J. D. BUTLER.

INTERLOCKED HEAVY SERVICE BLOCK FLOORING.

APPLICATION FILED JAN. 12, 1920.

1,367,795. **Patented Feb. 8, 1921.**

2 SHEETS—SHEET 1.

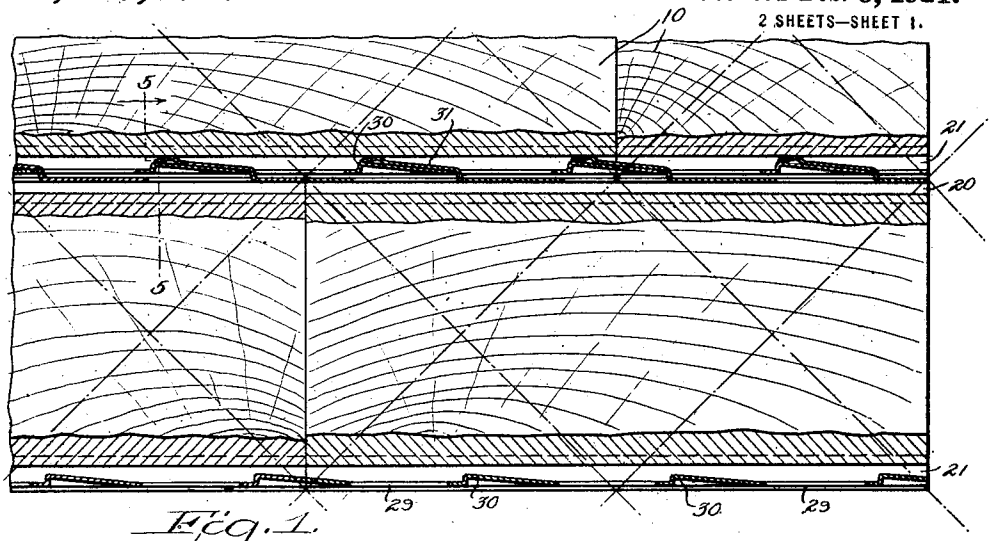


Fig. 1.

Fig. 2.

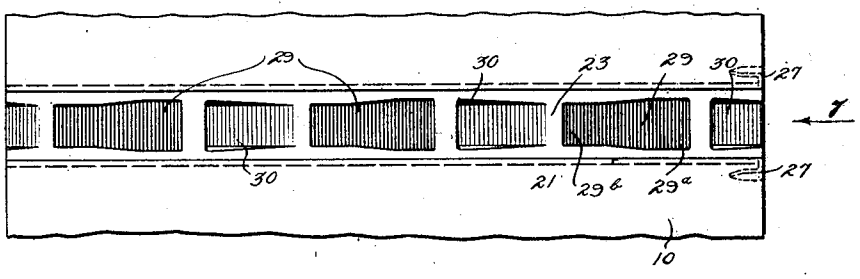
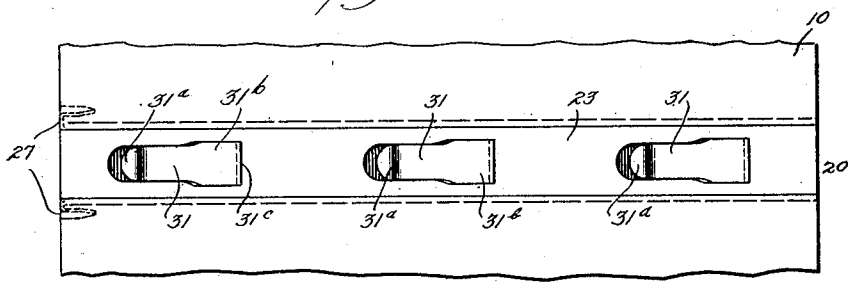


Fig. 3.



WITNESSES

Olive W. Holmes

Geo. L. Beeler

INVENTOR

JACOB D. BUTLER

BY Munn & Co

ATTORNEYS

J. D. BUTLER.

INTERLOCKED HEAVY SERVICE BLOCK FLOORING.

APPLICATION FILED JAN. 12, 1920.

1,367,795. **Patented Feb. 8, 1921.**

2 SHEETS—SHEET 2.

Fig. 4.

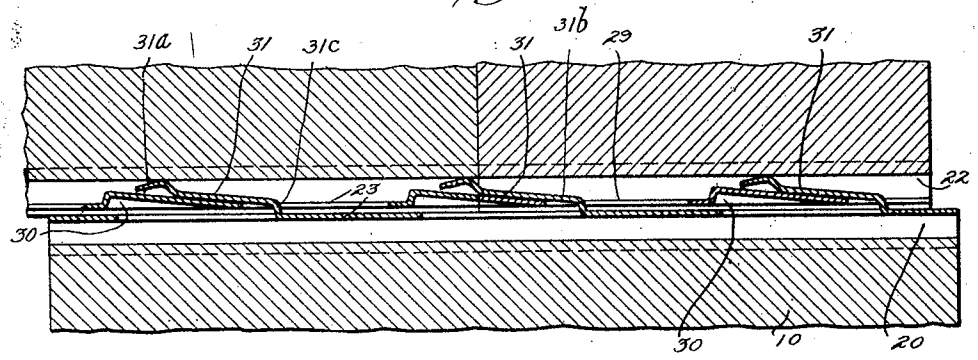


Fig. 5.

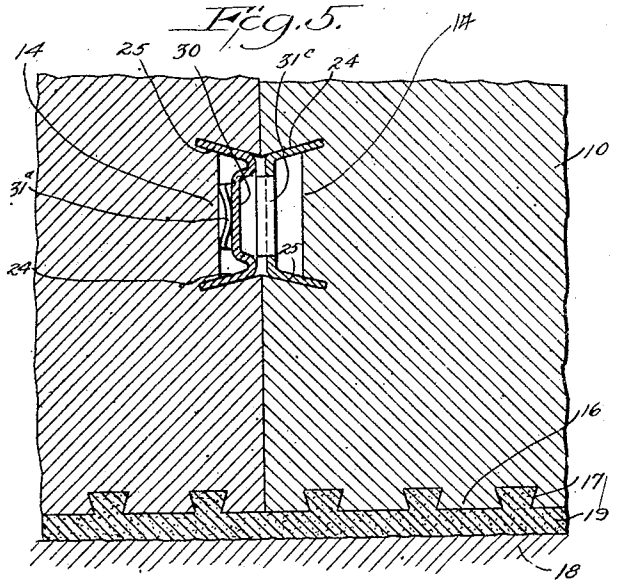


Fig. 6.

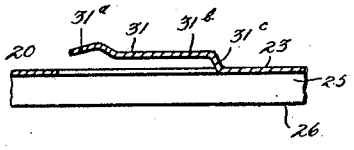


Fig. 7.

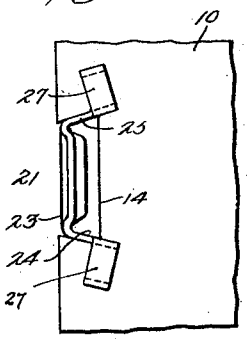
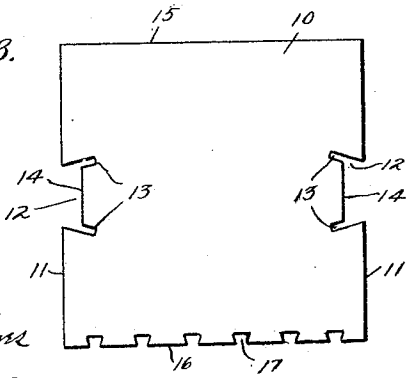


Fig. 8.



WITNESSES

Olive W. Holmes

Geo. D. Beeler

INVENTOR

JACOB D. BUTLER

BY Munn & Co

ATTORNEYS

UNITED STATES PATENT OFFICE.

JACOB D. BUTLER, OF NORTHAMPTON, MASSACHUSETTS.

INTERLOCKED HEAVY-SERVICE BLOCK-FLOORING.

1,367,795. Specification of Letters Patent. Patented Feb. 8, 1921.

Application filed January 12, 1920. Serial No. 350,855.

To all whom it may concern:

Be it known that I, JACOB D. BUTLER, a citizen of the United States, and a resident of Northampton, in the county of Hampshire and State of Massachusetts, have invented a new and Improved Interlocked Heavy-Service Block-Flooring, of which the following is a full, clear, and exact description.

This invention relates to floor constructions or pavements and has particular reference to flooring and pavements adapted for extreme strength under heavy service.

Among the objects of the invention is to provide a floor or pavement that is adapted to be built rapidly by any ordinary workman and from material of a relatively cheap character, and when so built the flooring or pavement is adapted to sustain unusually heavy loads or rough traffic without sagging, bending, breaking or destruction.

Another object of the invention is to provide a means for the expeditious and permanent laying of wooden blocks with the grain arranged vertically.

A still further object of the invention is to provide interlocking mechanism for wooden or other blocks, comprising a novel design or construction of tongue and slot members adapted for longitudinal mating and interlocked coöperation in the assembled flooring, each block being fitted on opposite sides with a pair of said interlocking members.

With the foregoing and other objects in view the invention consists in the arrangement and combination of parts hereinafter described and claimed, and while the invention is not restricted to the exact details of construction disclosed or suggested herein, still for the purpose of illustrating a practical embodiment thereof reference is had to the accompanying drawings, in which like reference characters designate the same parts in the several views, and in which—

Figure 1 is a plan view of a portion of floor embodying my improvements, portions being broken away to indicate the locking members in longitudinal horizontal section.

Fig. 2 is a side elevation of a portion of a block and the female or slot member fitted therein.

Fig. 3 is a similar view of the male or tongue member.

Fig. 4 is an enlarged horizontal section indicating especially the block and tongue member moving into interlocking position breaking joints with two previously laid blocks, this view indicating especially the locking and squeezing action of the tongue and slot members during the movement of the last laid block into final position.

Fig. 5 is a vertical transverse section on the line 5—5 of Fig. 1.

Fig. 6 is a horizontal sectional view of the tongue portion of a tongue member in normal form which in comparison with Figs. 1 and 4 indicates how the setting action of a block serves to modify the shape of the tongue.

Fig. 7 is an end view corresponding to the right end of Fig. 2 or from the position of the arrow 7.

Fig. 8 is an end view of a block indicating especially the manner of grooving the same uniformly longitudinally.

In my extensive experience with this invention I have employed with universal satisfaction selected blocks of end wood long leaf Georgia pine lumber accurately milled, each unit or block having a face exactly two and one-half by five inches and two and one-quarter inches thick or deep. It is to be distinctly understood however that this reference to specific materials or sizes is to be taken as an illustration only and in no sense as a limitation of the inventive idea. The blocks are cut and milled in uniform sizes and finished with perfectly smooth surfaces, each surface being perfectly flat as well as smooth and rectangular. Preferably the blocks then are thoroughly kiln dried, and after being so treated they are preferably treated with oil to insure durability and long life.

Each block 10 is grooved longitudinally along each side 11 with a dovetailed groove of peculiar form, the bottom corners or edges of which at 13 are extended inward forming a flat faced rib 14 extending throughout the length of the groove. Obviously the grooves 12 on the opposite sides of the block are of the same elevation and preferably about midway between the top 15 and the bottom 16 thereof. Said bottom wall is grooved at 17 with a plurality of dovetailed grooves especially when the blocks are to be laid on a fireproof base or foundation 18. At the time of laying these blocks any suitable cement or asphalt 19 may be applied to the bottom 16 of the blocks, portions of the cement entering the

grooves 17 forming solid interlocking tongues when the flooring is set.

As above intimated the blocks 10 are interlocked and held permanently together in practice by any suitable mating or interlocking tongue and slot members 20 and 21 which are adapted to not only hold the blocks from lateral separation but to actually cause the squeezing of the blocks tightly together during the process of assemblage. In view of the manner of making, finishing and treating the blocks therefore the floor after being laid is not only smooth and without cracks but is such that the formation of crevices or openings due to the separation of the blocks or otherwise is a physical impossibility. Not only is the tension, which is set up through the interlocking members, maintained constant under all service conditions, but furthermore such tension acts directly to set up such intense friction between adjacent faces of the blocks as to materially augment the tendency for one block to slip or move downward or upward with respect to any other block. It is to be noted however that the character of the tongue and slot members that I prefer to use adapts them for separation of the blocks if such result is desired, but the separation must be effected if at all by a reversal of the process of assemblage beginning hence at the last block laid.

The interlocking members 20 and 21 are formed preferably from sheet metal of uniform thickness and of a gage about .032 in the illustration given above respecting the dimensions of the blocks, but this gage of metal is to be understood as illustrative only and is subject to such variations as may be deemed advisable in various installations.

The two mating members except as soon to be described are similarly formed, each having an outer wall 23 lying adjacent to the corresponding wall of the mating member in practice, and two edge walls 24 and 25 which are inclined at an oblique angle to the planes of the first mentioned side and diverge from each other inward, they being adapted to fit snug against the inclined walls of the dovetailed slot 12 and into the extensions 13 at one side of the block. The member 20 or 21 after being stamped from sheet metal is bent to form the walls stated forming a flat channel member, and the joint between the meeting sides or walls is formed as shown plainly in Fig. 5. Hence the two side walls cannot spread away from each other. Neither can they spring or bend inward, being resisted by the rib 14. Therefore there is no possibility for the member to move in any direction laterally. It is limited from movement longitudinally in one direction by means of two integral prongs 27 formed at one end of the walls 24 and 25. Except for these prongs the outside dimensions of each member are exactly the same throughout the entire length of the member. At any time but preferably before the blocks leave the factory the interlocking members are driven into their respective grooves, the prongs 27 being thereby forced into the end of the block. The two members for each block are driven into their respective grooves from opposite ends of the block for a reason soon to appear.

The outer wall 23 of the member 21 is provided with a longitudinal series of openings or slots 29 formed directly through the main flat portion of such wall. Alternating with said slots 29 are a like series of inwardly struck inclines or bridges. Each of the slots 29 is wider at one end 29^a than it is at the other end 29^b. The corresponding outer wall 23 of the other member 20 is provided with a series of tongues 31 which on each block lie directly across from the slots 29, but bearing in mind that in the assemblage of the blocks each block breaks joints with a previous series of blocks the central tongue 31 of the block being applied is inserted into one of the end slots of the said previous series of blocks, but otherwise it will be understood that the tongues of one block correspond to the slots of another block as to size and endwise location. I prefer to make the tongues so that each tongue has a smaller free end 31^a and a larger end 31^b having integral connection at 31^c with the main flat portion of the wall 23. (See Figs. 4 and 6). The tongues are struck out from said flat wall 23 and in normal position the main portion of each tongue between the shoulder portion 31^c and the end 31^a is offset from and approximately parallel to the wall 23. The point 31^a is bent outward and thence inward with respect to the plane of the main portion of the tongue for at least two distinct reasons: First, when the block under manipulation is slipped into place the points of the tongues 31 are passed directly into the slots 29 and then the block is moved longitudinally so as to cause said points 31^a to ride up on the inner surfaces of the inclines or bridges 30. Thus it is assured that the tongues will be caused to engage behind or within the inclines. Secondly, the points 31^a acting as shoes come into contact with the rib 14 of the slot indicated in Fig. 4 prior to the time when the moving block reaches its destination. Therefore there is caused a pronounced degree of friction between the opposite surfaces of each tongue and the rib and outer wall portions respectively of the slotted member. This frictional contact insures extremely tight binding connection between the tongues and inclines.

It will of course be noted that in the laying of a floor or pavement the broken joint principle is carried into effect with the use

of blocks of half length as indicated at the upper right hand corner of Fig. 1, and the incline or bridge features adjacent to the ends of any block are fragmentary, that is to say at the adjacent ends of two blocks one portion of a bridge is carried by one block and the other portion of the same bridge is carried by the abutting block. The operation however of these features is exactly the same whether at the ends or between the ends of a block.

With the blocks made and finished as above described and with the metallic interlocking members fitted therein, preferably before they have left the factory, the manner of assemblage of the blocks is easily understood. The laying of all blocks is always effected in the same direction, that is to say as shown in Fig. 4 the direction of movement of assemblage is toward the left. Hence the block at the bottom of Fig. 4 in representing the block in motion is moving in the direction of the arrow and is within about a quarter of an inch of its home position. The tongues having been slipped directly into the slots 29 until the points of the tongues come against the rib 14 the block will then be forced longitudinally, using if necessary a mallet or hammer for this purpose. This forcing movement causes a tight frictional engagement between the tongue and slot members, as fully set forth above, the tongues lying at a slight angle to the planes of the main side walls of the interlocking members. The width of the tongue point 31^a being less than any portion of the slot the insertion of the tongues into the slots is a very easy expedient and the slight taper of the tongues insures the guidance of the tongues toward the home position so as to bring the wider end 31^b of each tongue and with the shoulder portion 31^c thereof into snug position both against the first end of the bridge or incline and also against the edges of the slot making it impossible for any vertical distortion to take place between adjacent blocks. The prongs 27 of the tongue member are arranged at the advancing end thereof, while the prongs on the slot member are located at the opposite end thereof. The frictional contact between the tongues and slotted members would otherwise tend to displace the metallic members longitudinally in their respective blocks, but as indicated the prongs arranged as set forth act on both members to prevent such displacement. In other words the hammering of the moving block by a hammer or mallet will cause the prongs of the tongue member to react against the opposite end of such block and likewise the friction between the tongues and the slotted members tends to cause the slotted members to remain in true position. The prongs also by virtue of their penetration into the wood serve to assist in preventing any possible twisting or torsional displacement of the members.

From the disclosure made herein it will be understood that this flooring is especially adapted for heavy service such as the floors of factories, mills, warehouses, freight or refrigerator cars, street pavements, or the like, and it is to be noted furthermore that the floor when laid as indicated is perfectly smooth and will remain so with the result that it is impossible for the blocks to move in any direction. Furthermore it will be noted that the ends of the blocks cannot move laterally nor twist in any direction because of the bracing stresses set up at the broken joints as indicated by the broken diagonal lines of Fig. 1.

I claim:

1. In an interlocked block structure, the combination with a plurality of blocks having companion grooves formed in adjacent sides, of mating interlocking members fitted in said grooves and serving to prevent relative lateral movement between the blocks in any direction.

2. In an interlocked block structure, the combination with a plurality of blocks having registered dovetailed grooves formed in their adjacent sides, the grooves in the several blocks intersecting the grain thereof, of mating interlocking members fitted in said grooves and bearing snug against the sides thereof, and serving by coöperation with each other to prevent relative lateral movement between the blocks in any direction.

3. As an article of manufacture, the herein described floor block of solid material provided on its opposite sides with longitudinal dovetailed grooves, and a pair of attachment members fitted endwise in said grooves and bearing snug against the sides thereof, each of said attachment members being adapted for coöperative interlocking engagement with an attachment member of the opposite character carried by another block.

4. As an article of manufacture the herein described block having formed in opposite sides parallel dovetailed grooves at the same elevation and tongue and slot attachment members fitted longitudinally in said grooves, said attachment members having means to limit the endwise movement thereof into place, and each tongue member being adapted for interlocking engagement wth a slot member of another block adjacent thereto.

5. In an interlocked block structure of the class set forth, the combination with adjacent blocks having registering dovetailed grooves, of a pair of interengaging tongue and slot members fitted endwise in the respective grooves, said members being fitted into said grooves from opposite di-

rections and each having means to limit the endwise movement thereof with respect to its block, the slot member having in advance of its slot a series of inclines projecting inward and arranged at an angle to the plane of connection between the blocks and upon which the tongues of the tongue member slide after the tongues are projected through the slots, and means to cause additional grip between the tongues and the slot members as a result of the forcing of the one block longitudinally of the other.

6. An interlocking block structure of the nature set forth in claim 5 in which the slots are wider than the points of the tongues to facilitate the interlocking action, while the portions of the slots which ultimately interlock with the tongues are of the same width.

7. In interlocked block structure, the combination with a pair of adjacent blocks having registering dovetailed grooves, of a pair of mating metallic fastening members fitted in said grooves and held from lateral displacement therefrom, one of said members being of flat channel form, one of the walls of which is longitudinally slotted and formed with inwardly directed inclines between slots while the other walls fit snug against the sides of its groove, the inclines being slightly spaced from the innermost wall of the grooved member, and the other member being provided with a plurality of tongues extending beyond the adjacent face of the block carrying the tongue member, but being arranged substantially parallel to said face but with their free ends extended outward from said plane to facilitate the admission of the tongues into said slots, said outwardly extended tongue ends being adapted to bear against the wall of the grooved member in the space aforesaid for the purpose of increasing the frictional engagement between the two members.

JACOB D. BUTLER.