

July 13, 1937.

E. E. SEELYE

2,086,744

FLOOR CONSTRUCTION

Filed April 21, 1936

FIG. 4.

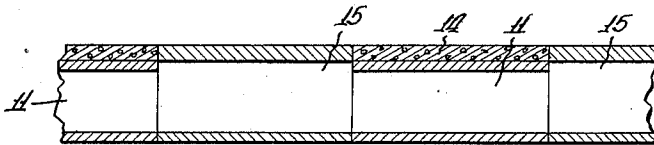


FIG. 3.

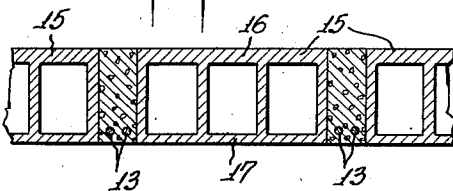


FIG. 2.

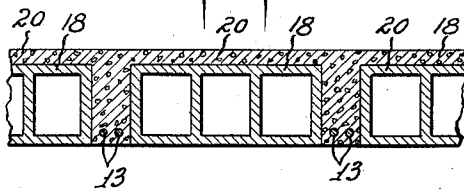
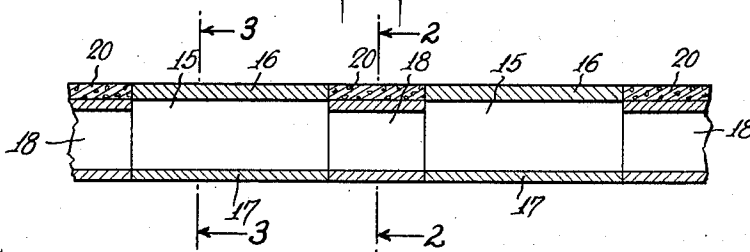


FIG. 1.



INVENTOR

Elwyn M. Seelye

BY

Dean, Fairbank, Hirsch & Foster

ATTORNEYS

UNITED STATES PATENT OFFICE

2,086,744

FLOOR CONSTRUCTION

Elwyn E. Seelye, White Plains, N. Y.

Application April 21, 1936, Serial No. 75,511

3 Claims. (Cl. 72-66)

In certain types of floor or roof constructions in which the structural hollow blocks or tiles are combined with concrete, it has been customary to provide a concrete topping for effectively resisting the compressive stresses developed, and the tiles have been considered only as fillers. In certain types of two-way hollow tile floor constructions, that is constructions in which the steel reinforcements run in two crosswise directions, such concrete toppings in some cases have been eliminated, and the compression resisting values of these tiles or blocks with dry joints therebetween have been utilized in the design of the floor construction.

In a one-way hollow tile floor construction, that is a construction where the reinforcement runs only lengthwise of the span between the main beams or supporting walls of the building, the tiles have been used more or less as fillers, and the structural value of these tiles in resisting compressive stresses has been ignored entirely or has been considered to a lesser extent than in the case of a two-way hollow tile floor construction. If the tiles or blocks are placed end to end with the cell openings running lengthwise between the supporting beams or supporting walls of the building, the joints between these abutting blocks or tiles will be dry or broken so that the proper and continuous transmission of compressive stresses from block to block will be prevented. Therefore, in the ordinary one-way hollow tile floor of the end to end construction type, it has been found necessary to provide a concrete top of substantial area over the hollow tiles or blocks to form a continuous unbroken strata through which the compressive stresses may be transmitted and effectively withstood.

One object of the present invention is to provide a concrete floor or roof construction which requires a minimum amount of labor to construct and which is adapted to carry a maximum load with a minimum floor thickness and a minimum amount of dead weight.

In carrying out the present invention, I provide a one-way floor slab comprising a series of hollow concrete blocks or clay tiles embedded in reinforced concrete and arranged end to end in rows extending lengthwise of the span of the slab. Each row of hollow tile or blocks comprises tiles or blocks of two different heights, alternately arranged to form recesses above the shallower tiles and between the ends of adjacent higher tiles. The concrete is poured between the rows of hollow blocks or tiles and also fills the recesses to the level of the top surface of the

deeper or higher blocks or tiles, and thereby forms T flanges on the main body of the concrete between the rows.

As a feature of the present invention, the higher tiles have their upper shell walls thicker than their bottom shell walls and the shallower tiles are of standard construction with their upper and lower shell walls of equal thickness, the concrete layer over these shallower tiles supplying any deficiency in the compression resisting values of their upper shell walls.

As a further feature, the shallower tiles are much shorter than the deeper tiles, so that the amount of concrete necessary to form a monolithic unbroken strata in the upper portion of the slab is reduced to a minimum. This has the advantage of reducing the cost of construction since concrete is more expensive than hollow tiles, and also materially reduces the dead weight of the slab.

It is well known that concrete and hollow clay or concrete tiles will form an intimate bond which may be relied upon to make the two materials act together as a monolithic unit. The concrete T flanges above the tiles of lesser depth will therefore form a strong bond between the ends of the deeper tiles and will produce a monolithic strata at and below the compression face of the slab and composed of tile and concrete. This strata will have no dry joints and therefore permits the effective continuous transmission of compression where it is most desirable to obtain the greatest strength and efficiency from the materials used. By means of this construction, I obtain and utilize the full compression resisting value of the hollow clay tiles or concrete blocks, this value exceeding that of concrete in the case of clay tiles. This advantage is obtained without sacrificing in any way the capacity of the floor slab to effectively resist the stresses developed therein. At the same time, the cost of the slab construction is decreased by a considerable amount.

Various other objects, features and advantages of the invention will be apparent from the following particular description and from an inspection of the accompanying drawing in which:—

Fig. 1 is a partial section of a floor slab, taken lengthwise of the span and through a row of longitudinally aligned hollow tiles,

Fig. 2 is a section taken on the line 2—2 of Fig. 1,

Fig. 3 is a section taken on the line 3—3 of Fig. 1, and

Fig. 4 is a section similar to Fig. 1 but showing another form of tile which may be used.

In the construction of Figs. 1, 2 and 3, the one-way floor slab shown may be supported on the beams or the walls of a building, and comprises one or more rows of tiles of the multiple cell type extending lengthwise of the span, each row comprising a series of hollow tiles 15 having a depth or height corresponding to the height of the floor slab and alternated by a series of tiles 18 of lesser depth than said tiles 15. These tiles 15 and 18 are arranged end to end with the cell openings running lengthwise of the span, and the shallower tiles 18 forming recesses between the ends of adjacent tiles 15. Reinforcing steel rods 13 extend between adjacent rows of hollow tiles in the tensioned portion of the slab.

The concrete is poured between the rows of hollow tiles 15 and 18 up to the upper surface of the deeper tiles 15, and the recesses between the ends of adjacent tiles 15 are each filled with a layer of concrete 20 to form T flanges. These concrete layers 20 form strong bonds between facing ends of adjacent deeper tiles 15, and serve to form a continuous monolithic unbroken strata on the upper edge of the slab, which will effectively withstand the compressive stresses developed therein.

As a feature of the present invention, the deeper tiles 15 are of a special construction or design so that the upper portions thereof where the greater compressive stresses are developed may be made to more effectively withstand these stresses. For that purpose, these tiles 15 have the upper shell walls 16 thicker than the bottom shell walls 17. The shallower tiles 18 are of standard construction and have their upper and lower shell walls of equal thickness since the concrete layers 20 supply any deficiency in the compression resisting value of their upper shell walls.

As a further feature, the shallower tiles 18 are materially shorter than the higher tiles 15, so that the concrete 20 between the facing ends of the tiles 15 is reduced to a minimum. This has the advantage of materially reducing the cost of the construction since concrete per unit weight is more expensive than hollow tiles, and also reduces the dead weight of the slab construction.

In the construction shown in Fig. 4, the deeper tiles 15 are alternated by the shallower tiles 18 which are of standard construction and which are equal in length to those of the deeper tiles 15. In this construction, the recess formed be-

tween the adjacent ends of the deeper tiles 15 is filled with a layer of concrete 14 to form a T flange in a manner already described.

Although the invention is described with reference to a floor slab, it must be understood that as far as certain aspects of the invention are concerned, it may be equally applied to any load-carrying beam or slab.

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

1. A one-way reinforced concrete floor slab, including a series of hollow structural tiles of the multiple cell type arranged end to end in a row extending lengthwise of the slab, said tiles being of two different heights and alternately arranged to form recesses above the shallower tiles, the upper shell walls of the higher tiles being thicker than their bottom shell walls, while the shallower tiles are of standard construction with the upper and lower walls of equal thickness, said shallower tiles being materially shorter than the higher tiles, and all of said tiles being embedded in concrete extending up to the level of the top surfaces of the higher tiles so that said recesses are filled with concrete to form a composite monolithic compression resisting strata of concrete and hollow tiles.

2. A one-way reinforced concrete floor slab including a series of hollow structural tiles arranged end to end in a row extending lengthwise of the span, said tiles being of two different heights and alternately arranged to form recesses above the shallower tiles and between the facing ends of adjacent higher tiles, the upper shell walls of the higher tiles being thicker than their bottom shell walls, while the shallower tiles are of standard construction with the upper and lower shell walls of equal thickness, and concrete filling said recesses to form a composite monolithic compression resisting strata of concrete and hollow tiles.

3. A one-way reinforced concrete floor slab including a series of hollow structural tiles arranged end to end in a row extending lengthwise of the span, said tiles being of two different heights and alternately arranged to form recesses above the shallower tiles and between the facing ends of adjacent higher tiles, said shallower tiles being materially shorter than the higher tiles, and concrete filling said recesses to form a composite monolithic compression resisting strata of concrete and hollow tiles.

ELWYN E. SEELYE.