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CEILING AND FLOOR STRUCTURE

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The object of the present invention is to provide a combination floor and ceiling structure of a novel nature that is relatively light in weight, substantially sound-proof and has peculiarly effective fire-resisting qualities.

In the accompanying drawings:

Figure 1 is a vertical sectional view of one embodiment of the invention, extending longitudinally of the joists.

Figure 2 is a cross sectional view at right angles to Figure 1.

Figure 3 is a detail sectional view of a modified form of construction.

Figure 4 is a detail sectional view on the line 4-4 of Figure 3.

In the embodiment disclosed, joists of skeleton formation are employed. Each joist consists of an upper chord member 5 substantially T-shaped in cross section and a lower chord member 6 of corresponding formation in cross sectional area. The lower chord member 6 has at its ends upward extensions 7 joined to the ends of the upper chord member 5, as illustrated at 8. Bottom chord extensions 9 are located below the inclined portions 7 and serve to complete the chord members 6 to the walls 10 of the structure supporting the joists. The chord members are connected throughout their length by a lattice 11 consisting of a rod bent into angularly disposed portions that extend from one chord member to the other and are suitably welded or otherwise secured to the chords.

On the upper chord member 5 is supported a floor deck consisting of sheet metal channeled units 12 having upper facing walls 13 located in the same plane and side walls 14 that are interlocked and rest upon the upper chord 5. The units 12, it will be noted, are thus chambered and these chambers are in open communication with the space in and around the joists.

A layer of sound insulating material 15 is located on the facing walls 13 of the deck and is preferably of relatively open cellular material. On this layer 15 is a second layer 16 of denser and harder supporting material that thus protects the underlying layer 15 and prevents its being dented or broken by furniture or other heavy objects placed on the floor. Over this layer 16 is a third layer 17 which may be linoleum or the like and constitutes a wear-resisting surfacing cover.

Suspended from the lower chord 6 by clips 18 or other suitable fasteners, are channelled hanger bars 19 having outstanding flanges 20 that lie against the bottom of the chords 6 and are engaged by said clips. These hanger bars 19 have their lower portions provided with oppositely outstanding flanges 21 forming grooves 22 that receive the margins of ceiling sheets 23. The sheets obviously may be of any desired or well known material. It will be noted that these ceiling sheets are spaced from the lower sides of the joists 6 and that the channels of the hanger bars 19 are open to the space within and around the skeleton joists.

The structure herein disclosed as an entity has been found to be peculiarly desirable one, constituting a complete unit of high fire-resisting qualities, substantially sound-proof, light in weight, and yet strong and permanent in its character. The open chambered interior, the spacing between the ceiling and joists, and the joists and floor with the overlying floor structure as shown and described absorbs and prevents the transmission of sound. The supporting elements at the same time can be of metal so that their destruction by heat or combustion is a remote possibility, and by reason of the fact that these metal elements are skeletonized or of sheet metal, insures lightness of weight and ease of assembly.

As an example of modification, attention is called to the structure shown in Figures 3 and 4. In this embodiment, the upper chord member is designated 5a, the lower chord member 6a, and the lattice 11a. The structure is the same as that disclosed in Figure 1. Supported on the upper chord member 95 are the sheet metal deck members indicated at 12a and on these is supported a layer 15a of sound insulating material. On these is the denser layer 16a carrying in turn the wear-resisting surfacing layer 17a.
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Pended from the lower chord member 6a are sheet metal hanger bars, one of which is illustrated at 19a. It has outstanding flanges 20a clipped as shown at 18a to the lower chord member 6a. This hanger bar 19a is provided between its side walls with inset doubled portions 21a that are slotted, as shown at 22a, the portions between the slots being inset as illustrated at 23a and designed to receive holding nails 24a driven through the ceiling sheets 25a and into said slots.

From the foregoing it is thought that the construction, operation and many advantages of the herein described invention will be apparent to those skilled in the art without further description, and it will be understood that various changes in the size, shape, proportion and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

What I claim is:

1. A floor-ceiling structure comprising a skeleton joist having upper and lower longitudinal bars and an open work lattice connecting the same, a deck of channel metal units having depending side flanges laid on the upper bar, a layer of sound insulating material laid on the deck, a layer of wear-resisting material denser than the insulating material and overlying the same, hangers carried by the lower bar of the joist, and a ceiling suspended by said hangers in spaced relation to the lower bar of the joist.

2. A floor-ceiling structure comprising a skeleton joist having upper and lower longitudinal bars and an open work lattice connecting the same, a deck of channeled metal units having depending side flanges laid on the upper bar, a layer of sound insulating material laid on the deck, a layer of wear-resisting material denser than the insulating material and overlying the same, channeled hangers secured to the lower bar of the joist, and a ceiling secured to the lower portions of the hangers in spaced relation to the lower bar of the joist.

3. A floor-ceiling structure comprising a skeleton joist, a deck mounted on the joist, a layer of sound insulating material on the deck, a layer of wear resisting material overlying the sound insulating material, and a layer of supporting material interposed between the two said layers and denser than the insulating material.

In testimony whereof, I affix my signature.

JULIUS KAHN.