Sept. 22, 1942. G. A. BOURDELAIS, SR., ET AL 2,296,699

INTERLOCKING BLOCKS

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FIG. 1.

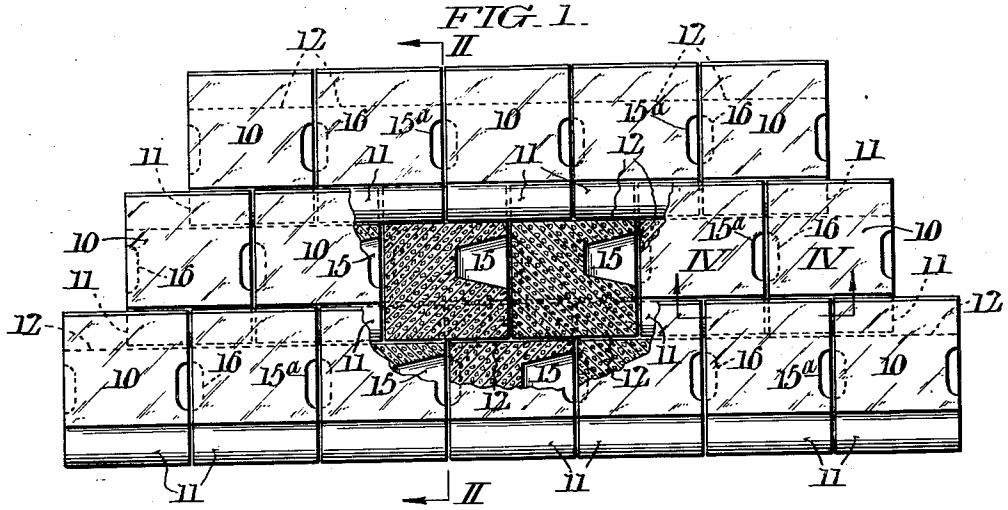


FIG. 2.

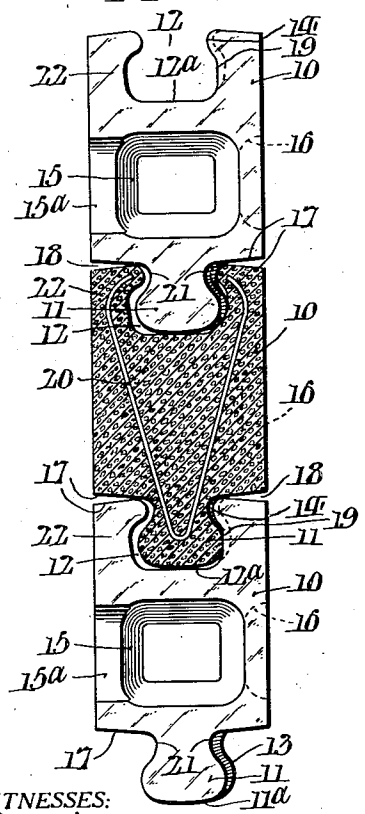
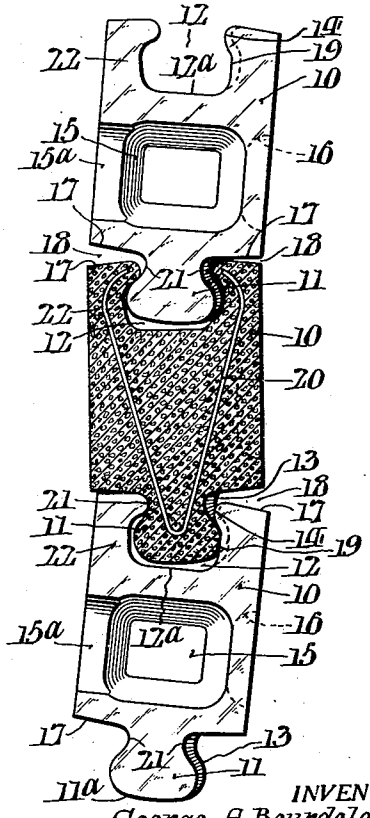


FIG. 3.



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FIG. 4.

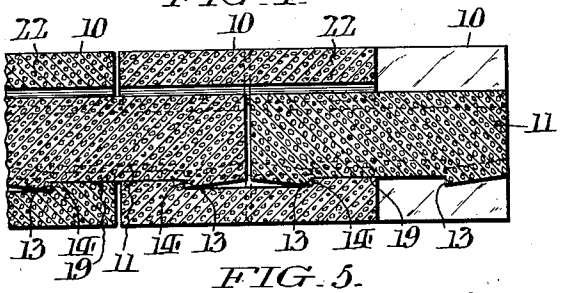


FIG. 6.

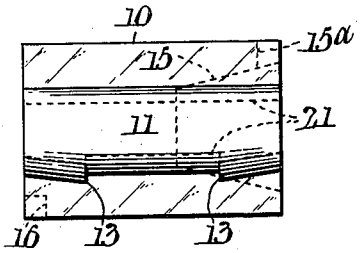


FIG. 5.

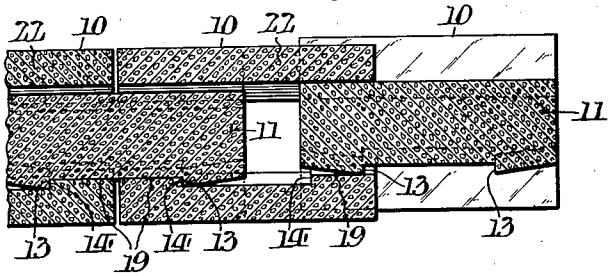


FIG. 7.

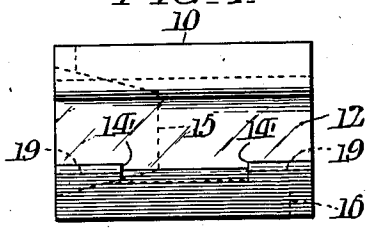


FIG. 8.

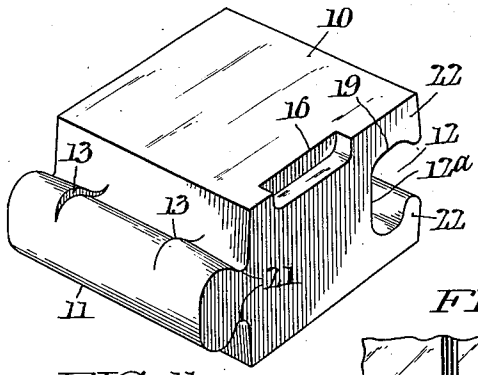


FIG. 9.

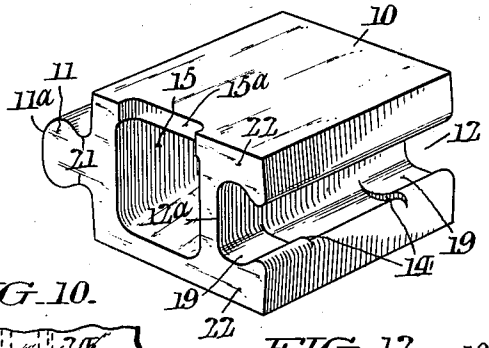


FIG. 10.

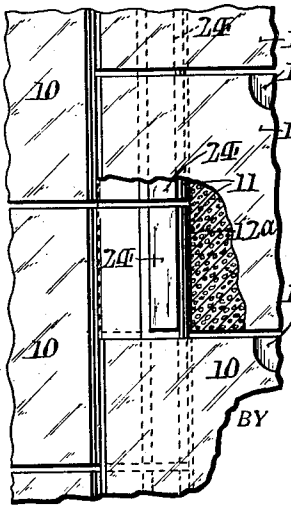


FIG. 11.

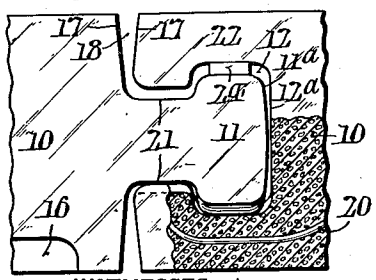
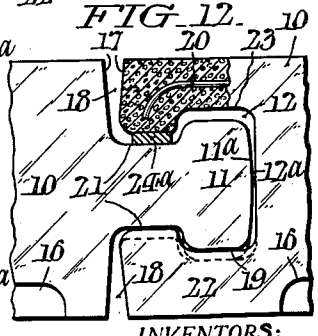


FIG. 12.



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UNITED STATES PATENT OFFICE

2,296,699

INTERLOCKING BLOCK

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Application January 3, 1941, Serial No. 372,976

9 Claims. (Cl. 72—38)

This invention relates to interlocking blocks and particularly to interlocking blocks of the tongue and groove type.

Interlocking blocks heretofore proposed have been unsuitable for many uses due to difficulty of assembly and also due to a tendency in such blocks to become disengaged under certain conditions. For example, in the broad field of revetment work laborious and expensive alternative methods have been used in the absence of suitable interlocking blocks. In the lining of river banks various expensive methods have been used including the laying of willow mats, the use of concrete blocks strung on copper cables and the use of a wire mesh reinforced asphalt mat. In the lining of canals "Gunite" has been used. All of these methods have disadvantages. Willow mats require an abundant and accessible supply of willow branches as well as suitable ballast. The use of copper cables to hold blocks together is very expensive as is a reinforced asphalt mat. "Gunite" requires portable equipment and skilled workmen and has the further disadvantage of deterioration in the event that water finds its way behind it.

We have discovered that interlocking blocks can be used advantageously in revetment work and the like provided that such blocks are so constructed as to make handling and assembly easy, and in addition are positively locked when engaged so that there is no chance of disengagement. At the same time it is important for some uses that such blocks should have a certain degree of flexibility relative to one another without actually disengaging.

Therefore the principal object of the present invention is to provide interlocking blocks which are relatively light in weight, easily assembled and which are positively locked after assembly while at the same time having a degree of flexibility.

Further objects and advantages of the present invention will be apparent from the description which follows, having reference to the following drawings:

Fig. 1 is a plan view showing a number of interlocking blocks as assembled, with the top surface partially broken out to show features of importance.

Fig. 2 is a view partially in elevation and partially in section showing the blocks interlocked and taken along the lines and arrows II—II in Fig. 1.

Fig. 3 is a view similar to Fig. 2 showing relative articulation of the blocks.

Fig. 4 is a section taken along the lines and arrows IV—IV of Fig. 1.

Fig. 5 is a view similar to Fig. 4 showing one of the blocks partly removed.

Fig. 6 is an end view of the tongue end of the block.

Fig. 7 is an end view of the groove end of the block.

Fig. 8 is a perspective view of a block.

Fig. 9 is a perspective view of a block shown from the opposite end.

Fig. 10 is a fragmentary plan view of a modified form showing a locking insert.

Fig. 11 is a fragmentary side view partially in section of a modified form.

Fig. 12 is a view similar to the preceding figure showing another modified form.

In describing the preferred embodiment of the invention illustrated in the drawings, specific terminology will be resorted to for the sake of clarity. However, it is not the intention to be limited to the specific terms so selected and it is to be understood that each specific term includes all technical equivalents which operate in a similar manner to accomplish a similar purpose.

The general form of the interlocking blocks of the present invention is shown in perspective in Figs. 8 and 9. The body 10 of the block has a tongue 11 at one end and a groove 12 at the other end. On the tongue 11 there are formed inwardly spaced abutments 13 which are slightly tapered as indicated in Figs. 4, 5, 6 and 8 and are adapted to engage inwardly spaced abutments 14 formed in the groove 12 of another similar block. It will be noted from Figs. 1, 4 and 5 that the preferred interlocking arrangement is one in which the tongue portions 11 of two separate blocks fit into the groove portion 12 of a third single block.

An important feature of the interlocking blocks of the present invention is that once put together in interlocked position they will remain engaged regardless of the relative movements of individual blocks normally experienced in their use. This is accomplished by the provision of abutments 13 and 14 which can be disengaged only by a lifting of the entire tongue-bearing block as shown in Fig. 5. As shown in Fig. 3 no amount of articulation is sufficient to allow abutments 13 and 14 to clear one another and consequently all accidental lateral movement of the blocks relative to one another is prevented.

In order to facilitate assembly of the blocks the abutments 13 are tapered outwardly as shown in Figs. 4, 5 and 6. This taper is such that tongue

11 is unsymmetrical with respect to its transverse axis throughout the major portion of the sections comprising abutments 13. However, the slope of the taper is arranged so that a condition of symmetry is reached at the extreme outer ends of the abutments 13. This feature greatly facilitates assembly of the blocks by providing an automatic, gradual lifting of the tongue-bearing block as it progresses laterally in groove 12 during assembly. Moreover, the symmetrical end of abutment 13 fits easily into the corresponding symmetrical portion of the groove 12 and this provides a smooth and easy start as the blocks are fitted together.

To provide for ease of handling and at the same time to reduce the weight of the block a hollowed out portion 15 is provided which communicates with a hand hole 15*a* large enough so that a man's hand may be inserted therein. A finger ledge 16 is also provided on the other side of the block making it possible to transport and fit the blocks together easily.

In order to insure limited relative movement of the blocks without disengagement, the outer or rocker surface 11*a* of the tongue 11 is rounded in form while the corresponding surface 12*a* of the groove portion 12 is substantially flat. In addition to this the contacting surfaces 17 are disposed at an acute angle to the horizontal axis of the block and this makes possible a relative hinging movement in both directions as indicated in Fig. 3. It will be noted that as a result of the angles of the contacting surfaces 17, a space 18 is present even where the blocks are disposed normally to one another as in Fig. 2. This space 18 is of advantage where grouting is desired. It will also be noted that the groove 12 has a substantially flat surface 19 at the abutments 14 which further facilitates movement inasmuch as this flat surface cooperates with the rocker surface 11*a* on the tongue 11.

As noted above the tongue 11 is symmetrical only in the central portion which lies between the abutments 13 and at the extreme outer ends. The groove 12, on the other hand, is symmetrical at the outer abutment regions and unsymmetrical in the space between the abutments 14. Therefore the regions of symmetry of the tongue 11 correspond with the symmetrical regions of the groove 12 when the blocks are interlocked and the unsymmetrical regions of tongue 11 and groove 12 also correspond when the blocks are in this position. This construction further facilitates articulative movement of the blocks relative to one another without interfering in any way with the positive interlocking of the blocks.

In order to provide additional strength, a reinforcing member 20 may be provided as shown in Figs. 2 and 3. The reinforcing member 20 may consist of an iron bar suitably shaped. One or more reinforcing members may be used where additional strength is desired particularly in the regions of the neck 21 of the tongue 11 and the overhanging portions 22 of the groove 12. In addition to the reinforcing member 20 axially formed holes may be provided for the reception of integrating or reinforcing rods or cables. However, for many purposes no reinforcing member will be needed.

For some uses the alternative arrangement shown in Figs. 10, 11 and 12 may be utilized to advantage. In this form of the invention the groove 12 is made somewhat larger and is provided with a flat surface 23. The corresponding surface of the tongue 11 is also flat and an additional locking safeguard is provided by the insertion of a creosoted lath 24 or the like. A similar lath may be inserted as shown at 24*a* in Fig. 12 for the same purpose. This form of the invention is of particular advantage where it is desired to prevent relative articulative movement.

It will be apparent from the above description that the interlocking blocks of the present invention may be used for many purposes. In revetment work the blocks would be made of concrete or some similar substance adapted to be poured into a mold and the interlocked blocks would be assembled in a continuous mat which would effectually prevent undercutting when placed along a river bank. The blocks of the present invention may also be used to advantage in the lining of canals and other artificial waterways. In addition to being laid in a horizontal plane the interlocking blocks of the present invention may be used to advantage in the construction of vertical structures such as silos, coffer dams, walls, cribbings and tunnel linings.

While the preferred embodiment of this invention has been described in some detail it will be obvious to one skilled in the art that various modifications may be made without departing from the spirit of the invention as hereinafter claimed.

Having thus described our invention, we claim:

1. An interlocking block having a headed tongue formed at one end, a groove of corresponding cross sectional configuration formed at the opposite end thereof, said tongue and groove being designed for cooperative action with similar tongues and grooves on other blocks, spaced opposed crosswise abutments formed on a surface of said tongue and similarly spaced opposed crosswise abutments formed on a corresponding surface of said groove.

2. A pair of interlocking blocks, a headed tongue formed on one of said blocks, a groove of corresponding cross sectional configuration formed on the other of said blocks, said tongue and groove being engaged and having capacity for disengagement only by a relative movement of the blocks in the direction of the longitudinal axis of said tongue, spaced opposed crosswise abutments formed on said tongue and similarly spaced opposed crosswise abutments formed in said groove.

3. The invention of claim 2 characterized further by the fact that said tongue has a rocker surface formed on the head thereof and said groove has a flat surface formed in the bottom thereof, whereby a limited relative hinging movement between said interlocked blocks is provided when said rocker surface is pressed into operative contact with said flat surface.

4. The invention of claim 1 wherein said inwardly spaced abutments formed on a surface of said tongue respectively taper outwardly toward the sides of the block to facilitate the efficient interlocking assembly of blocks.

5. The invention of claim 1 characterized further by the fact that said block has a hollow cavity formed therein, a hand hole communicating with said cavity from one side of said blocks and a finger ledge formed in the side of said block opposite the first mentioned side diagonally from the hand hole.

6. The invention of claim 2 wherein a side surface of said tongue is cut away sufficiently to provide a substantial clearance between the cor-

responding side surface of said groove and a locking lath element positioned between said corresponding side surface of said tongue and said groove.

7. As a new article of manufacture, a block having a body portion of generally quandrangular form with a transversely-extending headed tongue projecting from one end thereof and provided in its opposite end with a transversely-extending groove of corresponding cross sectional configuration and of somewhat larger dimensions, said tongue and groove being respectively formed with similarly spaced opposed transverse abutments.

8. A building block according to claim 7, in which the opposite ends of the block are beveled slightly outwardly away from said tongue and groove respectively toward the body of the block.

9. A pair of interlocking blocks respectively having substantially quadrangular body portions, one such block being provided with a headed tongue which extends transversely of one of its end faces, and the other block being provided in one of its end faces with a transversely-extending groove whereof the cross section corresponds to that of the headed tongue but of slightly larger dimensions for capacity to loosely receive the tongue on the first block endwise, said tongue and said groove being formed with crosswise abutments, which, when interengaged, lock the two blocks against separation in assembled relation, and the abutment of the tongue on one block being provided with a sloping surface which, incident to assembling, cooperates with the groove abutment on the other block to temporarily displace the first mentioned block relative to the other until the two abutments register, thereby to facilitate assembling.

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