Nov. 20, 1962 J. E. WAGONER 3,064,342

FORCE TRANSMITTING TOOL

Filed Sept. 18, 1958

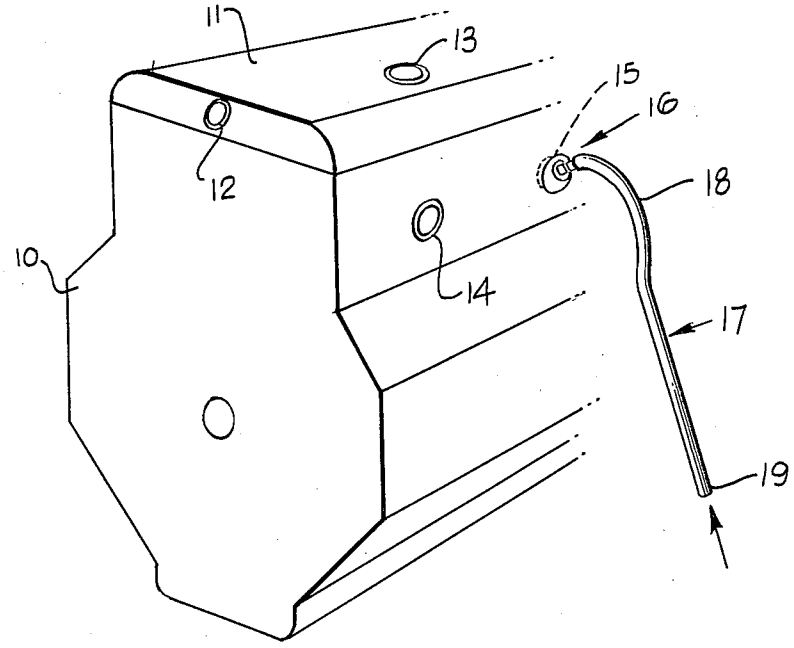


FIG. 1.

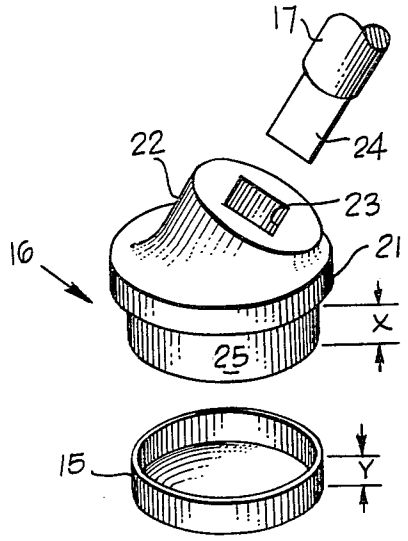


FIG. 2.

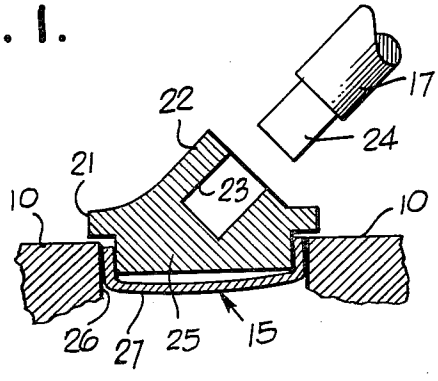


FIG. 3.

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United States Patent Office 3,064,342 Patented Nov. 20, 1962

3,064,342

FORCE TRANSMITTING TOOL

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Filed Sept. 18, 1958, Ser. No. 761,783
6 Claims. (Cl. 29—275)

This invention generally relates to a force transmitting tool and more particularly concerns a manually actuated tool for hammering a cup-shaped insert into the side walls of a member. The tool is particularly adaptable for forcing freeze plugs or expansion plugs into the head or block of an automobile engine, particularly in inaccessible areas where conventional hammering tools cannot be employed because of obstructing engine apparatus.

It will be appreciated that although the tool of the present invention will be described from the standpoint of its application and utility in conjunction with driving freeze plugs into the head or block of an automobile engine, the invention is equally adaptable to other applications characterized by similar environmental conditions.

Freeze plugs or expansion plugs are used in conjunction with many different types of automobile engines in order to prevent cracking or other damage to the block of the engine in the event of freezing of the cooling water therein. Such plugs normally comprise cup-like inserts which are forced into respective openings in the side walls of the block and/or head at several different locations. After a period of time, these inserts have a tendency to rust or deteriorate such that they must be replaced. In conventional practice, in order to replace the freeze plugs the head of the engine must be removed in order to make the freeze plug openings accessible to conventional tools. In some intances, other components of the engine must also be removed, and it will be appreciated that substantial labor expense is involved.

It is, therefore, an object of the present invention to provide a force transmitting tool which may be employed for forcing a cup-like insert into the side walls of a member.

Another object of the present invention is to provide a force transmitting tool in accordance with the foregoing object which may be used in inaccessible areas.

Another object of the present invention is to provide a force transmitting tool which may be employed for forcing freeze plugs or expansion plugs into the block or head of an automobile engine, wherein the head of the engine and various component parts need not be removed although the freeze plug location is in a normally inaccessible area.

A further object of the present invention is to provide a force transmitting tool for forcing freeze plugs or expansion blocks into the head or block of an automobile engine in which the tool is of relatively simple and rugged construction.

Still another object of the present invention is to provide a force transmitting tool for forcing a freeze plug or expansion plug into the head or block of an automobile engine, in which the tool will serve not only to properly align the plug within the block or head side walls but will also serve to drive the plug a predetermined distance into the side walls.

These and other objects and advantages of the present invention are generally attained by providing a tool for the above purpose which comprises the combination of an elongated member or rod together with a boss. The boss includes one portion thereof adapted to receive one end of the elongated member or rod and another portion thereof adapted to be received in the insert or freeze plug.

A better understanding of the present invention will be had by reference to the drawings, showing merely one illustrative embodiment, and in which:

FIGURE 1 is a general view of a portion of an automobile engine illustrating the use of the tool of the present invention;

FIGURE 2 is an enlarged partial isometric view of the tool of the present invention; and

FIGURE 3 is a sectional view illustrating co-operation of a portion of the tool in its use with an insert or freeze or expansion plug.

Referring now to the drawings, there is shown in FIGURE 1 a general representation of an automobile engine including a block **10** and a head **11**. In certain type automobile engines, freeze or expansion plugs are disposed in a plurality of locations about the engine, for example, as illustratively shown by expansionn plugs **12** and **13** in the head, and expansion plugs **14** and **15** in the block. For descriptive purposes, the tool of the present invention has been shown as being applied to the expansion plug **15**.

The tool comprises an adapter or boss **16**, which receives one end of an elongated rod **17**. Preferably, the rod **17** includes a curved portion **18** of pre-determined radius according to the accessibility of the particular plug being installed relative to the type of automobile engine. The rod **17** has an opposing end **19** which is adapted to receive an applied force in the direction of the arrow such as with a hammer or the like whereby the force is transmitted throughout the length of the rod **17** through the curved portion **18** and thereafter through the boss **16** to the freeze plug **15**.

The operation and particular features of the tool will be more clearly understood by references to FIGURES 2 and 3. In FIGURE 2, the freeze plug **15** is shown in enlarged view as comprising a cup-like member having side walls of a given height *y*. The boss **16** comprises a generally disc-like flanged portion **21** having integrally formed therewith an angularly projecting portion **22**. The portion **22** has formed therein a square bore **23** having rectilinear side walls adapted to receive in rotatively coupled relationship a shank **24** of similar cross section formed on an end of the member **17** adjacent the curved portion **18**. Assuming that the axis of the shank **24** is disposed at a forty-five degree angle to the axis of the main body of the member **17** and that the projecting portion **22** of the boss **16** is similarly at a forty-five degree angle with respect to the axis thereof, it is evident that hammering on the end **19** may be directed at angle of ninety degrees with respect to the direction in which the insert **15** is being forced into the block or head of the engine. It is apparent, of course, that the angle employed in the curved portion **18** as well as the angle employed in the projecting portion **22** of the boss **16** may be varied according to the particular insert location.

It will be noted that the boss **16** also integrally includes a downwardly projecting plug **25**, which is of slightly less outer diameter than the inner diameter of the insert **15**. The plug **25** has side walls of length *x*, which length is slightly greater than the length *y* of the side walls of the insert **15**. With this type of construction, the flanged disc-like portion **21** of the boss will not normally contact or damage the upper edges of the insert as the plug **25** is forced into the insert. On the contrary, the plug **25** and more particularly the bottom surface thereof will serve as the driving means by forcing the bottom of insert into the side walls of the block or head as the case may be.

It will further be appreciated by reference to FIGURE 3 that the boss **16** is so designed that it will serve to align the insert **15** properly within an opening **26**, for example, of the block **10**. Thus, in FIGURE 3 the insert of freeze plug **15** has been canted with respect to the opening **26**. However, as the plug **25** is forced down by the shank **24** into the bore **23**, the lower surface of

the flanged portion **21** will become co-planar with the outer surface of the block **10** thereby tending to re-center the insert **15**. Furthermore, as soon as the flange **21** impacts the side walls of the block **10**, no more force will be exerted against the insert **15** by the plug **25**, and the insert **15** will be properly disposed in a substantially flush position in the side walls of the block.

It will thus be appreciated that the force transmitting tool of the present invention enables expeditious and labor saving replacement of freeze or expansion plugs in automobile engines and/or blocks. Furthermore, the tool of the present invention is equally adaptable to other types of applications in which cup-like inserts must be forced into an opening of the side walls of a member. It is evident that many changes and modification may be made in structural details without departing from the spirit and scope of the invention as set forth in the following claims.

What is claimed is:

1. A tool for driving a cup shaped insert into an opening in the sidewalls of a member, said tool comprising: an elongated rod functioning as a part of a tool for driving said insert into said sidewalls; a boss having one end portion thereof defining a bore adapted to receive one end of said elongated rod such that said boss functions as another part of said tool; said boss having its opposite end portion defining a decreased diameter plug designed to be drivingly received in said insert, said bore being angulated relative to the longitudinal axis of said boss and said plug, said plug having a diameter slightly less than the inner diameter of said insert so as to fit therein.

2. The combination, according to claim 1, in which said bore is defined by rectilinear sidewalls, and in which said one end of said elongated rod is shaped to fit closely within said bore.

3. The combination, according to claim 2, in which said elongated rod embodies a curved portion adjacent said one end.

4. A tool for driving a cup-shaped insert into an opening into the sidewalls of a member, said tool comprising the combination of: an elongated rod; a boss having one end portion of greater diameter than said opening, said one end portion defining therein a bore adapted to receive in rotatively coupled relationship one end of said rod, and said boss having its opposite end portion defining a decreased diameter plug to be received in said insert, said bore being angulated relative to the longitudinal axis of said boss and plug, said plug having sidewalls of slightly greater height than the inner height of said insert, whereby upon insertion of said plug within said insert, said one end portion will not contact or damage the sidewalls of the cup-shaped insert, but will engage said sidewalls of said member and thereby gage the depth of positioning of said insert within said member.

5. A tool, according to claim 4, in which said bore and said shank are of square cross section.

6. A tool for driving a cup shaped insert into an opening in the sidewalls of a member, said tool comprising: an elongated rod; a boss having one end portion of greater diameter than said opening, said one end portion defining therein a bore adapted to receive in rotatively coupled relationship one end of said rod, and said boss having its opposite end portion defining a decreased diameter plug to be received in said insert, said bore being angulated relative to the longitudinal axis of said boss and plug, said plug having sidewalls of slightly greater height than the inner height of said insert, whereby upon insertion of said plug within said insert, said one end portion will not contact or damage the sidewalls of the cup-shaped insert, but will engage said sidewalls of said member and thereby gage the depth of positioning of said insert within said member.

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