

Oct. 9, 1934.

W. C. ROBINSON

1,975,976

UNDERFLOOR DUCT OUTLET

Filed March 11, 1933

2 Sheets-Sheet 1

FIG.1.

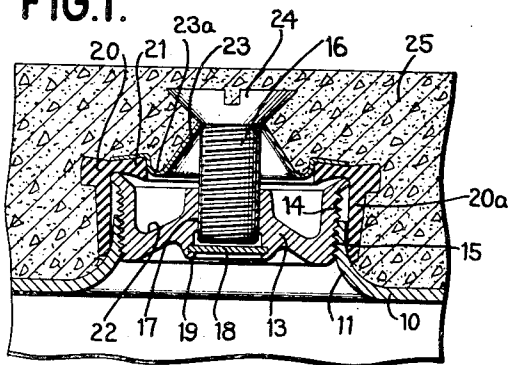


FIG.2.

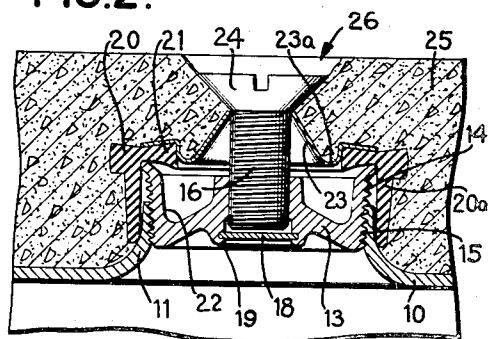


FIG.3.

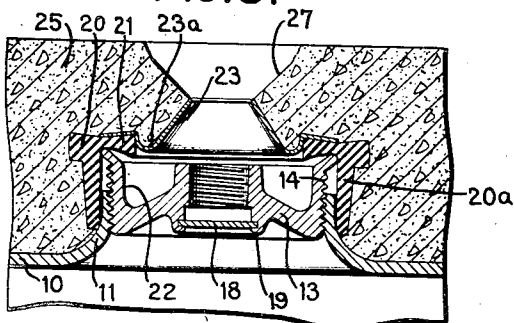


FIG.4.

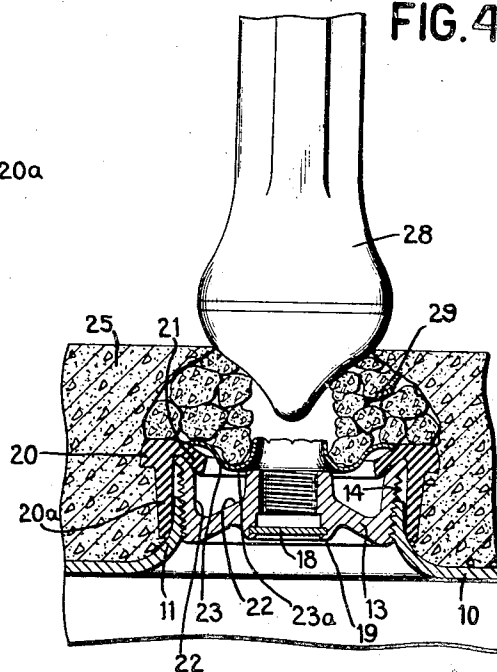
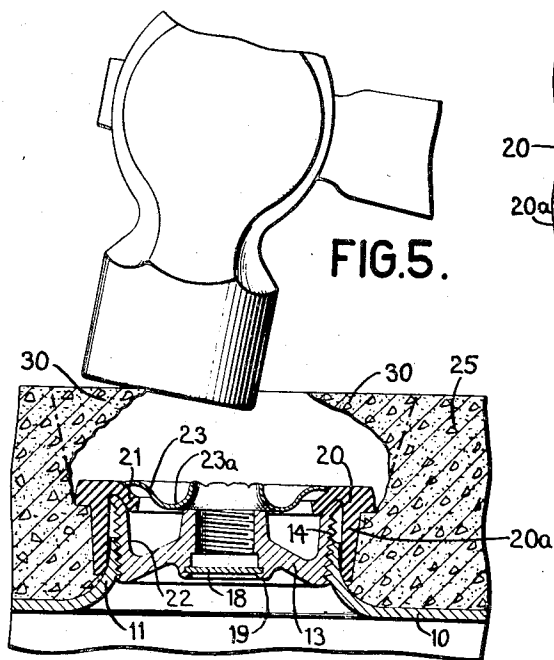


FIG.5.



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FIG. 6.

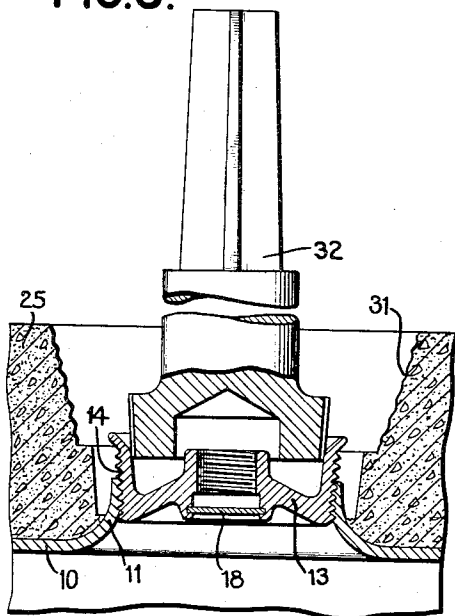


FIG. 7.

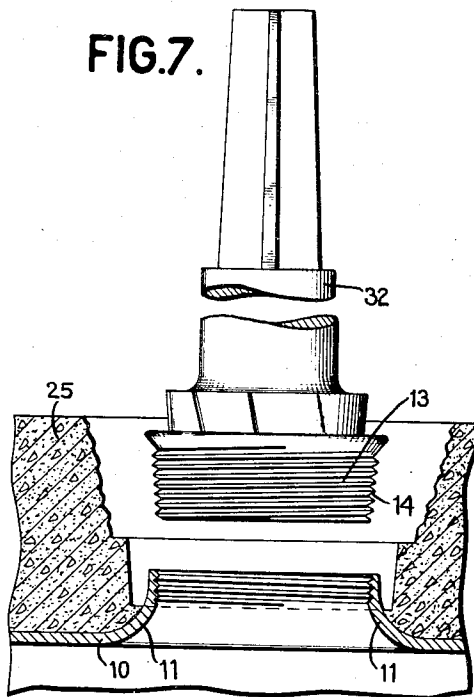


FIG. 8.

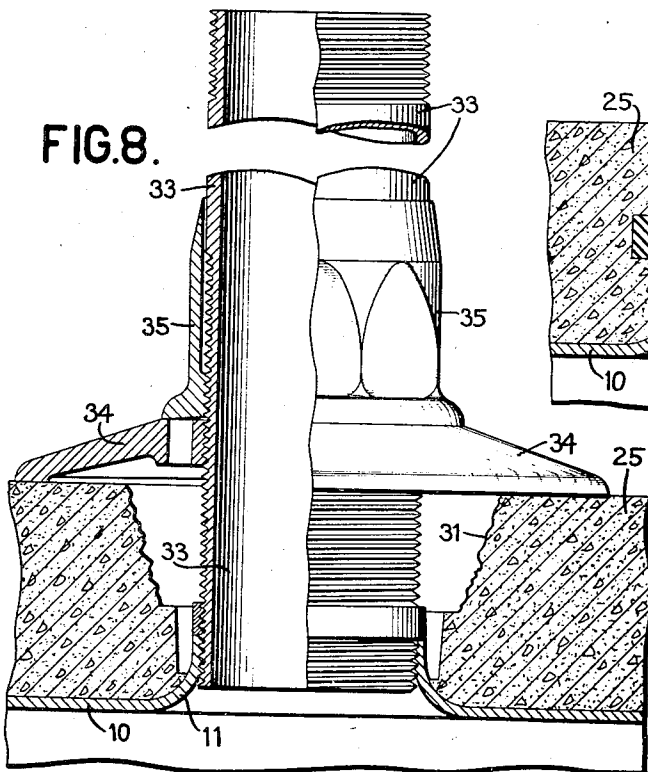
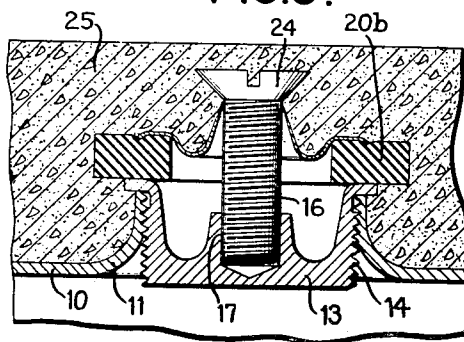


FIG. 9.



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1,975,976

UNDERFLOOR DUCT OUTLET

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Application March 11, 1933, Serial No. 660,337

9 Claims. (Cl. 247—28)

The present invention relates to systems of electrical conduits. More specifically it relates to such systems as have come to be known as underfloor duct systems and in which the ducts are buried in concrete or the like and are located a substantial distance below the surface thereof.

An object of the invention is to provide means for facilitating the cracking, breaking and removal of a large mass of concrete overlying the duct, in order to obtain access to the duct.

Further objects of the invention will appear as the invention is hereinafter disclosed.

Referring to the drawings which illustrate what I now consider a preferred form of the invention and one of the more numerous modifications that may be made therein within the scope of the appended claims.

Figure 1 shows a sectional view of my improved duct with its plug outlet closure completely embedded in overlying concrete;

Fig. 2 shows the second step of operation in providing an outlet to the duct;

Fig. 3 shows the third step with the locating screw removed;

Figs. 4 and 5 show the succeeding steps wherein the overlying concrete is first broken up and then cracked out;

Figs. 6 and 7 show succeeding steps, viz. the steps of removing the plug from the duct;

Fig. 8 shows the final step of assembly with a standpipe inserted and connected to the duct;

Fig. 9 is a sectional view like Fig. 1 with a modified form of plug.

In carrying out the invention, metallic underfloor ducts 10 are provided with outlet necks 11 at intervals therealong and such duct proper may have substantially the conformation of the duct shown in my previous U. S. Patent No. 1,776,195. In lieu of providing plugs which extend to, or adjacent to, the surface of the concrete as in the construction of the foregoing patent, a different construction is employed.

According to one embodiment of the invention, relatively short and hollow comparatively rigid plugs 13 are provided, which plugs are preferably of metal. Such plugs are exteriorly threaded as shown at 14 so that they can be threaded into the threads 15 of the outlet necks. The central portion of each plug 13 is also provided with a bored out portion which is threaded to receive a locating screw 16. For convenience in construction the bored out portion which receives the marking screw may initially extend completely through the plug, but after

the threading operation is performed at the point 17, such bore is closed at the bottom by a disk 18 which is secured in position by spinning over the metal of the plug under the disk at the point 19 or in any other desired manner. Each plug assembly also includes certain supplemental parts which will now be described. 20 designates a member of yielding material preferably rubber, which has a depending flange portion 20a adapted to extend over and constitute a sealing member for the exterior of an outlet neck. The resilient member 20 also has an inwardly extending portion 21 which extends to a considerable extent over the interior cavity portion 22 of the plug 13. Supported upon the portion 21 is a collapsible diaphragm shaped member 23 which, according to one embodiment, is made of relatively thin sheet metal and shaped partly in the form of a truncated cone and which member 23 also has a flange portion overlying the flange portion 21 of the yielding member and with an intermediate curved portion 23a. The locating screw 16 snugly fits the aperture in the top of the member 23 and the relation of parts is such that the head portion 24 of the locating screw seats against the top of the truncated cone when the locating screw is fully advanced into the plug.

In Fig. 1 the concrete 25 is shown as completely overlying the plug and also overlying the head 24 of the locating screw. Preferably the locating screw 16—24 is of magnetic material so that the location of an outlet in a duct can readily be ascertained by known magnetic finder methods. It may be explained, however, that it is not essential that the locating screws be of magnetized material, since certain locating and finding devices now in use are adapted to locate outlets by the presence of iron. The iron of the locating screw will serve to determine the location of an outlet.

When an outlet into the duct is to be secured, the first step in the procedure is to locate the locating screw 16—24. This may be done by the magnetic finding method as above mentioned. After the locating screw has been located, the workman who desires to provide the outlet, chips away the concrete overlying the head 24 of the locating screw. This step of procedure is indicated at 26 in Fig. 2. Thereafter the locating screw is wholly removed by a screw driver or other implement. The parts are now in the relation shown in Fig. 3, in which it will be noted that there is a very substantial amount of concrete over the buried assemblage. It will

be appreciated that with the parts in the relation shown in Fig. 3 that the plug assemblage includes a hollow cavity 22 and that there is also an extension of this cavity under the diaphragm member. The depression 27 which is now present in the concrete is centralized with respect to the plug and the artisan now applies any suitable concrete crushing implement to this aperture. Fig. 4 shows this crushing or cracking step. In this Figure an implement such as 28 is shown as applied to the aperture 27 and by imparting blows to or with this implement the overlying concrete may be broken into fragments as indicated at 29. The cracking of the concrete into fragments and the localizing of the fragmentation of the concrete is brought about by the effect of the blows and by the collapsing of the diaphragm 23 and by the yielding of the rubber gasket 20 and particularly by the yielding of the portion 21 of such rubber gasket.

As shown in Fig. 4, the truncated diaphragm has been collapsed out of its truncated form into a reverse shape as shown. When in such shape the diaphragm 23 serves to maintain the fragments of concrete above the diaphragm and prevents them from dropping down into the cavity portion 22 of the plug proper.

After the step illustrated in Fig. 4 has been completed the fragments 29 of concrete are removed. The floor is then in the condition shown in Fig. 5 in which there are certain extended over edges of the concrete as indicated at 30. By applying a hammer or other tool, these overlying flange portions of the concrete can be readily and quickly broken off so that they can be removed leaving a clean substantially frusto-conical opening as indicated at 31 in Fig. 6.

The next step in the procedure is to remove the metallic diaphragm and to remove the rubber gasket 20. The buried parts are now in the relation shown in Fig. 6.

The next step is to apply a plug removing wrench generally designated 32, to the interior of the plug 13 and to unscrew the plug (see Fig. 7). The outlet in the neck 11 is now accessible for the application of the usual service fitting or standpipe. Fig. 8 shows such a service fitting or standpipe applied to this outlet neck. In Fig. 8, 33 is the standpipe proper, 34 is a floor flange plate which covers the slightly enlarged hole 31 in the concrete and 35 is a lock nut for clamping the floor flange plate down to the concrete floor. The standpipe 33 it will be understood is directly threaded into the threads of the neck 11 of the duct.

Referring to Fig. 9 there is here shown a slightly modified form of construction. In lieu of providing the closing disk 18, the plug 13 is solid and the threads 17 are tapped in the plug boss. The gasket 20b is also somewhat different in configuration lacking the depending flange portion 20a and being made somewhat thicker. Other modifications will occur to those versed in the art. The providing of an outlet with the construction shown in Fig. 9 is the same as heretofore described.

It will be noted that the yielding member 20 has an external diameter at its upper portion which is greater than the largest diameter of the plug 13. Conversely, the largest diameter of the plug 13 is not greater than the largest diameter of the yielding member 20, and this

is an important feature as will now be pointed out.

When the concrete above the plug is broken as indicated in Figs. 4 and 6 the concrete will fracture to a base diameter at least as great or to a greater diameter than the largest diameter of the plug 13. Accordingly, when the simple operation of cracking the overlying portion 30 of concrete is performed (see Fig. 5) the hole (see Fig. 6) will be large enough, without any chipping operations (such as are ordinarily performed with a chisel or the like) to permit ready use of the plug. The operation with the form shown in Fig. 9 is similar in the respect last noted.

It will be further noted that the element of largest diameter being yielding may itself be readily removed.

What I claim is:

1. An underfloor duct system including an underfloor duct provided with an outlet opening, a closure for said opening, said closure structure including yielding material having a diameter at least as great as the largest diameter of the other portions of the closure structures to provide a localized cushion for concrete overlying the said closure to provide for localized fragmentation of overlying concrete upon the striking of such concrete above said closure.

2. An underfloor duct provided with an outlet opening and having a removable closure for said opening, said closure including a yielding element and a cooperating collapsible diaphragm member with the yielding element and diaphragm disposed in cavity-covering relation with the closure to provide a cavity to localize the fragmentation of overlying floor material directly over such closure.

3. Closure means for an underfloor duct outlet comprising in combination, a comparatively rigid closure element mounted in the outlet but removable therefrom, and a yielding member associated with said first mentioned closure element, the major diameter of said yielding member being at least as great as the major diameter of said first mentioned closure element whereby removal of the entire closure means when buried in concrete is facilitated.

4. Removable closure means for outlets of underfloor ducts to facilitate removal of the overlying concrete and removal of the closure means from a duct outlet, said closure means comprising a plug portion, and a yielding portion overlying and extending beyond the outer edge of the plug portion for the purpose described.

5. Removable closure means for underfloor ducts comprising in combination a comparatively rigid plug removably mounted in the outlet opening of a duct, a member of yielding material overlying said plug and having a major diameter at least as great as the major diameter of the plug and a collapsible diaphragm extending above said yielding member but not above the normal floor surface.

6. Removable closure means for underfloor ducts comprising in combination a comparatively rigid plug removably mounted in the outlet opening of a duct, a member of yielding material overlying said plug and a collapsible diaphragm extending above said yielding member but not above the normal floor surface, whereby removal of overlying floor material and removal of the closure means are facilitated.

7. Removable closure means for underfloor

duct systems comprising in combination, a plug for insertion in an outlet opening, a collapsible diaphragm extending across said plug, a yielding member between the diaphragm and said plug, and a locating screw between the collapsible diaphragm and plug for holding the elements of the closure means in assembled relation.

8. Removable closure means for an underfloor duct system comprising in combination a plug for insertion in a duct outlet opening, an inverted substantially cup-shaped member of yielding material surrounding and overlying the plug and a collapsible diaphragm extending across the cup-shaped member.

9. Removable closure means for outlets of an underfloor duct system to facilitate the removal of overlying concrete and the removal of the closure means from a duct outlet, said closure means comprising a plug portion resistant to impact blows upon overlying concrete and a yielding portion within which the resistant portion is located, the said yielding portion yielding under impact blows upon overlying intact concrete to provide for fragmentation of such overlying concrete and for the formation of a removal hole through the concrete through which the closure means may be withdrawn when the fragments are removed.

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