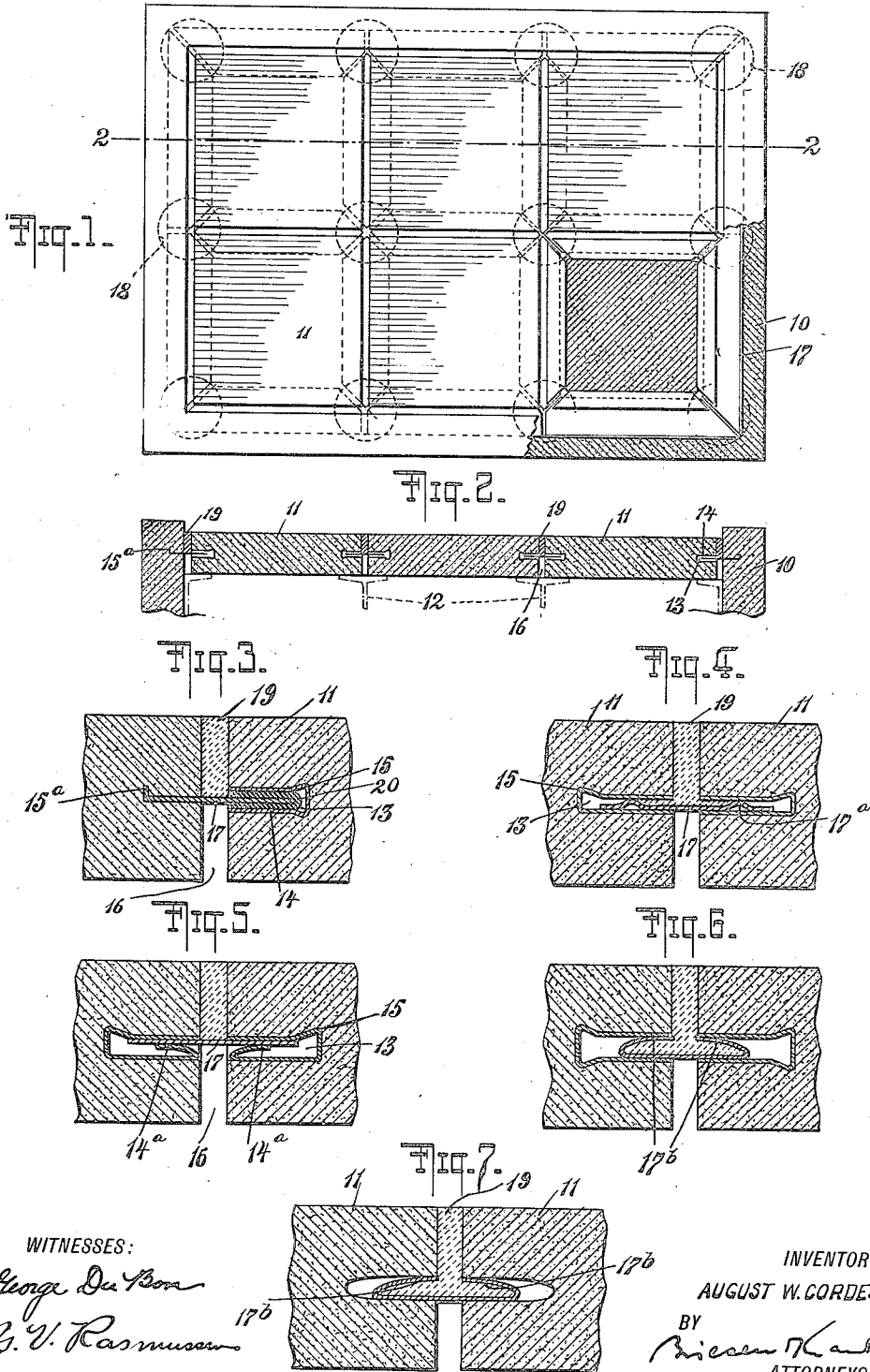


A. W. CORDES.
EXPANSION AND CONTRACTION JOINT.
APPLICATION FILED JULY 14, 1913.

1,122,866.

Patented Dec. 29, 1914.



UNITED STATES PATENT OFFICE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, AUGUST W. CORDES, a citizen of the United States, and a resident of the borough of Manhattan, city, county, and State of New York, have invented a certain new and useful Improvement in Expansion and Contraction Joints, of which the following is a specification.

My invention relates to expansion and contraction joints and more particularly to joints of this description adapted for use in connection with tile roofs, sidewalks, mosaic and concrete or other coalescent flooring and surfaces composed of units or elements of similar materials and other like constructions. It is well known in structures of this kind that variations in temperature produce physical changes therein, which result in cracks or other injuries either in and to the joints between the elements or units or in and to the elements or units themselves and which in any event destroy the usefulness of the structures by rendering the same leaky and otherwise faulty. The same applies to joints between stone blocks used to cover vaults and in monumental work and between sections of vault lights forming covers over vaults under sidewalks, etc.

In the structures referred to above, the joints or spaces between the units have heretofore been closed by calking with oakum or by introducing semi-liquid substances such as asphaltum or pitch which are objectionable because they become hard and brittle in cold weather and thus lose their resiliency, while in warm weather the asphaltum or pitch becomes soft and fluid and seeps through the structure.

In addition to the above, V-shaped metal strips having their opposite free edges embedded in adjacent units or sections have been used to bridge the spaces therebetween, the said strips opening and closing with the contraction and expansion of the units or elements. In such constructions a watertight connection at the joints is impossible and the semi-liquid material used for filling the spaces between the elements will run or leak out in hot weather. The same objections apply when the connection between adjacent units is made by means of metal or other tongues laid in grooves filled with asphaltum, pitch or the like. My improvement has for its object to overcome all of the

above mentioned defects and to provide a connection between adjacent units which is yielding in all directions and which is at the same time water-tight and of maximum efficiency under all conditions and is simple in construction and unlikely to become disarranged. My invention will be fully described hereinafter and the features of novelty will be pointed out in the appended claims.

Reference is to be had to the accompanying drawings in which—

Figure 1 is a face view of a structure composed of a number of individual elements and illustrating my improved joint; Fig. 2 is a cross-section thereof on the line 2—2 of Fig. 1 and Figs. 3, 4, 5, 6 and 7 are detail sectional views showing various forms of my invention.

Referring more particularly to Fig. 1 of the drawings which for the purpose of description and illustration of the present invention may be said to represent the roof of a building, 10 may represent the walls of the building and 11 blocks or units of material, for instance concrete, which are arranged adjacent to each other and supported in any suitable manner as by means of beams 12 shown in dotted lines in Fig. 2, it being understood that in Fig. 1 the filling material has been omitted in the spaces between said blocks. Each of said blocks 11 is formed with recesses 13 extending inwardly from the edge surfaces of the block and located between opposite faces thereof, and which preferably together form a continuous peripheral recess. In the preferred form of my improvement the said recesses 13 are provided with metallic linings 14 comprising substantially U-shaped elements open to the outside and having projections 15 adapted to form keys for maintaining said linings securely in place in the blocks or sections 11. In the illustration as shown in Fig. 1 each lining 14 is mitered at its ends and fits into a recess 13 at each side of the block to form pockets as clearly illustrated in section in the lower right hand corner of said Fig. 1. When the blocks or sections 11 are set up in position the open ends of the recesses of adjacent blocks will be opposed to and substantially in registry with each other as shown best in Fig. 2. In order that adjacent blocks may be properly connected and the spaces

16 between such adjacent blocks properly bridged I provide tongues or strips 17 of metal or other suitable material which extend into opposite recesses or pockets 13 and have their opposite ends mitered in two directions or otherwise shaped to properly fit together and thus completely bridge said spaces 16 at an intermediate point. The tongues 17 which in the illustration are partly located in the wall 10 are preferably inserted into the pockets 13 of the adjacent blocks 11 before the wall is completely built up so that when the wall is completed the particular tongues 17 referred to will be embedded therein, these particular tongues 17 being preferably bent up at one edge to form projections 15^a having the same purpose as the projections 15. In order that the joints or spaces between the opposed ends of the tongues 17 may be properly covered and rendered tight I prefer to provide plates, disks or similar elements 18 of metal or other suitable material which extend into the pockets 13 and walls 10 either above or below the tongues 17, in such a manner as to completely cover any spaces between the opposed ends of the tongues 17 as shown best in Fig. 1. Some of the plates, disks or the like 18 are also partly embedded in the walls 10 in the same manner as described with regard to certain of the strips 17. The said tongues 17 and plates or disks 18 thus form complete bottoms for the upper portion of the spaces 16 into which upper portions a suitable material 19, which will not become hard under the action of the atmosphere, is introduced to complete the structure. It is, of course, to be understood that the walls 10 may be constructed with pockets and linings similar to the pockets 13 and linings 14 if this should be desired and further that in some cases the linings 14 may be omitted and simple pockets formed in the sections 11 for the reception of the tongues 17 and disks 18. It will further be obvious that any of the forms hereinafter may be utilized and even combined in ways other than those shown if this should be found to be of advantage, the illustrations in Figs. 1 and 2 being substantially diagrammatic and intended to illustrate any of the forms hereinafter described more in detail.

In the form of my invention shown in Fig. 3 I introduce a layer of felt or similar material 20 into the pockets 13 between one or both surfaces of the tongues 17 and linings 14 which layer of felt serves to lubricate the said strips 17 and reduce friction and which also serves as a resilient packing to seal the open ends of said pockets 13 and thus prevent the material 19 from entering same. The said layer of felt will either firmly clamp the tongue between two portions of said felt or otherwise will firmly press said tongue against the lining 14 or a

wall of the pockets. In said Fig. 3 I have shown the tongues 17 partly embedded in a unit which may either correspond to the walls 10 or be a separate section or block 11 as desired.

In Fig. 4 I have illustrated on an enlarged scale another form of my invention in which the tongues 17 are provided with resilient projections 17^a adapted to engage one portion of the linings 14 and press the tongues firmly against the opposite portions of said linings. In this manner the pockets are completely sealed. It will be understood that the felt or similar layer 20 may be introduced into one or all of the pockets 13 in this form also if this should be desired. It will be noted, in Fig. 4 that the material 19 may run partly into the opposite pockets 13 until stopped by the projections 17^a to form substantially an inverted T, the material 19 however being incapable of flowing farther into the pockets or beneath the tongues 17. This is due to the fact that the tongues 17 are pressed upon the bottom member of the linings 14 by the resilient projections 17^a and thus completely seal said pockets and prevent said material 20 which never becomes quite liquid from flowing beneath said tongues 17.

In Fig. 5 the linings 14 are provided with inwardly extending, preferably resilient members 14^a upon which tongues 17 are adapted to rest as clearly shown. In this form also the tongues 17 may be embedded in one element if desired, instead of extending into opposed pockets 13. Otherwise this form of my invention may also be the same as hereinbefore described. In this form the pockets are sealed owing to the fact that the tongues 17 are pressed against the linings 14 by the resilient members 14^a and the material 20 is thus also prevented from reaching the interior of the recesses 13 it being understood that the members 14^a are sufficiently stiff to prevent the weight of said material 20 from depressing the tongues 17.

In Fig. 6 the tongues 17 are formed at opposite edges with preferably resilient members 17^b which engage and press against the one portion of the linings 14 and thus firmly press the tongues against the opposite portions of said linings so as to completely seal the said pockets. These members 17^b, when the strips are in position in the pockets 13, form recesses into which the material 20 flows and prevents the said material from flowing farther into the pockets or beneath the tongues, while at the same time said material 20 takes the form of an inverted T.

In Fig. 7 the strips 17 are the same as in Fig. 6, the linings 14 having, however, been omitted from this latter form of my improvement, it being understood that, as be-

fore stated, these linings may under certain conditions also be omitted from the other forms shown and described.

It will readily be seen, in all of the forms of my improvement that the units 11 are firmly connected with each other and with the walls 10 and yet are free to move relatively to each other as physical changes in the dimensions occur from any cause as for instance variations in temperature. It will also be seen that the joints between said units will be maintained in a water-tight condition no matter what relative movement may take place between the blocks or walls and further that said relative movement will be possible under all conditions. My invention is simple in construction and effective in operation. The linings 14 when used are preferably incorporated in the blocks or sections 11 when the same are being molded, any suitable process known or otherwise being used to accomplish the desired result, although any other method may be used if found more convenient.

Various changes in the specific form shown and described may be made within the scope of the claims to make a resilient connection without departing from the spirit of my invention.

I claim:—

1. The combination of two units arranged adjacent to each other, one of said units being provided with a pocket extending inwardly from a face thereof, a lining for said pocket, means for securing said lining in said pocket and a tongue engaging the other unit and extending into said pocket and slidable therein whereby the joint between said units is bridged and relative movement thereof is possible.

2. The combination of a plurality of units arranged adjacent to each other and each provided with a peripheral inwardly extending pocket located between opposite faces of said units the open ends of opposed pockets being in substantial registry with each other, linings for said pockets, means on said linings for securing them in said pockets, and tongues extending into said pockets and slidable therein whereby the joints between said units are bridged and relative movement thereof is possible.

3. The combination of a unit provided with a pocket extending inwardly from a face thereof, a lining for said pocket, a tongue extending into the same and resilient means on one of said last named elements whereby said tongue is held in said pocket and is slidable therein.

4. The combination of a plurality of units arranged adjacent to each other and each provided with a peripheral inwardly extending pocket located between opposite faces of said units, the open ends of opposed pockets being in substantial registry with each other, tongues extending into said pockets and slidable therein whereby the joints between said units are bridged and relative movement thereof is possible, said tongues having their ends in close proximity to the ends of adjacent tongues, plates extending into said pockets and bridging the joints between the ends of adjacent tongues and a filling in the joints between said units above said tongues and plates.

5. The combination of two units arranged adjacent to each other, one of said units being provided with a pocket extending inwardly from a face thereof at an intermediate point, a tongue engaging the other unit and extending into said pocket so as to be slidable therein whereby the joint between said units is bridged and relative movement thereof is possible and resilient means in said pocket between the tongue and a wall of the pocket whereby said pocket is sealed.

6. The combination of two units arranged adjacent to each other, one of said units being provided with a pocket extending inwardly from a face thereof at an intermediate point, a lining for said pocket, a tongue engaging the other unit and extending into said pocket and slidable therein whereby the joint between said units is bridged and relative movement thereof is possible and a resilient means in said pocket between said tongue and said lining whereby said pocket is sealed.

7. The combination of a plurality of units arranged adjacent to each other and provided with inwardly extending pockets located between opposite faces of said units, linings for said pockets, resilient members on said linings extending into said pockets, and tongues extending into said pockets and slidably clamped between said lining and said resilient members whereby the pockets are sealed and the joints between said units are bridged and relative movement thereof is possible.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

AUGUST W. CORDES.

Witnesses:

JOHN A. KEHLENBECK,
G. V. RASMUSSEN.