W. C. FLANNERY.

TILE AND FASTENER FOR SEWERS, AQUEDUCTS, OR LIKE CONDUITS.

APPLICATION FILED SEPT. 3, 1913.

1,177,311.

Patented Mar. 28, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

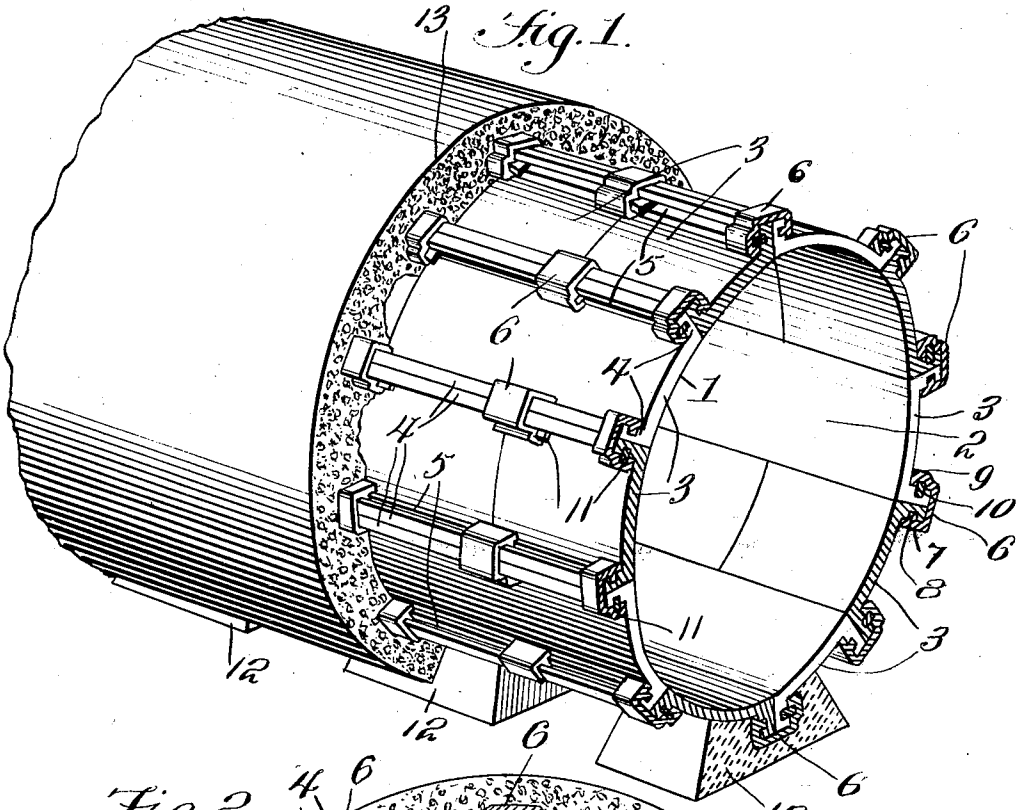
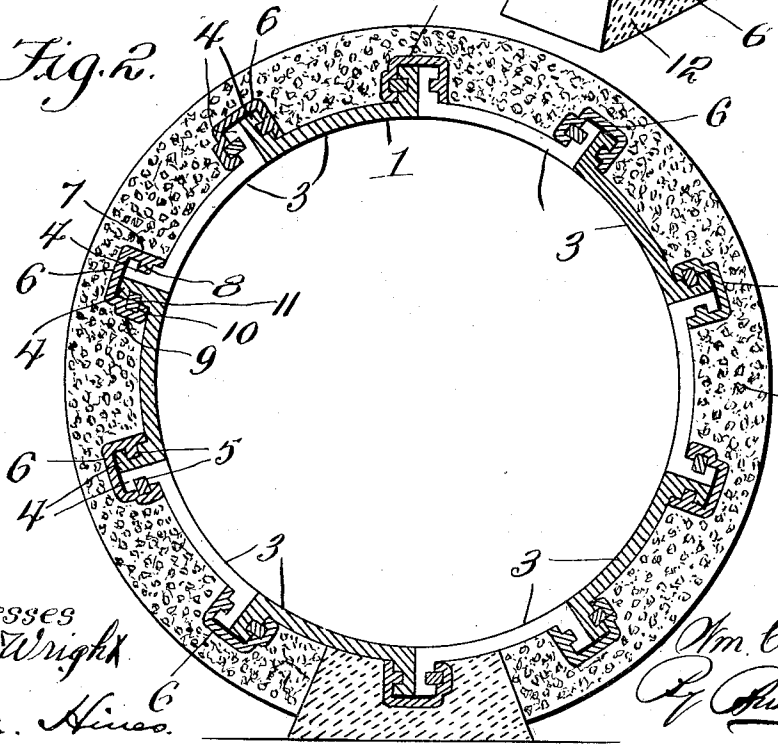


Fig. 2.



Witnesses
J. L. Wright
C. C. Hines.

Inventor
Wm. C. Flannery,
By Munn & Co
Attorneys.

W. C. FLANNERY.

TILE AND FASTENER FOR SEWERS, AQUEDUCTS, OR LIKE CONDUITS.

APPLICATION FILED SEPT. 3, 1913.

1,177,311.

Patented Mar. 28, 1916.

2 SHEETS—SHEET 2.

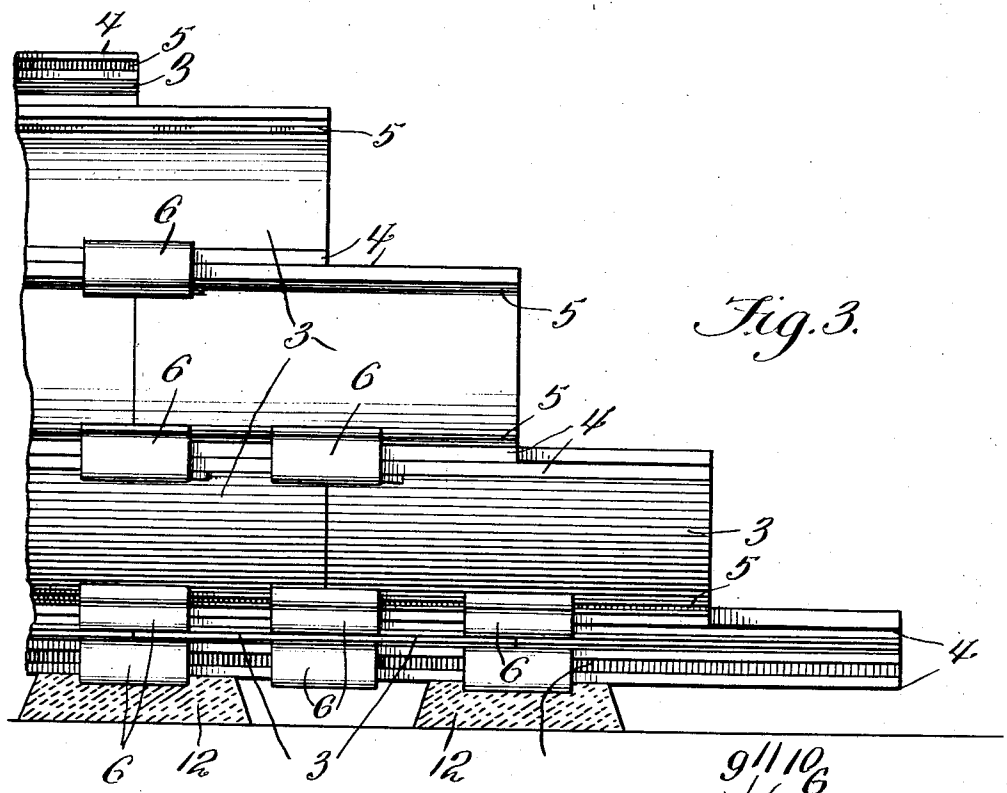


Fig. 3.

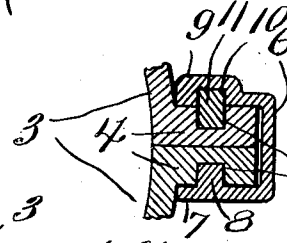
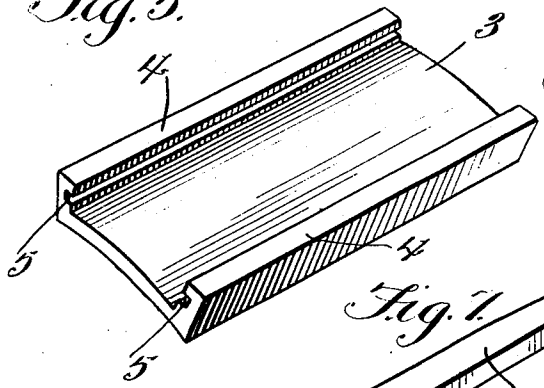


Fig. 4.

Fig. 5.



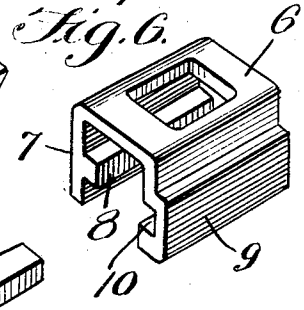


Fig. 6.

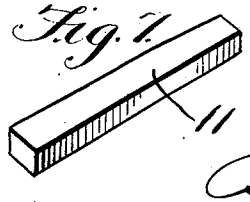


Fig. 7.

Witnesses

J. L. Wright

C. A. Hines.

Inventor

Wm. C. Flannery,

By Bruce & Bruce

Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM C. FLANNERY, OF WASHINGTON, DISTRICT OF COLUMBIA.

TILE AND FASTENER FOR SEWERS, AQUEDUCTS, OR LIKE CONDUITS.

1,177,311. Specification of Letters Patent. Patented Mar. 28, 1916.

Application filed September 3, 1913. Serial No. 788,015.

To all whom it may concern:

Be it known that I, WILLIAM C. FLANNERY, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Tiles and Fasteners for Sewers, Aqueducts, or like Conduits, of which the following is a specification.

My invention relates to improvements in the construction of tiles and fasteners for sewers, aqueducts and like conduits of the general type disclosed in my prior applications No. 639,454, filed July 19, 1911, and No. 683,317, filed March 12, 1912, wherein the sewer or other conduit is formed of a built-up inner wall, lining or shell of tiles, an outer wall of concrete, and a supporting means for, among other functions, holding the said inner wall, lining or shell in spaced relation to the bed of the trench, to sustain the shell during the process of erection and allow the concrete to be filled in on all sides about the same, whereby such supporting means is embedded with the shell in the concrete and forms a part of the completed conduit, thus obviating the necessity of employing forms or falsework and securing the attendant advantages set forth in said prior applications.

The primary object of the present invention is to provide a novel construction of tiles and fasteners for structures of the general type stated, whereby the tiles are adapted to be readily assembled and quickly and conveniently secured in assembled relation.

A further object of the invention is to provide fastening means upon the tiles constructed and arranged to be embedded in the outer wall of concrete of the sewer structure, whereby the parts will be firmly bound together.

With these and other objects in view, which will appear as the nature of the invention is better disclosed, the invention consists of the features of construction, combination and arrangement of parts, hereinafter fully described and claimed, reference being had to the accompanying drawings, in which:—

Figure 1 is a fragmentary perspective view of a sewer or like conduit embodying my invention, showing a portion of the same completed and a portion in the process of erection. Fig. 2 is a vertical transverse section through a completed portion of the conduit. Fig. 3 is a vertical longitudinal section through the portion of the conduit which is in process of erection. Fig. 4 is a vertical transverse section through adjoining tiles and the associated coupling element. Fig. 5 is a perspective view of one of the tiles. Fig. 6 is a similar view of one of the coupling elements. Fig. 7 is a view of a wedge key employed in connection therewith.

In the construction of a sewer or like conduit embodying the principles of the present invention, I provide an inner wall, lining or shell 1, built up into the desired cross sectional shape or contour to bound and inclose the sewer passage or channel 2, the said wall, lining or shell 1 being formed of united or radial segmental tiles 3, *i. e.*, tiles curved on an arc of a circle of a given radius. These tiles are preferably arranged to break-joint throughout the length of the sewer, and may be and preferably are of an acid-proof or acid-resisting character. In practice, ordinary salt-glazed tiles may be used with advantage, which tiles are made in different sizes to suit the diameter of the conduit to be constructed. The tiles may be shaped to produce an inner wall, lining or shell which may be of circular form in cross section, as shown, or of any other desired cross sectional contour. The tiles are adapted to be coupled together to form the inner wall, lining or shell, so that the body of the sewer or conduit may be built-up or constructed to a large extent *in situ*. To this end, the longitudinal marginal edges of the tiles are provided with outwardly projecting abutment flanges 4 provided along their inner surfaces with grooves 5. The inner faces of the flanges 4 of adjoining tiles abut squarely together, and such flanges are united by U-shaped coupling elements or members 6, made of metal, clay or other suitable material. This coupling embraces the flanges and has one of its side walls 7 provided with a longitudinally extending rib or tongue 8 to fit within the groove 5 of the flange of one of the tiles, and its other side 9 slightly thickened or offset and provided with a longitudinally extending groove 10 adapted to receive a tapered or wedge-shaped key 11 which extends into the groove of the flange of the other tile and when inserted in position holds the coupling element in place and the flanges of the tiles firmly assembled.

Any number of these coupling elements may be employed, as occasion may require, to hold the tiles firmly and securely assembled. The said inner wall, lining or shell 3 is supported within the trench by concrete blocks or pedestals 12, preferably of frusto-pyramidal form. These blocks or pedestals rest upon the bed or base of the sewer trench and support said inner wall, lining or shell therefrom and in spaced relation thereto. The blocks or pedestals may be molded exteriorly of the trench and placed in position therein, or molded or otherwise formed within the trench, and preferably the two bottom tiles of the series of tiles throughout are embedded with their connecting flanges and coupling elements in the underlying pedestal, by which the shell as a whole is more firmly and rigidly supported in position and the starting tiles at the base of the trench initially sustained so that the other tiles can be built up thereon in a ready and convenient manner to complete the formation of the shell.

In the process of assembling the elements described, it will be understood that the bottom tiles with the pedestals are molded or placed in position, after which the tiles composing the sides of the shell are coupled on up to the spring line and finally the tiles forming the crown or arch are placed in position and coupled to each other and to the previously assembled tiles. A rigid self-sustaining shell is thus produced which is then completely embedded in an outer wall 13 of concrete, in which the supporting blocks or pedestals 12 are also partially or entirely embedded, producing a monolithic sewer or other conduit structure. It will be observed from the foregoing description that a sewer or like conduit thus constructed may be produced without the use of erecting forms or other false work, thus reducing the cost of constructing the sewer, the amount of time and labor required in its production, and obviating the cost and maintenance of a large amount of framing and forming elements, the supporting means in this structure, *i. e.*, the blocks or pedestals 12 being enveloped with the shell in the outer concrete wall 13 and forming companion parts of the sewer structure. It will further be observed that these blocks or pedestals give the shell independent support from the bed of the sewer in addition to that secured from the wall 13, and that they also reinforce the wall 13 and adapt it to more effectually withstand the imposed strains and pressures, resulting in the production of a simple and inexpensive, yet exceedingly strong and durable type of sewer. In the process of construction, the pedestals 12 support the shell as a whole above the bed of the sewer, allowing the concrete to be easily filled in at all points, and as each section of the shell is built up to a certain degree, the work of filling in the concrete may be begun without waiting until the shell is completely formed at any certain point. It will be evident that in this type of sewer the inner wall or shell, in addition to serving as an acid-proof lining to protect the concrete from disintegration under the action of acids and alkalis in the sewage, also provides the form about which the outer concrete wall is shaped, the entire structural and forming elements being, therefore, embodied in the sewer structure.

I claim:—

1. In combination, tiles having longitudinally extending abutment flanges provided with grooves in the inner faces thereof, a U-shaped coupling device embracing said flanges, said device having one of its sides provided with a rib to engage a groove in one of the abutment flanges, and its other side provided with a groove to register with the groove in the other abutment flange, and a tapered key adapted for insertion into said grooves to lock the coupling device in position.

2. In combination, segmental tiles having abutment flanges along their longitudinal edges, the inner surfaces of said flanges being formed with longitudinal grooves, and the flanges of adjacent tiles being arranged to abut, U-shaped coupling members embracing said flanges, each coupling member having one of its sides provided with a rib to engage the groove in one of the abutment flanges, and its opposite side provided with a groove to register with the groove in the other abutment flange, and a tapered key fitted in said grooves and securing the locking device in position.

3. In combination, tiles provided with longitudinal abutment flanges having grooves in the inner surfaces thereof, a U-shaped coupling member embracing said flanges, said coupling member having one of its sides provided with a longitudinally extending rib engaging the groove in one of the abutment flanges, and having its opposite side provided with an offset portion formed with a groove registering with the groove in the other abutment flange, and a tapered key inserted longitudinally into said grooves and locking the coupling device in position.

In testimony whereof I affix my signature in presence of two witnesses.

WILLIAM C. FLANNERY.

Witnesses:
M. MARKHAM FLANNERY,
MARY P. FLANNERY.