

May 29, 1945.

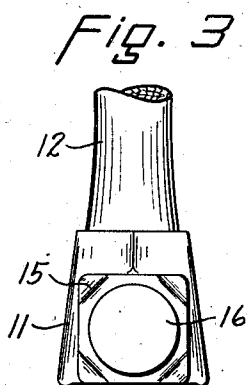
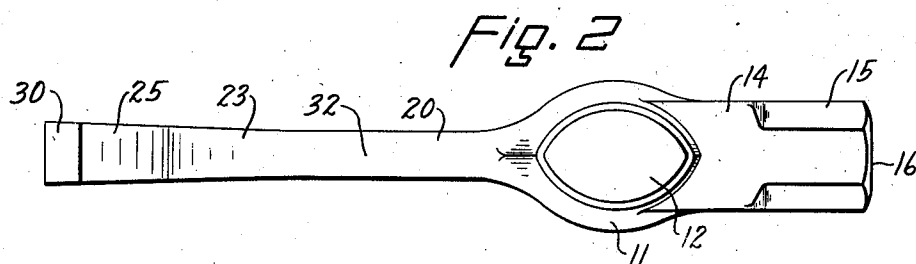
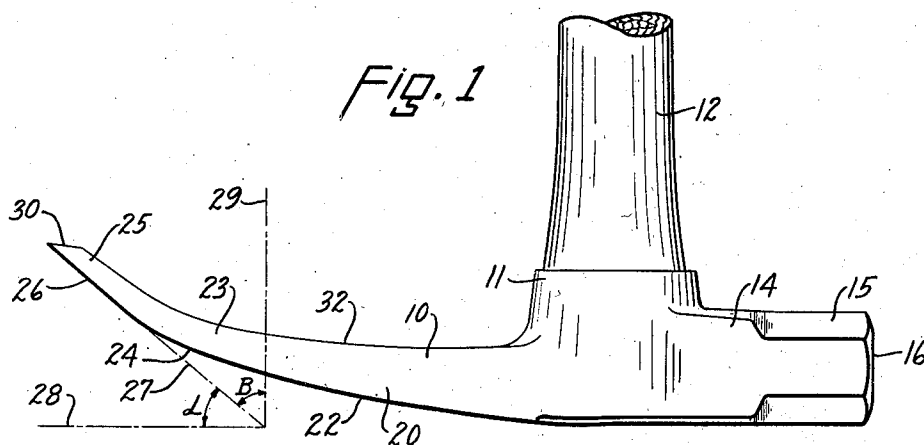
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2,376,978

HAND TOOL

Filed Jan. 6, 1943

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 4

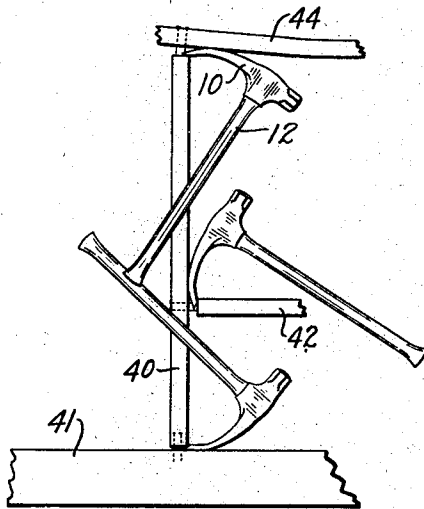


Fig. 5

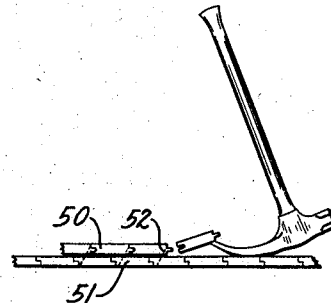
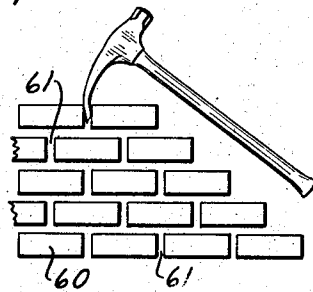


Fig. 6



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2,376,978

HAND TOOL

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Application January 6, 1943, Serial No. 471,451

2 Claims. (Cl. 254—131)

This invention relates to hand tools.

It is the principal object of the invention to provide a tool suitable for use in the wrecking or dismantling of building assemblies, timber, flooring, brick or masonry or the like, which is highly effective in use and which can be utilized to great advantage in many different ways in work of this character.

It is a further object to provide such a tool which can be utilized either as a sledge hammer or as a wedging or prying tool, in the nature of a pick, and for prying and separating assemblies, the tool being so constructed that it may be readily and conveniently operated for this purpose at floor levels, on a vertical surface, and overhead as well.

It is a still further object to provide such a tool particularly adapted for prying and lifting operations which embodies its own fulcrum and is so arranged that with the tool in proper working position the tool handle clears low objects and extends into a convenient location for use by the operator where he can develop maximum effort with an advantageous leverage in any plane in which the tool may be used.

Other objects and advantages will be apparent from the specification, the accompanying drawings, and the appended claims.

In the drawings.

Fig. 1 is a view in side elevation showing the tool constructed in accordance with the present invention;

Fig. 2 is a plan view looking down upon the tool from the handle side thereof;

Fig. 3 is an end elevation of the tool from the right-hand side as shown in Figs. 1 and 2;

Fig. 4 is a schematic showing of several positions in which the tool may be used advantageously in dismantling a building structure, for example;

Fig. 5 is a similar schematic view showing the use of the tool in removing flooring; and

Fig. 6 is a further schematic showing of the use of the tool in dismantling a masonry wall.

Referring to the drawings which disclose a preferred embodiment of the invention, the tool head is shown at 10 as comprising an integral member having a hollow tapered shank portion 11 within which there is received the wooden handle 12, the handle being suitably shaped and secured in place by the use of wedges or the like as commonly practiced. The handle is preferably long enough so that with the tool head resting on the floor, the top of the handle is in position to be conveniently at the level of the hands of

the operator or user, and in such position that he can develop a maximum leverage and effective use thereof.

At one side of the shank, an extension 14 is formed which is generally rectangular in cross-section and of substantial dimensions as to width and thickness. This extension is shaped to provide a polygonal end section 15, having for example an octagonal cross-section, the outer end 16 of which is faced off or turned to give a rounded sledge-like working face. The mass of the extension is such as to provide proper weight and body for the use of the face 16 for all operations in the nature of a sledge hammer. Preferably the face 16 is finished such that the plane of the face makes a right angle with the side surfaces of the polygonal section 15, the plane being parallel with the longitudinal plane through the axis of the handle.

On the opposite side of the shank 11 the tool is formed with a relatively long and narrow integrally extending arm 20. The thickness of this arm preferably tapers gradually toward its outer end, as shown in Fig. 1 while its width preferably increases slightly from its inner portion to its outer portion as shown in Fig. 2. As shown the extent of the arm 20 beyond the shank is approximately three times the corresponding extent of the hammer end 14.

The shape of the lower surface of the arm 20 is of particular importance since it is that surface which forms the fulcrum about which the tool operates in the course of its use. It is important, therefore, that the outer boundary of this surface have a predetermined shape, in order that the tool may have the capacity for performing the type of operation desired, and to provide the desired extent of travel of the fulcrum over the full working stroke of the tool. For this purpose the surface 22 adjacent the shank defining the lower side of the arm 20 is convexly curved, with a substantial radius of curvature which not cause the end of the tool to be raised beyond the desired level but which will provide a definite travel of the fulcrum point in use. This portion of the lower boundary surface continues outwardly from the central shank 11 for a distance comprising approximately half of the overall length of the arm 20.

Outwardly of the section 22 of the arm there is located an intermediate section 23 the lower surface of which is also defined by a curved surface 24 of relatively long radius, such as to provide a noticeable curvature. This radius may be the same as that of curved surface 22 but is prefer-

ably made somewhat shorter to give a more rapid inclination and lift to the end of the tool, and the arc is of such length as to extend over approximately half of the remaining portion of the arm outwardly of section 22 thereof. In any case however curve 24 merges into the curve 22 and forms a smooth continuation of that surface such that the fulcrum point travels continuously from the outer end portion up to a point adjacent the shank.

The terminal portion 25 of the arm is defined by a lower surface 26 which as shown is preferably plane, and tangent to the curved section 24, this terminal portion having a length generally commensurate with that of the portion 24 itself.

The extent and radii of curvature of elements 22 and 24 are preferably such that the tangent to surface 26, indicated at 27, substantially bisects the angle between the horizontal line 28 and the vertical line 29. While satisfactory results are secured with some variation in the angles so formed by this tangent line, it is preferred that the complementary angles α and β so formed lie within the range of approximately 40° to 50°.

The tip of the tool is beveled off as shown at 30 to form a sharp working and cutting edge, the plane of the bevel being slightly below the horizontal so as to give an edge of the desired sharpness and shape for properly performing its function.

The contour of the inner boundary surface 32 of the arm 20 is of less importance as to its precise shape than the outer boundary, and is preferably formed substantially as indicated in the drawing in order to afford proper sections throughout the length of the arm, and to give the proper weight distribution thereto.

The weight and mass distribution of the tool are such that it is balanced about all three axes with the center of gravity being located internally of shank 11, and within the end of wooden handle received therein. The entire body of the tool is thus used to perform useful work whichever end is being utilized. For example, when the sledge hammer end is used, the entire mass of the tool is made effective directly in line with the working face 16, and there is a minimum of shock transmitted to the handle and to the hand of the user; a similar condition occurs when the tip 30 is being driven into the work.

In the use of the tool the sledge hammer end 16 may be used in the normal manner, the tool having adequate weight and capacity for effective application in this manner. The tool is similarly effective in the use of the tip end 30 as a pick. When the tool is to be used as a wrecking tool for the dismantling of timbers, flooring, masonry and the like, the arm portion 20 is made use of. This is done by first engaging the tip end 30 of the arm between the parts desired to be separated. If at floor level, the tool is conveniently held in the hand with the handle 12 at an angle of between 40° and 50° to the vertical, such that the surface 26 is parallel with and can be moved along the floor level with as much force as desired into wedging or engaging position. Upon engagement of the tip 30, pressure is applied to the handle with the curved surface 24 bearing against the floor, and forming a fulcrum about which the tool turns. This turning of the tool causes a shifting of the fulcrum from an outer point toward the handle and as the leverage of the handle increases, with the

handle more closely approaching a vertical position, the leverage of the working end of the tool also increases because of the curve of relatively long radius along the lower curved surfaces 24 and 22 providing a highly effective operating condition over the entire working range of the tool.

These operations are shown schematically in Fig. 4 where the tool 10 is shown in the three positions for illustrating purposes. Thus for dismantling the upright member or stud 40 from floor 41, the tool is moved along the floor with the terminal portion 26 guiding the same and with the handle 12 at such angular position as to be above and clear of low lying objects and conveniently available for use by the operator. To separate the brace element 42, the tool may be operated along the vertical face of stud 40 either from above or below, with the handle in either case making substantially the same angle to the vertical and equally accessible in each position. To separate the overhead beam 44, the tool is again guided along the vertical surface by its terminal portion 26 into engaging position where the handle 12 occupies a position with its axis at an angle of from about 40° to 50° to the vertical such that it can be readily utilized in the most efficient manner.

The tool is especially adapted for the purpose of removing flooring, other tongue and grooved lumber, lipped lumber, etc., as shown in Fig. 5. With a tongue and groove arrangement, it is customary to apply the upper flooring 50 over the lower layer of flooring 51 and with the nails 52 driven at an angle. In order to remove the flooring with the minimum of damage thereto it is important to provide for lifting the edge of each piece in an inclined path, generally parallel to the direction in which the nails 52 were driven. The tool of the present invention is particularly adapted for such use, since in its normal operation, the tip portion 30 is caused to travel toward the handle in response to the travel of the fulcrum point about the lower curved surface of arm 20. As a result the tip not only moves upwardly, but also moves in the direction toward the handle as pressure is applied thereto, this combined motion providing for the raising of the flooring in approximately the angle of the nails 52, so that the nails are withdrawn and the tongue and groove disengaged with a minimum of damage taking place. When the handle of the tool is brought to a vertical position with the shank 11 resting on a flat surface, the tip portion 30 has been raised a distance such that a piece of flooring carried thereon will be forced above floor level sufficiently to completely withdraw the nails customarily used therewith. Thus for example in a typical embodiment, the surface of the tip 30 stands above the lower side of shank 11 a distance of 3 to 4", a preferred distance being 3 3/8 inches. Thus the lifting and laterally shifting action produced by the prying end of the tool is highly effective for the purposes described.

The tool is likewise particularly useful in dismantling masonry structures such as brick walls. As shown in Fig. 6 the bricks 60 are separated by the mortar joints 61, and the tip 30 of the tool may be forced into the joint far enough to effect a wedging engagement therein. In this position the tool occupies the position substantially as shown in Fig. 6, and can conveniently be lifted to complete the separation of the bricks in a rapid and easy manner.

The invention therefore provides an extremely simple and yet highly useful wrecking tool which combines the usefulness of a sledge hammer and additional new and desirable qualities of a pick or crowbar-like action, with a combined over-all effect which contributes to the ease and maneuverability of the operation of the tool, and adapting the same to a wide range of applications along these lines.

While the article herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise article, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A hand tool of the character described for prying, wrecking and the like, comprising a shank portion adapted to receive a handle, an elongated and relatively narrow arm extending laterally outward from said shank, the lower surface of said arm beginning at the shank having a relatively long radius of curvature over an inner portion thereof forming a moving fulcrum having a substantial lateral travel when the tool is in use, the radius of curvature of said lower surface being decreased at an intermediate portion forming a continuation of said moving fulcrum with a decreased lateral travel for the fulcrum and an increased angular rate of vertical travel for the end of the tool when the tool is in use and providing for elevating the end of said tool at a substantially higher angular rate than afforded by said inner portion, and an outer terminal por-

tion on said arm and having a substantially plane lower surface located relatively remote from said shank and extending upwardly relative thereto and in the general direction of said handle but at an acute angle with respect thereto forming a prying end which rises to a substantial elevation when said fulcrum moves adjacent said shank.

2. A hand tool for the character described for prying, wrecking and the like, comprising a shank portion adapted to receive a handle, an elongated and relatively narrow arm extending laterally outward from said shank, the lower surface of said arm beginning at the shank having a relatively long radius of curvature over an inner portion thereof forming a moving fulcrum having a substantial lateral travel when the tool is in use, the radius of curvature of said lower surface being decreased at an intermediate portion forming a continuation of said moving fulcrum with a decreased lateral travel for the fulcrum and an increased angular rate of vertical travel for the end of the tool when the tool is in use and providing for elevating the end of said tool at a substantially higher angular rate than afforded by said inner portion, and an outer terminal portion on said arm and having a substantially plane lower surface located relatively remote from said shank and extending upwardly relative thereto and in the general direction of said handle but at an angle of from about 40° to 50° with respect thereto forming a prying end which rises to a substantial elevation when said fulcrum moves adjacent said shank.

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