Nov. 18, 1924. 1,515,709

A. H. STOWELL

IRRIGATION DITCH

Filed May 23, 1922

Fig. 1.

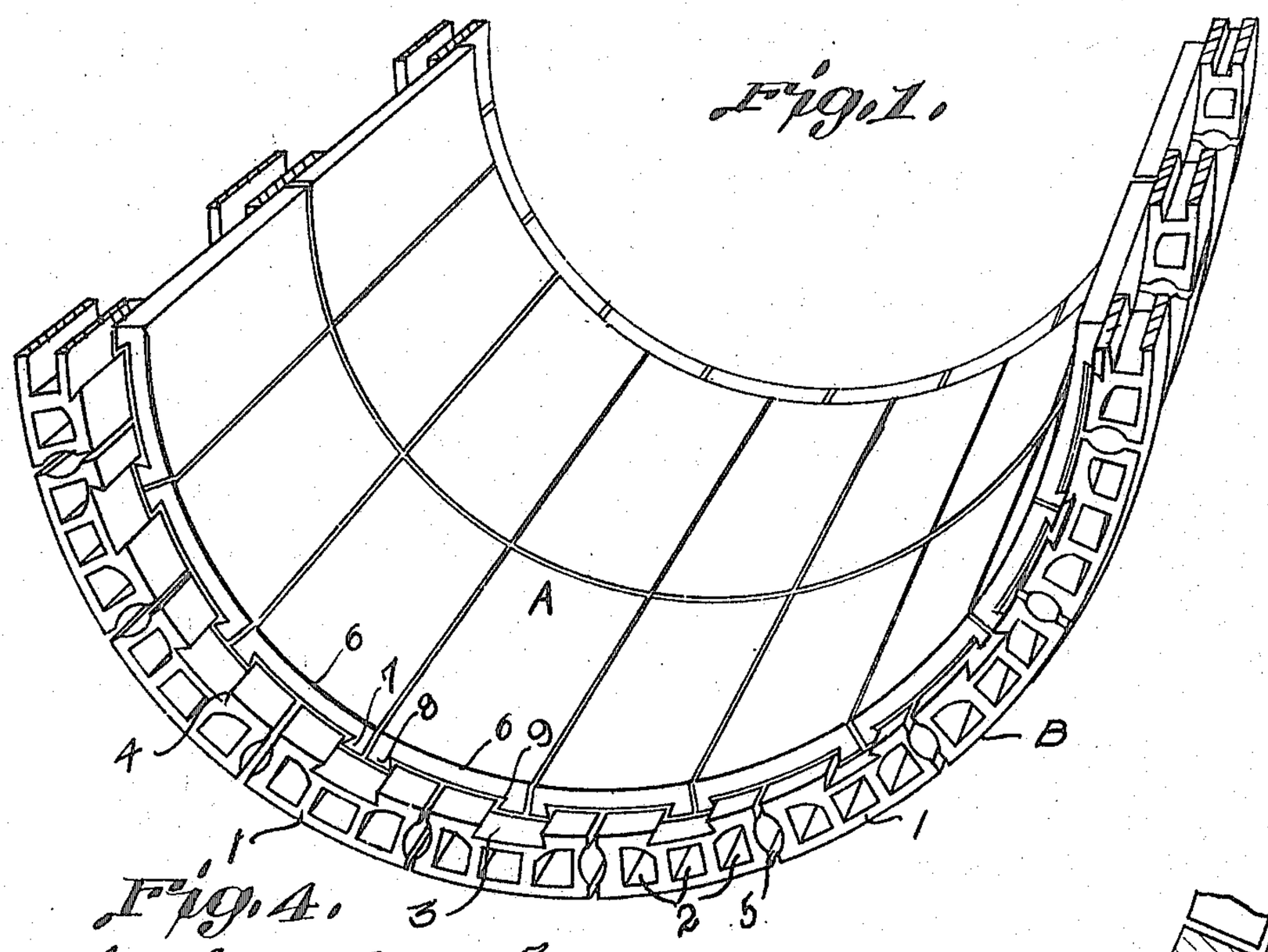

Fig. 4.

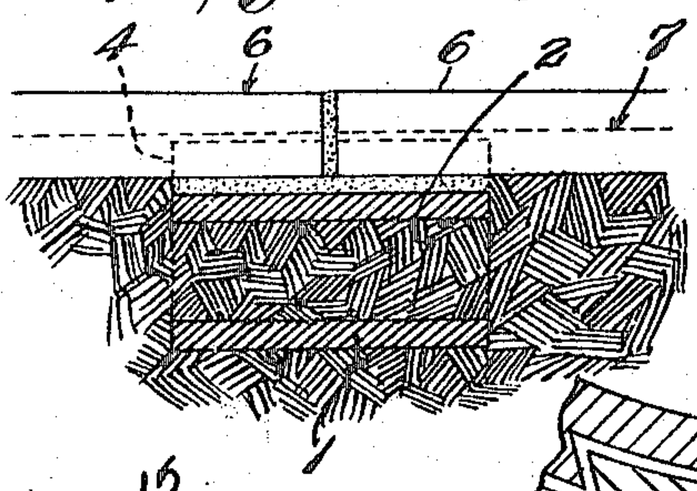

Fig. 2

Fig. 3

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IRRIGATION DITCH.

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To all whom it may concern:

Be it known that I, AUGUSTUS H. STOWELL, a citizen of the United States, residing at Spokane, in Spokane County, and State of Washington, have invented certain new and useful Improvements in Irrigation Ditches, of which the following is a specification.

My present invention relates to improvements in irrigation ditches used in hydraulic engineering, and the subject matter of the invention may be utilized in open construction sewers. The primary object of the invention is the provision of ditches, flumes, or open sewers that may be laid or built up of comparatively inexpensive material; which will not require skilled labor in their construction, but which may be built with facility and their parts rigidly keyed together with the whole bonded to the earth-walls of the ditch to prevent displacement.

The invention consists essentially in constructing the curved wall of the ditch or flume of rigidly interlocked sections comprising the outer bearing wall and inner lining wall or layer, of interlocked, keyed, and anchored elements, as tiles and hollow blocks, and in certain novel combinations and arrangements of these parts as will be hereinafter more specifically set forth and claimed.

In the accompanying drawings I have illustrated one complete example of the physical embodiment of my invention wherein the parts are combined and arranged according to the best mode I have thus far devised for the practical application of the principles of my invention, and a modified form of the invention is also disclosed in the drawings.

Figure 1 is a perspective view showing the completed wall of a ditch or flume according to my invention.

Figure 2 is an enlarged, detail, sectional view of part of the wall, formed as a rigid structure.

Figure 3 is a detail sectional view of a modified form of the flume or ditch wall.

Figure 4 is a sectional view taken longitudinally of the flume through one of the exterior hollow blocks, as at line 4—4 of Figure 2 indicating the anchoring means for the transverse courses.

The subject matter of the invention as before stated is applicable for use in constructing open sewers, flumes, irrigation ditches &c. in hyydraulic engineering and contemplates the formation of a solid, rigid and water-sealed wall laid in an excavated ditch or flume, the whole forming a substantial and durable wall or facing for the excavated ditch by means of which water may be flowed therethrough as desired.

The ditch wall as a whole comprises an inner lining wall indicated by the letter A and an outer bearing or supporting wall designated as a whole by the letter B, these sections being made up of units keyed together and the whole anchored solidly in the soil of the excavated ditch. The ditch wall as shown is built or laid upon a concave surface, the diameter of the arc being variable within limits to adapt the wall to various sizes of ditches.

In constructing the flume or ditch, after suitable excavation has been made, the bearing or supporting wall is made up of hollow blocks, preferably of burned clay, cement or concrete material, which are fashioned with one or more openings 2 extending longitudinally therethrough. These blocks are laid on the surface of the excavation, and the openings 2 adapted to receive mud or soft earth which when hardened forms an anchorage between the walls of the excavation and the bearing blocks. The blocks are laid in transverse courses and the filling material may be packed or tamped into the openings 2 as the successive courses are laid.

At the inner side of the curved block, a central longitudinal groove 3 is fashioned, extending from end to end thereof, and the lateral walls 4 of these grooves are undercut or formed of dovetail shape. At each side of the block are formed longitudinally extending grooves 5, which may have curved faces as shown, and these grooves also extend from end to end of the block to form bonding members between adjacent blocks. The complementary grooves 5 of adjoining blocks are adapted to receive cement to form the required bond, and the entire seam between these adjoining blocks is adapted to be cemented in usual manner. By this construction and arrangement of parts the bearing wall is laid or built up of the blocks 1, in transverse courses, the blocks being anchored to the earth-facing of the ditch, and all adjoining blocks being bonded together by cement filling in the seams and bonding grooves 5. A rigid, substantial, and durable bearing wall is thus

provided that is insured against slides or displacement as it is anchored to the excavation walls, and the units forming the bearing wall are bonded and keyed together.

The lining or inner wall A is made up of curved tile, arranged in transversely extending courses, with the tile staggered or overlapping the bearing wall blocks.

On its curved convex outer face each tile is fashioned with longitudinally extending beads 7 and 8 projecting outwardly along the lateral edges of the tile, and the inner walls of each of these beads are undercut, or dovetailed as at 9 to conform to the dovetail grooves in the inner convex faces of the hollow blocks of the bearing wall. The tile are laid with their complementary beads 7 and 8 on adjoining tiles disposed within the dovetail groove of the blocks, i. e., two tiles are interlocked with each block, and the adjoining beads 7 and 8 with their oppositely disposed undercut faces, when cemented together are keyed in the dovetail grooves. The tiles are positioned by setting them, either singly or in pairs, with the dovetail double-bead 7—8 occupying the dovetail groove of a block, and the seams and the spaces between the tiles and blocks are adapted to be cemented or filled with cement to key the parts together. The inner face of the inner wall or lining thus presents a smooth, plane curved surface over which water may flow freely, and which is impervious to the water and sealed against leaks.

In the modified form of the invention of Figure 3 the bearing wall is made up of tiles 10, curved to conform to the excavation of the ditch, and each of these tiles is fashioned with an exterior, central, longitudinal rib 11, adapted to be imbedded in the surface of the ditch excavation as an anchorage for the wall.

At its inner side the outer tile is formed with a central longitudinal groove 12 complementary to the exterior rib, and these outer tiles are laid in transverse courses upon the excavated surface. The inner wall or lining is made up of curved tile 13 also laid in transverse courses and the inner tiles span adjoining outer tiles, overlapping each adjoining tile so that complementary lateral beads 14, 15 at the side edges of the inner tiles fit into the grooves in the outer tiles. The course of inner tiles is cemented or keyed with cement filled in between the ribs and grooves and between the tiles and seams, providing a smooth surface for the inner face of the flume or ditch.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is—

1. In a hydraulic ditch a bearing wall comprising units laid in spaced transverse courses for anchorage in the soil of an excavation and an inner lining wall composed of tiles laid in adjoining transverse courses and overlapping adjoining units of the transverse courses, said tiles having means for interlocking with the units of the outer wall and keyed together.

2. In a hydraulic ditch a bearing wall comprising hollow blocks arranged in spaced transverse courses and each having an opening therein for anchorage to the soil of an excavation, an inner lining wall comprising tiles laid in complementary courses, exterior beads at the lateral edges of each tile and the adjoining beads of said tiles having undercut inner faces and adapted to interlock in pairs in a complementary centrally arranged groove in a block, and said blocks having lateral grooves to form cement bonding spaces.

In testimony whereof I affix my signature.

AUGUSTUS H. STOWELL.