Sept. 4, 1928. 1,683,025

R. M. DALLAM

LINER BLOCK FOR CEMENT SEWER PIPES

Filed June 28, 1926

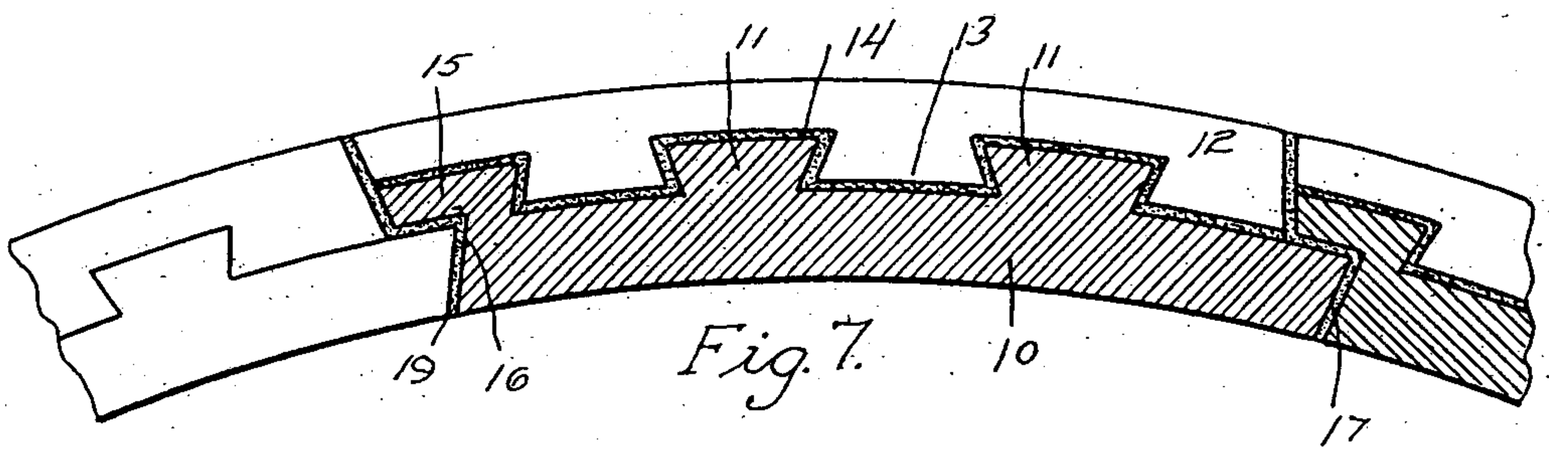

Fig. 7.

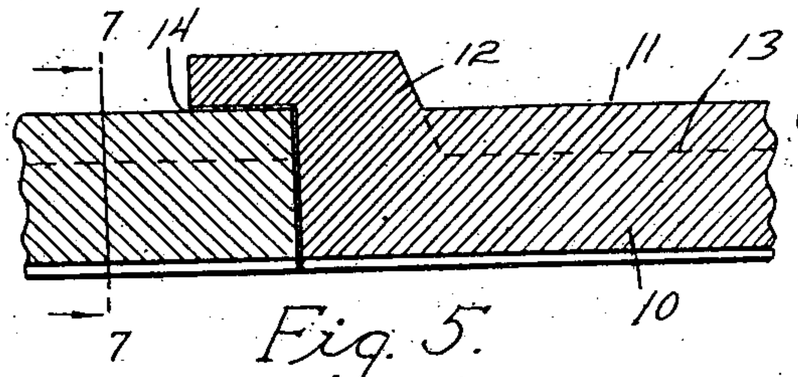

Fig. 5.

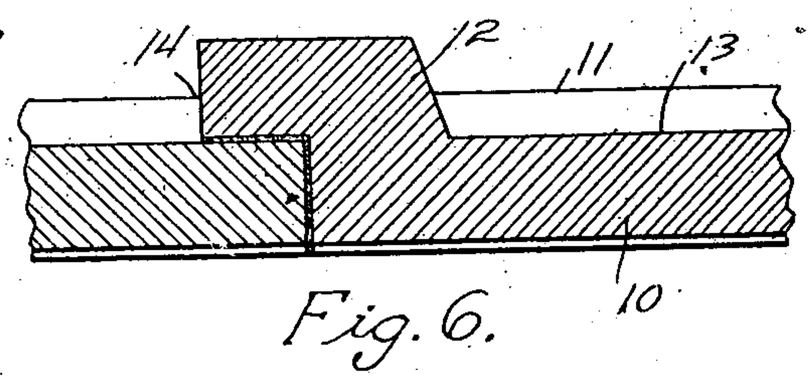

Fig. 6.

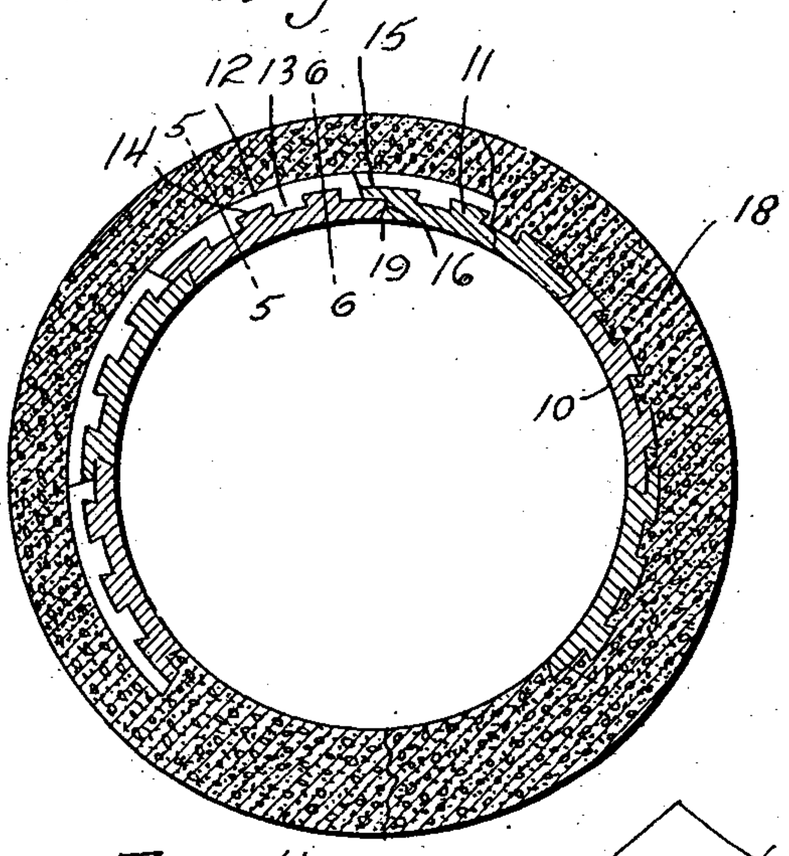

Fig. 4.

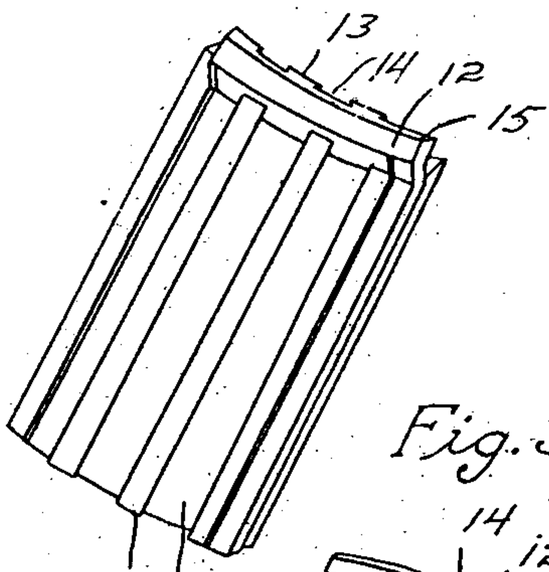

Fig. 3.

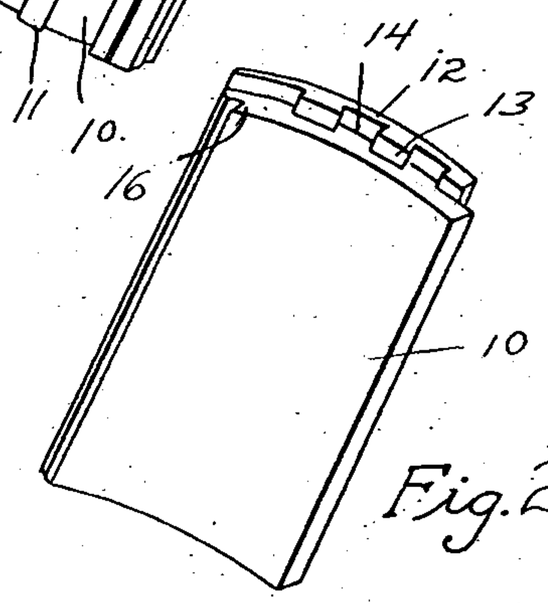

Fig. 2.

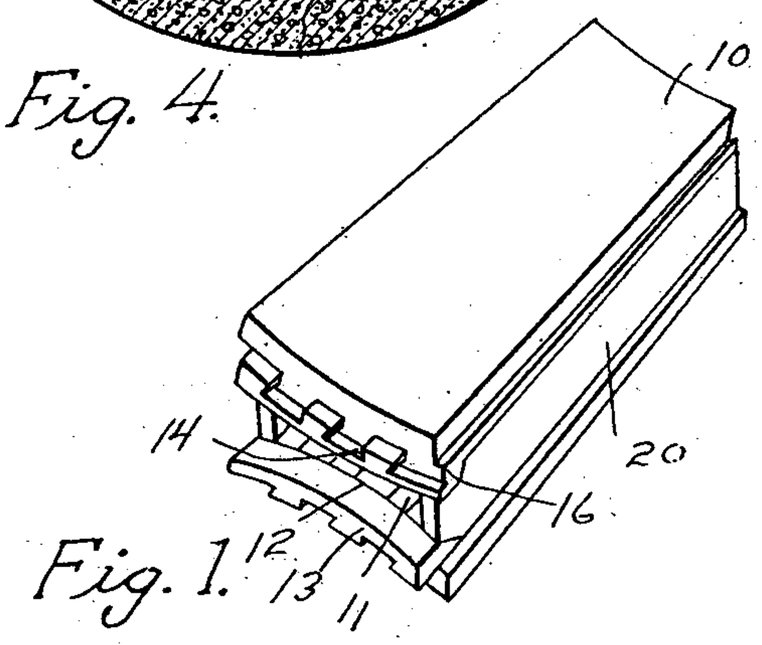

Fig. 1.

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Patented Sept. 4, 1928. 1,683,025

UNITED STATES PATENT OFFICE.

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LINER BLOCK FOR CEMENT SEWER PIPES.

Application filed June 28, 1926. Serial No. 119,187.

This invention relates to improvements in liner blocks formed of vitrified clay to be used in concrete sewer pipes.

Considerable difficulty has been experienced in retaining the liner blocks within the concrete sewer pipes after the same have been installed for a considerable length of time, due to the fact that certain gases are formed by the decomposition of the sewage, among which is hydrogen sulphide gas. This gas is easily decomposed in sulphuric acid which attacks the concrete and decomposes the same, causing the liners to become loosened, which later fall into the bottom of the pipe, leaving the inner surface of the concrete pipe exposed to the action of the gases, the hydrogen sulphide gas entering between the imperfect joints of the blocks, as it is almost impossible to form all the joints absolutely gas tight.

It is, therefore, the object of my invention to provide liner blocks of vitrified clay having joints so constructed that a large percent of the leakage of the destructive gases will be prevented, and further constructed in such a manner that even if one or more blocks in a given area should become loosened, they will not fall out of place, but will be locked in such a manner as to be retained therein.

A further object is to provide liner blocks of vitrified clay in the form of hollow building blocks, which may be readily constructed on a tile machine, and which may be readily broken into a number of slabs of proper dimensions and shapes after the tile has been burned.

My invention consists in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a perspective view of my improved block before it is broken into slabs.

Figure 2 is a perspective view of the inside of one of the slabs.

Figure 3 is a perspective view of the outside of one of the liner slabs.

Figure 4 is a transverse sectional view of a sewer pipe showing the manner in which my improved liner is applied, one portion of the section being cut near the flange of the liner and the other portion being cut near the central portion of the liner.

Figure 5 is an enlarged, detail, sectional view taken on the line 5—5 of Figure 4.

Figure 6 is an enlarged, detail, sectional view taken on the line 6—6 of Figure 4.

Figure 7 is a sectional view taken on the line 7—7 of Figure 5.

My improved liner comprises a body portion 10 substantially in the form of a rectangular slab and slightly curved longitudinally and has its inner face smooth, and the central portion of its back or outer face provided with a series of longitudinally extending ribs 11. The edges of said ribs are beveled inwardly to provide means whereby the tile will be anchored in the concrete.

One end of the body portion 10 is provided with a flange 12 of larger diameter than the body portion 10. The inner face of said flange 12 is provided with a series of longitudinally extending ribs 13, said ribs being spaced apart and having their inner surfaces beveled inwardly to form dovetail grooves 14 between said ribs. The said grooves 14 are designed to receive the ends of the ribs 11 when the end of one slab is placed adjacent to the other. It will be seen that the opposite ends of the ribs 11 terminate in the flange 12, in the manner clearly illustrated in Figure 3.

It will be seen by referring to Figures 3 and 7 that one edge of the back of the body portion 10 is provided with a rib 15 similar to the ribs 11, with the exception that the edge of said rib and the edge of the body portion is provided with a rabbet 16. That portion of the rabbet forming the edge of the body portion is slightly beveled. The opposite edge of the body portion 10 is also beveled at 17 to coact with the beveled edge of the rabbet 16 when two slabs are laid edge to edge. This leaves a portion of the rib 15 overlapping the adjacent end of the body portion of the slab. The adjacent edges of the

flange 12 are beveled in opposite directions from the beveled adjacent edges of the body portion, in the manner clearly shown in Figure 7.

The slabs are arranged over the surface of a cylindrical form or core in the manner shown in Figure 4, said slabs being placed in the upper two-thirds of said cylindrical surface, after which the concrete body portion 18 of the sewer pipe may be cast into position with the concrete entering the dovetail grooves between the edges of the ribs 11, thereby providing means whereby the liner slabs or blocks will be rigidly anchored in position within the pipe 18.

The joints between the edges of the slabs are painted with an acid-proof material 19, which is usually heavy enough to form a seal between the adjacent edges. These joints, however, are not always perfect, due to the fact vitrified tile or slabs usually warp considerably in burning and the joints are never perfect, so there is always a chance for gases and the like to enter between the slabs at various points. The gases usually attack the concrete and decompose it to a certain extent between the liner and the inner face of the sewer pipe.

It will be seen that by providing the longitudinal ribs with beveled edges, I have provided means whereby the slabs or blocks will be anchored in position even after considerable amount of decomposition of the inner surface of the concrete pipe has taken place.

It will further be seen that by beveling the adjacent edges of the slabs in the manner illustrated and described, the side slabs of the lining will assist in locking the top slabs in position.

By providing the inner surface of the flanges 12 with beveled ribs, I have also greatly increased the tendency toward locking one slab to the other, especially the abutting ends of said slabs, so that the whole liner is locked together in such a manner that it will be impossible to move any one of the slabs from position within the pipe without destroying the edges of the abutting slabs, even if the inner surface of the pipe 18 is decomposed to such an extent as to be of no further assistance in supporting the liner.

In order to produce a more rapid construction of the slabs, and also to prevent a large amount of warping while the drying and burning is taking place, I have provided means whereby two slabs may be formed with their convex surfaces facing each other and spaced apart by means of side members 20, as clearly shown in Figure 1, to substantially form a hollow block. The flanges 12 extend inwardly so that the outer surface of said blocks will be substantially rectangular and may be shipped or stacked conveniently, whereas if the flanges 12 extended outwardly, as heretofore has been the practice, the said flanges would greatly hinder the stacking of the ware and cause considerable damage due to breakage. The side members 20 are broken away when the slabs are placed in position, leaving a flat curved slab of the form clearly illustrated in Figures 2 and 3.

Another advantage in forming these slabs in the form of a hollow block having the flanges extending inwardly, lies in the fact that when the side members 20 are broken away, rough portions of the said side members remain on the outer surface of the slab and leaves the inner surface of the slab perfectly smooth, to permit free movement of the water through the pipe. In the drawings I have illustrated slabs which are slightly curved. It will be seen that flat slabs might be provided for lining rectangular pipes or containers without departing from the spirit of my invention.

The drawing also illustrates the liners covering two-thirds of the inner surface of the pipe. It is often desirable, however, to cover the entire inner surface of the pipe, and this also may be done without departing from the spirit of my invention.

Thus it will be seen that I have provided liner slabs for concrete pipes which are of comparatively simple and cheap construction, and which may be easily and quickly applied to the inner surface of the concrete pipe at the time of the construction of the pipe, and which, when so applied, will greatly increase the life of the concrete pipe.

I claim as my invention:

1. A liner block comprising a rectangular body portion having its outer surface provided with longitudinal ribs, and one end provided with an offset flange, the inner surface of said flange being provided with longitudinal ribs, the side edges of all of said ribs being beveled inwardly.

2. A liner block comprising a curved rectangular body portion having at one end a curved offset flange, the concave surface of said flange being provided with ribs extending longitudinally of said block, the side edges of said ribs being beveled inwardly.

3. A liner block comprising a curved rectangular body portion having at one end an offset and curved flange, the concave surface of said flange being provided with ribs extending longitudinally of said block, the side edges of said ribs being beveled inwardly, the side edges of said body portion being provided with a rabbet, the face of said rabbet that forms one edge of the main body portion being beveled inwardly.

4. A liner block comprising a curved rectangular body portion having at one end an offset and curved flange, the convex surface of the body portion being provided with longitudinal ribs terminating in said flange at one end, the side edges of said ribs being beveled inwardly, the concave surface of said

flange also being provided with ribs extending longitudinally of said body portion having their side edges beveled inwardly, the spaces between the last said ribs being designed to receive the ends of the first said ribs of an adjacent block, one edge of said body portion being provided with a rib having its outer side edge provided with a rabbet for receiving one edge of an adjacent block, substantially as described and for the purposes stated.

Des Moines, Iowa, June 17, 1926.

ROY M. DALLAM.