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2,754,882

INSERT WITH REMOVABLE LINER

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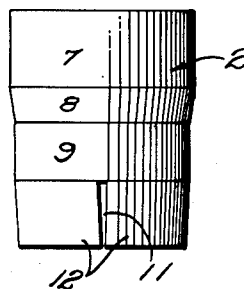
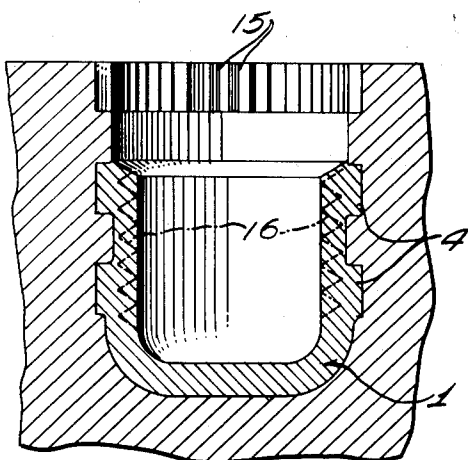
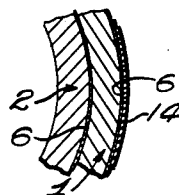
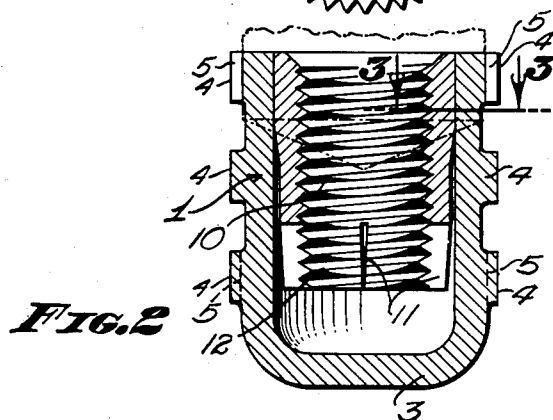
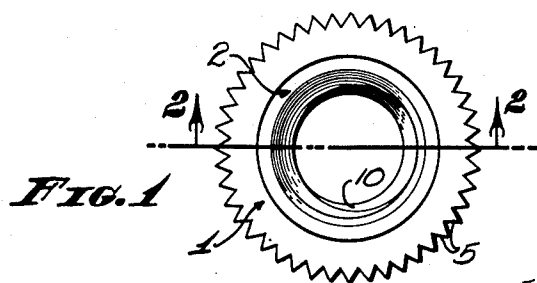
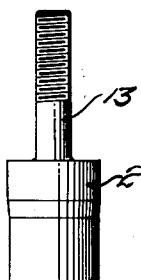


FIG. 4

FIG. 6



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2,754,882

INSERT WITH REMOVABLE LINER

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7 Claims. (Cl. 151—41.73)

My invention relates to inserts and more particularly to inserts adapted to be cast or molded in a body of material, and included in the objects of my invention are:

First, to provide an insert designed to receive a screw or stud which, though intended as a permanent installation, is so constructed that in event of damage, the insert may be removed in part, leaving a cavity adapted to be prepared for reception of a special insert such as that disclosed in my previous Patent No. 2,400,318 issued May 14, 1946.

Second, to provide an insert, which, though capable of replacement, is particularly economical of manufacture and which eliminates screwthreaded connections between the parts of the insert.

Third, to provide an insert which comprises an inner internally screwthreaded member, a stud supporting member and an outer cap or shell member uniquely bonded or fused together to withstand the loads imposed.

Fourth, to provide an insert of this class wherein the inner member is formed of stainless steel which is not readily plated and an outer shell of such material as to accept plating so that the two pieces may be furnace-brazed together and given a plating treatment after assembly without depositing metal on the stainless steel member to alter its dimensions.

With the above and other objects in view, as may appear hereinafter, reference is now directed to the drawings, in which:

Figure 1 is an end view of my insert.

Figure 2 is a sectional view thereof through 2—2 of Figure 1.

Figure 3 is an exaggerated fragmentary sectional view thereof through 3—3 of Figure 2, indicating particularly the plating applied to the cap member.

Figure 4 is a sectional view similar to Figure 2 showing the cap member molded in a surrounding body of material and indicating its condition after the liner or inner member has been removed for the purposes of replacement by a 2-piece insert.

Figure 5 is an elevational view of the inner member or liner.

Figure 6 is a reduced elevational view of the inner member or liner modified to incorporate an integral stud.

My liner includes a cap or shell 1 and a liner or inner member 2. The cap is cup shaped and is closed at its bottom end as indicated by 3. The side walls of the cap are provided with external annular ribs 4. In the illustration three such ribs are shown. Some or all of the ribs may have knurled peripheries as indicated by 5. The knurling on the upper or outermost rib preferably forms the surface into longitudinally extending serrations corresponding to the serrations of the ring member of a 2-piece insert of the type shown in my previous Patent No. 2,400,318. As will be brought out hereinafter, the arrangement of my present insert is such that it may be replaced by my 2-piece insert disclosed in the above mentioned patent.

The interior of the cap or shell is cylindrical and of a

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dimension to correspond to the drill size corresponding to a selected tap size, for example, the internal diameter of the cap may be such as to receive a "Q" drill which is the tap drill for a $\frac{3}{8}$ -24 tap.

5 Prior to receiving the liner 2 the cap is internally and externally plated as indicated by 6. The liner 2 may be tubular. One end is slightly enlarged to form a cylindrical bonding land 7 of such dimensions as to be press fitted into the plated cap 1.

10 Below the bonding land 7 the liner is slightly tapered externally and below the tapered portion 8 the liner forms a clearance portion 9. As shown particularly in Figure 2, the liner may be provided with internal screw threads 10 and its lower or inner end may be provided with radial slits 11. The segments 12 between these slits are contracted or pressed inwardly slightly so that they tend to grip the end of a screw threaded bolt fitted into the liner. Alternately the liner may be a solid member and be provided with an integral stud 13 which extends outwardly from a transverse end face of the insert and may be externally screw threaded.

The liner 2 is press fitted into the cap 1 until its outer transverse end face is flush with the cap as shown in Figure 2. The assembled cap and liner are then subjected to heat sufficient to braze or sinter the plating 6 so as to form a bond between the bonding land 7 and the interior of the shell 1. The brazed or fused connection thus formed is more than ample to withstand any torsional or axial loads applied to the liner.

30 After assembly the insert may be given a second plating 14 for protective purposes. In this regard it should be observed that the material of the cap or shell 1 may be soft iron of a type which readily plates whereas it is preferred to make the liner 2 out of stainless steel which does not lend itself to plating operations. Consequently when the assembly is subjected to a plating bath the plating accumulates on the outside surface of the shell but does not interfere in any way with the dimensional tolerances of the screw threads.

40 If for any reason the liner 2 should become damaged, a drill slightly larger than the minor external diameter of the cap or shell 1 is drilled into the cap as well as the liner to a sufficient depth whereby the bonding connection between the liner and cap is destroyed. Thereupon the inner end of the liner is removed. If it is undesirable to drill the full depth of the bonded section of the liner and cap, a drill corresponding in diameter to the interior of the cap or shell is selected to drill out the liner.

After the liner has been removed, the remaining shell appears substantially as shown in Figure 4. The ring of individual serrations which constitute the remaining portion of the upper rib is removed to form a longitudinally serrated counterbore 15. After removal of the liner 2 the interior of the cap is tapped to form screw threads 16 adapted to receive the screw threaded shank of my 2-piece insert mentioned hereinbefore. The remaining annular ribs 4 disposed inwardly of the bonding land 7 serve to lock the shell 1 against displacement relative to a surrounding body of material during the thread tapping operation. After the cap has been screw threaded my 2-piece insert is installed by first screwing the body member into the shell and then locking the body member by means of an internally and externally serrated ring.

It will be observed that with the exception of the screw threads provided within the liner or on the stud, the parts are joined without screw threaded connection. Instead the bonding effect of the fused or sintered plating between the two members is fully adequate to resist both longitudinal and torsional loads within the scope of bolts which might be connected to the liner.

Having fully described my invention, it is to be understood that I do not wish to be limited to the details herein

set forth, but my invention is of the full scope of the appended claims.

I claim:

1. An insert, comprising: a generally cup-shaped shell having a smooth-walled cylindrical cavity extending thereinto from its outer end; an inner liner in said shell having attachment means for receiving a threaded fastening member, said liner having a transverse face lying in substantially the same plane as the outer end of said shell and having an external cylindrical bonding land at the outer end of said cavity and being reduced in external diameter inwardly of said bonding land to clear the wall of said cavity; a fused coating in said cavity at the outer end of said shell bonding said land to said shell to secure said liner in said cavity; and means on the outer periphery of said shell, including portions disposed inwardly of said bonding land, for preventing rotation and axial movement of said shell in a surrounding body of material.

2. An insert as defined in claim 1, in which the inner liner is tubular and has an internally threaded bore forming said attachment means.

3. An insert as defined in claim 2, in which the inner end of the liner is contracted to provide a threaded bore which is reduced in diameter internally at its inner end to grip the end of a threaded fastening member when said member is threaded therein.

4. An insert as defined in claim 1, in which the liner member is in the form of a solid plug and includes a protruding stem extending outwardly from said transverse base forming said attachment means.

5. An insert as defined in claim 1, in which the fused coating comprises a fusible metallic plating applied to the cavity, and wherein a metallic plating is applied to the exterior of the shell.

6. An insert as defined in claim 1, in which a protective plating is applied to the exterior of the shell and the inner liner is of a material which is resistant to said plating.

7. An insert, comprising: a generally cup-shaped shell having a smooth-walled cylindrical cavity extending thereinto from its outer end; an inner liner in said shell having attachment means for receiving a threaded fastening member, said liner having a transverse face lying in substantially the same plane as the outer end of said shell and having an external, smooth, cylindrical bonding land at the outer end of said cavity and being reduced in external diameter inwardly of said bonding land to clear the wall of said cavity; a fused coating in said cavity at the outer end of said shell bonding said land to said shell to secure said liner in said cavity; and means on the outer periphery of said shell for preventing rotation and axial movement of said shell in a surrounding body of material, said means including an end flange at the outer end of said shell lying in a plane common with said bonding land, said flange having axially directed serrations and a channel below said end flange adapted to be intersected by a drill to permit simultaneous drilling out of said serrated end flange and said bonding land, when said shell is embedded in a surrounding body of material with the outer face of said end flange flush with said body, said means also including portions on the outer periphery of said shell disposed inwardly of said channel for retaining the remainder of said shell fixed in the body of surrounding material.

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