March 23, 1971 E. GLASSBURN 3,572,187

PLIERS TOOL

Filed June 11, 1969 2 Sheets-Sheet 1

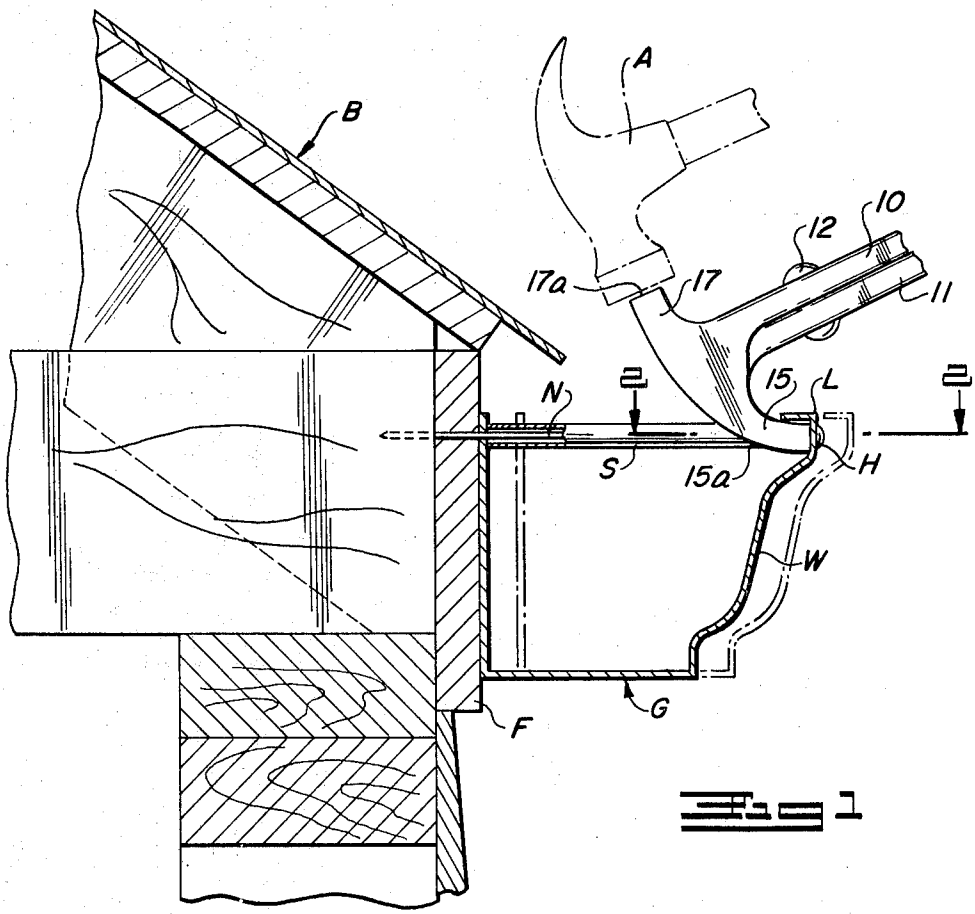


Fig. 1

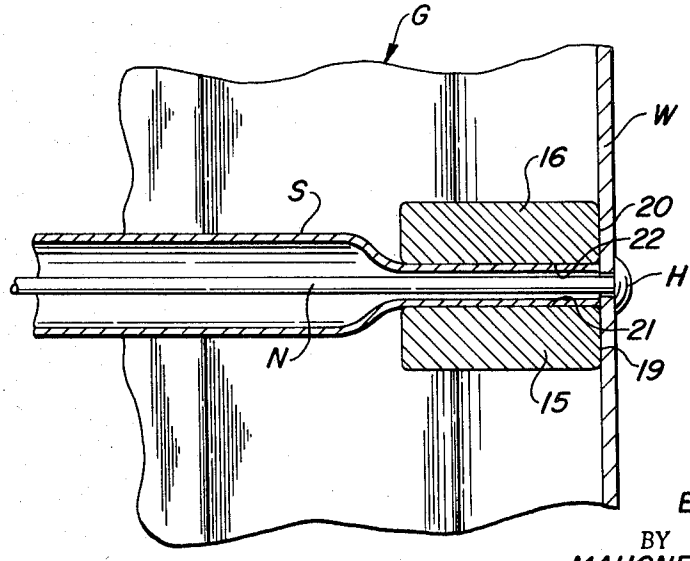


Fig. 2

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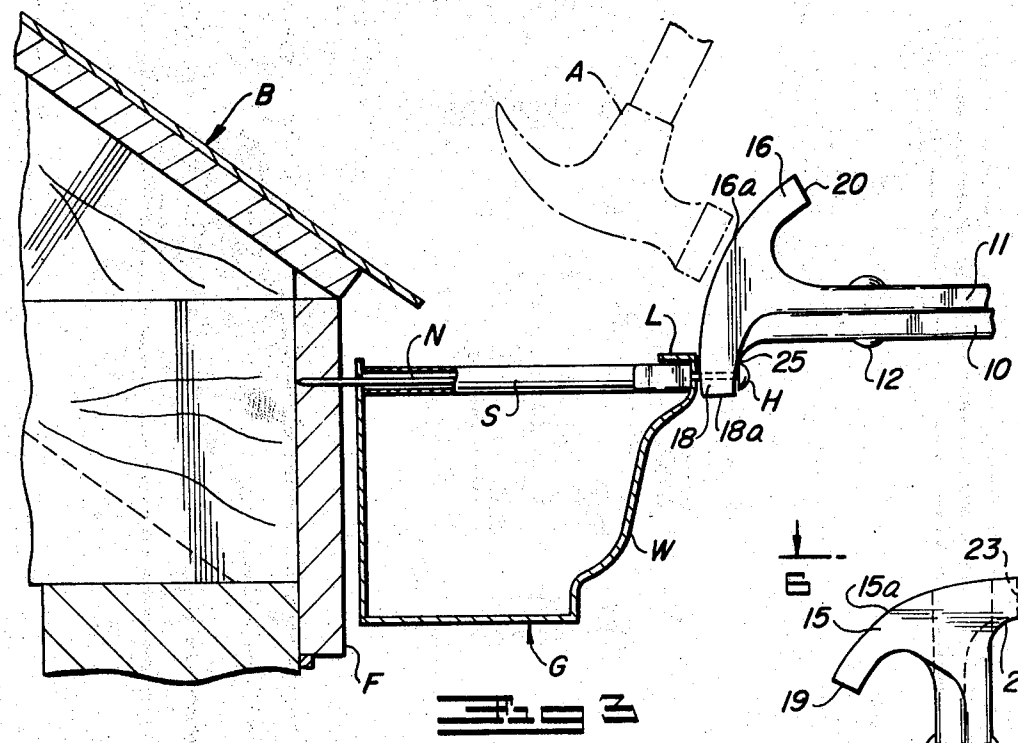


Fig 3

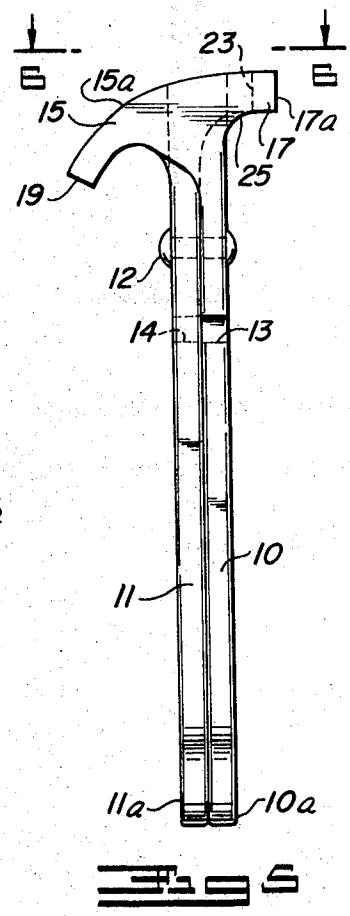


Fig 5

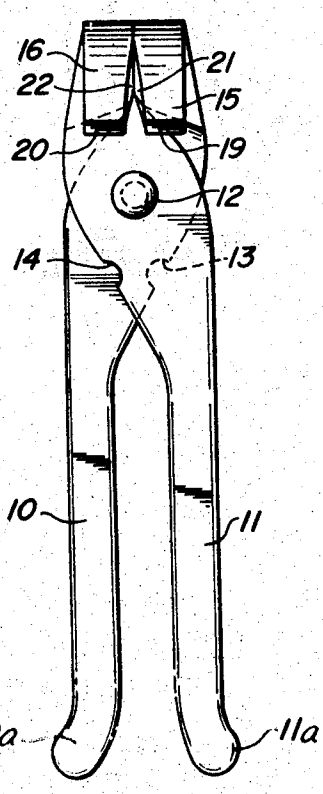


Fig 4

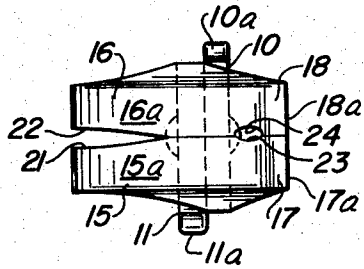


Fig 6

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PLIERS TOOL

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U.S. Cl. 81—5.1 5 Claims

ABSTRACT OF THE DISCLOSURE

A pliers-type tool facilitating removal of rain gutters or eavestroughs from a building structure is provided which avoids damage to the gutter as a consequence of removing a securing nail. The tool comprises a pair of jaw assemblies formed on one end of a pair of pivotally connected handles. Each jaw assembly is relatively oriented to the other to form a striking surface readily contacted by a hammer when the opposite jaw assembly is in engagement with the gutter fastening nail.

Rain gutter or eavestrough of the box-form having an ogee outer side wall is normally secured to the eaves of a building structure by a series of longitudinally spaced nails. These nails are usually provided with an ornamental round head and extend axially through a spacer tube interposed between vertical wall sections of the gutter. Accordingly, the nail does not present any part which may be readily gripped by usual mechanic's tools and removal of the nails for repair, replacement or positioning of the gutter by prior art practices usually results in damage or destruction of the gutter.

The pliers tool of this invention is designed to readily provide means of engagement with the nail head to permit application of the necessary force as by striking with a hammer to effect removal of the nail. One of the two jaw assemblies is adapted to compress the spacer tube around the nail and thus enable the ends of the jaws to bear against the interior wall surface of the gutter in at least partially underlying relationship to the nail head. Consequently, a force may be applied to the nail head for initiating removal of the nail without damage to the gutter wall. The opposite jaw assembly is adapted to engage the nail immediately beneath the nail head after removal is initiated while the first mentioned jaw assembly forms an anvil against which a driving force may be applied by means of a hammer to complete removal of a nail without further contact with the gutter.

These and other objects and advantages of this invention will be readily apparent from the following detailed description of an embodiment thereof along with the accompanying drawings.

In the drawings:

FIG. 1 is a fragmentary vertical sectional view of a building structure with a gutter and a pliers tool embodying this invention illustrating the first step in effecting removal of a gutter attaching nail.

FIG. 2 is a fragmentary horizontal sectional view on an enlarged scale taken along line 2—2 of FIG. 1.

FIG. 3 is a fragmentary vertical sectional view similar to FIG. 1 illustrating the second step in effecting removal of the nail.

FIG. 4 is a plan view of the pliers tool.

FIG. 5 is a side elevational view of the pliers tool.

FIG. 6 is an end view of the pliers tool as viewed on the plane of line 6—6 of FIG. 5.

Having reference to the drawings, a specific embodiment of a pliers tool of this invention is shown in detail in FIGS. 4, 5 and 6. This tool is seen to comprise a pair of elongated handles 10 and 11 having an end of each

shaped to form respective sections of the two jaw assemblies with the tool being fabricated from a suitable metal by appropriate and well known processes. The two handles 10 and 11 are pivotally interconnected adjacent the jaw assemblies by a hinge pin or rivet 12 as is customary with pliers to provide elongated lever arms for force multiplication. Each terminal end portion 10*a* and 11*a* of the lever arm of each handle 10 and 11 may be turned outwardly as shown in FIG. 4 to provide a more positive hand grip. In addition, the lever arms of each handle 10, 11, may be formed with mating notches 13, 14 at opposed edge surfaces and which form a nail or wire cutter of the well-known shear type also useful in the installation of gutters.

The ends of each handle 10, 11 terminate at the other side of the hinge pin 12 in respective allochiral jaw sections 15, 16 and 17, 18 which cooperatively form the two jaw assemblies. The pair of mating jaw sections 15, 16 and 17, 18 are oppositely directed in generally perpendicular relationship to the handles 10, 11 with the sections 15, 16 being curved rearwardly to facilitate positioning interiorly of a gutter as shown in FIG. 1. In addition, jaw sections 15 and 16 terminate in flat, coplanar end surfaces 19 and 20 with adjacent and opposed inner side wall portions 21 and 22 of each section being relatively divergently contoured. Also, front surfaces 14*a* and 16*a* of the jaw sections 15 and 16 are curved in a rearward direction, as can be best seen in FIG. 5, and form coplanar surfaces against which a driving force may be applied.

The other pair of jaw sections 17 and 18 are shaped to bring the adjacent opposed inner wall portions into contacting engagement with the pliers being in a closed configuration but have mating notches 23 and 24 of generally semi-circular, channel shape formed in the respective section. These notches 23 and 24 cooperatively form a generally circular aperture extending transversely through the jaw assembly and opening at both the front and rear surfaces. The rearwardly facing surfaces of each jaw section 17 and 18 as indicated at 25 with respect to section 17 in FIG. 5 form a relatively flat bearing surface. Each jaw assembly section 17 and 18 also terminates in respective flat, coplanar anvil surfaces 17*a* and 18*a* against which a driving force may be applied.

The utility of the novel pliers tool structure previously described in detail can be best illustrated with reference to the diagrammatic FIGS. 1, 2 and 3 which clearly demonstrate the functional operation of the tool in removing a nail N securing a gutter G to a building structure designated generally by the letter B. This pliers tool was specifically designed for utilization with the box-form type gutter G having an outer vertical sidewall W which generally approximates an ogee curve. The upper portion of this side wall W is formed with an inwardly turned flange or lip L. The supporting nail N having either a round or flat head H extends horizontally across the upper portion of the gutter through both vertical walls and into a facing board F of the building structure B. An elongated spacer tube S is also interposed within the gutter and the ends bear against the inner surfaces of the walls to maintain the desired wall spacing against the compressive forces applied during installation of the nail and thus completes formation of a relatively rigid gutter structure. The nail N also extends through the hollow spacer tube S and the head H of the nail combined with the tube and lip L prevents prior art tools from obtaining a positive grip on or under the nail head to permit removal without damage to the gutter.

Utilization of this pliers tool involves a two step operation which is sequentially illustrated in FIGS. 1 and 3. In the first step shown in FIG. 1, the pliers is positioned

with the jaw assemblies open and the sections **15** and **16** adjacent opposite sides of the spacer tube and projecting beneath the lip L. Closing the jaw assemblies through manipulation of the handles **10** and **11** then compresses or deforms the spacer tube S to a degree determined by the shape of the inner side wall portions **21** and **22**. This shape is such that, with the jaw assemblies fully closed as in the end view of FIG. 6, the spacer tube S will not be compressed into frictional engagement with the nail N and restrict relative axial movement but at least portions of the end surfaces **19** and **20** will be coextensive with the nail head H (see FIG. 2). It will be noted also that the thickness of the jaw sections **15, 16** at their marginal end portions is such that they will readily fit into channel shaped portions of the gutter walls. Consequently, a driving force applied to the anvil surfaces **17***a* and **18***a* by means of a hammer A will be transmitted to the nail head H through the gutter wall W; however, no damage will result to the gutter as this portion of the wall W will only be subjected to compressive forces and not shear forces as in the case of prior art practices where the spacer tube S is not compressed as shown in FIG. 2. Through appropriate configuration of the jaw assemblies to obtain the illustrated curvature where the plane of the anvil surfaces **17***a*, **18***a* is at an angle of 45–60 degrees to the plane of the end surface **19, 20**, a hammer may be readily utilized to apply the driving force without interference from the adjacent roof components of the building structure B. This first step of a nail removal operation is completed when the gutter G and nail N are displaced a distance outwardly from the facing board F to, approximately, the illustrated broken line position of FIG. 1.

When the nail N has been removed to this extent, the pliers tool is disengaged from the spacer tube S and interior of the gutter G permitting the gutter to be displaced to its original position against the facing board F leaving the nail partially removed with the nail head H spaced a distance from the gutter wall W. For the second step of the nail removal operation, the pliers tool is then positioned as shown in FIG. 3 with the opposite jaw assembly comprising the jaw sections **17** and **18** in engagement with that portion of the nail N projecting outwardly of the gutter. This is accomplished by first opening the jaw assemblies and then closing them with the nail shank extending through the aperture formed by the notches **23** and **24**. The aperature thus formed is preferably larger than the nail shank to readily permit the jaw assembly to slide into contacting engagement with the nail head H. Holding the pliers tool as shown in FIG. 3 with the base of the nail head bearing against the rearwardly facing surface **25**, a driving force for completing removal of the nail may be applied by means of the hammer A striking against the front surfaces **15***a* and **16***a* of the other jaw assembly. This driving force is continued to be applied until the nail N is completely removed. The curvature of the front surfaces **15***a* and **16***a* of the respective jaw sections enables a hammer to be utilized without interference from the roof components as the point of contact may be readily displaced along these surfaces and any force components transverse to the direction of pull compensated by the operator in holding the handles.

It is readily apparent from the foregoing detailed description that a pliers tool is provided which greatly facilitates removal of attaching or mounting nails for rain gutters. This tool enables removal of such nails without damage to the gutter through the novel configuration of two jaw assemblies which are alternatingly utilized with each jaw assembly forming an anvil or striking surface against which driving force may be applied by means of a hammer without intereference from adjacent parts of a building structure.

Having thus described this invention, what is claimed is:

1. A pliers tool for facilitating removal of rain gutter nails having a shank and enlarged head comprising:

(A) a pair of elongated handles pivotally interconnected adjacent one end by hinge means for relative swinging movement,

(B) a first jaw assembly including a pair of allochiral jaw sections which are each formed with a respective one of said handles at the end thereof most closely adjacent said pivotal interconnection and project laterally from said handles in a rearward direction along said handles, each of said jaw sections being formed with relatively divergent, opposed inner wall surfaces and terminating in respective end surfaces, said inner wall surfaces having a relative spacing such that said end surfaces will be at least partially coextensive with the head of a nail shank extending between said jaw sections when said jaw assembly is closed, and

(C) a second jaw assembly including a pair of cooperating allochiral jaw sections which are each formed with a respective one of said handles in opposed relationship to said first jaw assembly and project laterally from said handles, each of said jaw sections having a channel-form notch formed at an inner opposed wall surface with said notches cooperatively forming an open-ended aperature extending axially relative to said handles for receiving a nail shank with rearwardly facing surfaces of each jaw section having a bearing surface for engaging a nail head, said jaw sections terminating in respective anvil surfaces against which a driving force may be applied.

2. A pliers tool according to claim **1** wherein the plane of said end surfaces of said first jaw assembly sections is at an angle with respect to the plane of said anvil surfaces of said second jaw assembly sections in the range of 45–60 degrees.

3. A pliers tool according to claim **1** wherein said jaw sections of said first jaw assembly are formed with front surfaces curved in a rearward direction providing a coplanar surface against which a driving force may be applied.

4. A pliers tool according to claim **1** wherein the aperature formed by said channel-form notches in said jaw sections of said jaw assembly is dimensionally larger than the cross-sectional area of the shank of a gutter nail.

5. A pliers tool according to claim **1** wherein said handles at their marginal end portions opposite said jaw assemblies are each outwardly turned in the plane of swinging movement of said handles to form a restriction to sliding movement of an operator's hand axially of said handles.

References Cited

UNITED STATES PATENTS

300,244 6/1884 Gambrell ..... 7—3

FOREIGN PATENTS

255,825 12/1927 Italy.

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