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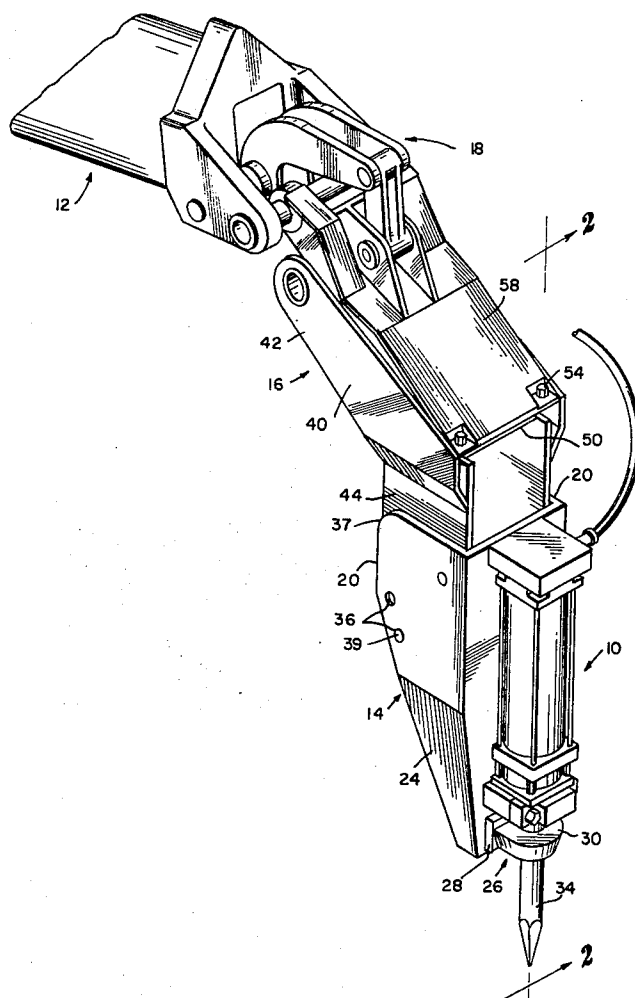
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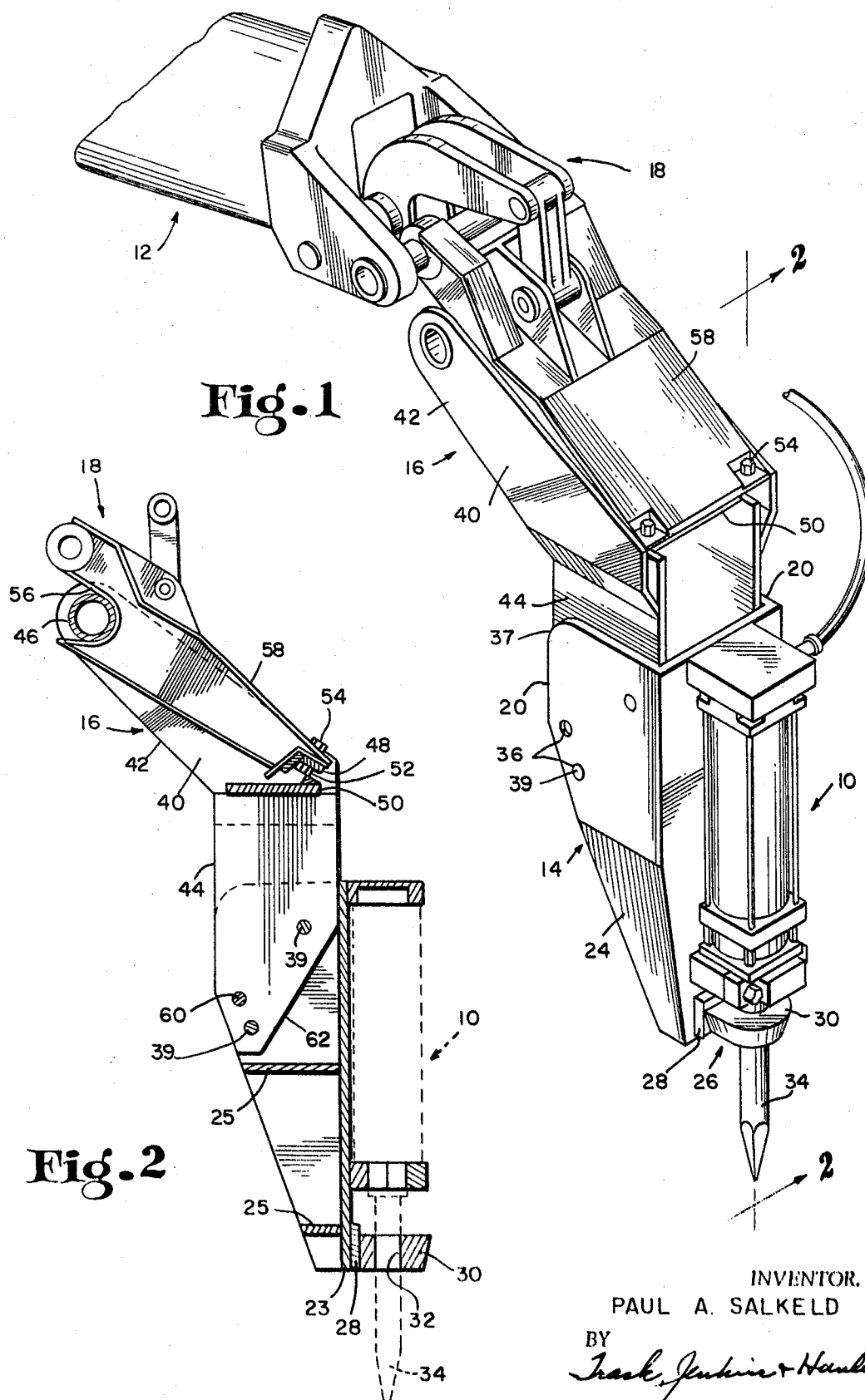
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[54] **TOOL MOUNTING APPARATUS**
9 Claims, 3 Drawing Figs.

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173/43
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173/43, 44; 299/70; 214/3, 1; 212/35

ABSTRACT: A mounting device having a rigid frame and a stabilizer for carrying a tool in an operable position, and which may be carried by a boom, or by an adapter member which is carried by a boom. Adapter members are provided which may be carried by various types of booms. The mounting device and the adapters are constructed so that the mounting device may be used with all of the adapters.





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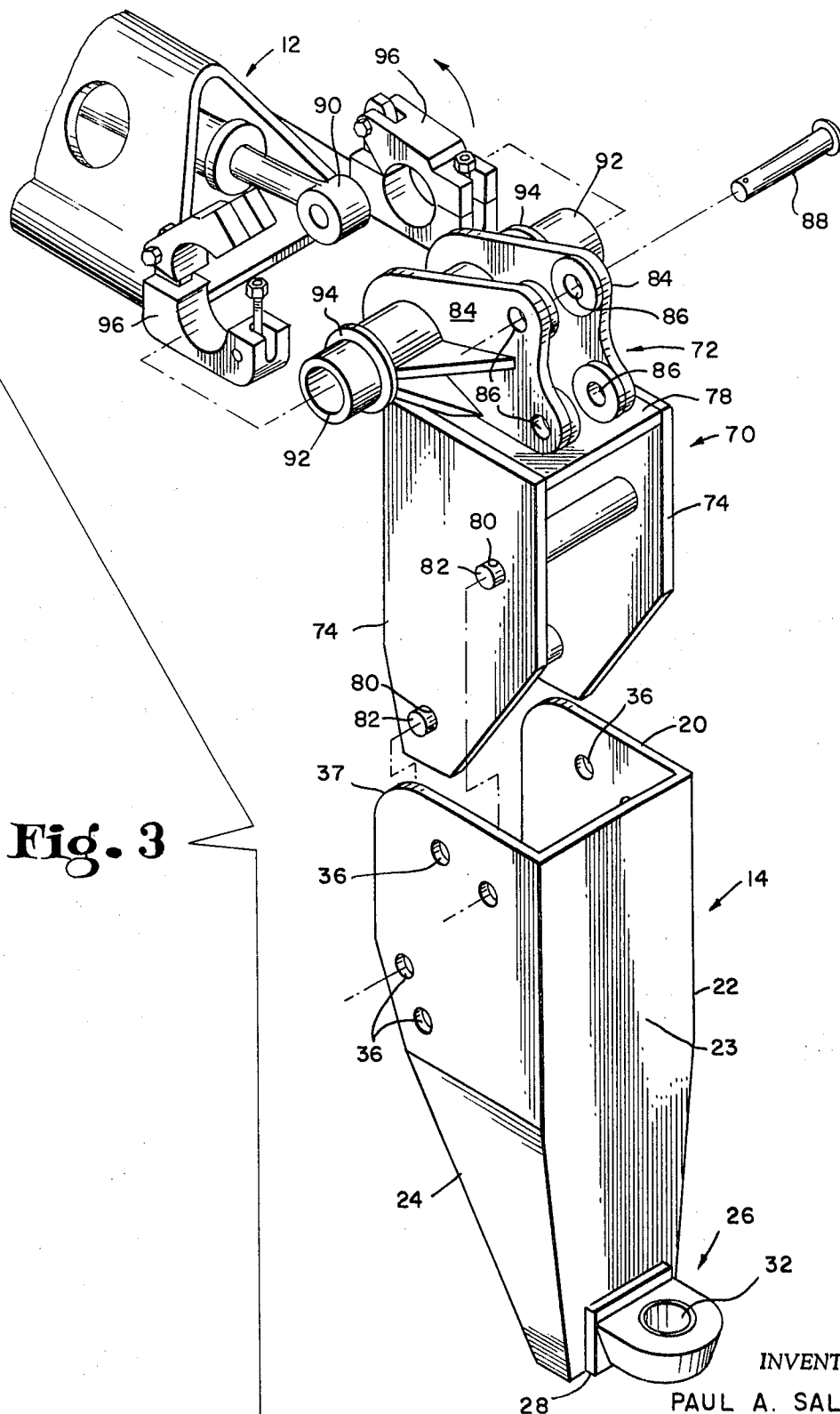


Fig. 3

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TOOL MOUNTING APPARATUS

BACKGROUND OF THE INVENTION

Demolition apparatus such as air or hydraulic hammers have long been used to break up concrete and asphalt and to perform other demolition tasks. Such equipment is normally hand-held and operated by a man, notwithstanding the severe physical burdens and personal dangers which must be endured. In particular areas of use, such as in steel mills where it is necessary to demolish an open hearth or other vessel which is still hot, workmen operating such equipment have had to enter and perform their strenuous tasks in these areas of very high heat. The physical strain and the dangers to the workmen are thus increased many fold.

Although demolition tools have sometimes been mounted on a boom, as by being welded to plates which are bolted to the boom, this does not adequately fulfill the needs. Apparatus in accordance with the present invention permits tools, and particularly demolition tools to be readily attached to and carried by a variety of different booms, and in varying positions and at various angles in order to reach otherwise inaccessible places. The tool is mounted on a mounting device of nearly universal use. The mounting device is adapted to be carried either directly by a boom, or by different adapter members which are in turn capable of being carried by different types of booms. Thus with a tool-mounting device and a few adapter members, the tool can readily be used with almost any boom.

The mounting device and adapter members of this invention provide great versatility for a tool such as an air hammer, and permit the tool to be taken out of the workman's hands and held by a boom. Not only does operational efficiency and versatility increase, but the resulting savings of human labor and discomfort is incalculable. And a significant source of danger to humans is removed.

SUMMARY OF THE INVENTION

The tool-mounting device of this invention comprises a rigid, three-sided frame having one flat surface to which a tool, such as an air-hammer, may be attached. That flat surface has a stabilizer adjacent its lower end so that the working portion or point of the tool will pass through the opening in the stabilizer. A plurality of aligned openings are provided in the other sides of the mounting device to permit the device to be pinned in various positions to a boom or an adapter member.

Adapter members are used, where necessary, as an intermediate connector between the tool-mounting device and the boom. Each adapter member is adapted to carry the tool-mounting device in a plurality of fixed positions. Different adapter members are used to connect to different types of booms. The adapter members comprise rigid frames and means to connect the frame to the boom.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is illustrated in the drawings in which:

FIG. 1 illustrates a demolition tool, a tool-mounting device, and an adapter member attached to a bucket arm on a boom; FIG. 2 is a cross-sectional view taken on the line 2-2 of FIG. 1; and

FIG. 3 illustrates the tool-mounting device, a trunnion adapter member, and the boom-attachment means.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As illustrated in the drawings, this invention provides apparatus which permits a demolition tool, such as air-hammer 10, to be operably carried from the end of a boom 12. The tool 10 is attached to a tool-mounting device 14, as by welding. In FIG. 1, the tool-mounting device 14 is shown as carried by an adapter member 16 which is in turn carried by boom 12, the adapter member 16 and boom 12 being connected together by

the bucket linkage 18. This type of arrangement may be used, for example, in carrying a demolition tool from a Gradall G-660, made by the Warner & Swasey Company.

The tool mounting device 14, as best seen in FIG. 3, comprises a rigid three-sided steel frame having sides 20 generally parallel to one another and perpendicular to a third side 22. The sides 20 each have lower portions 24 which taper inwardly toward one another. Side 22 has an external flat surface 23 to which a demolition tool may be affixed, as by welding. Supporting plates 25 extend between and are affixed to the three sides of the frame. A stabilizer 26 is attached to surface 23 adjacent its lower end. The base 28 of the stabilizer is welded to surface 23. The stabilizer has a generally cylindrical portion 30 which projects generally perpendicularly from its base 28, and has an opening 32 therethrough. The opening 32 is of a size to permit the working portion or point 34 of the tool to pass through it with a close clearance. In this manner, the tool may be operably carried and stabilized by the mounting device and the attached stabilizer.

Sides 20 each contain a plurality of openings 36, each opening being aligned with one of the openings in the other side and adapted to receive pins therethrough. The upper and outer portions of sides 20 are curved as at 37. The mounting device 14 may be attached to a boom or to an adapter member in a plurality of different working positions, by being connected by pins 39 through two sets of openings 36.

One form of an adapter member is illustrated in FIGS. 1 and 2. Adapter member 16 has laterally spaced sides 40 each having an upper leg 42 and a lower leg 44 extending at an angle therefrom. A tubular member 46 extends between and is affixed to sides 40 adjacent the upper ends thereof. Supports 48 and 50 extend between sides 40. Support 48 is provided with openings 52 which may receive locking bolts 54 therethrough. As shown in FIG. 2, member 16 is fixedly attached to the boom bucket linkage 18 by tubular member 48 fitting into an indentation 56 formed in the linkage and by locking bolts 54 which hold the bucket arm 58 to support 48.

The lower ends of sides 40 each have a plurality of openings 60, each such opening being aligned with an opening in the opposite side. When the sides 20 of mounting device 14 are fitted over the lower legs 44 of adapter 16, a pair of openings 36 and 60 will be in registry when the mounting device 14 and the adapter member 16 are at predetermined angles with respect to one another. This permits the mounting device and adapter member to be pinned together in different fixed positions by pins 39. The lower legs 44 are tapered, as at 62, to permit such movement to different positions.

Another form of an adapter member is illustrated in FIG. 3. This adapter member 70 includes trunnion adapter means 72 which may be used, for example, in carrying a demolition tool from the boom of a Gradall No. 2460 made by The Warner & Swasey Company.

Adapter member 70 has laterally spaced sides 74 and a plate 78 therebetween, thus forming a rigid frame. Two pairs of aligned openings 80 are formed in sides 74 and are adapted to receive a pin therethrough. As can be seen in FIG. 3, the tool-mounting device 14 may be carried by adapter member 70 in one or more fixed positions by means of two pins 82.

The trunnion adapter means 72 has a pair of spaced fins 84 extending perpendicularly from plate 78. Openings 86 in fins 84 are aligned in pairs, and fins 84 are spaced apart a distance to receive a cylinder rod therebetween. Thus the cylinder rod 90 and means 72, and consequently adapter member 70, may be held together in either of two positions by a pin 88 extending through two aligned openings 86 and the opening in rod 90. A tubular member 92 is carried by the fins 84 and by supports 94 which are attached to fins 84 on the external sides thereof. Tubular member 92 is adjacent an end of fins 84 away from holes 86, and extends laterally beyond the sides 74 of member 70. Member 92 may therefore be received and held by the tool attachment caps 96 on the boom, regardless of where the cylinder rod 90 is pin-connected to fins 84.

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The two adapter members 16 and 70 described herein are so constructed as to be useable with a great variety of booms presently available. And the adapter members 16 and 70 can each be used with the basic tool-mounting device 14. Thus a tool, such as the air-hammer 10, can be used with a variety of booms and in varying positions to perform a desired task. The apparatus of this invention permits ready and easy movement of a demolition tool from one boom to another or to different positions on one boom.

I claim:

1. A tool-mounting device for mounting a tool from a boom or an adapter member, comprising a rigid three-sided frame, a first of said frame sides having a surface with a stabilizer mounted thereon and adapted to have a demolition tool mounted thereon with its working portion proximate to said stabilizer, the other two frame sides being perpendicular to said first side and each having an opening therethrough, said openings being aligned with one another and adapted to receive a pin therethrough for attaching the mounting device to the boom, and a supporting plate extending between and affixed to the three sides of said frame.

2. An adapter member mountable on a boom, comprising laterally spaced sides, a tubular member extending between and affixed to said sides adjacent one end thereof, a support extending between said sides and having openings therein adapted to receive locking bolts, an opening through each of said sides adjacent another end thereof and aligned with one another and adapted to receive a pin therethrough, whereby said member may be attached to a bucket arm on a boom in order to carry a tool-mounting device.

3. The invention as set forth in claim 2 wherein said sides

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have an upper leg and a lower leg extending at an angle therefrom.

4. The invention as set forth in claim 3 wherein said lower leg has a tapered portion.

5. An adapter member mountable on a boom comprising laterally spaced sides and a plate therebetween forming a rigid frame, an opening through each of said sides aligned with one another and adapted to receive a pin therethrough in order to carry a tool-mounting device, trunnion adapter means mounted on said plate having a fin with an opening therethrough adapted to receive a pin, and a tubular member carried by said fin adjacent one end thereof and extending laterally beyond said sides, whereby said tubular member may be held by the tool attachment caps on the boom and said opening through said fin may be pinned to the cylinder rod of the boom.

6. The invention as set forth in claim 5 wherein said trunnion adapter member includes two laterally spaced fins having an opening in each fin aligned with one another so as to be capable of receiving the cylinder rod therebetween.

7. The invention as set forth in claim 6 wherein a plurality of openings are provided in each fin and aligned in pairs so as to be capable of receiving the cylinder rod therebetween in a plurality of positions.

8. The invention as set forth in claim 6 wherein a support for said tubular member is provided on each fin on the external sides thereof.

9. The invention as set forth in claim 6 wherein each of said sides has a tapered portion.

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