HAMMER WITH BUILT-IN NAIL PULLER

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The present invention relates to an improved double-jaw-type all mechanical puller for nails and the like, particularly long Shank nails and headless nails which cannot, without the aid of extra facilities, be pulled with a conventional claw hammer.

As the title of the invention implies, the nail pulling means is preferably incorporated in the head of an ordinary hammer such as is disclosed in the Rowe hammer Patent No. 759,019 of May 3, 1904. If, as may be desirable, the Rowe patent is examined it will be seen that the objective of the patentee was to provide a hammer attachment to be used for the purpose of extracting an extraordinary long nail without requiring the use of spacing and fulcruming blocks for fulcruming support.

An object of the instant endeavor is to structurally, functionally and otherwise improve on the Rowe patent and any other analogous solutions of the long nail pulling problem.

Looking toward satisfactory and reliable ways and means of doing so a specially constructed head is employed, the latter having, as is usually the case, a poll at one end and a claw at the other end, that portion of the body between the claw and handle having spaced parallel side and end walls defining a passage for a nail, a fixed jaw projecting into said passage and adapted to bite into one side of a nail extending through and beyond the passage, a spring-biased latch hingedly mounted on said body and operable in part in said passage and having a jaw opposed to and movable toward and from said fixed jaw, said jaws being normally close together and having coincident cooperating cam surfaces which are mated and, when forcibly rammed against the head of an anchored nail, allow the nail to cam the jaws apart and to pass between the jaws, whereby both jaws grip the nail so that it may be pulled.

In carrying out the invention a novelly constructed latch is utilized embodying a plate having shoulders fashioned into trunnions or journals rockably cradled in bearings provided therefor. Further, the plate is provided at one end with a lateral extension serving as a head fulcruming and pressure applying foot, the latter being wholly outside of said passage and directed away from said claw so that the thrust action borne by the foot serves to proportionately transmit the applied force to the movable jaw, insuring an in toto gripping action in excess of the gripping action that would be imparted to said jaw by way of the spring-biasing action alone.

Other and more specific structural features and advantages will become readily apparent from the following description of the details taken in conjunction with the views of the drawing and the invention as hereinafter claimed.

In the accompanying drawing wherein like numerals are employed to designate like parts throughout the views:

Fig. 1 is a view in elevation and section showing a hammer head having the improved built-in nail puller and wherein the cooperating jaws are in a normal abutting position ready to be opened when the nail is pressed against the same;

Fig. 2 is a top plan view of the head seen in Fig. 1;

Fig. 3 is a section on the vertical line 3—3 of Fig. 1, looking in the direction of the arrows;

Fig. 4 is a view in full lines and phantom lines and with portions broken away in the full line showing to illustrate how the nail is gripped for extraction from the work; and

Fig. 5 is a perspective view of the principal or component part herein referred to as a latch, or latch dog whichever is preferred.

The significant latch dog (Fig. 5) is denoted as an entity by the numeral 8 and, specifically, comprises a rigid plate or body portion 10 having a tapering laterally disposed fulcruming and presser foot 12 at one end. The plate is slightly narrower than the foot and at the juncture of the plate and foot the shoulders 14 are rounded to serve as journals. On the side or surface 16 spaced from the shoulders is a transverse embossment or rib having a rounded or curved surface 18 embodying a cam and a comparatively sharp edge 20 providing what is hereinafter referred to as the movable jaw. Below the jaw the plate is bifurcated and the furcations 22 have screw-threaded aligned holes 24 to accommodate the shank portions of the headed assembling and guide screws or equivalent members 26.

The hammer head 28 has a headed poll 30 at one end and the usual claw means 32 at the other end. The body portion 34 is fashioned into a socket to accommodate the handle 36 and to the left of the handle and between the claw means and the socket a passage is formed. The passage, denoted generally by the numeral 38 in Fig. 1, comprises end side walls and the side walls which are spaced and parallel are denoted by the numeral 40. It will be noticed that the upper edges are longitudinally arcuate at 42. Also, the lower edges are arcuately curved at 44. An insert or anvil-like member 46 is fitted into one end of the passage and has a flange 48 held in place by a headed fastener 50. Member 46 is formed with a similar rib or embossment which projects into the passage and provides the stationary jaw and the surface 52 thereof is likewise fashioned into a cam and the two cams 18 and 52 assume the ready-to-separate abutting relationship seen in Fig. 1. The plate portion 10 is located for movement back and forth in the slot or passage and is of a width so that its lengthwise edges have braced wiping contact with the interior surfaces of the side walls 40. The side walls are provided with notches 54 which as seen in Fig. 4 provide bearings in which the journals 14 are cradled. With the latch dog in place the foot is opposed to the handle of the handle and is movable toward and from the handle. Pressure applied to the foot serves to rock the latch dog in an obvious manner as seen in Fig. 4. The furcations extend slightly beyond the curvate edges 44 so that the heads 26 of the assembling and retaining screws ride back and forth on the edges. These screws and the proper proportioning in relationship of all components is such that the position and action of the latch dog is aptly and effectually stabilized. The latch dog is pressed into its initial gripping position by way of a flat leaf spring 56 anchored on the handle at 58. The spring bears against the intermediate portion of the plate 10 in the manner shown best in Fig. 1.

Assuming that it is desired to pull a nail, the nail 60 in the workpiece 62 as illustrated in Fig. 4, it is first necessary to press the hammer in position forcing the head of the nail against the cam surfaces 18 and 52. This spreads the jaws apart and allows the nail to pass between the jaws to the position shown. Rocking the
hammer in a familiar manner as illustrated in full and dotted line showing in Fig. 4 the nail is progressively extracted. As it is drawn out the hammer is shoved toward the work to take a new grip and this operation is repeated so that the nail is pulled out straight out from the workpiece without bending.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents which will fall within the scope of the invention as claimed.

What is claimed is as new as follows:

1. A hammer comprising a head having a handle secured thereto and having a claw at one end, that portion of the body portion of said head between the claw and handle having spaced parallel side and end walls defining a passage for a nail, a fixed jaw projecting into said passage and adapted to bite into one side of a nail extending through said passage, a spring-biased latch hingedly mounted on said body portion and operable in part in said passage and having a jaw opposed to and movable toward and from said fixed jaw said jaws being normally spring-pressed together and having cam surfaces which are cooperatively mated so that said surfaces are simultaneously and forcibly rammed against the head of an anchored nail, said jaws are spread, permitting said nail to pass between the jaws and so that both jaws grip the nail for pulling, said latch embodying a plate having aligned shoulders fashioned into and providing hinging journals, said body portion having bearings in which said journals are cradled for rocking movement, said plate being also provided at one end with a lateral extension serving as a head fulcruming and pressure applying foot, said foot being located wholly outside of said passage and directed away from said claw so that thrust action borne by the foot serves to proportionately transmit the progressively applied force to the movable jaw, insuring an in toto gripping action in excess of the gripping action that would be imparted to said jaw by way of spring-biasing action alone, said plate completely and transversely spanning the portion of the passage defined by said parallel side walls, the longitudinal edges of the plate having engaging, but stabilized contact with the cooperating interior surfaces of said side walls, the end of the plate opposite to the foot-equipped end being bifurcated, the tips of the furcations projecting slightly beyond the lengthwise edges of said side walls, said edges being arcuately formed, and said tips carrying stabilizing guide shoulders and shifted back and forth along said edges, whereby to distribute stresses and strains and to relieve the bearings and journals of undue strain.

2. A hammer comprising a head having a handle secured thereto and having a claw at one end, that portion of the body portion of said head between the claw and handle having spaced parallel side and end walls defining a passage for a nail, a fixed jaw projecting into said passage and adapted to bite into one side of a nail extending through said passage, a spring-biased latch hingedly mounted on said body portion and operable in part in said passage and having a jaw opposed to and movable toward and from said fixed jaw, said jaws being normally spring-pressed together and having cam surfaces which are cooperatively mated so that said surfaces are simultaneously and forcibly rammed against the head of an anchored nail, said jaws are spread, permitting said nail to pass between the jaws and so that both jaws grip the nail for pulling, said latch embodying a plate having aligned shoulders fashioned into and providing hinging journals, said body portion having bear-

ings in which said journals are cradled for rocking movement, said plate being also provided at one end with a lateral extension serving as a head fulcruming and pressure applying foot, said foot being located wholly outside of said passage and directed away from said claw so that thrust action borne by the foot serves to proportionately transmit the progressively applied force to the movable jaw, insuring an in toto gripping action in excess of the gripping action that would be imparted to said jaw by way of spring-biasing action alone, said plate completely and transversely spanning the portion of the passage defined by said parallel side walls, the longitudinal edges of the plate having engaging, but stabilized contact with the cooperating interior surfaces of said side walls.

References Cited in the file of this patent

UNITED STATES PATENTS

<table>
<thead>
<tr>
<th>Patent Number</th>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>72,655</td>
<td>Marden</td>
<td>Dec. 24, 1867</td>
</tr>
<tr>
<td>110,199</td>
<td>Calef</td>
<td>Dec. 20, 1870</td>
</tr>
<tr>
<td>832,387</td>
<td>Jensen</td>
<td>Oct. 2, 1906</td>
</tr>
<tr>
<td>1,103,767</td>
<td>Hendrickson</td>
<td>July 14, 1914</td>
</tr>
<tr>
<td>1,227,063</td>
<td>Minnich</td>
<td>May 22, 1917</td>
</tr>
<tr>
<td>1,519,069</td>
<td>Snyder</td>
<td>Dec. 9, 1924</td>
</tr>
<tr>
<td>1,833,603</td>
<td>Collocott</td>
<td>Nov. 24, 1931</td>
</tr>
</tbody>
</table>