April 27, 1926. 1,582,173

T. J. FOSTER

FIREPROOF FLOOR CONSTRUCTION

Filed Sept. 21, 1923

Fig. 1,

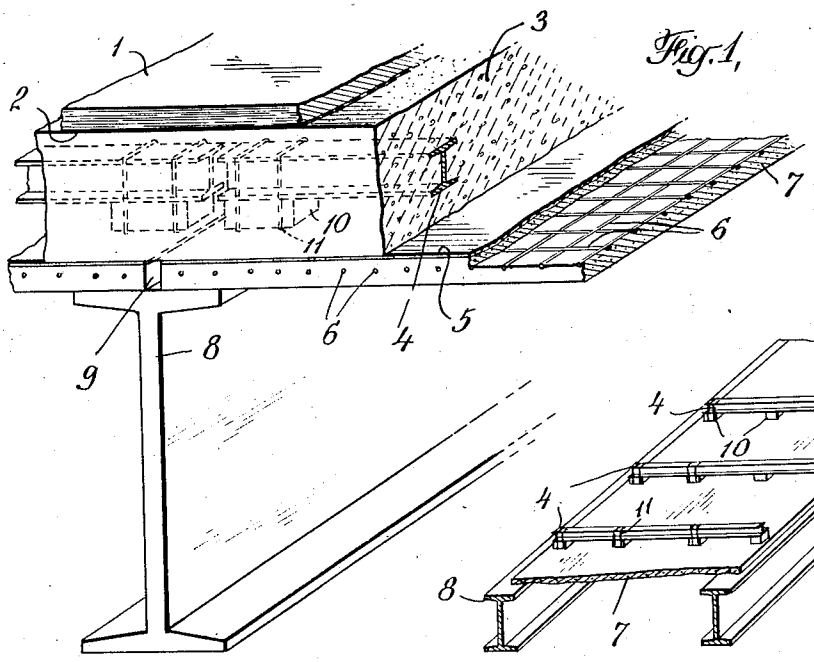


Fig. 2,

Fig. 3,

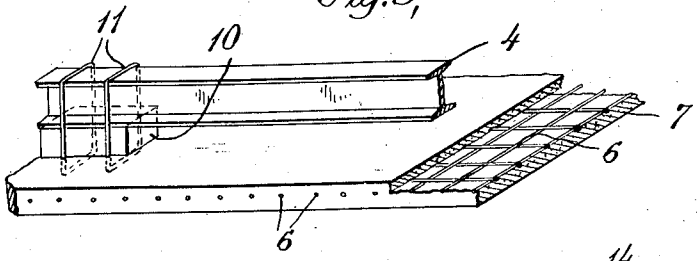
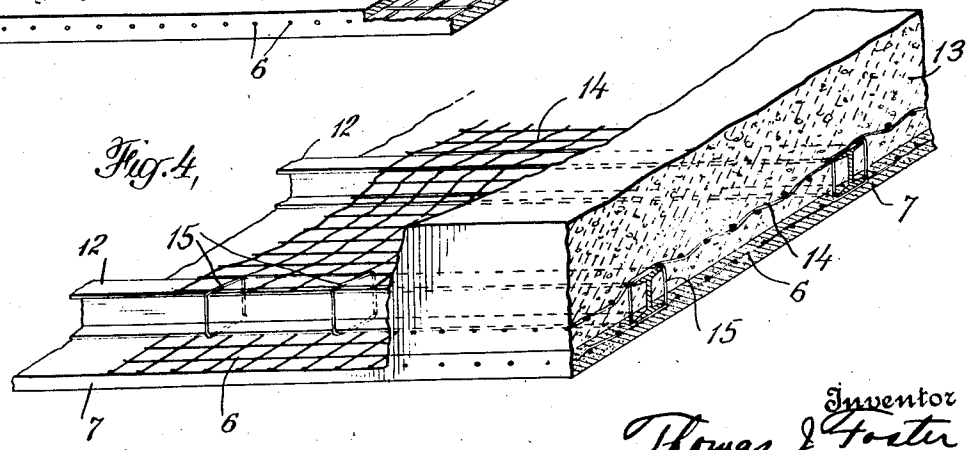


Fig. 4,



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UNITED STATES PATENT OFFICE.

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FIREPROOF FLOOR CONSTRUCTION.

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To all whom it may concern:

Be it known that I, THOMAS J. FOSTER, a citizen of the United States, and resident of Ridgewood, Bergen County, State of New Jersey, have made a certain new and useful Invention Relating to Fireproof Floor Constructions, of which the following is a specification taken in connection with the accompanying drawing, which forms part of the same.

This invention relates especially to fireproof floor constructions in which special fireproof floor supports such as long strips of reenforced and stiffened plaster board or the like are used upon the steel or other floor beams so as to support the concrete or cement or other hardening plastic constituting the body of the floor (hereinafter referred to indiscriminately as "concrete" or "cement") without in many cases requiring any additional centering or other supports between the beams. Floor supports for this purpose may be stiffened or reenforced plaster board or other relatively thin and preferably substantially fireproof composite board which may be made up with suitable wire or other reenforcement embedded therein or secured thereto so as to support the several foot spans of setting concrete between the beams. In many cases the concrete stiffening or reenforcing elements may be secured to or incorporated with these floor supports so that long strips of these plaster board or other supports of the proper width to correspond to the beam spacing and extend across one or more of the spans between the beams, may be readily put in place and the cement floor poured over the same with a minimum of trouble and expense. In many cases the concrete floor may be finished by applying a yielding tread composition such as a layer of linoleum or cork carpet secured to the concrete floor by a suitable plastic binder or cement, or a proper thickness layer of such cork or other yielding tread composition may be applied in plastic condition and united to the concrete floor where additional cushioning is desired.

In the accompanying drawing showing in a somewhat diagrammatic manner various illustrative embodiments of this invention:

Fig. 1 is a transverse vertical section of an illustrative construction

Fig. 2 shows the way the floor support may be applied to the beams

Fig. 3 is an enlarged view of the floor support and stiffener or reenforcing members, and

Fig. 4 is a sectional view showing another form of floor construction of this type.

The floor beams 8 which may be of any desired size and construction may be spaced apart at suitable uniform intervals as is usual, see Fig. 2. It is advantageous to apply to these beams which may, of course, be two or three feet more or less between centers, combined ceiling and floor support strips or sheets of non-combustible or fireproof material such as plaster board, sheet rock, or other still more fireproof asbestos board mineral compositions which may advantageously be made up or cut into strips of such width as to extend between the centers of adjacent beams, for example. Such strips 7 may be ten feet or more in length in some cases so as to cover the entire panel between two or more beams and it is of decided advantage to incorporate in or secure to such relatively thin light plaster board or other floor supports sufficient reenforcing or stiffening members such as wire strips or rods so that no independent centering or intermediate supports are required in many cases below these floor supports, while the cement floor is being laid and setting. As shown in Figs. 1 to 3, for instance, the floor support 7 which may be three-eighths to one-half inch thick more or less may have incorporated therein woven wire or other metal reenforcement 6 which prevents or minimizes breakage besides strengthening the floor support; and additional reenforcing stiffening strips or rods such as 4 may be used, preferably in contact with or above the floor supports so as to be embedded in the concrete floor and wired or otherwise secured to the floor supports at suitable intervals as shown in Figs. 2 and 3. These reenforcing stiffening strips may be of H sectioned steel a half or five-eighths of an inch high more or less and wired or secured to the plaster board or other floor supports at intervals as by the tie wires 11 which may extend around these stiffening rods and interposed cement or plaster board spacers 10, so as to strengthen the floor supports sufficiently so that they can support the concrete floor 3 which may be two or three inches more or less of Portland cement concrete poured upon or applied to the floor supports. Where sound cushioning action is particularly desirable the concrete

may be made up with this in mind and as much as forty per cent of cinders may be incorporated therein or considerable quantities of spongy or aerated furnace slag or smaller quantities such as ten per cent or less of sawdust or the like. It is also desirable in some cases to have a layer of paper 5 formed on the floor supports, this paper cushioning or covering layer being preferably waterproofed as by incorporating or applying waxy or tarry material thereto. If desired, of course, additional woven wire or other reenforcement may be applied to the floor supports so as to be embedded in the concrete floor and woven wire may, for instance, be used for this purpose and applied to the floor supports above the stiffening rods at any suitable time. It is advantageous for many purposes to have this reenforcement incorporated with the floor supports when they are made and as indicated in Fig. 4, suitable metallic stiffening strips or rods 12 of H or I section may in some cases be united or woven into a multiple woven wire reenforcement 6, 14 by suitable wire fence machines which may form the tie wires 15 around these stiffening elements. In this case it is desirable to have the lower reenforcing wire 6 relatively light while the upper reenforcing wire 14 is considerably heavier so as to be more effective when embedded in the concrete floor. This multiple wire fabric may be woven or made up in suitable widths corresponding to the length of the reenforcing strips 12 and may then be incorporated in the plaster board or other floor support strips 7 of similar width by forcing the lower reenforcing wire 16 into the soft plaster board composition which may be more or less smoothed over above the wire before setting takes place. The upper concrete reenforcing wire 14 is thus united to the plaster board and these floor supports may be applied to the steel or other beams so that a strip covers one or more of the panels and is preferably strong enough to support the concrete floor which when poured readily and thoroughly unites with the heavy reenforcing wire 14 which may be used so that in many cases no other floor reenforcement is needed, this reenforcement being preferably adjacent the lower part of the floor such as 13, which may be finished in any desired way. Fig. 1 shows an illustrative tread surface for this purpose which may comprise a layer 1 of suitable floor covering such as linoleum, cork carpet, etc. which may be adhesively united to the cement floor 3 as by the layer 2 of shellac or other adhesive cement which, together with the floor covering, gives increased cushioning and sound insulating properties to the construction.

This invention has been described in connection with a number of illustrative embodiments, forms, proportions, sizes, parts and methods of connection and use, to the details of which disclosure the invention is not of course to be limited since what is claimed as new and what is desired to be secured by Letters Patent is set forth in the appended claims.

In the claims the word "beams" is used to describe rolled or fabricated beams or joists, either made in one piece or built up of several pieces, such as are commonly used for floors for dwellings, apartments and office buildings; and the word "flange" is used to designate the top or bottom chord member or members thereof.

I claim the following as my invention:

1. The fireproof floor construction comprising steel beams spaced at substantially uniform distances apart, strip fireproof plaster board floor supports extending between and supported directly on said beams and adapted to form the ceiling surface, wire mesh reenforcement in said floor supports, transverse metallic stiffening strips united to the upper surface of the floor supports and woven wire reenforcement extending above said stiffening strips and united thereto, a concrete floor formed upon said floor supports and having said stiffening rods and upper reenforcement embedded therein and a cushioning floor covering above said concrete floor.

2. The fireproof floor construction comprising steel beams spaced at substantially uniform distances apart, strip fireproof board floor supports extending between said beams, reenforcement in said floor supports, transverse metallic stiffening strips united to their upper surface and woven wire reenforcement extending above said stiffening strips and united thereto, and a concrete floor formed upon said floor supports and having said stiffening rods and upper reenforcement embedded therein.

3. The substantially fireproof and sound proof floor construction comprising metal beams, floor supports of non-combustible cementitious material covering and insulating the upper flanges of said beams and supported thereby, said floor supports being poor conductors of sound, and a continuous floor of noncombustible quick setting cementitious material adhesively secured to said floor supports and forming a ground for a layer of sound deadening material adapted to be adhesively secured thereto to form a self-sustaining monolithic floor having sound deadening properties on both faces.

4. The substantially fireproof and sound proof floor construction comprising metal beams, continuous floor supports of non-combustible cementitious material covering the upper flanges of said beams and supported thereby, said floor supports being faced with materials that are poor conductors of sound,

and a continuous floor of non-combustible quick setting cementitious material adhesively secured to said floor supports and forming a ground for a layer of sound deadening material adapted to be adhesively secured thereto to form a self-sustaining monolithic floor having continuous sound deadening properties on both faces.

5. The substantially fireproof and sound proof floor construction comprising steel beams spread at substantially uniform distances apart, floor supports of plaster board or similar insulating material extending over and between said beams, metal ties extending above said plaster board, a continuous concrete floor formed upon said floor supports and having said ties embedded therein, and a sound insulating composition floor adhesively attached to the concrete whereby the latter is insulated on both faces.

6. The substantially fireproof and sound proof floor construction comprising steel beams spread at substantially uniform distances apart, floor supports of plaster board or similar insulating material extending over and between said beams, a continuous concrete floor formed upon said floor supports, and a sound insulating composition floor adhesively attached to the concrete whereby the latter is insulated on both faces.

THOMAS J. FOSTER.