

Jan. 27, 1959

A. ALVAREZ VAZQUEZ

2,870,988

EXTRACTOR FOR NAILS OR THE LIKE

Filed Oct. 5, 1953

2 Sheets-Sheet 1

Fig. 1.

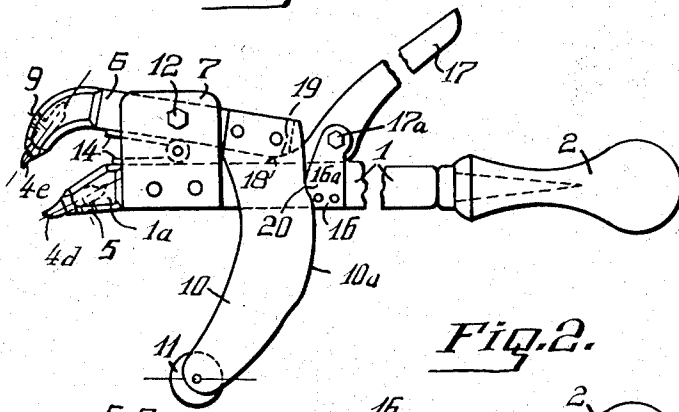


Fig. 2.

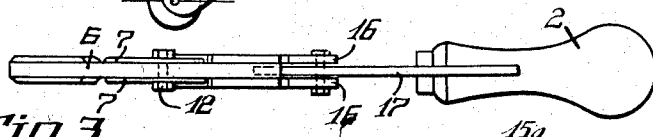


Fig. 3.

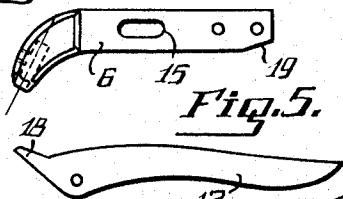


Fig. 5.

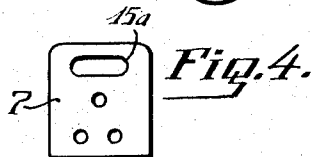


Fig. 4.

Fig. 8.

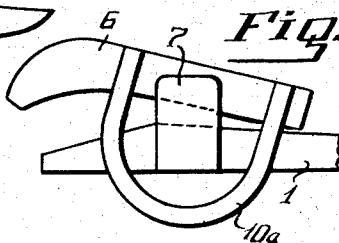


Fig. 6.

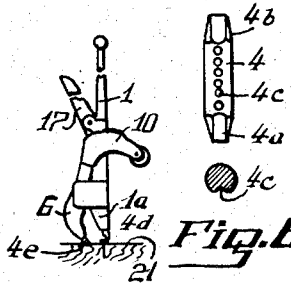
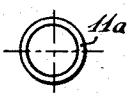


Fig. 7.

Fig. 9.



Inventor:
Amable Alvarez
Vazquez
By: Michael S. Striker
Attorney

Jan. 27, 1959

A. ALVAREZ VAZQUEZ

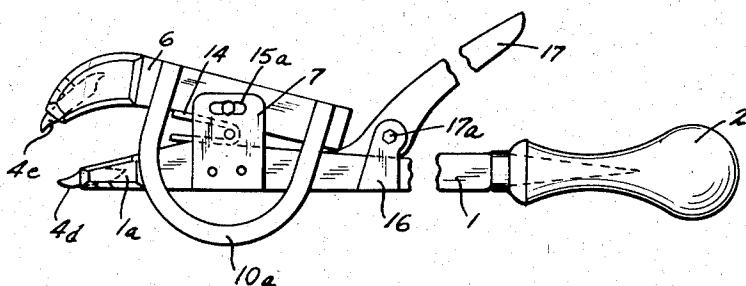
2,870,988

EXTRACTOR FOR NAILS OR THE LIKE

Filed Oct. 5, 1953

2 Sheets-Sheet 2

FIG. 10



INVENTOR
Amable Alvarez Vazquez
BY *Michael S. Striker*
ATTORNEY

1

2,870,988

EXTRACTOR FOR NAILS OR THE LIKE

Amable Alvarez Vazquez, Buenos Aires, Argentina

Application October 5, 1953, Serial No. 384,222

Claims priority, application France October 4, 1952

9 Claims. (Cl. 254—22)

This invention relates to improvements in tools for the extraction of fastening devices, and particularly to those used in extracting nails from wooden cases, wall partitions, ceilings, walls, floors and other surfaces.

An important object of this invention is to provide an improved extracting tool which may be used without damaging the surface from which the fasteners are extracted.

Another object of this invention is to provide an extracting tool which will not distort the fasteners extracted.

A further object of the present invention is to provide an extracting tool which may be used in the vertical as well as any other position.

Still another object of my invention is to provide an extracting tool which will reduce the effort required for extracting fasteners.

Yet another object of this invention is to provide an extracting tool which consists of few parts, simple in structure but durable and well adapted to withstand the rough usage to which devices of this sort are ordinarily subjected.

With the above objects in view, the present invention mainly consists in a nail extractor comprising in combination a first lever having at one end a nail-engaging end portion, a handle on the other end of the first lever, a second lever having at one end a nail engaging end portion, means securing the second lever to the first lever on one side thereof turnably relative to each other and slidably relative to each other in a direction substantially parallel to one of the levers, a supporting extension mounted on the other end of the second lever and having a supporting portion located on the other side of the first lever, and holding means movably mounted on the first lever and engaging the second lever for holding the same with their engaging end portions forced toward each other, whenever required.

The novel features which are considered as characteristic for the invention are set forth in particular in the appended claims. The invention itself, however, both as to its construction and its method of operation, together with additional objects and advantages thereof, will be best understood from the following description of specific embodiments when read in connection with the accompanying drawings, in which:

Fig. 1 is a side elevation of the tool;

Fig. 2 is a top plan view;

Fig. 3 is a side elevation of one of the levers employed in this invention;

Fig. 4 is a side elevation of a different embodiment of one of the supports for said lever;

Fig. 5 is a side elevation of the auxiliary grasping lever;

Fig. 6 is a side elevational view of the improved grasping teeth of my invention;

Fig. 7 is a side elevational view of the device, in reduced scale in a perpendicular position to the surface from which the fastener is being extracted;

2

Fig. 8 is a side elevational view of a different embodiment of a bearing piece connected to a lever of the device;

Fig. 9 is a view in elevation of a supplementary ring for a bearing roller used in a form of the device; and

Figure 10 is a side elevation of the tool using the different embodiments of Figs. 4 and 8.

Referring now to the drawings, wherein is illustrated a preferred form of my invention the tool comprises a bar 1 of oblong section provided with a tapered end fitting into the recess of a handle 2. Three views of this lever are shown in Figures 1, 2 and 10 and a partial view thereof designated as 1 in Figure 8. The other extremity of bar 1 has the shape of a jaw 1a slightly curved towards one side and provided with an axial bore for the reception of a tooth 4d which will be described hereinafter. This tooth is fixed by means of a lateral tightening screw 5. Another lever 6 (Figures 1, 2, 3, 7, 8 and 10) of oblong section is slidably pivoted with respect to the lever 1 between extensions 7 (Figures 1, 2 and 10) which project upwardly from both sides of lever 1 to which they are fixedly connected. The slidable pivoting in this invention may be accomplished by providing a longitudinal slot 15 in lever 6 for movement upon an axle 12 mounted in extensions 7; or lever 6 may be provided with an axle for slidable pivotable movement in a longitudinal slot 15a of extensions 7 as shown in Fig. 4. This arrangement allows, when necessary, to retract lever 6 and place the tool perpendicularly to the surface from which a nail or the like is to be extracted, as shown in Figure 7. One end portion of 6 is provided with an axial bore for the reception of tooth 4e which is held in place by a tightening screw 9. A supporting rocker bearing extension 10 is mounted on the other end of the second lever and consists of two lateral axle bearings between which is mounted the bearing roller 11. A set of cams 10a is formed on the edge of the supporting extension 10 and engages in groove 20 a fixed cam 16a formed in upwardly projecting members 16 which also hold shaft 17a. Pivoted on this shaft is a third auxiliary lever 17 (Figures 1, 5, 7 and 10) provided with an end 18 chamfered on 19. When not in use lever 17 contacts lever 6 and remains raised by leaf spring 14 (Figures 1 and 10). The leaf spring 14 is wound on a cross piece disposed intermediate the spaced bearing supports 7 carried by the lever 1, and this leaf spring has two extremities which respectively bear on the inner faces of the levers 1 and 6.

Another form of a supporting rocker bearing extension 10a for lever 6 is shown in Figure 8.

The teeth 4 (Figure 6) are bevelled on both ends 4a and 4b and may be re-sharpened in order to prolong the wearing ability thereof. A series of conical holes 4c shown in Figure 6 provide for the adjustment of the teeth with the aid of the set screws 5 and 9 (Figure 1).

The operation of the device is as follows:

The tool is grasped by the handle 2. The lower tooth 4d of the lower jaw 1a (Figure 1) is wedged underneath the nail head or similar fastener. The tool is then rotated clockwise using the wedged tooth 4d as a pivot point until the bearing roller 11 contacts the surface from which the nail or other fasteners are to be extracted. Since the tool is pivoted at 4d the supporting extension 10 moves counterclockwise upon contacting the surface containing the nail to be extracted. The cam 10a slides against the surface of cam 16a thereby sliding lever 6 forward and downward until tooth 4e of jaw 9 engages the nail or fastening device on the side opposite the tooth 4d. At this point the third auxiliary lever 17 may be brought into operation by pressing it downwardly with the other hand. This materially facilitates the pulling of the nails or similar fasteners. As shown in Figure 8, the U-shaped rocker bearing extension 10a may be

3

used instead of extension 10 in another variation of this invention.

When it is desired to extract unusually long nails supplementary ring 11a may be fitted over roller 11 as shown in Figure 9 to increase the diameter thereof. The improved tool of this invention is particularly well adapted when it is necessary to use it perpendicularly to the surface of the work. In such an instance the tooth 4d of jaw 1a is wedged under the nail or similar fastener and auxiliary lever 17 is pressed in the direction of lever 1 thereby causing its chamfered end 19 to propel lever 6 and tooth 4e towards the other side of the nail or similar fastener. Obviously in this instance no dependence is had on supporting extension 10.

It will be understood that each of the elements described above, or two or more together, may also find a useful application in other types of nail and fastener extractors differing from the types described above.

While the invention has been illustrated and described as embodied in a nail extractor, it is not intended to be limited to the details shown, since various modifications and structural changes may be made without departing in any way from the spirit of the present invention.

Without further analysis, the foregoing will so fully reveal the gist of the present invention that others can by applying current knowledge readily adapt it for various applications without omitting features that, from the standpoint of prior art, fairly constitute essential characteristics of the generic or specific aspects of this invention and, therefore, such adaptations should and are intended to be comprehended within the meaning and range of equivalence of the following claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A nail and spike extractor comprising, in combination, a first substantially rectilinear lever; a handle provided at one end of said first lever; a jaw provided at the other end of said first lever; a first pair of spaced supports carried by said first lever and projecting therefrom, said supports being provided with longitudinal slots parallel to said first lever; an axle slidably mounted in the longitudinal slots of the said first pair of supports, said axle being arranged at right angles with respect to said longitudinal slots; a second lever pivoted on said axle, the said second lever having a first substantially rectilinear portion and having a second portion connected to the rear end of said first portion and extending therefrom substantially at right angles and being directed toward said first lever and extending beyond same; a roller mounted for free rotation on the rear end of said second portion of the second lever; a first set of cams formed on the edge of said second portion nearest the handle of the first lever; a second set of cams fixedly connected to the first lever adjacent the first set of cams and coaxing therewith, said second set of cams being provided with shaft-bearing extensions; a shaft mounted in said bearing extensions; a third lever pivoted on said shaft and formed with a chamfered end portion adjacent the juncture of said first and second portion of said second lever and adapted to engage the same; a cross piece disposed intermediate of the said spaced bearing supports carried by said first lever; a leaf spring wound on said cross piece and having two extremities, each of which respectively bears on the inner face of the first and second levers; and a jaw provided at the first portion of said second lever, the said jaw curving toward said first lever.

2. A nail and spike extractor comprising, in combination, a first substantially rectilinear lever; a handle provided at one end of said first lever; a jaw provided at the other end of said first lever; a first pair of spaced supports carried by said first lever and projecting therefrom; an axle maintained in said supports, the said axle being arranged at right angles with respect to said supports; a second lever having a first substantially rectilinear portion provided with a longitudinal slot for slid-

4

able movement of said lever on said axle, and having a second portion connected to the rear end of said first portion and extending therefrom substantially at right angles and being directed toward said first lever and extending beyond same; a roller mounted for free rotation on the rear end of said second portion of the second lever; a first set of cams formed on the edge of said second portion nearest the handle of the first lever; a second set of cams fixedly connected to the first lever adjacent the first set of cams and coaxing therewith, said second set of cams being provided with shaft-bearing extensions; a shaft mounted in said bearing extensions; a third lever pivoted on said shaft and formed with a chamfered end portion adjacent the juncture of said first and second portion of said second lever and adapted to engage the same; a cross piece disposed intermediate of the said spaced bearing supports carried by said first lever; a leaf spring wound on said cross piece and having two extremities, each of which respectively bears on the inner face of the first and second levers; and a jaw provided at the first portion of said second lever, the said jaw curving toward said first lever.

3. A nail and spike extractor comprising, in combination, a first substantially rectilinear lever; a handle provided at one end of said first lever; a jaw provided at the other end of said first lever; a first pair of spaced supports carried by said first lever and projecting therefrom, said supports being provided with longitudinal slots parallel to said first lever; an axle slidably mounted in the longitudinal slots of the said first pair of supports, said axle being arranged at right angles with respect to said longitudinal slots; a second substantially rectilinear lever pivoted on said axle; the said second lever having two end portions; a U-shaped rocker arm connected to said second lever intermediate said end portions and extending therefrom at a substantially right angle; a shaft carried by said first lever; a third lever pivoted on said shaft and formed with a chamfered end portion adjacent the juncture of said first and second portions of said second lever and adapted to engage the same; a cross piece disposed intermediate of the said spaced supports carried by said first lever; a leaf spring wound on said cross piece and having two extremities, each of which respectively bears on the inner face of the first and second levers; and a jaw provided at the first portion of said second lever, the said jaw curving toward said first lever.

4. A nail extractor according to claim 1 wherein the jaws are provided with tooth receiving axial bores and nail grasping teeth formed with bevelled end portions positioned in said bores, and provided with a series of holes; adjustable set screws in said jaws mating with said holes for lateral adjustment of said teeth with relation to said jaws.

5. A nail extractor according to claim 1 wherein an annular ring is fitted over the bearing roller for enlargement of the diameter thereof whereby greater leverage is obtained.

6. A nail and spike extractor comprising, in combination, a first substantially rectilinear lever; a handle provided at one end of said first lever; a tooth provided at the other end of said first lever; a first pair of spaced supports carried by said first lever and projecting therefrom; a second lever having a first substantially rectilinear portion and a tooth at one end thereof and having a second portion connected to said first portion and extending therefrom at substantially right angles and being directed toward said first lever and extending beyond same; means mounting said second lever between said spaced supports with said tooth thereof located adjacent said tooth on said first lever for rotation of said first and second levers relative to each other and for slidable movement relative to each other in a direction substantially parallel to one of said levers; and manually operable lever means turnably mounted on one of said levers and engaging the other of said levers for holding the same with said teeth thereof

5

respectively forced towards each other, whenever required.

7. A nail and spike extractor comprising, in combination, a first substantially rectilinear lever; a handle provided at one end of said first lever; a jaw provided at the other end of said first lever; a first pair of spaced supports carried by said first lever and projecting therefrom; a second lever having a first substantially rectilinear portion and having a second portion connected to said first portion and extending therefrom substantially at right angles and being directed toward said first lever and extending beyond same; means mounting said second lever between said spaced supports for rotation of said first and second levers relative to each other and for slidable movement relative to each other in a direction substantially parallel to one of said levers; a roller mounted for free rotation on the rear end of said second portion of the second lever; a first set of cams formed on the edge of said second portion nearest the handle of the first lever; a second set of cams fixedly connected to the first lever adjacent the first set of cams and coaxing therewith, said second set of cams being provided with shaft-bearing extensions; a shaft mounted in said bearing extensions; a third lever pivoted on said shaft and formed with a chamfered end portion adjacent the juncture of said first and second portion of said second lever adapted to engage the same; a cross piece disposed intermediate of the said spaced bearing supports carried by said first lever; a leaf spring

6

wound on said cross piece and having two extremities, each of which respectively bears on the inner face of the first and second levers; and a jaw provided at the first portion of said second lever, the said jaw curving toward said first lever.

8. A nail extractor according to claim 2 wherein the jaws are provided with tooth receiving axial bores and nail grasping teeth formed with bevelled end portions positioned in said bores, and provided with a series of holes; adjustable set screws in said jaws mating with said holes for lateral adjustment of said teeth with relation to said jaws.

9. A nail extractor according to claim 2 wherein an annular ring is fitted over the roller for enlargement of the diameter thereof whereby greater leverage is obtained.

References Cited in the file of this patent

UNITED STATES PATENTS

478,855	Gray	July 12, 1892
642,111	Green	Jan. 30, 1900
832,387	Jensen	Oct. 2, 1906
1,261,399	Johnson	Apr. 2, 1918
2,532,474	Vazquez	Dec. 5, 1950

FOREIGN PATENTS

340,444	Germany	Oct. 5, 1950
---------	---------	--------------