

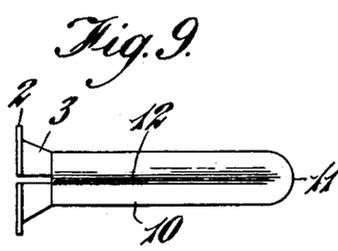
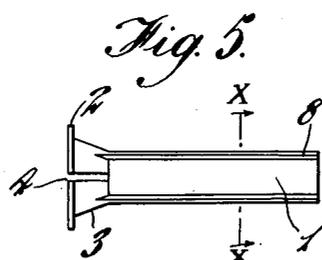
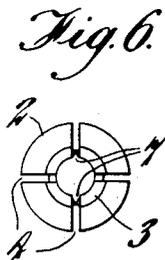
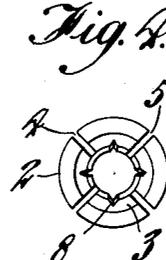
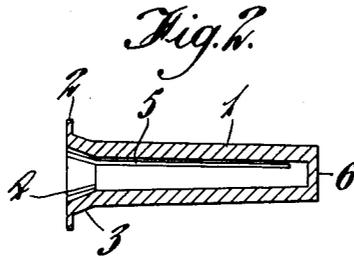
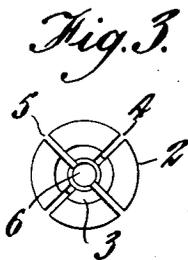
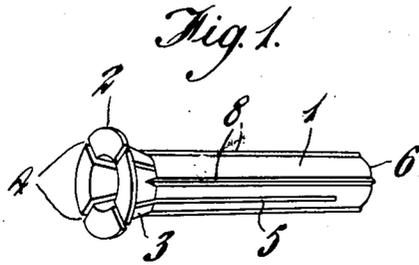
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WALL PLUG

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2,150,080

WALL PLUG

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7 Claims. (Cl. 85—2.4)

This invention relates to improvements in wall plugs of the kind intended to be inserted in prepared holes in bricks, plaster, stone or the like for the reception of nails, screws or like fastenings driven therein, the wall plug serving the purpose of securely holding the said nail, screw or the like.

When cylindrical wall plugs have been employed, it has been found that in some cases, more especially when fixing into hollow brick or other hollow partition walls, or when the hole for the reception of the plug and fastening has been drilled to a greater depth than is necessary to accommodate the plug, the latter is pushed too deeply into or through the hole when attempt is made to insert a nail or screw therein.

It has been proposed to provide tubular wall plugs with a rim at the outer end of the plug in order to overcome the above disadvantage, but difficulty has been experienced with such plugs in that such rim, being solid, is not readily expandable, the amount of metal or other material at this part of the plug being considerably greater than at any other part of the plug, since it has been found necessary to form the rim of considerable thickness in order to prevent it from being pushed into the hole when the nail or the like is driven into the plug. With such a solid rim it has been found that when an attempt is made to turn a screw into the plug, the latter frequently cannot be prevented from itself rotating in the hole, particularly should the hole be somewhat oversize, which is often the case in practice, and furthermore, the undue thickness of such solid rim prevents the fixture to be held by the nail or screw from being drawn properly into close contact with the wall or other surface, and a space is left between the back of the fixture and the wall in which dirt, moisture and other undesirable matter may accumulate.

The disadvantages above referred to are obviated in accordance with the present invention, in which a tubular wall plug is provided at its outer end with a relatively thin flanged portion extending at right angles to the axis of the plug, and a conical or flared portion connecting the flange with the cylindrical body portion of the plug. Notches or slots may be provided extending from the conical or flared portion of the plug into the flange thereof to enable the outer end of the plug to be readily expanded when a nail or screw is driven therein.

A convenient and advantageous method of manufacturing plugs in accordance with this invention is by die-casting or moulding, the mate-

rial of the plug being lead or other suitable material, such for example as fibrous material or synthetic resin.

The invention will now be described with reference to the annexed drawing, in which

Figure 1 is a perspective view of a wall plug constructed in accordance with the invention,

Figure 2 is a sectional view of the plug shown in Figure 1.

Figures 3 and 4 are front and rear end views respectively of the plug shown in Figures 1 and 2.

Figure 5 is a side elevation of a modified form of plug in accordance with the invention,

Figure 6 is a front end view of this plug.

Figure 7 is a section on the line X—X, Figure 5.

Figure 8 is a view similar to Figure 6.

Figure 9 is a side elevation of a plug made from sheet metal, and

Figure 10 is a sectional view of the plug shown in Figure 9.

As shown in the drawing, Figures 1 to 4, a tubular wall plug 1 is provided at its outer end with a relatively thin flanged portion 2 extending substantially at right angles to the axis of the plug, and a conical or flared portion 3 connecting the flange 2 with the cylindrical body portion 1 of the plug. Notches or slots 4, are formed at the outer end of the plug, extending from the periphery of the flange 2 to the inner limit of the coned or flared portion 3.

The plug is provided with its bore extending substantially throughout its length, and one or more axial slits 5 which may be formed as extensions of the notches or slots 4 in the flared portion 3 of the plug, are preferably provided to extend similarly substantially the whole length of the plug. For convenience of manufacture and also in order to maintain such longitudinally slit plugs in an integral condition during handling preparatory to use, it is desirable that the axial slits referred to shall not extend to the inner end of the plug, so as to leave a relatively small ring of material or length of unbroken cylindrical wall 6 at the inner end of the plug. Similarly the bore of the plug extends likewise to a distance relatively slightly short of the inner end of the plug, thus providing a closed end which prevents loose material left in the hole by the drilling thereof entering into the bore of the plug when the latter is inserted into the hole. Or the inner end of the plug when the bore extends entirely therethrough may be compressed, or the bore reduced at this point for the same purpose.

In a modified form of the plug, as shown in Figures 5, 6 and 7 in the place of the longi-

tudinally extending slits in the cylindrical wall thereof, the plug 1 may be formed with an unbroken cylindrical wall and with longitudinally extending inner grooves 7, such grooves extending from the bore of the plug outwardly towards the outer cylindrical wall thereof to a distance only slightly less than the thickness of such wall, thus forming longitudinal lines of weakness corresponding to the longitudinal slits hereinabove described.

The bore of the plug may be tapered in a direction away from the outer conical or flared portion 3 thereof, as shown in Figures 2, 3 and 4, so that the maximum of effective expansion of the plug is produced at the part thereof which is furthest removed from the exterior of the wall or other surface.

If desired, longitudinal ribs 8 may be formed in the exterior of the cylindrical wall of the plug thus providing a resistance to rotation of the plug within its hole additional to the resistance provided by the flanged and conical portions 2, 3 of the plug.

Instead of or in addition to the said longitudinal ribs 8, longitudinal grooves or indentations may be provided in the cylindrical wall of the plug to provide ribs or protuberances 9 on the inner wall thereof as shown in Figure 8. This arrangement promotes an initial expansion of the plug as soon as a screw inserted therein has a commencing rotary movement imparted to it and further provides parts in which the threads of a screw can become embedded.

The form of plug shown in Figures 6 to 8 inclusive, having an unbroken cylindrical wall, lends itself to a convenient and economical method of manufacture by moulding or casting in that a single mould can be used from which the plug, which is tapered both inside and outside, can be readily withdrawn and separated from the sprue.

Plugs formed with a flared or conical portion as hereinabove described are particularly suitable for use in holes drilled in soft material, since such holes in a large proportion of cases have a somewhat greater diameter at or adjacent the exterior surface owing to the crumbling or flaking away of the material at the rim or edges of the hole, and the provision of such conical or flared portion enables this peculiarity of holes formed in soft material to be turned from a disadvantage into an advantage, in that the flared portion of the plug fits closely against the superficial enlargement of the hole and assists in preventing rotation of the plug in the hole when pressure is exerted to drive a screw therein, also serving to prevent the plug from being itself forced too deeply into the hole. By reason of the action above referred to of the flared portion of the plug, it has been found possible to reduce the thickness of the flanged portion thereof to an extent such that no appreciable amount of separation is left between the wall and the fixture.

A further advantage of the improved plug lies in that the notched or slotted flanged and flared portions thereof assist the entry of a nail or screw into the plug and the formation by a screw of a screw thread in the interior wall of the plug, the said notches or slots allowing the said flanged and flared portions of the plug to be readily expanded by the screw and pressed into close contact with any superficial enlargement of the hole drilled in the wall or other surface.

The conical or flared portion of the plug may

be of a thickness relatively less than the cylindrical wall thereof.

The improved plug may alternatively be formed from a strip of sheet metal 10 which is bent upon itself to form a closed inner end 11 of the plug, as shown in Figures 9 and 10, the parts forming the two sides of the plug being interlocked on longitudinal lines 12, the interlocking preferably being of such a character that the overlapped parts can be readily forced apart by the application of an internally applied plug expanding force.

I claim:

1. A wall plug formed by a substantially cylindrical tube, an end wall closing one end of the tube, the other end of said tube being open, a flared part of the tube adjacent its open end, a flange formed at the outer end of said flared part of the tube, the said plug having one or more slots extending longitudinally thereof from the periphery of said flanged part through said flared part and terminating in longitudinal slits extending to points adjacent said closed end of the tube, and having a plurality of slots extending from the periphery of said flanged part of the plug to the inner end of said flared part of the plug.

2. A tubular wall plug comprising a body portion closed at one end and enlarged at the opposite end to form a flared portion and a relatively thin flange portion at the outer end of the flared portion, the flared portion and the flange being divided into parts by slots commencing at the outer edge of the flange and terminating at the inner end of the flared portion.

3. A tubular wall plug comprising a body portion enlarged at one end to form a flared portion and a relatively thin flange portion at the outer end of the flared portion, the flared portion and the flange being divided into parts by slots commencing at the outer edge of the flange and terminating at the inner end of the flared portion, and the bore of the plug terminating short of the end of the plug opposite to the flared end to provide an end wall closing this end of the plug.

4. A tubular wall plug comprising a body portion enlarged at one end to form a flared portion and a flange portion at the outer end of the flared portion, the flared portion and the flange being divided into parts by slots commencing at the outer edge of the flange and terminating at the inner end of the flared portion, and the interior wall of the bore being interrupted by longitudinal grooves forming lines of weakness.

5. A tubular wall plug comprising a body portion enlarged at one end to form a flared portion and a flange portion at the outer end of the flared portion, the flared portion and the flange being divided into parts by slots commencing at the outer edge of the flange and terminating at the inner end of the flared portion and longitudinal ribs on the exterior wall of the body of the plug.

6. A tubular wall plug comprising a body portion enlarged at one end to form a flared portion and a flange portion at the outer end of the flared portion, the flared portion and the flange being divided into parts by slots commencing at the outer edge of the flange and terminating at the inner end of the flared portion and the wall of the plug being divided by longitudinal slots commencing at the outer edge of the flange, continuing along the flared portion and merging into longitudinal slits along the body of the plug

and terminating short of the closed end of the plug so as to provide an entire cylindrical wall at the inner end of the plug.

5 7. A tubular wall plug formed from a strip of material bent on itself to form a closed end of the plug, a flared portion at the opposite end of the plug and a flange portion at the outer end

of the flared portion, the flared portion and the flange being divided into parts by slots commencing at the outer edge of the flange and terminating at the inner end of the flared portion, and the edges of the parts forming the two sides of the plug being loosely interlocked.

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