

(No Model.)

2 Sheets—Sheet 1.

W. R. FORBUSH.
FIRE PROOF FLOORING.

No. 469,082.

Patented Feb. 16, 1892.

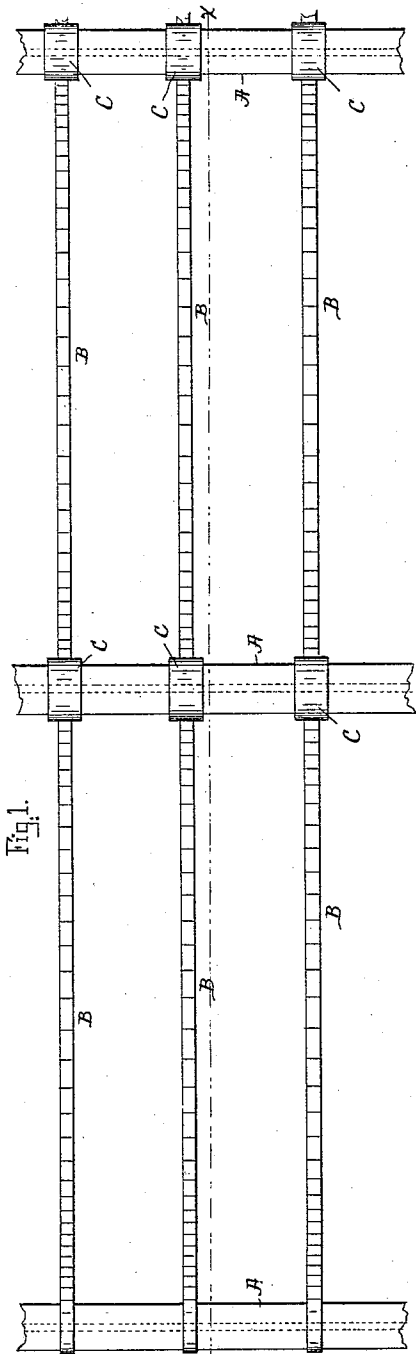


Fig. 1.

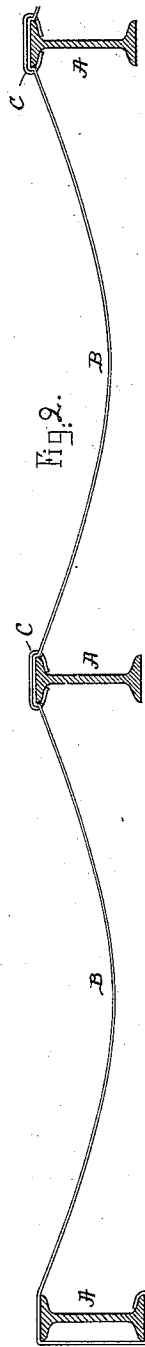


Fig. 2.

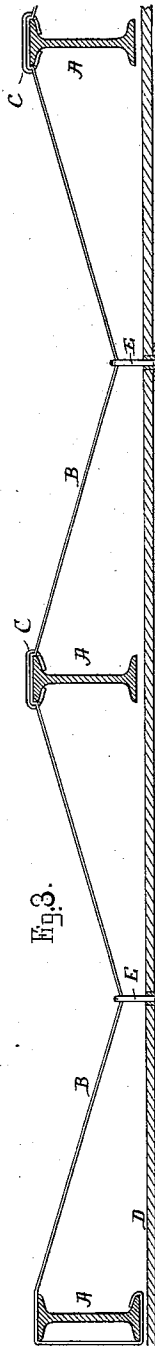


Fig. 3.

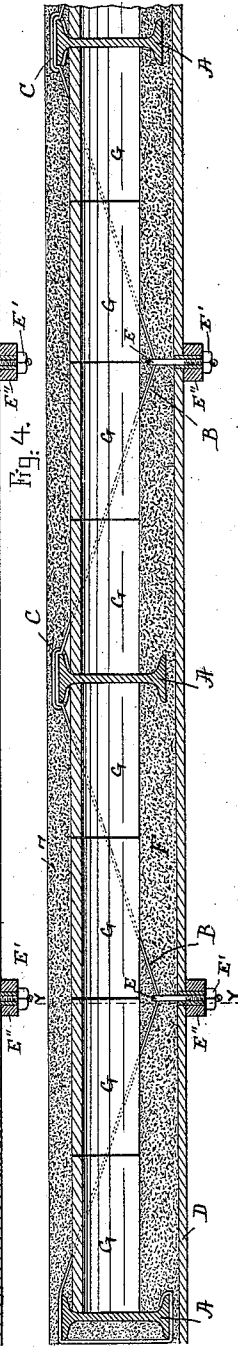


Fig. 4.

Witnesses.

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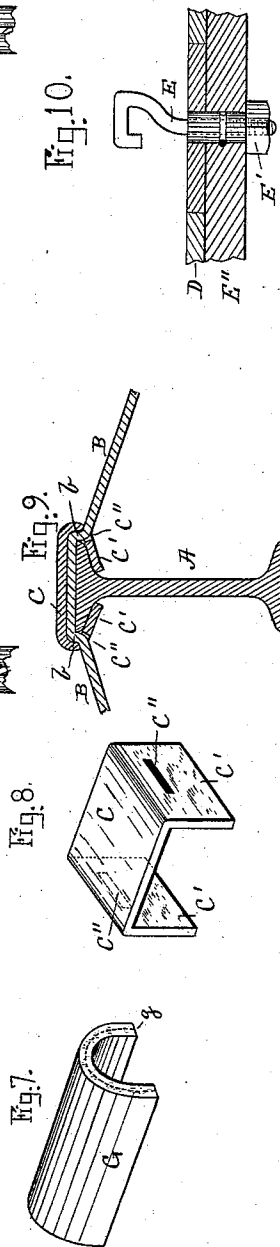
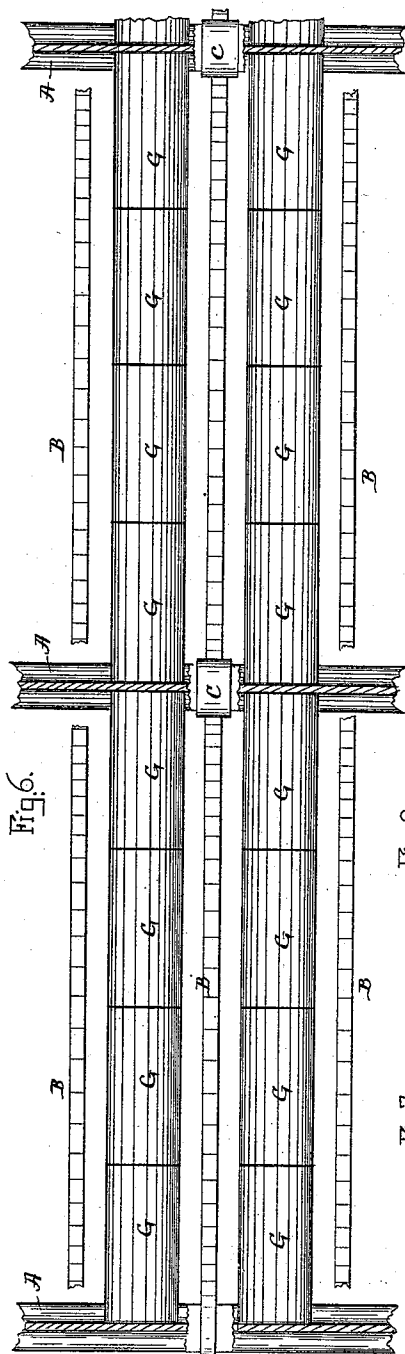
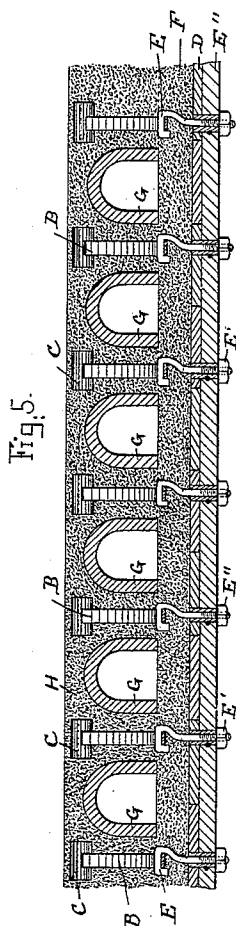
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UNITED STATES PATENT OFFICE.

WALTER R. FORBUSH, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO WILLIAM MARSH KASSON, OF SAME PLACE.

FIRE-PROOF FLOORING.

SPECIFICATION forming part of Letters Patent No. 469,082, dated February 16, 1892.

Application filed August 6, 1891. Serial No. 401,875. (No model.)

To all whom it may concern:

Be it known that I, WALTER R. FORBUSH, a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented new and useful Improvements in Fire-Proof Flooring, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention relates to improvements in fire-proof flooring, walls, or ceilings for buildings, bridges, &c.; and it has for its object to provide a very strong and comparatively light fire-resisting medium which can be easily laid in a very simple manner and capable of sustaining very heavy loads or strains, as hereinafter described and claimed, reference being had to the accompanying drawings, wherein—

Figure 1 represents a plan view of the floor-supporting beams and the metal bands secured to and supported from said beams. Fig. 2 represents a cross-section on the line X X, shown in Fig. 1. Fig. 3 represents a similar section showing the temporary staging in position below the beams for supporting the concrete or other plastic filling and cores during the process of making the flooring, showing also a tension device for imparting any desired tension to the metal bands. Fig. 4 represents a sectional view of the complete flooring, showing the temporary staging in position below it, same as in Fig. 3. Fig. 5 represents a cross-section on the line Y Y, shown in Fig. 4. Fig. 6 represents a plan view similar to Fig. 1, showing the cores in position between the metal bands. Fig. 7 represents a detail perspective view of one of the cores. Fig. 8 represents a detail perspective view of one of the clips or fastenings for securing the metal bands to the beams. Fig. 9 represents a cross-section of one of the beams, its metal band and clip or fastening device in locked position; and Fig. 10, a detail view of one of the tension devices for imparting a desired tension to the metal bands.

Similar letters refer to similar parts wherever they occur on the different parts of the drawings.

In carrying out my invention I proceed as follows: A A represent the floor-beams, as

usual, which may be made of wood or metal. In the drawings I have shown such beams as being made of metal of the well-known I-section; but they may be made of any other form, material, or construction without departing from the essence of my invention. The ends of said floor-beams are supported, as usual, in the walls of the building or otherwise, according to the nature of the structure for which the improved flooring is to be used. The said floor-beams are arranged at proper distances apart, according to the load they are to carry.

B B are the floor-supporting metal bands, which are made preferably flattened in section—that is, thinner in the direction of the weight of the load to be supported by them as compared with a direction at right angle thereto—and this is done for the purpose of properly supporting the concrete or other plastic filling from such metal bands without liability of cutting or disintegrating such filling. Each of said metal bands may be made of any desired section, as long as it is made thinner in the direction of the pressure of the load to be supported as compared with a direction at right angle thereto. Thus, for instance, flattened metal bands of any desired section may be used, and I wish to state that I do not use nor claim the use of wire strands for this purpose, as the latter have not the sustaining property of metal flattened bands, owing to their liability of cutting and disintegrating the concrete or other filling that is used. The said metal bands B B are looped in catenary curves from beam to beam and secured to the latter in any suitable manner, and this may be done preferably by means of U-shaped clips or fastenings C. (Shown in detail in Figs. 8 and 9.) Each of such fastening devices is made of a flat soft-metal plate, somewhat wider than the floor-supporting band B, and has its ends C' C' bent downward at right angles, or nearly so, to the top portion, each such end piece C' having a perforation C'', adapted to receive the metal band B, as shown. In using these fasteners they are strung upon the bands B before the latter are looped on the beams A, and after said bands are properly hung and adjusted—

ed the downwardly-projecting ends C' C' of the fasteners C are bent beneath the upper flanges of the beam A, as fully illustrated in Fig. 9. In hammering or bending the clasps in position on the beam and band shoulders *b b* are formed on the latter where it overlaps the edges of the beam, as shown in Fig. 9, causing the band to be held still more firmly secured to the beam, thus preventing it from slipping by any movement on the beams when a strain is brought to bear on said bands. The said bands may be secured to the end beams in series; also, by means of said clasps or by wrapping or bending the band around the beam, as shown in the left-hand portion of Figs. 1, 2, and 3. After the bands B B have been thus placed in position and secured at proper distances apart to the said beams, place below the beams A A a temporary platform D, the top of which is located about one inch below the under side of the beams A A, as shown in Figs. 3, 4, and 5. Said platform may be temporarily erected and supported in any well-known manner.

When it is desired to apply a tension to the metal bands B before embedding them in the concrete plastic composition or other filling material, I prefer to do this from below by means of a hooked screw or tie bolt E, (shown in detail in Fig. 10,) the upper end of which is hooked onto the band B midway between any two of the beams A A, and the proper tension or strain given to the band B by means of a nut E', that receives the screw-threaded shank of the hooked tie-bolt E, said nut being preferably journaled in a plank or beam E'', placed below the platform D, as shown. I now proceed as follows: Upon the platform D, I deposit a layer F of any of the usual concretes or plastic material, which is made, preferably, extending a little below the under side of the beams A A, of a thickness sufficient to extend upward about one-third of the height of said beams, or more or less, as may be desired. In using said filling preference is made to such as is tenacious, fire-resisting, light, and capable of withstanding severe and heavy crushing strains. Before such filling has had time to set and harden I place upon it, between the bands B B, a series of preferably inverted-U-shaped hollow cores G G, which are of uniform size and shape throughout their lengths. Said cores may, if so desired, be reinforced by metal wire, metal netting, or other suitable metal reinforcing material *g*, as shown in Fig. 7. Said cores are made to extend transversely from beam to beam between and unsupported by the bands B B, and in part above and in part below the latter, as shown in Figs. 4 and 5. After said hollow cores have been placed in position upon the plastic layer F, I fill the interstices between the hollow cores G G with a similar plastic or concrete fire-resisting mass H, which, together with the lower plastic layer F, is then allowed to set and harden, causing the whole structure to be firmly

united together to and about the beams, band, and cores. In practice I prefer to extend the upper filling H an inch or so above the upper portions of the beams A A, so as to entirely conceal and protect said beams when the flooring is completed. When the concrete or plastic filling F H is duly set and hardened, I remove the nuts E' and their bearing-planks E'', after which the temporary platform D is also removed and the projecting ends of the tension screw-bolts E cut off even with the under side of the flooring. By this arrangement I produce a very strong, durable, light, and fire-resisting flooring, which is cheaper and much more easily laid than others now in use.

By the employment of flattened metal supporting-bands, as described, the plaster filling is strongly and tenaciously supported thereon without danger of being cut, cracked, or disintegrated, and thus the very best results are obtained.

By the use of cores of preferably uniform size throughout their lengths the cost of making and laying the same is materially lessened, and by arranging said cores between the metal bands from beam to beam and in such a manner as to project in part above and part below said bands I am enabled to unite, bind, and most firmly secure together the component parts of the flooring. The hollow cores G lighten the weight of the flooring, and the plastic material above the cores distributes the superimposed load and forms a surface to receive the finished floor, while the plastic material below the cores constitutes a base to receive the finished ceiling.

Having thus fully described the nature and construction of my invention, I wish to secure by Letters Patent, and claim—

1. The combination, with the floor-beams, of metal bands supported on and suspended from said beams, a series of independent hollow cores arranged between each pair of bands, and concrete or plastic filling in which the said beams, bands, and hollow cores are wholly embedded, substantially as and for the purpose set forth.

2. The combination, with the floor-beams, of metal bands supported on and secured to said beams, slotted metal fastening-clamps arranged on said bands, and concrete or plastic filling in which said beams and bands are embedded, substantially as and for the purpose set forth.

3. The combination, with the floor-beams, of metal bands supported on and suspended from said beams, a series of independent hollow cores arranged between the bands, the concrete or plastic filling in which the beams, bands, and cores are wholly embedded, and a platform arranged below the beams, bands, and cores, and against which the concrete or plastic mass rests, substantially as described.

4. The combination, with the floor-beams, of the metal bands supported on and suspended from the beams, a platform arranged

below the beams and bands, the adjustable tie-bolts passing through the platform and engaged with the metal bands at points between the floor-beams, and the concrete or plastic filling resting against the platform, and in which the beams and bands are wholly embedded, substantially as described.

5. The combination, with the floor-beams A, of the metal bands B, supported on and suspended from said beams, a series of independent hollow cores G, arranged between the bands, the concrete or plastic filling resting upon the platform, and in which the said beams, bands, and cores are wholly embedded, and adjustable tie-bolts E, extending through the platform and engaged with the metal bands between the floor-beams, substantially as described.

6. The combination, with the floor-beams

A, of the metal bands B, supported on and suspended from said beams, a platform D, arranged below the floor-beams, a concrete or plastic layer F, resting on the platform, a series of independent hollow cores G, arranged between the metal bands and resting on the concrete or plastic layer to extend in part above and in part below the metal bands, and a concrete or plastic filling H, covering the floor-beams, the metal bands, and the cores, substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 1st day of August, A. D. 1891.

WALTER R. FORBUSH.

Witnesses:

ALBAN ANDRÉN,
WILLIAM M. KASSON.