Dec. 8, 1931. R. A. SHIPLEY 1,835,245

CONDUIT AND METHOD OF MAKING THE SAME

Filed Feb. 12, 1930 2 Sheets-Sheet 1

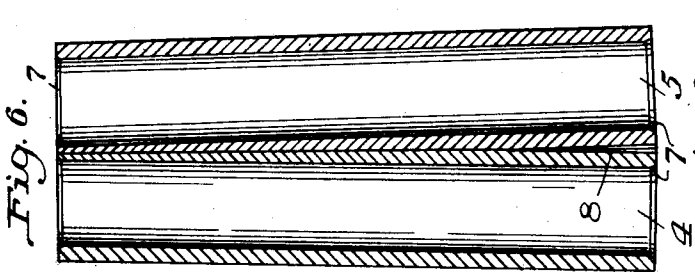


Fig. 6.

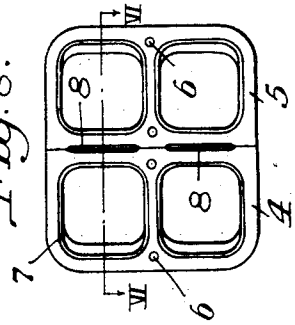


Fig. 8.

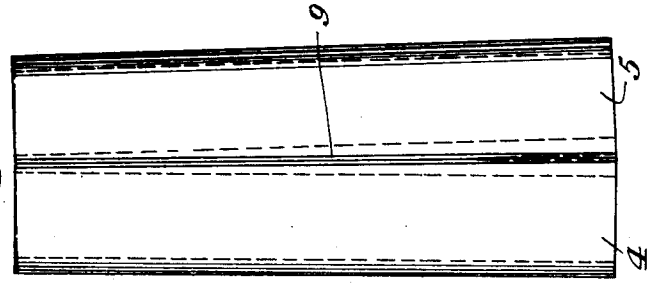


Fig. 5.

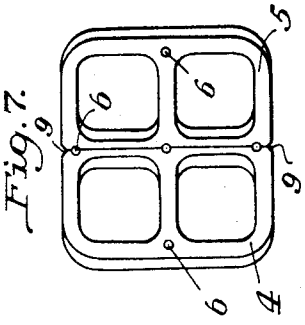


Fig. 7.

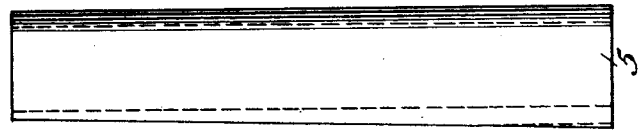


Fig. 3.

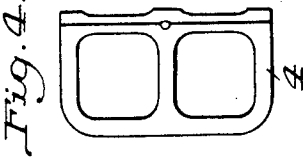
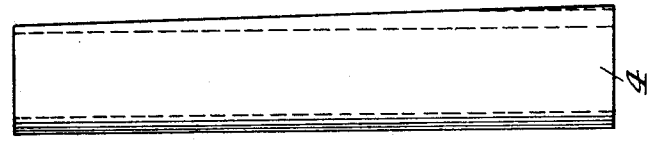


Fig. 4.



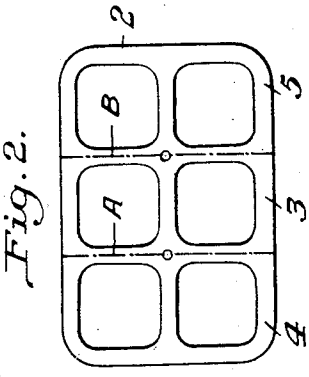


Fig. 2.

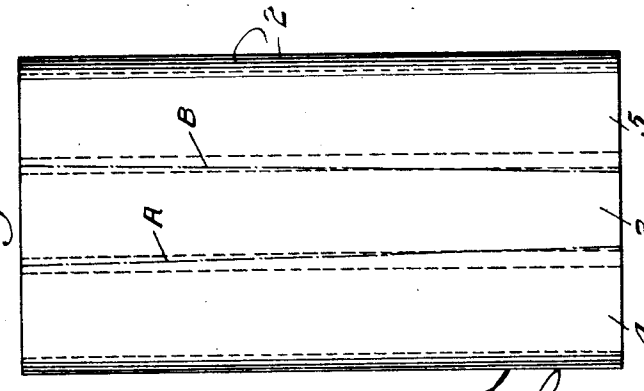


Fig. 1.

INVENTOR

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CONDUIT AND METHOD OF MAKING THE SAME

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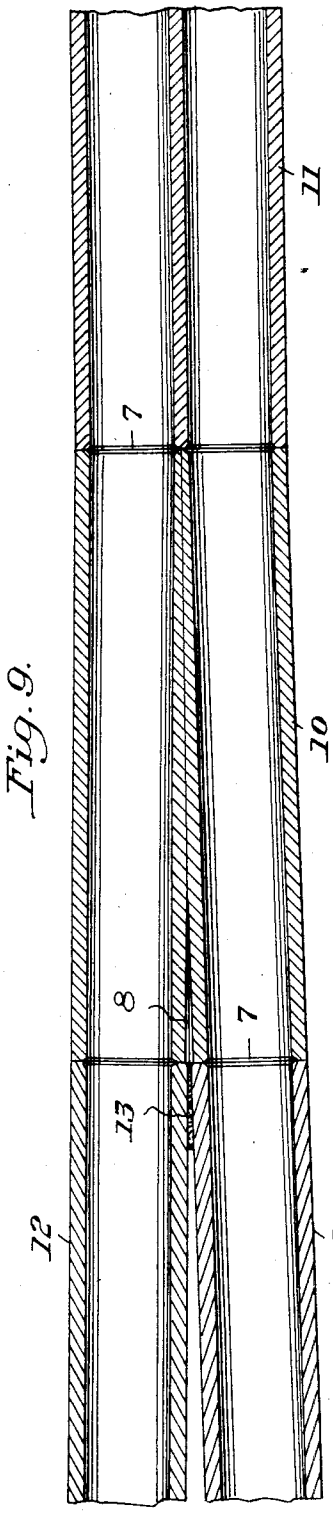


Fig. 9.

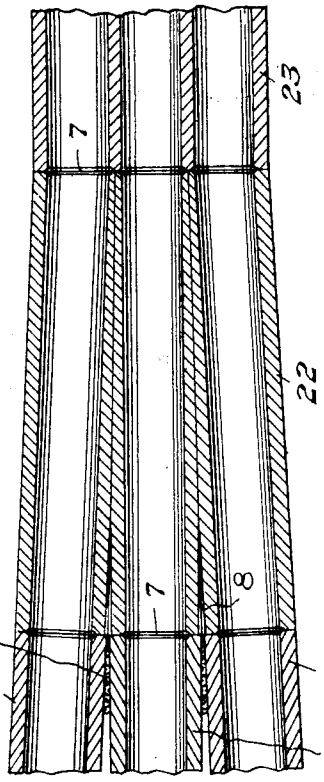


Fig. 12.

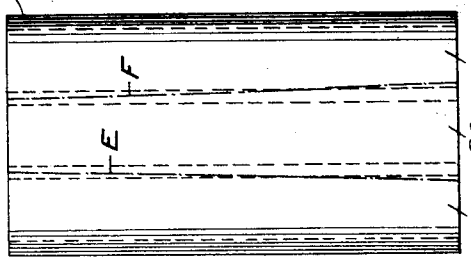


Fig. 11.

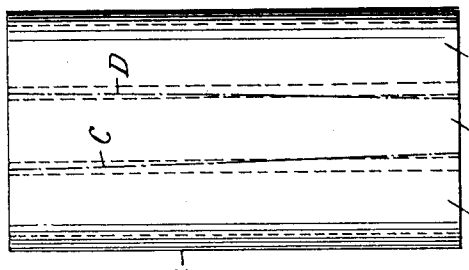


Fig 10.

INVENTOR

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Patented Dec. 8, 1931

1,835,245

UNITED STATES PATENT OFFICE

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CONDUIT AND METHOD OF MAKING THE SAME

Application filed February 12, 1930. Serial No. 427,824.

My invention relates to conduit, and particularly to a junction or connecting section adapted to connect a plural-duct conduit with two or more conduits extending therefrom.

It is often desirable to divide a multi-duct conduit into a plurality of branch conduits extending therefrom, either to avoid an obstruction or for other reasons.

The invention is designed to provide a junction conduit section which may be easily and cheaply made, is free from internal strains or defects, is easily applied, and has proven satisfactory in use. The invention also relates to an improved method of making such a junction section or sections.

In the drawings which show certain forms of my invention:

Figure 1 is a side elevation of a standard six-duct extruded conduit section of uniform cross section throughout, showing in dotted lines the cutting planes;

Figure 2 is a top plan view of the same showing the upper ends of the cutting planes;

Figure 3 is a side elevation showing the outer sections of Figure 1 after cutting;

Figure 4 is a top plan view of the left-hand section of Figure 3;

Figure 5 is a side elevation showing the sections of Figure 3 assembled and pressed together, and after grooves have been scored therein;

Figure 6 is a longitudinal section taken on the line VI—VI of Figure 8;

Figure 7 is a top plan view of the structure of Figure 5;

Figure 8 is a bottom plan view of the finished section;

Figure 9 is a cross-sectional assembly view showing the finished junction section in place;

Figures 10 and 11 are views showing the method of cutting for a case where three separate conduits lead from the junction box; and

Figure 12 is a view similar to Figure 9 showing in place a junction section joining a single multi-duct conduit and three separate conduits.

In Figure 1, 2 represents a standard six-duct conduit section formed of "green" clay or other ceramic material which has been extruded in the ordinary process. In this section, the ducts are parallel and a cross section is substantially uniform. In the "green" form, the material is more plastic and workable. Such a section is placed on a suitable base or support and cut longitudinally on the lines indicated at A and B in Figures 1 and 2, this being preferably done by a wire cutter pushed lengthwise through the material and guided in any suitable way, as by a frame, along the edge of which the wire slides. These cuts preferably start midway of the two cross webs of this six-duct conduit, and thence converge toward each other, finally passing into the middle ducts through their webs a short distance above the bottom of the section. The central portion 3 is then removed and discarded, leaving the outer sections, as shown in Figures 3 and 4. The inner longitudinal cut surfaces of the outer portions 4 and 5 are scratched or roughened and are then preferably coated with a bonding material, preferably of the same nature and plastic consistency as the section, and the two sections are then pressed together into contact along the cut and roughened surfaces. This may be carried out by hand with the sections resting on a suitable support and a skeleton box or frame is then preferably slid downwardly over the sections to press the cut and roughened surfaces of portions 4 and 5 firmly together. A mandrel is then preferably inserted in a duct and a swab pushed down through the adjacent ducts to press the webs together and insure solid webs and also to preserve the proper shape of the ducts.

The pressing box is preferably slightly shorter than the length of the section and after the pressing and swabbing, the upper end of the tile is cut off transversely and the box removed. The side seams 9 are then scored out from the exterior and the longitudinal grooves thus formed filled with soft clay and smoothed down with a knife.

Dowel pin holes 6 are then formed in the outside ends of the junction section, a guide being used if necessary to insure proper positioning. The ends of the respective ducts

are then reamed or chamfered, as shown at 7, slots 8 are preferably left or provided in the lower portion of the junction section between the webs to permit air to enter and assist in drying, and the ends are preferably scratched or roughened. The section is then burned in the usual way to form the completed article.

Figure 9 shows a junction section 10 in place in a conduit and joining a single multi-duct section 11 with a pair of sections 12. The thickness of the central web at one end of the junction section is substantially equal to the thickness of the central web of the standard multi-duct section 11, and the thickness of the central web of the junction section 10 at the opposite end is somewhat greater than twice the thickness of a standard outside wall.

A standard outside wall is of greater thickness than a standard inside web. Hence the section 2 is cut as shown in Figures 1 and 3 so that the inside web of the junction section will be somewhat thicker at the lower end than twice the thickness of a standard outside wall. This relation is clearly shown in Figure 9. The outside edges of the standard sections 12 are shown slightly spaced from each other at the junction with the section 10. This slight additional space permits of the insertion of mortar 13 between the sections 12 adjacent the junction section to positively connect together and properly space the sections 12 and to allow for imperfections in construction. It is important that the inner duct walls match up as closely as possible at the joint, the matching of the outer walls being of less importance.

Figures 10 and 11 illustrate the making of a junction section in which a three-duct section is connected to three one-duct sections. In this case, it is necessary to use two pieces of standard three-ways to make the junction conduit, as one cut is taken from the center of a tile and the other two pieces taken from the outside of another section.

In making a section for connecting together a three-duct section and three one-duct sections, two standard three-duct sections 14 (Figure 10) and 15 (Figure 11) are used. The section 14 is cut longitudinally on the lines indicated at C and D in Figure 10, and the section 15 is cut longitudinally on the lines indicated at E and F in Figure 11. The cuts C and D preferably start midway of the two cross webs of the section 14, and thence converge toward each other, finally passing into the middle duct through its webs a short distance above the bottom of the section. The cutting of the section 14 is exactly analogous to the cutting of the section 2 of Figure 1.

The cuts E and F of the section 15 of Figure 11 preferably start midway of the two cross webs and thence diverge toward the bottom of the section, passing into the outer ducts through their webs a short distance above the bottom. After the sections 14 and 15 have been cut as described, the portions 17 19 and 21 are discarded and the portions 16 and 18 are assembled on opposite sides of the portion 20 to produce a junction section substantially as shown in cross section at 22 in Figure 12. Except for the cutting and assembling of the section, the formation of the junction section 22 is accomplished in substantially the same manner as the formation of the section 10 of Figure 9.

In Figure 12 the junction section 22 is shown in place in a conduit between a standard three-duct section 23 and three standard single-duct sections 24, 25 and 26. The connections between the junction section and the standard sections are made similarly to the connections shown in Figure 9.

The junction section shown in the drawings has its lower extremity (Figures 5 and 6) somewhat pointed, which causes a slight divergence of the sections connected therewith such as the divergence of the sections 12 in Figure 9. Theoretically the junction section as completed is in substantial accordance with Figures 6 and 9, but on account of the fact that the green clay while being formed into the junction section is resting on the lower end, as shown in Figures 5 and 6, there is a tendency for the lower surface of the junction section to flatten out and become generally parallel to the cut-off upper surface. Probably in most cases the actual result will be somewhat between the theoretical showing of Figure 9 and a junction section having parallel end faces. The actual form which the junction section takes upon completion is not of great importance because the divergence of the standard sections immediately adjacent the junction section is not necessary. In most cases the actual divergence desired is obtained by slant sections of well known standard construction, and separation of the standard sections immediately adjacent the junction section is not relied on. However, as shown in Figures 9 and 12, it is possible to obtain such a divergence if desired.

It will be observed that my improved junction conduit is made of two or more separately formed and separate pieces or sections which are united and burned together. Also that the ducts are substantially straight from end to end and without internal strains; also that the internal web at one end is of normal thickness and at the other end is at least twice normal web thickness and preferably slightly more than this, to allow for imperfections, easy joining and any slight separating material at this point where the separate conduits branch off. The axes of the conduits are preferably straight, but diverge from one end toward the other, and at one end the section fits the normal multi-duct section,

while at the other end it provides for the proper web thickness for joining the two or more branching sections.

As shown, a four-duct junction box is made out of a six-duct standard extruded section, but it will be understood that connecting or junction sections of various sizes may be cut from standard sections of various sizes and shapes. For example, the four-duct connecting section shown may obviously be made out of two four-duct standard sections. As shown in the later figures, two standard sections may be cut up to provide a three-1—1—1 connection. Standard single-duct sections may be used for making a junction section for connecting standard single-duct sections with a standard multi-duct section or for making other types of junction sections.

It is preferred to utilize only standard extruded sections in the making of the junction sections. This greatly reduces the cost of the junction sections, as it obviates the necessity of providing special extrusion dies. However, if desired, special sections may be extruded for making the junction sections, such sections being cut and joined as herein disclosed.

It will be noted that in the final junction section, the dividing web or wall between each pair of ducts is of gradually increasing thickness, and is formed of portions of the webs of two independently formed sections which are fastened together by burning or otherwise.

Many variations may be made in the method of making the junction or connecting section and in the article itself, which may be made from two, three or more separately formed duct pieces.

I claim:

1. A junction section for multi-duct conduits consisting of a plurality of separately formed duct sections burned together.

2. A junction section for multi-duct conduits consisting of a plurality of separately formed duct sections burned together, the sections having a web between them of increasing thickness.

3. A junction section for multi-duct conduits consisting of a plurality of separately formed duct sections burned together, the sections having a two-layer separating wall of normal web thickness at one end and increasing in thickness toward the other end.

4. A junction section for multi-duct conduits consisting of a plurality of separately formed duct sections burned together, the sections having a separating web wall thinner at one end than the other.

5. A junction or multi-duct conduit section consisting of a plurality of separately formed sections burned together, at least one section having a wall thinner at one end than at the other.

6. A junction section for multi-duct conduits having an increasing cross section from one end to the other, the separating web being thinned down at one end.

7. A junction or connecting section for multi-duct conduits consisting of a plurality of separately formed sections burned together, at least one of said sections having a connecting web portion with a thinned down portion.

8. A junction or connecting section for multi-duct conduits consisting of a plurality of separately formed sections burned together, at least one of said sections having a connecting web portion with a thinned down portion, the total connecting web being of normal thickness at one end and of abnormal thickness at the other.

9. As an article of manufacture, a unitary junction section for multi-duct conduits comprised of a plurality of separately formed duct sections.

10. As an article of manufacture, a unitary junction section for multi-duct conduits comprised of a plurality of separately formed duct sections at least one of which has a web of uneven thickness.

11. As a manufacture, means for connecting a conduit with a plurality of conduits extending therefrom comprising a member having ducts whose axes are substantially straight from end to end and non-parallel, the distance between adjacent walls of such ducts being at least substantially twice as great at one end of the member as at the other end.

12. As a manufacture, means for connecting a conduit with a plurality of conduits extending therefrom comprising a ceramic member having ducts whose axes are substantially straight from end to end and non-parallel.

13. As a manufacture, means for connecting a conduit with a plurality of conduits extending therefrom comprising a unitarily burned ceramic member having ducts whose axes are substantially straight from end to end and non-parallel.

14. As a manufacture, means for connecting a conduit with a plurality of conduits extending therefrom comprising a ceramic member comprising a plurality of longitudinally extending sections joined together while green, such member having a plurality of longitudinally extending non-parallel ducts.

15. As a manufacture, means for connecting a conduit with a plurality of conduits extending therefrom comprising a ceramic member comprising a plurality of separate longitudinally extending sections integrally joined, said member having longitudinally extending non-parallel ducts.

16. A method of making a conduit section, comprising providing a standard conduit section of generally constant cross section,

removing from such standard conduit section a longitudinally extending portion so as to leave a plurality of portions, and connecting together the remaining portions.

17. A method of making a conduit section, comprising providing a standard conduit section, removing therefrom an interior layer, and connecting together the remaining layers to form a conduit section.

18. A method of making a ceramic conduit section, comprising providing a green standard conduit section, cutting out a portion thereof so as to leave a plurality of portions, connecting together the remaining portions, and burning such connected portions to form a ceramic conduit section.

19. A method of making a conduit section, comprising cutting angularly through at least one web of at least one standard conduit section to produce at least two partial sections having tapered webs, and joining together such partial sections in such manner as to produce a conduit section of non-uniform cross-section.

20. A method of making a conduit section, comprising providing at least two longitudinally extending portions at least one of which has a tapered wall, and connecting together such portions at such tapered wall to form a conduit section of non-uniform cross-section.

In testimony whereof I have hereunto set my hand.

ROY A. SHIPLEY.