April 7, 1936. D. J. AJOUELO 2,036,988

MACHINE FOR MAKING AND INSERTING METALLIC FASTENINGS

Filed June 29, 1932 2 Sheets-Sheet 1

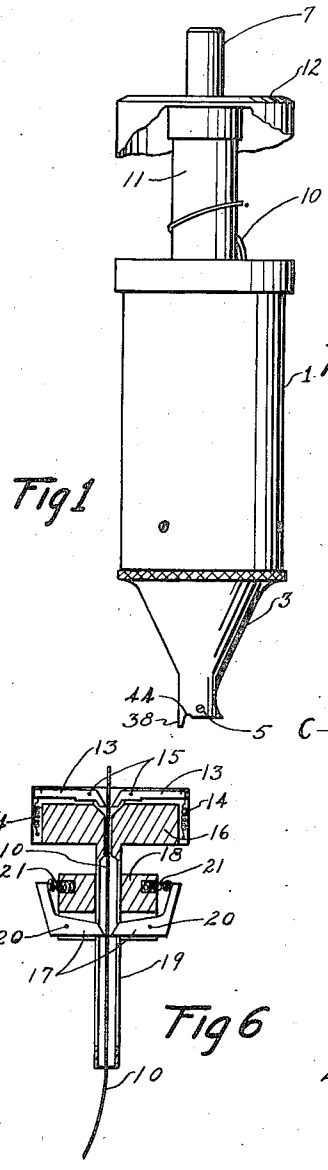


Fig 1

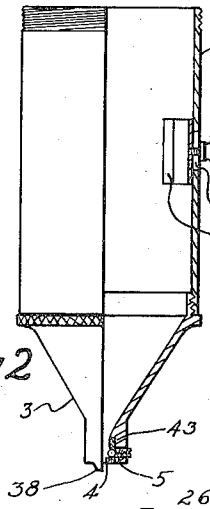


Fig 2

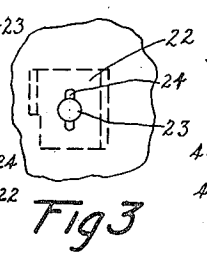


Fig 3

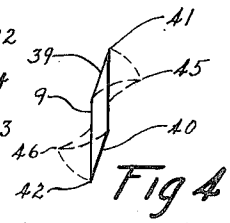


Fig 4

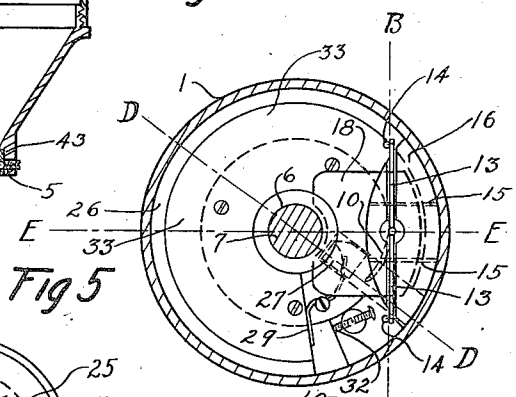


Fig 5

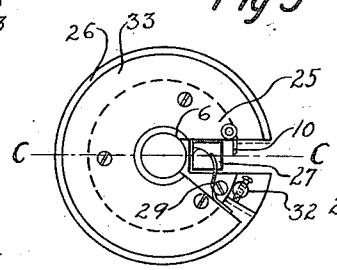


Fig 7

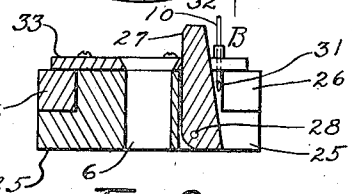


Fig 8

Fig 6

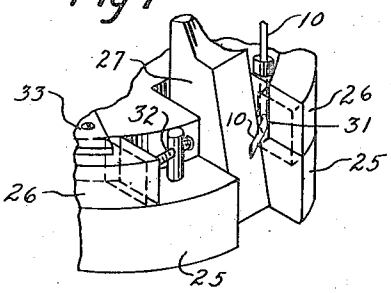


Fig 9

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MACHINE FOR MAKING AND INSERTING METALLIC FASTENINGS

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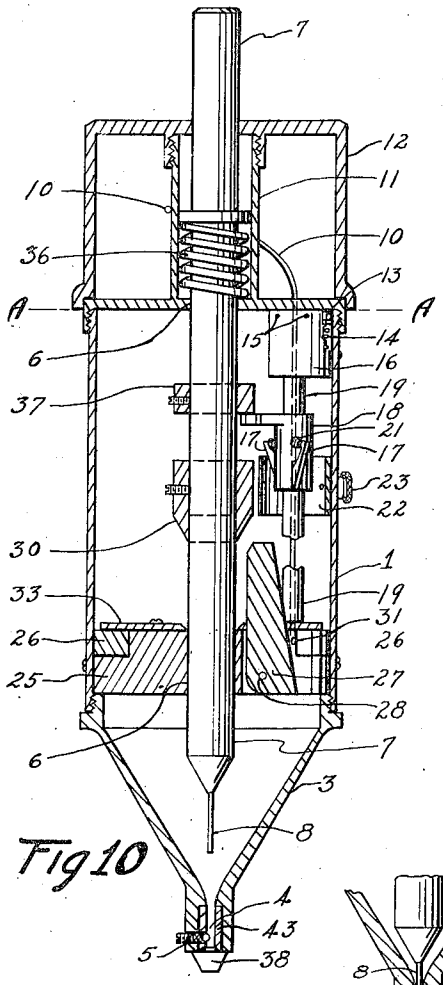


Fig 10

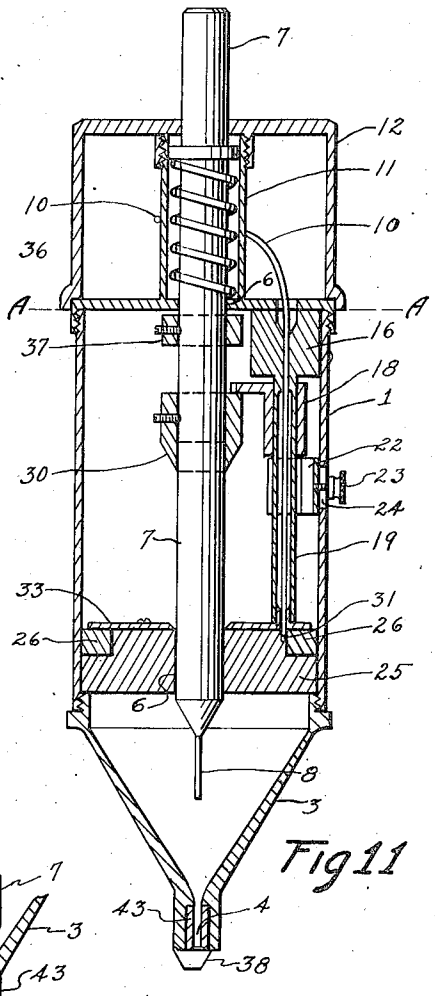


Fig 11

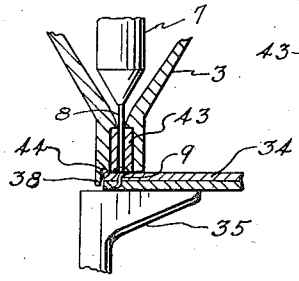
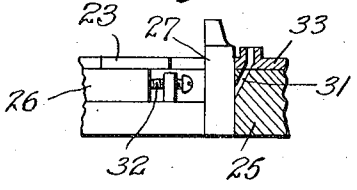


Fig 12

Fig. 13.



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MACHINE FOR MAKING AND INSERTING METALLIC FASTENINGS

Davis J. Ajouelo, Atlanta, Ga.

Application June 29, 1932, Serial No. 620,029

9 Claims. (Cl. 1—51)

The present invention relates to improvements in machine for making and inserting metallic fastenings and has for an object to provide a machine more particularly useful in connection with the nailing or fastening of shoe soles or similar articles.

Another object of the invention lies in providing a device which manufactures its own fasteners directly from a roll or spool of wire attached thereto, said fasteners being unique in character and especially useful and efficient for the purposes intended.

A further object of the invention is to provide an implement which performs the multiple operation of forming direct from a spool or roll of wire a special form of fastener which is of a unique character, of feeding said fastener into the tip or nozzle of said implement and of expelling said fastener therefrom and into the materials to be joined or united and clenching or beading over the ends of said fastener thereby firmly and securely uniting the aforementioned materials, the whole operation being performed with a single stroke of a plunger.

A further object of the invention is the provision of a special fastener for the fastening together of shoe soles or other materials.

With the foregoing and other objects in view the invention will be more fully described hereinafter and will be more particularly pointed out in the claims appended hereto.

In the drawings wherein like symbols refer to like or corresponding parts throughout the corresponding views.

Fig. 1 is a perspective view, with the spool cover broken away, of the machine which forms the subject matter of this invention.

Fig. 2 is a one-quarter section in elevation of the main body shell with the nozzle or tip in place and with the finger for adjusting the feed in place.

Fig. 3 is a fragmentary view showing in more detail the operation of the feed adjusting finger.

Fig. 4 is a view of the type of fastener driven by the machine.

Fig. 5 is a cross section view of the complete machine as seen from above taken along the line A—A (Fig. 10).

Fig. 6 is a cross section in elevation of the feed mechanism taken along the line B—B (Fig. 5).

Fig. 7 is a plan view of the shearing mechanism.

Fig. 8 is a cross section in elevation of the shearing mechanism taken along the line C—C (Fig. 7).

Fig. 9 is a fragmentary view of a portion of the shearing mechanism showing the method used to adjust the shearing edges.

Fig. 10 is a sectional elevation taken along the line D—D (Fig. 5) of the complete machine with the plunger on the down stroke.

Fig. 11 is a sectional elevation taken along the line E—E (Fig. 5) of the complete machine with the plunger near the top of its stroke.

Fig. 12 is a fragmentary section of the tip or nozzle together with a portion of the plunger shown at the bottom of its stroke and showing the fastener in position and clinched in the materials which have just been joined.

Fig. 13 is a sectional view of Fig. 8 showing the location of the wire passage relative to the cutting face or edge of the movable cutter.

Referring to the drawings for a more particular description of my invention which consists essentially of a hollow tube or casing 1 at the bottom of this casing 1 is a hollow nozzle 3 which has in its lower extremity a cylindrical opening 4 and fastener retaining means 5. Extending through bearing supports 6 in the casing 1 is a plunger 7 to which is attached a tip 8 for the purpose of ejecting and clinching the special fasteners 9. The wire 10 from which the fasteners 9 are formed is wrapped on a spool 11 which has a removable top and cover 12, the movement of the wire 10 through the machine is accomplished by the action of a feeding device (Fig. 6) which consists essentially of an upper pair of jaws 13 controlled by springs 14 so that they will allow the wire 10 to move downward but will prevent it from moving upward, these jaws are attached by hinge pins 15 to the jaw frame 16 which may be a part of the casing 1 or may be removable with respect thereto. The feed jaws 17 which cause the wire to move through the escapement jaws 13 above mentioned are similar in character to the escapement jaws 13 and are preferably mounted just below them on a frame 18 which is slidable on a slotted tube or rod 19. The feed jaws which are hinged to their frame 18 by pins 20 and controlled by springs 21 are so formed that in moving down they clamp the wire 10 and cause it to move with them but on their upward stroke the wire is released. The length of the feed is controlled by an adjustable finger 22 which is fastened to the casing 1 by means of a thumb screw 23 passing through a slotted hole 24 in the casing 1. The feed control finger above described

is so formed that the feed jaws 17 will be forced to open when they come in contact with it and by adjusting its relative location with respect to the casing 1 the amount of wire fed at each stroke may be controlled. After leaving the feed mechanism, the wire passes into the shearing mechanism, (Fig. 7, Fig. 8, and Fig. 9) which consists essentially of a cylindrical plug 25 which fits into the lower part of the casing 1, this plug 25 is offset at the top and fitted with a ring 26, said ring being partly cut away so as to allow the movement of a knife 27 which is attached to the plug 25 by a hinge pin 28 vertically mounted in said cut away portion, constituting a block element having an inclined face forming a cutting or blade edge and is held in its extreme retracted or inactive position by a spring 29, the movement of the knife to cutting or shearing position being caused by the action of a cam 30 attached to the plunger 7 above mentioned. The knife 27 operates in a groove cut in the plug 25 and the wire 10 is fed through a hole 31 which intersects one side of the knife groove at a very slight angle, thus allowing the knife to cut through the wire in such a way as to make fasteners with sharp one-sided points. The hole 31 above referred to occurs at a point in the plug 25 closely adjacent to one end of the incomplete ring 26, the operation of the mechanism being such that the movable knife 27 forms one blade of a pair of shears and the ring 26 forms the other blade, the location of the cutting face of ring 26 with respect to the plane of the knife edge is controlled by the adjusting screw 32. The dotted lines forming the square and rectangle in Fig. 9 are intended to represent the adjustable movement of the stationary cutter ring 26. The cover plate 33 clamps the ring 26 in a position which is determined by the screw 32. The fastener blank cut off by the shearing mechanism drops into the hollow tip or nozzle 3 above described and thence into the cylindrical opening 4 which is lined with a hardened steel bushing 43 which is countersunk below the surface of the tip. The fastener blank is held by the fastener retaining mechanism 5 until it is struck by the downward action of the plunger tip 8 which forces it out of the nozzle 3 and through the materials to be joined 34 where it is clinched on the lower side by a last or steel plate 35 (not a part of this invention) and on the upper side by the plunger tip, the plunger 7 being returned by the action of a spring 36 or other suitable means. During the return of the plunger, the feed jaws 17 and their supporting frame 18 are returned by the top part of the cam 30. The lower part of the cam 30 also serves on the downward stroke to operate the knife 27 as before mentioned. The downward movement of the feed jaws 20 being caused, by coming in contact with a ring member 37 not previously mentioned which is also attached to the plunger 7. Referring to Figures 1, 10, 11, and 12, 38 is an extension tip or guide located on one side of the extreme lower end of the nozzle 3, said extension tip or guide 38 serves to keep the center opening 4 properly located with respect to the edge of the materials which are being joined. 44 refers to a relief or undercut closely adjacent to the abovementioned tip or guide 38, said undercut 44 serves to prevent the machine from bruising or otherwise damaging the edge of the materials 34 which are being united. Referring more particularly to Fig. 4, the improved fastener 9 is shown having the pointed ends 41 and 42 offset to relatively opposite sides of the fastener. The fastener ends are sloping or beveled in opposite directions as indicated at 39 and 40 and, when driven into the sole, the fastener ends are adapted to clinch over in opposite directions as indicated by the dotted lines 45 and 46, as shown in Figure 12.

Assuming the parts to be in their normal positions, the wire threaded in the device with its lower pointed end in position to be advanced, the downward movement of the plunger 7 causes member 37 to engage element 18 forcing feed jaws 17 into clamping engagement with the wire 10 advancing said wire until opening of said feed jaws is effected by control element 22, the upward movement of said wire being prevented by jaws 13. The further downward movement of plunger 7 causes cam 30 to engage cutter block 27 moving its blade edge with respect to the cutting edge of stationary ring 26 and severing wire 10 thereby forming the pointed fastener 9 which is directed by the inclined wall of nozzle 3 into opening 4 where it is held by retaining means 5, the continued downward stroke of the plunger 7 causes tip 8 to insert said fastener in the materials 34 and effect clinching in opposite directions of the ends of said fastener on opposed surfaces of the material, as clearly shown in Fig. 12 of the drawings. The return of plunger 7 to its initial position by the action of spring 36, the movable parts are returned to their initial positions, including the wire feeding mechanism which is returned to its initial position (Fig. 11) by cam 30, whereupon the device is in readiness for another cycle of operation as above described.

It is obvious that various changes and modifications may be made in the details of contruction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. A device for inserting metallic fasteners comprising a plunger guide having a recess, a cutter pivotally mounted in said recess, an adjustable ring mounted in the guide, means on said ring providing a cutting edge for cooperation with said movable cutter, a plunger movable through the guide, and means carried by the plunger for operating the movable cutter.

2. A device for inserting metallic fasteners comprising a plunger guide having a recess, a movable cutter block mounted in the recess, an adjustable ring mounted on the guide, means on said ring providing a cutting edge to coact with the cutter block, means carried by the plunger for operating the cutter block when the plunger is moving in one direction, and means associated with said plunger for returning the plunger to its initial position.

3. A device for forming and inserting metallic fasteners formed from a continuous wire comprising a casing having a discharge nozzle, a plunger guide mounted in said casing and formed with a recess, a cutter block pivotally mounted in said recess, an adjustable ring member mounted on the guide, means on said ring providing a cutting edge adapted to coact with the cutter block, guide means formed in said plunger guide for directing the wire to the cutting edge of said ring and movable cutter block, a plunger

movable through said plunger guide, means carried by the plunger for operating said cutter block, and releasable fastener retaining means associated with said nozzle.

4. A device for making and inserting metallic fasteners formed from a continuous wire comprising a plunger, a wire feeding mechanism, a wire cutting mechanism, said cutting mechamism including a plunger guide provided with an opening, an element formed with a cutting edge pivotally mounted in said opening, a stationary cutter carried by said guide and formed with an opening, one face of the opening in said ring constituting a cutting blade edge, means for adjusting said stationary cutter with respect to said movable cutter element, means for directing the wire between said cutting edges, and means coacting with the feeding mechanism and additional means coacting with the movable cutter to predeterminedly advance the wire and effect severing thereof during the downward stroke of said plunger.

5. A device for making and inserting metallic fasteners formed from a continuous wire including a casing, a plunger guide member mounted in said casing, said member being formed with a cut out portion, a movable cutter pivotally mounted in said cut out portion, a stationary cutter in the nature of an adjustable ring having a segmental opening mounted on said guide member, means on one face of said cut out portion providing a cutting edge for coaction with said movable cutter, means for effecting adjustment of said ring with respect to said movable cutter, means adapted to secure said ring in adjusted position, a plunger movable through said guide, means associated with said plunger for feeding the wire to said cutter, and additional means operating said movable cutter during the movement of said plunger in one direction.

6. A device for inserting metallic fasteners comprising a plunger, a plunger guide having a cut out portion, a wire feeding mechanism, a wire cutting mechanism, said cutting mechanism comprising a stationary cutter seating on said guide, and a movable cutter in the nature of a swivel block mounted in said cut out portion, one edge of said block coacting with the edge of the stationary cutter, a ring lug carried by the plunger for moving the feeding mechanism in one direction, and means fixedly carried by said plunger for moving said feeding mechanism in the opposite direction, said latter means also constituting operating means for the movable cutter on the driving stroke of the plunger.

7. A device for inserting metallic fasteners comprising a casing, a plunger, a plug element mounted in said casing formed with a cut out portion, a wire feeding mechanism, a wire cutting mechanism, said cutting mechanism comprising a stationary cutter adjustably mounted on said plug element, a movable cutter in the nature of a swivel block mounted in said cut out portion, one edge of said block coacting with the edge of the stationary cutter, means fixedly carried by the plunger for moving the feeding mechanism in wire feeding direction, means adapted to render said mechanism inactive when it has reached a predetermined point in feeding direction, a cam element fixedly carried by the plunger adapted to operate the movable cutter when the plunger is moving in one direction and to return the feeding mechanism to its initial position when moving in the opposite direction.

8. A device for making and inserting metallic fasteners formed from a continuous wire comprising a plunger, a wire feeding mechanism, and a fastener forming mechanism, said fastener forming mechanism including a plunger guide member, a movable cutter pivotally connected to said member, a stationary cutter mounted on said member and adjustable with respect to said movable cutter, said plunger guide being formed with a wire guide opening projecting at an angle diagonal to the cutting edges of said cutters, whereby the wire is so directed to said cutting edges that the line of severance in forming the fastener will be diagonal to the axis of the wire.

9. A device for making and inserting metallic fasteners formed from a continuous wire comprising a plunger guide, a cutter pivotally connected to the guide, an adjustable ring mounted on the guide, means on said ring providing a cutting edge for cooperation with said movable cutter, a wire guide formed in said plunger guide extending in a diagonal direction with respect to the cutting edge of said ring member for directing the wire diagonally to said cutters, and a plunger movable through said plunger guide.

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