

Dec. 1, 1931.

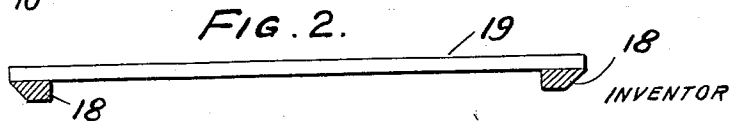
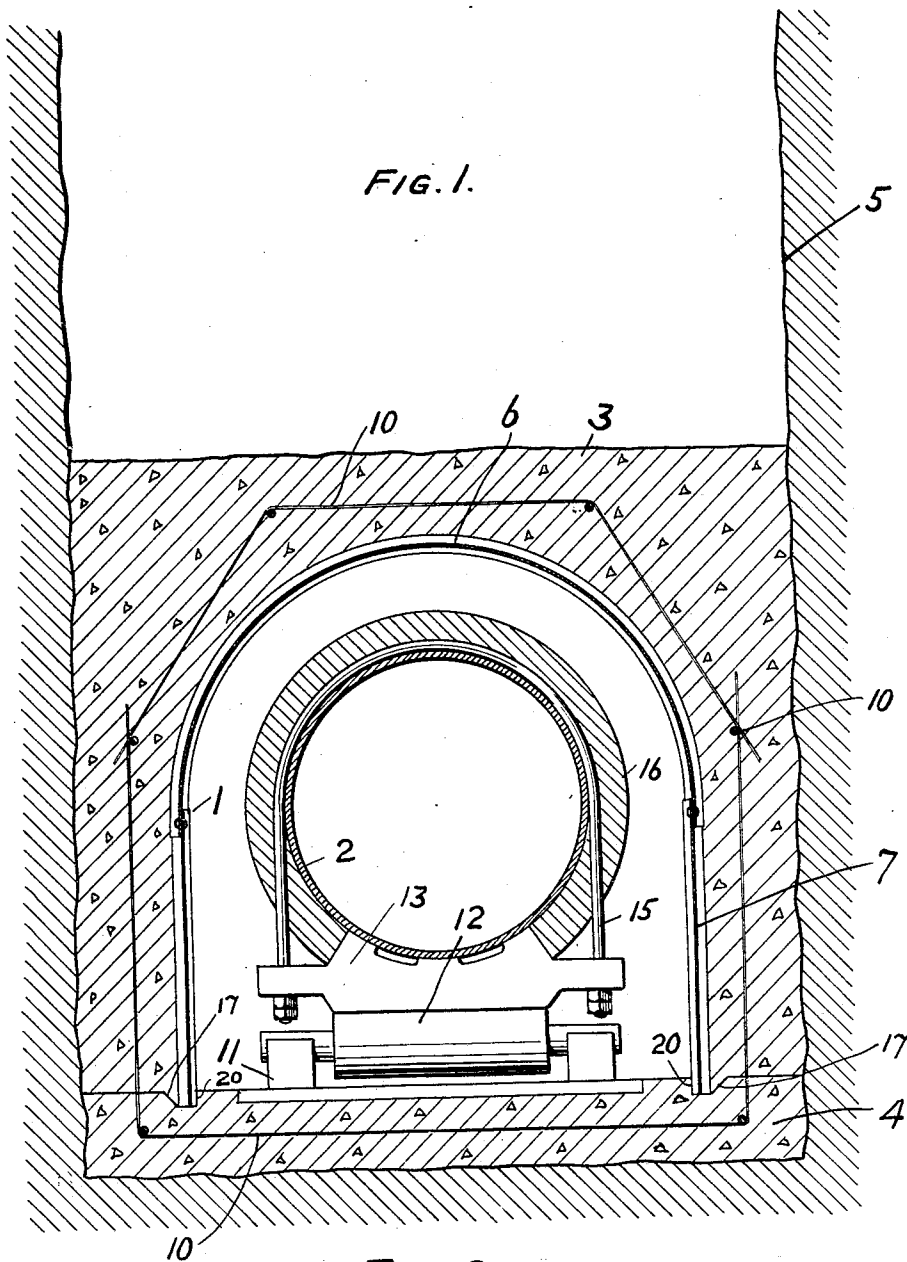
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1,834,549

UNDERGROUND CONDUIT FOR STEAM MAINS

Filed June 13, 1928

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

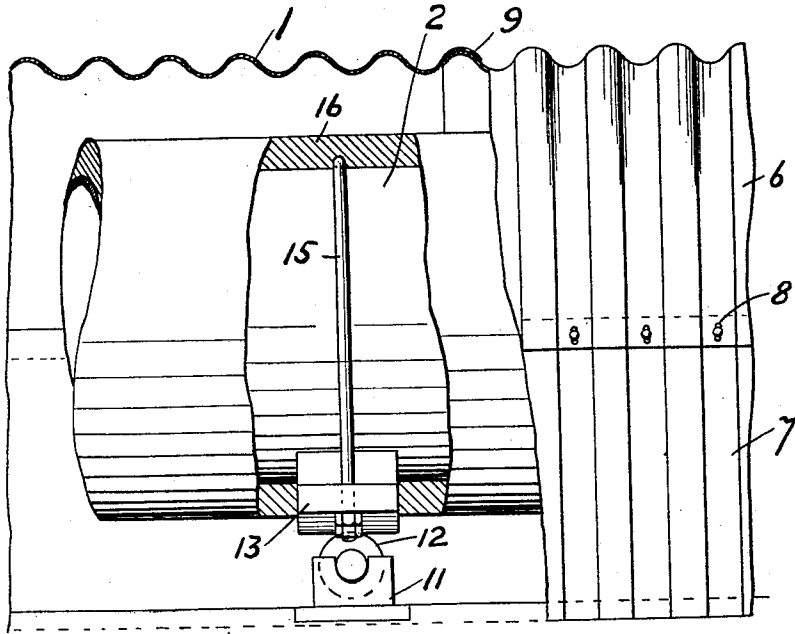


FIG. 3.

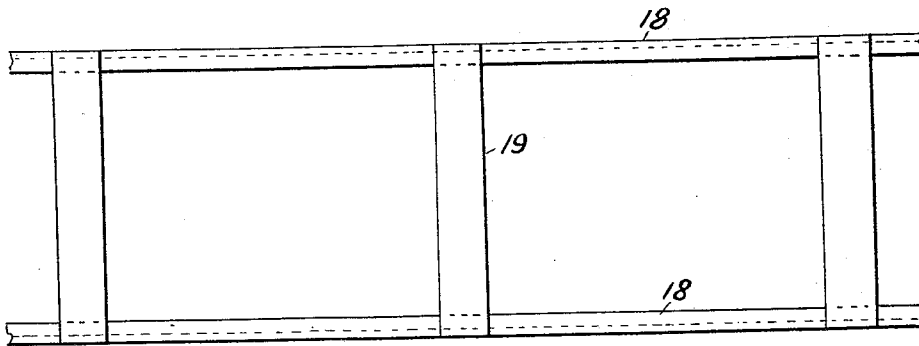


FIG. 4.

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UNDERGROUND CONDUIT FOR STEAM MAINS

Application filed June 13, 1928. Serial No. 285,191.

The primary object of the present invention is to prevent the entrance of moisture or water to the conduits of steam distribution systems. This is accomplished by providing a section of conduit having neither horizontal nor vertical joints within the section.

Objects of the present invention are to effect a material saving in the cost of construction; to increase the strength of the finished structure; to effect a saving in the cost of excavation; to dispense with temporary form work such as was hitherto quite generally employed on both the interior and exterior including the top or roof of the concrete box that provided the conduit; to effect a material saving of time and labor in the construction of the conduit; and to reduce the reinforcing rods used.

Other objects of the invention will appear from the following description.

The invention may be said to comprise an underground conduit for steam mains including a corrugated sheet metal arch construction arranged over the steam main, and concrete surrounding and encasing the outside of the metallic arch construction both providing a form and also constituting a permanent reinforcement for the concrete mass surrounding the arch construction.

The invention also comprises the method of making an underground conduit for steam mains which consists in digging a trench excavation, placing roller supports and pouring a bottom slab of concrete in said trench, grooving the edges of the slab by embedding a form therein and permitting the form to swell and loosen, when the slab is set removing the form, and placing the pipe or main on the roller supports, arranging the feet of sections of corrugated sheet metal arch construction in said grooves and assembling said corrugated sections, and surrounding and encasing the assembled arch construction with concrete.

The invention also comprises the improvements to be presently described and finally claimed.

In the following description reference will

be made to the accompanying drawings forming part hereof and in which

Figure 1 is a transverse sectional view of an underground conduit for steam mains embodying features of the invention.

Fig. 2 is a transverse sectional view of a form temporarily employed in the construction of the conduit.

Fig. 3 is a side view of arch construction with parts broken away and parts in section, and

Fig. 4 is a top or plan view of the form shown in Fig. 1.

Referring to the drawings 1 is a corrugated sheet metal arch construction arranged over the steam main 2 with space between. 3 and 4 indicate concrete surrounding and encasing the outside of the arch construction. The metal arch construction provides a form for the concrete before it has set and it also constitutes a permanent reinforcement for the concrete mass which surrounds it and fills the trench or excavation 5 sufficiently. The arch construction may be fabricated in sections in the shop from corrugated galvanized iron sheets, built up, as shown, of three sections, one rolled or curved section 6 forming the top, and two straight sections 7 riveted to the tangents of the curved section. As shown in Fig. 3 the rivet holes 8 are elongated to accommodate expansion.

In the field the ends of the corrugated plates which make up the arch construction are fitted one within the other as shown at 9 in Fig. 3. This also provides for expansion due to heat thrown off or given out from the steam main 2 which is usually of the high pressure variety. The metal rods 10 in the concrete are provided to effect an equalization of temperature. 11 are roller supports for rollers 12 upon which ride saddles 13 mounted under the pipe or main 2 and secured thereto, as shown, by tie rods 15. 16 indicates insulating material applied to the exterior of the pipe or main.

By way of description it may be said that assuming that the arch construction is fabricated from corrugated sheets of 18 gauge, the conduit will carry a superimposed load of approximately three hundred pounds

without the concrete casing. With the concrete casing, about five or six inches thick, the superimposed load strength is approximately fifteen hundred pounds per square foot or one hundred pounds per square foot greater than the customary requirements for a conduit placed in the street and subjected to heavy traffic loads.

According to the present invention an underground conduit for steam mains is constructed as follows:

A trench 5 is excavated and since it need not exceed in width the width of the concrete, because no temporary forms are employed, the trench is comparatively inexpensive to excavate. The roller supports 11 are placed and the bottom slab 4 of concrete is poured. The edges of the slab 4 are grooved as at 17 by embedding into the slab the cleats 18, Fig. 2, of the ladderlike form 19 Fig. 4. The form is permitted to swell and loosen and is then removed.

It will be observed that the cleats 18 are beveled inward at their outer edges and are straight at their inner edges which facilitates their loosening in the concrete and at the same time there is provided in the face of the slab 4 a groove 17 having a vertical edge 20 which supports the foot of the arch construction against inward pressure when the concrete 3 is poured. When the slab 4 is set the form 19 is removed. The pipe or main is placed on the rollers 12 and is properly insulated. The sections of the corrugated arch construction are assembled as the work progresses and the feet of the arch construction are arranged in the grooves 17. The surrounding and encasing concrete 3 is poured into the trench and onto the arch construction and onto the faces of the slab 4 which project beyond the arch construction. In this mass of concrete 3 are arranged the rods 10 which, as already stated, serve the function of equalizing the temperature. Obviously the work of construction may proceed progressively and rapidly and it is inexpensive, requires little labor and is both strong and durable.

In the case of smaller conduits, such as service branches to buildings, the conduit sections may be made from a single sheet instead of from three pieces.

It will be obvious to those skilled in the art to which the invention relates that modifications may be made in details of construction and arrangement and matters of mere form without departing from the spirit of the invention which is not limited to such matters or otherwise than the prior art and the appended claims may require.

I claim:

1. A section of jointless, underground conduit for the insulated steam pipes of a steam distributing system comprising a metallic arch constituting a form and reinforcement

and adapted to receive the steam pipe in spaced relation and to provide an air insulation, and a continuous mass of concrete within the section completely encircling the arch and extending across the base thereof to exclude moisture and to heat insulate from the ground.

2. Means for distributing steam comprising, a pipe, an insulating covering on said pipe, a sheet metal arch adjacent said pipe but spaced therefrom to provide an air space between said pipe and said arch, and a monolithic self-supporting layer of concrete circumferentially surrounding said pipe and said arch so as to be reenforced by said arch.

3. Means for distributing steam comprising, a pipe, an insulating covering on said pipe, a sheet metal arch adjacent said pipe but spaced therefrom to provide an air space between said pipe and said arch, and a monolithic self-supporting layer of concrete circumferentially surrounding said pipe and said arch so as to be reenforced by said arch, the ends of said arch being embedded in said concrete.

4. An underground conduit for a steam main comprising a sheet metal arch construction arranged over the steam main and concrete completely surrounding said metal arch construction and said steam main, said metal arch construction both providing a form and also constituting a permanent reenforcement for the concrete surrounding the arch construction.

MERWYN C. RANDALL.