J. G. ZWICKER.

FLOOR AND ROOF CONSTRUCTION.

APPLICATION FILED NOV. 13, 1907.

929,364. **Patented July 27, 1909.**

Fig. 1

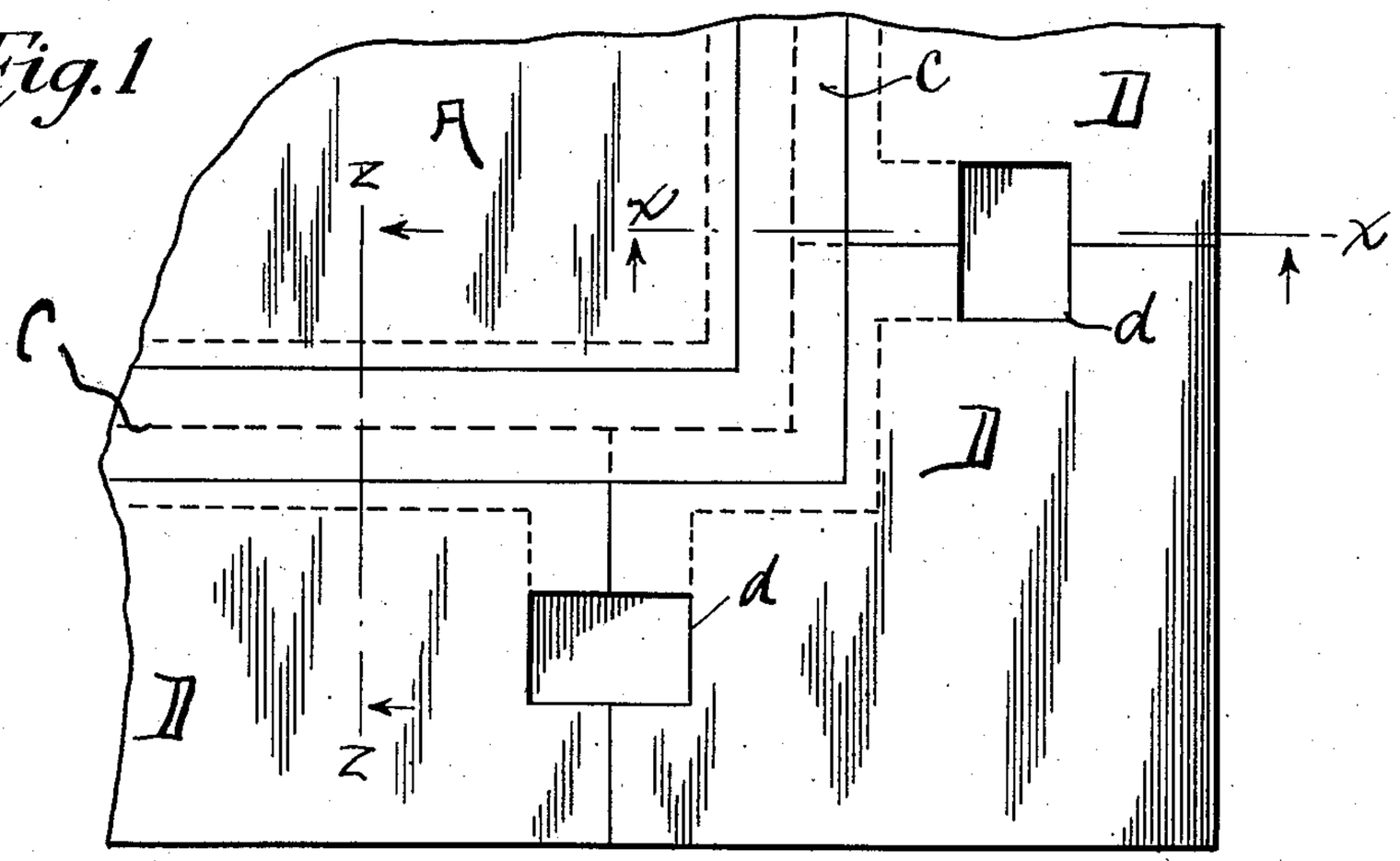


Fig. 3

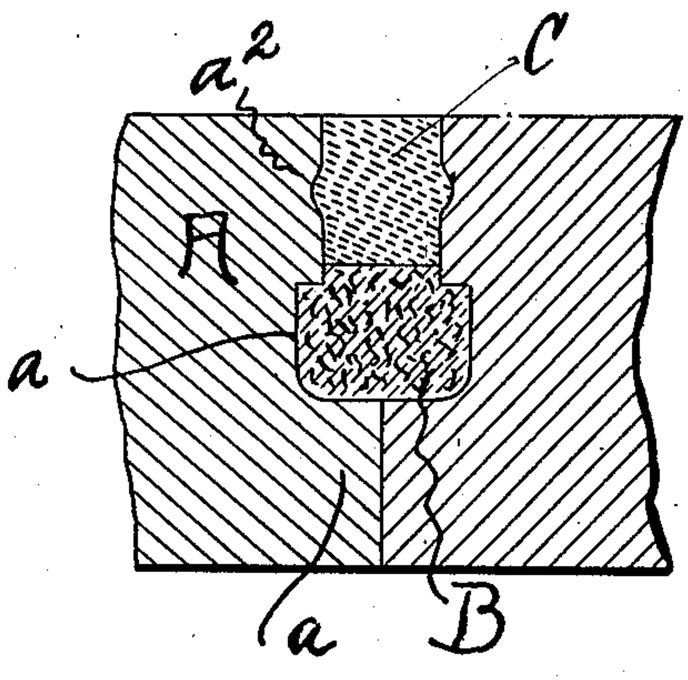
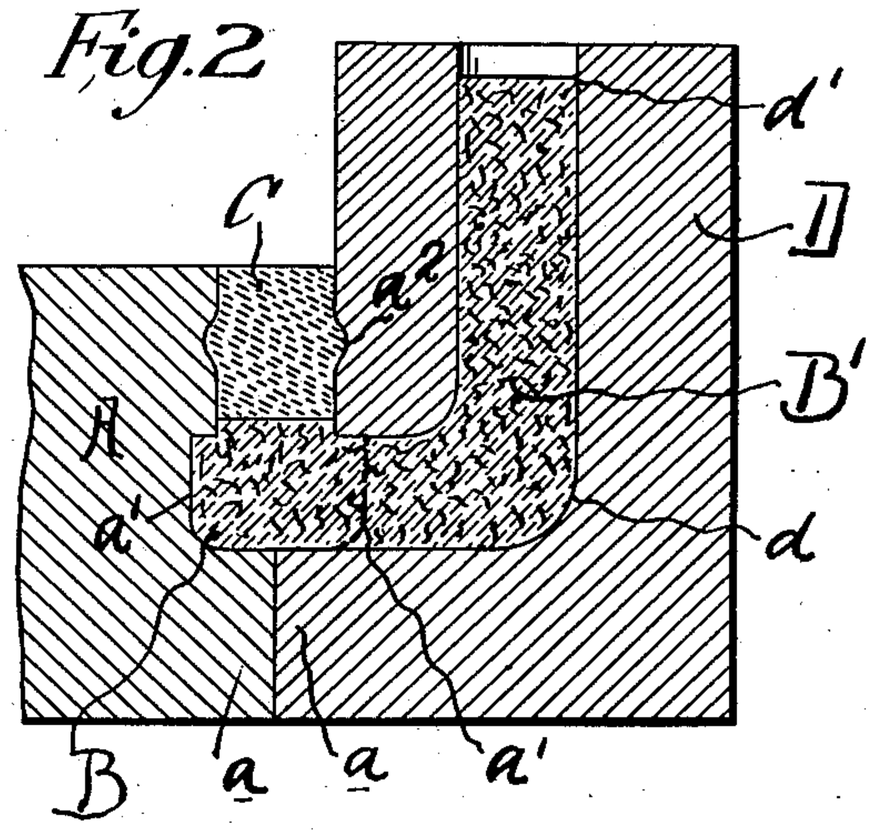


Fig. 2



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UNITED STATES PATENT OFFICE.

JULIUS GOTLOB ZWICKER, OF MEXICO, MEXICO.

FLOOR AND ROOF CONSTRUCTION.

No. 929,364. Specification of Letters Patent. Patented July 27, 1909.

Application filed November 13, 1907. Serial No. 401,922.

To all whom it may concern:

Be it known that I, JULIUS GOTLOB ZWICKER, a citizen of the United States, residing at the City of Mexico, State of Mexico, and Republic of Mexico, have invented certain new and useful Improvements in Floor and Roof Construction, of which the following is a specification.

My invention relates to floor and roof constructions and particularly to a floor or roof composed of sections or units, and means for making waterproof the joints between units or sections, and to units or sections of impermeable material having side edges so formed as to permit of their holding the waterproofing filling in place.

The object of my invention is to provide an absolutely watertight face for roofs, floors, or the bottoms of reservoirs or tanks, and this object is attained by the peculiar construction and arrangement of parts hereafter described and particularly set forth in the claims appended.

In the drawings, Figure 1 is a plan view of a portion of a floor, roof or reservoir bottom. Fig. 2 is a section on line *x*—*x*, Fig. 1. Fig. 3 is a section on line *z*—*z*, Fig. 1.

Like characters throughout the several views indicate like parts.

A designates a block or unit of stone, brick, tile or composition, either solid or hollow, and of any desired size or shape in plan, which shall admit of the contiguous sides of adjacent blocks being parallel to each other along the whole longitudinal extent of said sides. I have shown the blocks as rectangular in plan and prefer to make them of this shape.

Each edge of each block is rabbeted so as to form an outwardly projecting horizontal flange *a* projecting out beyond the upper portion of the tile or block on all sides and adapted to contact with the outwardly projecting flange of the next adjacent block. Thus while the lower portions of each of the units contact with each other when the units are in position, the upper portions of the edges of adjacent units or blocks are separated. Thus there is a channel formed between two adjacent blocks, said channel being closed at its bottom for the reception of certain waterproofing and joint-filling materials. All the edges of the block just above the flange *a* are recessed as at *a'*, said recess extending along the entire edge of each side. This recess is horizontal and parallel with the upper face of the block and the upper wall of the recess is at right angles with the edge of the block, the lower wall of the recess being slightly inclined or curved. Above the recess *a'* the edge of the unit or block is longitudinally grooved as at *a''*. This groove is very slight and is merely for the purpose of more thoroughly engaging the concrete filling C.

B designates the filling of sulfur, pitch, asphalt or similar waterproof substance which if protected will keep a permanent state of plasticity. This is poured in a heated condition into the channel between the blocks and fills the lower portion of the channel and the recess *a'* of each block. Preferably the plastic material B fills the channel to a point slightly above the recess *a'*. When this lower filling B has sufficiently hardened the upper portion of the recess formed by the adjacent rabbeted faces is filled with a filling C of cement or concrete or other relatively hard and impermeable material, this being held firmly in place by the locking groove *a''*.

The object of this construction is as follows: It is well known that asphalt, pitch or similar substances with which seams or joints in constructions of this kind are filled, more quickly deteriorates when exposed to the elements and to change of temperature and thus cease to fulfil their functions. It is necessary then that material of the character of pitch, tar, asphalt or other ingredients of a plastic character peculiarly sensitive to the action of the elements and particularly to the action of heat and cold should be protected from exposure to the air or to the elements or in the case of reservoirs, etc., exposure to the action of water, and therefore I provide the covering filling C which is of a relatively hard character, as for instance, cement or concrete. Cement or concrete is not as good material with which to waterproof the joints of a floor, roofs, or reservoir construction as is pitch or tar, etc. but it is much more capable of withstanding variations in temperature and exposure to the elements: Hence I have devised this mode of combining both of these filling agents so

that the lower filling will be protected from deterioration and will therefore maintain its waterproofing qualities for a long period.

An important feature of my invention resides in the peculiar form given to the adjacent edges of the units or blocks and particularly to the peculiar form of the recess a' which is horizontal or parallel with the plane of the floor or wall and has a flat upper face at right angles with the edge of the block, tile or unit and a lower face having the same general character. This permits expansion or contraction of the units while the joint is also fully protected. The upper side of the recess a' will slide on the filling B while at the same time a pressure will be exerted downward upon the filling causing it to retain its waterproof qualities. It will be also noted that the lower corner of the recess a' is rounded. In the slight expansion of the tiles, blocks or other units, these rounded corners act to wedge the material up against the upper face of the recess a' and to press it there and fill the entire space between the tiles. This expansion of the blocks, tiles or other units is extremely slight and almost infinitesimal but it must be taken into account and any construction which does not take it into account cannot be entirely waterproof. It will be seen that the tarry or pitchy material used to form the lower filling B is in a condition of much greater softness and plasticity than the material C and that being protected from the air, sun or water as it is it will to a large extent retain its plasticity and its capability of filling the space between the units and keeping the joint tightly packed.

In Fig. 2 I have shown the joint heretofore described as modified by use with a curbing or edge blocks or units. The inside face of each curb unit D is made as heretofore described with regard to the central sections or units; that is with a rabbeted edge, a projecting portion a, a recess a' and a groove a'', but at the end of each of these edge or curb units I provide a recess d extending downward from the top to a level with the recess a'' and then outward to connect with said recess. This construction is plainly shown in Fig. 2. This recess d is then filled with tar, pitch, sulfur, asphalt, or other plastic or semi-plastic material B′ up to the point d' or thereabout and above this point the recess is filled in with concrete or cement as before described, the filling B′ naturally attaching to and becoming an integral part of the filling C.

The result of the construction heretofore described is that every joint is fully protected by a permanent filling of plastic material not liable to get out of place, adapted to always cover the joint; and also with a protective covering or a shield of relatively hard material. Thus there are no cracks or joints through which water can percolate and experience has shown that roofs constructed in this fashion will last and retain their waterproof qualities much longer than roofs of the ordinary construction.

It is to be understood that while I have named sulfur, pitch, tar and asphalt as the materials to be used for the inner filling, and cement and concrete as the materials to be used for the outer filling, I do not wish to be limited to these materials as it is evident that other materials of like qualities or attributes might be used. Neither do I wish to be limited to the use of my construction in floors and roofs as it is plain that it might be used for a variety of masonry constructions and for vertical constructions as well as horizontal.

In using the term relatively soft material throughout the claims, I do not wish to be limited to material which will remain entirely soft and plastic but refer particularly to material which would be easily deteriorated and damaged by contact with water or would be injured by exposure to the sun, the essence of my invention lying in the protection of such relatively easily damaged filling by an outer filling of relatively hard and undamageable material, the special construction of the contiguous edges of the blocks or sections peculiarly adapting them for use with this filling, but I do not wish to be limited to the use of such blocks or sections.

Having described my invention, what I claim is:

1. In a floor or roof construction, a series of contiguous blocks or sections, the adjacent edges of said blocks on all four sides being rabbeted so that a channel will be formed between the blocks, said channel being closed at the bottom; all four edges of the block at the lower portion of the rabbet having an inwardly extending continuous recess, the upper wall of said recess being horizontal and at right angles to the edge of the block, the wall of said rabbet above said recess being formed with a longitudinal locking groove; a relatively soft permanently plastic material filling the bottom of said channel and said recess, the upper portion of said channel and said groove being filled with a permanently hard but originally plastic material protecting the said inner filling.

2. In a roof or floor construction, a series of main blocks contiguous on their under surface; and a series of curbing blocks having edges contiguous with the edges of the main blocks, the contiguous edges of the said main and curbing blocks being rabbeted to form on each block an outwardly projecting flange, the edge of each block being provided just above said outwardly extending flange with a longitudinal recess; a relatively soft permanently plastic waterproofing material filling the bottom of said recess and the said

recess in each block, the upper portion of said recess being filled with a permanently hard but originally plastic material protecting the said inner filling, the contiguous ends of said curbing blocks being each provided with a vertical recess extending downwardly and then inwardly and joining the longitudinal recess formed on the edge of the said curbing block; relatively soft material filling said recesses at the ends of the said curbing blocks and contacting with and forming part of the inner filling of the edge recesses before referred to; and an outer filling of permanently hard but originally plastic material filling the upper portion of said end recesses of said curbing blocks.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this twenty-first day of October 1907.

JULIUS GOTLOB ZWICKER.

Witnesses:

CHARLES GRANT KOFFROTH,

HERBERT M. COOLEY.