O. L. PRIME.

METHOD OF FORMING COMPOSITE METAL PLUGS.

APPLICATION FILED FEB. 17, 1919.

1,334,051.

Patented Mar. 16, 1920.

Fig. 1.

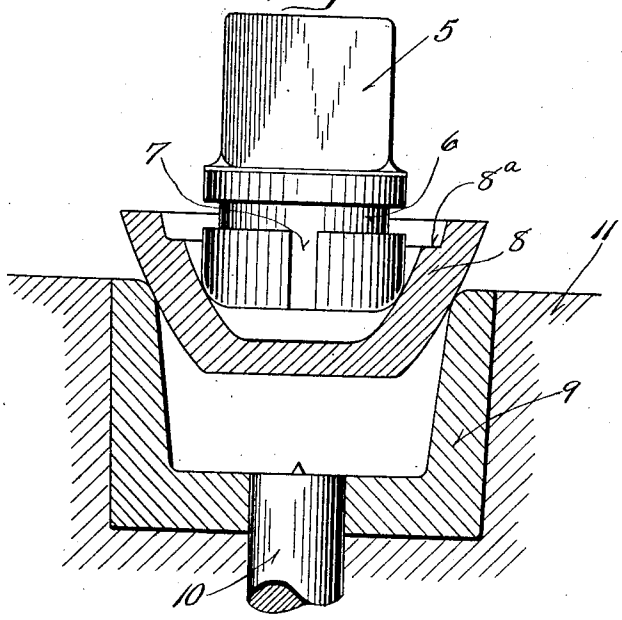


Fig. 2.

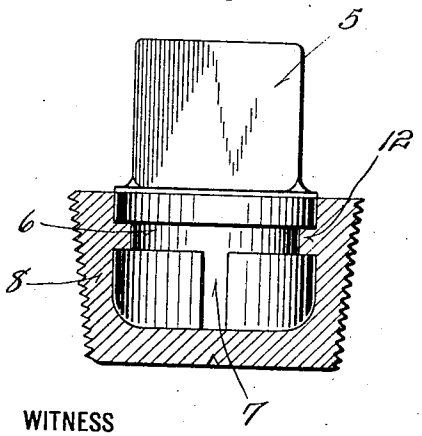
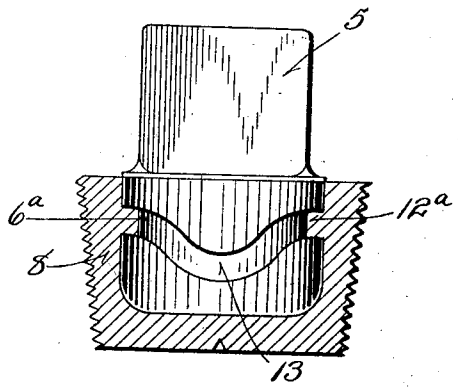


Fig. 3.



WITNESS

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METHOD OF FORMING COMPOSITE METAL PLUGS.

1,334,051. Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed February 17, 1919. Serial No. 277,585.

To all whom it may concern:

Be it known that I, ORTON L. PRIME, a citizen of the United States, and resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Methods of Forming Composite Metal Plugs; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to new and useful improvements in the method of forming composite metal plugs of the type shown in my co-pending application for patent, filed June 19, 1918, Serial No. 240,819 and comprising a core or body member having suitable wrench faces on one end portion and having its other end portion engaged and interlocked in a cup-shaped shell of brass or other non-corrosive metal. These plugs are adapted for various purposes, and when used as closures for the cleanout holes of locomotive or other boilers, they are subjected to exceedingly high pressures which procure a certain amount of leakage through the pores of the shell if it is merely cast onto the body member.

It is therefore primarily the object of my invention to provide an improved method of forming a composite plug whereby incidental to placing the shell in interlocked position about the body member, a decided pressing and shaping action will be exerted upon the shell which will close the pores thereof to prevent leakage through the shell, and at the same time effect a most perfect union with the body member.

More particularly, my object resides in the provision of an improved method of forming the plugs which may be carried out with a maximum economy.

In the accompanying drawings:

Figure 1 is a sectional view through a die member showing one step in the method of forming my improved plug.

Fig. 2 shows the completed composite plug, the body member being an elevation and the shell being in section.

Fig. 3 is a similar view showing a modified interlocking arrangement for preventing relative movement of the body and shell.

Referring now more particularly to the accompanying drawings, Fig. 1 shows my improved method of connecting the body member and shell of the plug. The body member, which is cast or forged of steel or malleable iron has one end portion provided with suitable wrench faces 5, while its other end portion which engages in the shell is preferably cylindrical and is provided with an annular groove 6, and longitudinal grooves 7 for receiving rib portions of the shell to prevent relative movement of the body and shell in any direction.

The shell 8 is cast or forged separately from the body in cup shape with its wall flared whereby when the body portion is set within the cup it will seat against the intermediate portion of the flared wall. The wall of the cup is reduced at its upper portion forming the consequent shoulder 8^a on its inner periphery. This reduction of the thickness of the wall is for the purpose of facilitating the flow of metal under pressure into the grooves of the body member. In shaping the shell about the body member there is provided a die cup 9 seated in the usual die block 11 and having an ejecting plunger 10 slidable in its bottom. The shell casting 8 is placed on the die member, the intermediate portion of its wall seating against the mouth of the die member. The body member is then placed within the shell and pressure is exerted on the body member to force the shell and the body member into the die whereby the shell will assume its desired slightly tapered shape and will fit intimately against the body member, portions of the shell being pressed into the grooves of the body member to form ribs 12 interlocking therewith. At the same time due to the pressure exerted and to the flux of the metal procured in the shaping operation, the pores of the shell will be closed to prevent leakage therethrough under the exceedingly high pressure to which the plug may be subjected in use. It is particularly noted that both the body and shell members employed in my present method of forming the composite plug may comprise casting or forging members of the most simple nature, which may consequently be formed in a most economical manner, and but a single step is involved in connecting said members, and at the same time subjecting the shell to pressure and flux to close the pores thereof.

After the shell has been placed about the body member, the periphery of the shell is provided with the usual screw threads to form the finished plug.

In Fig. 3 there is shown a slightly modi-

fied form of plug, wherein a portion of the annular locking groove 6^a of the body member is offset at 13 to provide and interlock with the correspondingly shaped annular rib 12^a of the shell preventing rotative movement, it being however appreciated that any interlocking relations of body and shell portions to prevent relative movement of the body and shell in any direction may be employed.

What I claim is:

That method of forming a composite plug having a body member and a cup shaped shell receiving and interlocked with one end portion of the body member, which consists in providing a body member and a cup shaped shell casting or forging member having its wall flared outwardly and having its base of lesser dimension than the base of the body member, and in then forcing said body member and shell into a cup shaped die member to press the shell member into interlocking engagement with the body member and simultaneously close the pores of said shell member.

In testimony that I claim the foregoing I have hereunto set my hand at Milwaukee, in the county of Milwaukee, and State of Wisconsin.

ORTON L. PRIME.