March 28, 1939. A. C. OLSEN 2,152,418

BUILDING CONSTRUCTION

Original Filed Sept. 4, 1935

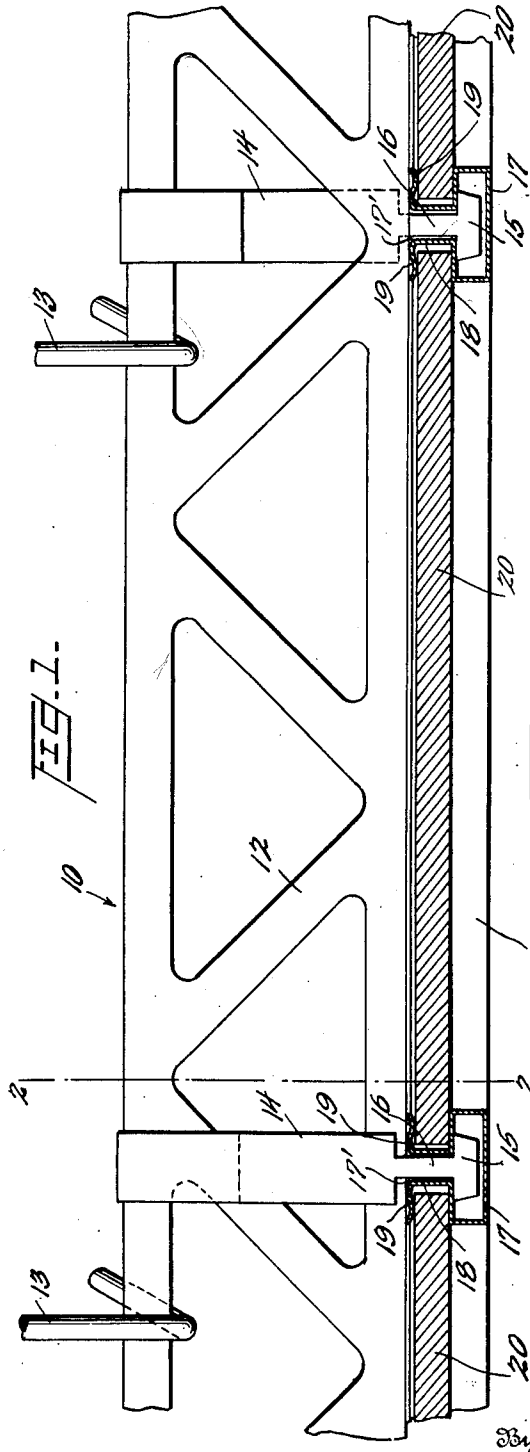


FIG. 1.

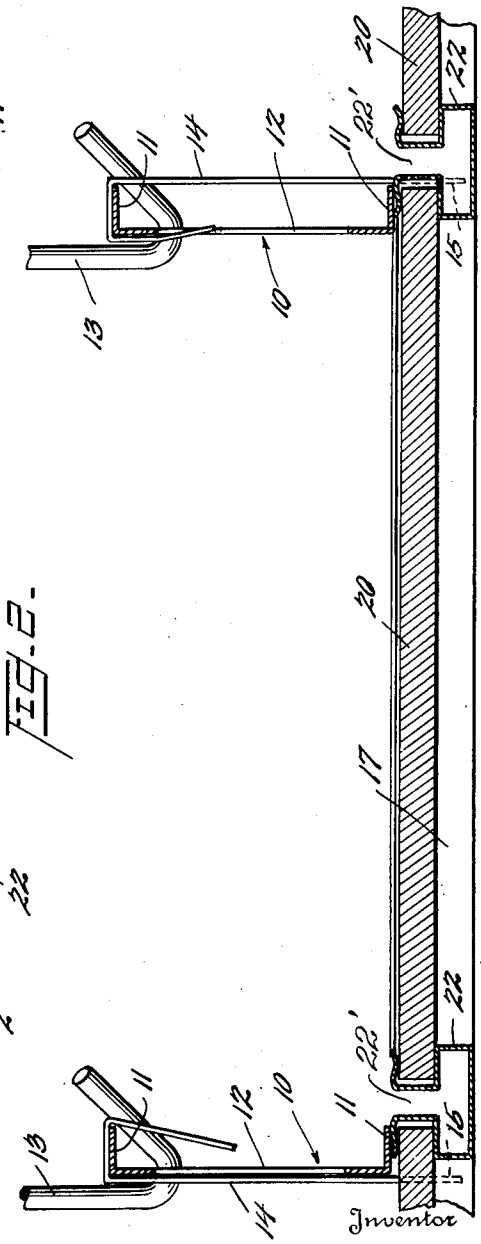


FIG. 2.

Inventor

Anders C. Olsen,

By Watson, Coit, Morse & Grindle

Attorney

Patented Mar. 28, 1939 2,152,418

UNITED STATES PATENT OFFICE

2,152,418

BUILDING CONSTRUCTION

Anders C. Olsen, Gwynedd, Pa.

Application September 4, 1935, Serial No. 39,155
Renewed September 10, 1938

4 Claims. (Cl. 72—118)

The present invention relates to building structures and particularly to ceiling constructions.

In my Patent No. 1,865,131, granted June 28, 1932, is disclosed a ceiling construction of the built up panel type which is of ornamental and decorative nature while at the same time of eminently practical construction, inexpensive to fabricate and install, and which may be readily applied or dismantled. The present invention relates to a ceiling of the same general type as that disclosed and claimed in the patent referred to but contemplates certain changes intended to facilitate the application of the ceiling to large structures, particularly where ceilings of large size are to be suspended from the super-structure of the building and it is intended that the ceiling shall be rigid and fire-proof throughout.

One form of the invention is illustrated in the accompanying drawing by way of example and one skilled in the art will appreciate that the advantages of the invention may be realized despite changes in the precise design and arrangement of its several component elements, all of which may be more or less modified in adapting the invention to special conditions.

In the drawing:

Figure 1 is a vertical section through portion of a ceiling, showing the details thereof; and

Fig. 2 is a section on line 2—2 of Figure 1.

The fire-proof ceiling contemplated by the invention may be utilized in connection with almost any kind of building structure but it is particularly advantageous to utilize the same in connection with warehouses, factories, theaters, homes, and light buildings in which the ornamental built-up panel type of ceiling is desired and where it is necessary to suspend the ceiling from an overhead structure rather than to directly attach the ceiling to such a structure. The parts employed in the formation of the ceiling are relatively few in number, light in weight, and simple in construction. Except for the actual panels, all parts are of metal and the panels themselves may be of fire-proof materials, thus making the ceiling completely fire-resisting.

Two parallel light-weight beams are indicated at 10 in the drawing and in the construction of a ceiling of substantial size a considerable number of these beams will be utilized, all arranged in parallel relationship and disposed in a common horizontal plane. While the beams may vary in details of construction, I prefer to employ beams which are channel-shaped in cross-section, as shown in the drawing, having the flange members 11 and the connecting web 12. The connecting web is preferably apertured, as shown, to promote lightness, the diagonal members connecting the flanges 11 being only sufficiently wide to give the beam as an entirety the necessary stiffness and strength. These parallel beams 10 are supported by means of suspending elements 13 from the overhead structure above the ceiling, which may be more or less remote from the ceiling. The elements 13 may be long or short as circumstances require and are disposed vertically. The lower end of each element is laterally and upwardly turned so as to project through one of the apertures formed in the web of beam 10 and to engage the upper edge of this aperture and the outer edge of the upper flange 11, thus adequately supporting the beam. Each beam will naturally be supported by a plurality of suspending elements 13 spaced longitudinally thereof, the number of such elements varying with the length of the beam and the weight of the ceiling structure carried by the beams.

Hanger members are indicated at 14, these hanger members being preferably formed of comparatively ductile sheet metal in order that their upper ends may be flexed and bent or looped over the upper edges of the beams, respectively, as shown in Figure 2. The lower end of each hanger 14 is provided with a head 15, connected to the main portion of the hanger by a neck 16. Panel edge engaging and supporting strips are indicated at 17, each of these strips comprising an elongated sheet metal member, substantially box-like in cross-section as shown, each strip being longitudinally slotted to receive the necks 16 of the hanger and the body of each strip being sufficiently large interiorly to receive the several heads 15 of the hanger. Parallel flanges 18 of the strips project outwardly from the margins of the grooves formed in the supporting strips and teminate in oppositely directed flanges 19. Flanges 19 are preferably resilient and each such flange cooperates with a portion of the body of the strip 17 which lies in a substantially parallel plane, in gripping the edge of a panel 20. The adjacent parallel edges of adjacent panels are therefore securely retained within grooves 17' defined by the walls of the supporting strips and the flanges 19. The panels 20 may be of any desired type and may carry any chosen designs but preferably are of some such material as asbestos, which will not burn.

As may be clearly perceived in the drawing, alternate hanger members are disposed upon opposite sides of the common beam from which they are suspended. Thus the hanger member 14 to

the left of Figure 1 has the face thereof which lies adjacent the channel member in contact with the channel member, at least at points adjacent the top and bottom flanges of the channel member, while the hanger shown to the left of Figure 1 is positioned on the opposite side of the channel member and its vertically disposed mid-portion contacts only with the outer edges of the flanges 11 of the channel. In both cases, however, the channel beam provides spaced guiding surfaces for the hanger members, such surfaces being disposed in parallel vertical planes. By placing alternate hangers on opposite sides of a common beam 10 stiffness of the structure is promoted. The adjacent edges of adjacent panels, which edges are disposed parallel to each other, are clamped within oppositely facing grooves 22' formed in cross strips 22, which cross strips are disposed at right angles to the supporting strips 17 and are intended primarily for decorative purposes in that they completely hide the cross joints between pairs of adjacent panels.

In assembling the ceiling thus described, no securing devices need be employed, which is one of the advantages of the construction. The beams 10 are merely loosely engaged by the suspending elements 13. The beams 10 might turn within the hook-like lower ends of the suspending elements, and would so turn, were they not locked in position by the hanger elements 14, between which each beam is held, the lower ends of the hanger units being held against sliding movement relatively to the supporting strips 17 by reason of the frictional engagement of the upper surfaces of the heads 15 of the hangers, which are tightly pressed against the downwardly facing interior surfaces of the strips 17, owing to the weight of the panels 20 carried by the supporting strips. The hanger members are axially slidable upon the beams, thus facilitating assembly of the ceiling parts, the ceiling being built up panel by panel. The margins of the ceiling will contact with cornice structures or room side walls, thus additionally stiffening the construction. Notwithstanding the apparent looseness of the various metallic parts with respect to each other, and the absence of any positive securing means therefor, a ceiling structure fabricated in accordance with the invention possesses great strength and rigidity as well as being fire-proof and highly ornamental in appearance. The construction just described, furthermore, lends itself readily to the erection of ceilings having acoustic properties, it being easily possible to utilize panels having the necessary apertures therein and to place upon the upper surfaces of these panels sound absorbing materials of any desired kind.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. In a ceiling construction of the built-up panel type, in combination, parallel horizontally disposed channel beams having apertures formed in the webs thereof and the webs being vertically disposed, vertically disposed suspending elements having their lower ends laterally directed and passing through the apertures in the webs of the beams for suspending said beams, hanger members looped over the tops of the beams and extending downwardly beyond the same, said hanger members lying flat against the webs of the beams, panel edge supporting strips attached to the lower ends of the hanger members and disposed in parallel relationship, and panels extending between, and having their parallel edges supported by, said supporting strips.

2. In a ceiling construction of the built-up panel type, in combination, a plurality of beams arranged in parallelism and disposed in a common plane, each such beam having hanger guiding surfaces disposed in a vertical plane, suspending means loosely engaging and supporting said beams, hanger members having their upper ends looped over said beams, their lower ends projecting below the beams and their mid-portions resting against the guiding surfaces of said beams, parallel panel supporting strips attached to the lower ends of said hanger members and supported thereby, and panels supported by said strips.

3. The combination set forth in claim 2 in which alternate hanger members attached to a single beam are positioned on opposite sides of the beam, thus strengthening the structure.

4. The combination set forth in claim 2 in which the beams are channel-shaped in cross-section and in which every other hanger member on a beam lies flat against the web of such beam, alternating hanger members having portions which rest against the edges of the flanges of the beam.

ANDERS C. OLSEN.