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SLEEVE JOINT FOR CONCRETE TUBES

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Fig. 1

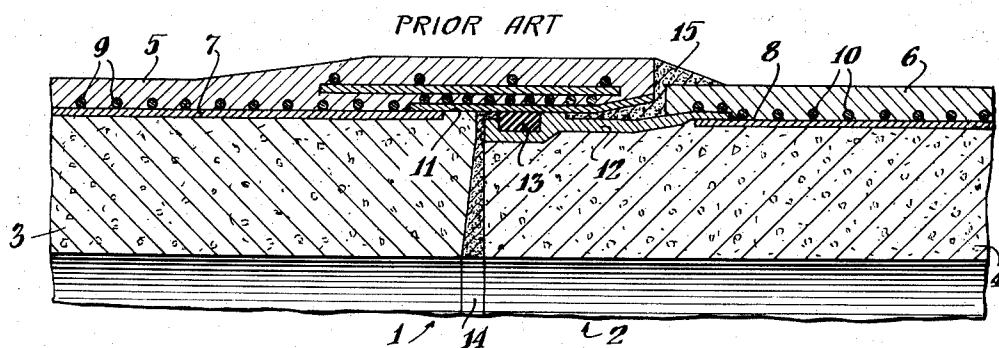


Fig. 2

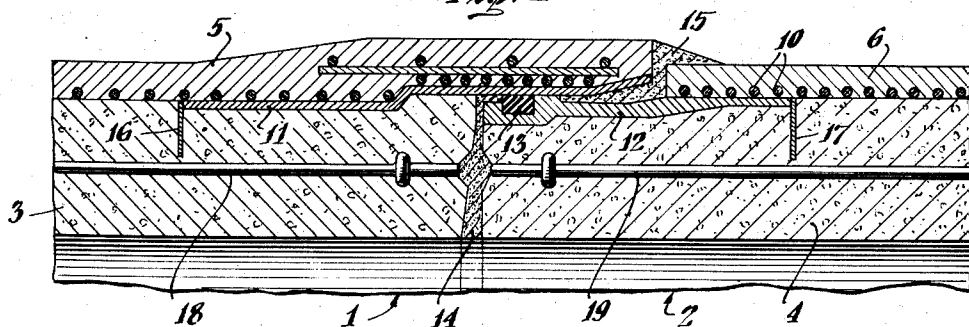
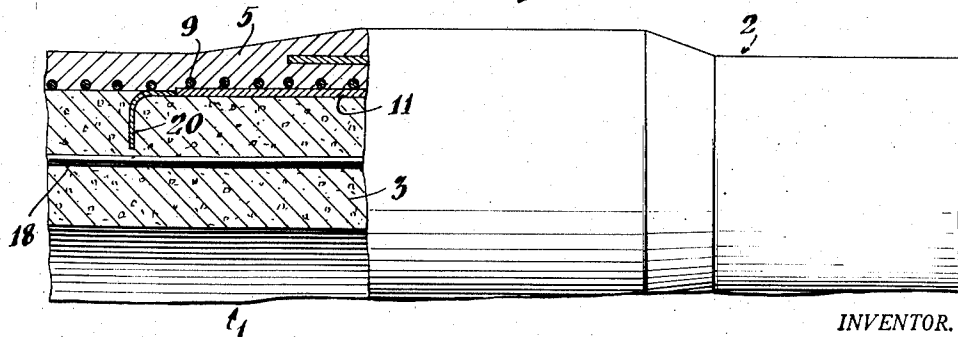


Fig. 3



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SLEEVE JOINT FOR CONCRETE TUBES

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3 Claims. (Cl. 138—84)

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The invention relates to a sleeve joint for concrete tubes, and especially conduit pipes having concrete tubes.

It is known to employ concrete tubes formed of two layers of concrete and between which a core tube of steel is located, the steel core tube being reinforced transversely by a tensioned wrapping. Conduit pipes having such tubes are connected to each other by means of a sleeve joint, in such a way, that a metallic coupling sleeve, fixed to the steel core tube, extends into a corresponding metallic coupling sleeve attached to the core tube of an adjoining conduit pipe. A tight fitting packing ring is provided between the overlapping sleeves of the joined conduit pipes.

The present invention relates to a sleeve joint for conduit pipes not having a tubular steel core. Owing to the absence of a tubular steel core the problem of keeping the concrete tubes watertight is much greater, because should water come between a coupling sleeve and the inner layer of the concrete, said water can displace along the sleeve to the outer surface of the concrete tube.

According to the invention the coupling sleeves have at some distance from the ends of the concrete tube edges or rings directed radially inward from the sleeves and extending into the concrete, in such a way that there is concrete at both sides of said edges or rings, which concrete is kept under compression by longitudinal reinforcement embedded in the concrete tubes, in such a way that the edges or rings are subjected at both sides to the pressure of the stressed concrete.

The invention is illustrated in the accompanying drawing and more precisely described hereinafter.

Fig. 1 shows a part of a known sleeve joint of concrete tubes.

Figs. 2 and 3 show parts of tube connections according to the invention.

In the drawing, 1 and 2 indicate the ends of two conduit pipes having concrete tubes. The tubes consist of an inner layer 3, 4 of concrete and an outer layer 5, 6. According to Fig. 1 a tubular thin-walled steel core 7, 8 is provided, around which a tensioned transverse reinforcement 9, 10 has been wound. To the steel core 8 of the conduit pipe 2 a metallic coupling sleeve 12 is welded, whereas in a corresponding way the metallic coupling sleeve 11 is connected with the steel core 7, in which sleeve 11 the sleeve 12 fits.

As illustrated in Fig. 1 of the drawing, the

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concrete outside the sleeve 11 is reinforced by an extra reinforcement. A packing ring 13 is provided between the sleeves 11 and 12. When the sleeve joint is formed, the spaces 14 and 15 are filled with mortar or another packing material. When the concrete loosens locally from the metal of the sleeves 11 and 12, e. g. in consequence of shrinking, water cannot come to the outside of the sleeves because the tubular steel cores 7, 8 are connected to the coupling sleeves and a continuous water-barrier of metal extends for the full length of each conduit pipe.

This is otherwise when the tubular steel core fails, or is not present. No tubular steel core is employed in the conduit pipes illustrated in Figs. 2 and 3. According to Fig. 2 the sleeves 11 and 12 are provided at the ends of the conduit pipes in a corresponding way as described for Fig. 1, which sleeves are embedded in the concrete. However they do not connect with tubular steel cores of the type illustrated in Fig. 1. Consequently water could leak along the inner walls of the sleeves 11 and 12 and flow toward the inner ends of the sleeves.

According to the invention leakage along the interior surfaces of the coupling sleeves is prevented by providing flanges or rings at those ends of the sleeves which are remote from the extremities of the conduit pipes. The flanges or rings are connected to the sleeves in a watertight fashion, and are directed inwardly and into the prestressed concrete of the tubes so that the rings or flanges are at both sides subjected to the pressure of the prestressed concrete. Said rings or flanges are indicated in Fig. 2 with 16 and 17, whereas in Fig. 3, a more cap-shaped ring 20 is substituted for the flange 16 of Fig. 2. In the tubes 3 and 4 (Figs. 2 and 3), a longitudinal reinforcement 18, 19 is provided, which keeps the concrete stressed, so that axial pressure is constantly exerted against both sides of the flanges 16 and 17, and of the ring 20, respectively. If water should come between the sleeves 11 or 12 and the concrete 3, or 4 respectively, it is still impossible for this water to penetrate under the rings or flanges 16, 17 or 20 and leak to the outside of the conduit pipes.

It is clear that the flanges 16 and 17 need not be precisely square to the axis of the sleeve. They can also be formed as conical rings or be obtained in another way as by forming circular skirts directed toward the inside of the tube.

I claim:

1. In a conduit pipe, the combination comprising a concrete tube, a metallic joint ring mounted

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to an end of said concrete tube, said joint ring having a tubular portion overlapping said concrete tube and an annular flange extending from said tubular portion inwardly thereof into the concrete of said tube, and longitudinal reinforcement 5 embedded in the concrete of said tube, said reinforcement being stressed to hold said concrete tube under axial compression and having portions thereof radially displaced from said flange whereby the concrete adjoining both sides 10 of said flange is constantly pressed thereagainst.

2. The combination set forth in claim 1 in which said flange is located adjacent the end of said tubular portion of said joint ring remote from the end of the conduit pipe.

3. A sleeve joint comprising two concrete tubes, a metallic coupling sleeve mounted to an end of each of said tubes for forming a joint therebetween, each of said coupling sleeves having a tubular portion overlapping respective ones of 20 said concrete tubes, an annular flange projecting inwardly from each of said coupling sleeves

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and embedded in said concrete tubes, and longitudinally prestressed tension means spaced apart from said annular flanges, said tension means being embedded in said concrete tubes and holding the concrete thereof in compression and firmly pressed against both sides of said annular flanges whereby fluid from within said joint is prevented from flowing beyond said flanges.

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