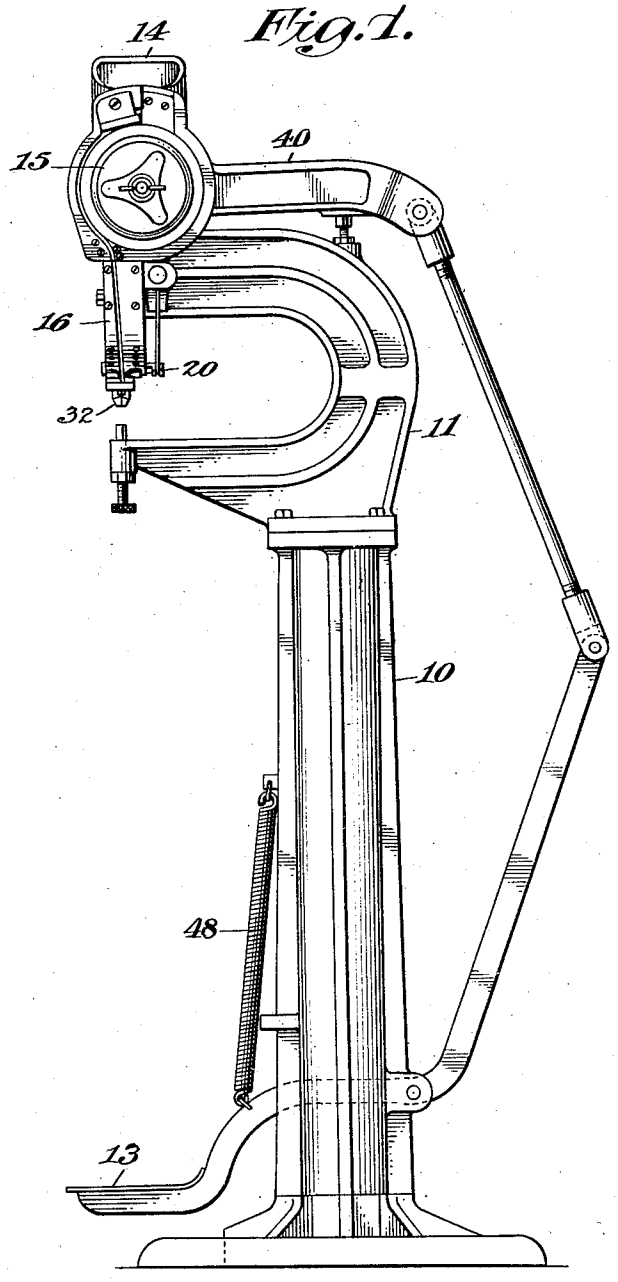
Dec. 23, 1930. T. PUCAR 1,786,088

FEEDING DEVICE FOR PRONGED FASTENERS

Filed May 18, 1929 3 Sheets-Sheet 1

Fig. 1.



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FEEDING DEVICE FOR PRONGED FASTENERS

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Fig. 2.

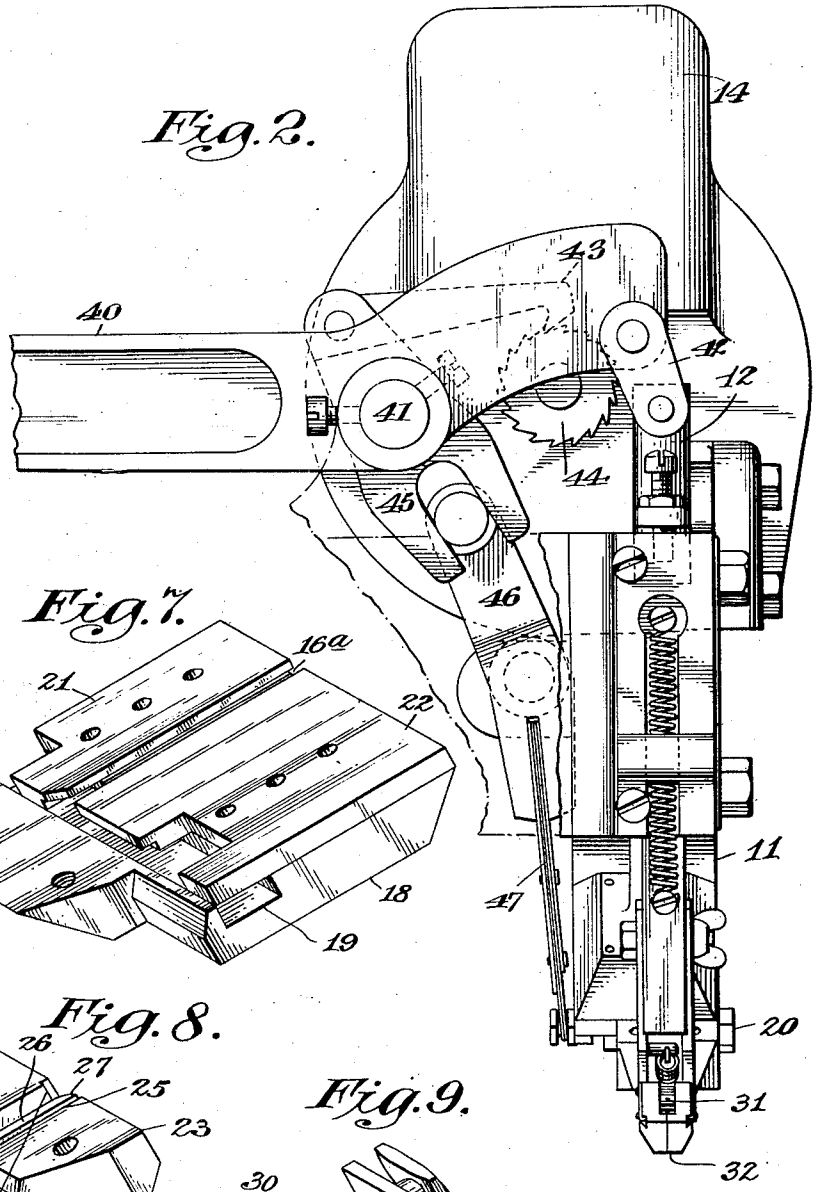


Fig. 7.

Fig. 8.

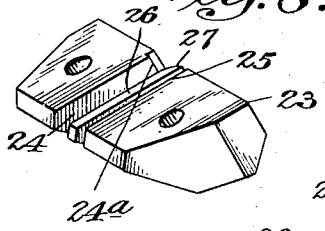
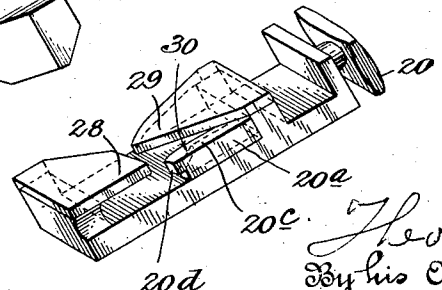


Fig. 9.



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Fig. 3.

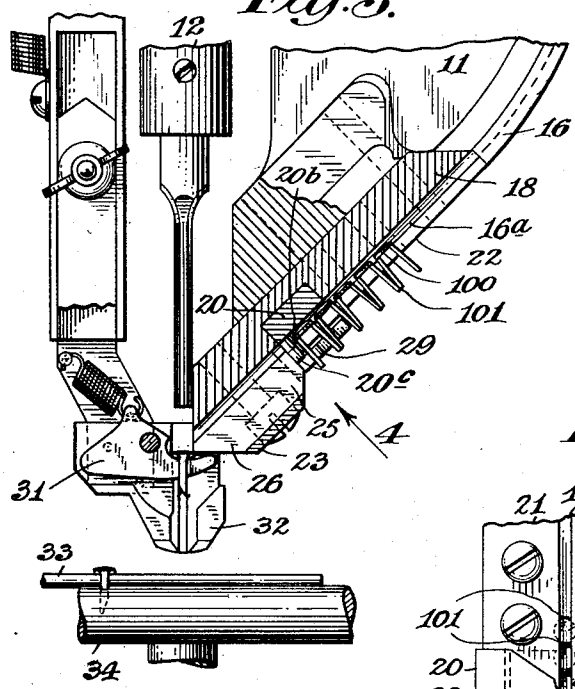


Fig. 5.

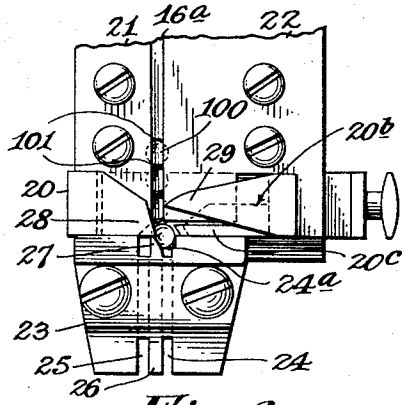


Fig. 4.

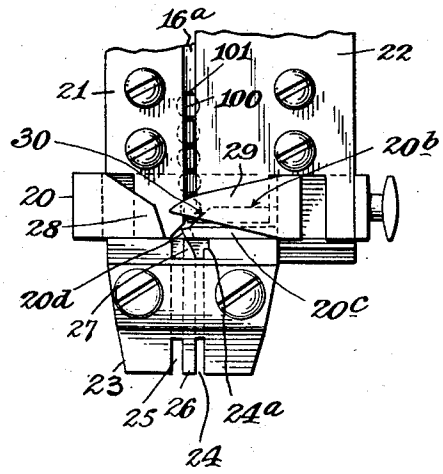
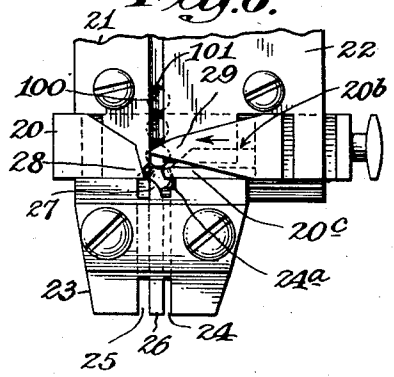


Fig. 6.



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1,786,088

UNITED STATES PATENT OFFICE

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FEEDING DEVICE FOR PRONGED FASTENERS

Application filed May 18, 1929. Serial No. 364,036.

This invention relates to machines for driving double-pronged fasteners, such as staples, and provides certain novel features of construction and operation of such machines.

In stapling machines heretofore known the driving plunger has been mounted on a U-shaped head, and the staples have been fed so that they arrive at the driving pocket in a position at right angles to the U-shaped head. Such an arrangement is satisfactory for many types of work, but when it is desired to set the staples (for example) in a long pole transversely to the axis of the pole, it is necessary to feed the pole in a direction parallel to the U-shaped head and the free space provided by the head is often insufficient to permit the required feeding movement.

A primary object of the present invention is to provide a machine in which the staples are fed in such a way that they arrive at the driving pocket in a position parallel to the U-shaped head. With this arrangement a pole or similar long article can be fed at right angles to the U-shaped head, and staples can easily be inserted transversely to the axis of the pole at any point along its length.

The present mechanism is generally similar to that disclosed in my pending application Serial No. 355,238 filed April 15, 1929, which provides for the proper turning of staples having flat, substantially diamond-shaped heads; a particular object of the present invention is to provide turning mechanism which operates in a generally similar manner but is modified for the proper handling of differently shaped staples and especially staples having round heads.

Other objects and advantages of the invention will become apparent as the description proceeds.

While a preferred form of the invention has been disclosed for purposes of illustration, it should be understood that various changes may be made in the structure and arrangement of parts without departing from the spirit and scope of the invention as hereinafter set forth and claimed.

In the drawings:

Fig. 1 is a side elevation of a machine embodying the invention.

Fig. 2 is an enlarged detail of part of the operating mechanism.

Fig. 3 is an enlarged detail showing the mechanism for feeding the rivets to the plunger.

Fig. 4 is a view of the cut-off slide and adjacent parts from the position indicated by the arrow 4, Fig. 3.

Fig. 5 is a similar view, showing the parts in another position.

Fig. 6 is a similar view showing the parts in still another position.

Fig. 7 is a perspective view of the block attached to the lower end of the feed arm, the block being shown in inverted position.

Fig. 8 is a perspective view of the nose-piece.

Fig. 9 is a perspective view of the cut-off slide.

Referring to the drawings more particularly, the numeral 10 indicates the pedestal of the machine, which supports a U-shaped head 11. A driving plunger 12 is mounted on the head for vertical reciprocation and is operated from the pedal 13 by suitable lever mechanism.

The staples are placed in the hopper 14 and are fed by the rotatable drum 15 to the guideway 16, from which the cut-off slide 20 permits them to drop one at a time to the driving position under the driving plunger. Suitable connections are provided to operate the drum 15 and cut-off slide 20 at properly timed intervals in the sequence of operations of the machine.

Arm 40 is pivoted at 41 and, when pedal 13 is depressed, this arm swings in a clockwise direction (Fig. 2). This movement of arm 40 effects the operation of several parts, viz.: driver 12 is depressed through the action of connecting link 42; pawl 43 is advanced on ratchet wheel 44; and slide 20 is moved to the right, viewed as in Fig. 2 (to the left viewed as in Figs. 4–6). The operation of slide 20 is through rocker arm 45, rocker arm 46, and spring connecting member 47. When pedal 13 is released it is moved upwardly by spring 48 (Fig. 1), and arm

40 swings in a counter-clockwise direction (Fig. 2). This movement restores driver 12 to its uppermost position, returns slide 20 to its left-hand position (Fig. 2), and causes pawl 43 to rotate ratchet wheel 44 and drum 15. Drum 15 operates in a manner well known in the art to arrange the staples deposited in hopper 14 and deliver them in regular order to guideway 16.

As the staples leave the drum 15 they pass down the guideway with their heads retained in the guideway and the long axis of the staples parallel to the guideway, and the present invention relates particularly to means for turning the staples so that they arrive in driving position at right angles to the guideway, or parallel to the U-shaped head of the machine. This turning of the staples is accomplished by the co-operation of the cut-off slide and the nose-piece of the guideway in a manner that will now be described.

At the lower end of the guideway a block 18, shown in perspective in Fig. 7, is attached to the feed arm of the machine. This block 18 is formed on its under side with a channel 19 in which the cut-off slide 20 is slidingly mounted. Plates 21 and 22 are attached to the under side of block 18 and assist in keeping the cut-off slide in position, while the spaced-apart, undercut edges of these plates form a continuation 16*a* of the guideway 16 and guide the staples to the cut-off slide.

Below the cut-off slide the nose-piece 23 is attached to the lower side of the block 18. This nose-piece, as shown in Fig. 8 is provided with deep slots 24 and 25 which define between them a slide or rib 26. One of the slots, 25, is preferably wider than the other to permit proper movement of one of the staple prongs into the slot, and the upper end of the slide or rib is rounded off at one side, as at 27, forming a point, with the rounded surface leading into slot 24. The rib is cut down so that its upper surface is spaced below the upper surface of the remainder of the nose-piece. These parts are so arranged that when the nose-piece is properly secured in its place the point 27 is alined with one side of the guideway 16ª, and the rib 26 is spaced from plate 18 a sufficient distance to permit the head of the staple to ride over the rib while the prongs of the staple extend into the slots 24 and 25.

The cut-off slide 20 is provided with fingers 28 and 29 which travel over the outside of plates 21 and 22 and operate on the prongs of the staples, and the slide also carries a lug or block 20*a*, Fig. 9, having a flange portion 20*b*, Fig. 4, which travels below a lower end portion of plate 22 and has a beveled end 30 which in one position underlies the plane of the rivet heads at the bottom of the guide channel 16*a*. The block 20*a* also has a flange 20*c* extending at a right angle to the portion 20*b* and terminating in an end or toe 20*d*. The channel 24 in nose-piece 23 has at one side, at its upper end, a notch or recess with a lower shoulder 24*a* to cooperate with the staple prong.

The staples to be handled in the present mechanism have round heads 100 and prongs 101, and lie in the main guide channel 16 in a column, with the prongs aligned with the channel axis and ready to descend by gravity through the channel 16*a* in block 18 which is a continuation of the main channel 16.

As the cut-off slide 20 reciprocates it permits the staples to pass one at a time from the lower end of the guide channel 16*a*, and at the same time rotates them through an angle of 90° so that they can ride down the slide or rib 26 to the driving position, in which position they are at right angles to the guideway 16. The details of this turning operation will be clear from an inspection of Figs. 3 to 6 inclusive.

When the driving plunger 12 is in depressed position the cut-off slide is in the extreme left-hand position as shown in Fig. 4 with the finger 29 extending between the prongs of a staple and retaining the staple in a preliminary position. The beveled face 30 on block 20*a* also lies under the head of the lower rivet and tends to support it. As the cut-off slide moves to the right (toward the position of Fig. 5), the upper face of finger 29 is removed from its supporting contact with the upper prong of the staple, and the beveled face 30 as it is retracted permits the rivet head to slide down so that the lower prong descends toward the point 27 of rib 26. By the angular action of the rounded face 27 (assisted by the action of the lower end or point of the finger 28) the staple is caused to rotate on its own axis and the lower prong lodges in the recess or upon the shoulder 24*a* near the top of channel 24, with the upper prong located near the point at the upper end of rib 26 (Fig. 5). If the upper prong does not of itself drop into slot 25, upon return movement of the cut-off slide, in the direction indicated in Fig. 6, the end 20*d* of flange 20*c* engages the upper prong and moves it definitely over channel 25 and dislodges the lower prong from the recess 24*a* and the staple then drops by gravity through the channels in the nose-piece 23. At the same time the end of finger 29 enters between the prongs of the next rivet in the column, and beveled face 30 also runs under the head of that rivet tending to elevate the whole stack of rivets slightly and position the lower one properly for the next feed action.

After the staple leaves the slide 26 it falls onto the movable support 31, which engages under the head of the staple and maintains it in a vertical position during the first part of the driving operation. As the driving plunger descends it engages the staple, re-

moves it from the support 31 and drives it through the split holding pocket 32 and into the work.

The advantages of this new machine become apparent when (for example) performing such work as attaching branches 33 to the trunk of an artificial Christmas tree 34. In this case the trunk is a long pole and the staples must be set transversely of the trunk. With the present machine the trunk 34 can be fed parallel to the guideway for the staples, which means that the trunk is fed transversely to the U-shaped head and is therefore entirely free from any limitations of movement due to contact with parts of the machine.

The machine can be used for setting double-pronged fasteners, and especially double-pronged staples with round heads such as shown and described, the fasteners being fed down the main guideway with the fasteners so positioned that a line passing through both prongs of a fastener is parallel to the guideway. The operating mechanism turns the fastener through 90° to a position in which the line passing through both prongs of the fastener is transverse to the guideway.

I claim:

1. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, and a member on the slide adapted to have supporting contact under a staple head.

2. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, a member on the slide adapted to have supporting contact under a staple head, and another member on the slide adapted to cooperate in its return motion with an upper portion of the staple.

3. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, a member on the slide adapted to have supporting contact under a staple head, and guide means below the feed slide including a rib and channels at opposite sides thereof through which staple prongs may slide in a position straddling the rib and aligned at a right angle to their position before turning.

4. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, a member on the slide adapted to have supporting contact under a staple head, and guide means below the feed slide including a rib and channels at opposite sides thereof through which staple prongs may slide in a position straddling the rib and aligned at a right angle to their position before turning, said rib having a pointed upper end portion approximately aligned with one side of the guide first mentioned.

5. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between the prongs of each of the staples, another finger on the slide adapted to operate on a lower staple prong, a member on the slide adapted to have supporting contact under a staple head, and guide means below the feed slide including a rib and channels at opposite sides thereof through which staple prongs may slide in a position straddling the rib and aligned at a right angle to their position before turning, one of the channels in said lower guide means having at its upper end a recess to receive a lower staple prong.

6. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, and an angular supporting member on the slide adapted to have supporting contact under a staple head.

7. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, an angular supporting member on the slide adapted to have supporting contact under a staple head, and another member on the

slide adapted to cooperate in its return motion with an upper portion of a staple.

8. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, an angular supporting member on the slide adapted to have supporting contact under a staple head, another member on the slide adapted to cooperate in its return motion with an upper portion of a staple, and guide means below the feed slide including a rib and channels at opposite sides thereof through which staple prongs may slide in a position straddling the rib and aligned at a right angle to their position before turning.

9. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, an angular supporting member on the slide adapted to have supporting contact under a staple head, another member on the slide adapted to cooperate in its return motion with an upper portion of a staple, and guide means below the feed slide including a rib and channels at opposite sides thereof through which the prongs of each of the staples may slide in a position straddling the rib and aligned at a right angle to their position before turning, said rib having a pointed upper end portion approximately aligned with one side of the guide first mentioned.

10. Mechanism for feeding and turning two-pronged staples of character described, comprising a guide in which the staples descend by gravity with their heads in alignment and their prongs aligned with the guide axis, a feed slide moving perpendicularly to the guide, a finger thereon adapted to enter between staple prongs, another finger on the slide adapted to operate on a lower staple prong, an angular supporting member on the slide adapted to have supporting contact under a staple head, another member on the slide adapted to cooperate in its return motion with an upper portion of a staple, and guide means below the feed slide including a rib and channels at opposite sides thereof through which staple prongs may slide in a position straddling the rib and aligned at a right angle to their position before turning and said rib having a pointed upper end portion approximately aligned with one side of the guide first mentioned, one of the channels in said lower guide means having at its upper end a recess to receive a lower staple prong.

11. Staple feeding and turning mechanism of the class described, adapted to feed singly round-headed staples having opposite prongs, and comprising an upper guide channel in which the staples move with their prongs aligned with the channel axis, a lower guide channel in which the fed staple moves with its prongs aligned on an axis at a right angle to the channel, and intermediate the guide channels a reciprocatory feed slide having means to feed the staples one at a time to the lower channel and at the same time turn them to the position for feeding through the lower channel, said means including a surface which in one position of the slide engages one of the staple prongs to initiate the turning movement and another surface which thereafter engages the other staple prong to complete the turning movement.

12. Staple feeding and turning mechanism of the class described, adapted to feed singly round-headed staples having opposite prongs, and comprising an upper guide channel in which the staples move with their prongs aligned with the channel axis, a lower guide channel in which the fed staple moves with its prongs aligned on an axis at a right angle to the channel, and intermediate the guide channels a reciprocatory feed slide having means cooperating with the lower channel formation to feed the staples one at a time to the lower channel and at the same time turn them to the position for feeding through the lower channel, said means including a surface which in one position of the slide engages one of the staple prongs to initiate the turning movement and another surface which thereafter engages the other staple prong to complete the turning movement.

13. Staple feeding and turning mechanism of the class described, adapted to feed singly round-headed staples having opposite prongs, and comprising an upper guide channel in which the staples move with their prongs aligned with the channel axis, a lower guide channel in which the fed staple moves with its prong aligned on an axis at a right angle to the channel, and intermediate the guide channels a feed slide having means to feed the staples one at a time to the lower channel and at the same time turn them to the position for feeding through the lower channel, said means comprising opposite fingers to cooperate with upper and lower staple prongs respectively, and an angular lug formation having supporting cooperation with a staple head.

14. Staple feeding and turning mechanism of the class described, adapted to feed singly round-headed staples having opposite prongs, and comprising an upper guide chan-

nel in which the staples move with their prongs aligned with the channel axis, a lower guide channel in which the fed staple moves with its prongs aligned on an axis at a right angle to the channel, and intermediate the guide channels a feed slide having means to feed the staples one at a time to the lower channel and at the same time turn them to the position for feeding through the lower channel, said means comprising opposite fingers to cooperate with upper and lower staple prongs respectively, an angular lug formation having supporting cooperation with a staple head, and also a flanged end portion to cooperate with an upper staple prong after the feeding of the staple has been initiated.

In testimony whereof I affix my signature.

THEODORE PUCAR.