

June 19, 1928.

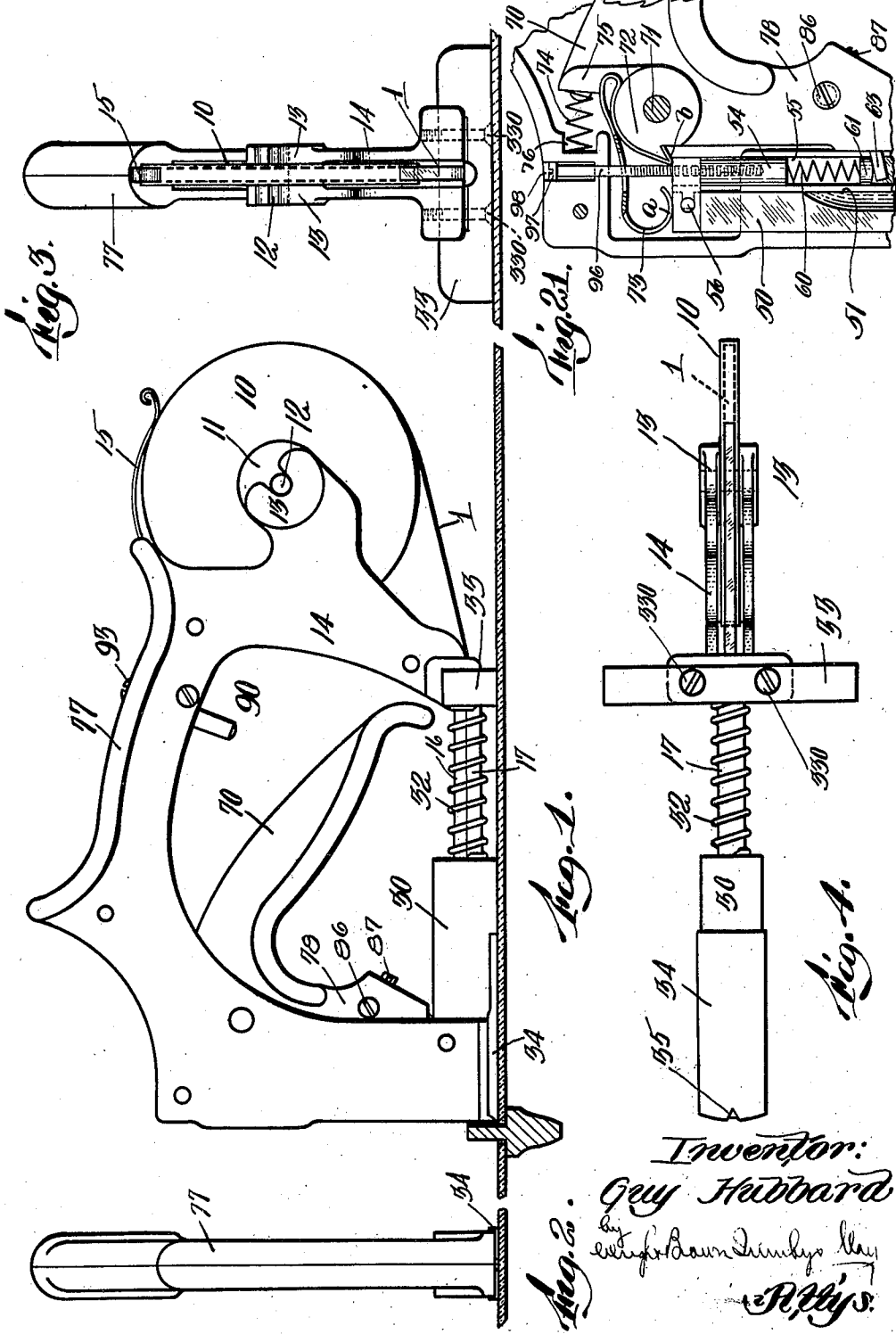
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GLAZIER'S POINT SETTER

Filed Oct. 22, 1921

3 Sheets-Sheet 1



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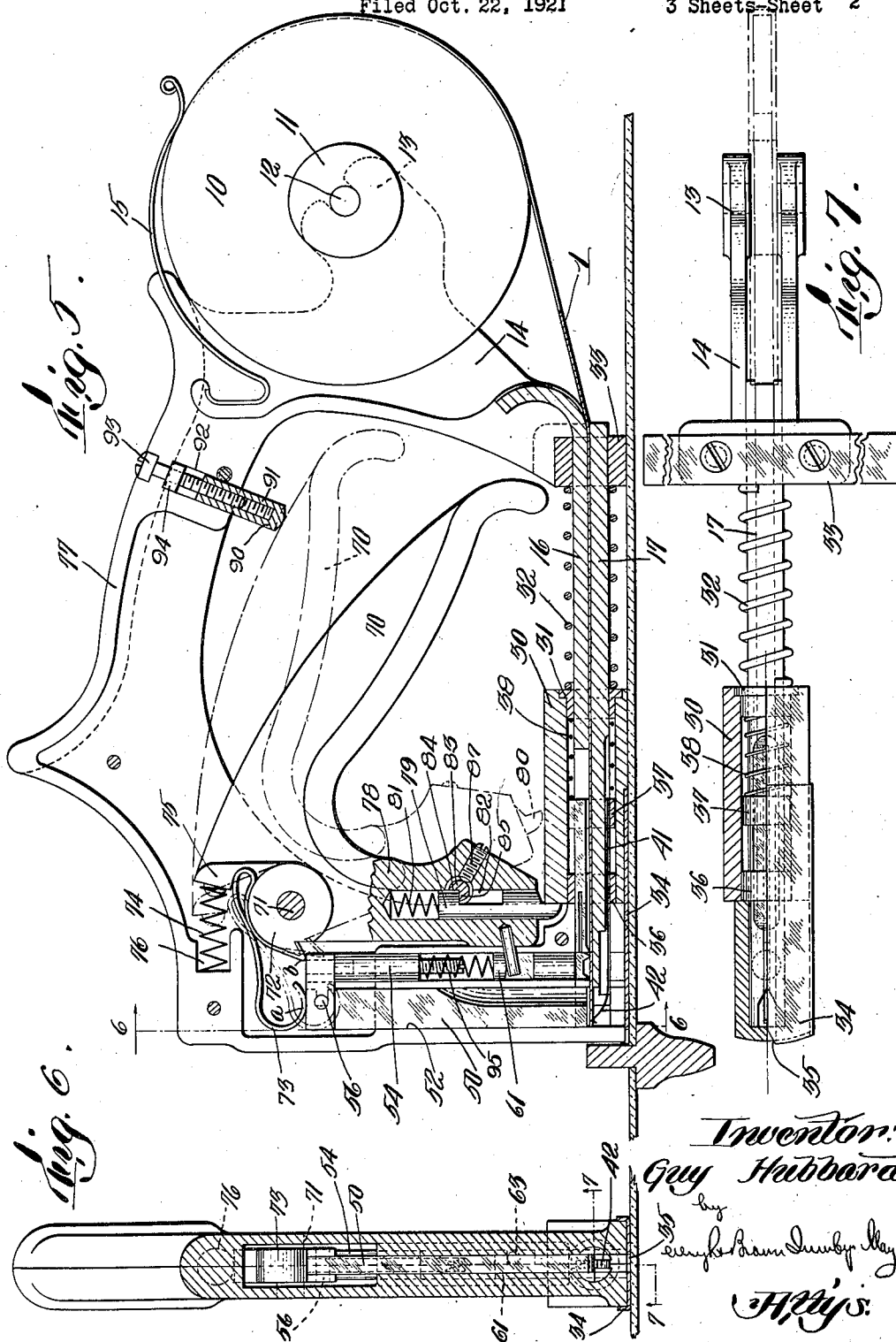
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Filed Oct. 22, 1921

3 Sheets-Sheet 2



UNITED STATES PATENT OFFICE.

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GLAZIER'S POINT SETTER.

Application filed October 22, 1921. Serial No. 509,762.

In setting glass in sashes it has been customary to drive into the sash to hold the glass in place before the sash is puttied metal points of either triangular or diamond shape.

5 The use of the diamond point, while saving half the material with equal holding power over the triangular form required the development of a machine for driving the points, since with a diamond shape there is no flat surface to receive the driving blow.

10 A machine for this purpose is shown in the patent to George W. Hubbard No. 252,379, January 17, 1882, the diamond points themselves being covered by Patent No. 230,631, granted August 3, 1880 to the same inventor.

15 In the machine the points are stacked in superposed relation and driven out one by one from the bottom of the stack as required.

20 In order to facilitate the handling and loading of these points it has been proposed to cement them together to form columns or sticks insertable as units in the machine, this being shown and described in the Hubbard Patent No. 230,632, dated August 3, 1880.

25 As the lowest point of the stick must be sheared off when being driven it is essential that the cement be somewhat weak and consequently the sticks are inclined to break apart, especially when roughly handled.

30 Such sticks are commercially put up in lengths of two inches, each stick having about one hundred points. It is therefore necessary to load the machine often and some times with several short sections.

35 The present invention seeks to provide a machine in which the points are cut from a strip insertable in the machine coiled and in which the cutting, driving and feeding operations are controlled by a single operative movement of the main actuator for the machine. Such a coil having an outside diameter of approximately $3\frac{1}{4}$ inches and wound on a core of about one inch in diameter contains somewhat over a thousand points of the type contemplated by this invention and is not subject to being broken up in handling as are the sticks.

40 In order to drive the points in the same direction as the feed through the machine and at the same time to avoid waste in cutting, a novel shape of point has been devised which utilizes almost as small an amount of metal as the diamond point and possesses certain advantages in holding power there-
55 over.

The machine for driving these points is so designed that by movement of a trigger in one direction a point is punched off and presented in position to be driven, and the driver is retracted under spring pressure and then released to drive the point, the remainder of the strip being held from movement. As the trigger is allowed to move in the opposite direction the strip is released and a feed finger permitted to feed it forward preparatory to cutting and driving a succeeding point. This feeding takes place between the driving strokes of the machine and is effected by a spring so that the action is not sudden like that of the driving, but is accomplished without shock or jerk.

For a more complete understanding of this invention, together with further objects and advantageous details and combinations of parts, reference may be had to the accompanying drawings in which:

Figure 1 is a side elevation of the machine, the parts being shown in position ready to drive a fastener.

Figures 2 and 3 are end elevations looking in opposite directions.

Figure 4 is a bottom plan view.

Figure 5 is a central longitudinal cross section.

Figure 5^a is a fragmentary section similar to a portion of Figure 5; but illustrating a slight modification.

Figure 6 is a section on line 6—6 of Figure 5.

Figure 7 is a section on line 7—7 of Figure 6.

Figures 8 and 9 are fragmentary sections similar to Figure 5, showing the parts in different relative positions.

Figure 10 is a plan of the fastener strip.

Figure 11 is a cross section thereof.

Figure 12 is a section on line 12—12 of Figure 10.

Figure 13 is a perspective view of a point on an enlarged scale as cut off from the strip.

Figure 14 is a detail and perspective of the feeding and supporting members of the machine.

Figure 15 is a detail of the same guide members shown separated.

Figure 16 is a perspective of the lower guide member in longitudinal section.

Figure 17 is a perspective of the punch.

Figure 18 is a top plan of the punch lifter.

Figure 19 is a side elevation of the same.

Figure 20 is a perspective of the strip-retaining plunger.

Figure 21 is a fragmentary section similar to a portion of Figure 5, but showing a modified construction of certain parts.

Referring first to Figures 10 to 13, the strip from which the points are cut comprises a metallic ribbon 1 having beveled sides 2 which is indented at intervals to form parallel V-shaped or reentrant angle indentations 3 which define the lines along which the sections are to be cut off by the punch to form the individual points. As shown more particularly in Figure 12, the depressions 3 are formed with a bevel 4 along the outside of the angle and a substantially vertical edge 5 on the other side so that the points when cut, as shown in Figure 13, comprise a pair of outwardly beveled prongs 6 which may be driven into the sash somewhat in the nature of a staple and tend to spread increasing the holding effect of the point, the other end of the point terminating in a single projecting point 7 complementary to the space between the prongs 6. The strip is formed in this manner by being passed between corrugated rolls and through a die, the action of the rolls forming the depressions 3 which serve to partially sever the strip into sections which form the driving points, to sharpen the inner faces of the prongs which enter the sash, and which also serve to stretch the material of the strip lengthwise so that an increased number of points may be cut therefrom, while the action of the die is to bevel the outer edges of the strip, and to "size" it after any deformation by the corrugated rolls. The weakened portions of the strip formed by the depressions 3 also render the strip more flexible so that it may be readily wound into a coil on a mandrel which may be supported in the driving machine. These depressions also furnish pockets for containing lubricant for lubricating the punch and other mechanism of the driving machine if desired and they also serve as abutments engageable by the feed and retainer fingers to be later described so that the feeding action is rendered accurate and certain.

The strip is preferably coiled within a suitable container such as a round cardboard box as shown at 10 in Figures 1, 3, 4, and 5 having a central bore 11 through which is passed a pin 12 which may rest between a pair of upwardly and rearwardly extending jaws 13 fixed at the rear end of the frame 14 of the driving machine. A leaf spring 15 fixed at its forward end to the frame 14 may bear on this box to hold it in position. The strip may be led out through a suitable slot in the outer wall of this box which is stationary and from thence passes between a pair of supporting and guiding rods 16 and 17 projecting forwardly from the frame and

leading to the forward edge of the machine from which the driving of the points takes place. The supporting and guiding rods for the strips are shown detached in Figures 15 and 16, the upper of these rods 16 having a grooved lower face 18 within which the fastener strip may lie. The forward end of this rod is slotted out to form a guideway 19 in which may be slidably guided a feed finger which will be described later and is recessed at 20 so that a punch may pass therethrough. The lower rod 17 has a flat top face 21 which serves to retain the fastener strip within the groove 18 when the rods are positioned together in the machine. The forward end of this rod 17 is recessed at 22 mating with recess 20 and forms a die for the punch and merging into this opening 22 is the forward end of a groove 23.

The rods 16 and 17 when placed together form a substantially round guide on which is adapted to reciprocate a driving ram 30 formed as a sleeve. This driving ram is supported from the rods 16 and 17 at one end by means of a bushing 31 which has a sliding fit upon the rod, this bushing receiving the thrust from a coil spring 32 around the rods 16 and 17 and bearing at its rear end against a slotted block 33 supported in the machine frame, through which the guide rods pass, and by which they are clamped in place by tightening the screws 330 which fasten the block to the frame. The forward end of the ram 30 has fixed thereto a point driver 34, this driver having at its forward end a notch 35 to engage on the rear pointed end of the point. The front end of the ram is guided on the rods 16 and 17 by means of a bushing 36, the internal diameter of the ram between the bushings 31 and 36 being somewhat larger than the external diameter of the guide rod. Between the bushings 31 and 36 is a collar 37 which is free to slide on the rods 16 and 17 and within the ram. This collar is normally urged toward the bushing 36 by means of a coil spring 38 positioned between it and the bushing 31. The collar 37 has projecting from its forward face a feed finger 138 having a spring portion 39 terminating at its outer end in a point 40 which may find engagement within the indentations 3 of the fastener strip. This feed finger is adapted to slide within the notch 19 of the upper guide rod. Opposite the feed finger is mounted a spring supporting finger 41 having an upwardly directed outer end 42. This spring is movable within the slot 23 of the lower guide rod and its forward end is adapted to support the point strip within the die opening 22 prior to the cutting off operation.

The points to be driven are sheared off by a punch shown at 50 having its rear face pointed at 51 to mate the strip indentations

3. This punch is slidable vertically within a rectangular opening 52 of the machine frame, this frame being composed of a pair of mating side sections riveted together at intervals and having mating recesses to form the openings to receive the various parts. This punch is normally held upwardly by means of a punch lifter shown at 53 consisting of a cylindrical bar 54 vertically slidable in a cylindrical recess 55 substantially parallel to the punch opening 52. The upper end of the lifter is forked and projects on opposite sides of the upper end of the punch 50 and between the forked portions is passed a rivet 56. To receive the rivet, the upper end of the punch is formed with a slot 57 terminating in a circular opening or perforation 58 of somewhat greater diameter than the width of the slot. One side of the rivet 56 is cut away as shown at 59 so that by turning the lifter 53 to extend substantially at right angles to the punch its flattened portion will come in alignment with the slot 57 permitting the rivet to be withdrawn through the slot. When the lifter is in its normal position, substantially parallel to the punch, the flattened portion 59 is against the back wall of the opening 50 and the rivet can not be withdrawn through the slot. This construction provides means by which the parts may be readily assembled and disassembled when required.

The punch is normally held upwardly by means of a coil spring 60 bearing on the under face of the lifter 53. This spring also acts on the upper face of a circular strip retainer plunger 61 also slidable in the lifter passageway 55, this plunger having a flattened finger 64 terminating in one or more points 65 which serve to hold the fastener strip from feed motion until the driving has been effected. This retainer 61 has a notch 62 in one face thereof, as shown more clearly in Figure 20, within which may engage a flat sided pin 63 carried by a trigger which will be later described, by which this plunger may be lifted to bring it out of engagement with the strip.

The trigger member above referred to comprises a lever 70 pivoted at 71 between the side frames of the machine, and having a combination positive and spring punch operating shoe portion 72 which bears at two places upon the top of the punch lifter. This punch operating shoe consists of a double curved piece of tempered spring steel 73 so shaped as to spring or snap on to the trigger member, and has two bearing points *a* and *b* which come into contact with the top surface of the punch lifter during the operation of the machine. This trigger is normally held with its free end rocked downward by means of a spring 74 reacting against an abutment 75 thereon and seated in a socket 76 in the frame portions. In

place of the coil spring 74 a construction shown in Figure 5^a (Sheet 3) may be employed in which the punch operating shoe 72' is continued above the trigger to form a resilient finger 720 reacting against the inner surfaces of the frame portions as at 721. Above the free end of the trigger lever the frame portions are formed as a gripping handle 77 positioned relative to the trigger so that as the handle is grasped by the operator's hand his fingers may extend beneath the trigger so that the trigger may be drawn upward toward the portion 77 by a squeezing action to operate the machine. Such upward drawing action depresses the punch, slowly and powerfully at first through the medium of point *b* of the operating shoe, which swings on a short lever arm and thereby gives great power to shear off the fastener from the strip, and then rapidly through the medium of point *a* which has a spring support and therefore tends to snap the fastener down to the surface of the glass at a rate faster than would be given by its longer lever arm, were this arm rigid. To sum it up, the combined actions of these two mutually operated bearing points serve to first cut off the fastener from the strip within the die portion 22, and then to snap the fastener down upon the surface of the glass in front of the driving plate as soon as the supporting finger is withdrawn from beneath the punch. At the same time spring 60 is compressed so that the strip retainer is urged against the strip under increased pressure holding the strip firmly.

The trigger lever has a downwardly depending portion 78 within which is fixed the pin 63, before referred to, and in a vertical socket therein is slidably supported a trigger gear 79. This gear has a latch shaped end 80 which may engage the forward end of the ram 30 so that by rocking the trigger upwardly the ram is pressed rearwardly against the tension of the spring 22 until the latch face of the gear slips off the ram allowing the spring to project it forwardly whereupon the driver engages and drives the point into the sash. In order that the gear may re-engage the plunger on release of the trigger it may retract into the portion 78 against the pressure of a spring 81 reacting between its upper end and the upper end of its socket. It is desirable that the amount to which it is normally projected may be adjusted in order to determine the extent of retraction imparted to the ram. For this purpose the gear is notched through as shown at 82 and passed through the portion 78 of the trigger is a pin 83 milled out on one side as shown at 84 to furnish an abutment 85 projecting across the slot 82. This pin 83 has at one end a screw-driver slot 86, as shown in Figure 8, for engagement with a tool by which it may be rotated

to adjust the effective height of the abutment portion 85. It may be fixed in adjusted position by means of a set screw 87.

As the trigger is raised and the ram 30 carried rearwardly the bushing 36 impinges on the sleeve 37 and retracts the feed finger and the spring finger 41. The pin 63 at the same time is removed from the notch 62 which allows the spring 60 to urge the locking plunger 61 downwardly to retain the strip against motion. As the sear trips from the ram 30 permitting the driving stroke to take place, the feed finger engaging in one of the indentations is prevented from moving the strip as it is now held by the retainer. This causes the spring 38 to be compressed storing energy to be used later in feeding the strip. As the trigger handle is allowed to descend to its initial position the compression of spring 60 is reduced and the pin 63 re-enters the notch 62 and acts to raise the plunger 61 whereupon the spring 38 is allowed to actuate the feed finger to push the strip forward to bring another section beneath the punch.

It is essential that the punch shall be given a proper length of stroke so that it may properly cut the strip section but may not project downwardly sufficiently to be struck by the driver. In order that this important adjustment may be effected, two stops are provided. The one shown at 90 is used to roughly adjust the movement of the trigger, and thereby of the punch, and serves also as an efficient bumper to receive the shock of the sudden movement of the trigger after the sear slips off the edge of the ram. This stop comprises a sleeve 91 threaded internally and slidable within a socket 92 in the under portion of the handle of the frame. This sleeve is adjusted in and out by means of a screw 93 threaded therein and held against upward movement by means of a collar 94.

The other stop (see Figures 5, 8, 9, and 19) is a headless set screw 95 located in a hole tapped through the cylindrical bar 54 of the punch lifter 53. This set screw projects downward in the lifter passageway 55 toward the top of the strip retaining plunger, and is so adjusted that when the bottom of the punch is even with the lower face of the frame members, or in other words the thickness of a fastener from the surface of glass, this set screw rests upon the top of the strip retaining plunger, thus gagging the stroke of the punch in a positive and accurate manner.

In Figure 21 a modified construction of punch stop is shown in which a set screw 96 is threaded into the upper end of the punch lifter bar 54, this screw passing through slots in the spring 73 and its head 97 bearing in a counter bored hole 98 in the frame members. By turning this screw by means of a

screw-driver inserted in the hole, the extent to which the punch lifter, and thereby the punch, may be depressed, is regulated, by the head of the screw striking the base of the counterbore.

While this invention has been described in connection with glazing it is evident that many of the desirable features thereof might find application for driving mechanisms and fasteners of other types or for other purposes. The term "fastener" has therefore been used in a generic sense in this case to include glaziers' points as well as other similar devices.

Having thus described a preferred embodiment of this invention it should be evident to those skilled in the art that many changes and modifications might be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. In a machine of the class described, a pair of rods, one of said rods having a grooved face to define with said other rod a guideway for a fastener strip, and a driver for driving sections of said strip slidably guided on said pair of rods.
2. In a machine of the class described, a pair of rods, one of said rods having a grooved face to define with the other rod a guideway for a fastener strip, and a punch for cutting off sections of said strip, one of said rods having a die portion cooperating with said punch.
3. In a machine of the class described, a pair of rods, one of said rods having a grooved face to define with the other rod a guideway for a fastener strip, a punch for cutting off sections of said strip, one of said rods having a die portion cooperating with said punch, and a member for driving the sections cut off by said punch slidably guided on said rods.
4. In a machine of the class described, means for supporting and guiding a fastener strip, a die, a punch cooperating with said die to shear off sections of said strip to be driven, means to drive said sections, a member movable after each drive to feed the strip to said die, and a member movable with said feeding member to support the strip beneath said die.
5. In a machine of the class described, means for supporting and guiding a fastener strip, a die, a punch cooperating with said die to shear off sections of said strip to be driven, means to drive said sections, a member movable to feed the strip after each driving action and retracted during the shearing stroke of said punch, and a member for supporting the strip beneath said die movable with said feed member to be retracted from said die to clear the punch on its shearing stroke.
6. In a machine of the class described,

means for guiding and supporting a fastener strip, means for cutting off sections of said strip, a driver member, a slidable ram connected to said driver member, a spring for urging said ram in one direction, means for moving said ram in the opposite direction to tension said spring and to release said ram to allow the spring to impart a driving stroke to said driver, a feed member retractable with the motion of said ram to tension said spring, and a second spring interposed between said ram and feed member and tensioned on the driving stroke of said ram, said second spring imparting feed motion to said feed member.

7. In a machine of the class described, means for guiding and supporting a fastener strip, means for periodically cutting off sections of said strip, resiliently actuated means for driving each section after it has been cut off, and means for intermittently feeding the strip in the same direction as that of the driving stroke to said cutting off means, a spring tensioned on the driving stroke of said driving means, and means for feeding the strip to said cutting off means deriving its feeding motion from said spring.

8. In a machine of the class described, means for supporting and guiding a fastener strip, means for cutting off sections of said strip, a spring pressed sleeve slidable on said supporting and guiding means, a fastener driving member carried by said sleeve and to which driving impulses are imparted by said spring, a collar slidable on said supporting and guiding means and within said sleeve, a member for feeding the strip fixed to said collar, and a spring interposed between said sleeve and collar and tensioned by the driving stroke of said sleeve to impart feed movement to said strip.

9. In a machine of the class described, means for supporting and guiding a fastener strip, means for cutting off sections of said strip, a spring pressed sleeve slidable on said supporting and guiding means, a fastener driving member carried by said sleeve and to which driving impulses are imparted by said spring, a collar slidable on said supporting and guiding means and within said sleeve, a member fixed to said collar for feeding the strip, a spring interposed between said sleeve and collar and tensioned by the driving stroke of said sleeve to impart feed movement to said strip, and means for restraining the feed of said strip until after the driving stroke of said sleeve.

10. In a machine of the class described, means for supporting and guiding a fastener strip, means for cutting off sections of said strip, means having driving and retracting strokes for driving said sections, a spring tensioned by the driving stroke of

said driving means, and means comprising a member positively retracted by the retraction of said driving means and actuated by said spring after each driving stroke to feed the strip to said cutting off means.

11. In a machine of the class described, means for supporting and guiding a fastener strip, means for cutting sections from said strip, means having driving and retracting strokes for driving said sections, a spring for imparting driving strokes to said driving means, means for feeding said strip, means for holding said strip against feeding, and manually operated means for actuating said cutting off means, imparting retracting strokes to said driving means, and rendering said strip-holding means operative.

12. In a machine of the class described, means for supporting and guiding a fastener strip, means for cutting off sections of said strip, means for driving said sections, means for holding the strip against movement, a spring interposed between said cutting off means and said strip-holding means acting to normally hold said cutting off means retracted from the strip and said holding means pressed against the strip, and means to actuate said cutting off means to cut the strip.

13. A machine of the class described, means for supporting and guiding a fastener strip, means for cutting off sections of the strip, means for driving said sections, a spring for imparting the driving strokes to said driving means, means actuated by said driving means for feeding the strip to said cutting off means, a retainer for preventing such feeding motion, and a member for actuating said cutting off means to cut off a strip section and to retract said driver, and thereafter to move said retainer from the strip to allow said feeding means to feed the strip.

14. In a machine of the class described, a fastener strip guiding and supporting means, a punch for cutting off sections of the strip, a punch lifter, a strip retainer, a spring between said lifter and retainer tending to retain said punch retracted from the strip and said retainer pressed thereagainst, a driver for the cut sections, a spring for imparting driving strokes to said driver, a feed finger for engaging said feed strip and retracted on the retraction of said driver, a spring interposed between said driver and feed finger arranged to be tensioned on the driving stroke of said driver to impart feeding impulse to said finger, a lever actuable in one direction to depress said punch, a sear carried by said lever and movable therewith when said punch is depressed to retract and release said driver, and a member carried by said lever acting to raise said retainer

from the strip to allow the feed finger to feed the strip when such lever is returned to its initial position.

15. In a machine of the class described, a frame having a pair of substantially parallel passages therein, a punch slidable in one of said passages, a bar slidable in the other passage, a spring normally retaining said bar upwardly, and a connection between said bar and punch releasable by relative movement of said punch and bar out of parallel relation.

16. In a machine of the class described, a frame having a pair of guideways, a punch slidable in one of said guideways and having a lateral slot merging into an enlarged perforation, a bar slidable in the other of said guideways and movable to actuate said punch, and a flattened pin carried by said bar and fitted in the perforation of said punch, said pin normally preventing separation of said punch and bar but actuable to pass through said slot to disengage said bar and punch when said bar and punch are moved out of their normal angular relationship.

17. In a machine of the class described, a spring pressed ram, a trigger, a sear having a notch therein and slidable in said trigger for engagement with said ram, whereby rocking of said trigger in one direction retracts and releases said ram, a spring normally projecting said sear outwardly of said trigger, and a flattened pin in said trigger engageable in said notch, and angularly movable to adjust the extent of projection of said sear.

18. In a machine of the class described, a frame having a handle portion, a trigger lever pivoted adjacent one end of said handle portion and adapted to be pulled there-toward by the fingers of an operator grasping said handle, means to present a fastener strip, a fastener driver carried by said frame and actuable by said lever, a punch movable in said frame and positively actuable on the rocking of said lever to punch a section from said strip during a portion of its stroke and resiliently actuable during the remainder of its stroke to present said section into driving relation to said driver, and an adjustable stop carried by said handle portion to limit the motion of said lever and thereby limit the stroke of positive actuation of said punch.

19. In a machine of the class described, means for guiding and supporting a fastener strip, means for driving sections of said strip, a reciprocating punch, and means for actuating said punch positively to cut off a section from said strip and then yieldingly to present said strip to said driving means.

20. In a machine of the class described, means for supporting and guiding a fas-

tener strip, means for driving sections of said strip, a punch for cutting sections of said strip and presenting said sections to said driving means, a trigger for depressing said punch, a sear carried by said trigger for retracting and releasing said driving means, and a stop for limiting the stroke of said punch independently of the extent of motion of said trigger.

21. In a machine of the class described, means for supporting and guiding a fastener strip, a punch for cutting sections from said strip, means for actuating said punch positively during the cutting portion of its stroke and resiliently during the remainder of its stroke, and means for limiting the extent of motion of said punch comprising a screw having threaded connection with said punch and a fixed member engageable by the head of said screw.

22. In a machine of the class described, means for supporting and guiding a fastener strip, means for driving sections of the strip, and a member acting with a relatively slow powerful stroke to cut off the sections from said strip and with a relatively fast less powerful stroke to present the cut sections to said driving means.

23. In a machine of the class described, means for supporting and guiding a fastener strip, means for driving sections of the strip, and a member acting with a relatively slow powerful stroke to cut off the sections from said strip and with a relatively fast less powerful and resilient stroke to present the cut sections to said driving means.

24. In a machine of the class described, means for supporting and guiding a fastener strip, means for driving sections of the strip, a punch for cutting off the sections of said strip and presenting the cut off sections to said driving means, and a lever having relatively long and short arms for actuating said punch, said lever acting through said relatively short arm to effect the cutting off action of the punch and through said relatively long arm to effect the presentation of the cut section to said driving mechanism.

25. In a machine of the class described, means for supporting and guiding a fastener strip, means for driving sections of the strip, a punch for cutting off the sections of said strip and presenting the cut off sections to said driving means, and a lever having relatively long and short arms for actuating said punch, said lever acting through said relatively short arm to effect the cutting off action of the punch, and through said relatively long arm to effect the presentation of the sections to said driving mechanism, said long arm being resilient.

26. In a machine of the class described,

means for supporting and guiding a fastener strip, means for driving sections of said strip, a punch for cutting off the sections from the strip and presenting the cut
5 off sections to said driving mechanism, a lever for actuating said punch pivoted adjacent to said punch and having a relatively long resilient arm and a relatively short rigid arm extending therefrom, said relatively short arm engaging said punch during
10 the cutting off of sections from said strip to effect a relatively slow powerful motion thereto, and said relatively long arm acting during the presentation of the cut sections to said driving mechanism to snap
15 said sections into cooperative relation thereto with a relatively quick motion.

In testimony whereof I have affixed my signature.

GUY HUBBARD.