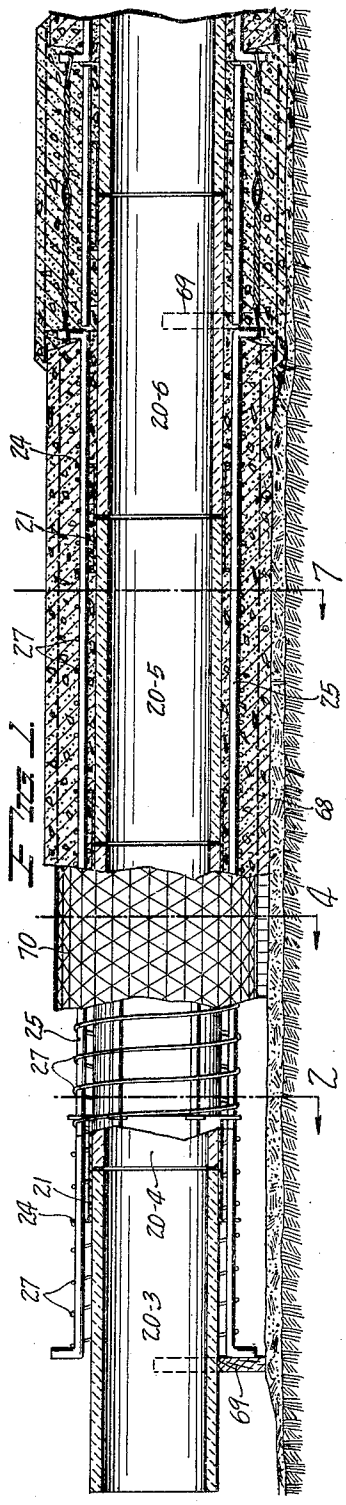
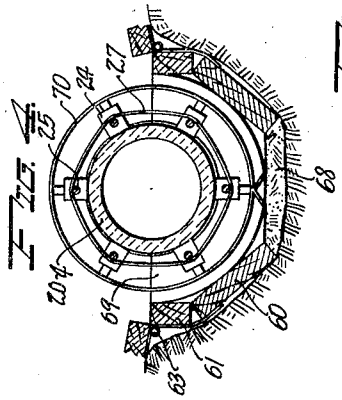
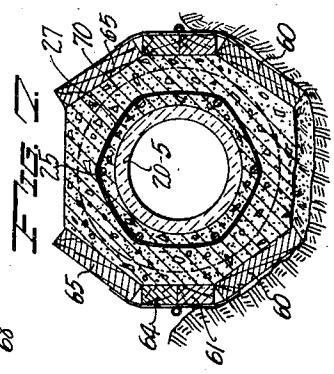
May 23, 1933. T. DE LA MARE 1,910,594

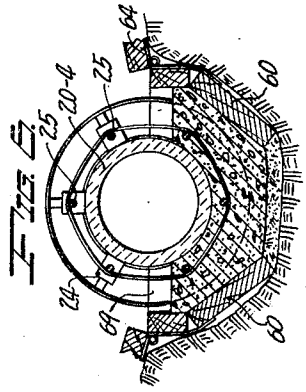
SYSTEM FOR CONSTRUCTING PIPE

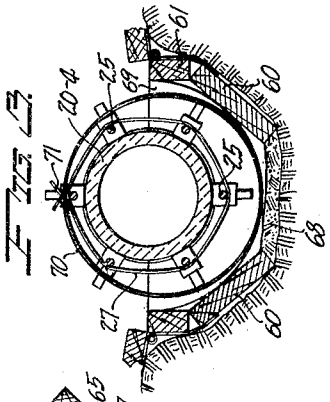
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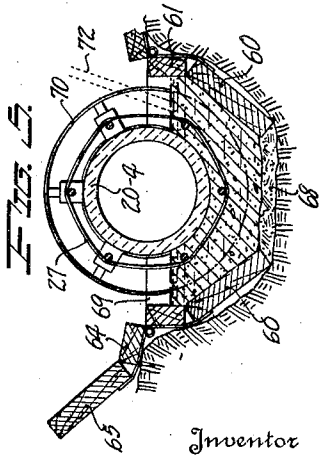


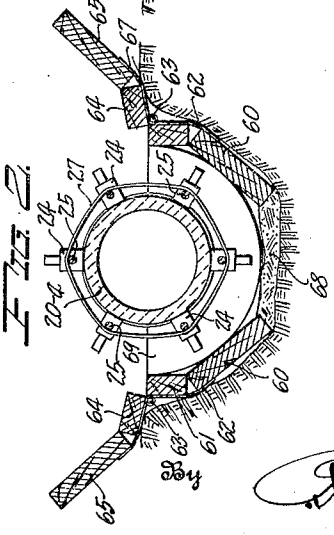












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Patented May 23, 1933 1,910,594

UNITED STATES PATENT OFFICE

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SYSTEM FOR CONSTRUCTING PIPE

Application filed May 13, 1929. Serial No. 362,607.

This invention relates to a system for constructing pipe of concrete or other plastic material, and more especially the non-corrodible composite pipe described in my pending application for U. S. patent, Serial No. 255,676, though it is not necessarily limited thereto. The principal objects of the invention are:

First.—To produce a pipe of high quality for conducting liquids or gases.

Second.—A pipe which shall be strong and durable.

Third.—One that can be produced at a comparatively low cost.

Fourth.—A system by the use of which the pipe may be expeditiously produced in the field.

Heretofore it has not been possible to construct a reinforced concrete pipe of good quality in the field. As a consequence, all high grade reinforced concrete pipe has been manufactured at some definite factory point, and shipped to the job in sections of convenient length.

Concrete pipe is naturally of considerable weight, so transportation charges from the factory to the job are necessarily high.

A pipe line built of pre-formed sections must necessarily have these sections joined to one another in the field long after the sections themselves have been manufactured, which results in less perfect joints than where both sections and joints are built at practically the same time.

The transportation rate on the raw material for forming the pipe in the field is considerably less than the rate on the finished pipe, and moreover, the actual cost of transportation of the raw material to the field site is often no greater than to ship the same raw material to the factory. This results in a clear saving of transportation charges on the finished product.

The present invention has to do particularly with the construction of the composite pipe for which I have made application for U. S. patent filed Feb. 20, 1928, Serial No. 255,676, although not restricted thereto.

The composite pipe described in said application for patent consists of a lining of non-corrodible material such as vitrified sewer pipe or glass, around which is built a reinforced shell or jacket of concrete or like material, applied in a plastic state to the outside of the lining.

Heretofore it has been impossible to successfully surround the lining with a jacket of plastic concrete in the trench, owing to the difficulty of placing the concrete in the tunnel under the lining. The stiffness of a proper mix of the plastic concrete prevents the concrete from completely filling the space under the lining. Especially is this the case when steel reinforcing in the form of rods and netting around the lining, is used.

In my improved system, after the lining is properly placed in the trench and surrounded by the steel reinforcing, plastic concrete in the form of what is termed as a sloppy mix, that is to say, a mixture containing an excess of water, is poured into the trench and is readily made to fill the space in the trench below the lining. This complete filling is accomplished in the final degree by poking with light rods through the interstices of the reinforcing, and at the same time adding sufficient cement to the previously poured sloppy mix, so as to bring the proportion of cement up to the standard mixture required.

Contrary to usually accepted notions of many engineers, I have found that pouring a sloppy mix, and immediately adding cement in sufficient quantities to bring the mix up to standard proportions, does not in any way impair the quality or strength of the resulting finished product.

The features of this invention, for which the protection of Letters Patent of the United States is desired, are collectively grouped in the claims concluding this specification.

In the drawing, which illustrates one type of apparatus used in the practice of my improved system.

Fig. 1 represents a longitudinal vertical center section showing the pipe in various stages of construction;

Fig. 2, a cross-section on line 2, Fig. 1, showing what may be called the skeleton;

Fig. 3, the same as Fig. 2, with the exception that a cylinder of wire mesh reinforc-

ing has been added and placed in a preliminary position;

Fig. 4, a cross-section on line 4, Fig. 1, showing the wire mesh cylinder in its proper position;

Fig. 5, the same as Fig. 4, with the exception that plastic concrete in the nature of a sloppy mix is represented as having been poured;

Fig. 6, the same after having added cement in the required proportions to the sloppy mix; and

Fig. 7, a section showing the finished pipe before removal of the forms, the section being taken on line 7, Fig. 1.

Referring to the drawing, the first step in the construction of the pipe, is to assemble a skeleton length. Such a skeleton length may consist of a plurality of pieces of vitrified clay or glass pipe, designated by numerals 20—3, 20—4, 20—5 and 20—6 in Fig. 1, these lengths being coupled to one another by means of the metallic sleeves 21. The sleeves 21 have the lugs 24, which carry the longitudinal reinforcing rods 25. Around the rods 25 may be wrapped transverse reinforcing 27, consisting of heavy wire or light rods, as fully shown and explained in previously mentioned application for U. S. patent, Serial No. 255,676. Skeleton lengths of pipe thus constituted, may be assembled and distributed along the trench in which the finished pipe is to rest.

After the trench is dug, forms are provided consisting preferably of longitudinal boards 60 and 61, held angularly together by straps 62 of hinges 63, the hinges being spaced apart longitudinally. Other boards 64 and 65 may be similarly held by the other angular straps 67 of the hinges. The forms, including two such groups of boards, are placed in the trench as shown in Fig. 2, and if the soil in which the trench is dug, has not naturally a sand or gravel bottom, then a layer 68 of sand or gravel may be spread in the bottom of the trench to the depth of, say, about two inches.

Half annular collar boards 69 support both ends of the skeleton length of the form boards, the collars being placed between the two groups of longitudinal boards, as indicated in Fig. 2, and the skeleton pipe laid in the collars.

The metal netting reinforcing 70 is now placed around the pipe skeleton in the manner about to be explained. The netting comes in rolls and therefore is curved so that pieces cut from the roll naturally form cylinders. Each piece of netting is brought around the skeleton, and its cut ends, forming fingers, are brought together so as to interlock, as indicated at 71, Fig. 3. It is convenient to interlock and tie the netting in approximately the position shown in Fig. 3. After interlocking and fastening the netting in the form of a cylinder, it is rotated through approximately a half turn, until the interlocked ends rest on the bottom of the trench. The projecting fingers of the netting are of such dimensions as to support the netting cylinders in a properly spaced annular position with reference to the skeleton. Everything is now ready for pouring the concrete.

The pouring is done by making a sloppy mix and pouring it to approximately the depth indicated in Fig. 5. Immediately after the sloppy mix is poured, ramming rods may be introduced through the interstices of the wire netting 70, as indicated by the dotted lines 72, the rods being poked down into the sloppy mix so as to force the latter well under and around the lining, to thoroughly fill all voids. At the same time, a mixture of cement and preferably sharp plastering sand in the proportion of about one part cement to one and one-half parts sand, is added to the sloppy mix, and the poking continued until finally a well balanced concrete of the desired consistency is reached. The upper parts of the molds are then swung into place and concrete of the usual standard mix is poured, resulting in the finished pipe, as indicated in Fig. 7.

By the term sloppy mix I means a mixture of plastic concrete having an excessive water-ratio. The excessive water-ratio is reduced after pouring the excessive water-ratio mixture, by bringing the water-ratio down to substantially a predetermined normal figure.

While I have shown and described a specific instance of the practical use of this invention, it is to be understood that various modifications could be made in the system apparatus without departing from the spirit of the invention as defined in the claims.

Having fully described my invention, what I claim is:

1. In a system for constructing pipe, consisting in placing a core, pouring sloppy concrete under said core and part way up the sides thereof, adding cement and sand to said sloppy mix until the consistency thereof is brought substantially to a predetermined standard mix, and pouring concrete of a predetermined standard mix around the main portion of said core.

2. The method of constructing pipe, consisting in building a skeleton having a glass or vitrified pipe lining, placing metal reinforcing around said skeleton, pouring a sloppy plastic mix under and partly around said reinforcing and said skeleton, adding cement and sand to said sloppy plastic mix until said mix is brought up substantially to a standard mix, and encasing remaining portions of said reinforcing and skeleton with concrete of substantially the standard mix.

3. A method of constructing pipe, consisting in building a skeleton length, placing

said skeleton length in a trench and spaced apart from the bottom thereof, pouring a sloppy plastic mix into said trench and under said skeleton length, bringing said plastic mix up to predetermined standard consistency by adding comparatively dry concrete ingredients to said plastic mix after it is so poured, and completing said pipe by pouring a plastic mix of substantially standard proportions of ingredients around the remaining portion of the skeleton.

4. A method of constructing pipe, consisting in placing a skeleton, placing a wire mesh reinforcing around said skeleton, forming a longitudinal joint in said wire mesh reinforcing by bringing two ends thereof together in a position above said skeleton, turning the wire mesh reinforcing around the skeleton until said joint comes to the bottom, pouring a sloppy mix of concrete under said skeleton, poking said sloppy mix of concrete into the interstices of said wire mesh reinforcing and said skeleton, changing the composition of said sloppy mix of concrete to substantially a predetermined standard composition by adding comparatively dry concrete ingredients to said plastic mix of concrete after the latter is so poured, and completing the pipe by pouring plastic concrete of substantially predetermined standard composition around the remaining portions of said skeleton and said wire mesh reinforcing.

5. A system for constructing pipe, consisting in placing a vitrified clay or glass lining in a desired position, pouring plastic concrete having a high water-ratio partially around said lining, changing the composition of said plastic concrete by adding comparatively dry concrete ingredients thereto, thus reducing the water-ratio to substantially a predetermined amount, and completing the pipe by pouring plastic concrete of substantially standard composition around remaining portions of said lining.

In testimony whereof, I sign my name hereto.

THOMAS DE LA MARE.