

June 16, 1936.

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2,044,178

CENTRIFUGALLY SPUN CONCRETE PIPE AND APPARATUS FOR MANUFACTURE OF THE SAME

Filed Dec. 26, 1931

4 Sheets-Sheet 1

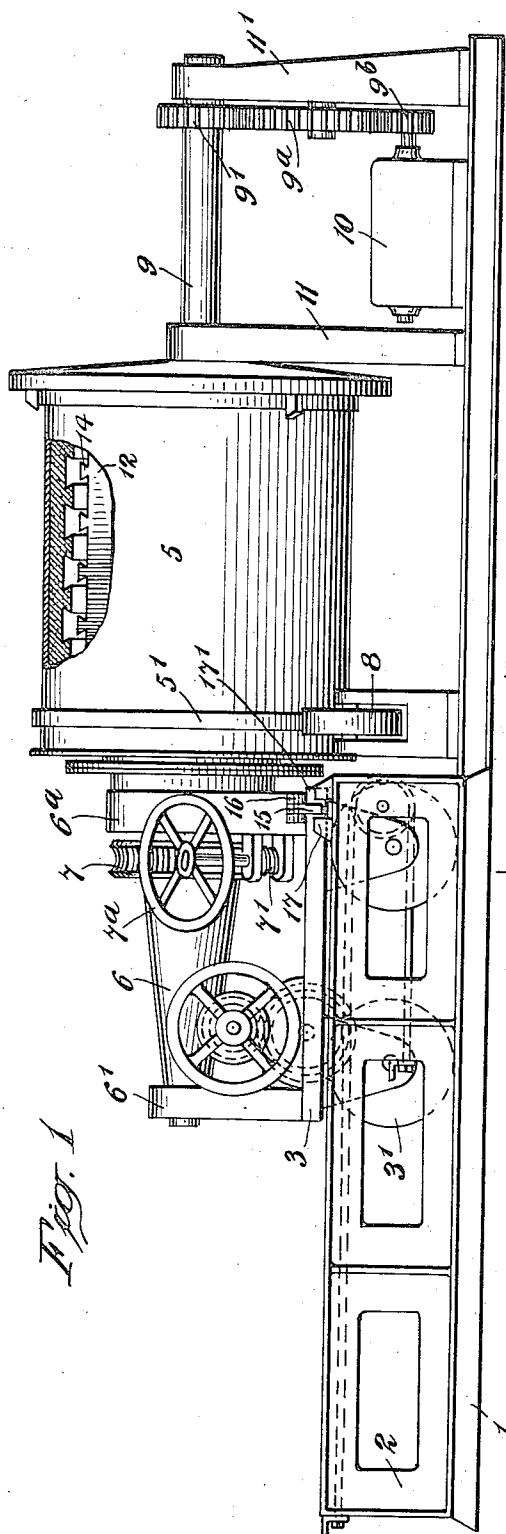


Fig. 1

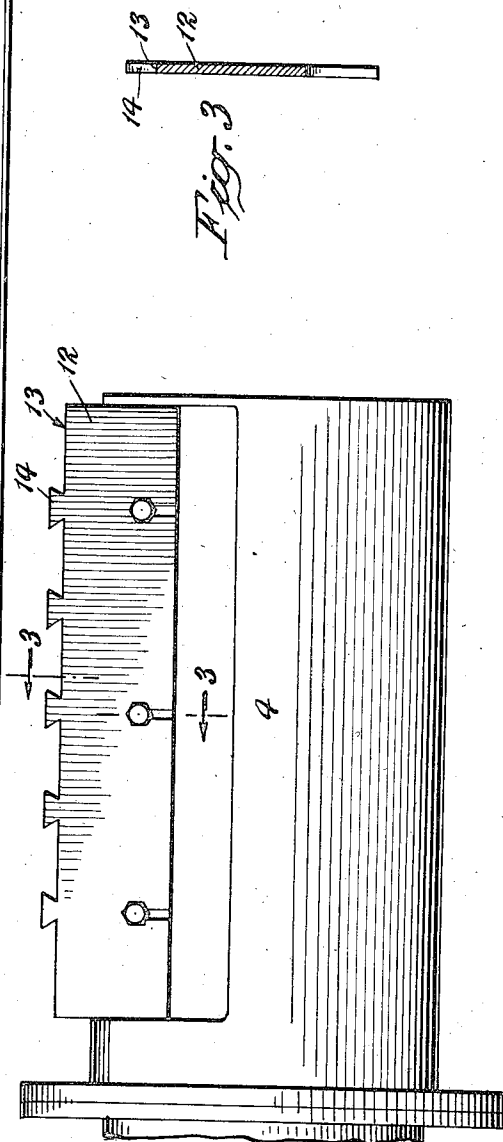


Fig. 2

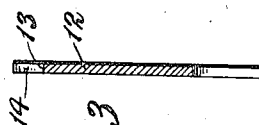


Fig. 3

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Fig. 4

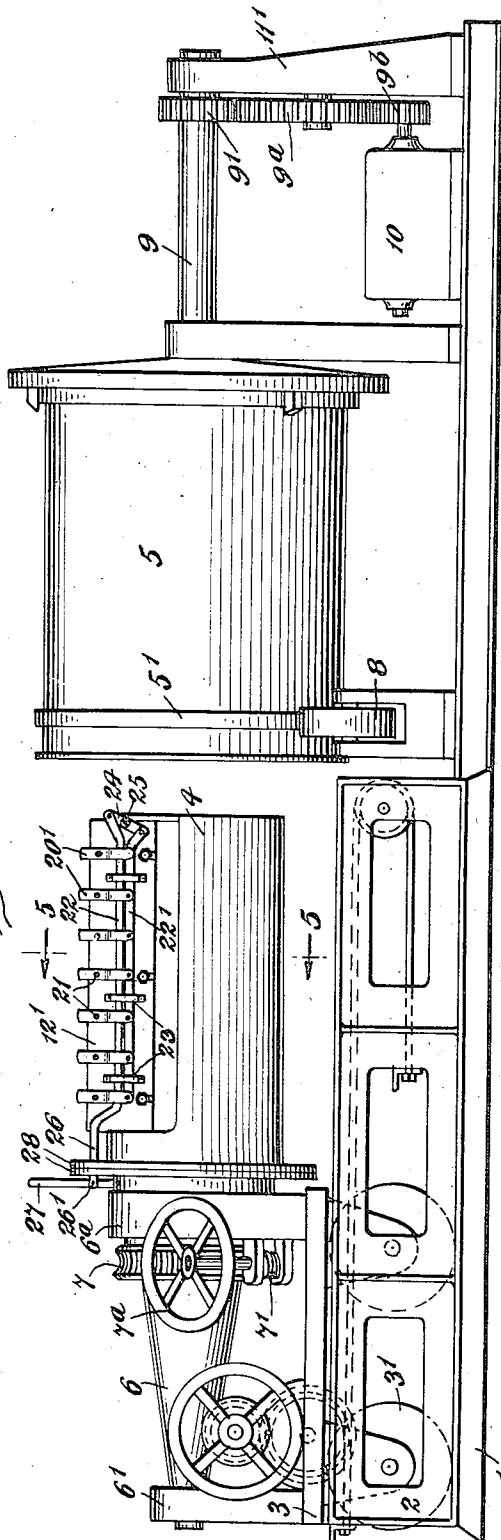
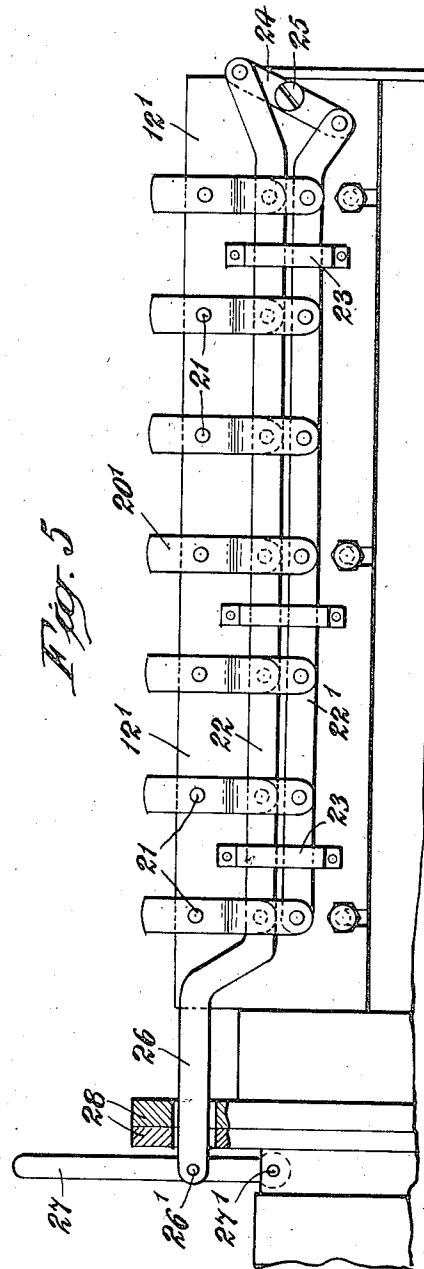


Fig. 5



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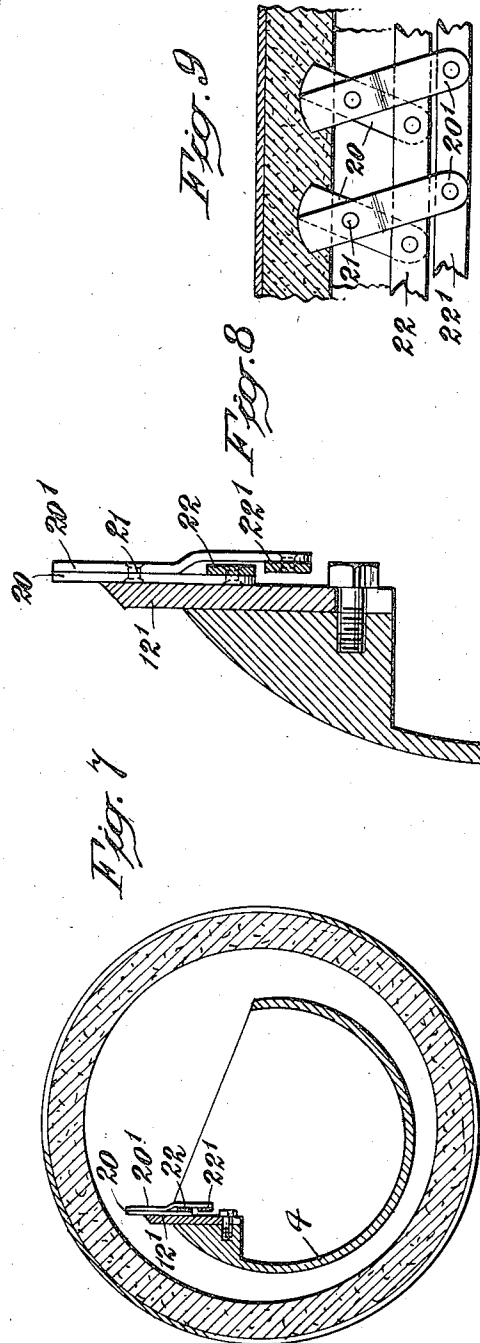
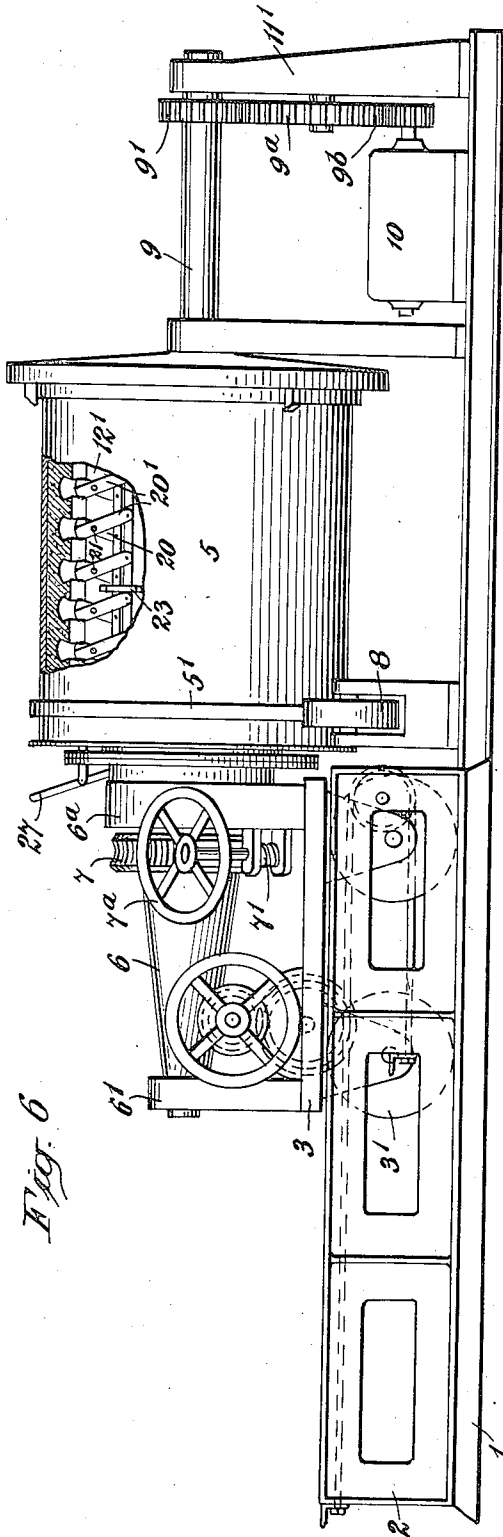
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Fig. 10

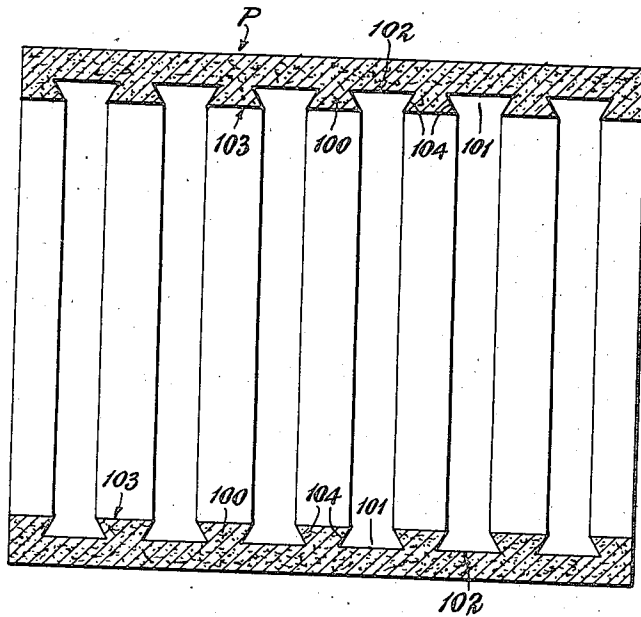
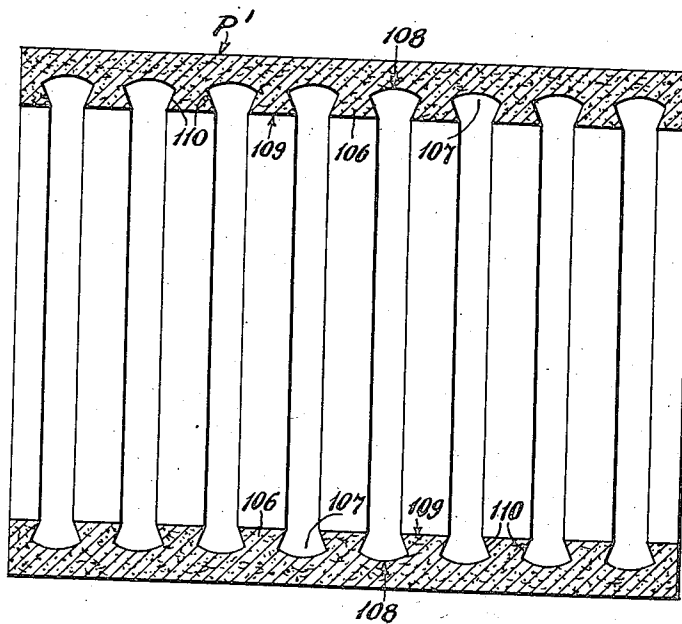


Fig. 11



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UNITED STATES PATENT OFFICE

2,044,178

CENTRIFUGALLY SPUN CONCRETE PIPE
AND APPARATUS FOR MANUFACTURE OF
THE SAME

Albert R. McMullin, New York, N. Y.

Application December 26, 1931, Serial No. 533,203

2 Claims. (Cl. 138—80).

This invention relates to improvements in centrifugally spun concrete pipes and apparatus for the manufacture of the same.

Objects of this invention are to produce a concrete pipe which will have on the interior surface of the pipe grooves having widths at the bottom thereof of greater extent than the widths at the surface and preferably to produce grooves of dove-tail conformation, which grooves may be utilized for attaching or securing to the said concrete pipe linings or surfacings of any material suitable for a given service with respect to the pipe manufactured and to enable such lining to be keyed to the interior surface of the pipe; and to provide mechanism by which grooves of the type hereinabove specified may be formed in the inner surface of the concrete pipe.

With these and other objects in view, the invention comprises the combination of members and arrangement of parts so combined as to co-act and co-operate with each other in the performance of the functions and the accomplishment of the results herein contemplated, and comprises in one of its adaptations the species or preferred form illustrated in the accompanying drawings, in which:—

Fig. 1 is a view in side elevation of a centrifugal spinning machine with the mechanism in spinning or "in" position and having means applied thereto by which grooves of dove-tail conformation may be formed in the interior surface of the pipe;

Fig. 2 is an enlarged fragmentary view of the bucket with one of the smoothing blades employed to produce such grooves;

Fig. 3 is a section on the line 3—3 of Fig. 2 of the blade shown in Fig. 2;

Fig. 4 is a view in side elevation of another form of centrifugal spinning machine shown with the bucket withdrawn from the mold, or in "out" position before insertion in the mold to spin a pipe and to form grooves in the inner surface of the pipe.

Fig. 5 is a fragmentary view showing in side elevation, grooves forming elements mounted on a blade of the bucket and operating mechanism therefor;

Fig. 6 is a view in side elevation of another form of centrifugal spinning machine shown in "in" position by the use of which grooves of the type specified may be formed in the inner surface of the pipe;

Fig. 7 is a section on the line 5—5 of Fig. 4;

Fig. 8 is an enlarged section similar to Fig. 7 of the bucket blade and groove forming elements;

Fig. 9 is a fragmentary view showing in side elevation groove forming elements in extended position;

Fig. 10 is a longitudinal section through the axis of a pipe embodying my invention and showing grooves made by the machine shown in Figs. 1 to 3.

Fig. 11 is a similar sectional view of another form of pipe made by the machine shown in Figs. 4 to 9.

Referring now to these drawings which illustrate a preferred embodiment of my invention, 1 indicates a concrete base on which is suitably mounted rail members 2 preferably comprising a heavy I-beam forming wheel channels or tracks for the wheels 3' of the bucket carriage 3, having mounted thereon a bucket 4, which is adapted to be traversed along the tracks into "in" and "out" positions respectively, in relation to mold 5.

As shown, bucket 4 is mounted on the carriage to rotate on the shaft 6 supported by bearings 6'—6^a to permit dumping thereof within the mold. A hand operated worm-wheel 7 is attached to the shaft 6 and a hand operated worm 7' is adapted to mesh with said worm for the purpose of turning the shaft 6 and the bucket 4 therewith, a hand-wheel 7^a being provided for this purpose.

As illustrated, the mold 5 is provided with a track 5' running upon rollers 8 to support the forward end of the mold and said mold is rotated through a shaft 9 supported in bearings 11—11', a system of gears 9', 9^a and 9^b being interposed between said shaft and motor, 10.

Centrifugal spinning machines of the type hereinabove described are well-known in the art and are described in patents to Moir and Buchanan.

In accordance with my present invention, the bucket of such machine has mounted at one of the edges thereof, a smoothing blade 12 which after the bucket is dumped and the concrete centrifugally spun, is adapted, in the conventional way, to be pressed against the inner surface of the pipe to smooth such interior surface. In accordance with my present invention, the normal smoothing surface 13 of the blade has projecting above it a series of grooving-elements or teeth 14 which are dove-tail in conformation, and the carriage has mounted thereon a latch 15 pivotally mounted in bearings 16 and adapted when swung down into operating position, as shown in Fig. 1, to extend between stop members 17—17'. The latch 15 is narrower than the distance between the stop member 17—17'. These stop members

are spaced from each other and from the side edges of the latch 15 a distance corresponding to the width in excess of the width of the teeth that it is desired to make the grooves which it is desired to form in the internal surface of the pipe. The latch, which is also of predetermined width is reciprocated between the stops by a traversing movement of the carriage and this movement of the carriage within the limits of the stops causes the groove-forming elements or teeth to be moved laterally and to form dove-tail grooves in the surface of the pipe of widths corresponding to the movement of the carriage between the stop members plus the width of the teeth 14.

It will be understood that the carriage is moved during the trowelling of the interior surface and when the trowelling blade is in contact with the interior surface of the pipe, and that when the carriage is, as aforesaid moved to and fro within the limits of the stops above mentioned, the grooves will be cut by the grooving elements or teeth. These grooves will be wider than the teeth, thus permitting the trowelling blade, after cutting a groove, to be moved out of contact with the interior concrete surface of the pipe without injury to the edges of the groove.

In Figs. 4 to 9 I have shown another modified form of mechanism for cutting grooves of the type hereinabove specified. As illustrated, this mechanism comprises the pivoting on a blade 12' at the edge of the bucket 4 of a series of pairs of blades arranged in scissor-wise pairs. As illustrated, (see particularly Figs. 5, 8 and 9) a pair of such blades, 20—20', is pivoted on a common pivot 21 and has its free ends extended upwardly so as to produce a groove forming element having a substantially dove-tail conformation and the opposite ends of the blades 20—20' are connected together with operating rods 22—22', which will enable the free ends of said blades to be moved into registry and contracted in width and to be swung into expanded position to provide a combined element of dove-tail conformation. Suitable means for guiding the movement of these rods 22—22' is provided and as illustrated, I have shown straps 23 for this purpose and means is also provided for actuating said blades into extended and contracted positions and in the preferred embodiment illustrated, the rod-members 22—22' are at one end or at their rear end pivoted to a common link 24 which is pivoted intermediate its ends at 25 and at the opposite end of said rods, one of the same is provided with an extension 26 which is pivoted at 26' to an operating lever 27 pivoted at 27' outside the mold, the extension 26 of the rod 22 preferably passing through partitions or flanges 23 used for fastening the bucket to its shaft. In operation, the mechanism described in Figs. 4 to 9 is, during the trowelling operation, first moved into contracted position as shown in Fig. 5 and is thereafter by the lever 27 moved into extended position as shown in Fig. 9 in which position the dove-tail grooves will be cut in the interior surface of the pipe. When these grooves have been properly formed, and the interior surface of the concrete pipe smoothed by the edge of the blade 12', the blades will again be moved into contracted position, as shown in Fig. 5, whereupon the blades may be moved out of the

dove-tail grooves without injuring the walls thereof.

In Fig. 10 I have shown a concrete pipe P in a longitudinal section through the axis thereof in which the internal surface 103 is provided with a dove-tailed groove 101 having a rectilinear bottom portion 102 and side walls 104 inclining toward each other to cause the groove 101 to have a dove-tailed conformation and to produce projections 100, likewise of dove-tailed conformation. This pipe is produced by the mechanism shown in Figs. 1 to 3 inclusive of the drawings herein.

In Fig. 10 I have shown a similar concrete pipe P' having in the internal surface 109 a series of grooves 107. These grooves as shown have arcuate bottom portions 108 and rectilinear side wall portions thus causing each of said grooves 107 to have substantially dove-tailed conformation and also providing along the inner surface projections 106, also of dove-tailed conformation.

It will be seen that I have provided a centrifugally-spun pipe-unit comprising a continuous and completely cylindrical shell composed of concrete and having formed in its interior surface a series of grooves, each of dove-tail conformation with its bottom portion of greater width than its mouth portion and that, in accordance with the objects of the invention hereinabove specified, these grooves may be utilized for attaching or securing to the concrete pipe or shell, linings or surfacings of any material suitable for a given service with respect to the pipe manufactured and to enable such lining to be keyed to the interior surface of the pipe. Obviously, dove-tailed grooves of the type specified may be employed to attach or secure to the internal surface of the shell linings of a material which will not bond with the internal surface of the shell or which will form only an imperfect bond therewith. For example, it is well known that asphalt, even when poured very hot will not produce a perfect or good bond with concrete in cold condition. By the use of my shell having grooves of dovetail conformation, a lining of this material may be more effectively secured or attached, and even if a better bond between such materials be secured by heating the concrete surface, a more secure attachment and greater bonding surface is attained.

As many changes could be made in the above construction and many apparently widely different embodiments of this invention could be made without departing from the scope thereof; it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

Having described my invention, I claim:

1. A centrifugally-spun cast concrete pipe unit, comprising a continuous and completely cylindrical shell composed of concrete and having in its interior surface a groove with a bottom portion of greater width than the top or mouth portion thereof.

2. A centrifugally-spun cast concrete pipe unit, comprising a continuous and completely cylindrical shell composed of concrete and having in its interior surface a groove of dove-tail conformation with a bottom portion of greater width than the top or mouth portion thereof.

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