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WATER RING FOR CONCRETE PIPE FORMS

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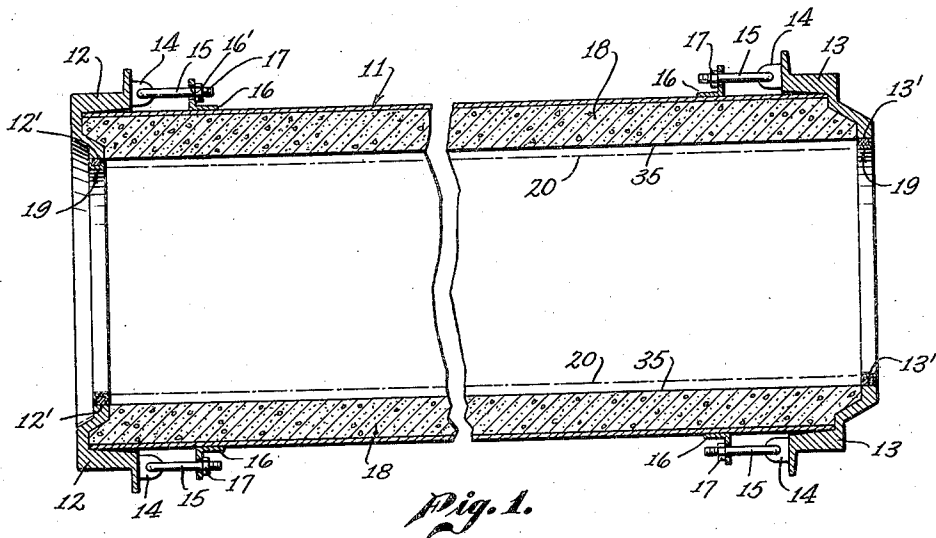


Fig. 1.

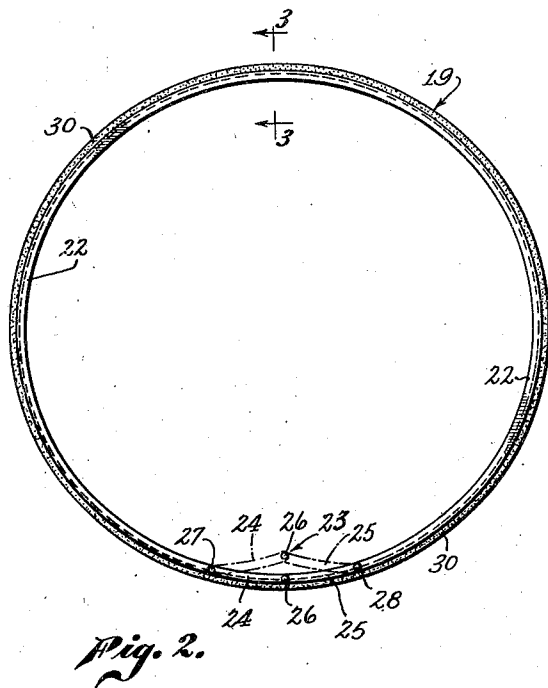


Fig. 2.

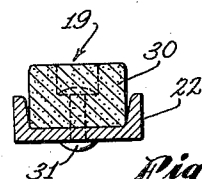


Fig. 3.

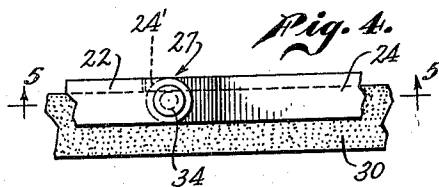


Fig. 4.

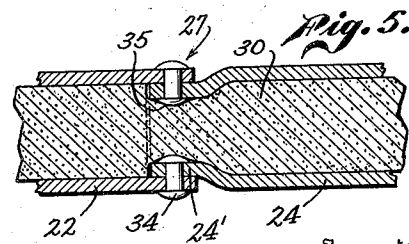


Fig. 5.

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WATER RING FOR CONCRETE PIPE FORMS

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3 Claims. (Cl. 25—30)

This invention relates generally to the manufacture of centrifugally spun concrete pipe and particularly to the forms used in the manufacture of such pipe.

In the manufacture of centrifugally spun concrete pipe, the pipe form is rotated by suitable apparatus and the concrete introduced into the form while it is rotating. Due to the compacting of the concrete by centrifugal force, it is necessary to fill the form to a greater thickness of concrete than the desired thickness of the completed pipe. It is also desirable to have the end rings of the form the same width as the thickness of the completed pipe so that they may function as guide means for troweling and finishing the interior of the pipe. Also, if the rings of the form are made wider than the desired thickness of the completed pipe it is difficult to remove the water and slurry after the concrete has been compacted against the sides of the form. In view of this, some provision must be made for temporarily increasing the width of the end ring forms to prevent escape of concrete and water during the compacting period. Steel split rings have been used for this purpose, but without success, as they permit the escape of water and it is desirable to retain the water to aid in compacting the concrete and in providing a smooth dense impervious inner surface thereto. The split rings are also unsatisfactory in that they often become loose during the spinning operation and fall out of the pipe.

In view of the above disadvantages of the present methods of retaining the concrete and water in the pipe during the compacting operation it is a primary object of this invention to provide an improved water ring for concrete pipe forms which will effectively retain concrete and water in a spinning concrete pipe form. It is also an object of this invention to provide a water ring which is of simple construction and which may be easily installed and easily removed and which, when installed in an end ring of a concrete pipe form will remain in place during the rotation of the pipe form.

These and other objects will be apparent from the accompanying drawing which is for illustrative purposes only, and in which

Fig. 1 is a longitudinal sectional elevation of a typical centrifugal pipe form showing two of the water rings of this invention installed therein.

Fig. 2 is an end elevation of the water ring.

Fig. 3 is a cross section of the water ring taken on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary elevation of one of the hinged connections of the toggle joint.

Fig. 5 is an inverted sectional plan view on line 5—5 of Fig. 4.

More particularly describing the invention, reference numeral 11 generally indicates a cylindrical concrete pipe form which is adapted to be rotated by means of suitable apparatus such as a belt or engaging rollers. The form is provided with detachable end rings 12 and 13 for the purpose of holding the concrete in the cylindrical form 11 during the spinning operation and for the purpose of forming the bell and spigot ends of the pipe. These end rings may be held in place by any suitable attachment means and to accomplish this the rings have been shown provided with eye brackets 14 which are adapted to accommodate bolt hooks 15. These bolt hooks extend through hole 16 of brackets 16 on the cylindrical form 11 and are threaded at their ends to accommodate nuts 17.

Reference numeral 18 indicates concrete, the concrete being shown in the position it occupies when compacted to the shape of the completed pipe section. The ring of this invention, generally indicated by reference numeral 19, is shown in position at each end of the form and adjacent the inner end faces 12' and 13' of the rings 12 and 13.

In the manufacture of a section of concrete pipe the concrete is introduced into the cylindrical form 11 during rotation of that member until it is of a thickness equal to the distance between broken line 20 and the interior surface of the form 11. In other words, when the form 11 is rotated, broken line 20 indicates the inner limit of the concrete prior to the compacting of the concrete by centrifugal force.

Referring to Figures 2 to 5 inclusive, for details in construction, the ring 19 comprises a metal channel ring member 22 which is provided with a toggle means generally indicated by reference numeral 23. The toggle means comprises the short channel links 24 and 25 which are pivotally connected at 26 and which are joined to the metal channel ring 22 by the pivotal connections 27 and 28.

A rubber ring 30 is mounted in the channel 22 by any suitable means, such as rivets 31. It has also been found that the rubber ring may be secured to the channel member by means of cement. This ring is continuous and unbroken and is preferably not secured to the links 24 and 25. Thus the ring hangs free of the links 24 and 25 when the toggle means is collapsed to the broken

line position of Fig. 2. The ring extends in width considerably beyond the channel member 22 and is adapted to form a fluid seal between itself and the inner end face of the end ring into which it is fitted.

A means of forming the toggle joint is shown in Figures 4 and 5 wherein inner ends 24' of the link 24 fit inside of the channel 22 and are held in place by means of rivets 34. The rubber ring 30 is suitably cut out at each of the pivotal points as at 35 to accommodate the hinged connection.

In the manufacture of centrifugally spun concrete pipe a ring 19 is inserted inside of each of the end rings 12 and 13 and the toggle means expanded to the full line position shown in Fig. 2, thereby effecting a fluid seal between each of the water rings 19 and the inner end faces 12' and 13' respectively of the end rings of the form. The entire form is then rotated and concrete introduced until the inner limit of the concrete is approximately even with the inner portion of the water ring or, in other words, to the broken line 20 of Fig. 1. During the rotation of the form the concrete is compacted and the water and air largely removed therefrom.

In the latter stages of the formation of the pipe the space between the line 20 and line 35, which line indicates the inner surface of the completed pipe, is largely slurry and water. During the rotation of the form the water rings 19, by reason of the fact that they include a rubber ring 30 in pressure engagement with the inner end surfaces 12' and 13', effectively prevent escape or leakage of water from the concrete. When the concrete is compacted and set, rotation of the form is stopped and the rings may readily be removed from the forms by collapsing of the toggle means. The water and slurry may then be removed and troweling or finishing of the inner surface of the pipe may be accomplished,

using the inner end faces 12' and 13' of the end rings as a guide for the finishing means.

In the description of this invention the ring 30 has been described as being rubber, however it is within the scope of this invention that any suitable resilient material might be used in place of rubber. The metal ring 22, although shown and described as a channel member might be made in some other shape, as for example, a flat band ring.

I claim as my invention:

1. A water ring for concrete pipe forms comprising: a channel ring member having a toggle joint therein; and a continuous ring formed of resilient material secured to said channel ring member in the channel portion thereof, said continuous ring of resilient material having a greater outside diameter than said channel member; said channel ring member forming a continuous ring when in expanded position.

2. A water ring for concrete pipe forms comprising: a channel ring member having a toggle joint therein the channel portion of said ring being on the outside thereof; and a rubber ring secured to said channel member in the channel portion thereof, said rubber ring having a greater outside diameter than said channel member; said channel ring member forming a continuous ring when in expanded position.

3. A water ring for concrete pipe forms comprising: a contractible metal ring member, said ring member being continuous when in normal expanded position; a continuous ring of resilient material mounted on the peripheral surface of said ring member; and means for expanding the metal ring to bring the ring of resilient material into pressure engagement with the interior of the pipe form.

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