

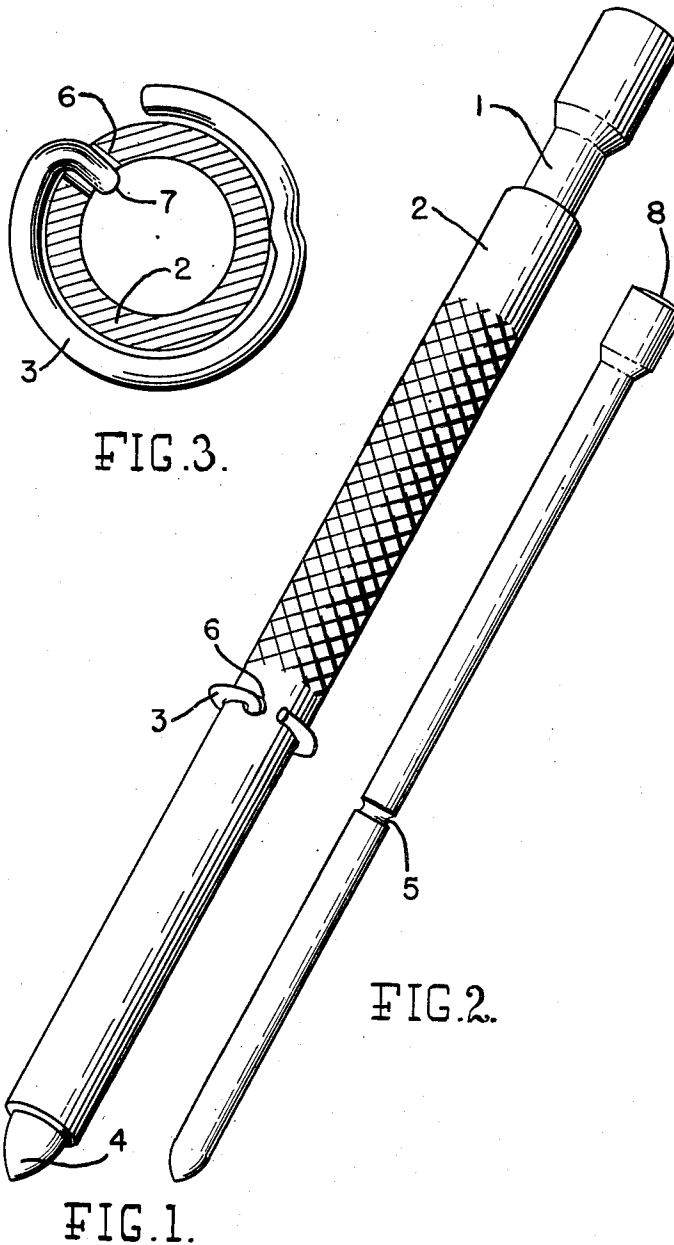
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COMBINATION NAIL DRIVER AND SET

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COMBINATION NAIL DRIVER AND SET

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This invention pertains to carpentry, and is directed more particularly to a device which is particularly useful in driving nails of the general class called finishing nails and flooring nails.

It has been the practice heretofore to apply soap or grease to finishing nails when the hardness of the wood into which they are to be driven is such that would cause many unlubricated finishing nails to be bent before they are completely driven into the said wood. In addition to the above objectional feature, the lubricant remains on the said finishing nails and reduces their holding capacity. Difficulty is also encountered when a lubricated finishing nail is driven through one board and encounters a concealed knot in the second board which usually causes the said finishing nail to bend, in which case it must be withdrawn and discarded.

The object of my invention is to surmount the aforesaid difficulties by providing a small and inexpensive device which will enable the user, with the aid of a hammer, to quickly drive and set unlubricated finishing nails of three consecutive sizes, including rusty finishing nails which might otherwise be useless, and embodying a sensitive element which will indicate when the said finishing nails have been driven to the predetermined depth without the necessity of visual observation of the aforesaid finishing nails while being driven and set. Great skill in the use of a hammer is unnecessary.

Those versed in the art to which this invention pertains will be enabled to make and use this device after examination of this specification and the drawings in which:

Fig. 1 shows the device completely assembled with the various elements in the position they would assume when a finishing nail has been completely driven into wood and set below the surface of the said wood. A metal plunger is shown at 1 which extends through a metal guide tube 2 and terminates in a point shown at 4. The guide tube shown at 2 is slidable and rotatable on the said plunger 1 and may have part of its outer surface knurled to provide means for a firm handgrip of the user. An aperture is drilled through the side of the said guide tube which aperture is in communication with the interior of the said guide tube and is shown at 6. The element 3 is a resilient segment of a circle which partially embraces the said guide tube and which has one radial end terminating in a rounded tip 7 within said guide tube, and the rounded tip thereof contacts the plunger within the said guide tube via the aperture 6.

The aforesaid segment forms the resilient indicator element. The inside diameter of the guide tube 2 is slightly larger than the head of the largest finishing nail to which this device is adapted.

Fig. 2 shows the plunger 9 drawn on a reduced scale and removed from the guide tube so that its form may be visualized. This plunger is a metal shaft having a circumferential groove 5 formed thereon, which will later be referred to herein as the indicator groove. The plunger is enlarged on one end in order that it may present a greater amount of surface where hammer blows are delivered at 8 during use.

Fig. 3 is a cross-sectional view of the guide tube with the plunger removed and the resilient indicator element embracing the tube and having one end thereof extending into the tube to cooperate with the plunger shown in Fig. 2.

The resilient indicator element may be formed of a spring wire having a body portion 3 which embraces the guide tube 2 and which has an inwardly extending portion 7, which extends into the tube 2 via a radial passage.

In operation, the plunger 9 is partially withdrawn from the guide tube 2, thus leaving an unoccupied cylindrical space within one end of the said guide tube into which a finishing nail is injected head first until the head of the said finishing nail has passed the aperture 6 when it is subject to slight pressure exerted upon the said finishing nail head by the rounded indicator element 7, thus preventing the finishing nail from falling from the aforesaid guide tube which is held by the user at the knurled part while the forefinger contacts the resilient indicator element. The lower end of the guide tube is then placed against the wood at the point where it is desired to drive the said finishing nail, this action causing the said finishing nail to be retracted further into the said guide tube. Hammer blows are then applied to the driving head 8, Fig. 2, thereby causing the plunger to force the finishing nail out of the guide tube 2 axially and into the wood until the said plunger has arrived at a predetermined point where the indicator groove 5 coincides with the aperture 6 in the said guide tube when the rounded indicator element 7 is forced into the indicator groove 5 by spring action, causing perceptible movement of the resilient indicating element 3 which is readily detected by feel via the index finger of the user, indicating that the finishing nail has been driven to the predetermined depth. During this operation the finishing nail may be forced through a

hard knot in the wood, and the finishing nail may be subject to slight bending which is limited by the inside wall of the said guide tube 2 and the firmness of the said wood surrounding the part of the said finishing nail which has entered said wood at this time.

During the driving and setting operation the finishing nail is concealed from the vision of the user by the guide tube, this being an advantage which allows the user to concentrate his vision on the driving head which is more easily seen than the head of a finishing nail due to the greater size of the driving head 8. In the event of the user delivering the last hammer blow with excessive energy which causes overdriving, the indicating element would not function as a positive plunger stop, but would snap out of the indicator groove which is advantageous in preventing the guide tube from being forced against the wood surface, thus defacing the said wood surface. There should preferably be at least one half inch of extra travel of the plunger within the guide tube before the driving head would be stopped by the inevitable contact with the upper end of the said guide tube.

The resilient indicator element 3 functions in three useful capacities; (a) it indicates when the unseen finishing nail has been driven to a predetermined depth, (b) it prevents the finishing nail from falling from the guide tube 2 before the point of the said finishing nail has come in contact with the wood into which it is to be driven, and (c) it also acts as a means for holding the device in the position shown in Fig. 1, thus preventing the plunger from becoming accidentally separated from the guide tube when not in use, while it may also have an extra loop bent to form a spring clip for attachment of the device to the top of the workman's pocket for convenience. This clip would be of the conventional type as used on pencils and pens and may be an integral part of the one piece indicator element.

Without departing from the essence of my invention, there may be a plurality of indicating elements embodied within this device such as an extra indicator groove for signalling the approach of the nail head to the wood surface or for use in special work such as the manufacture of games wherein round balls are rolled over a board having numerous pins, which pins are partially driven finishing nails. The materials used in this device may be any metal found suitable and may be heat treated, hardened where necessary or any or all parts may be magnetized if so desired. If it is desired to increase the amount of resilience of the resilient indicator element without decreasing the diameter of the wire from which this element is made, then it may be made to describe a zig zag course around

the guide tube instead of the symmetrical segment of a circle which is shown, thus employing a greater length of wire and providing more resilience.

Having described this device I claim as my invention:

1. In a nail driver and set, in combination, a guide tube element having a radial hole formed therein and communicating with the interior thereof, a plunger reciprocally carried in said tube and having an enlarged outer end adapted to be hammered along the axis of said tube, an annular groove formed on said plunger, the position of the groove on the plunger and the position of said radial hole being definitely related to the length of the nail used, so that said groove and said hole are substantially in alignment when a nail in said tube has been driven to a position at least level with a surface into which said nail is being driven, and spring loaded means on the outside of said guide tube and having a portion extending via said hole into co-operative relation with said plunger and said groove for contact by the user's finger for indicating to the user that the penetration of the nail into said surface has progressed to the aforesaid degree.

2. A combination nail driver and set in accordance with claim 1 in which the end of said plunger adapted to engage the head of a nail in said tube is provided with a tip of reduced diameter adapted to function as a nail set.

3. In a nail driver and set an elongated metal tube adapted to have a nail inserted head first into one end thereof with its point facing said end, a metal shaft having an enlarged head and a shank portion which forms a working fit in said tube and having a nail head engaging end within the tube, an annular groove formed on said shank portion in spaced relation with respect to said engaging end, an aperture formed in, and having its axis 90° with respect to the axis of said tube and located a predetermined distance from the first mentioned end of said tube, and a resilient spring element carried on the exterior of said tube and having a portion extending via said aperture into the interior of said tube and in contact with said shaft.

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