This invention relates to a manual implement for feeding and driving staples, tacks, or other fasteners, usually in strip form, and is adapted for operation in the manner of a hammer to drive the staples, tacks, or the like into wood or other penetrable material.

The primary object of this invention is to provide, at the point where the staples are successively driven into the work, a guide which is so positioned as to furnish an extension of the way through which the staple driver is advanced when driving each staple into the work; and to mount such a guide fixedly to assure maintenance of its operative positioning with the associated parts, but in such a manner as to permit its ready removal when access to the driver way is desired, as when there is a jamming or congestion of staples at this point to be relieved.

This, as well as other objects of my invention as will hereinafter appear, is attainable by a construction of which a certain preferred embodiment is set forth in the accompanying drawing wherein:

Figure 1 is a longitudinal section through the stapling implement in its entirety;

Fig. 2 is a transverse section, taken on line 2—2 of Fig. 1;

Fig. 3 is an enlarged fragmentary sectional view of the head end of the implement;

Fig. 4 is an exploded view of the staple driving mechanism and block associated therewith;

Fig. 5 is a transverse section, taken on line 5—5 of Fig. 1;

Fig. 6 is a detail section, taken on line 6—6 of Fig. 3;

Fig. 7 is a detail section, taken on line 7—7 of Fig. 1; and

Fig. 8 is a detail section, taken on line 8—8 of Fig. 4.

In the present implement any suitable form of staple driving mechanism may be employed. As here shown, it comprises a lever arm swingingly mounted upon a head that is carried by a hollow handle in which is provided a magazine for holding a supply of staples or other fasteners; it comprises also means for automatically feeding these staples or fasteners into driving position in the hammer head, and a driver activated by movement of a striker in response to impact with the work, the driver then being free to advance against an operatively positioned staple to drive it into the work. While the invention as illustrated and described is referred to as an implement for driving substantially U-shaped staples, it is to be understood that it may, with slight modification, feed and drive fasteners of other types, such as tacks, brads, nails, or the like. Throughout the specification and claims, therefore, the term "staple" is used to indicate broadly all forms of pointed fasteners which may be driven to position by the implement of my invention.

The working parts of the staple hammer herein shown are protected by an exterior casing C of channel form having an arched top wall 5 connecting a pair of spaced side walls 6. The casing top wall extends horizontally for a substantial portion of its length to cooperate in providing a handle, and then rises upwardly and levels off again through the head end region of the implement. At its forward end the connecting wall 5 is extended downwardly at a to provide a front enclosure. At its rear end an enclosure is afforded by a depending connecting wall b.

Within the casing is the implement framework comprising a longitudinally extending frame rail R of channel cross section, mounting an inner channel rail 7 for reception of a staple strip S. The rear end of this strip is engaged by the forward end of a follower P which comprises a base plate 8 whose side edges are slidingly fitted in facing grooves 9 formed below inturmed lips 10 at the tops of the opposed walls of the frame rail R. A coiled spring 11 connected at one end 12 to a depending end of the base plate is turned over and around a sheave 13 near the forward end of the implement, and then extends rearwardly to a point near the rear end of the handle where it is anchored to a hook 14. The tension of this spring urges the follower forwardly, thereby to advance the staple strip so that its foremost staple s is maintained in an operative position ready to be driven into the work.

Near its forward end the channel rail 7 carries a pair of spaced upstanding ears 15 which support between them two hollow pins 16 and 17, one above the other. Pivoted on the upper pin 16 is one end of a channeled arm A which extends forwardly nearly to the wall a of the casing. At its forward end the side walls of the channeled arm A are inturmed at 20 to engage the T-head 21 of a depending driver D comprising a bar 22 having a widened and depending base plate 23. The lower end of the driver plate 23, when advanced downwardly, is arranged to engage the foremost staple s in the strip therebelow. Through a hole in the T-head 21 is passed one end portion 25 of a spring wire W which extends lengthwise of the channeled arm A to engage therewith at a bend 26, then through one or more coils 27 around
the pivot pin 16, and then downwardly past the lower pin 17 to engage with the forward side thereof. The tension of this spring is exerted on the arm and driver to maintain the latter in the normal up position shown in Fig. 1. The driver D is maintained by the spring end portion 25 in engagement with the base of the channel of the arm A, and it is so suspended as to have capacity for a limited swinging movement in a fore and aft direction.

There is affixed to the forward end of the frame rail 37 an anvil block 30 secured in place as by one or more cross pins 31 and a pivot pin 32. A complementary guide block 35 is also positioned above the anvil block between upstanding risers 36 on the walls of the frame rail R. The guide block 35 is spaced slightly from the anvil block 30 therebelow so as to accommodate therebetween the forward end portion of the staple strip S and also, when the strip is nearing exhaustion, the base plate 8 of the follower. The pivot pin 31 provides a pivotal mounting for the casing C which is free to swing therearound through 180° or more, to expose the working parts of the implement. This same pivot pin also serves as a mounting for a bell crank lever L which constitutes a striker for the work. This lever is duplex in that it comprises a pair of spaced arms 37 of like contour which extend upwardly along the outside of the frame rail R and therebetween to support between them a pivot pin 38 which traverses a channel link 39 which in turn is connected by a pivot pin 40 to the arm A within the channel thereof. The two arms 37 of the bell crank lever extend forwardly in their lower region, and at their extremities are interconnected by a work-engaging nose 41. When the arm A is in its normal up position (see Fig. 1) the striker nose inclines downwardly below the anvil plate. In this position the upper end portions of the two arms 37 of the striker are swung to a forward position of engagement with opposite end portions of the pin 40 which for this purpose are extended outwardly a slight distance (see Fig. 5); a stop is thereby provided to limit upward swinging movement of the arm to a fixed point.

The driver which is prolonged from the free end of the arm A is propelled downwardly thereby with each actuation of the striker in response to its engagement with the work. To guide the driver through a straight-line vertical movement I have provided a guide head H having certain novel and improved characteristics. This head is formed with a front wall 42 wherein is cut a way 43 with notches 44 laterally thereof for slidingly receiving the bar 22 and base plate 23 of the driver D. A pair of wings 45 extend rearwardly from the front wall, and in each wing is a hole 46 in its rear upper portion, and forwardly thereof a slot 47 which extends upwardly from its bottom edge for approximately half the height of the wing. A hole 48 is shown as formed through each wing at the upper end of the associated slot 47. The head front wall defines well below the wings 45 to provide for an elongation of the way 43 and notches 44, a slotted window opening 50 being formed through this depending portion of the front wall to expose the parts inwardly thereof.

This guide head H is secured fixedly, yet removably, in place by duplex means comprising (a) the protruded end portions 52 of an anchored pin which is extended crosswise of the guide block 35 and the enclosing risers 36 of the frame rail R, and (b) a pair of spaced buttons 55 which are accommodated within a chamber 56 extending crosswise of the block 35 and urged outwardly by a compression spring 57 therefrom. These two buttons which are protruded through a transverse section of smaller diameter in the enclosing walls of the frame rail are enlarged inwardly thereof to be confined thereby. These buttons constitute in effect a pair of dentants, and will be so referred to at times hereinafter. The ends 52 of the anchored pin are arranged to enter the two slots 47 and movement lengthwise thereof concurrently with engagement of the two dentants by a pair of cam faces 58 which are formed interiorly of the wings 45 adjacent their bottom edges at points directly below the holes 46. When the guide head H, so positioned with respect to the pin ends 52 and opposed detents 55, is pushed downwardly, the detents are forced to yield inwardly while the guide head down movement continues up to the point that the two pin ends 52 stand at the upper ends of the slots 47 to engage therewith. Hereby, to expose the working parts of the implement, and concurrently the holes 46 are positioned oppositely of the detents to be engaged thereby. A releasable lock is thereby provided for holding the guide head fixedly in place. When so positioned, its depending front wall overlies the front faces of the anvil block 30 and guide block 35 thereabove, and coats therewith to provide for the driver a guideway by which its movements are definitely confined to a vertical straight line. In consequence, each down movement of the driver will displace the foremost staple s from the strip which is maintained in a forward position by the spring-actuated follower F, and propel the staple downwardly through the way provided by the guide head H and outwardly into the work.

If and when, through careless handling or otherwise, there should be any jarring of the one or more staples, the point of trouble will usually be found in the vertical guideway through which the driver operates. The window opening 50 will probably reveal the condition at a glance. To clean out the guideway, the guide head H is raised in response to a manual force sufficient to overcome that of the detents, whereupon the head becomes freed for removal from the implement. If the jammed staple (or staples) does not then drop off of its own accord, it can be readily forced out and away to clear the machine, whereupon the guide head is ready to be replaced in the manner already described. For any such operation the casing C will first be swung around on its pivotal mounting 32 to the point of exposing the working parts of the implement, including the guide head H.

The driver at every point in its movement range remains vertical, i.e., aligned with the way wherein it is guided by the head H coacting with the blocks 30 and 35. Since the arm A which transmits movement thereto is mounted to swing about the pivot pin 16, the driver is required to execute a slight sliding and rocking movement at the point of its connection with the forward end of the arm, but provision for so doing is afforded by the means which suspend the driver from the arm.

I claim:

1. A staple hammer having at one end a head mounting a reciprocable driver normally maintained in an up position, means for urging a strip of staples forwardly to position the fore-
most staple beneath the driver to be propelled downwardly thereby, a guide coacting with the head to provide a way for guiding the driver and staple propelled thereby while advancing downwardly toward the work, the guide being provided with a pair of vertically disposed spaced wings extending rearwardly along opposite sides of the head, coacting spring detent means comprising movable parts carried by the head and fixed parts carried by the wings to releasably secure one to the other, and also coacting slots carried by the wings, and pin means carried by the head to positively lock one to the other, the coacting slots being vertically disposed and closed at their upper ends to afford a vertical support to the guide.

2. A staple hammer having at one end a head mounting a reciprocable driver normally maintained in an up position, means for urging a strip of staples forwardly to position the foremost staple beneath the driver to be propelled thereby, a guide coacting with the head to provide a way for guiding the driver and staple propelled thereby while advancing downwardly toward the work, the guide being provided with a pair of vertically disposed, spaced, apertured wings extending rearwardly along opposite sides of the head, a pair of oppositely disposed detents carried by the head at points oppositely of the wing aperture for engagement therewith when the guide is positioned operatively upon the head, there being also a pair of vertically disposed slots, one in the confronting face of each wing, extending upwardly from its lower edge for a distance less than its full height, and a pin extended crosswise of the head and beyond its opposite sides for engagement with the vertical slots of the guide thereby to fix its vertical position relative to the head, the arrangement being such that a positive vertical support is afforded to the guide by the pin and a releasable securement therefor by the detents.

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