My invention relates to certain new and useful improvements in roof and floor construction, wherein cast or precast, plaster or concrete, roof or floor decks are united with the supporting purlins in such a way as to produce a stiffer and stronger structure.

In the building of reinforced gypsum and concrete roofs and floors, it has been the practice to lay along the beams employed as purlins, a desired arrangement of supporting T's, rails or the like, and by the use of form work to build reinforced poured monolithic decks supported on the beams. In some cases it has been the practice to tie or clip the supporting members to the beams; but such structures have been clumsy and inadequate and served merely to keep the deck down on the beam.

Also where precast blocks of reinforced cement or plaster have been employed for forming the deck, said blocks being merely laid on the purlins or tied down in a crude way, there has been an inadequate union of all parts of the construction, so as not to produce the lightest weight and strongest structure.

My invention is directed to a very simple but fully adequate arrangement of beams, supporting and reinforcing members, and cast monolithic block roof and floor decks, together with a series of members set into the beams rigidly, and anchored into the floor or roof decks, in such a way as to prevent lateral flexure of the beams, slipping of the deck structure on the beams, and lifting of the decks from the beams; while at the same time the anchorage is sufficiently elastic to allow for expansion and contraction of the supporting framing without damage to the deck.

I accomplish my objects by that certain construction and arrangement of parts to be hereinafter more specifically pointed out and claimed.

In the drawings Fig. 1 is a detail section of a poured slab, resting on a channel type purlin, with a simple form of anchor bolt in use.

Fig. 2 is a like view showing a section at right angles and the anchor bolt provided with a nut to increase the engagement with the slab.

Fig. 3 is a view like Fig. 2 showing a hook type anchor bolt engaged over a reinforcing rod.

Fig. 4 is an elevation of the hook type anchor bolt.

Fig. 5 is a perspective view of a roof slab of the Hoge type.

I have illustrated my invention chiefly as applied to the Hoge type of gypsum plaster construction, as described in the U. S. patent to Edward Clyde Hoge, Number 1,464,711, dated August 14, 1923. It will be understood, however, that it has application to precast slabs, and also to various forms of concrete and plaster construction where the older type of form work is used, such as is illustrated in the sectional detail marked Fig. 3, said form work to be removed after the floor or roof has set.

In forming a Hoge type roof or floor construction I may provide the steel purlins 1, in the channel form, which is the accepted structure for this purpose. The purlins have their top flanges bored previous to installation with holes for the reception of the anchor bolts.

In Fig. 1 and Fig. 5 is shown the simplest form of bolt, which has threaded shank 2, and a head 3, and a nut 4. The bolts are set into the purlins and the nuts 4 turned down to make them fast and permanently in place. The rails 5 are then arranged crosswise of the purlins, and plaster board supports 6 placed on the flanges of the rails with their free edges meeting over the tops of the purlins.

The reinforcing rods 6 or wire mesh is then set in place so as to form loops crosswise of the rails, and the plaster slab 7 is then poured.

The bolt shanks rise in the spaces between the edges of the plaster board supports, where they meet over the purlins and the poured slab will completely embed the bolts.

As a result of this the purlins will be tied crosswise of their length by the poured reinforced slab, at a series of points. The slab itself will be prevented from slipping on the purlins, and will also be prevented from lifting away from them.

This permits a lighter construction, with less weight and yet imparts strength to the entire floor or roof construction which is well beyond that of any other form of construction with such low weight.
To increase the anchorage of the bolts in the poured slab, they may be provided with additional nuts 8, which are imbedded in the poured slab, as shown in Fig. 2.

Also bolts having curved shanks 9, with nuts 10 and 11 may be employed, and as shown in Fig. 3, the curved shanks may be hooked over the reinforcing rod mesh 6a.

I have shown at the unobstructed edge of a purlin in Fig. 5, two other modes of securing the anchorage members. Thus a tapered pin 12 may be driven up or down through the purlin flange, or a pin 13 may be welded to the purlin flange.

It may be observed also that a precast slab forming sections of the roof or floor deck, can also be used with my invention. Thus I have indicated in dotted lines 14, in Fig. 1, where the original side walls of two precast slabs would be located, in forming a floor or roof deck by laying such slabs over the purlins, and then filling the spaces between them with a grouting. The bolts would extend up between the precast slabs, just as they do between the two pieces of plaster board 6, in Fig. 1. The grouting will then be poured between the slabs, and will serve to hold the slabs down on the purlins, and the lateral force against flexure of the purlins will be fully provided even if the grouting were not considered.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. In a reinforced floor or roof construction, the combination with supporting beams, and rails or beams extending crosswise of the supporting beams, of a reinforced slab arranged on the supporting means, and enclosing the crosswise rails or beams, and interspaced means of small area rigid with the supporting beams, and nonrigid with relation to the crosswise rails or beams, extending into the slab construction intermediate said cross rails or beams, for the purpose described.

2. In a reinforced floor or roof construction the combination with supporting beams and rails or beams with a T-shaped base laid crosswise of the supporting beams, of plaster board supported on the bases of the rails, and interspaced members secured of small area rigidly in the supporting beams, and projecting through spaces between the plaster boards and a poured slab supported on the plaster board, and engaging in the slab, said slab enclosing the crosswise rails or beams.

3. In a reinforced floor or roof construction the combination with supporting beams and rails or beams extending crosswise on the top thereof, and not secured rigidly to the supporting beams, of interspaced members of small area rigidly held in the supporting beams, and projecting upwardly, and a poured slab arranged upon said supporting beams, and enclosing the crosswise rails or beams.

4. In a reinforced floor or roof construction the combination with supporting beams and rails or beams extending crosswise on the top thereof, and not secured rigidly to the supporting beams, of interspaced members of small area rigidly held in the supporting beams and projecting upwardly, and a poured slab arranged upon said supporting beams, and enclosing the crosswise rails or beams.

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