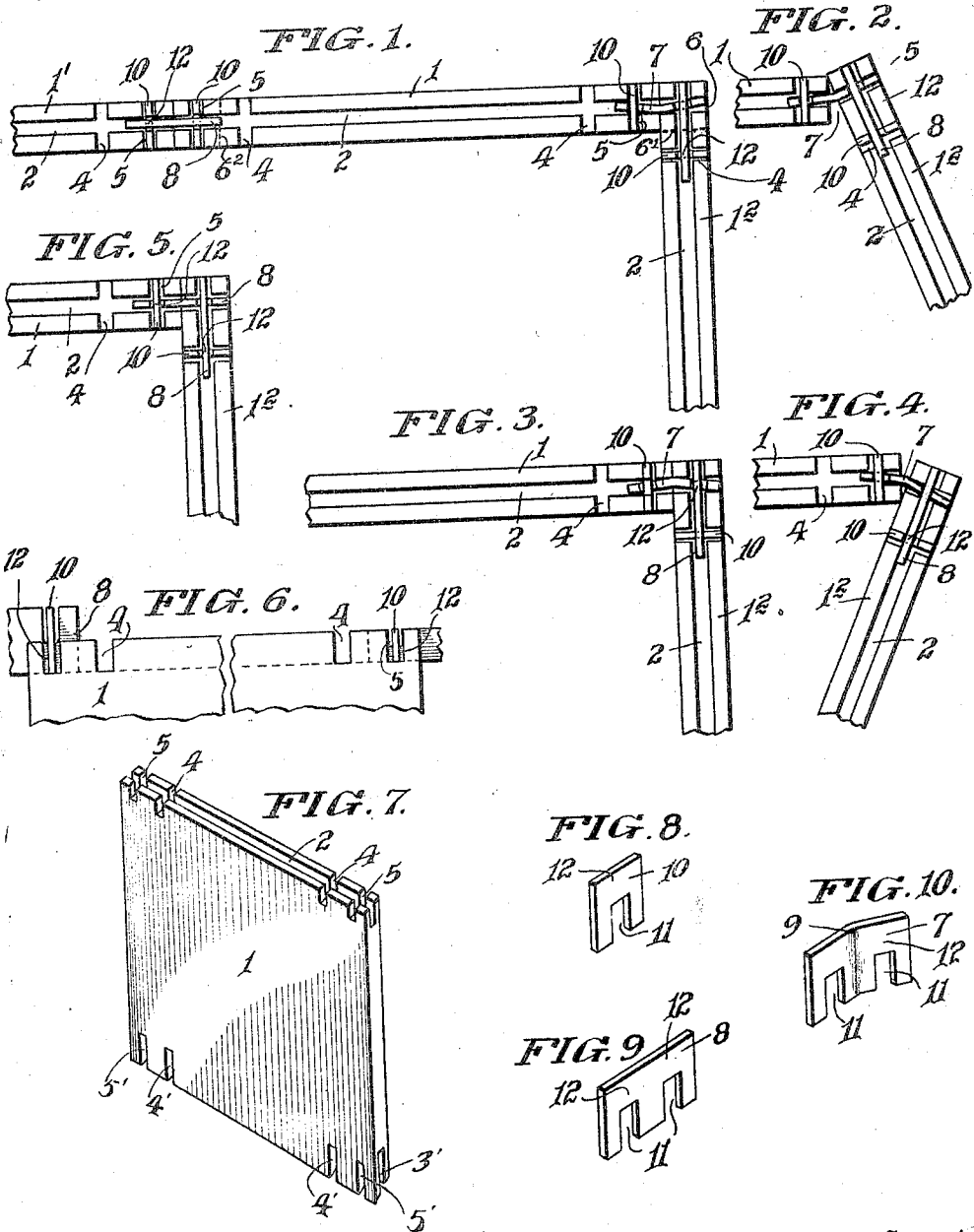


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 JOINT FOR BUILDING BLOCKS.  
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1,000,395.

Patented Aug. 15, 1911.



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# UNITED STATES PATENT OFFICE.

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JOINT FOR BUILDING-BLOCKS.

1,000,395.

Specification of Letters Patent. Patented Aug. 15, 1911.

Application filed December 21, 1910. Serial No. 598,587.

To all whom it may concern:

Be it known that I, CHARLES W. FROST, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain new and useful Joints for Building-Blocks, of which the following is a specification.

My invention relates to means for forming a temporary joint between blocks of building material of any character.

The purpose of my invention is to provide the same form of temporary union for the junction of building blocks, particularly toy blocks, in different positions with respect to each other and to provide for variation in the angles between the blocks.

A further purpose of my invention is to provide a joint between adjoining blocks upon the same level which shall at the same time align and join thereto blocks upon a different level.

I have preferred to illustrate my invention by that form thereof which has been found in manufacture to be most practical and suitable and which, at the same time, presents the principle of my invention to great advantage.

Figure 1 is a top plan view of one form of my invention. Fig. 2 is a top plan view of the structure of Fig. 1 showing the range of angular movement permitted. Figs. 3 and 4 are top plan views of the structure of Figs. 1 and 2 with the parts in different positions therefrom. Fig. 5 is a top plan view of a slightly variant form of connection. Fig. 6 is a side elevation showing the heights of different sets of my connections. Fig. 7 is a perspective view of one of the blocks which I prefer to use. Figs. 8, 9 and 10 are perspective views of the connecting parts preferred.

In the drawings similar parts are referred to by corresponding numerals of reference.

I prefer to use a block of the character shown at 1, 1' and 1<sup>2</sup> in Fig. 1 when toy use is made of my invention, though it is evidently applicable to a great variety of forms of toy blocks as well as to other building blocks. In this form of block 1, I prefer to groove both the top and bottom longitudinally of the edge, the grooves in the top being shown at 2 in order that connection may be made both at the top and at the bottom to laterally adjoining blocks and, in all cases except the bottom block, also to vertically adjoining blocks aligned thereby. The grooves,

such as 2 2, preferably extend from end to end of the blocks, for convenience in cutting, though I prefer to make actual use of that portion only of the grooves in proximity to the side edges of the blocks. I also make transverse cuts 4, 5 both most desirably through from side to side of the block. Of these cuts, those at 4, the more remote from the edge, are used for the purpose of stiffening the joint between blocks in the same plane but might be omitted in this use. In successive rows vertically I prefer to "break joints", placing the block above block 1, for example, with its right hand edge in vertical alignment with the edge 6 of block 1<sup>2</sup>. In this case the use of a clip such as 10 in the slot 4 of block 1<sup>2</sup> is desirable to stiffen against lengthwise movement of the block above it, as this block terminates in the position shown by dotted line 6'. Likewise the block above block 1 terminates at dotted line 6<sup>2</sup>, and the slot 4 adjoining is useful for the same purpose. In each case the other end of the block is also retained against longitudinal movement.

I make use of ties between adjoining blocks, showing two forms of these ties at 7 and 8. The form at 7 is bent at 9 preferably to the angle hereinafter indicated, and the tie 8 is straight. These ties are anchored in each block either by other ties or by clips, transverse to the ties anchored, and preferably of the form shown at 10. The ties and clips are each recessed laterally as at 11, there being preferably two such recesses in each tie and but one in each clip. The recess 11 extends through to approximately the middle of the ties and clips, leaving solid material in line therewith at 12 of approximately the same depth as the depth of the cut. In placing these anchoring ties or clips together, I place them reversely so that the solid material 12 of one shall enter the recess 11 of the other, forming a joint therebetween and holding each against movement with respect to the other. In Fig. 1, I show two such joints. The one between the parallel blocks 1 and 1' is made up of a straight tie 8 shown as anchored by two clips 10. The straight tie is here selected because it is desirable to maintain the blocks 1 and 1' in alignment should it be desirable to place them at an angle to each other, a tie of the general form shown in Fig. 10 would be used, forming this angle itself or, in connection with the looseness of joint permitted by

the excessive width of the groove 2, permitting this side movement.

In Figs. 1 and 3, blocks 1 and 1<sup>2</sup> are at approximately right angles to each other.

5 Here I use a bent tie 7, but with the bend in the tie directed oppositely in the two figures, each preferably having the square position of the blocks as the limit in one direction and having the movements away 10 from that limit so as to form an obtuse angle in Fig. 2 and an acute angle in Fig. 4. Any intermediate position can evidently be reached by this one angle of the tie. In each case the anchorage is shown as formed 15 in one block by the clips 10 and in the other block by a straight tie 8 with an additional and, under some circumstances, unnecessary clip 10 also spanning the tie 8. Straight ties 8 could be used for the corners 20 as well as for the connection between the alined blocks, as best seen in Fig. 5.

In Fig. 6 I have shown ties and clips of two different heights. Those at the left end have width approximately twice the 25 depth of the groove for the purpose of alining and joining other blocks in a tier above the block shown. Evidently they will unite the blocks of the upper tier to each other in the same manner as those below, 30 in the same straight or angular relation, and at the same time the ties and bonds will unite the two tiers against relative movement in other than in a vertical direction. The tie and bond at the right hand end of 35 Fig. 6 are shown as narrow enough to lie entirely within the grooves and are designed for use against a plane surface, such as a floor, roof, etc.

In Fig. 7 I show another way of providing for the projection of the ties and clips beyond the edges of the blocks in most instances and their entire inclusion within the grooves in others, by difference in the depth of the grooves upon opposite edges of 45 the blocks, so that the same widths of ties and clips will project suitably from one edge of the block and may lie wholly within the groove along the other edge. It will be evident that the additional depth of the 50 groove does not in any way interfere with the use of these blocks for successive tiers where advantage is not to be taken of the extra depth, as the edge in which the deeper groove is cut may be made the lower edge

and the ties and clips will enter it to the 55 extent of the projection from the block below and to this extent only. The grooves 3', 4' and 5', represented in Fig. 7, should be approximately twice the depth of the grooves 3, 4 and 5 in the same figure. 60

The bending of the tie 7 greatly increases the angular range of possible placement of the blocks to produce other than square figures without interfering with the formation of a closed square figure when desired, 65 and, as the position of the bent tie in Figs. 1 and 3 indicates, the square corner will be more rigid because of the use of a bent tie which in the closed position takes up the lateral play of the tie in the groove 2. 70

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

1. In a device of the character stated, two blocks having longitudinal and trans- 75 verse edge grooves horizontally in line, a tie fitting in the grooves of both blocks and having recesses in one side of said tie, and means fitting into the grooves of the different blocks for anchoring the tie against 80 movement in either block, the tie and anchoring means extending above the said blocks for engagement with other blocks superimposed thereon.

2. In a device of the character stated, a 85 tie bent along a transverse line and laterally recessed at points between the bend and each end of the tie, cooperating recessed members fitting with their solid portions within the recesses of the tie and their recessed portions inclosing the solid portions of the tie 90 and blocks within which the tie and members fit.

3. In a device of the character stated, a plurality of blocks having longitudinal 95 grooves in their edges in combination with a bent tie of appreciably less thickness than the width of the grooves fitting into the groove on the edge of one and cooperating with the other to permit angular 100 movement of the blocks outside or inside of rectangular relation of the blocks with different facing of the bend.

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