March 30, 1926. 1,579,015

H. E. MARKS

CEILING CONSTRUCTION

Filed March 1, 1924

Fig. 1.

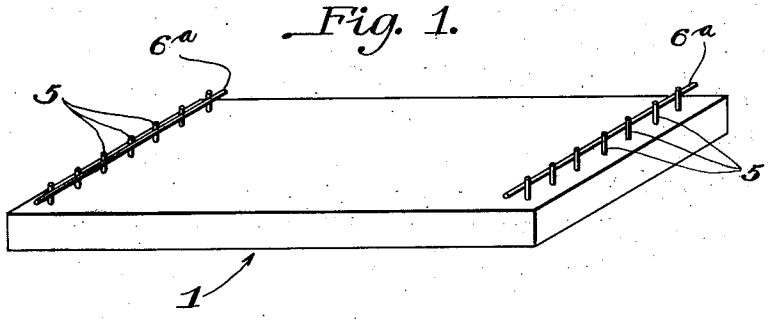


Fig. 2.

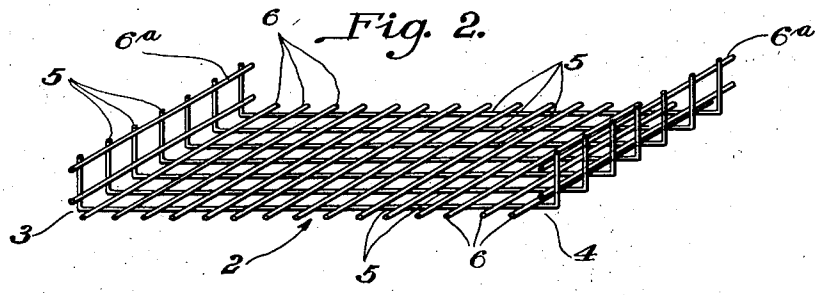


Fig. 3.

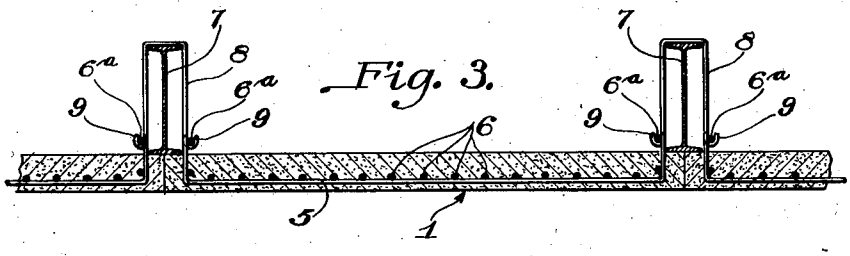
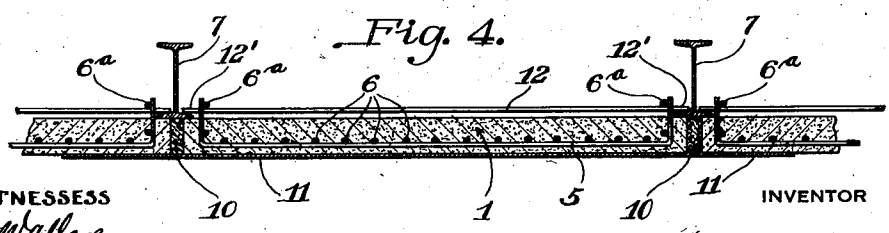


Fig. 4.



WITNESSES

A. B. Wallace

C. R. Talbert

INVENTOR

Herbert E. Marks

by Winter & Brown

his attys

Patented Mar. 30, 1926. 1,579,015

UNITED STATES PATENT OFFICE.

HERBERT E. MARKS, OF GLEN OSBORNE, SEWICKLEY, PENNSYLVANIA.

CEILING CONSTRUCTION.

Application filed March 1, 1924. Serial No. 696,210.

To all whom it may concern:

Be it known that I, HERBERT E. MARKS, a citizen of the United States, and a resident of Glen Osborne, Sewickley, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Ceiling Construction, of which the following is a specification.

This invention relates to a fireproof ceiling construction, and particularly to a metallic reinforced slab of cementitious material for use in connection therewith.

The principal objects of the invention are to provide a simple, sturdy, economical and durable pre-cast slab which is effectively reinforced throughout, which is convenient to handle, which can be readily suspended directly from the reinforcement within the slab without throwing the various strains upon localized areas, which due to the special association of the reinforcement with the body of the slab will effect a substantially uniform distribution of the strains throughout the entire slab, and which can be effectively and easily suspended from the main beams by the aid of different forms of auxiliary devices without deformation of the reinforcement.

It is a special object to provide a pre-cast reinforced cementitious slab having the above characteristics in which the reinforcement is in the form of a metallic wire mesh comprising longitudinal and transverse wires or strands welded together at their intersections, in which said mesh lies in the tension zone of the slab throughout the greater portion of its body and projects above the top of the slab at points spaced from the opposite ends thereof with a transverse wire or strand of the mesh disposed slightly above its upper face.

These and other objects of the invention will more fully appear when taken in conjunction with the following description and the appended claims.

In the accompanying drawings, illustrating the preferred embodiment of the invention, Fig. 1 is a perspective view of the slab showing the disposition of the reinforcement in the tension zone of the body and the positioning of the extremities of the reinforcement with respect to the upper face of the slab; Fig. 2 a perspective view of the metallic wire mesh used for reinforcing and supporting the slab; Fig. 3 a vertical sectional view showing one method of supporting the pre-cast slabs from the main beams; and Fig. 4 a similar view showing another method of supporting the pre-cast slabs from the main beams.

The slab is indicated generally in the drawings by the reference numeral 1 and the metallic wire mesh reinforcement by the numeral 2. The body of the slab may be formed of any suitable cementitious material, and is preferably made of a material which is fire-resisting, the reinforcement being imbedded in the material of the body, with the portion of the reinforcement between the points 3 and 4 lying in the tension zone of the slab, while the extremities of the reinforcement beyond these points are bent upwardly substantially at right angles and project through the body of the slab at points spaced from the ends of the slab, as clearly indicated in Fig. 1 of the drawings.

The reinforcement is made up of a plurality of longitudinal wires or strands 5 and a plurality of spaced transverse strands or wires 6, the longitudinal and transverse wires being welded together at their points of intersection. The reinforcement is embedded within the body of the slab, in the manner previously described, and the parts are so proportioned that the terminal transverse wires or strands, indicated by the reference numeral 6^a are disposed slightly above the upper face of the slab, these terminal transverse wires serving as a convenient and effective method of suspending the pre-cast slabs in place in a manner now to be described.

The main beams have been indicated in Figs. 3 and 4 of the drawing by the reference numeral 7, the form shown in the drawings being ordinary I-beams of well known construction. Preferably, the length of the pre-cast slabs corresponds to the distance between the beams so that a slab will entirely bridge the space between two adjacent beams. As shown in Fig. 3, the slabs may be suspended in operative position to form the ceiling by means of straps 8 having their mid-portions resting upon the top of the I-beams and their extremities provided with hooked portions 9 which operatively engage the transverse wires 6^a of the reinforcement, thus effectively suspending the slabs in contact with the lower flanged bases of the beams 7. In Fig. 3, the contiguous ends of adjacent slabs are permitted to abut. In many constructions, if slabs having fin-

ished lower faces are employed, a satisfactory appearance is secured without any additional steps.

However, if a neater finish is desired than that secured with the ceiling construction illustrated in Fig. 3, the contiguous ends of adjacent slabs may be spaced a slight distance apart as illustrated in Fig. 4, this space being filled with any suitable grouting 10 and the entire lower surface of the ceiling coated with a finishing layer 11. Fig. 4 also illustrates an alternative method of supporting the slabs 1. In this case, bars 12 are provided which are adapted to have their extremities 12′ rest upon the flanged base of the beam 7. By threading the bars 12 through the space between the terminal transverse wires 6^a and the upper face of the slab, with the extremities of the bars resting upon the bases of the main beams, the slab is effectively and securely suspended in place.

Due to the fact that the upturned terminal portions of the reinforcement project substantially at right angles to the body of the slab, the strains exerted upon the reinforcement do not tend to break away the cementitious material of the body, which would necessarily result if the reinforcement were to project obliquely through the slab, also due to the fact that the transverse wires 6^a are rigidly connected to all of the longitudinal wires of the reinforcement, the strains are not concentrated at localized areas, but operating in conjunction with the entire metal mesh are distributed substantially uniformly throughout the entire slab.

Although but two methods of suspending the slabs, namely by means of the hooked straps 8 and the bars 12, have been described, it is obvious that other auxiliary means may be employed for suspending the slabs in operative position. It is particularly noted that with both of the methods illustrated, there is no alteration or deformation of the slab from its pre-cast form. This feature is considered of great practical importance, since it not only facilitates the handling of the slabs but permits the same to be pre-cast in a manner to secure the most efficient results, and without danger of having the beneficial results incident to its original formation destroyed or lessened during subsequent handling.

It is thus seen that the invention provides a simple, economical and efficient reinforced pre-cast slab which is convenient to handle, which may be directly suspended in operative position by the reinforcement of the slab without danger of throwing undue strains upon localized areas, which distributes the various stresses through the entire slab, and which may be readily and effectively suspended from the main beams in various ways without the necessity of deforming or altering the slab from the form in which it was originally made.

I claim:

1. A ceiling slab comprising a body of cementitious material provided with reinforcing strands extending longitudinally of it, the extremities of said strands projecting upwardly through said body at points spaced from the ends of the body, and a transversely extending member connected to said projecting extremities of said strands for engagement by slab-supports.

2. A fire-resisting ceiling slab comprising a body, a metallic mesh reinforcement provided with rigidly connected longitudinal and transverse wires imbedded in said body throughout its major portion, the opposite extremities of said reinforcement projecting through the body at points spaced from the ends of the slab, the extremities of the reinforcement above the body having transverse wires thereof spaced above the upper face of the slab.

3. A ceiling slab comprising a body of cementitious material, a metallic mesh reinforcement having longitudinal and transverse wires welded together at their intersections imbedded in said body throughout the greater portion of its length, the extremities of the reinforcement projecting through the body at points spaced from the ends of the body, said extremities projecting upwardly at substantially right angles to the body with one of the transverse wires at each extremity spaced above the upper face of the slab.

4. In a ceiling, the combination with floor beams, of ceiling slabs having their ends beneath the floor beams and comprising a body of cementitious material provided with reinforcing strands extending longitudinally of it, the extremities of said strands projecting upwardly through said body at points spaced from the ends of the body, a transversely extending member connected to said projecting extremities of the strands at each end of each slab, and means engaging said transverse members for attaching the slabs to the floor beams.

5. A ceiling slab comprising a body of cementitious material, a metallic mesh reinforcement having longitudinal and transverse wires welded together at their intersections imbedded in said body throughout the greater portion of its length and lying in the tension zone of the slab, the extremities of the reinforcement projecting upwardly at substantially right angles to the body with one of the transverse wires at each extremity spaced above the upper face of the slab.

In testimony whereof, I sign my name.

HERBERT E. MARKS.