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M. OVERVAD

2,102,968

PROCESS FOR THE MANUFACTURE OF CONCRETE PIPES

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Fig. 1.

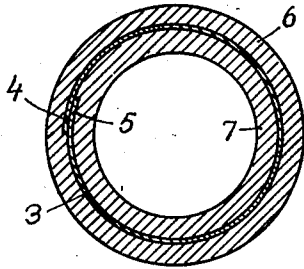


Fig. 2.

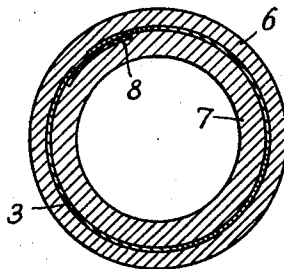


Fig. 3.

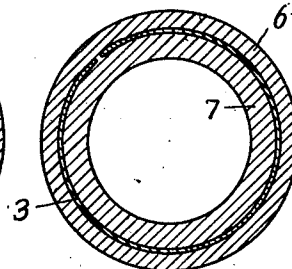


Fig. 4.

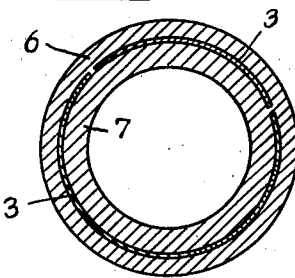


Fig. 5.

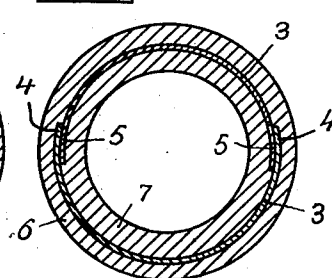


Fig. 6.

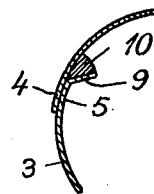


Fig. 7.

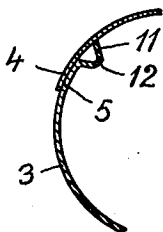


Fig. 8.

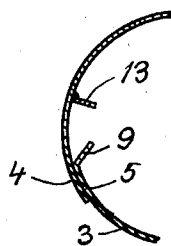


Fig. 9.

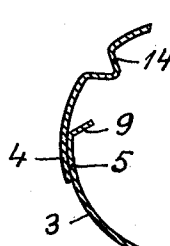
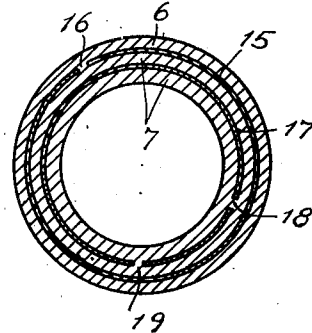


Fig. 10.



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PROCESS FOR THE MANUFACTURE OF
CONCRETE PIPES

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5 Claims. (Cl. 25—154)

It is known to cast concrete pipes or other hollow articles in rotating moulds, the so-called centrifugal casting, whereby the advantage is attained that the article becomes especially compact and very strong. It is similarly known to fit such concrete bodies, cast in rotary moulds, with an iron reinforcement or the like.

On the other hand, if it is attempted to place, within a concrete pipe or other hollow concrete body, a plate-shaped body, for instance an iron pipe, surrounded entirely by the concrete mass, then the concrete body cannot be cast in the ordinary manner in a rotary mould, as the iron pipe prevents the concrete mass in the pipe from being flung outward so as to fill the mould, and similarly the lighter particles situated near the surface of the mould, for instance air bubbles and the like, will be prevented by the pipe from moving towards the centre. Such concrete bodies are therefore manufactured for instance by casting first an outer concrete covering around the sheet-iron body or iron pipe concerned, after which the sheet-iron body or pipe is given, by centrifugal casting, an interior covering of concrete. The external concrete covering, however, produced by tamping or otherwise, will never be as sound and firm as the inner covering produced by centrifugal casting, and this is frequently a serious drawback.

The present invention relates to a process according to which the inner as well as the outer concrete covering can be formed by centrifugal casting. This can be done by using, instead of an ordinary metal pipe, a longitudinally slit pipe. This pipe may suitably be produced by bending an iron plate into cylindrical shape, for instance by rolling. In order to attain better sealing the two edges of the pipe may overlap one another. How far the two edges have then to overlap one another depends on the requirements to be filled by the finished product. The procedure is now that a concrete pipe is cast in a rotating mould, after which a slit metal pipe is inserted into the concrete pipe. This metal pipe may suitably, before being inserted into the concrete pipe, be compressed to a slightly smaller diameter than the one it would have when left to itself, and when this pipe, after having been inserted into the concrete pipe, is released from the means by which it has been compressed, it will expand by its own resiliency and fill the concrete pipe entirely. Then the mould is again rotated, whereby the metal pipe is pressed out against the surrounding metal mantle, and a sec-

ond concrete pipe is cast within the metal pipe. Instead of the two edges of the pipe being allowed to overlap one another, one or more additional slit metal pipes may be inserted within the metal pipe first inserted, the slits of the said pipes being offset relatively to one another and to the slit of the metal pipe first inserted, in such a manner that the slits will thereby be covered. By the casting of the inner concrete covering a part of the cement mortar will be flung out in the slit in the iron pipe or into the space between the iron pipes, and will fill any cavities entirely. After the outer iron pipe has been placed into position, this pipe may also be lined, by centrifugal casting, with a layer of rich cement mortar or the like, after which another slit iron pipe is inserted and, maybe, also lined with cement mortar etc., whereafter finally the inner concrete lining is cast.

Thereby a concrete pipe is attained in the wall of which a metal pipe is embedded, and the inner as well as the outer concrete covering is produced by centrifugal casting. The metal pipe is slit longitudinally, but the degree of overlapping of the edges, or the width of the slits, may be adjusted according to the purpose for which the concrete pipe is to be used, and thereby it will be feasible to reduce, or entirely eliminate, the drawbacks that may be involved by the slitting of the metal pipe. Instead of the metal pipe being slit along one single line, the same may be slit at two or more places.

If the inner or outer covering, or both, are desired to be reinforced, this can be done according to the methods known heretofore. Further, socket or flange members may be embedded in the concrete at the ends of the pipe, in such a manner that the mutual joining of pipes manufactured according to the present invention can be effected by the same methods and devices as are known for joining of other concrete pipes or iron pipes.

In the accompanying drawing,

Figs. 1-5 show five cross-sections of pipes manufactured according to the invention,

Figs. 6-9 are cross-sections of the overlapping edges of the reinforcing pipe, in four different constructions, and

Figure 10 is a cross section of a pipe having two metal cylinders inserted therein showing the slits being off-set relative to one another.

As shown in Fig. 1, the metal pipe 3 which is intended to serve as reinforcing or sealing, and preferably may be made from iron, is slit longitudinally, and the two edges 4 and 5 thereof are

overlapping one another. The pipe has an outer concrete covering 6 and an inner concrete covering 7.

In the construction shown in Fig. 2 there is attached, to one edge of the slit iron pipe 3, a plate strip 8 covering the open slit in the iron pipe and extending down below the other edge of the iron pipe. By this last construction the advantage is attained that the iron pipe 3 preserves its cylindrical shape, so that it can better fit the cylindrical cavity in the outer concrete covering 6.

Before the inner covering 7 is cast, the slit of the iron pipe and any cavities around the iron pipe may be filled by centrifugal casting, if desired, with a suitable cement mixture or the like, after which the iron pipe is covered with concrete in the manner described above. The said special cement mixture may be administered so liberally that the same will cover the iron pipe entirely with a more or less heavy layer, after which the inner concrete covering is applied to this layer.

In the construction shown in Fig. 3 the pipe 3 is merely slit at one single point of its periphery, and here the slit is not covered. In the construction shown in Fig. 4 the pipe 3 is slit at two points. Fig. 5 shows a construction in which the pipe 3 is composed of several parts, in the present case two parts, the edges 4 and 5 of which are overlapping one another.

In order to attain an efficient sealing of the slit in the iron pipe, the constructions shown in Figs. 6-9 may be used. As shown in Fig. 6 the inner edge 5 of the pipe may be fitted with a flange 9 directed obliquely inward, and the corner 10 thus formed may be filled with the sealing material, which by the subsequent centrifugal casting of the inner covering will be flung by centrifugal force into the slit, thereby sealing the same. As shown in Fig. 7 the flange on the edge 5 may be bent entirely around, so as to get the shape of a wave 11. Before the iron pipe is inserted into the outer concrete covering, the said wave is filled with sealing material, and openings 12 may be provided on the top of the wave enabling concrete to penetrate into the latter during the subsequent centrifugal casting, so as to replace the sealing material flung out into the slit.

Fig. 8 shows a ledge 13 attached, for instance welded, to the inner face of the edge 4. Between the flange 9 and the ledge 13 a space is thereby formed, which is filled with sealing material, and by the subsequent centrifugal casting this material will be held between the flange and the ledge, so that it cannot be spread out by the concrete mass. The ledge 13 may also be detachable, so that it can be removed during the casting process.

Fig. 9 shows how the attached ledge 13 can be replaced by a wave 14 impressed in the wall of the iron pipe.

In the modification shown in Figure 10, a metal pipe 15 provided with a slit 16 is first inserted within the outer layer 6. A second pipe 17 provided with slits 18 and 19 is then inserted within the cylinder 15 in such a manner that the slits of the respective cylinders are offset relative to one another.

In the same manner as other similar concrete pipes the present pipes may be fitted with sockets, branch pipes and the like.

I claim:

1. A process for manufacturing concrete pipe or the like by centrifugal casting comprising the steps of casting an outer layer in a rotary mold, inserting a metal cylinder within said outer layer, said metal cylinder being split longitudinally in at least one place, spinning the mold to expand the split metal core and compact the concrete, and casting an inner layer within said metal cylinder.

2. A process for manufacturing concrete pipes or the like by centrifugal casting comprising the steps of casting an outer layer in a rotary mold, compressing a metal cylinder split longitudinally so that its diameter will be smaller than the diameter of said outer layer, inserting said compressed cylinder within said outer layer, spinning the mold to expand the slit metal core and compact the concrete, and casting an inner layer within said metal cylinder.

3. A process for manufacturing concrete pipes or the like by centrifugal casting comprising the steps of casting an outer layer in a rotary mold, compressing a metal cylinder split longitudinally to a smaller diameter than that of said outer layer so that the edges of said split cylinder overlap, inserting said pressed cylinder within said outer layer, spinning the mold to expand the slit metal core and compact the concrete, and casting an inner layer within said metal cylinder.

4. A process for manufacturing concrete pipes or the like by centrifugal casting according to claim 1, comprising the additional step of covering the metal cylinder with a layer of plastic material preliminary to casting said inner layer.

5. A process for manufacturing concrete pipes or the like by centrifugal casting comprising the steps of casting an outer layer in a rotary mold, inserting a metal cylinder, split longitudinally in at least one place within said outer layer, inserting a second metal cylinder split longitudinally in at least one place within said first mentioned cylinder in such a manner that the slits are offset relative to one another, whereby said slits will be covered, spinning the mold to expand the split metal cylinders and compact the concrete, and casting an inner layer within said metal cylinder whereby the concrete will penetrate into said slits and between said metal cylinders.

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