

Oct. 27, 1931.

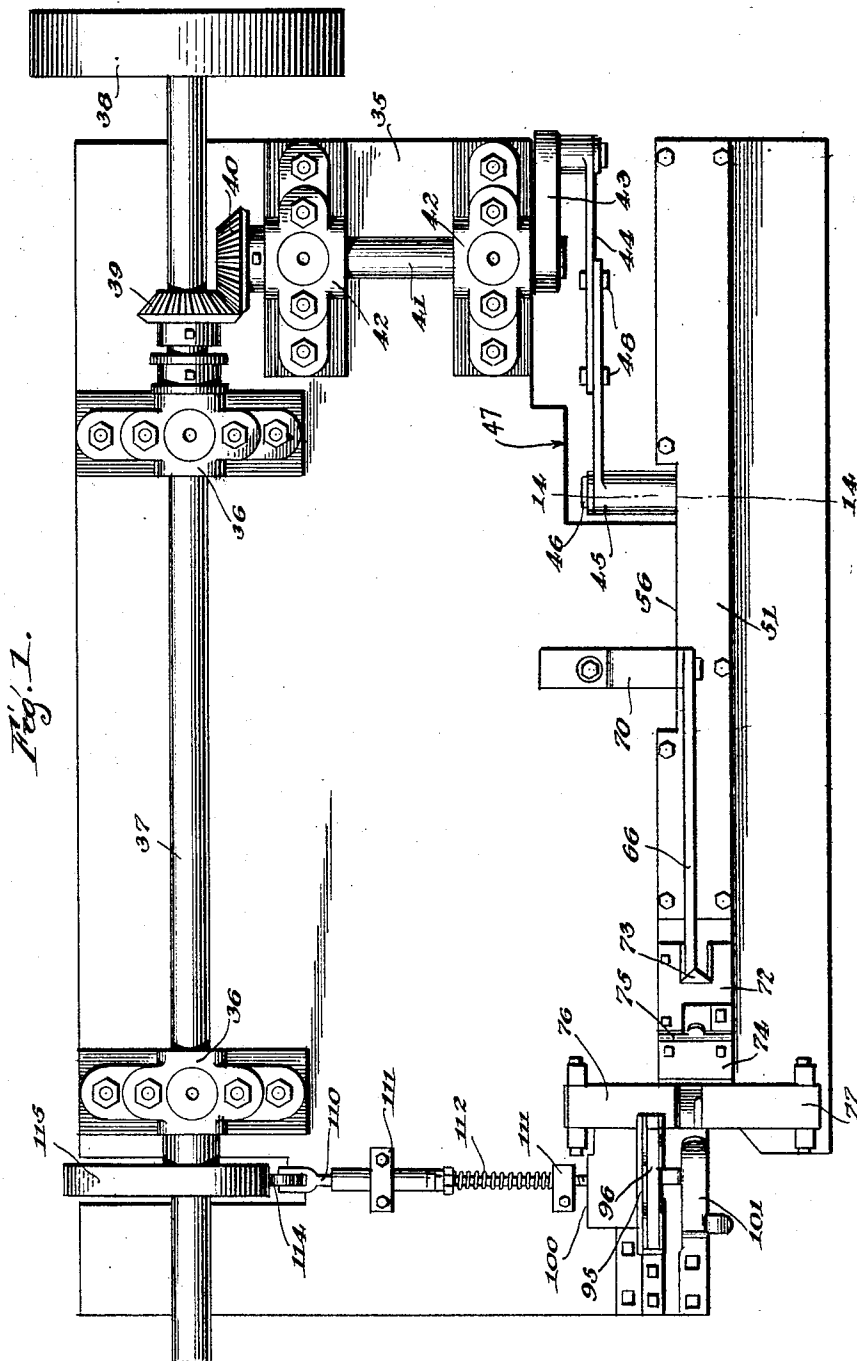
E. W. HENDERSON

1,829,651

ASSEMBLING MACHINE

Filed May 16, 1928

5 Sheets-Sheet 1



INVENTOR
Ellis W. Henderson
BY *Munn & Co.*
ATTORNEY

Oct. 27, 1931.

E. W. HENDERSON

1,829,651

ASSEMBLING MACHINE

Filed May 16, 1928

5 Sheets-Sheet 2

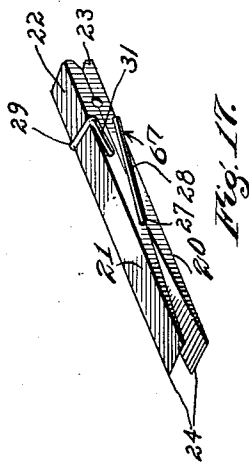
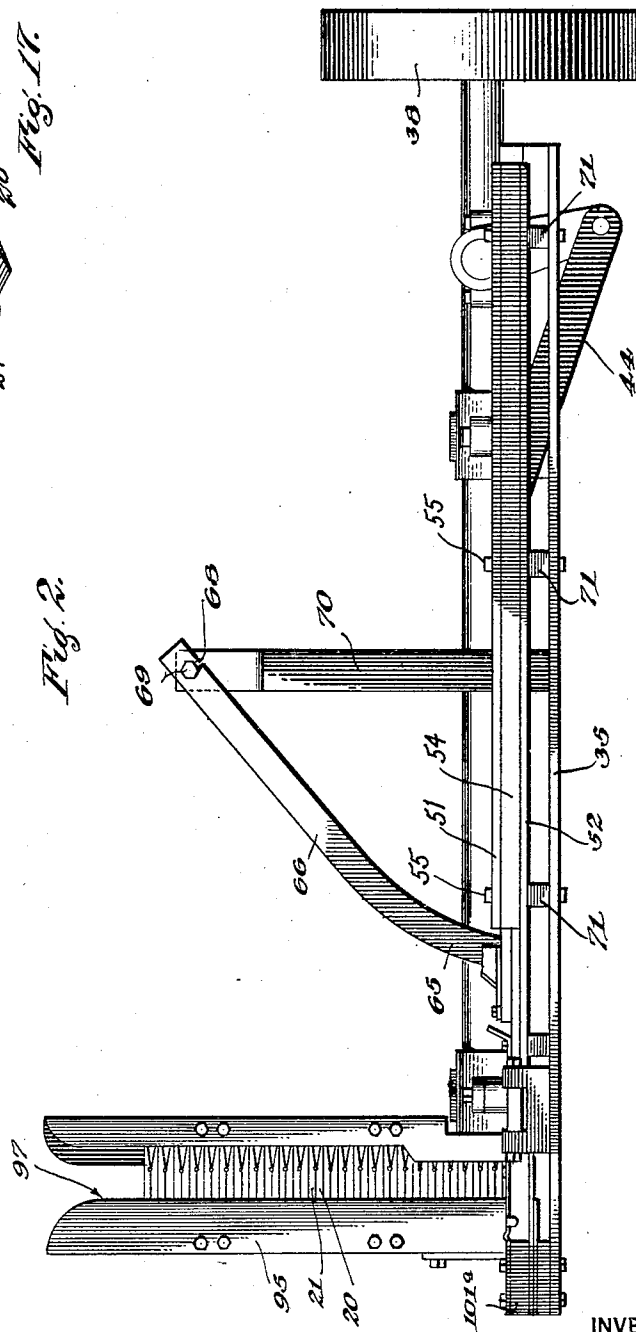


Fig. 2.



INVENTOR
Ellis W. Henderson
BY *Marion C. Co.*
ATTORNEY

Oct. 27, 1931.

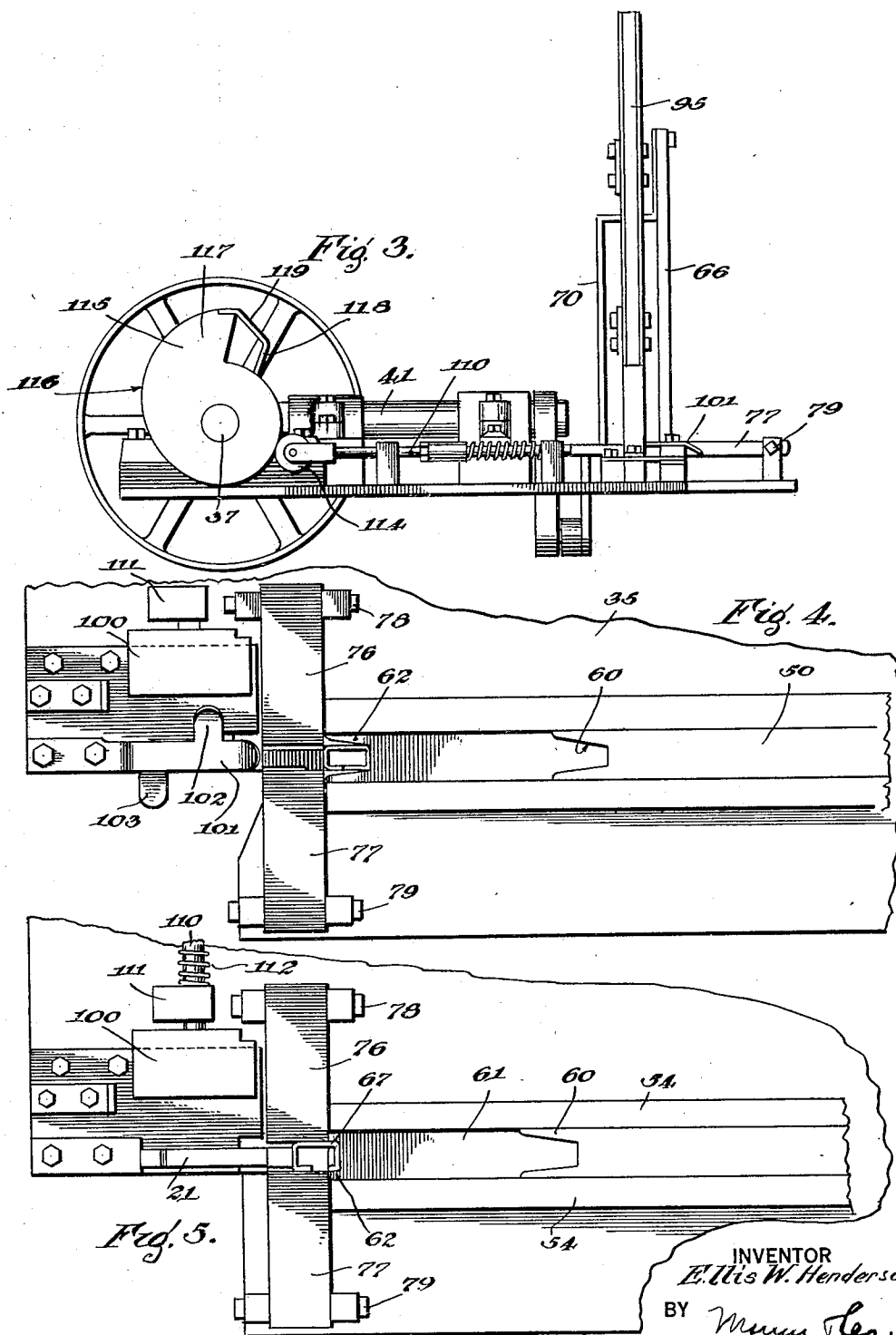
E. W. HENDERSON

1,829,651

ASSEMBLING MACHINE

Filed May 16, 1928

5 Sheets-Sheet 3



INVENTOR
E. W. Henderson
BY *Wm. Leo.*
ATTORNEY

Oct. 27, 1931.

E. W. HENDERSON

1,829,651

ASSEMBLING MACHINE

Filed May 16, 1928

5 Sheets-Sheet 4

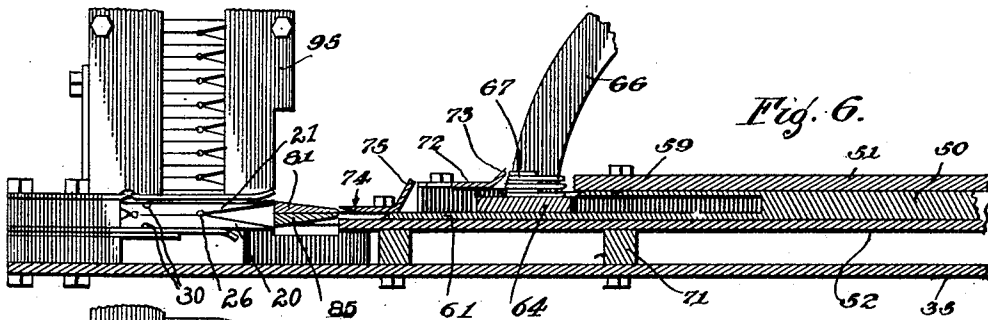


Fig. 6.

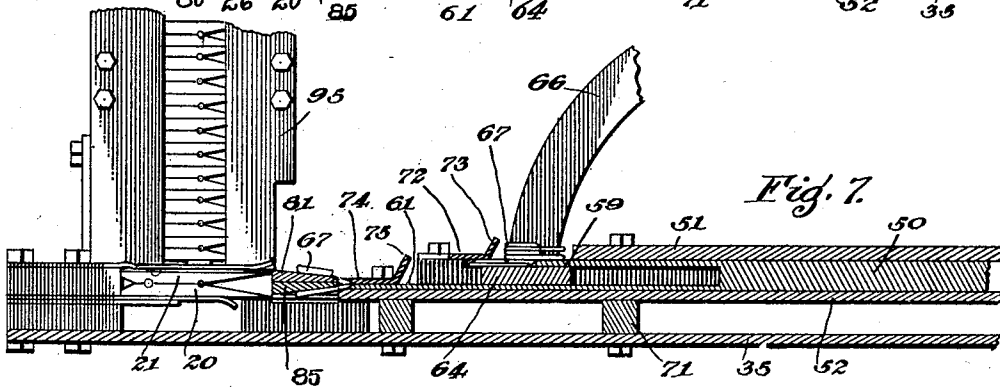


Fig. 7.

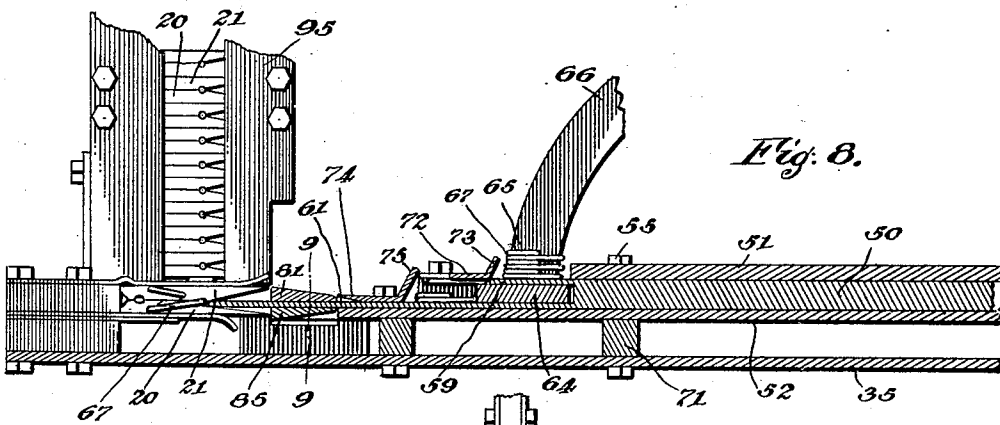


Fig. 8.

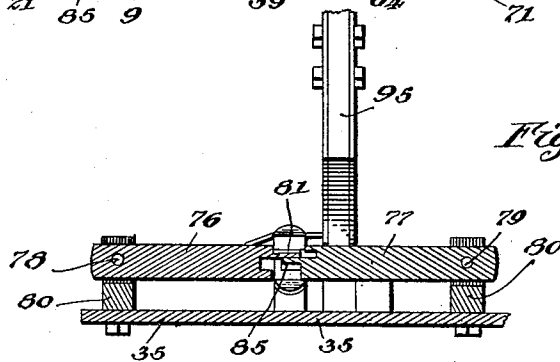


Fig. 9.

INVENTOR
Ellis W. Henderson.

BY *Wm. L. Co.*
ATTORNEY

Oct. 27, 1931.

E. W. HENDERSON

1,829,651

ASSEMBLING MACHINE

Filed May 16, 1928

5 Sheets-Sheet 5

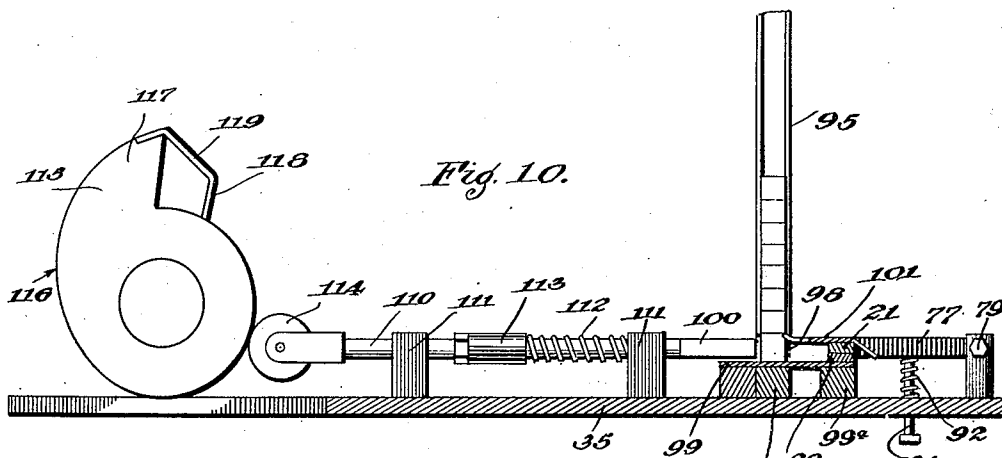


Fig. 11.

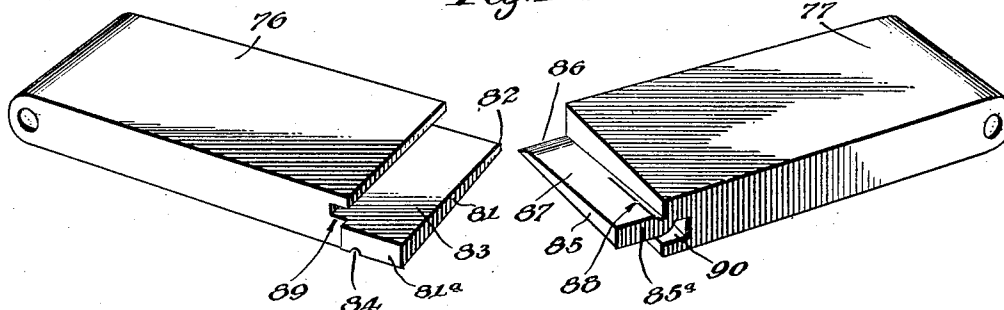


Fig. 12.

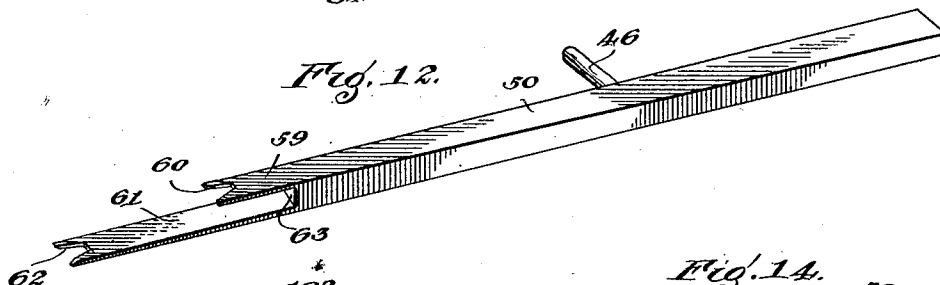


Fig. 13.

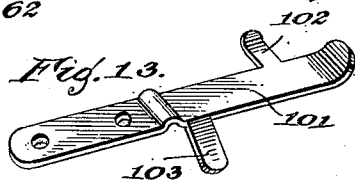


Fig. 14.

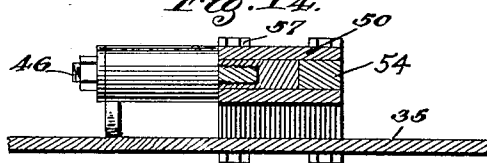
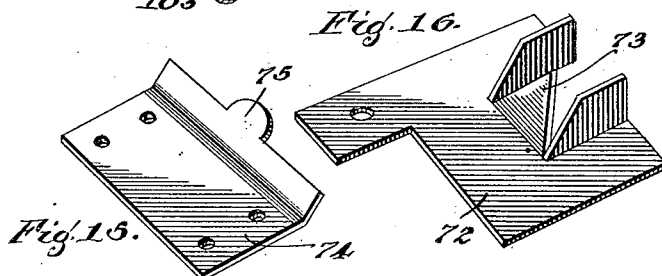


Fig. 16.



INVENTOR
Ellis W. Henderson.
BY *Wm. Geo.*
ATTORNEY

UNITED STATES PATENT OFFICE

ELLIS W. HENDERSON, OF CHARLOTTE, NORTH CAROLINA

ASSEMBLING MACHINE

Application filed May 16, 1928. Serial No. 278,306.

This invention relates to a device for assembling clothes pins of the type having spring pressed movable jaws:

An object of the invention is the provision of a device for periodically placing pairs of clamping jaws of a spring clothes pin in position for the application of the torsion spring to the jaws, each completely assembled clothes pin being automatically and periodically replaced by a pair of jaws after the torsion spring has been fitted on said jaws.

Another object of the invention is the provision of a device for assembling the elements of a clothes pin of the type having spring pressed clamping jaws and includes a magazine for feeding pairs of the clamping jaws by gravity to a space where they are forced by a plunger to an operative position beneath a spring holding member for the application of the torsion spring, the torsion spring being fed while at the same time spreading the arms and forcing the spring in proper position on a pair of the clamping jaws, the operation being continuous so that the device will function as long as the clamping jaws are fed to the magazine and the springs are supplied to the die for application to the jaws.

A further object of the invention is the provision of a device for applying torsion springs to pairs of jaws to form a clamping element, and in which the feeding device for the clamping jaws is operated periodically and alternately with a mechanism for forcing the torsion springs into operative relation with pairs of the clamping jaws, the completed element being ejected periodically by the next pair of clamping jaws.

This invention will be best understood from a consideration of the following detailed description in connection with the accompanying drawings; nevertheless, it is to be understood that the invention is not confined to the disclosure being susceptible of such changes and modifications as shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:—

Figure 1 is a plan view of the elements for

constructing the clothes pin according to the principles of my invention,

Figure 2 is a longitudinal side view of the device,

Figure 3 is a front end view,

Figure 4 is a fragmentary enlarged plan view of the mechanism for applying the torsion springs to clamping jaws to be clamped,

Figure 5 is an enlarged fragmentary plan view of the torsion spring applying mechanism with the holding spring for the clamping arms of the clamps to be moved,

Figure 6 is a fragmentary longitudinal vertical section through the spring applying mechanism before the springs are fed to the reciprocating plunger,

Figure 7 is a similar section to that shown in Fig. 6 showing the spreading means for the torsion spring receiving the spring,

Figure 8 is a similar section to that shown in Figs. 6 and 7 showing the spring applied to a pair of clamping arms,

Figure 9 is a transverse vertical section taken along the line 9—9 of Fig. 8,

Figure 10 is a transverse vertical section showing the feeding mechanism of the clamping arms,

Figure 11 is a view in perspective of the dies for aiding in applying the torsion springs to the clamping arms,

Figure 12 is a view in perspective of a device for forcing the torsion springs in position,

Figure 13 is a view in perspective of a spring member for maintaining the clamping arms in position during application of the torsion spring,

Figure 14 is a fragmentary vertical section taken along the line 14—14 of Fig. 1.

Figure 15 is a view in perspective of the forward guide for the spring applying device,

Figure 16 is a view in perspective of a guiding means for the torsion springs,

Figure 17 is a view in perspective of a clothes pin or clamping device showing the elements assembled.

Referring more particularly to Fig. 17, a clothes pin or clamping element is shown in assembled relation and is a type of clothes

pin or clamping device operated on in the assembling machine. This clothes pin consists of a pair of clamping arms 20 and 21 having clamping jaws 22 and 23, respectively. The opposite ends of the clamping arms present finger pieces 24 for forcing the jaws apart in opposition to the spring, generally designated by the numeral 67. Each of the arms is provided with transversely disposed and internally located grooves 26 adapted to receive the bight 27 of the spring 67. From the opposite ends of the bight extend spring arms 28. One arm is located along one edge of a clamping arm 20 or 21. Right angular portions 29 of the arms are received within grooves 30 in the clamping arm. The free end of the spring arm, as shown at 31, is bent downwardly and embraces an edge of a clamping arm which is opposite to the position of a spring arm 28.

It will be noted that one spring arm 28 is located upon one side of a plane passing through the center of the clamping member with each spring arm forming an acute angle with the plane. By this construction each spring arm acts upon its respective clamping member 20 or 21 for maintaining the jaws 22 and 23 in spring pressed and clamping relation.

Referring more particularly to Figs. 1 to 16 inclusive, 35 designates a table on which are mounted bearings 36 supporting a driven shaft 37, which is adapted to be revolved by a pulley 38 in any approved manner.

Fixed to the shaft 37 is a bevel gear 39 in mesh with a bevel gear 40 secured to a countershaft 41 mounted in bearings 42 carried by the table 35. A crank 43 is rigid with the shaft 41 to which is pivotally connected a link 44. The opposite end of the link is provided with a sleeve 45 receiving a pin 46. The link 44 is movable within a slot 47 formed in the table 35. It will be noted that the link is formed of two parts and is adjustable by means of the bolts 48.

A plunger bar 50 is slidably mounted in a guide composed of a top plate 51 and a bottom plate 52. Plates 54 are located between the plates 51 and 52 and are secured to said plates by means of bolts 55. The plate 54 is cut away, as is the top plate 51, as shown at 56 to provide a slot for the movement of the sleeve 45. The pin 46 is threaded at 57 into the plunger bar 50, so that as the pin is reciprocated in a longitudinal plane, said bar will also be reciprocated.

The inner end of the plunger bar 50 is provided with an extended flange 59 carrying a fork 60 at its free end. A second flange 61 spaced from the flange 59 is integrally formed with the bar 50 and has a fork 62 at its free end. The flange 61 is longer than the flange 59 for a purpose which will be presently explained. The shoulder 63 formed on the inner end of the plunger bar 50 where the

flanges 59 and 61 are connected with said bar, is adapted to abut a fixed stop 64.

The free end 65 of a curved bar 66 which forms a magazine for the torsion springs 67, rests upon the fixed stop 64 over which the flange 59 rides. The upper end of the bar 66 is provided with a notch 68 adapted to receive a bolt 69 secured to the top of a standard 70 carried by the table 35, upon which is supported by means of block 71, the lower plate 52 of the guide for the plunger bar 50. A plate 72 is secured to the plate 52 in any approved manner and is provided with a lip 73 adapted to engage the torsion spring 67 when the torsion spring is removed from the lower free end 65 of the magazine 66 by the fork 60 and for retaining the torsion spring in place until the flange 59 is moved rearwardly to permit the torsion spring to drop through the fork 60 onto the flange 61. A second plate 74 is secured to the plate 52 above the flange 61 for aiding in guiding the flange in its reciprocating movement. A lip or stop 75 projects upwardly from the plate 74 and is adapted to engage the torsion spring 67 for retaining said spring in position until the fork 62 is moved back sufficiently to permit said spring to fall on the plate 52 and be located forwardly of the fork.

A pair of die plates 76 and 77 are respectively pivoted at 78 and 79 on standards 80, which are secured to the table 35. The die plate 76 has a die 81 presenting a sharp edge 82 to the torsion spring. The upper face 83 of the die is inclined downwardly from its outer end to the sharp edge 82. The under face of the die is provided with a groove 84 adapted to receive one of the arms 31 of the torsion spring.

The die plate 77 has a die 85 presenting a sharp edge 86 to the torsion spring. The upper face 87 of the die is inclined downwardly from its outer end to the sharp edge 86. This face is also provided with a groove 88 to receive the other arm 31 of the torsion spring. The die plate 76 has a groove 89 to receive one edge of the flange 61 while the die plate 76 has a groove 90 to receive the opposite edge of said flange. The die 85 normally rests upon the die 81 and the plates 76 and 77 are supported by means of bolts 91 which are forced upwardly and into supporting relation with the die plate by means of a compressed spring 92.

A magazine generally designated by the numeral 95 has an elongated vertical passage 96 in which are adapted to be placed pairs of the clamping arms 20 and 21. The magazine is provided with longitudinal vertical slots 97 whereby it is possible to arrange the arms in proper order if distorted or displaced at any time.

The magazine, as shown at 98, is open whereby the lowest pair of clamping arms which rests upon the supporting plate 99

may be ejected from the magazine by means of the plunger 100 and under a spring member 101. This spring member has an upturned lip 102 for facilitating the application of a pair of arms beneath said spring member. A down turned finger 103 is adapted to aid in maintaining the clamping arms 20 and 21 in position on the plate 99, while the torsion spring is being applied. The spring 101 is secured to a block 101^a carried by the table 35. It will be noted that the plate 99 is supported in the blocks 99^a carried by the table 35.

A reciprocating rod 110 is mounted in bearings 111 secured to the table 35. A coil spring 112 on the rod 110 engages a shoulder 113 and the bearings 111 tending to move the rod and likewise a roller 114 into engagement with the cam member 115. The plunger 100 is secured to the rod 110 and is operated thereby.

The cam member 115 is secured to the shaft 37 and is continuously revolved thereby. This cam member consists of a circular portion 116, a cam face 117 and a releasing cam portion 118 which is formed of metal and secured to the circular portion 116 and the cam member 117, so that after the cam portion 117 rides over the roller 114 the roller will then be moved outwardly by the spring 112 as it rolls over the sliding face 119 of the member 118. The straight portion of the member 118 permits the roller to move the plunger 101 rapidly from the magazine upon which has been resting a series of pairs of clamping arms 20 and 21, whereby another pair of clamping arms will be disposed in alignment with the plunger 100 and also in alignment with the opening 98.

The operation of my device is as follows:

The magazine 95 is secured in the proper manner with pairs of the clamping arms 20 and 21, with the plunger 100 in the position shown in Fig. 10. The magazine curved bar 66 is supplied with the torsion springs 67 and the clothes pin assembling machine is ready for operation. The pulley 38 is revolved causing rotation of the shaft 37 and cam 115 for causing reciprocation of the rod 110 thereby reciprocating the plunger 100. Reciprocation of this plunger forces a pair of the clamping arms 20 and 21 from the magazine 95 and under the spring 101, which has sufficient force to retain the clamping members in position preparatory to the application of the torsion spring. After the pair of arms have been moved into position beneath the spring 101, the fork 62 which has received a torsion spring 67 which has been removed by the fork 30, forces said spring beneath the plate 74 and into engagement with the knife edges 82 and 86 of the dies 81 and 85, respectively. As the fork forces the torsion spring forwardly, the bridging portion 27 of the torsion spring is in engagement with the fork

62, the members 29 of the arms 28 being located forwardly for engagement with the knife edges of the die. These knife edges are closely associated and are approximately in the same horizontal plane and therefore engage beneath the portions 29 of the arms 28 and forces them apart with one of the turned members 31 riding in the groove 84, while the other member is adapted to ride in the groove 88. The bridging portion, however, moves between the knife edges 82 and 86 of the dies 81 and 85 and therefore rides between the under face of the die 85 and the upper face of the die 81. The thickened outer end 81^a and 85^a, respectively, in the dies 81 and 85 aid in spreading the arms 28 in opposite directions and likewise the members 29 of the spring, when as shown more particularly in Fig. 7, the member 29 of the spring 67 passes beyond the thickened portions 81^a and 85^a which will slip over the outer ends 24 of the clamping arms 20 and 21. The continued longitudinal movement of the fork 62 between the dies 81 and 85 forces the bridging member 27 between the finger pieces 24 of the clamping arms 20 and 21 until the said bridging portion is received within the transverse grooves 26. At this time, however, the members 30 of the spring 24 are riding over the outer faces of the clamping arms 20 and 21 and fit within the grooves 30 at the same time that the bridging portion 27 is seated within the cooperating grooves 26. By this last operation the clamp or clothes pin is completely assembled and is ready to be ejected from its position beneath the spring holding member 101.

While the fork 62 is being moved outwardly for applying the torsion spring to the clamping arms 20 and 21, the fork 60 is being moved forwardly and engaging another torsion spring 67 and forcing it from the free end of the magazine bar 66. This spring member is then deposited on the flange 61 when the bar 50 is withdrawn from beneath the magazine 95. The continued rotation of the pulley 38 causes the link 44 to reverse the movement of the bar 50 so that as has been explained, said bar moves rearwardly carrying the flange 61 rearwardly until the fork 62 passes beyond the spring member 67 whence the bridging or bight portion of said spring member is received by the fork 62.

While the bar 50 is being moved rearwardly and away from the dies 81 and 85 the cam member 117 will have been moved to a position where it will engage the roller 114 and force the rod 110 and plunger 100 against a pair of the clamping arms 20 and 21, thereby forcing said clamping arms from the magazine and into engagement with the completed clothes pin, shown in Fig. 8. The plunger 100 is moved sufficiently beyond the magazine 95 to cause the clamping arms 20 and 21 of the released pair to force the assembled

clothes pin from beneath the spring 101, while positioning the unassembled clamping arms beneath said spring.

Upon the return of the clamp bar 50 towards its operative position with respect to the dies 81 and 85, the fork 60 removes another torsion spring 67 from the magazine bar 66. The previously removed torsion spring, as has been described, has been deposited upon the flange 61 and engaged by the fork 62 so that during the operative movement of the bar 50, said torsion spring is again forced into position with the dies 81 and 85 whereby the outer free ends of the arms are forced apart and placed over the clamping arms 20 and 21 of the clothes pin with the bridge or bight 27 of the torsion spring being forced beneath said clamping arms and located within the cooperating grooves 26.

It will be noted from the above that while the pulley 38 and the shaft 37 are continuously revolved, that a succession of the operations just explained are maintained for applying torsion springs to pairs of the clamping arms and for removing an assembled clothes pin by means of the displacement of a pair of unassembled clamping arms from the magazine.

I claim:—

1. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar for causing periodic reciprocation of said bar, said plunger bar including a pair of spaced forks, a magazine for the torsion springs, one of the forks being adapted to remove a torsion spring from the second mentioned magazine, the other fork being employed for forcing the torsion springs into clamping relation with the arm.

2. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar for causing periodic reciprocation of said bar, means disposed in the path of the reciprocating plunger bar for causing the elements of the spring to properly engage the clamping arms of the pin.

3. An assembling machine for clothes pins comprising a magazine for storing pairs of

clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar for causing periodic reciprocation of said bar, a die through which the torsion spring is forced for adapting the elements of the spring for application to the clamping arms.

4. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar for causing periodic reciprocation of said bar, a pair of cooperating die plates in the path of the plunger bar and cooperating with said bar for adapting the elements of the spring for application to the clamping arms of the clothes pin.

5. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar for causing periodic reciprocation of said bar, a pair of cooperating die plates V-shaped in cross section and presenting a knife edge toward the free end of the plunger bar and cooperating with said bar adapting the elements of the spring for application to the clamping arms of the clothes pin when said spring is forced into embracing relation with the clamping arms of the pin.

6. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar for causing periodic reciprocation of said bar, a pair of cooperating die plates V-shaped in cross section and presenting a knife edge toward the free end of the plunger bar and cooperating with said bar adapting the elements of the spring for application to the clamping arms of the clothes

pin when said spring is forced into embracing relation with the clamping arms of the pin, said die plates being disposed in overlapping relation with each other.

5 7. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion
10 spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar
15 for causing periodic reciprocation of said bar, a pair of cooperating die plates in the path of the plunger bar and cooperating with said bar for adapting the elements of the spring for application to the clamping arms
20 of the clothes pin, means for pivotally supporting the die plates.

8. An assembling machine for clothes pins comprising a magazine for storing pairs of clamping arms of the pins, a plunger for forcing pairs of the arms of the pins into a position for the application of a torsion
25 spring, means for actuating periodically the plunger, a plunger bar for forcing the torsion spring into clamping relation with the arms, means operatively connecting the operating means for the plunger with the plunger bar
30 for causing periodic reciprocation of said bar, a pair of cooperating die plates in the path of the plunger bar and cooperating with said bar for adapting the elements of the spring for application to the clamping arms
35 of the clothes pin, means for pivotally supporting the die plates, and means for supporting and adjustably positioning the free ends of the die plates.

9. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion
45 spring, a plunger bar, means for periodically actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on
50 the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and die plates in the path of the second fork for adapting the elements of the spring for application to the arms.

10. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion
60 spring, a plunger bar, means for periodically actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on
65

the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and overlapped die plates to receive and adapt the elements of the spring for application to the arms.

11. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion
75 spring, a plunger bar, means for periodically actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on
80 the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and pivotally mounted and overlapped die plates to receive and adapt the elements of the spring for application to the arms.

12. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion
90 spring, a plunger bar, means for periodically actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on
95 the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and pivotally mounted and overlapped die plates to receive and adapt the elements of the spring for application to the arms, and means for supporting the free ends of the die plates in a horizontal plane and for adjustably positioning said plates relative to the second mentioned fork.

13. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion
110 spring, a plunger bar, means for periodically actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on
115 the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and pivotally mounted and overlapped die plates to receive and adapt the elements of the spring for application to the arms, a cushioning means for adjustably supporting the free ends of the die plates for receiving the second mentioned fork between said plates.

14. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion
125 spring, a plunger bar, means for periodically

70

75

80

85

90

95

100

105

110

115

120

125

130

actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and overlapped die plates to receive and adapt the elements of the spring for application to the arms, a cushioning means for adjustably supporting the die plates whereby said fork will be moved between the die plates.

15. An assembling machine for the elements of clothes pins comprising a magazine for storing pairs of clamping arms of the pins, means for positioning pairs of the arms of the pins for the application of a torsion spring, a plunger bar, means for periodically actuating the positioning means and the plunger bar, a magazine for the torsion springs, a fork on the bar for releasing a spring from the magazine, a second fork on the bar for receiving the spring and forcing the same into operative relation with the clamping arms, and overlapped die plates to receive and adapt the elements of the spring for application to the arms, a resilient means in line with the plunger for receiving and holding a pair of the clamping arms ejected from the magazine.

16. In a machine of the character described, means for moving the side arms of a spring member of a clothes-pin away from each other to spread the bridle portions thereof, comprising wedge shaped spreading means about which said bridle portions are adapted to pass, and means whereby said spread spring member is engaged about the two clamping members of the clothes-pin.

17. In a machine of the character described, means for holding two clamping members of a clothes-pin for feeding a spring member longitudinally into embracing relation with said clamping members, and means for moving the side arms of the spring member away from each other to spread the bridle portions thereof, and about which said spring member is adapted to pass during its longitudinal feeding movement.

18. In a machine of the character described, means for moving the side arms of a spring member of a clothes-pin away from each other to spread the bridle portions thereof, comprising a pair of superimposed separable spreading members about which said bridle portions are adapted to pass and between which the fulcrum and tension portion is adapted to pass, and means whereby said spread spring member is engaged about the two clamping members of the clothes-pin.

19. In a machine of the character described, means for holding two clamping members of a clothes-pin, means for feeding a spring member longitudinally into embracing relation with said clamping members, and means

for moving the side arms of a spring member away from each other to spread the bridle portions thereof, comprising a pair of superimposed separable spreading members about which said bridle portions are adapted to pass, and between which said spring feeding means and the fulcrum and tension portion of the spring member are adapted to pass, during the longitudinal feeding movement.

Signed at Charlotte in the county of Mecklenburg and State of North Carolina, this 12th day of May, A. D. nineteen hundred and twenty-eight.

ELLIS W. HENDERSON.

80

85

90

95

100

105

110

115

120

125

130