This invention relates to a novel portable driver for fasteners, such as pronged disc fasteners for securing roofing paper and the like in place.

The primary object of the invention is the provision of an efficient, practical, fast-acting and easily used device of the kind indicated, which saves substantial time and labor over that involved in the manual placing and nailing of fasteners, as ordinarily practiced, drives the fasteners more securely, and does a neater job.

Another object of the invention is the provision of a device of the character indicated above involving magazine means, composed of a plurality of fastener holders, the magazine means being rotatable to feed fasteners from selected holders to a fastener positioning slide having an opening into which fasteners are fed, the slide being operable by depression of the hammer of the device to move fasteners one at a time into position beneath the hammer.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a side elevation of a device of the present invention;

FIGURE 2 is an edge elevation of said device, looking from left to right in FIGURE 1, portions being broken away and in section;

FIGURE 3 is a vertical longitudinal section taken on the line 3—3 of FIGURE 2, showing the hammer and a fastener feeding plunger in elevated positions;

FIGURE 4 is a top plan view of the device;

FIGURES 5, 6 and 7 are horizontal sections taken on the lines 5—5, 6—6 and 7—7, respectively, of FIGURE 2;

FIGURE 8 is a fragmentary view, like FIGURE 3, but reversed relative thereto, showing the device engaged with such as tar paper for driving a fastener through the tar paper into a roof board, fasteners being present in a holder and a single fastener being in place in the slide opening and registered with the base opening, beneath the hammer; and

FIGURE 9 is a fragmentary view like FIGURE 8, showing the hammer depressed and a fastener driven thereby into the paper and the roof board.

Referring in detail to the drawings, wherein like numerals designate like parts throughout the several views, the illustrated device comprises a longitudinally elongated rectangular base plate 10, having end edges, formed centrally with semi-circular fastener spacing and positioning notches 12, and parallel longitudinal first and second side edges 14 and 16, respectively. A transversely elongated slide plate 18 biases slidably upon the base plate 10 and works endwise through a slot 29 formed in the lower end of an upstanding cylinder boss 22 which is fixed centrally in the upper surface of the base plate 10 and which boss has extending therethrough a vertical bore 24 which includes a counterbored upper portion 26. The slide plate 18 works, in its extended or operated position, through a U-shaped guide 28, which rises from the upper surface of the base plate 10 near the edge 14 thereof and between spaced cleats 29 on the base plate 10. The slide plate 18 has, on its end remote from the guide 28, an upstanding U-shaped wall 30, which surrounds a depression 33 in the surface of the slide plate.

A vertically elongated hammer tube 32 has its lower end seated in the counterbore 26, as shown in FIGURES 8 and 9, in line with an opening 34, provided in the base plate 10, and the slide plate 18 has a similar opening 36, which, in the operated position of the slide plate, is registered with the opening 34. A vertically elongated cylindrical hammer 38 works in the hammer tube 32, is shorter than the tube 32, and has a disc head 40, secured on its lower end, as by means of the boss 22. A vertical guide slot 44 is provided on a side of the hammer 38 and receives the tip 46 of a screw 48 which is threaded through the side wall 59 of the tube 32, whereby rotation of the hammer in the tube, out of a predetermined position, is prevented. The side of the hammer 38, opposite the guide slot 44 is formed with a vertical cam slot 55, having a laterally inwardly and downwardly angled bottom 54, which reaches to the lower end of the hammer 38.

A vertical gusset plate 54 is fixed to and extends radially outwardly from the hammer tube 32, on which is pivoted, as indicated at 56, the upper end of a pendant slide plate operating lever 58. A ring shaped horizontally lever 60 spacedly surrounds the hammer tube 32 and is fixed, at one end thereof, to the upper end of the lever 58, as shown in FIGURES 8 and 9. On its other end, the lever 60 carries an upward arm 62, which is normal to the lever 60, and has, at its upper end, a laterally inwardly extending cam 64, having a rounded nose 66.

In the normal horizontal, unlifted position of the lever 60, shown in FIGURE 3, the cam 64 extends inwardly through a vertical slot 68, provided in the hammer tube sidewall 56, and engages in the cam slot 55, with its nose 66 bearing against the cam slot bottom 54, the levers 58 and 60 are held yieldably in their normal positions, by a coil spring 70 which is looped around the hammer tube 32, at a location spaced downwardly from the lever 60, and is secured to an intermediate part of the lever 58, as indicated at 72.

Depression of the piston 38 from its retracted elevated position, shown in FIGURE 3, causes the cam slot bottom 54 to push the cam 64 outwardly, whereby the lever 60 is tilted and the lever 58 is swung outwardly, against the resistance of the spring 70, with its lower end 74 engaged in the depression 32 of the slide plate flange within the wall 30, whereby the slide plate 18 is moved to a position wherein its opening 36 is registered with the bore 24 of the boss 22, and with the base plate opening 34, as shown in FIGURES 8 and 9, in advance of full descent of the hammer 38, so that a fastener 18 is positioned in the base plate opening 34, to be driven by the hammer head 40, into tar paper 12, overlying a roofing board 35, as shown in FIGURES 8 and 9. Fasteners of a type suitable to be driven by the instant device can comprise discs 76 having downwardly extending prongs 78, as shown in FIGURE 9.

Triggered by the instant device can comprise discs 76 having downwardly extending prongs 78, as shown in FIGURE 9.

A vertical hammer retracing coil spring 84 is circumposed on the operating rod 86, and it and the lower part of the rod 80 are enclosed in a vertically elongated tubular spring housing 86, which is shorter than the rod 80. The lower end of the housing 86 is threaded into the upper end of the hammer tube 32, as indicated at 88, and the rod 80 works through a central opening 90 provided in a lower end wall 92 of the housing. The upper end of the housing 86 is closed by a threaded plug 94 which has an axial bore 96 through which the operating rod 80 works. A preferably spherical handle knob 98 is provided on the upper end of the rod 80.

The housing 86 has fixed thereon, on the side thereof.
remote from the slide operating lever 58, a downwardly extending bracket 100 which is spaced from and extends downwardly along the hammer tube 32, and terminates, at its lower end, in a laterally outwardly extending horizontal arm 102 having a boss 104 on its underside. A vertical boss 106 extends through the arm 102 and the boss 104, through which works a vertical elongated fastener feeding plunger rod 108, having a preferably spherical handle knob 110, on its upper end.

The feeding rod 108 has a cylindrical tubular head 112 on its lower end, which is fixed in place therein, as by means of a pin 114 extending therethrough and through the rod 108. The head 112 has a lateral circular flange 116, at its lower end, of a diameter to work vertically in fastener holding tubes 118 of a magazine 120. A coil spring 122 is circumscribed on the rod 108 and on the boss 104, and is compressed between the bracket arm 102 and the head flange 116, whereby the fastener feeding rod 108 is biased downwardly.

The fastener magazine 120 comprises a horizontal sector-shaped block 124 which has projecting from its straight diametrical edge 126 an upwardly offset collar 128, having a central opening 130 which is journaled on the hammer tube 32, and bears upon the upper surface of the boss 22. As shown in Figure 7, the edge 126 is provided with an axial semi-circular notch 131 which conformance receives the boss 22, and has a spring-pressed detent 132, seated in a radial socket 134, which is adapted to engage in selected ones of equally circumferentially spaced V-shaped detent notches 156, provided in the outer surface of the boss 22, for releasably holding the block 124 in selected rotated positions, wherein fastener holding tubes 118 are registered with the bore 24 of the boss 22 and the base plate opening 34. The block 124 is held in place, with the lower end thereof permissibly bearing upon the upper surface of the slide plate 18, by suitable means, such as a snap ring 137, seated in and projecting from an external groove 139 in the hammer tube 32, and bearing upon the upper surface of the arm 128.

The sector block 124 is formed with a plurality of equally circumferentially spaced vertical bosses 138, here shown as being four in number, which have counterbores 140, at their upper ends. The fastener holding tubes 118 have their lower ends removably seated in the counterbores, as shown in Figures 8 and 9, and having open upper ends 142.

For bracing the fastener holding tubes 118 accurately in place, a bracket 144 is provided, which comprises a horizontal sector-shaped portion 146 which has a radial arm 148, projecting from its straight edge and provided with an opening 150 which receives the hammer tube 22, on a level slightly below the upper ends of the fastener holding tubes 118, the arm 148 is suitably secured in place on the hammer tube 32, as by means of upper and lower snap rings 150 and 152, engaged in external grooves 154 and 156, provided in the hammer tube, above and below the arm 148. The sector portion 146 of the bracket 144 is provided with evenly spaced semi-circular openings 158 which receive upper portions of the holding tubes 118. As shown in Figure 4, dual V-shaped spring friction detents 160 are suitably fixed on the upper surface of the sector portion 146 between adjacent tubes 118, and have divergently tensioned arms 162 which bear frictions against the adjacent tubes 118, for holding the same down in place in the counterbores 140 of the sector block 124 and in the openings 158 of the bracket 144. The sector portion 146 of the bracket 144 has single spring friction detents 164 thereon, to bear retractably against the end tubes 118. Diagonally opposed vertical aligning slots 159 and 161 extend between and are connected to the sector portion 146 of the bracket 144 and the sector portion of the block 24, and serve to hold the bracket and the block in alignment with each other so that openings are aligned for accurately securing the tubes 118.

In use and operation, some or all of the tubes 118 having been partially or fully filled with fasteners F, with the feeding rod 108 retracted, as indicated in Figure 122, with its head 112 above the upper ends of the tubes 118 being filled, the magazine 120 is manually rotated, on the hammer tube 32, so that the spring-pressed detents 132 ratchet out of the detent notches 136, and until a desired one of the tubes 118 has been registered with the slide plate opening 34, in the normal or retracted position of the slide plate 18 and with the feeding rod head 112. The feeding rod is then released, so that its head 112 is forced downwardly by the spring 122, into the registered tube 118, and bears upon the stack of fasteners therein, so that the lowermost fastener F is partially or fully seated in the slide plate opening 36. The hammer operating rod knob 98 is then grasped and the rod 80 pushed downwardly, so that as explained hereinbefore, the slide plate 18 is moved to its extended or operated position, and the fastener then positioned in the base plate opening 34 is contacted by the hammer head 40 and is driven downwardly into the work to be fastened. The knob 98 is then released, so that the spring 84 can retract the hammer 38 upwardly, preparatory to driving another fastener F.

When one fastener holding tube 118 has been emptied of fasteners F, the feeding rod 108 is elevated to put its head 112 above the tubes 118, and the magazine 120 is rotated to put another filled tube 118 in place, so that the device is "reloaded" for further fastener driving operations.

Although there has been shown and described herein a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes is in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. A portable driver for fasteners, comprising a horizontal base plate, a horizontal slide plate bearing upon the base plate for endwise movement relative thereto, guide means on the base plate for the slide plate, an upstanding hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slidable in said hammer tube and having an upstanding operating rod, a lever assembly pivotable at one end on one side of said hammer tube, a vertical lever pivot fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, the other end of said horizontal lever having a vertical arm thereof carrying a laterally inwardly extending cam, the adjacent side of the hammer tube having a vertical slot through which said cam slides, means precluding rotation of the hammer in the hammer tube, said hammer having a vertical cam slot having a downwardly and laterally inwardly angled bottom surface, with which the cam is engaged, manual depression of the hammer in the hammer tube serving to force the cam slot bottom surface against the cam and tilt said lever assembly and move the slide plate to register its opening with the base plate opening and the lower end of the hammer tube, and a fastener magazine located in the slide plate opening only in the retracted position of the slide plate.

2. A portable driver for fasteners, comprising a horizontal base plate, a horizontal slide plate bearing upon the base plate for endwise movement relative thereto, guide means on the base plate for the slide plate, an upstanding hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube, and a fastener magazine located in the slide plate opening only in the retracted position of the slide plate.

In use and operation, some or all of the tubes 118 having been partially or fully filled with fasteners F, with the feeding rod 108 retracted, as indicated in Figure 122, with its head 112 above the upper ends of the tubes 118 being filled, the magazine 120 is manually rotated, on the hammer tube 32, so that the spring-pressed detents 132 ratchet out of the detent notches 136, and until a desired one of the tubes 118 has been registered with the slide plate opening 36, in the normal or retracted position of the slide plate 18 and with the feeding rod head 112. The feeding rod is then released, so that its head 112 is forced downwardly by the spring 122, into the registered tube 118, and bears upon the stack of fasteners therein, so that the lowermost fastener F is partially or fully seated in the slide plate opening 36. The hammer operating rod knob 98 is then grasped and the rod 80 pushed downwardly, so that as explained hereinbefore, the slide plate 18 is moved to its extended or operated position, and the fastener then positioned in the base plate opening 34 is contacted by the hammer head 40 and is driven downwardly into the work to be fastened. The knob 98 is then released, so that the spring 84 can retract the hammer 38 upwardly, preparatory to driving another fastener F.
tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slide able in said hammer tube, and having an upwardly spring retracted hammer slide able in said hammer tube, and having an upwardly retracted hammer slide able in said hammer tube, and having an upwardly retracted hammer slide able in said hammer tube, having a vertical arm thereon carrying a semi-circular notch conforming to said slide plate, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slide able in said hammer tube, and having an upwardly retracted hammer slide able in said hammer tube, and having an upwardly retracted hammer slide able in said hammer tube, having a vertical arm thereon carrying a semi-circular notch conforming to said slide plate, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, a lever assembly comprising a horizontal lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, a pendant vertical lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, a pendant vertical lever pivoted at one end on one side of said hammer 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hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, a pendant vertical lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, a pendant vertical lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, a pendant vertical lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, said vertical lever having a lower end operatively engaged with the slide plate, a pendant vertical lever pivot
arcuate side and having a spring-pressed detent for engaging in selected detent notches.

6. A portable driver for fasteners, comprising a horizontal base plate, a horizontal slide plate bearing upon the base plate for endwise movement relative thereto, a guide means on the base plate for the slide plate, an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said slide plates, a lever assembly comprising a horizontal lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said horizontal lever having a vertical arm thereon carrying a laterally inwardly extending cam, the adjacent side of the hammer tube having a vertical slot through which said cam slides, means precluding rotation of the hammer in the hammer tube, said hammer having a vertical cam slot having a downwardly and laterally inwardly angled bottom surface, with which the cam is engaged, manual depression of the hammer in the hammer tube serving to force the cam slot bottom surface against the cam and tilt said lever assembly and move the slide plate to register its opening with the base plate opening and the lower end of the hammer tube, and a fastener magazine registered with the slide plate opening only in the retracted position of the slide plate, and an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said hammer tube and having an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said hammer tube and having a plurality of equally circumferentially spaced vertical bores extending therethrough, upward facing fastener holding tubes having open lower ends secured in the block bores, a brace bracket fixed to the hammer tube and having a laterally projecting arm having opening means receiving upper portions of the fastener holding tubes, and friction spring detent means on said lateral arm retainingly engaged with the tubes.

7. A portable driver for fasteners, comprising a horizontal base plate, a horizontal slide plate bearing upon the base plate for endwise movement relative thereto, a guide means on the base plate for the slide plate, an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said hammer tube and having an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said hammer tube and having a plurality of equally circumferentially spaced vertical bores extending therethrough, upward facing fastener holding tubes having open lower ends secured in the block bores, a brace bracket fixed to the hammer tube and having a laterally projecting arm having opening means receiving upper portions of the fastener holding tubes, and friction spring detent means on said lateral arm retainingly engaged with the tubes.

8. A portable driver for fasteners, comprising a horizontal base plate, a horizontal slide plate bearing upon the base plate for endwise movement relative thereto, a guide means on the base plate for the slide plate, an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said hammer tube and having an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slides in said hammer tube and having a plurality of equally circumferentially spaced vertical bores extending therethrough, upward facing fastener holding tubes having open lower ends secured in the block bores, a brace bracket fixed to the hammer tube and having a laterally projecting arm having opening means receiving upper portions of the fastener holding tubes, and friction spring detent means on said lateral arm retainingly engaged with the tubes.

9. A portable driver for fasteners, comprising a horizontal base plate, a horizontal slide plate bearing upon the base plate for endwise movement relative thereto, a guide means on the base plate for the slide plate, an upward facing hammer tube mounted upon the base plate and having an open lower end, said base plate having an
opening registered with the lower end of the hammer tube, said slide plate having an opening adapted to register with the base plate opening and the lower end of the hammer tube only in an operated position of the slide plate, an upwardly spring retracted hammer slidable in said hammer tube and having an upstanding operating rod, a lever assembly comprising a horizontal lever pivoted at one end on one side of said hammer tube, a pendant vertical lever fixed to said one end of the horizontal lever, said vertical lever having a lower end operatively engaged with the slide plate, the other end of said horizontal lever having a vertical arm thereon carrying a laterally inwardly extending cam, the adjacent side of the hammer tube having a vertical slot through which said cam slides, means precluding rotation of the hammer in the hammer tube, said hammer having a vertical cam slot having a downwardly and laterally inwardly angled bottom surface, with which the cam is engaged, manual depression of the hammer in the hammer tube serving to force the cam slot bottom surface against the cam and tilt said lever assembly and move the slide plate to register its opening with the base plate opening and the lower end of the hammer tube, and a fastener magazine registered with the slide plate opening only in the retracted position of the slide plate, and retracting spring means extending between and connected to the hammer tube and said lever assembly for retracting the slide plate from extended operated position to retracted position.

No references cited.