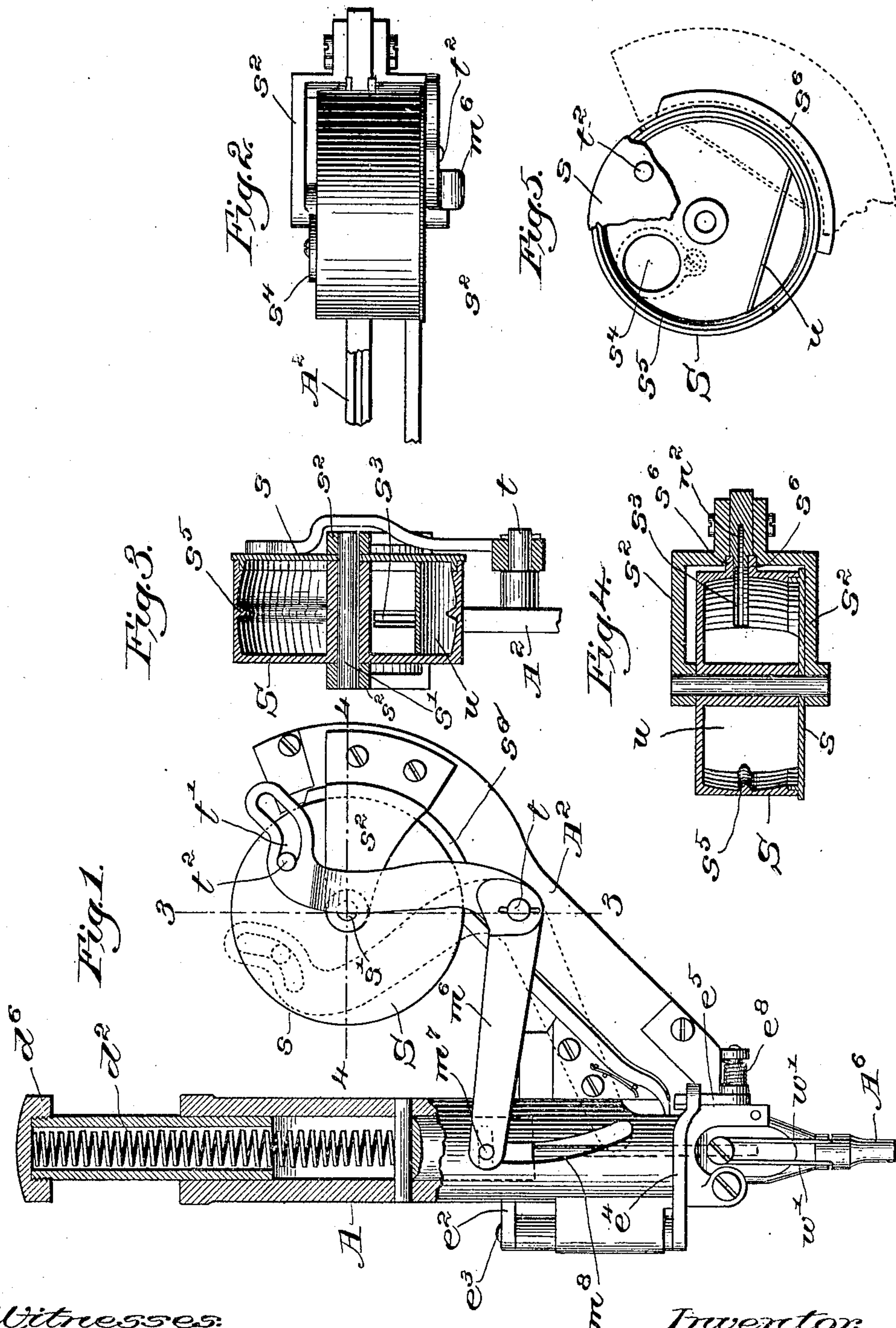


M. BROCK.
NAILING APPARATUS.
APPLICATION FILED JULY 31, 1899.

919,533.

Patented Apr. 27, 1909.



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UNITED STATES PATENT OFFICE.

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NAILING APPARATUS.

No. 919,533.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, MATTHIAS BROCK, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Nailing Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

My invention relates to nailing apparatus for delivering, or delivering and driving nails, tacks, or other forms of fastenings.

The object of my invention is to provide a novel and improved apparatus of this kind in particulars that will be hereinafter set forth and pointed out in the claims.

While I denominate my invention as relating to a nailing apparatus, and shall here refer to the fastenings by use of the generic term nail, yet I desire it to be understood that in so doing I do not restrict my invention to single pointed drive nails, but use the term generically to apply to any type of fastening capable of being used in a machine or apparatus made in accordance with my invention.

In the drawing, Figure 1 is a side elevation partly in section of a nailing apparatus containing one embodiment of my invention. Fig. 2 is a top or plan view of the hopper portion of the apparatus, Fig. 1. Fig. 3 is a vertical section taken on the dotted line 3—3, Fig. 1, looking to the right. Fig. 4 is a horizontal section taken on the dotted line 4—4, Fig. 1, looking down, and Fig. 5 a side elevation, partial section, of the hopper shown in Fig. 1.

For the present purpose of disclosing my invention generally, I have shown the same as embodied in a nailing apparatus of the hand type commonly known as hand nailers, or hand tackers, such for instance as illustrated in my Patent #601,941, dated April 5, 1898.

In the drawings of this my present application, the hand piece or case A provided with a nose A⁶, a driver bar d² and its cap d⁶ for reciprocating the driver within the nose A⁶, the spring d³ within the cap d⁶ the retaining blocks controlled by the spring w', the gate e⁵ controlled by spring e⁸ and actuated from the driver bar by the lever e⁴, vertical shaft e³, and arm e², are and may be of the construction shown in my said Patent #601,941, and operating as there described,

or the said driving mechanism or apparatus may be of any other suitable or well known construction.

My invention has particular reference to the receptacle or hopper which receives the tacks, and to the means for delivering the tacks or nails therefrom to the conductor that conveys the same to the driver.

Referring now first to Fig. 1, the hopper made in accordance with my invention, as shown in the present apparatus and indicated at S, is represented as in the form of a cylinder having one side closed by a removable cap s that may be secured in place in any suitable manner. The hopper S is shown as so mounted that it may be oscillated about a pin s' preferably having a substantially horizontal axis and carried by and between two brackets s² secured to and carried by the upper end of the raceway A², said pin occupying a substantially horizontal position when the apparatus is in use. The raceway A² has its nail receiving groove or slot indicated at n², see Fig. 4, this slot being to receive the shanks or long parts of the nails or fastenings and conduct the same, in the present instance with their heads resting upon the top edges or walls of the raceway, down to the driving mechanism referred to.

In the embodiment of my invention here shown the upper end of the raceway A² is shown as partially encircling the periphery of the hopper S, the nail receiving passage n² of the raceway being in a plane which if prolonged would intersect the axis of rotation of the hopper. The hopper is provided with a peripheral exit opening s³ of suitable length, arranged to move opposite the entrance to the nail receiving groove n² in the raceway, and is oscillated or has imparted to it a rotary reciprocating motion about its axis, so as to cause said slot to be moved over and in front of the entrance to the groove of said raceway by any suitable mechanism that may be actuated, for instance, by or from the driver.

In the present instance of my invention a pin m⁷ on the driver carrier and projecting through a slot m⁸ in the driver case, as in my said Patent #601,941, engages one end of a bell crank lever m⁶, here shown as pivoted at t to the side of the raceway A², the upper end of said lever m⁶ being provided with a cam-shaped slot t' that receives a pin t² on the

side of the hopper S, so that reciprocation of the driver carrier in driving the successive nails will act through the bell crank lever m^6 to impart to the hopper S a rotary reciprocating motion that causes its exit opening s^3 to vibrate in front of the entrance to the nail receiving groove of the raceway.

The nails are deposited within the hopper S through a suitable opening here shown in the side of the hopper and normally closed by a pivoted plate or cover s^4 , and as the hopper is oscillated or moved as described the mass of nails within the hopper is thrown back and forth in front of the exit opening in the periphery of the hopper through which they find exit, point first, into the groove n^2 of the raceway, the heads of the fastenings or tacks in this instance bringing up against the open slotted edge or top of the raceway the latter supporting the nails or tacks as they slide downwardly along the raceway to the driving mechanism by which they are picked off one at a time and driven into the work. Moving the hopper as described obviates the use of buckets or lifts therein as has been common heretofore, and at the same time enables the side and end walls of the exit opening to remove surplus nails or tacks from the open grooved edge of the raceway, keeping the latter free and clear for ready entrance into the groove of the nails or tacks that may be presented properly endwise thereto.

In order that the nails or tacks may be presented to the exit opening in the direction of the length of the opening or parallel with the length of the raceway, or the plane of the raceway, I prefer to make the interior of the hopper more or less cup-shaped as indicated, so that the natural tendency of the nails is to fall into positions extending end to end around the hopper instead of crosswise thereof, the former positions being such that they may readily pass through the exit opening into the raceway.

It is quite impossible for a workman using a hand machine of the class here shown to always maintain the same in a truly vertical position, the tendency being always to tip the same in one or the other direction, and recognizing this, to prevent the mass of tacks within the hopper being thereby caused to slide bodily to one or the other side of the hopper, and perhaps more or less away from the exit opening therein, especially when the mass is more or less reduced, I have provided an interiorly projecting annular separating or retarding rib s^5 that encircles in part the interior of the hopper, and prevents the mass sliding bodily from one to the other side thereof, it acting to separate the mass of tacks contained within the hopper into two portions which are retained by this separating rib normally upon their respective sides of the said rib.

It will be noticed that in my apparatus as

here shown the exit opening is in the periphery of the hopper, and that the nails or fastenings project or escape therethrough endwise and in a plane parallel with the plane of the depth of the raceway, which plane intersects the axis of the hopper, instead of being ejected sidewise with their lengths substantially parallel with the axis of the hopper as in some devices heretofore constructed. This construction is of great advantage because it insures certainty of delivery of the required quantity of nails from the hopper into the raceway, and thereby insures a full and proper supply of nails to the tack driving devices.

To prevent as far as possible the points of the tacks becoming clogged in the exceedingly small clearance necessary between the moving hopper and the stationary raceway, I have provided the hopper with two arc-shaped guide lips s^6 that straddle the slotted edge of the raceway presented thereto, see Fig. 4, and by their closeness of fit and arrangement act to prevent any clogging of the tacks between the moving and stationary parts.

In apparatus of this class it is desirable to reduce as far as possible the motion imparted to the hopper, and to enable me so to reduce the said movement and yet obtain the required agitation of the tacks or nails within the hopper, I have provided the hopper with an interiorly arranged device that may be called a pitching table u , shown as arranged like the chord of an arc within the hopper. The pitching table is arranged with one end adjacent to the lower end of the exit opening s^3 in the periphery of the hopper. As the hopper assumes one extreme position this table u will reach its dotted line position Fig. 5, causing the mass of tacks or nails within the hopper to slide bodily toward the bottom of the hopper, and then as the said hopper is rotated or moved quickly into its opposite extreme position, shown in full lines Fig. 5, the action of this pitching table, by reason of its more abrupt plane as compared with the curved inner wall of the hopper, is to pitch the mass of tacks at its bottom toward the portion of the hopper having the exit opening s^3 through which they may pass to the raceway.

The slot t' in the upper end of the bell-crank lever m^6 for operating the hopper is shaped to permit a considerable initial movement to be imparted to said lever from its full line position, Fig. 1, to the left without imparting substantial movement to the hopper through the pin t^2 . Further movement of said lever into its dotted line position, Fig. 1, caused by the descent of the driver d^2 , turns the hopper quickly and brings the pitching table into its dotted line position Fig. 5, causing the nails on said table to be pitched upwardly abruptly against the inner

surface of the hopper opposite the slotted raceway end, then temporarily covered by the pitching table. Thereafter the upward movement of the driver bar by its usual spring moves the lever m^6 and instantly turns the hopper backwardly, putting the pitching table into its normal position and uncovering the slot in the raceway, so that the nails may drop into said slot. With this movement a part of the nails meet the inclined face of the pitching table, thereafter move down the same and enter the slot of the raceway.

My invention is not restricted to the particular embodiment here shown, as said embodiment is selected merely as a means for illustrating my invention.

Having described my invention, what I claim and desire to secure by Letters Patent is:—

1. In apparatus of the class described, a circularly movable hopper having an exit opening in its periphery at substantially right angles to its axis of movement for the escape of headed fastenings therefrom; combined with a raceway grooved for the reception of the shanks of the fastenings, the upper side of said raceway being arranged in the exit opening of said hopper and receiving and sustaining the nails in their passage along the raceway.

2. In an apparatus of the class described, a grooved raceway to guide fastenings sustained by their heads, a hopper movable about an axis at substantially right angles to the raceway and provided with an exit opening parallel with the raceway and directly over it, and flanges on the hopper embracing the side walls of the raceway for dislodging misplaced fastenings therefrom as the hopper is moved relatively to the raceway.

3. An apparatus for feeding headed nails, comprising a circularly movable hopper provided with an exit opening through only a portion of its periphery, said exit opening being wider than the heads of the nails to be discharged therethrough, and a grooved raceway having a concaved face fitting that portion of the periphery of the hopper in which said exit opening is located, said raceway being so located with reference to said hopper that its concaved face sustains the under sides of the heads of nails leaving said exit opening, while the shanks of the nails hang and travel in the groove of said raceway.

4. In an apparatus of the class described, a hopper having a peripheral exit opening and provided with guide lips at the sides of said opening, and a raceway arranged opposite said opening to receive the fastenings directly from the hopper, said guide lips straddling said raceway and preventing clogging of the fastenings between the hopper and raceway.

5. In apparatus for inserting fastenings,

a hand piece, a driver bar therein having a driver, a centrally sustained circularly movable hopper having its axis at right angles to the driver bar and provided with a slot extended but partially about the periphery thereof and forming an exit opening for the headed fastenings, and means between said driver-bar and hopper to move the hopper as the driver is actuated.

6. In an apparatus for driving fastenings, a hopper having a peripheral exit opening and provided with outwardly extended guide lips at the sides of said opening, means to impart reciprocating movement to said hopper, and a grooved raceway having a concaved edge facing said hopper and extending between said guide lips.

7. In an apparatus of the class described, a movable hopper having a longitudinal exit opening said hopper being provided with an inwardly projecting nail dividing or separating rib to separate the fastenings into a plurality of masses, and means to reciprocate said hopper in the direction of the length of the opening to place the nails intermittently in position to be discharged.

8. In an apparatus of the class described, a raceway, a hopper having a rib extended partially about the interior thereof to form a plurality of circumferential troughs therein and provided with an exit opening extending longitudinally of and in communication with both said troughs, in combination with means to move said hopper in the direction of the length of the troughs to cause the fastenings therein to become arranged lengthwise of said troughs in position to be discharged through said opening into the raceway.

9. In an apparatus of the class described, a raceway, a circularly movable drum or hopper having a low interior rib dividing the hopper into a plurality of circumferential troughs and an elongated exit opening in substantial alinement with said rib, and means to oscillate the hopper to cause the nails to become arranged in both said troughs lengthwise of the said opening in position to be discharged into the raceway.

10. In an apparatus of the class described, a hopper having a rib on its interior bottom wall, means for reciprocating the hopper in the direction of the length of said rib whereby the nails adjacent to said rib are caused to arrange themselves parallel thereunto, said hopper having an elongated slot or exit opening at the end of said rib and in alinement therewith through which the nails so arranged may be discharged sidewise.

11. In a machine for driving fastenings, a hopper having a slot extended through a portion of its periphery and being unslotted at another portion thereof, the unslotted portion being provided with a rib to separate fastenings sustained in the hopper into a

plurality of masses prior to discharging the fastenings from said masses, said rib being substantially in line with said slot, and means to reciprocate said hopper to enable
5 fastenings to be discharged through said slot into a raceway.

12. In an apparatus of the class described, a centrally pivoted oscillating hopper having a peripheral slot and a pitching table sus-
10 tained in said hopper standing as a chord to the periphery thereof and crossing the plane of said slot.

13. In apparatus of the class described, a circularly movable hopper having a pe-
15 ripheral slot and containing a pitching table that normally sustains the fastenings, means to actuate the hopper to cause the pitching table to throw the fastenings upwardly against the inner surface of the hopper that
20 said fastenings may drop and enter said slot, and a raceway co-acting with said slot to directly receive the fastenings entering said slot, said raceway conducting the fasten-
ings into position to be driven.

14. In an apparatus of the class described, a hopper having a peripheral slot and pro-
25 vided at its interior with a pitching table acting normally to sustain the mass of fastenings in the hopper, and means to reciprocate said hopper at a variable speed whereby a
30 quick movement is obtained to cause the pitching table to throw the fastenings against the slotted part of the hopper that said fastenings may enter said slot and thence
35 pass into a raceway.

15. In a mailing apparatus, an oscillating hopper having an elongated exit opening, a
40 raceway standing in said opening, a driver, and means connecting the hopper and the driver to operate the former by the latter, said means being constructed to provide a
dwell in the movement of the hopper while the driver is ascending.

16. In a nailing apparatus, a circularly
45 movable hopper having an elongated exit opening and provided at its interior with a pitching table crossing the plane of said opening and substantially parallel with the axis of rotation of said hopper, a raceway entering
50 and partially filling said opening leaving a portion of said opening unoccupied for the reception of the heads of fastenings or nails, a driver, means coacting normally to retain said driver in its elevated position with the
55 pitching table sustaining the nails, and means connecting the hopper and driver to operate the former by the latter.

17. In a nailing apparatus, a circularly
60 movable hopper having an elongated opening and provided at its interior with a pitching table crossing the plane of said opening and substantially parallel with the axis of rotation of said hopper, a slotted raceway having a portion standing in said opening,

a driver, and means actuated by said driver 65 and connected with said hopper to oscillate the latter and cause the pitching table to throw fastenings against a portion of the interior opposite the slotted part of the hop-
70 per that said fastenings may fall and enter said slot and then pass into said raceway.

18. In apparatus of the class described, a centrally pivoted hopper having a slot ex-
75 tended partially about its periphery, and a pitching table within and sustained by said hopper, adapted as the hopper is moved in one direction to throw the nails upwardly that they may drop and enter said slot.

19. In apparatus of the class described, a centrally-supported circularly-movable hop-
80 per having an exit opening in its periphery, combined with an interiorly-arranged pitching table sustained by said hopper and crossing said exit opening, and means for moving said hopper and with it said pitching table. 85

20. In an apparatus of the class described, a pivotally mounted hopper for containing
fastenings having an exit opening in the form of a peripheral slot, and an interiorly
90 arranged pitching table for said fastenings standing as a chord to a portion of the periphery of said hopper.

21. In an apparatus of the class described, a pivotally mounted hopper for containing
95 fastenings having an exit opening in the form of a peripheral slot, and an interiorly arranged pitching table for said fastenings standing as a chord to a portion of the periphery of said hopper and positioned so that
100 one of its ends is adjacent one end of said slot.

22. In apparatus of the class described, the combination with a circularly-movable
hopper, having a curved outer wall concen-
105 tric with its axis of movement and having an exit opening in said wall likewise concentric with said axis, of means movable with said hopper for quickly transferring the fastenings from one portion of said wall to a non-adjacent portion.

23. In apparatus of the class described, 110 the combination with a circularly-movable hopper, having a curved outer wall concentric with its axis of movement, said wall being adapted to support the mass of fastenings in said hopper, and having an exit open-
115 ing in said wall likewise concentric with said axis, of means connected with said hopper for causing said mass of fastenings to be raised from said wall and transferred from one portion of said wall to another. 120

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

MATTHIAS BROCK.

Witnesses:

FREDERICK L. EMERY,
LAURA T. MANIX.