



(No Model.)

2 Sheets—Sheet 2.

E. HOMAN.  
FIREPROOF FLOOR OR CEILING.

No. 505,659.

Patented Sept. 26, 1893.

Fig. 5.

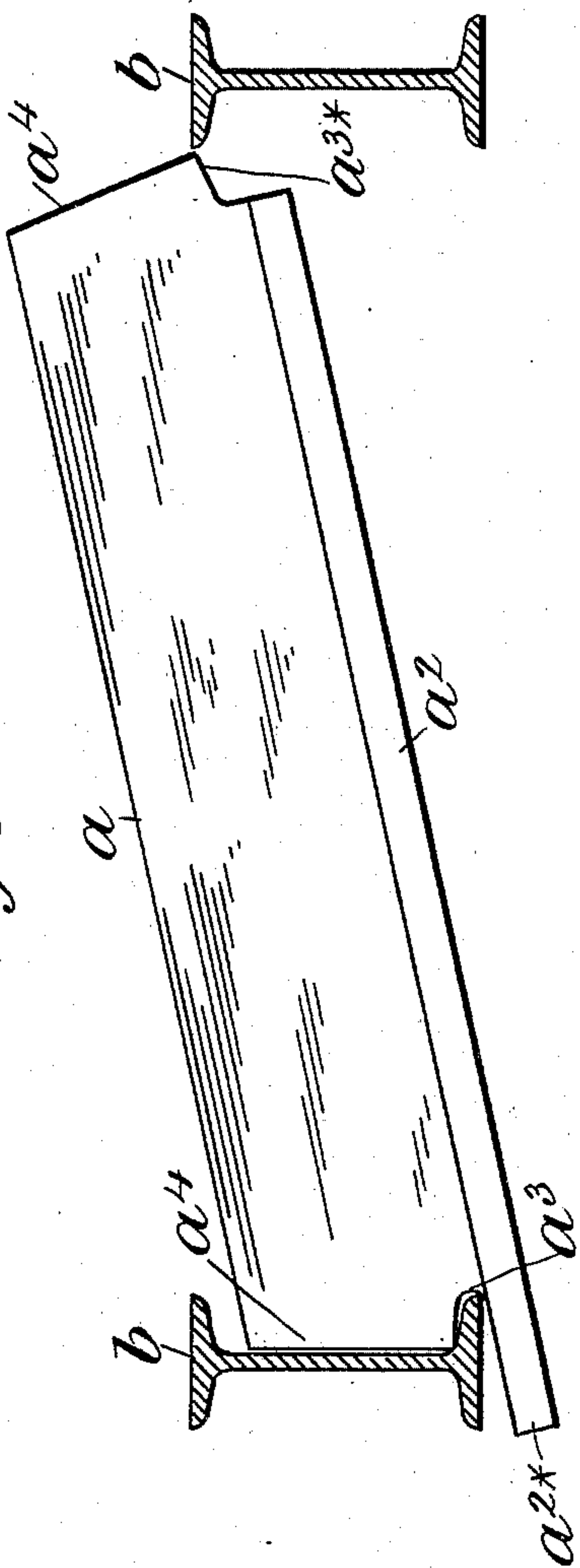


Fig. 7.

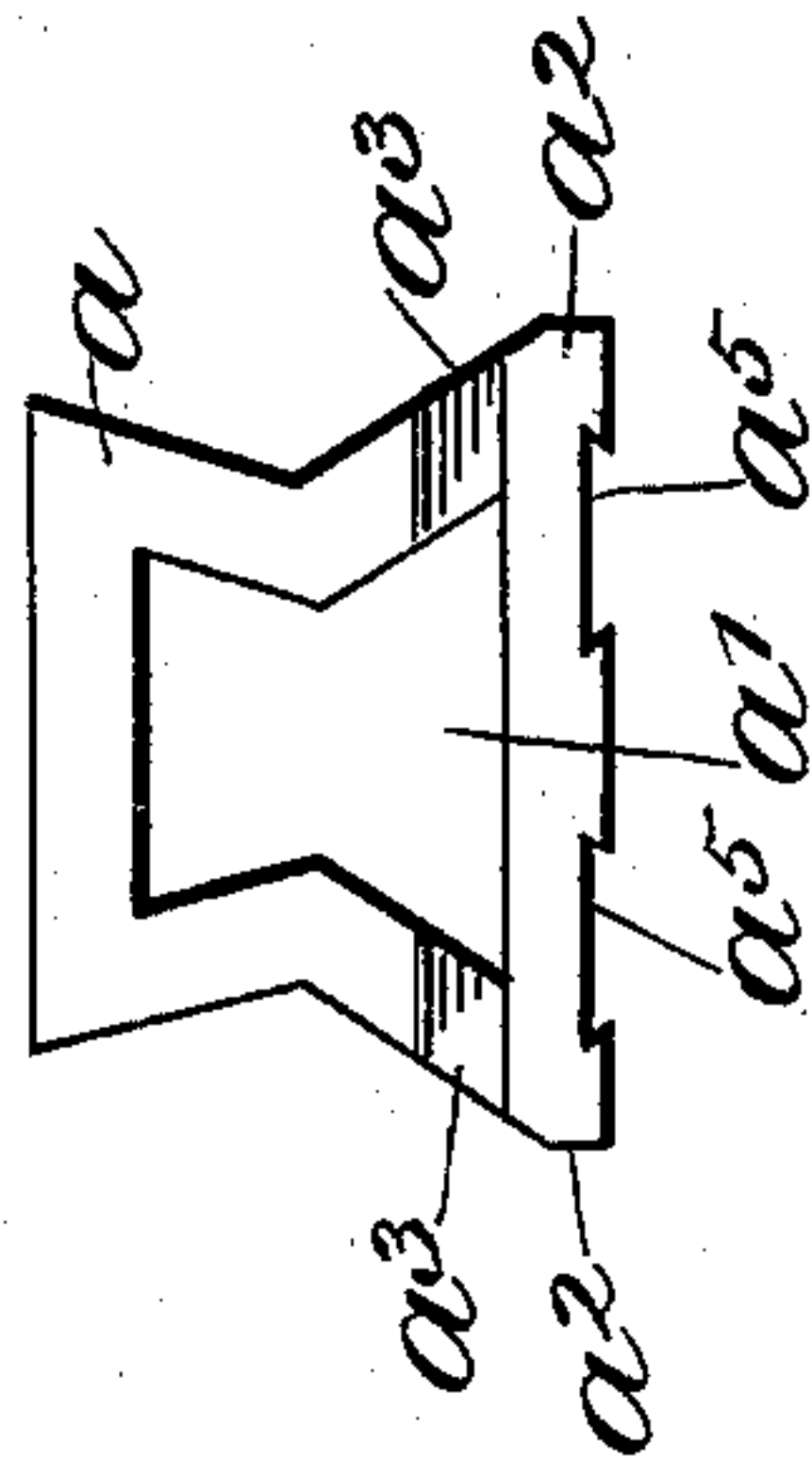
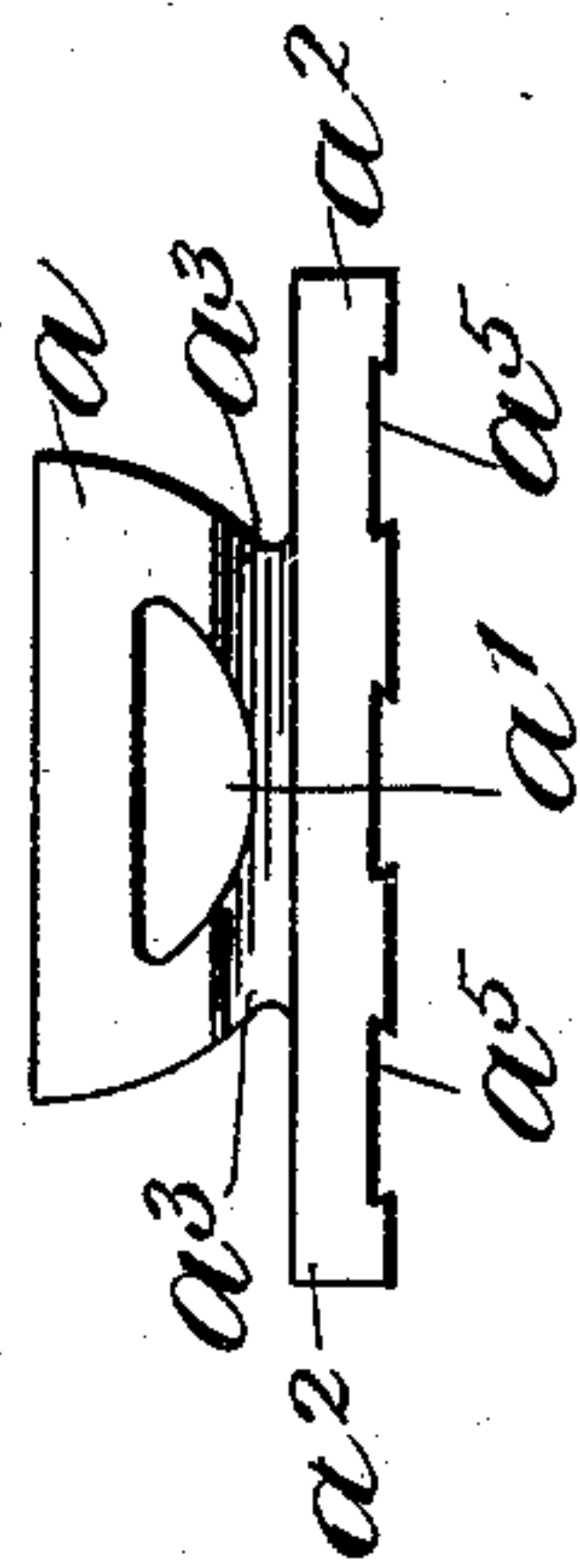


Fig. 6.



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# UNITED STATES PATENT OFFICE.

ERNEST HOMAN, OF LONDON, ENGLAND.

## FIREPROOF FLOOR OR CEILING.

SPECIFICATION forming part of Letters Patent No. 505,659, dated September 26, 1893.

Application filed April 5, 1893. Serial No. 469,191. (No model.)

*To all whom it may concern:*

Be it known that I, ERNEST HOMAN, engineer, a subject of the Queen of Great Britain, residing at 17 Gracechurch Street, in the city of London, England, have invented certain new and useful Improvements in the Construction of Fireproof Floors and Ceilings and in Bricks or Blocks to be Employed Therein, of which the following is a specification.

In fire-proof buildings as at present constructed the floors and ceilings are generally composed of iron girders upon the lower flanges of which are supported hollow or tubular bricks or blocks formed of fire resisting material laid side by side the entire length of the girders and transversely thereof concrete or the like being filled in between and over the bricks or blocks and up to the level of the upper flanges of the girders. The hollow bricks or blocks form a centering for the concrete or the like until the same is set while at the same time by reason of their hollow formation they materially reduce the dead weight of the structure and the contained air acts as an effective check to the passage of heat and sound. Hollow or tubular bricks or blocks of this character have hitherto been formed of such shape as to support the concrete and to rely mainly for their own support upon the flanges of the girders where their extreme ends rest but in practice it is found that merely supporting the bricks or blocks at their extreme ends in the manner above described is not altogether reliable as the weight of the concrete while in a plastic state aided or not by the sudden impact of a heavy body will frequently fracture a brick or block causing the same to fall out of place and inasmuch as the bricks or blocks are generally so constructed that they are only capable of being placed in position upon the girders previous to the filling in of the concrete it will be understood that accidents of this character give rise to many difficulties.

Now the primary object of my present invention is to so construct the hollow or tubular bricks or blocks that while acting to support the concrete or the like they will at the same time receive a certain amount of support therefrom along their entire length upon each side thereof and over a considerable area of their surface so that a perfect bond

will be formed between the concrete or the like and the bricks or blocks and the difficulty above pointed out will be obviated. For this purpose instead of forming the hollow or tubular bricks or blocks as heretofore in transverse section of pyramidal half round or other shape which will only afford support to the concrete I form the same wholly or partly of a reverse section to that above described, that is to say I form it in such manner that the tubular portion thereof increases in diameter from the base to the top of the brick or block or for part of such distance according to the section given to the hollow brick or block thus obtaining a supporting surface to the brick of considerable area and extending the entire length on each side thereof while I laterally extend the base of the brick or block to afford the necessary support to the concrete. Hollow or tubular bricks or blocks are generally constructed with slotted notched or flanged ends so that they will rest upon the flanges of the girders and at the same time cover the undersides thereof and thereby protect them against direct contact with flame or heat arising from a fire in the apartment immediately beneath. In order to place bricks or blocks of this character in position it is necessary to insert them diagonally between the girders and then turn them into their correct position at right angles thereto or to insert them at the ends of the girders and slide them along into the required position. These methods of placing the bricks or blocks in position are troublesome and consequently expensive and I therefore propose to construct my hollow bricks or blocks in such manner that they may be dropped into their correct position from above and without the necessity for any manipulation of the character above referred to. For this purpose I form one end of each brick or block with a notch or slot to receive the lower flange of the girder and I extend lengthwise the base of the brick bordering the lower side of such notch so that it will completely cover the under side of the girder while I form the opposite end of the brick or block with a simple projection or shoulder to rest upon the lower flange of the adjacent girder, and I bevel or incline the ends of the brick or block to such an angle as will permit the extended



end to be first placed in position and the shouldered end to be afterward lowered onto the flange of the girder without meeting with any obstruction therefrom. And in order  
 5 that the said invention may be more clearly understood and readily carried into effect I will proceed aided by the accompanying drawings more fully to describe the same.

In the drawings Figure 1 is a vertical section of a fire-proof floor or ceiling having my  
 10 invention applied thereto. Fig. 2 is a transverse section taken on the line 1—1 of Fig. 1. Fig. 3 is a side elevation of one of the hollow or tubular bricks or blocks separately and  
 15 Fig. 4 is an end elevation thereof. Fig. 5 is a somewhat similar view to Fig. 1 but showing the method of placing the brick or block in position. Fig. 6 is a similar view to Fig. 4 but representing a slight modification and  
 20 Fig. 7 is a similar view representing a further slight modification.

In the several figures like parts are indicated by similar letters of reference.

Referring to Figs. 1 to 4  $a$  represents the  
 25 hollow or tubular brick or block constructed according to the present invention.  $b$  represents the ordinary iron girders upon which the hollow or tubular bricks or blocks are supported and  $c$  represents the concrete or  
 30 like filling. In this example the brick or block  $a$  which is formed tubular or with a hollow  $a'$  therethrough instead of as heretofore being constructed of a half round or other  
 35 section decreasing in diameter from the base upward and which section was adapted only to afford a support to the concrete or like filling  $c$  and not to receive a reliable support  
 40 therefrom is according to the present invention formed wholly or partly of a reverse section to that above described, that is to say it  
 45 is formed in such manner that the tubular portion  $a$  increases in diameter from the base  $a^2$  to the top of the brick or block  $a$  or it might be for a part of such distance accord-  
 50 ing to the section given to the hollow or tubular brick or block  $a$ , as hereinafter described.

The base  $a^2$  of the hollow or tubular brick or block is extended laterally so that it meets  
 50 or nearly meets the like bases of adjacent bricks or blocks and thus forms a support for the concrete or like filling  $c$  until it has set while by reason of the peculiar section given  
 55 to the hollow or tubular brick or block  $a$  the latter receives a certain amount of support from the concrete or like filling  $c$  along the  
 60 entire length of each side thereof and over a considerable area of its surface so that a perfect bond is formed between the concrete or  
 65 like filling  $c$  and the hollow or tubular bricks or blocks  $a$ .

The hollow or tubular brick or block  $a$  instead of being formed slotted notched or  
 70 flanged at both ends to engage the lower flanges of the girders  $b$  as hereinbefore described is according to the present invention  
 75 formed at one end thereof with a notch or slot  $a^3$  to receive the lower flange of the girder  $b$

and the base  $a^2$  bordering the lower side of the notch or slot  $a^3$  is extended lengthwise at  
 80  $a^{2*}$  so that it will completely cover the under side of the girder  $b$  while the base  $a^2$  at the  
 85 opposite end of the hollow or tubular brick or block  $a$  is cut away to leave a simple projection or shoulder  $a^{3*}$  adapted to rest upon  
 90 the lower flange of the next adjacent girder.

The ends of the brick or block  $a$  are beveled or inclined at  $a^4$  to such an angle as will  
 95 permit the extended end  $a^{2*}$  to be first placed in position upon the lower flange of the girder  $b$  as represented more particularly at Fig. 5  
 100 and the shouldered end  $a^{3*}$  to be afterward lowered onto the lower flange of the girder  $b$  without meeting with any obstruction there-  
 105 from. By this construction the hollow or tubular bricks or blocks  $a$  may be readily placed in position without the necessity for intro-  
 110 ducing them diagonally between the girders or sliding them into position from the ends of the girders as hereinbefore described with  
 115 respect to other well known devices while the extension  $a^{2*}$  of each brick or block  $a$  entirely covers a portion of the length of the lower  
 120 flange of the girder.

In the example given at Fig. 6 the brick or block  $a$  is formed of a half round section or  
 125 approximately so, that is to say the diameter thereof increases from the base  $a^2$  to the top thereof but otherwise it is similar to that  
 130 hereinbefore described.

In the example given at Fig. 7 the principle  
 135 of construction of the hollow brick or block is similar to that hereinbefore described but in this case the hollow or tubular brick or  
 140 block  $a$  is formed of a double pyramidal section, that is to say the diameter thereof decreases gradually from the base  $a^2$  to the center  
 145 and increases gradually from the center to the top. This form of hollow or tubular brick or block although perhaps generally  
 150 not altogether possessing the strength of that represented at Figs. 1 to 4 is however a very  
 155 useful form inasmuch as the strength thereof at the base  $a^2$  is superior to that of the other forms of brick or block hereinbefore shown  
 160 and described.

In all the examples hereinbefore given the  
 165 hollow or tubular bricks or blocks  $a$  are formed upon their under surface with dovetail grooves  $a^5$  to form keys for the plaster of  
 170 the ceiling.

By the construction of floor or ceiling and  
 175 hollow or tubular brick or block hereinbefore described I obtain a mutual support between the brick or block  $a$  and the concrete or like  
 180 filling  $c$  and I thereby greatly add to the strength of the finished structure while I obtain the advantage that the hollow or tubular  
 185 bricks or blocks  $a$  are held securely in place until the concrete or like filling has become set and furthermore by reason of the peculiar  
 190 construction of the ends of the brick or block I reduce the labor in the building up of the floor or ceiling and consequently cheapen the  
 195 cost of construction thereof.



Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

5 1. A hollow or tubular brick or block formed of a gradually increasing diameter from the base to the top or for a part of such distance and with a laterally extended base substantially as herein shown and described and for  
10 the purpose stated.

2. A hollow or tubular brick or block formed of a gradually increasing diameter, from the base to the top or for a part of such distance with a laterally extended base with a notch  
15 and extended base at one end a shoulder at the other end and with both ends beveled or inclined substantially as herein shown and described and for the purpose stated.

3. A hollow or tubular brick or block formed  
20 with a notch and extended base at one end a shoulder at the other end and with both ends beveled or inclined substantially as herein shown and described and for the purpose stated.

25 4. In a fire-proof floor or ceiling the combi-

nation of a series of iron girders a number of hollow or tubular bricks or blocks each formed of increasing diameter from the base to the top or for part of such distance and provided with a laterally extended base and a filling  
30 of concrete or the like substantially as herein shown and described and for the purpose stated.

5. In a fire-proof floor or ceiling the combination of a series of iron girders a number of  
35 hollow or tubular bricks or blocks each formed of increasing diameter from the base to the top or for part of such distance and having a laterally extended base a notch or slot and an extension of the base at one end a shoulder  
40 at the other end a bevel or incline at each end and a filling of concrete or the like substantially as herein shown and described and for the purpose stated.

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