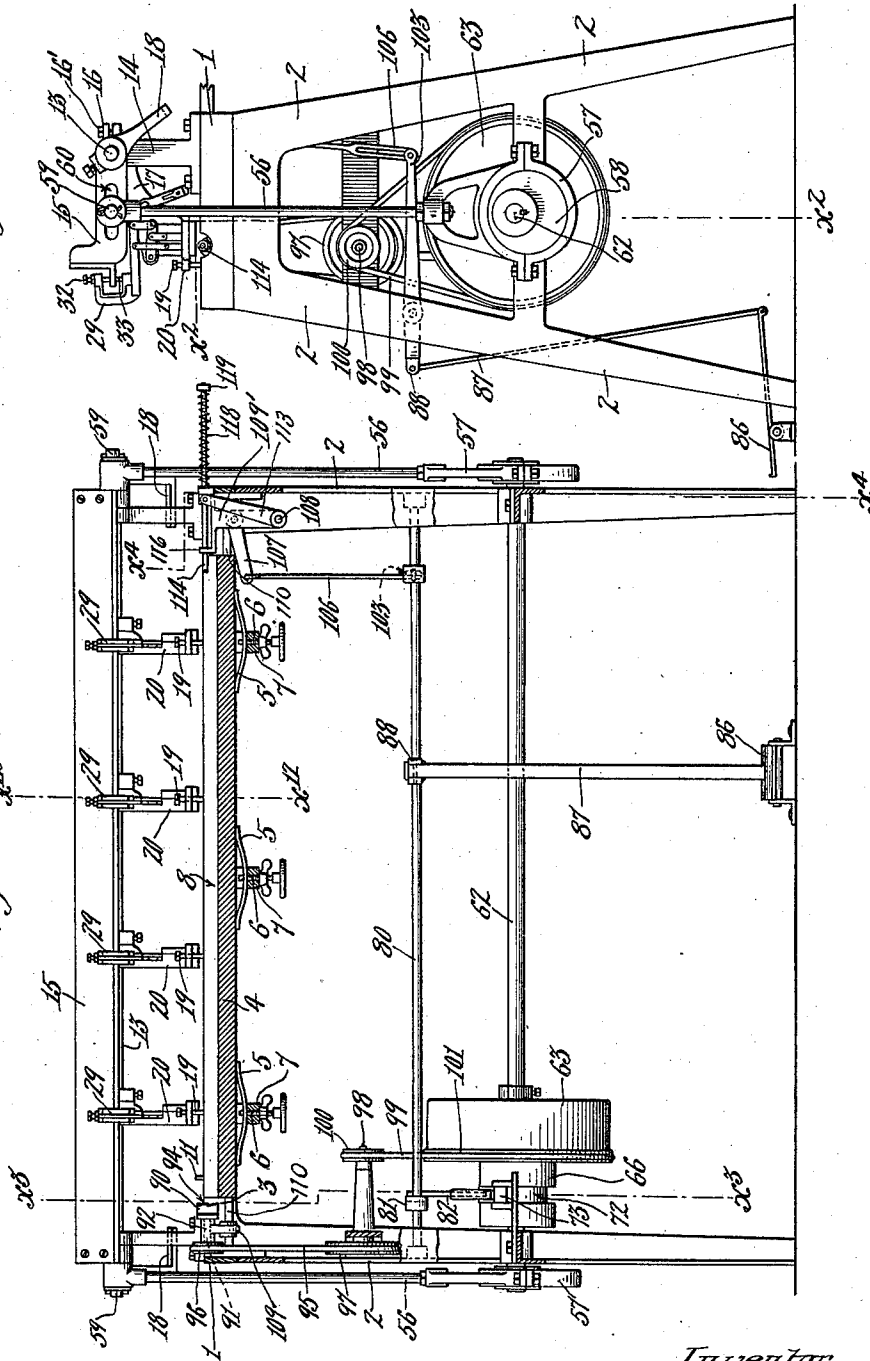
989,345.

Patented Apr. 11, 1911.

3 SHEETS—SHEET 1.

Fig. 1.

Fig. 2.



Witnesses:
Frank L. Mahan
Louis W. Gratz

Inventor,
Louis B. Girard.
 by *Foran and Lyon, Attorneys*

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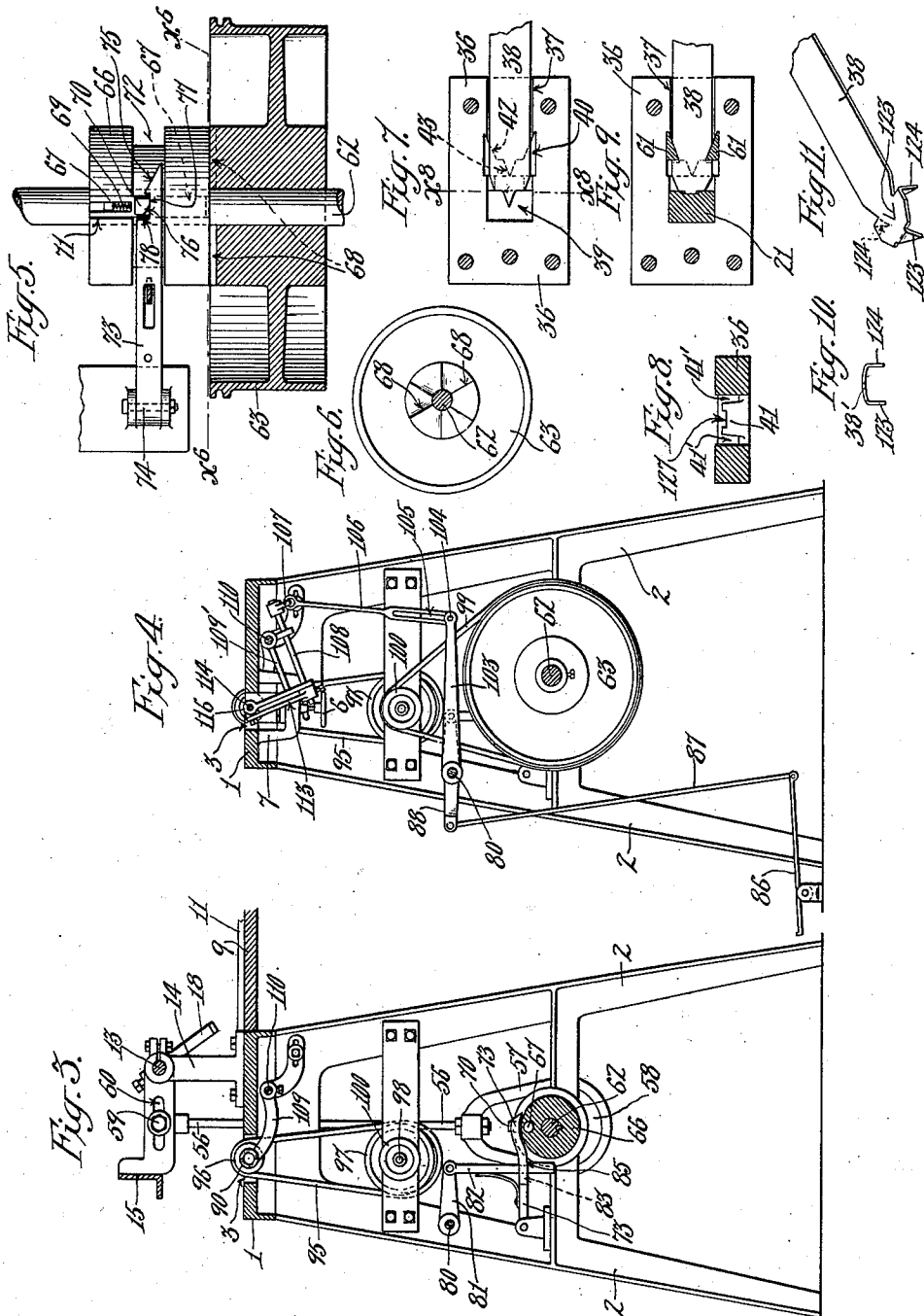
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3 SHEETS-SHEET 2.



Witnesses:
Samuel L. Abraham
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3 SHEETS-SHEET 3.

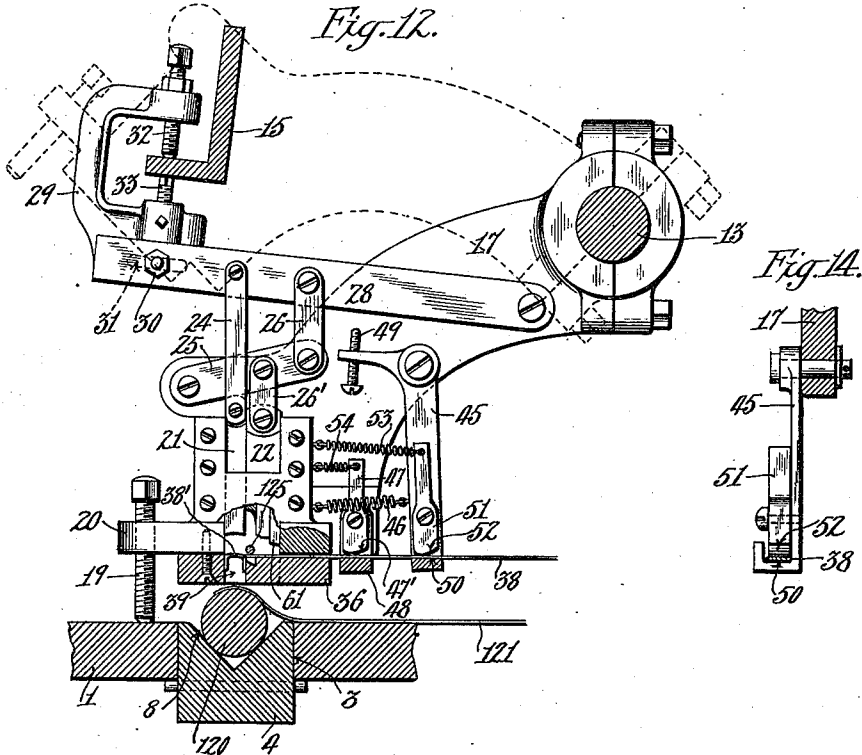


Fig. 14.

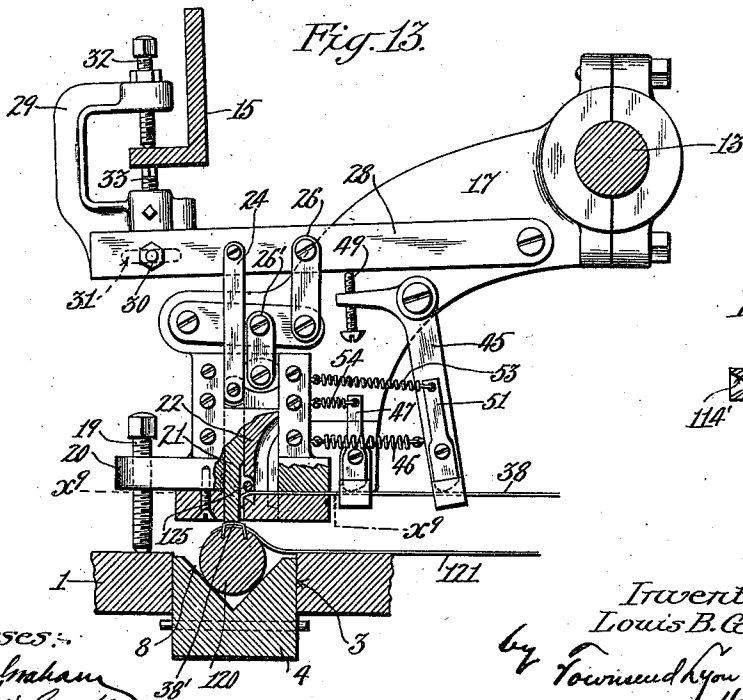
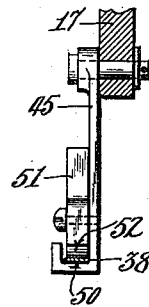
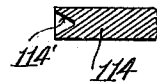


Fig. 15.



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UNITED STATES PATENT OFFICE.

LOUIS B. GIRARD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THE GIRARD MANUFACTURING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA.

MACHINE FOR FASTENING AND WINDING SHADES ON ROLLERS.

989,345.

Specification of Letters Patent.

Patented Apr. 11, 1911.

Application filed August 2, 1909. Serial No. 510,923.

To all whom it may concern:

Be it known that I, LOUIS B. GIRARD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Machine for Fastening and Winding Shades on Rollers, of which the following is a specification.

The main object of the present invention is to provide a machine which will perform the operation of securing and winding shades on rollers in a more rapid and economical manner than is possible by manual operation.

Other objects of the invention will appear hereinafter.

Referring to the accompanying drawings illustrating the invention: Figure 1 is an end elevation of the machine. Fig. 2 is a section thereof on the line x^2-x^2 in Fig. 1. Fig. 3 is a transverse section on the line x^3-x^3 in Fig. 2. Fig. 4 is a transverse section on the line x^4-x^4 in Fig. 2. Fig. 5 is a horizontal section of the clutch and throw-out for the operating mechanism. Fig. 6 is a section on line x^6-x^6 in Fig. 5. Fig. 7 is a plan of the die. Fig. 8 is a transverse section on the line x^8-x^8 in Fig. 7. Fig. 9 is a horizontal section on the line x^9-x^9 in Fig. 13. Fig. 10 is an end elevation of the staple. Fig. 11 is a perspective of the strip or ribbon of which the staples are formed showing a partly formed staple at the forward end thereof. Fig. 12 is a transverse section on the line $x^{12}-x^{12}$ in Fig. 2, showing the die and staple driving mechanism in normal position. Fig. 13 is a similar view showing the parts in operated position. Fig. 14 is an end view of the feeding mechanism. Fig. 15 is a detail section of the pressure bar for the roller.

The frame of the machine comprises a table 1 and legs or standards 2. The table 1 is provided with a longitudinal slot or channel 3 to receive the roller support 4 which is movable vertically in said slot and is normally sustained in position by bow-springs 5 engaging with the bottom thereof, the pressure of said bow-springs being adjusted by screws 6 engaging therewith and working in yokes or V-shaped brackets 7 depending from the table 1. By thus yieldingly supporting the roller support, it is enabled to adjust itself for small variations in

the size of the roller during the operation of the die mechanism. The adjustability of the support by the means 6, provides for operation with different sizes of rollers. Roller support 4 is provided in its upper face with a longitudinal groove or channel 8 preferably V-shaped, to receive and hold the shade roller during the operation. A table extension or platform 9 extends rearwardly from the table 1 to receive and support a pack or pile of shades in position to enable them to be drawn quickly over the shade roller. A gage or guide 11 may be provided on this table serving as a limit to the lateral movement of the shades, so that they can easily be brought to or maintained in proper position with respect to the length of the roller.

Means are provided for forming staples or fasteners and for driving said staples or fasteners into the roll to attach the shade thereto by one and the same operation. Said means comprises a shaft 13 mounted in bearings or standards 14, sets of die mechanism mounted on said shaft, and means for intermittently operating the die mechanism to perform the forming and driving operation. A rocking frame or member 15 is mounted to rock on the shaft 13, being provided with a split collar 16 which may be contracted by a bolt 16' to take up wear. A series of arms 17 are fastened to said shaft, said arms carrying the matrices of the die mechanism. In the operation of the machine, as will be later described, the frame 15 and arms 17 swing upward together through a limited angle, and stop means are provided for arresting the shaft 13 and arms 17 after they have moved through a certain angle, while the frame 15 is permitted to continue its upward movement. Said stop means consists of an arm 18 on the shaft 13, which engages with a standard 14, to limit the upward movement of the arms. A screw 19 on a head 20 on each arm 17, engages the table 1 to limit the downward movement of the arms and the matrices of the die mechanism. The relative movement of the rocking frame 15 and the arms 17 carrying the matrices of the die mechanism, which ensues on such arrest of the matrices, effects the operation of the die mechanism. Said die mechanism preferably comprises two movable or male dies 21, 22, slidable vertically in the head 20 and connected to be operated by the frame

15 in the said relative movement. For this purpose said dies are connected respectively by link 24 and by lever 25 and links 26, 26' with an operating lever 28, pivoted to arm 5 17 and having a yoke 29 slidably mounted by bolt 30 in a slot 31 in the yoke, said yoke having upper and lower screws 32, 33 to engage a flange 34 on rocking frame 15, these screws serving for adjustment of the die 10 operation.

While any suitable die mechanism may be employed, I prefer to use that shown in the Patent No. 953,416, granted to me Mar. 29, 1910, the die mechanism herein shown being similar to that described and claimed in 15 said application, except for the changes hereinafter specified. The matrix 36 of said die mechanism is formed on its upper face with a longitudinal channel 37 of sufficient 20 depth and width to receive the strip or ribbon 38 of which the staples or fastening devices are to be formed, and said matrix is further provided with two vertical passages or channels 39, 40 for the passage, respec- 25 tively, of the dies 21, 22 and with a bridge or wall 41 between said channels 39, 40.

The rear wall of the passage 40 is provided with a forward projection 42 tapering toward the front and terminating in a 30 pointed or V-shaped tongue 43, the top of this projecting portion and tongue being in the plane of the bottom of the way or channel 37 and the top of the bridge 41 being somewhat below this level for the purpose here- 35 inafter set forth. The top of the bridge 41 is rearwardly and downwardly inclined and at each side the bridge is cut away at its top to form a channel 41', said channel being downwardly tapering or convergent. Rear 40 die 22 is provided with flanges 61 to work in the space at each side of the projection 42.

Ribbon or strip feeding means is provided for each die mechanism, each feeding means comprising a lever 45 pivoted to the arm 17 45 and normally drawn forwardly by a spring 46, said lever being provided with a friction grip lever 51 pivoted thereto and having a cam face 52 to pinch the ribbon or strip 38 between said face and the shoulder 50 of the 50 lever 45, a spring 53 being connected to said lever 51 and to the head 20 to tend to hold this friction grip lever in contact with the ribbon. Lever 28 operates lever 45 by engaging a screw 49 therein. Another friction grip lever 47 is pivoted to arm 17 and 55 has a grip or cam face 47' engaging with the ribbon 38, a guide seat 48 being provided for reception of the ribbon, and the lever 47 pinching the ribbon against said seat, under the action of a spring 54. The ribbons or 60 strips 38 are supplied by any suitable means, such as reels, not shown.

The rocking frame 15 serves as the operating member for the above described die 65 mechanisms and is operated by bars or links

56 whose lower ends are connected to the straps 57 of eccentrics 58 and whose upper ends are provided with bolts 59 which are adjustable in slots 60 in the ends of the rock- 70 ing frame 15, this adjustment being radial with respect to the shaft 13 to provide for variation of the stroke of the rocking frame 15. Eccentrics 58 are carried by a shaft 62 journaled in the standards 2, a driving 75 pulley 63 being loosely mounted on the shaft and clutching means being provided to clutch the driving pulley to the shaft when it is de- sired to perform the forming and driving operation. Said clutching means comprises 80 a collar 66 fast on the shaft 62 and a bolt or catch member 67 longitudinally slidable in said collar to move into or out of engaging relation with radial slots or notches 68 in the 85 hub of the pulley 63, a spring 69 being provided for tending to press the bolt 67 into such engagement. Said bolt has a lateral arm or extension 70 extending through a slot 71 in the collar 66 and into an annular neck 72 around said collar and an arm 73 pivoted 90 at 74 to one of the standards 2 is adapted to extend in said neck, said arm 73 being provided with a beveled end 75 for engaging a correspondingly beveled face 76 of the pro- 95 jection 70 and said arm being provided back of said beveled head with a notch or recess 77 to receive and retain said projection, the inner shoulder 78 thereof forming a stop en- 100 gaging said projection.

The controlling means for the clutch comprises a shaft 80 mounted to turn in the 100 standards 2 and having an arm 81 to which is pivoted a depending bar 82 extending through a slot 83 in the arm 73, said bar 82 having a shoulder 85 for engaging under the arm 73 at the rearward end of said slot; a 105 treadle or controlling lever 86 being connected by a rod 87 to an arm 88 on the shaft 80 for operation thereof.

The means for winding the shade on the roller after it is fastened thereto comprises 110 a rotary head 90 carried by a shaft 91 mounted to rotate in a bearing 92 supported at one end of the groove 8 in the roller support 4, means for rotation of said shaft and head, and means at the other end of the said 115 groove to serve as an abutment or pressure applying means for the other end of the roller to hold the roller against the head. The head 90 is preferably provided with oblique teeth 94 to engage the end of the roller 120 and insure rotation of the roller with the head, the central portion of said head being recessed for the reception of the bearing pin or journal of the roller. The shaft 91 of the head 90 is rotated by a belt 95 running over 125 pulleys 96, 97 on the shaft 91 and on a counter-shaft 98, said shaft 98 being journaled in bearings on one of the standards 2 and being driven by a belt 99 running over 130 a pulley 100 on said shaft and over a grooved

strip, is bent down by the rear face of the front die 21. The rear die, as it descends, cuts two tongues 124 from the sides of the metal strip by the side flanges 61 of the die descending on each side of the projection 42 from the rear wall of the matrix, these flanges being higher in front so as to leave these tongues attached to the metal strip. In this downward movement of lever 28, at the latter part of the stroke, said lever strikes screw 49 and causes arm 45 to move rearwardly, the friction grip 51 slipping on the metal strip in this movement, and the stationary friction grip device 47 preventing back movement of the metal strip. These operations take place in the downward stroke of the eccentric rods. As the eccentric begins to move the rods 56 and the frame 15 upwardly, the friction between the male and female members of the dies causes them to stick together which causes the arms 17 and shaft 13, and the die mechanism to also move upwardly until the arm 18 on shaft 13 is arrested by engagement of arm 18 with standard 14. This stops further rotation of the shaft 13 and thus prevents further upward movement of arms 17. The eccentric rods, however, continue to rock the frame 15 upwardly. Further upward movement of the frame 15 overcomes the friction between the dies and matrix and causes the dies 21, 22 to be withdrawn from the matrix and as the lever 28 passes away from screw 49, thus stripping the dies, the spring 46 acts to move lever 45 and friction grip means 51 forwardly to advance the metal strip until its forward end abuts against the front wall of matrix channel 39. Thus at the completion of rotation of the eccentric, the die mechanism and the metal strip are left in the original condition and in this rotation one set of fasteners has been severed from the strip and driven into the roller and another set has been formed ready for the next severing and driving operation and the front tongue of still another set has been marked out on the strip 38. Having by this operation fastened the shade to the roller, the operator sets in motion the winding mechanism by depressing the heel portion of treadle 86. In the depression of the toe portion of the treadle the pin 104 of arm 103 slides freely in slot 105 in bar 106, but when the heel portion of the treadle is depressed, said pin 104 engages with the lower end of said slot to pull down bar 106 and arm 107 thereby rocking shaft 108 and sliding bar 114 longitudinally toward the roller until the socket 114' in said bar reaches the journal pin of the shade roller and pushes the roller endwise so that it is gripped between the bar 114 and the head 90. As arm 107 can turn no farther relatively to the arm 109 the further downward movement of the

bar 106 turns the frame constituted by arms 109 and shaft 110 along with the arm 107, raising the bar 114 and the head 90 so that the roller is lifted clear of its support and is sustained wholly by its end bearing on the head 90 and the pivot bar 114. The last part of the upward movement of the frame 109 causes the belt 95 to be tightened on its pulleys and sets the head 90 in rotation, turning the roll so as to wind the shade thereon. When the pressure on the treadle heel is removed the parts drop back to their normal position and the members 90 and 114 move clear of the roller, allowing it to fall on to its support.

The strip 38 is held down onto the matrix by the portion of head 20 overlying the channel 37. The rear prongs 124 of the fastener, when formed by the downstroke of die 22, do not extend down far enough to prevent their forward passage through channels 41' in the feeding operation, but when the fastener is bent by the next operation of the die 21, then the prongs are further depressed so as to catch against the front face of bridge 41 and prevent retraction of the strip in the rear movement of the friction feed. A pin 125, extending over the strip 38 between the dies 21, 22, serves as a stripper to hold the strip from following the dies in their upward motion. Bridge 41 is cut away at its middle, as shown at 127, so that the severing action of the front die does not extend to the front prong 123 of the next fastener.

What I claim is:

1. Means for supporting a roller during the fastening of shades thereon and winding the shades on the roller comprising, in combination, a roller support, a rocking frame, a rotary head mounted on one end of said rocking frame and adapted to engage one end of the roller, means for rotating said rotary head, a bearing mounted on said rocking frame to engage the other end of the roller and movable longitudinally of the roller, and controlling means operating on said rocking frame and longitudinally movable bearing thereon to move said bearing into engagement with the roller and in the further movement of said operating means to raise the said rocking frame with the bearings thereon.

2. Means for supporting a roller during the fastening of shades thereon and winding the shades on the roller comprising, in combination, a roller support, a rocking frame, a rotary head mounted on one end of said rocking frame and adapted to engage one end of the roller, means for rotating said rotary head, a bearing mounted on said rocking frame to engage the other end of the roller and movable longitudinally of the roller, and controlling means operating on said rocking frame and longitudinally mov-

portion 101 on the main driving pulley 63, said driving pulley being continually in rotation by the operation of suitable driving belt not shown. In the normal position of the head 90 the belt 95 is so loose as not to transmit power to the head 90 and means are provided for raising this head when it is desired to tighten said belt and cause rotation of the head. For this purpose an arm 103 on the shaft 80 engages by pin 104 in a slot 105 in a link or bar 106 whose upper end is pivoted to an arm 107 on a shaft 108 journaled in a rocking frame constituted by a rock shaft 110 and arms 109 and 109' carried thereby, said rock shaft extending from end to end of the machine and the arm 109 of said rocking frame being provided with bearing 92 for the head 90. The arm 109' at the other end of the rock shaft 110 carries means for yieldingly engaging the corresponding end of the roller, said arm 109' being provided with guides 116 in which slides a bar 114 adapted to engage the end of the roller. The aforesaid shaft 108 carries an arm 113 pivotally connected to the bar 114, said bar being provided with a recess or socket 114' adapted to engage the journal pin at one end of the said roller to form an abutment and holder therefor. A spring 118 on said bar 114 engaging with a nut 119 screwing on said bar serves for retraction of the bar to normal position.

The operation is as follows: In normal position the arms 17 and head 20 are in elevated position, as shown in dotted lines in Fig. 12, so that the die mechanisms are raised clear of the table 1. Operating pulley 63 is in rotation by its driving means, and pulley 100 is rotated by a belt 99 but the shaft 62 and eccentric 58 are at rest, the clutch bolt 67 being retracted as shown in Fig. 5, so as to disconnect the shaft from the driving pulley 63 and the roller driving head 90 is at rest, as the belt 95 is loose. The operator places a shade roller, indicated at 120, in the groove 8 in support 4 and draws a shade indicated at 121 forward from the pile until its front portion rests on top of the roller. He then depresses the toe portion of the treadle 86, causing the shaft 80 to turn forwardly and lift the release bar 82, the shoulder 85 of said bar engaging the lever 73 to raise the hook 78 of said lever clear of the pin or projection 70 on bolt 68. Said bolt is then shot by its spring 69, into engagement with one of the notches 68 in the pulley 63, and collar 66 and shaft 62 are thereby caused to rotate with pulley 63. In the rotation of the collar 66, the pin or projection 70 comes into engagement with release bar 82, pushing it forward so that its shoulder 85 is disengaged from lever 73 and the latter drops into the groove 72, so that on completion of the rotation of the collar the beveled faces 75, 76 en-

gage to cause the bolt 68 to be withdrawn from the driving member 63 and the collar then comes to rest with its pin 70 engaging the shoulder 78 of the lever 73. By this means I insure that when the treadle has been operated the shaft 62 will make one and only one complete rotation, irrespective of any failure of the operator to keep the treadle in proper position, or to restore it to proper position. In the rotation of the shaft 62 the eccentric 58 operates through bar 56, to lower the frame 15 and by the frictional connections 16 to rock the shaft 13, so as to bring the die mechanism directly over and adjacent to the shade roller, the movement of the arms 17 carrying the die mechanism being arrested by stop screws 19 striking the table 1. In the continued movement of the rocking frame 15, by the eccentric means, the relative movement of the frame with respect to arms 17, causes operation of lever 28 by engagement of screws 32, 33 with said lever, and by the connections 24, 25, 26, said lever 28, forces the dies 21, 22 downwardly on the matrix 36. The end of each sheet metal strip or ribbon 38 extends normally within and under the matrix, its end portion having been formed by the preceding operation as shown in Fig. 11 with downward projections or tongues, namely a front projection 123 which rests against the front wall of the channel 39 in the matrix, and two rear projections 124 which rest against the front of the bridge wall 41 of the matrix. The operating means 24, 25, 26 for the dies 21, 22 causes said die 21 to move downwardly more rapidly than the rear die, and when the front die strikes the front portion of the strip 38, it bends the front end thereof down, the depression of bridge 41 below the level of the strip supporting channel allowing the metal to bend directly in front of the tongue 43, so that the finished fastener will be bent at the top, as shown in Fig. 10. Further downward movement of the forward die 21 severs the fastener at the rear edge of the front die 21 and drives the fastener down through the channel 39 in the matrix. The severing operation takes place along the line between the already marked out or partially severed V-shaped prong 123 and the cuts left by cutting the prongs 124. The shade roller with the shade therein being directly below the matrix, the fastener is driven thereonto, and the tongues 123, 124 of the fasteners are caused to penetrate the shade and roller so that the top of the fastener engages the shade and clanches it to the roller, the bending of said top, as above described, enabling it to conform more closely to the curvature of the roller. In this movement of the front die the forward tongue 123 which has precedently been marked or partially cut from the rear end of the severed portion of the

able bearing thereon to move said bearing into engagement with the roller and in the further movement of said operating means to raise the said rocking frame with the bearings thereon, said controlling means comprising a rock shaft carried by said rocking frame and rocking in a plane transverse to the rocking movement of said rocking frame, an arm carried by said rock shaft and operating on the aforesaid bearing, an operating lever, and a connection therefrom to said rock shaft.

3. Means for supporting a roller during the fastening of shades thereon and winding the shades on the roller comprising, in combination, a roller support, a rocking frame, a rotary head mounted on one end of said rocking frame and adapted to engage one end of the roller, means for rotating said rotary head, a bearing mounted on said rocking frame to engage the other end of the roller and movable longitudinally of the roller, controlling means operating on said rocking frame and longitudinally movable bearing thereon to move said bearing into engagement with the roller and in the further movement of said operating means to raise the said rocking frame with the bearings thereon, said controlling means comprising a rock shaft carried by said rocking frame and rocking in a plane transverse to the rocking movement of said rocking frame, an arm carried by said rock shaft and operating on the aforesaid bearing, an operating lever, a connection therefrom to said rock shaft, and a spring connected to the longitudinally movable bearing to withdraw the same from the roller.

4. Means for supporting a roller during the fastening of a shade thereon and winding the shade on the roller comprising, in combination, a roller support, bearings at the respective ends of the roller support, one of said bearings being movable longitudinally of the roller to hold the roller between said bearings and means connected to said movable bearing to move the same longitudinally of the roller, one of said bearings being provided with a rotary head for engaging and rotating the roller to wind the shade thereon.

5. A machine for supporting shade rollers during the fastening of a shade thereon and for winding the shade on the roller com-

prising, in combination, a roller support, bearings at the respective ends of the roller support, one of said bearings being movable longitudinally to engage the roller between said bearings and one of said bearings being provided with a rotary head for engaging and rotating the roller to wind the shade thereon, and means for simultaneously raising said bearings to lift the roller from the roller support.

6. A machine for supporting shade rollers during the fastening of a shade thereon and for winding the shade on the roller comprising, in combination, a roller support, bearings at the respective ends of the roller support, one of said bearings being movable longitudinally to engage the roller between said bearings and one of said bearings being provided with a rotary head for engaging and rotating the roller to wind the shade thereon, means for simultaneously raising said bearings to lift the roller from the roller support, driving means for the rotary head, and means for operatively connecting said driving means in the lifting movement of said bearings.

7. A machine for supporting a shade roller during the fastening of a shade thereon and for winding the shade on the roller comprising, in combination, a roller support, bearings at the respective ends of the roller support, one of said bearings being movable longitudinally to hold the roller between said bearings, and one of said bearings being provided with a rotary head for engaging the rotating roller, a controlling device, means operated by said controlling device to move one of said bearings longitudinally to engage the roller, means operated by said controlling device upon arrest of such longitudinal motion to lift both of said bearings simultaneously, driving means for said rotary head, and means for connecting said driving means to rotate the said rotary head when the bearings are lifted.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 17th day of July 1909.

LOUIS B. GIRARD.

In presence of—

ARTHUR P. KNIGHT,
FRANK L. A. GRAHAM.