May 25, 1926. 1,586,217

F. POLZER

PIN FASTENING MACHINE

Filed April 14, 1925 2 Sheets-Sheet 1

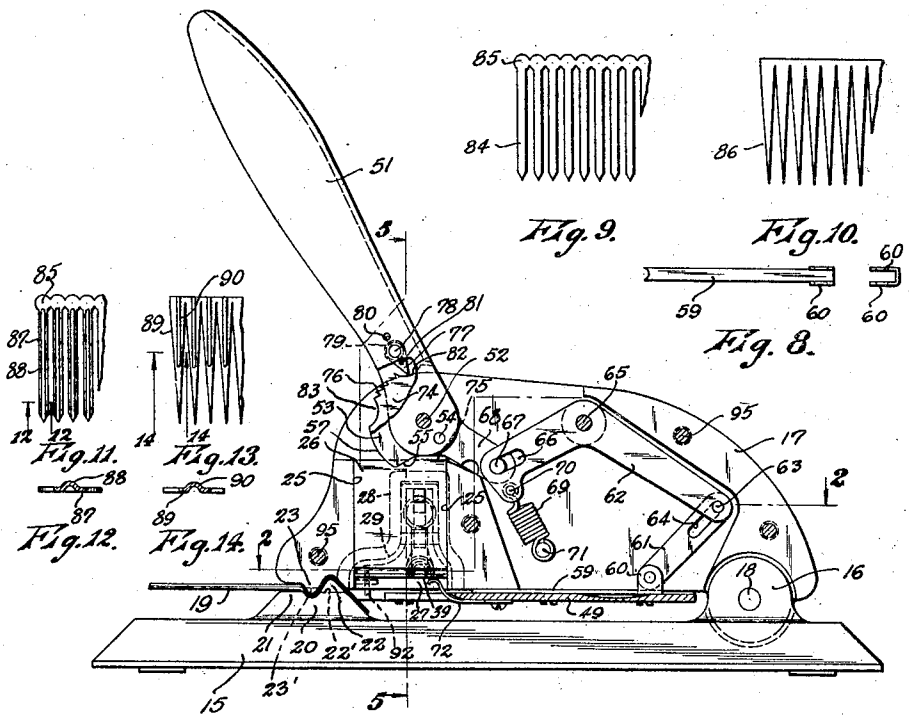


Fig. 1.

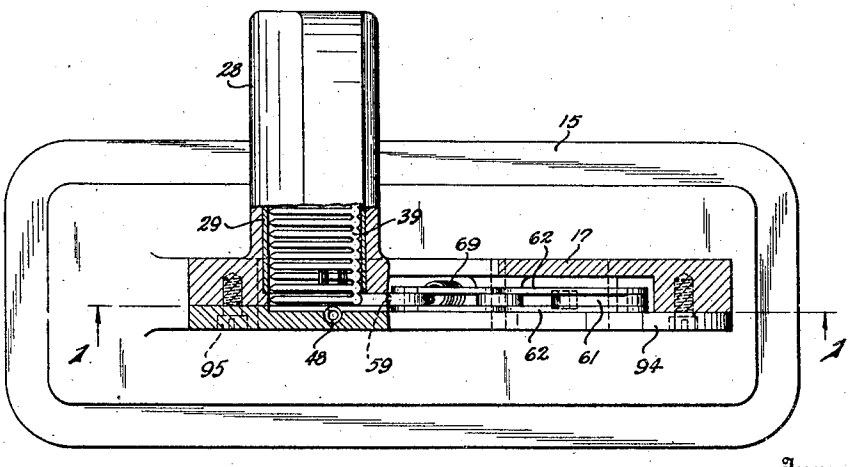


Fig. 2.

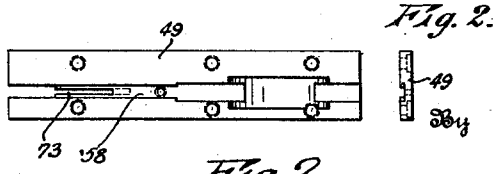


Fig. 2.

Inventor

Fridolin Polzer

By Wooster & Davis

Attorney

May 25, 1926. 1,586,217

F. POLZER

PIN FASTENING MACHINE

Filed April 14, 1925 2 Sheets-Sheet 2

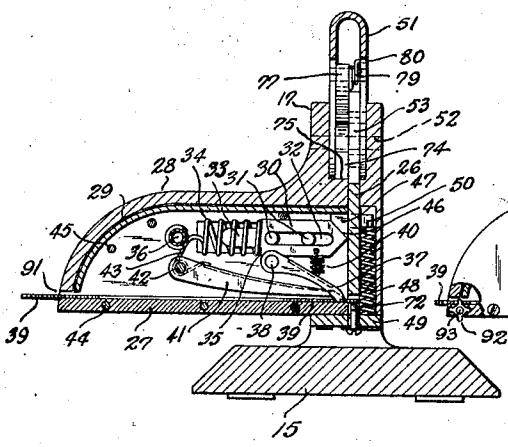


Fig. 5.

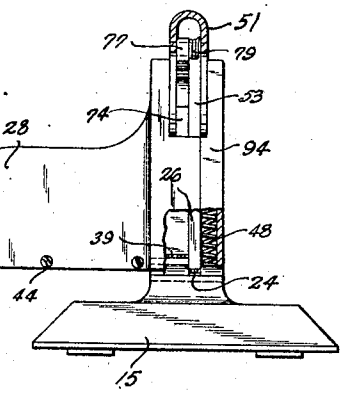


Fig. 6.

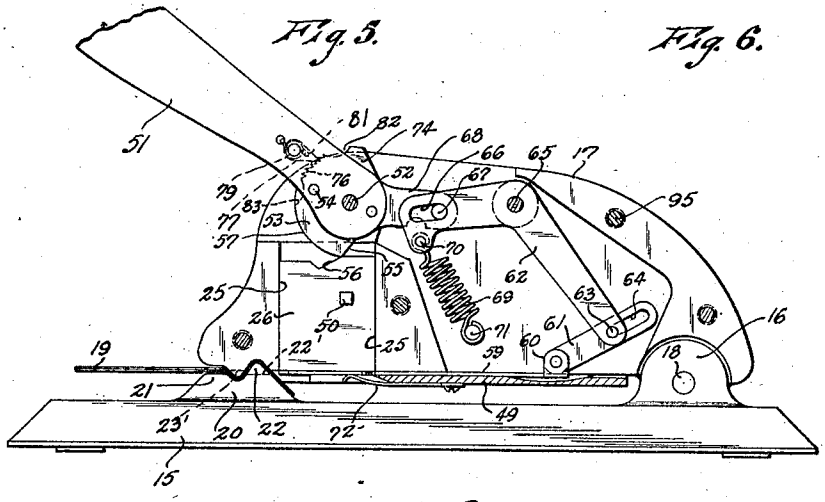


Fig. 3.

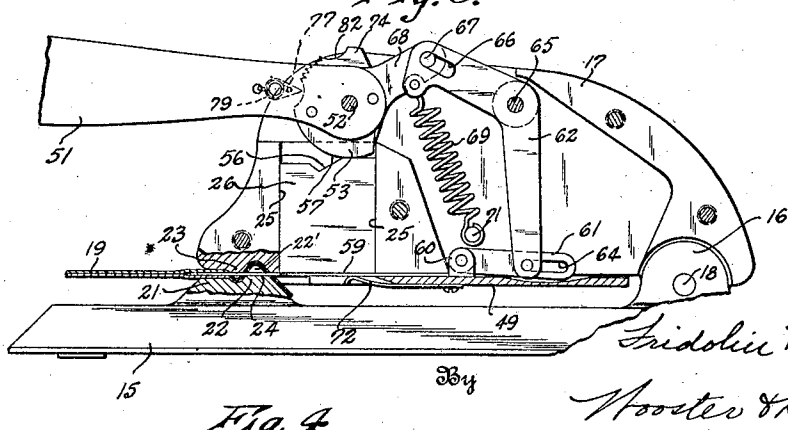


Fig. 4.

Inventor

Isidolie Polzer

By Wooster & Davis

Attorneys.

Patented May 25, 1926. 1,586,217

# UNITED STATES PATENT OFFICE.

FRIDOLIN POLZER, OF NORWALK, CONNECTICUT, ASSIGNOR TO THE E. H. HOTCHKISS COMPANY, OF NORWALK, CONNECTICUT, A CORPORATION OF CONNECTICUT.

## PIN-FASTENING MACHINE.

Application filed April 14, 1925. Serial No. 22,976.

This invention relates to devices for securing together a plurality of articles such as sheets of paper and the like, and has for an object to provide an improved device which will secure a plurality of these articles by means of a securing element without clinching, and particularly by means of a straight flat pin.

It is also an object of the invention to provide a device of this character which will cut the individual pins from a strip of integrally connected pins and will then insert them through the articles in the proper holding position.

It is a further object of the invention to provide a construction in which after a movement of the operating means for the pin severing and driving mechanism has been started it cannot be returned to its original position without completing its forward stroke, to thus prevent clogging of the machine by an incomplete operation of the same.

With these and other objects in view, I have devised the construction illustrated in the accompanying drawings forming a part of this specification, similar reference characters being employed throughout the various figures to indicate corresponding elements. In these drawings,

Fig. 1 is a longitudinal vertical section of the upper portion of my improved device taken substantially on line 1—1 of Fig. 2, the base portion being shown in elevation, and the elements being shown in the normal position before operation for securing the members is commenced.

Fig. 2 is a partial top plan view and partial section substantially on line 2—2 of Fig. 1.

Fig. 3 is a view similar to Fig. 1 showing the position of the elements after one of the securing elements has been severed from the strip.

Fig. 4 is a similar view showing the elements in the position they occupy at the end of the forward movement of the operating lever.

Fig. 5 is a transverse section substantially on line 5—5 of Fig. 1.

Fig. 6 is a front elevation with portions of the housing being broken away to more clearly show the construction, the elements being in the position corresponding to Fig. 3.

Fig. 7 is a detail plan and end elevation of the guide for the pin and driving slide.

Fig. 8 is a top plan and end elevation of the driving slide.

Fig. 9 is a top plan view of a portion of a strip of pins for use in this machine.

Fig. 10 is a similar view showing a slightly different shape of pin.

Fig. 11 is a view similar to Fig. 9 showing means for strengthening the pin.

Fig. 12 is a transverse section of one of the pins on an enlarged scale taken on line 12—12 of Fig. 11.

Fig. 13 is a view similar to Fig. 10 showing means for strengthening this type of pin, and

Fig. 14 is a transverse section of one of the pins of Fig. 13 on an enlarged scale and taken substantially on line 14—14.

My improved device comprises a base 15 provided with upwardly extending ears 16 between which is pivoted a housing 17 by means of a pivot pin 18 to allow the opposite end of the housing to be lifted for insertion and removal of the articles 19 to be connected. Carried by the base adjacent its opposite end is an anvil 20 curved substantially as shown at its upper end to provide a pair of spaced ridges 21 and 22 adapted to seat in correspondingly spaced transverse grooves in the lower surface of the housing, these grooves being separated by a ridge 23 to extend into the groove between the ridges 21 and 22, so that when the housing is pressed down on sheets of flexible material 19 between the housing and the anvil these sheets will be crimped substantially as shown. The ridge 22 is higher than the ridge 21 and is provided with a groove 22′ for passage of a securing pin 24 as will presently be described, the bottom of this groove being so arranged with respect to the top of the ridge 21 that there is sufficient space beneath the pin for at least one sheet of the articles to be connected, so that after the pin is inserted its point will be between two adjacent sheets, as shown in Fig. 4, where the point cannot catch on other articles or injure any one. Although this device is ordinarily intended for use in pinning together sheets of paper it is, of course, adapted for use in pinning together other flat articles, such as cloth and the like, and although throughout the specification and claims I use the term

"paper sheets", for sake of brevity I wish it to be distinctly understood that by so doing I do not limit the use of the device for securing together sheets of paper.

Mounted in the housing is the means for severing the pins from the integral strip and inserting them through the crimped sheets of paper. The housing is provided with vertical guides 25 in which a plunger 26 is mounted to reciprocate, the lower end of this plunger being arranged to cooperate with the forward end of a guide and supporting element 27 to cut the individual pins from the strip. The guide 27 is mounted in a laterally extending portion 28 of the housing. This laterally extending portion is open on the under side thereof for the insertion of a unit assembly including the guide or support 27 and feeding mechanism for the strip of pins. This assembly comprises a casing 29 adapted to fit in the chamber in the lateral portion 28 of the housing, and it is inserted in the same through the open under side of this portion. Mounted in this casing is a sliding cam member 30 guided to reciprocate on transverse pins 31 carried by the casing and extending through an elongated slot 32 in the member 30. The member 30 is reduced at its outer end 33 where it is embraced by a spring 34 reacting against the shoulder 35 and pin 36 to tend to move the member 30 forwardlly to the position shown in Fig. 1, the movements of this member being limited by the pins 31 engaging the ends of the slot. A feed pawl 37 is pivoted to the member 30 at 38 and has teeth at its free end to engage the pins on the strip 39 to advance the strip as the member 30 is advanced under the action of the spring 34. The free end of the pawl is held in engagement with the strip by means of a spring 40. A hold-back 41 is pivoted in the casing at 42 and has similar teeth at its free end to engage the pin strip to prevent backward movement of the strip when the pawl 37 is moved backwardly over the strip for a succeeding feeding operation. The holdback is normally held in engagement with the strip by a spring 43. The casing is open at its under side, in which opening the guide or support 27 is mounted as by means of screws 44, and the casing may be secured in the housing by means of transverse pins or screws 45. The member 30 is tapered at its forward end as shown at 46 for engagement with a cam lug 47 on the plunger 26. It will be apparent that as the plunger is reciprocated up and down the member 30 will be reciprocated by means of the cam lug 47 and spring 34 to advance the pin strip 39 with a step by step movement to bring the individual pins successively to the severing position under the lower end of the plunger. The plunger is normally held in its upper position by a spring 48 engaging at its lower end a guide plate 49 and at its upper end the lug 50 carried by the plunger.

Mounted in the casing above the plunger is an operating lever 51 preferably substantially U-shape in cross section as shown, and it is pivoted in the housing by means of a pin 52. Between the sides of this lever is mounted a cam member 53 secured to the lever to swing therewith by any suitable means such as screws or pins 54. This cam has an inclined wall 55 to engage the upper end of the plunger and particularly an inclined cam surface 56 thereon, and the cam member has a surface 57 formed on the arc of a circle with the pin 52 as a center so that as the lever is swung downwardly about its pivot the cam surfaces 55 and 56 will move the plunger downwardly to the position shown in Fig. 3 to sever a pin from the strip 39, but further downward movement of the lever will not impart any further movement to the plunger because the concentric edge 57 will engage the upper end of the plunger. This concentric edge will, however, hold the plunger stationary in the position shown in Figs. 3 and 4 so that the lower end of the plunger will form a guide at the upper side of the severed pin.

Means is provided to force the severed pin through the crimped portion of the sheets of paper or other material 19. For this purpose there is mounted at the lower edge of the housing a guide plate 49 provided with a groove 58 in its upper side in alignment with the plunger, so that as the plunger is forced downwardly to cut a pin from the strip the severed pin will lie in the forward end of the groove 58 under the plunger. There is also mounted in this groove and back of the pin a slide or pusher 59 which has upwardly extending ears 60 for pivotal connection with a link 61 connected to one arm of a bell crank 62 by means of a pin 63 extending through a slot 64. The bell crank is pivoted in the housing at 65 and its other arm is provided with a slot 66 to receive a pin 67 carried on an arm 68 of the operating lever 51. The bell crank preferably comprises two members on opposite sides of the arm 68 and the link 61 so that in operation there will be no cramping action on the pivotal connections. A spring 69 connected to the latter arm of the bell crank by a pin 70 and to the housing by a pin 71 tends to swing this bell crank counterclockwise, as viewed in Figs. 1, 3 and 4, and to thus lift the operating lever and hold it in its upper position and also retract the slide or pusher 59 to the position shown in Fig. 1. The slide or pusher 59 will engage the head end of the severed pin under the plunger and push it forwardly to the position shown at 24 in Fig. 4 when the operating lever 51 is moved from the position of

Fig. 3 to the position of Fig. 4. A spring finger 72 is mounted on the under side of the guide plate 49 with its free end projecting upwardly through a slot 73 in the bottom of the guide groove 58 so that this spring will engage the under side of the severed pin and guide it while the slide 59 is pushing it forwardly. It will also hold the pin in proper position and prevent its dropping out.

It will be apparent that should the operator force the operating lever 51 downwardly part way, say to the position shown in Fig. 3, a pin will be cut off the strip, but if for some reason he should return the lever to the original position without completing the forward movement to force the severed pin into the crimped sheets, the pin would lie under the plunger in the groove 58, and if another movement should be given to the operating lever another pin would be cut off and the machine might be clogged. To prevent this, means is provided to prevent return of the operating lever 51 to its original position after its forward movement has once been started, unless this movement has been completed to drive the pin. For this purpose a plate 74 is mounted between the sides of the operating lever and on the pivot 52. This plate has a flat lower edge resting on the shoulder 75 of the housing so that the plate is held stationary. It is provided on its edge with a series of teeth 76 in position to be engaged by the free end of a pawl 77 pivoted to the lever at 78, and a coil spring 79 embraces this pivot pin and is secured at one of its free ends 80 to the lever and at its other free end 81 to the pawl, so that should the pawl swing in either direction from the position of Fig. 1 it will tend to swing the pawl back to this position. At the opposite sides of the teeth 76 the plate 74 is provided with notches or recesses 82 and 83 which will allow the free end of the pawl to swing in either direction. Thus should the lever be forced downwardly, say to the position shown in Fig. 3, the pawl 77 will engage one of the teeth 76 and prevent its return to the original position unless the forward movement is completed to the position shown in Fig. 4, where the notch 83 will allow the pawl to swing in the opposite direction and permit the lever to be swung back to the original position shown in Fig. 1. In this position the notch 82 will allow the pawl to swing and permit another forward or downward movement of the lever.

The pins for this machine are formed in integral strips as for instance such as illustrated in Figs. 9 to 14, although other shapes of course may be used if desired. The pins are cut from a strip of sheet metal and are left integrally connected at one end as the head end, and this connection is cut as described above the plunger to separate the individual pins from the strip before they are inserted in the crimped sheets of paper. In the form shown in Fig. 9, the pins 84 are substantially of the same width throughout and pointed at one end, and are provided with heads 85 which are connected together. In Fig. 10 the pins 86 are tapered to give a pointed end and to make them relatively wide at the opposite end where they are connected together. In Figs. 11 and 12 the pins 87 are substantially the same, as shown in Fig. 9, except a strengthening rib 88 is formed extending longitudinally of the body of the pin by pressing it into the pin. By this arrangement a pin of a given stiffness may be provided from a thinner metal stock, thus giving a saving in the amount of metal required. In Figs. 13 and 14 the pins 89 are similar to the pins of Fig. 10 but are provided with longitudinal strengthening ribs 90 the same as shown in Figs. 11 and 12.

The operation will be apparent from the foregoing description. The housing 17 is provided with an opening 91 above the guide 27 for insertion of the strip of pins. It will be obvious that the pins must be inserted with their points directed toward the crimping means 20 to 23, and I, therefore, provide means to insure that the strip will be properly inserted in the housing. For this purpose I mount adjacent the inlet opening 91 a starred or toothed wheel 92 mounted in a recess in the guide 27 on a pivot pin 93. It is so located that the teeth project above the top surface of the guide in position to project between the pin if the strip is inserted in proper position, but if the strip is reversed and an attempt made in insert it with the pins pointing in the opposite direction the teeth on this wheel will engage the metal joining the pins together and will prevent insertion of the strip in this position.

Assuming the pins are properly inserted the first or forward pin on the strip when the elements are in the positions shown in Figs. 1, 2 and 5 will lie under the lower end of the plunger 26. The free end of the housing may be lifted by means of the operating lever 51 and the sheets 19 to be connected may be placed over the anvil 20. By lowering the housing the sheets are crimped as shown. The operating lever 21 is then forced downwardly and the cam surfaces 55 and 56 will force the plunger downwardly to the position shown in Figs. 3 and 4, which will cut the first pin from the strip and place it in the groove 58. During this movement of the plunger the slide or pusher 59 has made only a slight movement because of the pin and slot connection 63—64, but on further movement of the operating lever from the position shown in Fig. 3 the plung-

er 26 will remain stationary and form a guide at the upper side of the severed pin while the slide 59 will be advanced under the action of the bell crank lever 62. During this forward movement the forward end thereof will engage the head end of the pin and push it forwardly under the plunger through the notch 22' in the top of the ridge 22 and through the crimped sheets 19 as indicated in Fig. 4, but with the free end of the pin between two adjacent sheets so that it is not exposed to catch on other sheets or injure any one.

It will be apparent from the foregoing description that the device is very simple in construction and so may be made strong and rigid and in a manner not likely to be easily gotten out of order. The operation of the device is a very simple one requiring merely the lifting of the free end of the housing by means of the operating lever, placing the sheets to be connected over the crimping anvil, lowering the free end of the housing on the top of the sheets to crimp them and then forcing the lever downwardly as far as it will go. The use of pins in integral strips makes the device easy to load and greatly facilitates the handling of the pins. It will be apparent from the drawing that the housing is open on one side so that the operating lever, plunger, bell crank and so forth are easily mounted in position and then the open side is closed by a relatively heavy plate 94 which may be secured by suitable screws 95. When in position this plate in effect forms a part of the housing and supports the opposite ends of the pivot pins 52 and 65 as well as acting to retain the elements in the housing.

Having thus set forth the nature of my invention, what I claim is:

1. In a device of the character described, a base, a housing pivoted to the base, coacting paper crimping means carried by the base and housing, means mounted in the housing for severing the individual pins from an integral strip of preformed pins, and means for inserting the severed pin through the crimped paper.

2. In a device of the character described, a base, a housing pivoted to the base, coacting paper crimping means carried by the housing and base, said housing being provided with a laterally extending portion, feeding means in said lateral portion for advancing a strip of integrally connected pins, and means in the housing for severing the individual pins from the strip and inserting them through the crimped paper.

3. In a device of the character described, means for crimping a plurality of flexible sheets, means for advancing a strip of integrally connected pins, means movable in a direction laterally of the plane of the strip for severing the individual pins from the strip, and means movable substantially parallel with the plane of the strip for inserting the severed pins through the crimped sheets.

4. In a device of the character described, a housing, a support for a flat strip of integrally connected pins in said housing, feeding means for advancing the strip on the support, said housing being provided with an opening for insertion of said strip, means arranged to cooperate with the connections between the pins for preventing inserting of the strip except when the points of the pins extend in a certain direction, and means for severing the individual pins and inserting them in articles to be secured.

5. In a device of the character described, a housing having a laterally extending portion, a plunger in the housing for severing individual pins from an integral strip, means for crimping a plurality of flexible sheets, means for inserting the severed pin through the crimped sheets, and a unit assembly arranged to be inserted as a whole into the housing including a guide for the strip and feeding means for advancing the strip to bring the pins succesively to severing position.

6. In a device of the character described, a housing having a laterally extending portion open at one side thereof, means in the housing for severing individual pins from an integral strip, means for inserting the severed pins in articles to be secured, and a unit assembly including a casing, a strip support carried by the casing and feeding means mounted in the casing to advance the strip to bring the pins successively to severing position, said unit arranged to be inserted in the said open side of the housing, and means for securing it in the housing.

7. In a device of the character described, a reciprocable plunger for severing individual pins from an integral strip, means for feeding a strip of integrally connected pins to bring the pins successively to the severing position, means for crimping flexible sheets to be connected, a reciprocable slide for inserting the severed pins in the crimped sheets, and a pivoted lever for operating the plunger and the slide.

8. In a device of the character described, a base, a housing pivoted to the base, coacting means carried by the housing and base for crimping flexible sheets, a reciprocable plunger carried by the housing for severing individual pins from an integral strip, feeding means for advancing the strip to bring the pins successively to the severing position, a slide for inserting the severed pins in the crimped sheets, and a lever pivoted in the housing having operative connection with the plunger and the slide.

9. In a device of the character described, a housing, a reciprocable plunger in said

housing for severing individual pins from an integral strip, means for feeding the pins to the severing position, a pivoted lever, a cam operated by the lever for shifting the plunger, a slide for inserting the severed pins in articles to be secured, and an operative connection from the lever to the slide.

10. In a device of the character described, a housing, a support in the housing for a strip of pins integrally connected adjacent one end thereof, means for severing the individual pins from the strip and inserting them in articles to be secured, said housing having an opening for insertion of the strip, and a rotary wheel having a plurality of teeth on its periphery arranged to engage the connections between the pins to prevent insertion of the strip with the points of the pins directed in the wrong direction, but to extend between the pins when they point in the opposite direction.

11. In a device of the character described, means for crimping flexible sheets, a support for a strip of integrally connected pins, a reciprocable plunger for severing the individual pins from the strip, a guide beneath the plunger for the severed pins, a slide in the guide for inserting a severed pin through the crimped sheets, and means for operating the plunger and slide in timed relation.

12. In a device of the character described, means for crimping flexible sheets, a support for a strip of integrally connected pins, a reciprocable plunger for severing the individual pins from the strip, a guide beneath the plunger for the severed pins, a slide movable in the guide and arranged to engage the head of the pin to force it into the crimped sheets, a spring finger carried by the slide to engage the under side of the pin, and means for operating the plunger and slide.

13. In a device of the character described, a housing, a support in the housing for a strip of integrally connected pins, means for crimping flexible sheets, a reciprocable plunger for severing the individual pins from the strip, a slide for inserting the severed pins in the crimped sheets, a pivoted lever, a cam operated by the lever for shifting the plunger, a pivoted bell crank lever, and operative connections for the bell crank lever to the first lever and to the slide.

14. In a device of the character described, a housing, a support in the housing for a strip of integrally connected pins, means for crimping flexible sheets, a reciprocable plunger for severing the individual pins from the strip, a feeding means for advancing the strip to bring the pins successively to the severing position and operated by movement of the plunger, a guide below the plunger for the severed pins, a slide movable in the guide arranged to engage the head of a pin to force it through the crimped sheets, a pivoted lever, and operative connections from the lever to the plunger and the slide.

15. In a device of the character described, means for crimping a plurality of superimposed flexible sheets, means for severing individual pins from a strip of integrally connected pins, and means for inserting a severed pin through the crimped sheets so as to leave its point between two adjacent sheets.

16. In a device of the character described, means for severing a securing element from an integral strip of these elements and for driving the individual elements after they have been severed, means for operating said severing and driving means including a lever pivoted for forward and reverse movements, a pawl pivoted to the lever and arranged to swing in both directions about its pivot, a spring tending to hold it in an intermediate position, a stationary member having a series of teeth to engage the pawl to prevent reverse movement of the lever unless it is first moved to sufficient distance to drive the securing element, said member being provided with recesses to allow reversal of the pawl at the extremes of the lever movements, an arm on said lever, and means operated by the arm for actuating said driving means.

In testimony whereof I affix my signature.

FRIDOLIN POLZER.