To all whom it may concern:

Be it known that I, HERBERT E. MARSH, a citizen of the United States, and a resident of Sewickley, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Roof or Floor Constructions, of which the following is a specification.

This invention relates to roof structures and is in particular an improvement on the roof structure shown in my Patent No. 1,398,073, issued November 22, 1922. The object of the invention is to improve roof structures of the kind illustrated in the above-named patent so that the reinforcing metal mesh is located as low down in the slab as possible, without the necessity of having the mesh sheet sag downwardly between its points of support.

In the accompanying drawings, Fig. 1 is a vertical section through a roof constructed in accordance with the invention, the section being taken parallel to the main supporting beams or purlins; Fig. 2 is a similar section taken at right angles to the section of Fig. 1; and Fig. 3 is a detail view of one of the notched bars.

The invention is applicable to a roof of any type and in the drawings, for simplicity, is shown as applied to a flat roof. In said drawings 2 indicates the main frame members, in this instance the purlins. These are shown as formed by rolled channel beams, but obviously structural shapes of any suitable kind may be used. Supported upon the purlins are a plurality of angle bars, specifically of the kind shown as T-bars, 3, which rest with their base flanges upon the purlins and are suitably secured thereto and with their legs projecting upwardly. These T-bars extend parallel to each other and are spaced sufficiently close that the distance therebetween can be bridged by ordinary sizes of commercial plaster or gypsum boards. The latter are well known articles in the trade being generally composed of molded gypsum or the like, and generally are quite thin, usually about three-eighths of an inch in thickness. The plaster or gypsum boards are shown at 4. They can be chosen of any suitable length, and in use form the centering upon which the cementitious roof composition is poured, thus dispensing with the usual centering or false work. Since the plaster boards are quite thin it is desirable to support their end portions to prevent them from sagging when the cementitious material is poured into place. As a means for supporting their end portions it is preferred to use small angle members 6, also shown as T-bars and of a length equal to the distance between the adjacent main T-bars 3 and having their ends resting upon the flanges of the latter. Consequently the thin plaster boards bridge the space between the angle members.

The small T-bars 6 also serve as supports for the metallic reinforcement, 7, preferably a metallic mesh, such as metallic lath, wire mesh or the like. As shown in my previous patent, the metallic mesh rests upon the top edges of the upstanding flanges of the T-bars 6. After the mesh is put in place, cementitious material, such as concrete, gypsum or other suitable material, mixed with a proper proportion of water, is poured directly in place, that is, upon the centering formed by the plaster boards 4 and to a depth somewhat greater than the main T-bars 3. This composition is of such a nature that when poured in place it bonds onto the plaster boards so that the latter and the solidified cementitious material form a unitary or monolithic slab with the reinforcement embedded in it. Because the plaster boards form a part of the slab, the reinforcing metallic mesh when resting on the tops of the flanges of the small T-bars 6 will be spaced a considerable distance above the lower tension zone of the complete slab, unless said mesh is caused to sag or hammock between the points of its support. In order that the metallic mesh may be positioned as low down in the slab as possible, and without the necessity of it sagging down, and therefore remaining straight and more effectively taking care of the tension stresses, I provide the upstanding flanges of the small T-bars 6 with notches 8 of such depth as the metallic mesh is intended to assume, and spaced such distances apart as to register with the longitudinal strands of the metal mesh. The metallic mesh is thus put in place it will be straight from end to end of the panel but nevertheless will be positioned so low down that after the cementitious material is poured and has become solidified, said metallic mesh is well down in the tension zone of the monolithic slab. The plaster boards 4 insure that said mesh will not be exposed on the lower face of the slab.
The metallic mesh may be a continuous strip extending from edge to edge of the roof, in the case of a flat roof, or from the eaves to the ridge, in the case of a sloping roof; or it may be composed of a number of pieces the ends of which are overlapped such a distance that when embedded in the cementitious material it has the same reinforcing effect as a continuous strip. As shown in the drawings the strip of metallic mesh is of a width to fit between adjacent main T-bars 3, but if desired it can be made considerably wider so as to overlap at its edges the upper edges of the T-bars 3 and also overlap the strip in the next adjacent panel, so that when embedded in the cementitious material a practically continuous reinforcement or tie is disposed transversely of the roof as well as longitudinally thereof.

It is obvious that in lieu of using a T-bar for either the member 3 or the member 6, a pair of small angle bars placed with their upstanding angles back to back, will serve the same purpose.

With this construction and since the cementitious material is poured to a depth somewhat greater than that of the T-bars 3, the entire roof becomes in effect a monolithic slab with no portion of the metal exposed on the top surface and no portion of the reinforcing mesh exposed on the bottom surface. Such slab is strong and can be of minimum thickness and the metal members can be of light cross section. The plaster boards used in the way described serve as centering thus dispensing with the usual centering or false work and result in a great saving in cost of erection. Such plaster boards also give a good finish to the lower face of the roof which forms the ceiling of the room underneath, and also prevents such ceiling from “dusting”, that is from small bits of cementitious material spalling off and falling down into the room below.

The top surface of this roof structure will be suitably water-proofed, such as applying thereto a coating of asphaltum or the like, and can be finished in any of the ways of finishing roofs of this kind, such as by providing the same with a gravel or other surface.

I claim:
1. A roof of the character described, comprising purlins, metal angle members supported on the purlins and presenting oppositely projecting flanges, small angle members having substantially straight longitudinal axes extending between the first named angle members and resting on the flanges of the latter and also presenting oppositely projecting flanges and an upstanding flange provided with spaced notches, the bottoms of which lie in a plane closely adjacent to that of the base portions of the said small angle members, thin composition boards bridging the space between said angle members, metallic mesh having its longitudinal members entering the notches in the second named angle members and supported by the latter in closely spaced relation to the composition boards, and cementitious material embedded in all of said metallic members and bonded to said composition boards.

2. A structure of the character described comprising parallel angle members presenting oppositely projecting flanges, small metal angle members having substantially straight longitudinal axes extending between the first named angle members and resting on the flanges of the latter and also presenting oppositely projecting flanges and an upstanding flange provided with spaced notches, the bottoms of which lie in a plane closely adjacent to that of the base portions of the said small angle members, plaster boards bridging the space between angle members, metal mesh placed with its longitudinal members in the notches of the small angle members and held by the latter in closely spaced relation to the plaster boards, and a cementitious body molded in place on the plaster boards and bonding therewith and extending above the first named angle members and thereby forming a monolithic reinforced slab.

In testimony whereof, I sign my name.

HERBERT E. MARKS.