

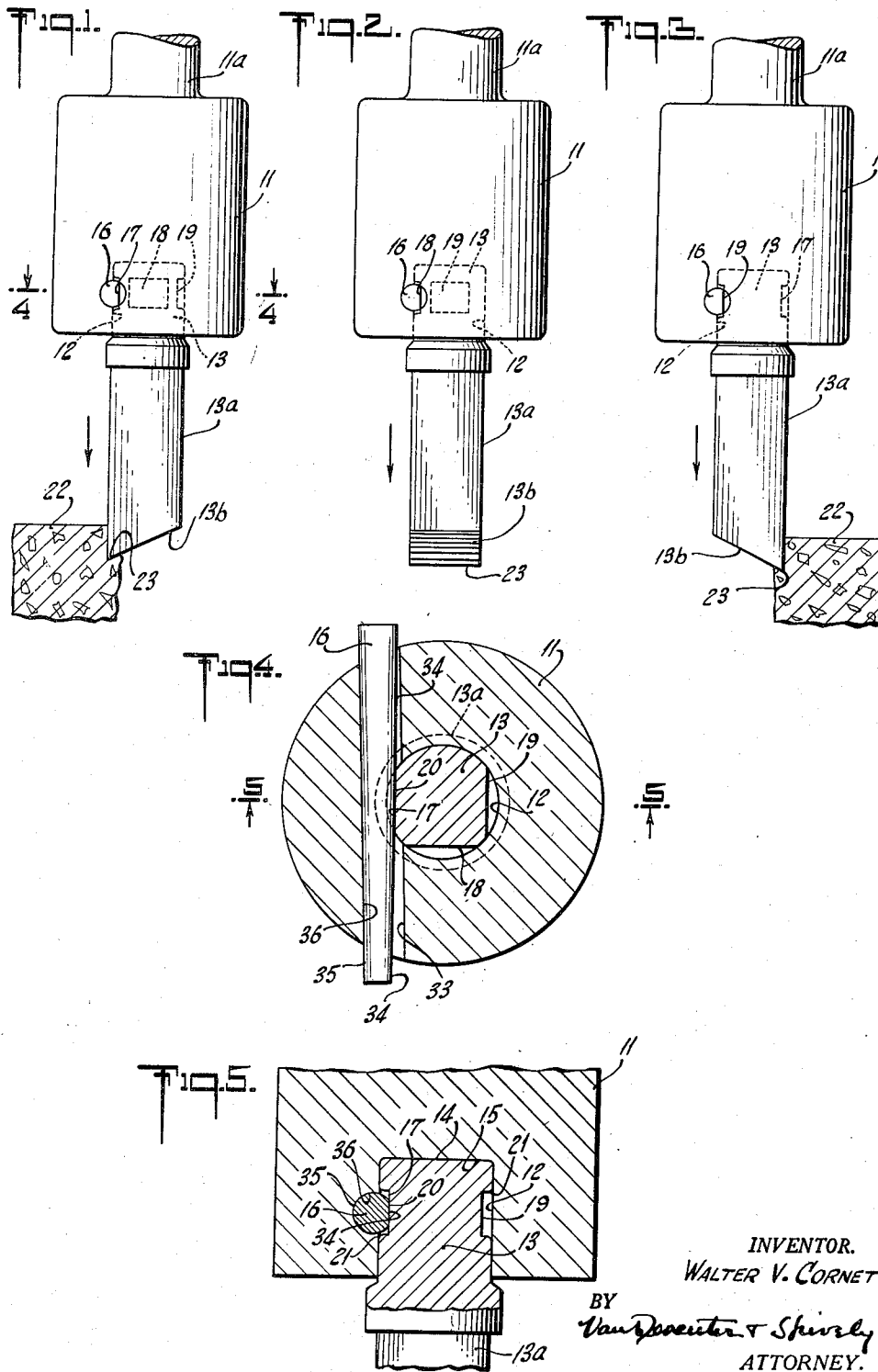
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W. V. CORNETT  
TOOL FOR DEMOLITION MACHINES

2,700,549

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2 Sheets-Sheet 1



INVENTOR.  
WALTER V. CORNETT  
BY  
*Van Dusen & Shirley*  
ATTORNEY.

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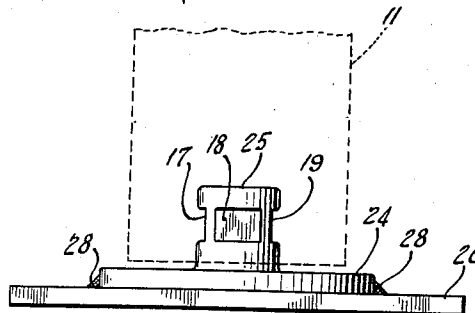
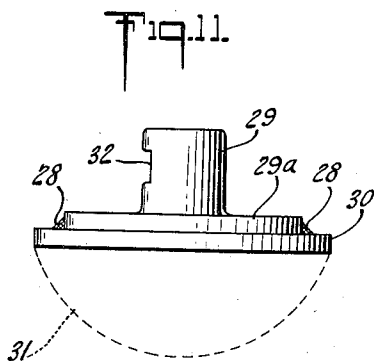
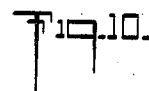
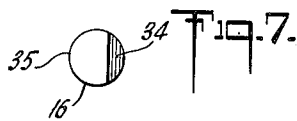
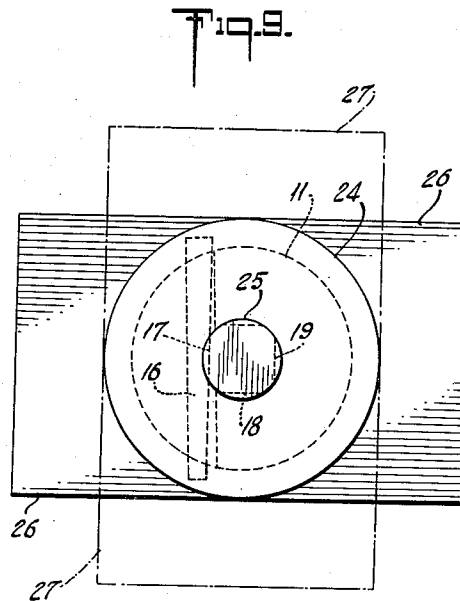
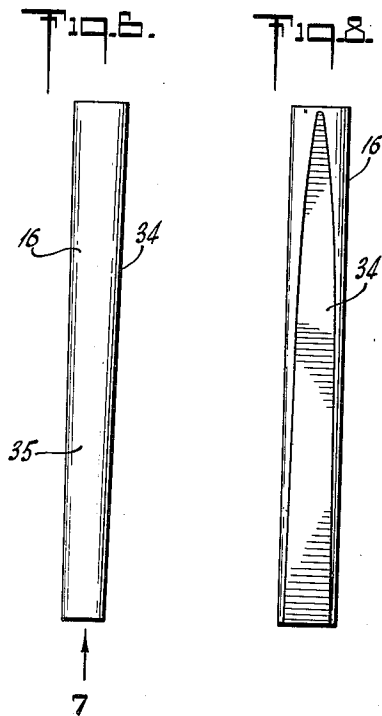
W. V. CORNETT

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2 Sheets-Sheet 2



INVENTOR.  
WALTER V. CORNETT  
BY  
Van Doren & Shirley  
ATTORNEY.

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## TOOL FOR DEMOLITION MACHINES

Walter V. Cornett, Los Angeles, Calif.

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1 Claim. (Cl. 279—97)

This invention relates to tools for demolition machines where the hammer—usually pneumatically operated—is used to break concrete roads and structures and for cutting trenches in asphalt, for tamping and other demolition and construction work. A typical machine of this description is disclosed in applicant's co-pending application #33,603, dated June 17, 1948, now Patent 2,672,331, dated March 16, 1954. Said copending application discloses a pneumatic hammer having a piston rod equipped with a hammer head having a tool-receiving socket therein and secured to said rod to reciprocate vertically therewith. Means is secured to the frame of the hammer and slidably engages the hammer head, whereby said head is prevented from revolving. It is therefore necessary, if it is desired to change the position of tools held in said tool-receiving socket, to revolve said tools therein, securing them in various adjusted positions.

The tools used in such machines are subject to very severe working conditions as they are employed for striking blows on, for example, solid concrete up to 15–20,000 foot pounds and, therefore, these tools must be securely held in the hammer head which, in the pneumatic type of tool, is connected to the piston operating in an air cylinder.

It is, therefore, an object of this invention to provide an efficient means for securing such tools to the reciprocating hammer head in such a manner that they will not come loose even after long service.

Heretofore the tools have usually been held in a dovetail or in a tapered socket, or by means of a pin driven through the hammer head and passing through the shank of the tool. In all of these arrangements difficulty is encountered in keeping the tool securely attached to the hammer head, as such arrangements require expensive and rather accurate machining which is eliminated by the present invention which requires no bolts and no tapered sockets and in which the tool shanks are easy to machine, no accurate fit being required.

A further object of the invention is to provide a tool that can be rotated in the hammer head to assume various positions relative to the hammer head.

A further object of the invention is to provide a tool having a cylindrical shank with a plurality of flat chordal channels therein intermediate its length which are used in connection with holding the tool in the hammer head, as hereinafter described.

Another object is to provide a tool having a body portion having a shank extending therefrom adapted to engage the hammer head, said body portion having secured thereto a pavement engaging member, preferably by welding or the like, whereby the working face of the tool can be replaced from time to time as it wears.

Other objects and advantages will be apparent from the following specification and accompanying drawings. It will be understood, however, that the description and drawings are illustrative of the invention and not limitative thereof, the same being as defined by the appendant claims. In the accompanying drawings,

Figs. 1, 2 and 3 show a tool embodying this invention in three different positions in the hammer head, as hereinafter described.

Fig. 4 is a view on the line 44 of Fig. 1.

Fig. 5 is a view on the line 55 of Fig. 4.

Fig. 6 is a view of the pin used to secure the tool to the hammer head.

Fig. 7 is an end view of the pin Fig. 6, looking in the direction of the arrow 7 in Fig. 6.

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Fig. 8 is a view of the pin Fig. 6, showing the flattened tapered side thereof as hereinafter more fully described.

Fig. 9 is a plan view of a tool having attached thereto a pavement engaging member.

Fig. 10 is a side view of the tool Fig. 8.

Fig. 11 is a side view of a tool having a circular pavement engaging member secured thereto, and shown in dotted lines is a hemispherical pavement engaging member secured to the tool.

Referring to the drawings, numeral 11 indicates the hammer head attached to the piston rod 11a whereby it is reciprocated and in this head (as best seen in Fig. 5) is a suitable bore or socket 12 which, for the sake of illustration, is shown as cylindrical and which is adapted to receive the shank 13 of the tool. It will be noted in the form of the invention shown that the outer end of said shank, indicated at 14, is flattened to engage the bottom end wall 15 of the tool receiving socket so that the force of the striking blow is transmitted directly from the shank 13 to the hammer head 11 and is not taken up by the pin 16.

As best seen in Figs. 4 and 5, the shank 13 is provided intermediate its length with one or more flats which may be best described as chordal channels, shown at 17, 18 and 19 in Fig. 4. While these channels may be of any desired shape they are preferably made with flat bottoms, as indicated at 20 in Fig. 5.

It will also be noted that said channels have slightly rounded outer edges, as indicated at 21, and that said channels are wider than the diameter of the pin 16 so that when said pin is in place, as hereinafter described, the pin contacts only the bottom walls 20 of these channels so that the pin is normally held out of contact with the top and bottom surfaces thereof.

Referring now to Figs. 1, 2 and 3, it will be seen that the body portion 13a of the tool therein has a chisel edge as shown at 13b. Assuming that the machine is being used to cut a trench in a concrete roadway such as indicated at 22, the machine traveling along the trench in a plane perpendicular to the drawing, it will be seen that the lowermost or chisel edge 23 of the tool will cut a smooth line or edge. This will occur when the pin 16 is in the channel 17.

Now, if the tool is rotated in the hammer head, as shown in Fig. 3, then the cutting edge 23 of the tool will be against the right hand edge of the trench, enabling that edge to be smoothly trimmed. In this case the pin is located in the channel 19, the tool having been turned around to permit this.

If it is desired to cut intermediate the two sides of the trench so that the broadside of the chisel would be presented to the work in order to cut as wide a portion as possible, then the pin 16 is placed in the channel 18 as shown in Fig. 2.

A large variety of tool ends, such as 13b–23, can be employed depending on the nature of the work to be done, but in nearly all instances it is desirable to be able to rotate the tool in the socket in the hammer head as above described.

The foregoing will be evident from a study of Figs. 9, 10 and 11. In Fig. 9 tool 24 is shown, which has the same shank and socket construction as the tools previously described, this shank Fig. 9 being shown at 25. By positioning this shank with the channel 17 to the left as shown, the rectangular tool face 26 may be used to tamp crosswise of the path of travel of the machine; or, by rotating the tool by turning the channel 18 towards the pin, the tool may be used the long way of the trench in narrow trenches, as indicated by the dot and dash lines 27, Fig. 9.

The work engaging face or pavement engaging member 26 may be secured to the body of the tool in any suitable manner, such as by welding, as indicated at 28, Fig. 10. By thus providing a plurality of flats or channels on the shank of the tool it may be easily turned to any desired position.

In Fig. 11 is shown another type of tool which may have the shank 29 secured to the body member 29a, to which may be welded the cylindrical pavement engaging member 30. A hemispherical pavement engaging mem-

ber 31 may be employed instead of 30, or may be welded to 30 or welded direct to the body 29a of the tool.

In this type of tool, where the pavement engaging members are circular, it is only necessary to provide one channel 32 in the shank although, of course, additional channels may be used if desired.

The use of the pin 16 to secure the tools in place in the hammer head 11 will now be described in further detail, reference being made to Figs. 4 and 5. Here it will be seen that there is a cylindrical cross bore 33 that extends through the hammer head 11. This bore is not exactly perpendicular to the axis of the hammer head but is slightly offset, as shown in Fig. 4.

The shank 13, 25 or 29 of any of the tools previously described is placed in the socket 12 and the pin 16 is driven in the bore 33 from either side. The pin 16 is shown in detail in Figs. 6 to 8 inclusive and is generally cylindrical in form, having a flat tapered portion 34 along one side thereof so that when the pin is driven into the cross bore 33 the flat side 34 will make contact with the bottom 20 of one of the flats or channels on the shank—such, for example, as the flat 17—while the cylindrical surface 35 of the pin engages the adjacent wall 36 of the hammer head. The result is that the pin 16 is in firm engagement with the hammer head throughout practically its entire length and the flat 34 on the pin is also in firm engagement with the flat 17 on the shank of the tool, and said shank is automatically positioned to have firm bearing against the pin.

It will also be observed from a study of Fig. 5 that, the parts being assembled as shown, when the hammer strikes a blow the force is transmitted from the shank 13 of the tool directly to the hammer head 11, and that none of this force is taken up by the pin 16 which is only in contact laterally with the shank and which merely serves to hold the shank in the socket. This is important, as pins or keys such as 16 are soon battered out of shape when they have to withstand the repeated blows that they are called upon to withstand in devices where the force of the hammer blow must be taken up by the pin.

While a round pin has been shown, it will be obvious that the same results could be obtained by a circular or rectangular wedge-shaped pin, the inventive concept being to so associate the pin with the hammer head and the shank of the tool that it is not called upon to withstand any upward pressure, the pressure being applied by the wedge-shaped pin only laterally against the shank which is thereby held in position in the socket without requiring the pin to withstand any heavy strain.

What is claimed is:

In combination with a power-driven reciprocating hammer head having a tool-receiving socket therein and having a smooth cylindrical cross bore extending across a chord of said socket, a tool having a body portion and a shank extending therefrom and adapted to fit within said socket, and a generally cylindrical pin having a tapered flat portion extending therealong and adapted when driven into said cross bore to engage the adjacent wall of the hammer head on the cylindrical portion of said pin while the flat portion of said pin engages the wall of said shank, the latter having a plurality of flat sections intermediate its length to permit a portion of said flattened portion of said pin to lie in contact with a selected one of said flat sections whereby said tool can be rotated in said socket to assume various positions relative to the hammer head.

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