May 19, 1936. A. C. SCHROEDER, JR 2,041,267

KNOCK-DOWN CULVERT

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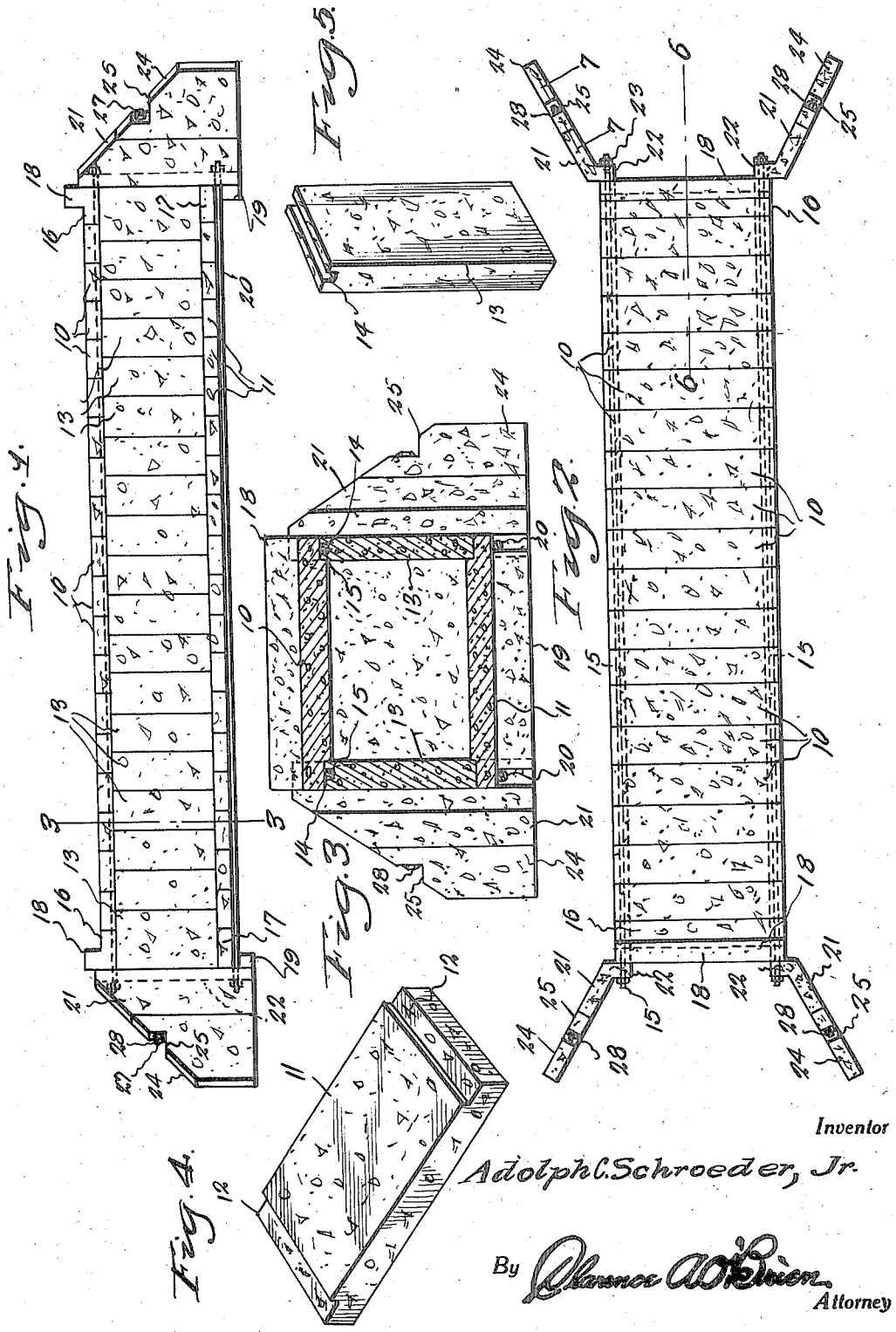


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

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Fig. 7.

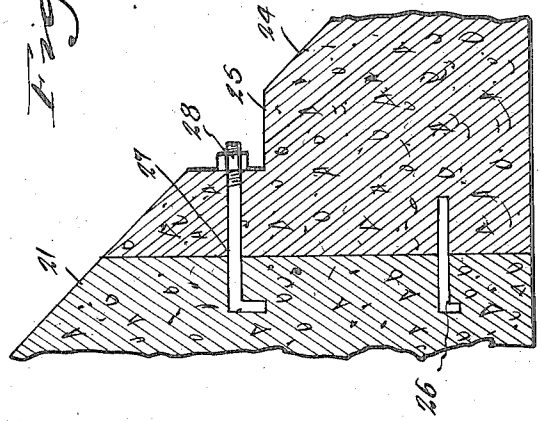


Fig. 9.

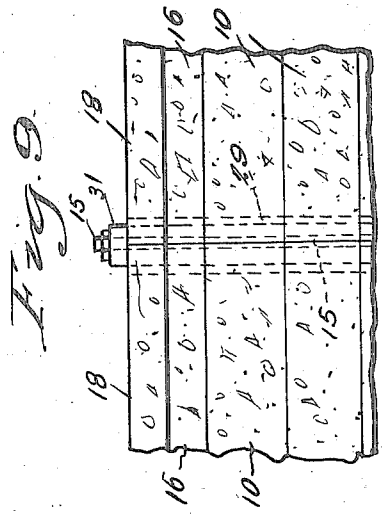


Fig. 6.

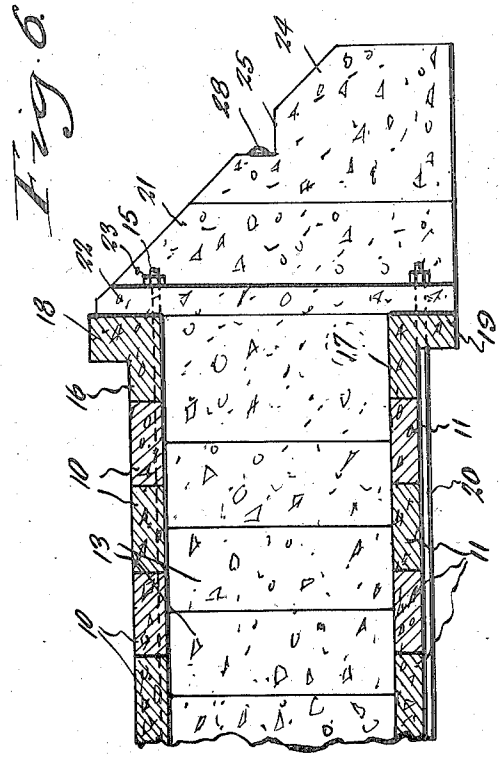
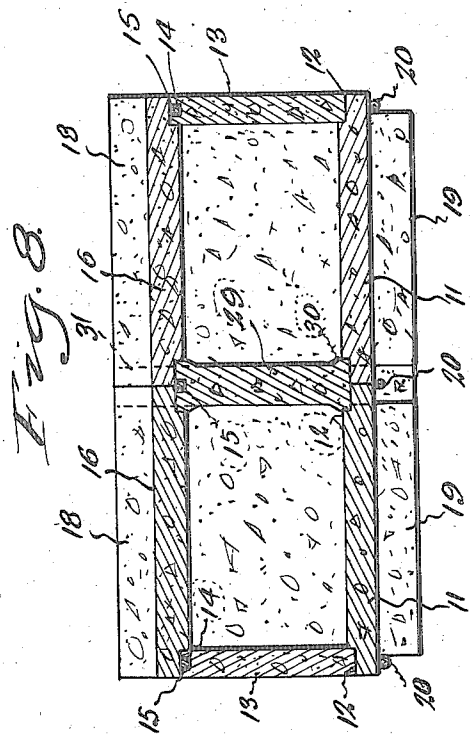


Fig. 8.



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KNOCK-DOWN CULVERT

Adolph Carl Schroeder, Jr., Yorktown, Tex.

Application September 3, 1935, Serial No. 39,054

3 Claims. (Cl. 61—16)

This invention relates to that assemblage or classification of structures referred to in the prior art and trade as culverts, and has more specific reference to a sectional or made up culvert construction formed from a plurality of complemental pre-cast members.

The field of invention to which the present improvement relates may be more specifically classified by making brief reference to a similar culvert construction disclosed and claimed in a patent granted to me under date of April 9, 1935 and identified as 1,997,236. Giving a synopsis of the prior development I deem it sufficient to say that it had to do with a culvert comprising a multiplicity of base forming elements referred to as footings, side slabs connected with and rising from the footings, top slabs mounted on the upper portions of the side slabs, and common means for clamping these parts together into an appropriately assembled culvert construction.

In the prior patented arrangement the culvert is bottomless. I have found that this type of a culvert is not practicable in certain kinds of soils, for it lacks the proper foundation and anchorage facilities. Moreover there are instances wherein the ground does not form a good runway for the water. Under the circumstances I have improved upon my prior patent, and so far as I know upon similar prior art devices, by incorporating in the culvert an auxiliary bottom, and other companion features calculated to more aptly fulfill the requirements of an invention of this class.

Manifestly, my primary aim is to generally improve upon known types of culverts by perfecting one which is constructed from easily transportable preformed parts, the parts being interchangeable and of such design and adaptation as to permit them to be assembled to form either single or multiple duct culverts.

Other explicit features will become more readily apparent from the following description and drawings.

In the drawings:

Figure 1 is a side elevational view of the complete culvert as constructed in accordance with my present ideas.

Figure 2 is a top plan view of the arrangement shown in Figure 1.

Figure 3 is a cross section, on an enlarged scale, taken approximately on the plane of the line 3—3 of Figure 1.

Figures 4 and 5 are perspective showings of certain of the complemental concrete pre-cast slabs.

Figures 6 and 7 are sections taken on the planes of the lines 6—6 and 7—7 respectively of Figure 2.

Figure 8 is a view like Figure 3 showing the manner in which the parts may be assembled for forming a duplex or dual type culvert.

Figure 9 is a top plan view of a fragmentary type of one end portion of the assemblage shown in Figure 8.

As a matter of convenience I will describe first the single conduit type culvert and in accomplishing this I call attention conveniently to the assemblage depicted in Figure 3. Here it will be observed that the upper and lower or top and bottom concrete slabs are denoted by the numerals 10 and 11 respectively. Each slab is substantially rectangular in form as shown in Figure 4 and the end portions are notched as indicated at 12 to provide keeper seats for the upper and lower ends of the vertical or side wall slabs 13. The slabs 13 are of the type shown in Figure 5. Each one is rectangular and formed at its top with a channel or groove 14 to accommodate the tie rod or wire 15. The slabs 10, 11 and 13 are assembled as here shown so that the ends of the side slabs 13 fit into the seats 12 to provide the desired interlocking joints. This maintains the parts in rigid assembly and avoids collapsing. This is a feature of rigidity considered to be an improvement over my prior patent.

In connection with the horizontal slabs 10 and 11 I call attention to the endmost adapter slabs which are differentiated by the numerals 16 and 17 respectively. These are provided with lateral extensions 18 and 19 which are in effect anchoring and stabilizing curbs. These are disposed at the extreme ends of the conduit or culvert. Incidentally it is observed that a culvert of this type is to be embedded in the earth or soil and by having the curbs 18 and 19 thus embedded they avoid endwise slippage of the device as a unit. I want to call attention to the depending curbs 19 in Figure 3. These curbs are of a predetermined length and of a length less than the slabs 11. This permits them to be disposed between spaced parallel tie rods 20 located at the bottom of the structure. This is a feature of stability and strength playing an important role in the complete assemblage.

I next call attention to the deflector wings at the opposite ends of the structure. These are arranged in outwardly diverging pairs and are denoted by the numerals 21. Each one is the same in construction and has at its inner end an obtuse angular attaching and retention flange 22. The flanges are apertured so as to permit passage

of the threaded ends of the tie rod therethrough and to render the clamping nut **23** easily accessible. Thus it will be seen that the tie rods connect the two end wing structures together and that the remainder of the slabs are located therebetween. This is believed to be an unique method of assembling the various parts into culvert forming relationship. Or stated otherwise by arranging the tie rods **15** in the channel formed by the groove in the parts **13** and by arranging the rods **20** so as to underlie the lower horizontal bottom slabs **11**, this constitutes a unique and dependable set-up.

It is to be noted that the wings **21** carry extensions **24**. As shown in Figure 7 these extensions have an accommodation notch **25**. Moreover the extensions are assembled and held in place by substantially L-shaped studs or pins **26** and **27**. The lower stud **26** fits into a socket in the extension **24** and the upper stud passes through a bore in the adjacent portion of the extension where the threaded end is exposed to accommodate a clamping nut **28** located in the notch **25**. This constitutes an expeditious and dependable means for maintaining the extensions **24** in place.

Giving analytical consideration to the structure in whole and in part these distinguishable structural factors will be observed. The body portion of the culvert is made up of upper and lower slabs **10** and **11** having their ends notched for interfitting connection with the side wall slabs **13**. This provides interchangeability of parts **10** and **11** and also provides proper assembling and keeper means for the side slabs **13**. Together this series of slabs form the main tubular body. This tubular body as a unit is bolted, so to speak, to the end wings, the wings extending below the bottom of the culvert so as to raise it out of the ground. This permits the dirt to get around all sides and beneath the structure for secure maintenance and anchorage and insures a firm foundation. Novelty is also predicated upon the idea of this multiple series of tube forming slabs wherein the bottom forming slabs **11** rest on spaced parallel rods or tie wires **20** which constitute common connecting means for assembling the parts as illustrated in Figure 3. Additional novelty has to do with the end wing construction providing proper means for connecting the wings in place as well as utilizing the wings as supports for the tubular body located therebetween. Then too the special adapter slabs **16** and **17** at the ends with their flanges **18** and **19** provide appropriate curb means for secure anchorage and promotes greater rigidity.

Directing attention to Figures 8 and 9 showing the double or duplex conduit arrangement it will be observed that the same parts already described are employed. In other words all that is necessary here is to use a central partitioning element **29** which may be sectional, if desired. This has its upper and lower end widened as indicated at **30** and its upper end properly grooved to accommodate the adjacent tie wire **15**. The headed ends **30** are sufficiently wide to fit into the combined keeper notches on the respective top and bottom slabs. Otherwise and with the exception of the clamping bar **31** at the end as shown in Figure 9 the arrangement of parts is the same as already described. These figures are utilized to illustrate the special adaptability of the invention and its convertible phase.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in shape, size, and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

What I claim as new is:

1. A culvert construction of the class described comprising end supports, a pair of spaced parallel supporting and connecting rods fastened to said end supports, a sectional culvert bottom made up of a plurality of abutting horizontally disposed slabs, said slabs being seated transversely on said rods, the opposite ends of the upper sides of said bottom slabs being notched, spaced parallel side walls having their lower end portions fitted into said notches, the upper ends of said side walls being formed with grooves defining channels, a top wall comprising a plurality of abutting horizontally disposed slabs, the opposite ends of the undersides of said top slabs being notched to receive the grooved upper ends of said side walls, and tie rods located in said channels and connected to said end supports.

2. A culvert construction of the class described comprising a pair of duplicate longitudinally spaced end units, each unit embodying a pair of opposed outwardly diverging wing-like members, said wing-like members being formed at their inner ends with laterally directed vertical supporting flanges, a pair of spaced parallel horizontally disposed supporting and connecting rods fastened at their opposite ends to the flanges of the respective wing-like members, a pair of duplicate adapter slabs supported on the end portions of said connecting rods and abutting said flanges, said adapter slabs including depending right angularly disposed anchoring curbs, a plurality of complemental slabs resting in abutting edge to edge relation on said connecting rods and located between the adapter slabs and cooperating therewith in forming the bottom of the culvert, a pair of complemental side walls supported vertically in operative relation on said bottom slabs, a top supported on the upper portions of said side walls, said top including special end adapter members having upstanding flanges abutting the flanges on said wing-like members.

3. A culvert construction of the class described comprising end supports, a series of three spaced parallel horizontally disposed supporting and connecting rods secured at their opposite ends to said end supports, a sectional culvert bottom made up of a plurality of abutting horizontally disposed slabs, said slabs resting on said connecting rods and being formed at opposite ends with notches, a pair of spaced parallel side walls vertically disposed and having their lower portions fitted in the outermost notches of said bottom slabs, a central divider partition arranged between and in spaced parallelism with said side walls and having its lower edge portion resting in the complemental notches on the inner ends of said bottom slabs, said side walls and divider partition having grooves in their upper portions defining channels, a series of tie rods located in said channels and connected at their opposite ends to said end supports, and a sectional top cooperable with the side walls and partitioning wall.

ADOLPH CARL SCHROEDER, JR.