

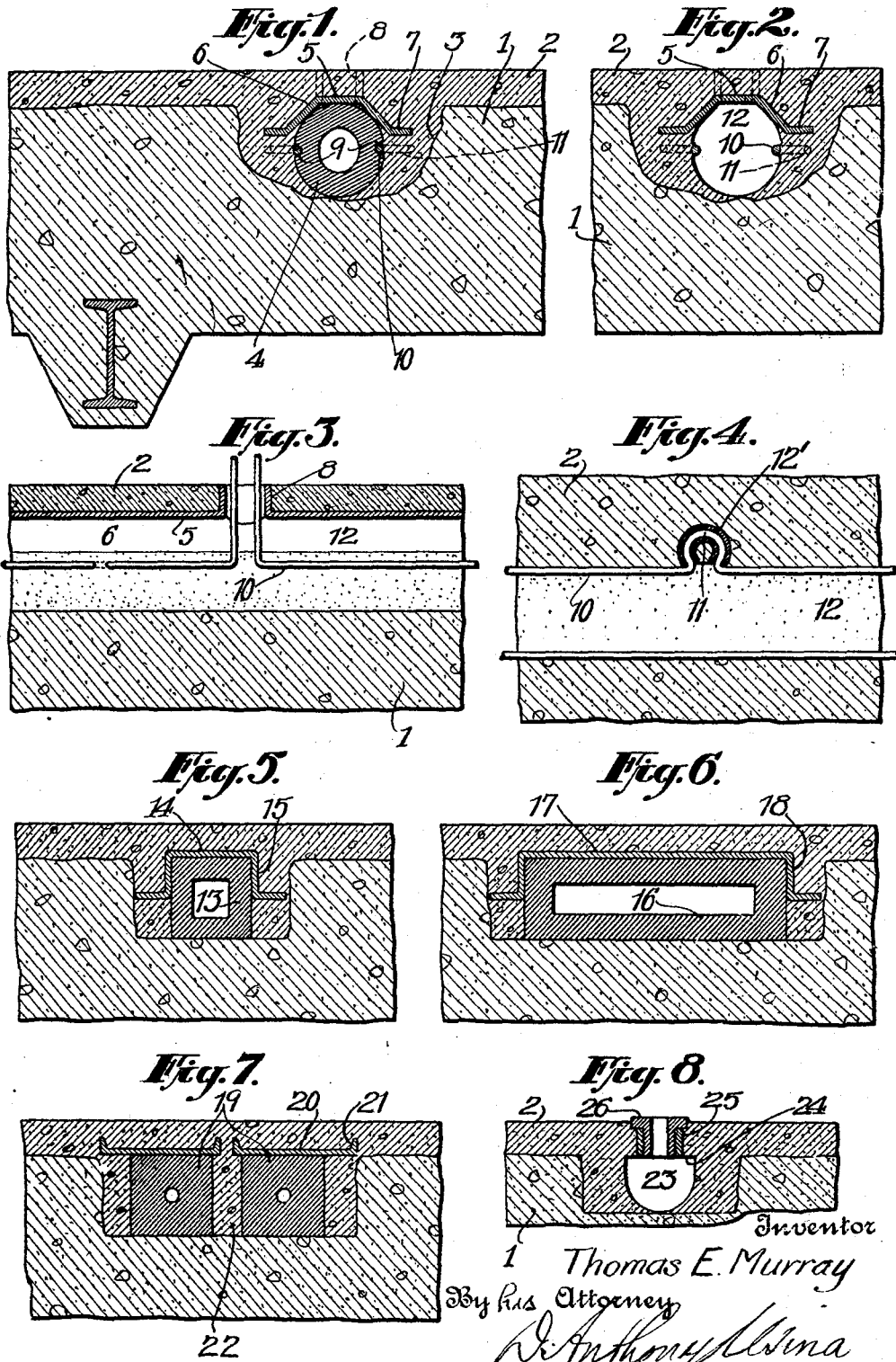
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CONDUIT AND METHOD OF PRODUCTION

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CONDUIT AND METHOD OF PRODUCTION

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My invention aims to provide improved conduits in concrete or similar material for carrying electric cables or wires or other utilities. The accompanying drawings illustrate embodiments of my invention.

Fig. 1 is a cross-section of a floor illustrating in place a core for forming the conduit therein;

Fig. 2 is a similar view with the core removed;

Figs. 3 and 4 are vertical and horizontal sections of the same respectively, in longitudinal direction;

Figs. 5, 6, 7 and 8 are cross-sections illustrating the application of the invention to other styles of conduit.

The invention is illustrated in connection with the concrete floor of a building, but it may be used in connection with various other structures; such, for example, as walls, street conduits, and so forth.

Referring to Fig. 1, a floor is shown composed of a base 1 generally of comparatively coarse concrete and a top layer 2 of comparatively fine concrete. A conduit is to be formed therein near the upper surface with outlets for taking out electric wires or other utilities. The coarse concrete is first laid with recesses 3 in the upper part and in these recesses are located removable cores 4. These cores are preferably of highly resilient rubber with a comparatively thick wall adapted to withstand the pressure involved in laying and tamping the concrete around. After the concrete has hardened the core is withdrawn by pulling it out endwise. Its composition is such that a longitudinal pull will contract it transversely sufficiently to free it from the surrounding concrete and to permit its withdrawal, and it is of such resiliency that it will automatically resume its original shape for reuse. Cores of this character are more fully described in previous pending applications of mine. On top of the core is laid a cover plate 5 of metal or other comparatively stiff material intended to remain in place. The plate has side portions 6 serving to embrace the circular core so as to hold it in a straight line against its natural tendency to bend and twist.

Where the conduit is, however, curved the plate will be correspondingly curved and will hold the core in proper line. The plate is provided also with lateral flanges 7 extending outward from the core. After the core and plate are in position the space around them is filled with the fine concrete 2, the latter being laid at the desired top level. When the concrete is hardened the rubber core is withdrawn, leaving a conduit substantially circular in cross-section with the cover plate over the top of it imbedded at its edges in the concrete and thus firmly held in place during withdrawal of the core as well as during the subsequent drawing of cables through the conduit.

The cover plate is formed at intervals with outlets 8 (Fig. 3) leading to the top of the floor through which connecting wires or pipes may be passed for utilization in apparatus above the floor. These will be at predetermined junction points and of any shape suitable to the intended purpose. Where the connections are to be taken out below the floor the conduit will generally be made in the lower portion of the concrete and with a bottom plate having similar outlets leading to the lower surface.

The plates or liners thus provided at the side of the conduit on which the outlets are to be made serve to hold the duct in shape and to prevent injury to the concrete around the outlet. And in the stretches between outlets they protect the conduit from accidental injury as by the dropping of a heavy weight on the top thereof. They may be provided throughout the length of the conduit or only adjacent to the intended outlets, as desired.

I have illustrated also in connection with Figs. 1 to 4 a method of laying conductors in the conduit during the formation of the latter; and this method may be applied also to the conduits shown in the other figures and indeed to conduits of various other styles. For this purpose the core 4 is formed with recesses 9 extending longitudinally and just large enough to accommodate the conductors 10 which are laid in the recesses before the concrete is applied. The conductors

are bent at intervals to form loops 11 projecting outward so as to be imbedded in the surrounding concrete to anchor the conductors in place. For greater security against water which may get into the concrete these loops 11 may be surrounded with a coating of plastic insulating material 12' before the concrete is laid.

When the core is withdrawn, there is left a conduit 12, Figs. 2, 3 and 4, the wall of which is formed partly by a cover plate 5 and partly by the concrete itself, finished with a very smooth surface produced by the use of a rubber core, and with conductors 10 anchored at intervals to the concrete so as to be held in place, and exposed between such anchoring points so as to permit connections at any desired one of the outlets 8 which are provided. Additional conductors may be threaded into the duct resting on the bottom and out of contact with the conductors 10. Or such additional conductors may be laid in the conduit, similarly to the conductors 10 and at other points on the periphery of the core by suitably grooving the latter.

Fig. 5 illustrates the application of the invention to the making of a square conduit. The rubber core 13 in this case is square and the cover plate 14 has its side portions 15 vertical instead of flared as in Fig. 1.

According to Fig. 6 a rectangular conduit of suitable width, so as to accommodate a greater number of conductors or other utilities, is formed with the aid of a wide rectangular core 16 and a correspondingly wide cover plate 17 with vertical side portions 18 embracing the upper part of the core.

Fig. 7 illustrates the forming of two separate parallel conduits, useful where two conductors or sets of conductors must be kept entirely separate. This figure illustrates also the use of cores 19 which are nearly solid, having only a fine central hole. This illustrates also a different style of cover plate 20. This has no side portions embracing the core and is anchored in the concrete merely by small flanges 21 on its edges. The two conduits have to be laid fairly close together with a well tamped wall 22 of concrete between them, so that it is advisable to use stiffer cores than in the other cases illustrated. Also they are so close together as to leave no room for the cover plate to have side plates and lateral flanges as in the other figures.

The flanges 21 extend upward into the thin layer of fine concrete at the top and serve to reinforce it against cracking; the flanges on the plates in the other figures serve also to reinforce the concrete around the conduit, so as to strengthen the latter against cracking.

The plates shown may be used for electrically grounding the system by connecting them to the wires. With the plate following a duct throughout its length, the plate will

act to electrically ground the entire system.

The outlets 8 will generally be arranged at predetermined points. When a connection is to be made at some other point the duct can be located by the aid of the outlet 8. That is, the duct will be located on the line between two outlets. We may then drill from the top of the floor down into the duct, tapping the metal plate on the top and screwing a fitting into it, or fastening the fitting in any other usual or suitable way.

Openings may be drilled into the duct even when the latter is formed without a top plate, and the fitting cemented or otherwise attached to the concrete. The making of the duct flat on the top facilitates the drilling operation and is particularly advantageous where there is no metal plate forming a wall on the conduit. See Fig. 8 for example. Here a conduit 23 is formed with a flat top 24. The concrete above is drilled, a sleeve 25 is cemented therein and a tubular fitting 26 is screwed into the sleeve, thus making easy the introduction and connection of the wires. This flat top can be drilled or tapped better than the round top which has been previously proposed, especially in the smaller sizes of conduit.

Though I have described with great particularity of detail certain embodiments of my invention yet it is not to be understood therefrom that the invention is restricted to the particular embodiments disclosed. Various modifications may be made by those skilled in the art without departure from the invention as defined in the following claims.

What I claim is:

1. A structure of concrete or the like having a conduit therein, the wall of which is formed partly by the surrounding concrete and partly by a separate plate having flanges imbedded in the concrete.

2. A structure of concrete or the like comprising a base portion of coarse concrete with recesses in its face and a layer of fine concrete applied on said face and having a conduit located in the fine concrete, the wall of the conduit extending below the general level of the fine concrete and into said recesses and being formed partly by the surrounding concrete and partly by a separate plate.

3. A structure of concrete or the like comprising a base portion of coarse concrete, and a surface layer of fine concrete and having a conduit located in the fine concrete, the wall of the conduit being formed partly by the surrounding concrete and partly by a separate plate having flanges imbedded in the concrete.

4. A structure of concrete or the like having a conduit therein the lower portion of which is formed by the concrete and the upper portion of which is formed by a plate having a flat center and having flanges imbedded in the concrete.

5. A structure of concrete or the like having a conduit therein the lower portion and part of the sides of which are formed by the concrete and the upper portion and remainder of the sides of which are formed by a plate.

6. A structure of concrete or the like comprising a base portion of coarse concrete with recesses in its face, and a layer of fine concrete applied on said face, and having a conduit formed and enclosed in said fine concrete, a cover plate embedded in and covered by said concrete and extending over the top surface of said conduit, the wall of the conduit extending below the general level of the fine concrete and into said recesses.

In witness whereof, I have hereunto signed my name.

THOMAS E. MURRAY.