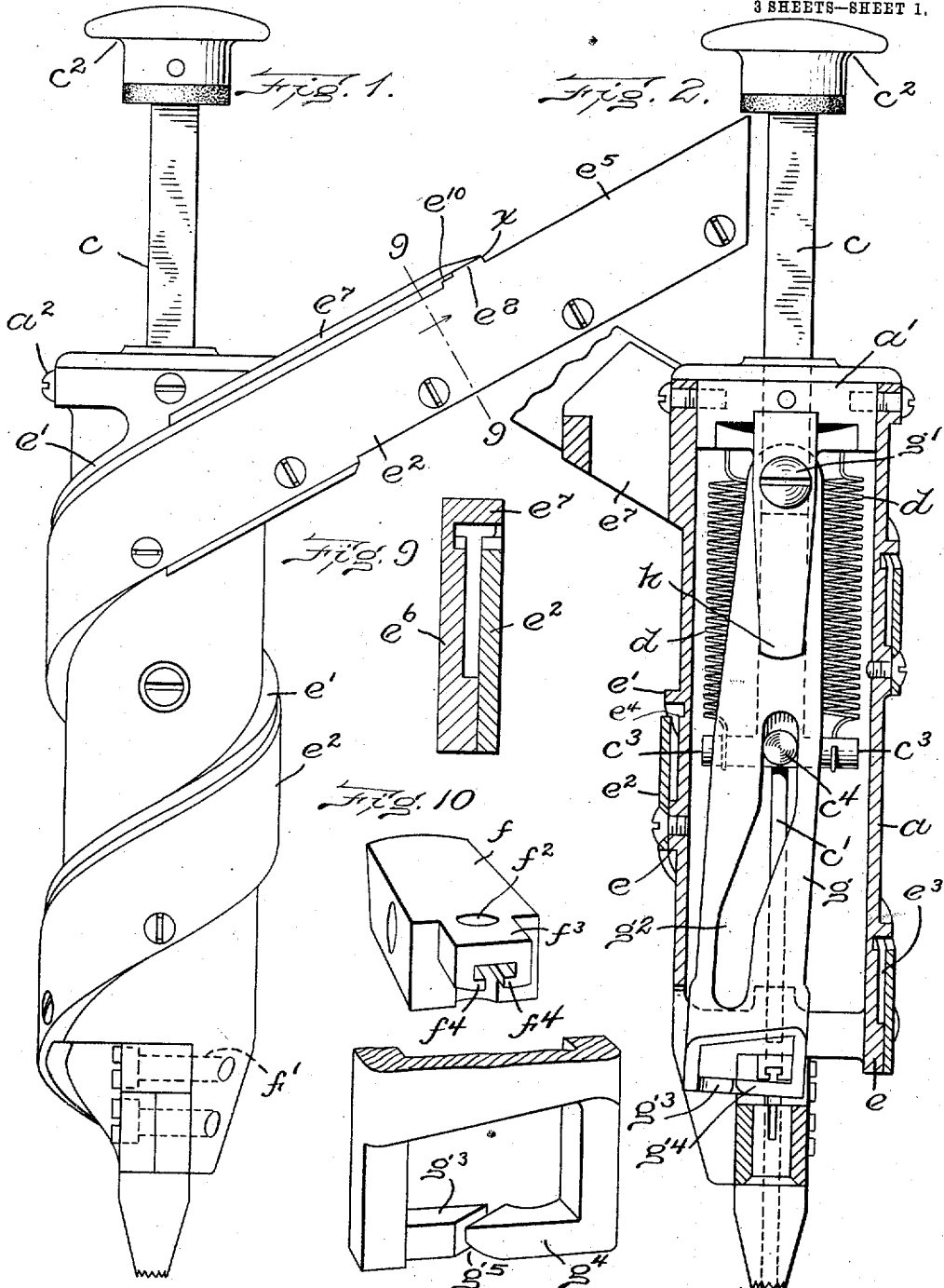


H. A. BALLARD.
MECHANISM FOR INSERTING FASTENERS.
APPLICATION FILED AUG. 31, 1906.

969,934.

Patented Sept. 13, 1910.

3 SHEETS—SHEET 1.



Witnesses:
Walter P. Ahl
A. L. Folsom

Fig. 11

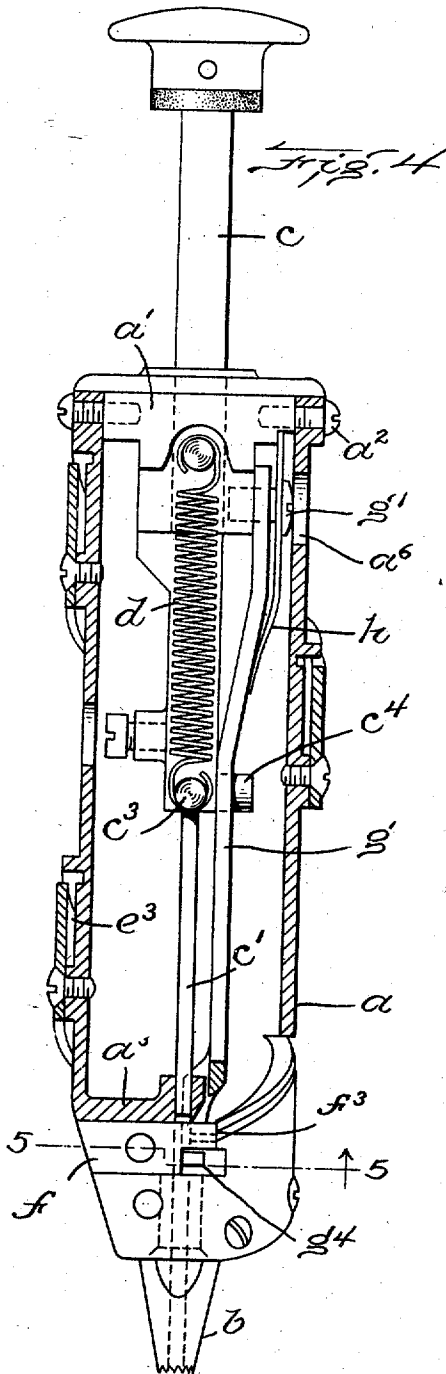
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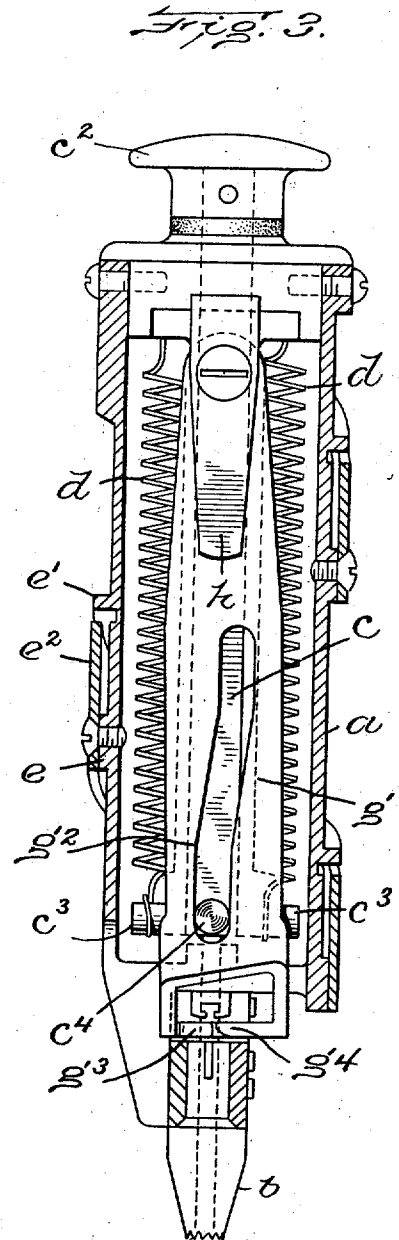
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3 SHEETS—SHEET 2.



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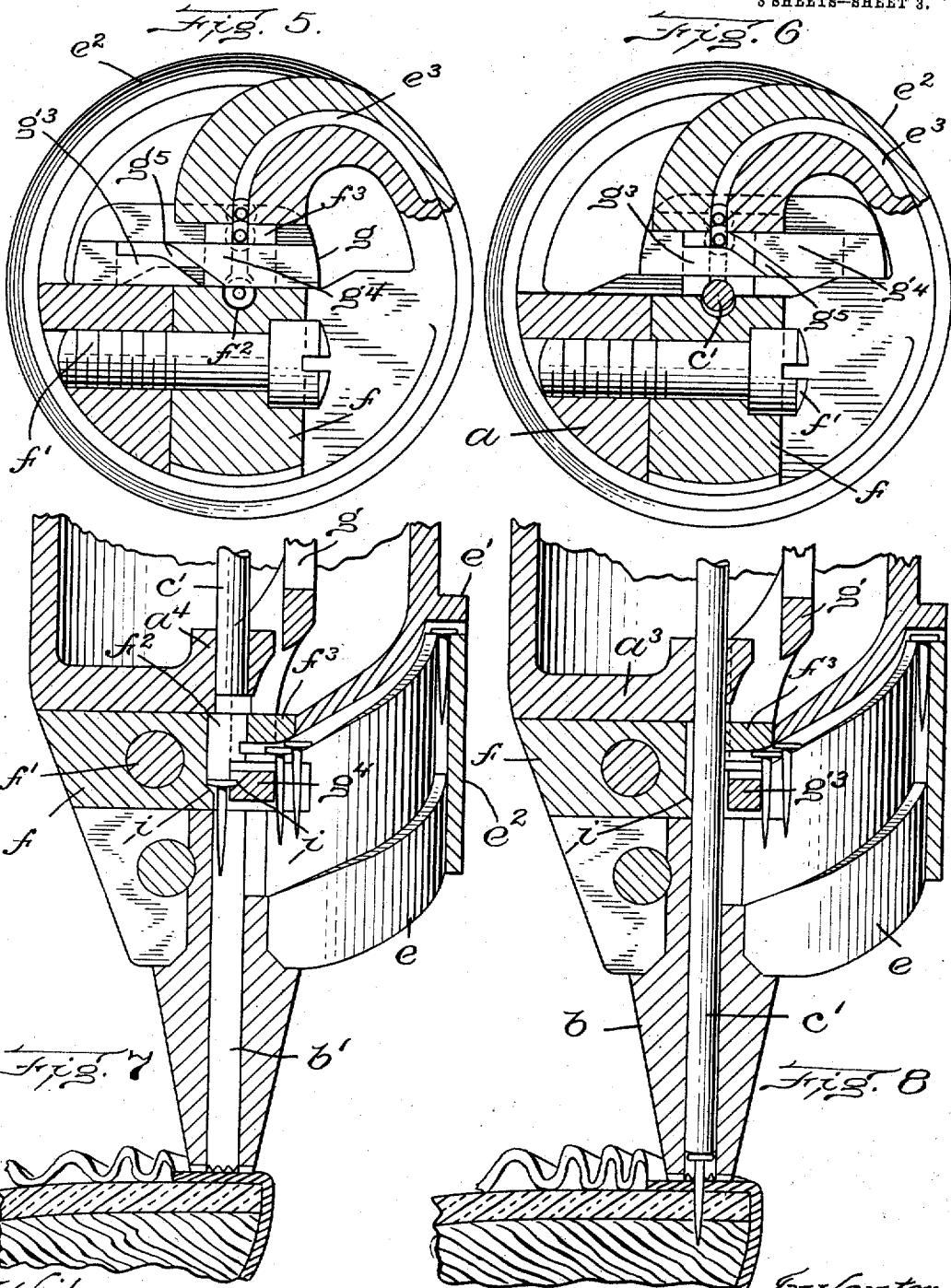
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

HARRIE A. BALLARD, OF SOMERVILLE, MASSACHUSETTS, ASSIGNOR TO THE BOYLSTON MANUFACTURING COMPANY, OF BOSTON, MASSACHUSETTS, A CORPORATION OF NEW JERSEY.

MECHANISM FOR INSERTING FASTENERS.

969,934.

Specification of Letters Patent. Patented Sept. 13, 1910.

Application filed August 31, 1906. Serial No. 332,794.

To all whom it may concern:

Be it known that I, HARRIE A. BALLARD, of Somerville, in the county of Middlesex and State of Massachusetts, have invented certain new and useful Improvements in Mechanism for Inserting Fasteners, of which the following is a specification.

This invention has relation to fastener inserting mechanism or implements for attaching the uppers to the inner soles of partially formed shoes.

The object of the invention is to provide certain improvements in mechanisms of the character referred to, and particularly in hand tacking tools by means of which the tacks or other fasteners may be fed and driven more accurately than heretofore, by which the tacks will be less likely to clog or obstruct their passageway and are more easily accessible in case of clogging than has hitherto been possible in previous tools, and by which the construction of the tool may be simplified and its efficiency enhanced.

To these ends, the invention in the form illustrated in the accompanying drawings, comprises a barrel, cylinder or casing, in which the driver-bar is adapted to reciprocate to drive a tack through a nipple into the work, a picker for successively presenting tacks to the action of the driver, and a raceway for the tacks which is arranged helically about the exterior of the barrel or cylinder and extends thereinto to deliver tacks to the picker. The raceway is preferably provided with an extension projecting tangentially from the barrel or cylinder for insertion in a loading machine.

The picker in the illustrated embodiment of the invention is adapted to reciprocate across the end of the raceway, and is spring-pressed to yieldingly engage and hold each tack in the path of the driver after it has been moved to proper position. The picker may be pivoted at its upper end, and actuated by a pin and cam-slot connection with the driver-bar.

The end of the raceway communicates with a block which is apertured to receive the driver, and into the aperture in which the picker feeds a tack on the upstroke of the driver, and holds it yieldingly, as hereinbefore described.

In addition to these features, my invention comprises other features of construction and arrangement of parts as illustrated

upon the accompanying drawings, described in the following specification, and particularized in the appended claims.

On said drawings,—Figure 1 illustrates a hand tacker embodying the invention. Fig. 2 represents a vertical section through the same with the driver raised. Fig. 3 represents a similar section with the driver depressed. Fig. 4 illustrates the tool partially in section on a plane at right angles to the plane on which Fig. 3 is taken. Figs. 5 and 6 are enlarged sections on the line 5—5 of Fig. 4 looking upward and illustrates the picker at the two extremes of its position. Figs. 7 and 8 are enlarged sections of the lower portion of the tool, Fig. 7 showing the driver raised with a tack in position to be driven, and Fig. 8 illustrating the driver depressed. Fig. 9 (Sheet 1) represents a section on the line 9—9 of Fig. 1. Fig. 10 represents the block detached. Fig. 11 illustrates the lower portion of the picking device.

Referring to said drawings on which similar reference characters indicate similar parts or features, as the case may occur, *a* indicates the casing, barrel or cylinder which constitutes the body of the implement and which may be grasped by one hand of the operator while he manipulates the driver with the other hand. The upper end of the barrel or casing is closed by a head *a'* having a boss which may be inserted in the end of the barrel, and into which screws or other fastenings *a''* are inserted.

At the tapering lower end of the barrel or casing is a solid portion *a'''* to which is secured the shank of the nipple *b*. The driver-bar *c* is preferably angular in cross section and passes through a complementary aperture in the head *a'*. On the lower end of the driver-bar is formed or secured a driver *c'* which enters an aperture *a''* in the lower end of the cylinder or barrel, and which is adapted to pass through the aperture *b'* in the nipple. To the upper end of the driver-bar is attached the handle or head *c''*. The driver-bar has at its lower end laterally projecting pins or studs *c'''*, to which are attached the lower ends of springs *d d* whose upper ends are attached to the head *a'*. These springs serve to maintain the driver-bar in its elevated or raised position.

The raceway for the tacks is exterior to the barrel or casing, and extends helically

therearound. The barrel is provided with two helical flanges e e' , that at e' projecting to a slight extent beyond the outer surface of the flange e . To said flange e is secured a helical metallic strip e^2 , in consequence of which, there is formed a groove or raceway e^3 for the passage of the tacks, between it and the exterior surface of the casing or barrel. The heads of the tacks are adapted to rest upon the upper edge of the strip e^2 and upon a shoulder e^4 , formed by helically grooving the exterior surface of the barrel or casing. The upper end of the raceway communicates with an extension e^5 , which projects tangentially and upwardly from the barrel or casing. This extension is formed by the projecting end of the strip e^2 and by an arm e^6 which is secured to a web e^7 of the casing. From its end to the shoulder e , the groove in the raceway extension is uncovered, but from said shoulder to the casing there is a covering for the raceway, consisting of the lateral flange e^7 , as illustrated in Fig. 9, this flange e^7 coinciding with the flange e^1 on the casing or barrel. The shoulder e is formed by a projection e^8 which extends upwardly from the strip e^2 into engagement with the flange e^7 . The upper edges of the side walls of the extension e^5 beyond the shoulder e , are in a plane above the plane of said edges between the shoulder and the casing, and between said edges is the shoulder e^{10} , which prevents the tacks from sliding rearwardly in case the barrel is held with the extension pointing downwardly. The end of the extension is adapted to be inserted in a suitable loading machine, by which tacks will be supplied to the raceway.

At its lower end, the raceway is curved inward toward the center of the barrel, as shown in Figs. 5 and 6, so as to bring the end of the raceway into registry or alignment with a block f which is inserted in the lower portion of the barrel and is held in place by a screw pin f^1 . The block f is provided with a vertical aperture f^2 , through which the driver is operated, as illustrated in Fig. 8, and which is in alignment with the aperture through the nipple. The said block has a projecting end f^3 with inwardly projecting flanges f^4 f^4 , the upper surfaces of which register with the upper edges of the walls of the raceway at its lower end, as is clearly illustrated in Figs. 4, 7 and 8. These inwardly projecting flanges f^4 f^4 are adapted to guide the tacks as they are fed successively into the aperture f^2 , for engagement by the driver.

The picking mechanism comprises a picker g , which in the present instance may be a lever loosely fulcrumed upon a screw g^1 inserted in a downwardly projecting portion of the head a^1 , as illustrated in Fig. 4. The lever itself is bent as shown in the last

mentioned figure, and it is provided with a slot g^2 , in which extends a pin e^4 on the lower end of the driver-bar, so that as the driver is reciprocated, the picking lever g will be oscillated first in one direction and then in the other. At its lower end, the picking lever is formed with a yoke, whose arms are formed or provided with oppositely projecting picking fingers g^3 g^4 , with an inclined passageway between them, adequate to receive the shank of a tack. These fingers lie immediately beneath the projection f^3 on the block f and between the inner end of said block and the lower end of the raceway. (See Figs. 5 to 8 inclusive.) The finger g^3 acts as a stop to limit the passage of the tack at the lower end of the raceway, and this finger normally lies in the position shown in Fig. 5 when the driver-bar is raised. It is of less width than the finger g^4 , so that the lowest tack in the raceway will normally lie at the entrance of the passageway g^5 between the ends of the fingers. The finger g^4 , when the picking lever is moved from the position in Fig. 6 to the position in Fig. 5 as when the driver moves upward, engages the lowest tack and wedges it along the flanges f^4 of the block until it is in alignment with the aperture f^2 in said block. The face of the finger g^4 nearest the raceway holds back the remainder of the tacks in the raceway until the pick lever is moved in the opposite direction, to permit the tacks to feed one step.

It will be observed from Figs. 5 and 6 that the fingers are less in width than the space between the end of the raceway and the end of the block f . This is for the purpose of permitting the picking lever, and therefore the picking fingers, to move toward and from the end of the block.

The leaf spring h has one end bearing upon the outer face of the pick lever g , and its other end resting upon the head a^1 . The screw g^1 , hereinbefore referred to, passes through an aperture in said spring and may be screwed in or out to cause its head to increase or diminish the pressure of the spring upon the pick lever. It may be observed in passing, that this screw is accessible through an aperture a^6 in the casing through which a screw driver may be inserted.

From Fig. 7 it will be observed that the inner end of the block f which constitutes an abutment, and the confronting face of the finger g^4 , are provided with inclined shoulders i i^1 , upon which the head of a tack may rest. The tack is thus held yieldingly between the end of the block and the finger g^4 of the picker with its shank extending into the aperture b^1 of the nipple. When the driver descends, its end engages the finger g^4 and forces the picking lever bodily toward the inner end of the raceway,

so as to release the tack. But the end of the driver could by engaging the head of the tack and forcing it downward, swing the picking lever bodily outward to effect the same result. When the driver descends, it first engages the finger g^4 and causes the release of the tack held thereby, forcing the tack downward until it is disengaged from the block and the finger. The continued downward movement of the driver bar causes the pick lever to be swung from the position in Fig. 6 toward the left, so as to feed another tack toward the aperture in the block f . The driver continues its downward movement and forces the tack into the work. Then, as the driver moves upward under the tension of the springs d $\bar{d}$, it moves the picking lever to the right during the middle portion of its upward movement, and as the end of the driver is raised to a point above the picking fingers, the spring h forces the lower end of the lever toward the block, so that the tack is pushed against the abutment where it is held yieldingly as previously described, the tacks in the raceway, in the meantime, sliding down so that the lower tack rests against the outer face of the finger g^3 , in alinement with the passageway between the beveled ends of the fingers g^3 g^4 . Thus at all times when the driver is raised, a tack is held in position to be forced by the driver into the work.

So far as I am aware, I am the first to have provided a hand tacking tool of the character herein described, in which the raceway extends helically around the exterior of the barrel or casing. One of the advantages of the construction is that the heads of the tacks are always visible between the upper edge of the strip e^2 and the flange or cover e^1 , so that in case they become clogged or stuck, the point at which they become clogged may be observed at once, and they may be forced into the raceway and be brought into proper overlapping relation.

Another feature of the invention which I regard as novel, is the yielding picker by which the tacks are advanced successively into the driving position and by which they are held yieldingly in said position to be engaged by the driver. While in this embodiment of the invention, I have illustrated the pickers as mounted upon a pivoted lever, nevertheless, I am aware that this detail of construction and arrangement may be varied without detracting from the spirit and scope of the invention. This feature of the invention, as well as others, may be utilized in other forms of fastener driving machines.

There are other features of the invention which I regard as important, but to which I need not refer in detail as their advantages will be apparent to those skilled in the art to which this invention relates.

Having thus explained the nature of my invention and described a way of constructing and using the same, although without attempting to set forth all the forms in which it may be embodied, or all the modes of its use, I declare that what I claim is:—

1. A hand implement for inserting fasteners, comprising a driver, picking devices, an outer exposed continuous barrel or casing, and an open raceway extending helically around the exterior of said barrel or casing.

2. A hand implement for inserting fasteners comprising a driver, picking devices, an outer exposed continuous cylindrical barrel or casing, a raceway formed on the exterior of said barrel, and having its receiving end terminating exteriorly of said barrel, and its delivering end terminating interiorly of said barrel to deliver fasteners to said picking devices.

3. A hand implement for inserting fasteners comprising a driver, picking devices, an outer or inclosing barrel or casing, a helical raceway on the exterior of the barrel or casing, and a helical flange on said casing forming a cover for said raceway which renders the fasteners visible.

4. A hand implement for inserting fasteners comprising a driver, picking devices, a barrel or casing, and a raceway extending helically around the exterior of said barrel or casing, said raceway having an extension projecting tangentially from said barrel or casing.

5. A hand implement for inserting fasteners comprising a driver, picking devices, an outer barrel or casing, a helical flange on the exterior of said barrel or casing, and a helical strip attached to said flange and constituting, with the exterior of said barrel or casing, an open exposed raceway for the fasteners.

6. A hand implement for inserting fasteners comprising a driver, picking devices, a barrel or casing, a nipple located in the axial line of the barrel or casing in alinement with the driver, and a raceway extending helically around the exterior of said barrel or casing and having its end curved spirally inward toward and terminating at the aperture in the nipple.

7. In a mechanism for inserting fasteners, a driver, a raceway, an abutment opposite the end of the raceway, a loosely mounted reciprocatory picker having oppositely projecting fingers for successively picking the end fasteners in the raceway, and a spring exerting its force transversely of the path of movement of the picker for causing the picker to hold a fastener between it and the abutment.

8. In a mechanism for inserting fasteners, a driver, a raceway, a picker having oppositely projecting fingers, means for recip-

rocating the picker, and yielding means for causing one of the fingers of said picker yieldingly to hold a fastener in the path of the driver, and to yield transversely of the path of movement of said picker.

9. In a mechanism for inserting fasteners, a driver, a raceway for guiding fasteners toward the driver, a picker having oppositely projecting fingers, means for causing a relative lateral movement of the raceway and the picker longitudinally of said fingers to effect the presentation of a fastener to the driver, said picker having a loose movement toward and from the raceway, and a spring bearing against said picker transversely of its path of movement to cause it to yieldingly hold a fastener in the path of the driver.

10. In a mechanism for inserting fasten-

ers, a driver, a raceway, a block separate from the raceway and having flanges registering with the raceway to receive fasteners therefrom, a picker located between the block and the raceway, and movable toward and from the end of the raceway, said picker having oppositely disposed fingers with beveled ends, one of said pickers having a shoulder opposite the end of the block, a spring bearing against said picker, and means for effecting a relative lateral movement of the picker and raceway.

In testimony whereof I have affixed my signature, in presence of two witnesses.

HARRIE A. BALLARD.

Witnesses:

M. B. MAY,
A. L. FOLSOM.