No. 722,247. PATENTED MAR. 10, 1903.

J. & D. W. OHAVER.

SUBWAY CONSTRUCTION.

APPLICATION FILED NOV. 1, 1902.

NO MODEL.

Fig. 1.

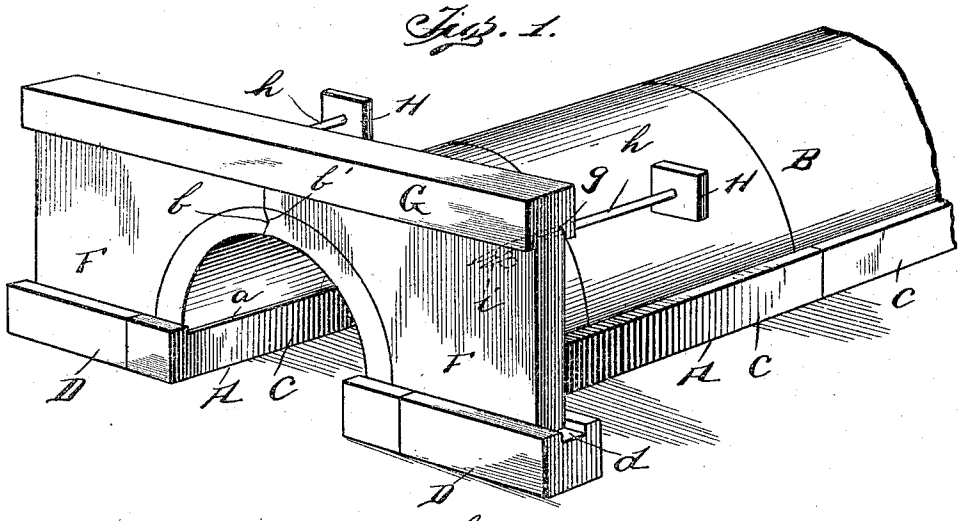


Fig. 2.

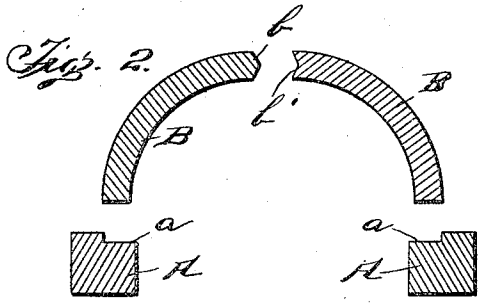


Fig. 3.

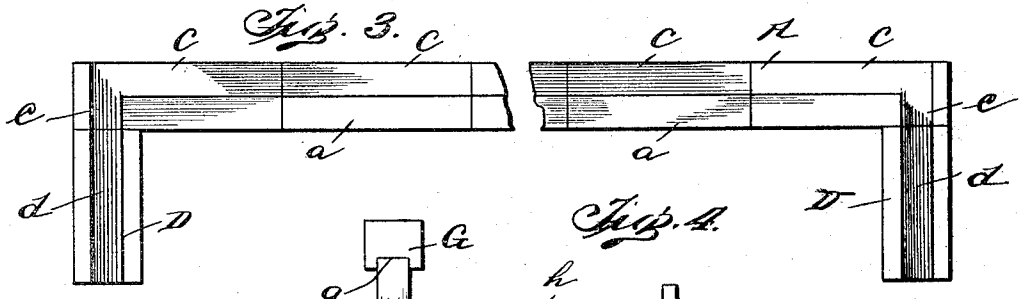
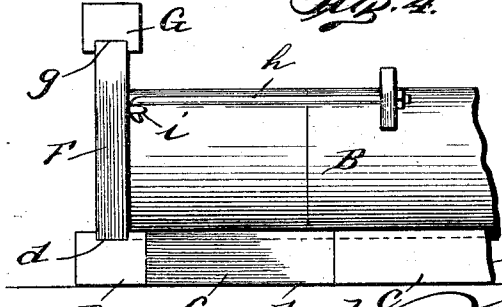


Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

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SUBWAY CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 722,247, dated March 10, 1903.

Application filed November 1, 1902. Serial No. 129,683. (No model.)

To all whom it may concern:

Be it known that we, JAMES OHAVER and DAVID W. OHAVER, citizens of the United States, residing at Rockville, in the county of Parke and State of Indiana, have invented certain new and useful Improvements in Subway Constructions; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improvement in subway constructions or culverts; and its object is to make a subway construction which is composed of sectional blocks and which can be easily transported from place to place and be quickly set up in any desired sizes and lengths and be withal strong and durable.

In the drawings, wherein a preferable embodiment of our invention is shown, Figure 1 is a perspective view of our subway construction when complete. Fig. 2 is a transverse section with the parts separated. Fig. 3 is a top plan view of one of the side sills broken away in the center, and Fig. 4 is a side elevation view of our invention.

Referring now to the drawings, in which like letters of reference refer to similar parts in the several views, A represents the sills, on which the arch-sections B are adapted to set. Each sill is composed of a number of longitudinal sections C and of the end sections D, extending laterally therefrom. The longitudinally-disposed sections or blocks are adapted to support the arch-sections, while the sections or blocks extending laterally therefrom are for the support of the end walls F. The arch-sections B consist of slabs of molded cement or other suitable material of any desired and practical curvature. Each section is flat on the edge which is adapted to rest on the sills, while their upper adjoining edges are formed with interlocking means, preferably a tongue and groove, as shown at *b* and *b'*. The longitudinally-disposed blocks of the sills, with the exception of those adjoining the end blocks D, are formed with a ledge *a* along their front edge, on which the arch-sections are adapted to rest. The blocks of the longitudinally-disposed series adjoining the blocks D are also provided with the ledge *a;* but the ledge instead of extending the full length of the block terminates short of one end of the block, where it is intersected by a groove *c* of approximately the same depth as the ledge, which extends from the end of the ledge to the back edge of the block, thus forming a groove in the block, which stands at right angles to the ledge. The end sections D are also formed with grooves *d*, which form a continuation of the hereinbefore-described grooves *c* when the blocks are set in their proper position. These grooves *c* and *d* are for the purpose of receiving and supporting the edges of the end walls F. These slabs F are in the nature of end walls extending a suitable distance laterally beyond the arch, the inner lower ends of said walls or slabs being cut away to conform to the curvature of the arch, so that when in place they will overlie the arch. The end walls F are of such thickness that they can readily be inserted in the grooves *c* and *d*. To connect the two end walls, we employ a cap section or block G, which is formed with a groove *g*. This cap-section is adapted to overlie the top of the two end walls, the top edges of which fit into the groove *g*. As a further means for holding the end walls F in position we provide anchors therefor, which consist of weights H, attached to iron rods *h*, which are fastened to the end walls F by means of staples *i*, which are embedded in the walls F at the time of their manufacture. These anchors are adapted to be embedded in the earth which is packed around the arch after it has been completed.

Having described the various parts of our invention, we will now describe the method of assembling them.

Sills of the desired length are first placed on the ground at a proper distance apart with their ledges facing each other. The curved arch-sections are then placed so that their bottom edges rest on the ledges of the sills and their top edges interlock. The end walls are then placed in position with their bottom edges resting in the grooves *c* and *d* and their curved edges overlying the arch. The cap-section is then placed over the top edges of the end walls and the whole is then covered with dirt.

While a particular embodiment of the in-

vention is disclosed in the drawings, it is not the intention to be limited to the precise details and arrangement shown, because it is obvious that many minor changes and alterations therein may be made without in the least departing from the spirit of the invention.

What we claim, and desire to secure by Letters Patent, is—

1. In a structure of the character described, a base comprising a pair of sills, said sills consisting of a series of longitudinally-disposed blocks and of end blocks extending laterally therefrom, a series of arch-blocks resting on the longitudinally-disposed blocks of the sills and meeting at their upper edges, and end walls resting on the end blocks of said sills and overlying said arch-sections, as and for the purposes set forth.

2. In a structure of the character described, a base comprising a pair of sills, an arch supported by said sills, end walls resting on said sills and overlying the arch and means for connecting the top edges of said end walls, as and for the purposes set forth.

3. In a structure of the character described, a base comprising a pair of sills, said sills consisting of a series of longitudinally-disposed blocks and end blocks extending laterally therefrom, arch-sections resting on the longitudinally-disposed blocks and end walls resting on the end blocks and overlying the arch, said longitudinally-disposed blocks being provided with ledges along their inner edges and said end blocks being provided with grooves for the support of the bottom edges of the arch-sections and end walls respectively, as and for the purposes set forth.

4. In a structure of the character described, a base comprising a pair of sills, said sills consisting of a series of longitudinally-disposed blocks provided with supporting-ledges, end blocks extending laterally therefrom and having grooves in their tops, arch-sections resting on the ledges of the longitudinally-disposed blocks, end walls resting in the grooves of the end blocks and overlying the arch, and a cap-section resting on and connecting the top edges of said end walls, as and for the purposes set forth.

5. In a structure of the character described, a base comprising a pair of sills, an arch supported by said sills, end walls supported by said sills and overlying said arch, a cap-piece resting on and connecting the top edges of said end walls, and anchors attached to said end walls, as and for the purposes set forth.

6. In a structure of the character described, a base comprising a pair of sills, an arch supported by said sills, end walls supported by said sills and overlying said arch, and anchors attached to said end walls, as and for the purposes set forth.

7. In a structure of the character described, a base comprising a pair of sills, said sills consisting of a series of longitudinally-disposed blocks provided with ledges for supporting an arch and end blocks extending laterally therefrom and provided with grooves in their tops for supporting end walls, and blocks at the intersection of said longitudinally-disposed blocks and end blocks, provided with a ledge registering with the ledges of the other longitudinal blocks and a groove registering with the groove in the end blocks, as and for the purposes set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES OHAVER.
DAVID W. OHAVER.

Witnesses:
JOSEPH CRONIN,
MAHLON W. MARSHALL.