No. 607,223. Patented July 12, 1898.

A. DE MAN.

ARTIFICIAL SLAB.

(Application filed June 23, 1897.)

(No Model.)

Fig. 1.

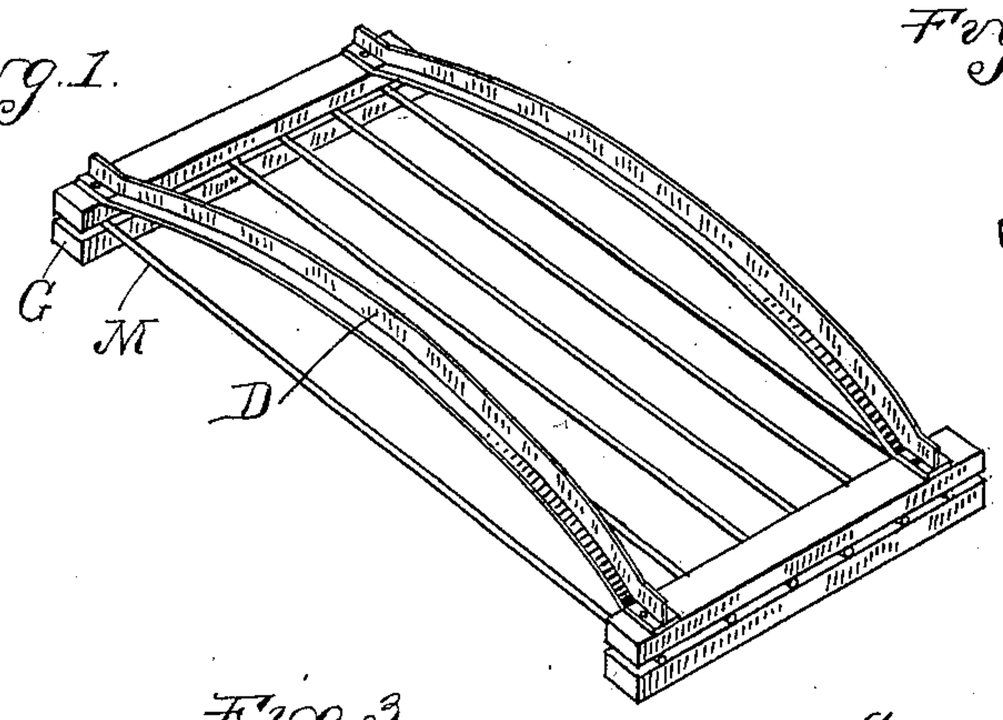


Fig. 4.

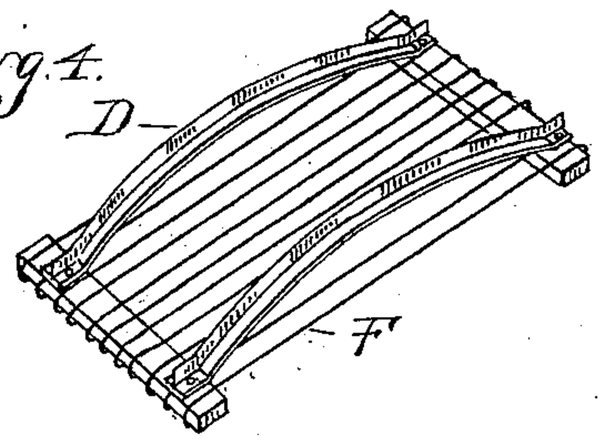


Fig. 10.

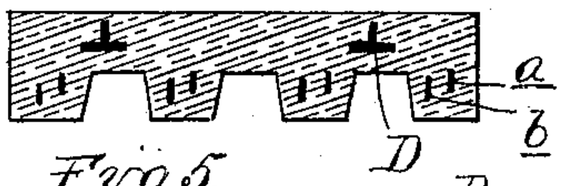


Fig. 3.

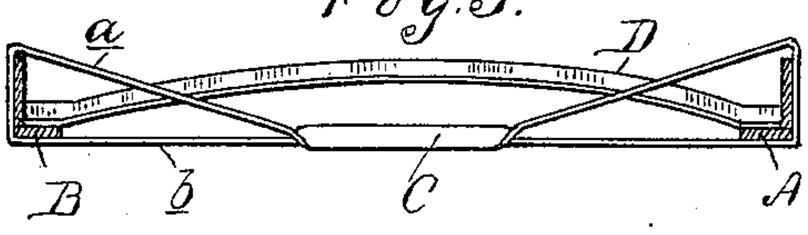


Fig. 5.

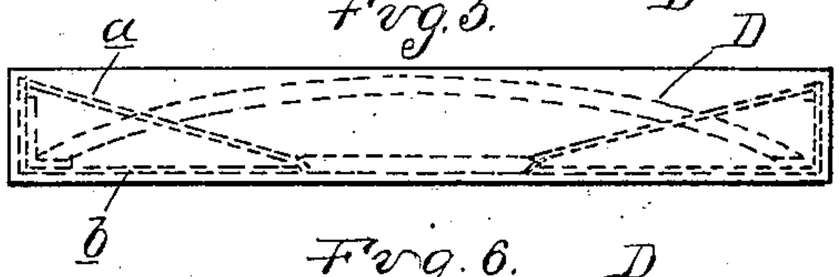


Fig. 2.

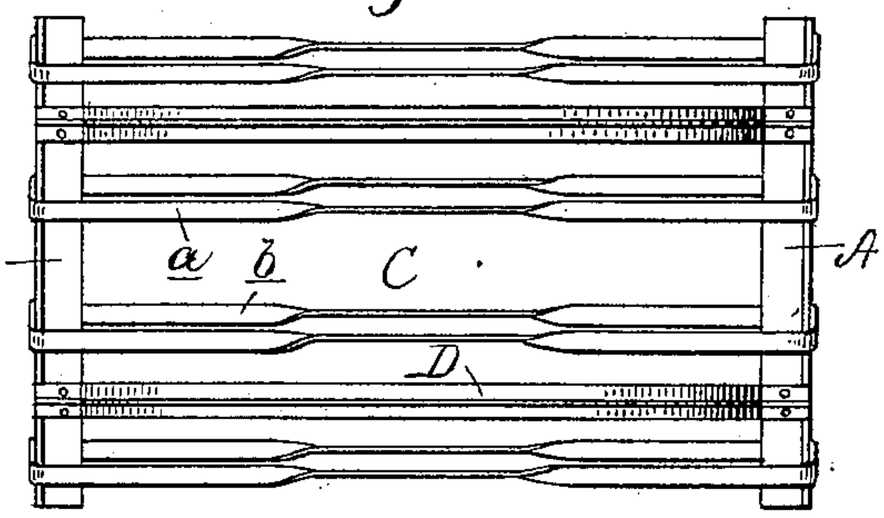


Fig. 6.

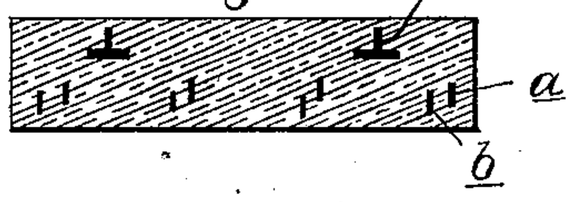


Fig. 7.

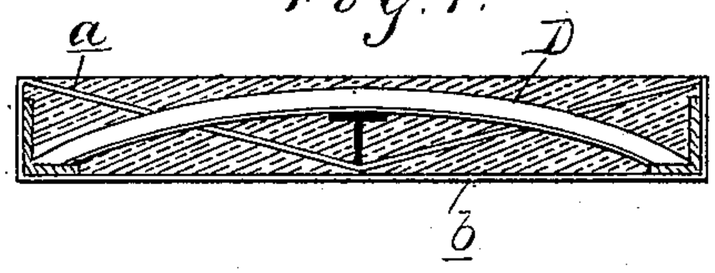


Fig. 8.

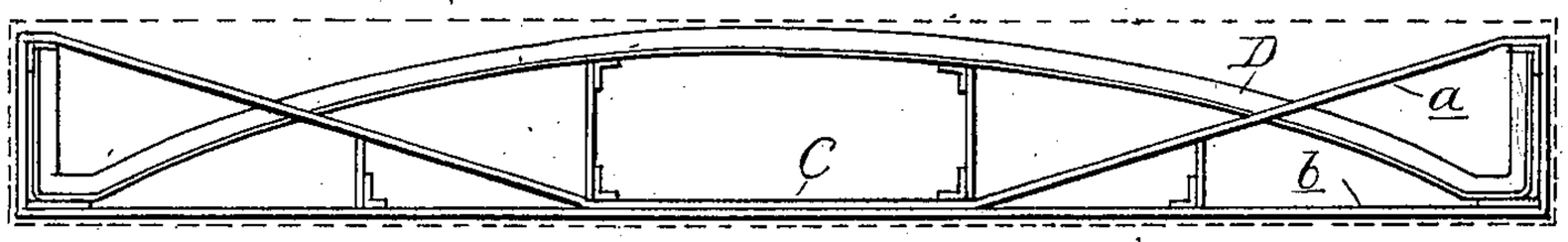


Fig. 9.

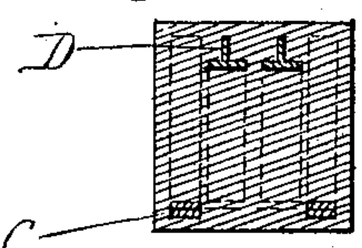
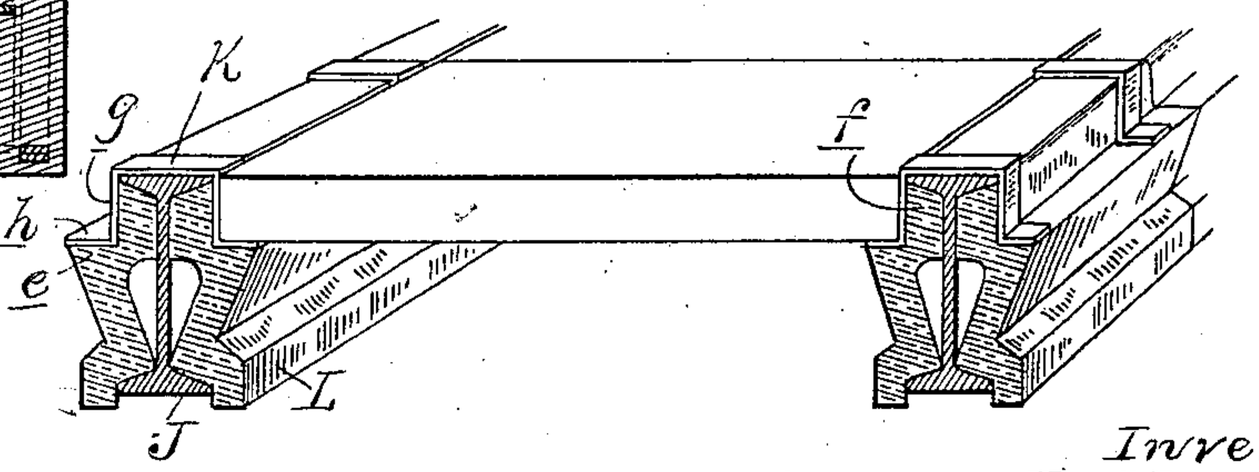


Fig. 11.



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Attys.

UNITED STATES PATENT OFFICE.

ALPHONSE DE MAN, OF DETROIT, MICHIGAN.

ARTIFICIAL SLAB.

SPECIFICATION forming part of Letters Patent No. 607,223, dated July 12, 1898.

Application filed June 23, 1897. Serial No. 641,879. (No model.)

To all whom it may concern:

Be it known that I, ALPHONSE DE MAN, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Artificial Slabs, of which the following is a specification, reference being had therein to the accompanying drawings.

In the present state of the art of building construction artificial stone or concrete is frequently employed in constructing the floors or for incasing beams, columns, &c., to render the structure fireproof. This is generally employed while in a soft or plastic state, and as considerable time is required for hardening and drying before the further work of finishing the building may be proceeded with the completion of the structure is thus necessarily delayed.

It is the object of my invention to facilitate the work of building such structures by providing artificial portable slabs having all of the valuable properties of artificial stone and in addition thereto greater strength, which slabs may be manufactured at any convenient place, and when completely hardened and dried transported to the building in the process of construction, where they may be readily laid in place without the necessity of building a temporary scaffolding.

The invention consists in the peculiar construction of a composite portable slab comprising a skeleton frame embedded in a body of artificial stone; further, in the peculiar construction of the skeleton frame for said slab, and, further, in the peculiar construction of a floor structure in which said slabs are employed, all as more fully hereinafter described and claimed.

In the drawings, Figures 1, 2, 3, and 4 show several modifications of the skeleton frame forming a part of my slab. Fig. 5 is a side elevation of the completed slab. Fig. 6 is a cross-section thereof. Fig. 7 is a longitudinal section through another modified construction of slab. Fig. 8 is an elevation of the skeleton frame of a beam similarly constructed to the slab. Fig. 9 is a cross-section thereof. Fig. 10 is a cross-section through a slab, showing another modification; and Fig. 11 is a perspective view of a portion of a floor construction in which my slab is employed.

The skeleton frame forming a part of my composite slab is so constructed as to furnish to the completed structure just the elements of strength most lacking in the body portion of this slab. As the artificial stone which is employed for the body portion is deficient in tensile strength, a slab formed from that material alone could not be safely employed where subjected to transverse stress, as in floor construction where supported at the ends only, nor would a slab thus formed have even sufficient strength to stand the jar of transportation without danger of breakage. I therefore construct the skeleton frame with special reference to increasing the transverse strength of the slab, preferably employing a number of longitudinal compression and tensile members united by end cross-bars forming a combination truss. Although this truss comprises both tension and compression members, the strength of the former is preferably greatly in the preponderance, the object of the compression members being partly to hold the parts in proper relationship to each other before being embedded in the body, which latter may be relied upon to sustain all compression strains, and, further, to give sufficient rigidity to the frame to prevent danger by breaking of the slab during the transportation or handling thereof.

In Figs. 2, 3, and 4 I show the manner of constructing the skeleton frame for a slab designed especially for a floor or pavement where subjected to transverse stress on one side only. In this construction A and B are two metallic cross-bars, preferably angle-bars. C are a series of longitudinal tensile members in shape of loops formed of metallic bands arched over said cross-bars. D are the compression members formed of inverted-T bars into a bow shape and riveted or otherwise secured at their ends to the horizontal flanges of the angle-bars. The upper strands *a* of the loops C are bent down toward the center portion, which is preferably twisted to stand in a vertical plane, a similar twist being made in the center portion of the lower strands *b*.

In place of the band-loops C, I may use convolutions of wire, as shown at F in Fig. 4, or, if desired, the angle-bars may be omitted and plain double-end cross-bars G may be used, between which are clamped the ends of longitudinal tension-wires M, with the com-

pression members D extending between the end bars, as shown in Fig. 1. The preferable construction, however, is that shown in Figs. 2 and 3.

After the skeleton frame is completed it is placed in a suitable mold and the material comprising the body tamped in, completely surrounding the frame. For the material composing the body I may employ any of the compounds used in producing artificial stone, but preferably the ordinary concrete, which possesses the properties most desirable, such as uniting firmly with the iron structure and having practically the same coefficient of expansion. When the body has solidified, the members *a* and *b* will furnish the requisite tensile strength where it is needed to withstand the strains to which the slab may be subjected, while the cross-bars A and B and the bars D will strengthen the slab from breaking when handled. The end bars A and B also form base-plates on which the ends of the slab may be supported without danger of shearing off. At the same time the body portion of the slab forms a complete covering for the metallic structure, protecting it from heat and corrosion. Thus the completed article is capable of being transported and handled in a manner and subjected to the strains which a slab formed wholly of artificial stone would be too fragile to withstand.

Fig. 7 shows a slab in which the skeleton frame has a central cross-bar between the compression members and upper strands of the loops C.

In Fig. 10 I show the manner in which a slab may be cored out between the members of the skeleton frame to decrease the weight without diminishing the strength of the slab.

Fig. 8 shows a beam constructed in a similar manner to the construction of the slab, differing therefrom only in being of lesser width and having some additional bracing members in the metallic frame.

Although I employ the term "slab" in describing my invention, I do not wish to be limited to any particular form, size, or proportion of dimensions.

In Fig. 11 I show a floor construction formed by slabs constructed as above described and laid to span the space between the floor-beams J, in which they are supported at the ends. These slabs are preferably supported on the beams by resting on the artificial-stone blocks L, which form a side-protecting casing for the beams J and are supported on the lower flange thereof. The blocks L are preferably formed with a ledge or shoulder *e*, on which the slab rests, and the upward extension *f* between the end of the slab and the beam. In laying the floor the blocks L are first placed along the side of the beam, and to hold them temporarily in place the straps or saddles K are placed over the top of the beam, the downward-bent portion *g* of which hooks over the portion *f* of the block and the laterally-projecting ends *h* rest on the ledge *e*. The slabs are thus laid in place, the saddles K holding them a slight space away from the blocks, and after all are in position liquid cement is run into the crevices, thus firmly uniting the slab and blocks. Such a floor structure may be very quickly laid and without the necessity of first erecting a scaffolding to work on, so that the time necessary for the completion of the work is considerably diminished.

What I claim as my invention is—

1. A composite floor-slab comprising a body of artificial stone and a skeleton frame embedded therein consisting of longitudinal trusses and connecting end cross-bars the latter also forming bases for the slabs.

2. A skeleton frame for artificial-stone slabs comprising longitudinal tension members and compression members and end cross members forming connecting-headers to which said tension and compression members are secured and also supporting-bases for the slab.

3. A skeleton frame for artificial-stone slabs, comprising end cross-bars or headers, longitudinal tension members strung across between and secured to said headers, and one or more bowed compression members extending between said headers, the whole forming a bow-string truss.

4. A skeleton frame for artificial-stone slabs comprising end cross-bars or headers, longitudinally-extending loops lashed around said cross-bars having their upper strands centrally depressed and longitudinally-bowed compression members extending between and connected to said end cross-bars.

5. A composite slab comprising a skeleton frame having end cross-bars and longitudinal bow-trusses connected thereto, and a body of artificial stone in which said frame is embedded cored out between the cords of said bow-trusses.

6. A floor construction, comprising a metallic floor-beam, an artificial-stone block forming a side protecting casing for said beam, an artificial-stone slab spanning the space beside said beam and a saddle hung over said beam having the downwardly-extending portion *g* and outwardly-extending portion *h* adapted respectively to secure said block to the beam and form a support for the slab.

7. A floor structure comprising metallic beams, blocks of artificial stone resting on the lower flange of said beams, the side ledges *e* and upward extension *f*, the saddles K hung on the tops of the beams, a composite slab resting on said saddles which separate it from the ledge *e* and extension *f* of the block, and cement filling the space between said slab and block and uniting the two.

In testimony whereof I affix my signature in presence of two witnesses.

ALPHONSE DE MAN.

Witnesses:
M. B. O'DOGHERTY,
OTTO F. BARTHEL.