Jan. 18, 1927. 1,614,570

G. F. PAWLING

SUPPORT FOR BAR JOISTS

Filed May 23, 1924

Fig. 1.

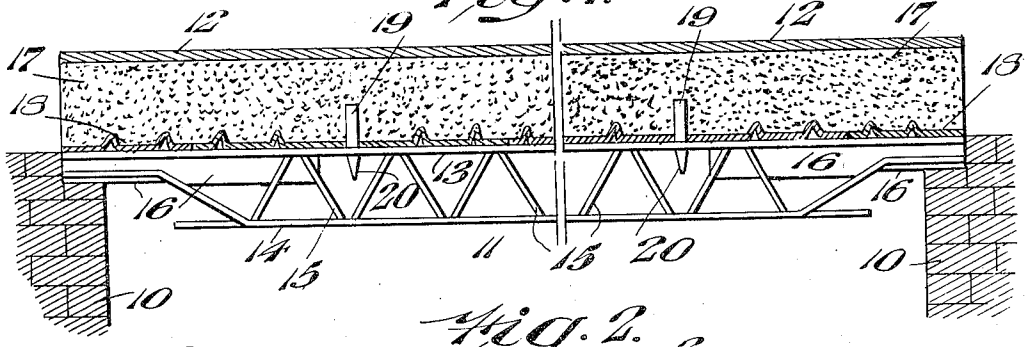
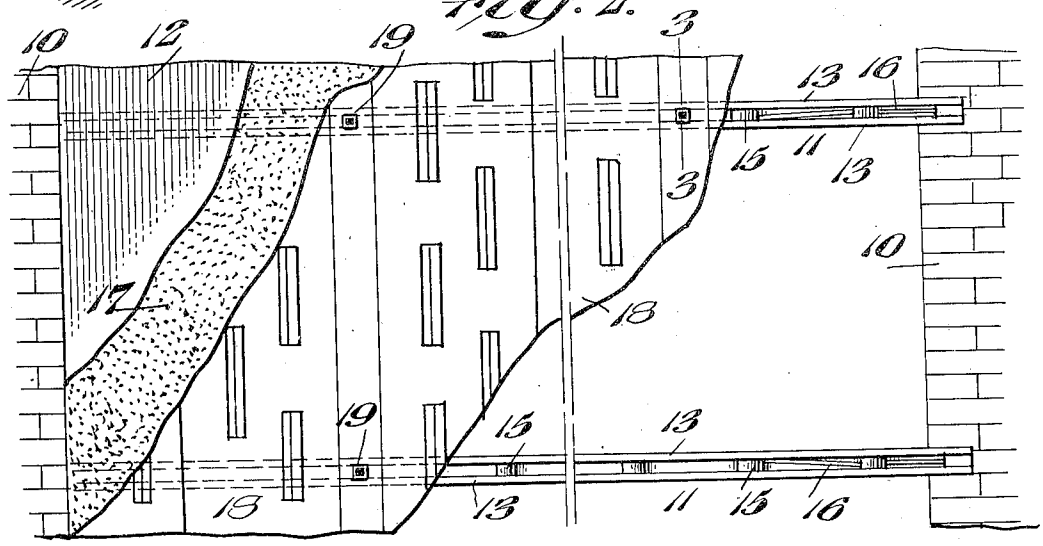


Fig. 2.



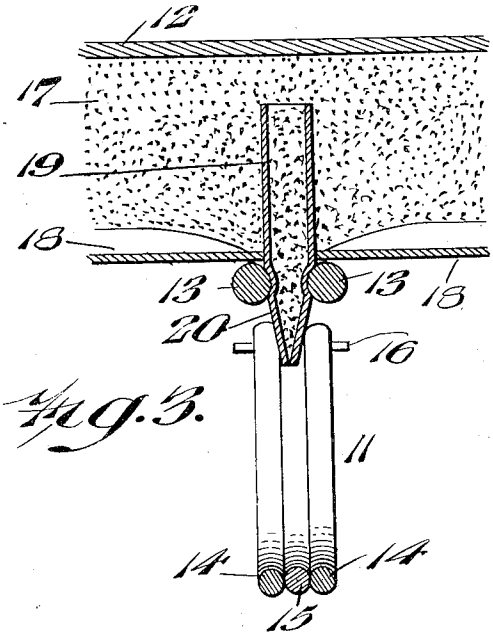


Fig. 3.

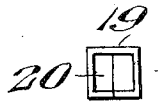


Fig. 5.

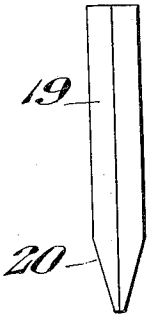


Fig. 4.

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UNITED STATES PATENT OFFICE.

GEORGE F. PAWLING, OF PHILADELPHIA, PENNSYLVANIA.

SUPPORT FOR BAR JOISTS.

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This invention, generally stated, relates to floor and like constructions and has more especial relation to so called bar-joist floor construction.

In a construction of this character the bar-joist each comprise, generally stated, five cylindrical bars of structural grade steel fashioned into a unit of the configuration of a Warren truss, which units are manufactured in various, standard sizes of span, and provide for efficiency, cheapness and general desirability. These bar-joist are fabricated in accordance with safe loading tables and are assumed to be sufficiently braced or supported laterally considered. However, practice dictates that the spaced, upper, parallel bars of a joist unit, in many instances and noticeable in spans of great length, require support or bracing at, which is termed commercially speaking, one-third or other points. Heretofore three-eighth inch bracing bars have been arranged at right angles to the joist and wired thereto. Obviously this consumes time and from an engineering viewpoint is inefficient and not in keeping with an otherwise practical principle of floor construction. Used in conjunction with such bar-joist is steel lath and a concrete fill of a depth usually of from one and one half to two inches in depth. It has heretofore been the practice to secure such lath to place by means of wire. Obviously this also is an inefficient method of procedure for obvious reasons.

The leading object of the present invention is to overcome the above recited disadvantageous features and provide a bar-joist, floor or like construction in which not only is the joist upper bars efficiently, cheaply and rapidly supported or braced by unskilled labor, but, the means employed for such support or brace constitutes an interlock for the steel lath also. A further object of the present invention resides in the provision of a novel arrangement, connection and combination of parts for attaining the results sought by said leading object. Other and further objects not at this time more particularly set forth will appear hereinafter.

The invention consists of the novel construction herinafter described and finally claimed.

The nature, characteristic features and scope of the invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof, and in which:

Fig. 1 is a view in longitudinal section illustrating a floor or like construction embodying features of the invention.

Fig. 2 is a top or plan view thereof, with parts broken away for the sake of clearer illustration.

Fig. 3 is a fragmentary view in cross section taken upon the line 3—3 of Fig. 2.

Fig. 4 is a view in elevation of one of the pins shown in the forgoing figures, and

Fig. 5 is a top or plan view of Fig. 4.

For the purpose of illustrating my invention I have shown in the accompanying drawings one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of the instrumentalities as herein shown and described.

Referring to the drawings in detail, 10 designates spaced supporting structures adapted to be spanned by a plurality of bar-joist 11 to sustain a floor or like construction 12. The structure 10 may comprise I-beams or girders, concrete, stone, brick or other walls, brick walls being shown for illustrative purposes. The floor 12 may be of cement, tiles, wood or other desired material. The bar-joist, as they are commercially known, are of standard construction and form no part of the present invention, except in the combination herein claimed. Generally stated, for a proper understanding of the invention, each bar-joist consists of an upper pair of spaced, horizontally disposed cylindrical bars 13; a pair of similar bars 14 therebelow; and a fifth bar 15 connecting the top and bottom sets as shown to provide a Warren truss effect. The parts are usually welded together and at each end are connected by a plate 16 which functions as a brace, gusset and bearing plate. Arranged upon and cross-wise of the upper set of bars 13 as best seen in Fig. 2 is steel lath to receive and sustain a concrete fill 17, which in turn supports the flooring 12. The steel lath may be of any of the conventional types as employed for reinforcing the floor slab. However, I prefer to employ apertured sheet-metal plates designated 18 pro-

vided therein at suitable places and in register with the space between adjacent top bars of a bar-joist, with apertures for the penetration of pins, pegs, or wedges embodying features of the invention. These pins, pegs or wedges are best seen in Figs. 3, 4, and 5 and are constructed of metal sheets first bent tube-fashion and thereafter either pressed or drawn to the tapered configuration shown. Each pin, peg or wedge is of rectangular, hollow cross-section, see Fig. 5 and consists of an upper rectilinear portion 19 and a contracting or tapering lower portion 20. A pin, peg or wedge of this type is driven through a metal lath aperture, down between a pair of bars 13 so that the bottom of said pin, peg or wedge assumes a position appreciably below said bars as clearly shown in Fig. 3. After the tapered end passes between the bars 13 the rectilinear body portion yields sufficiently, because of its hollow structure, to conform to the inner faces of said bars 13, without however spreading of said bars. The result is that when the concrete fill is introduced part thereof enters said hollow pins, pegs or wedges so that a bond is effected to rigidly support or brace, laterally considered, said bar-joist. Not only is this result obtained but the metal lath is anchored with respect to the joist, as is apparent, thus obviating any necessity for wiring. The distance apart of said hollow pins, pegs or wedges, through the length of a span varies, but located at what is termed one-third points answers for general purposes. Obviously the tops of said pins, pegs or wedges are positioned below the top surface of the concrete fill.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description and while I have in the present instance shown and described the preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

What I claim is:

1. In combination a structure to be spanned, a plurality of spaced bar-joist spanning said structure, metal lath arranged upon said joint, hollow, open ended pins the lower ends of which penetrate said lath and extend in deformed condition between the top bars of said joist and a concrete fill a part of which enters said hollow pins to effect a bond for rigidly supporting laterally said joist.

2. In combination a structure to be spanned, a plurality of spaced bar-joist spanning said structure, metal lath arranged upon said joint, hollow, open ended pins the lower ends of which are tapered to penetrate said lath and extend in deformed condition between the top bars of said joist and a concrete fill a part of which enters said hollow pins to effect a bond for rigidly supporting laterally said joist.

3. In combination a structure to be spanned, a plurality of spaced bar-joist spanning said structure, metal lath arranged upon said joist, hollow, open ended rectilinear pins the lower ends of which are tapered to penetrate said lath and extend in deformed condition between the top bars of said joist and a concrete fill a part of which enters said hollow pins to effect a bond for rigidly supporting laterally said joist.

4. In combination a structure to be spanned, a plurality of spaced bar-joist spanning said structure, metal lath arranged upon said joist, hollow, open ended rectalinear pins the lower ends of which are tapered to penetrate said lath and extend between the top bars of said joist so that the walls of said pins yield sufficiently to conform to the faces of opposed top bars, and a concrete fill a part of which enters said hollow pins to effect a bond for rigidly supporting laterally said joist.

5. An article of manufacture of the character stated consisting of a metal, open ended, hollow and relatively short pin the penetrating end of which is wedge-shaped, the major portion of the pin being of rectangular cross-section and having a plane surface throughout its extent, that portion of the pin immediately above said wedge-shaped portion being calculated to become deformed when driven between bars of skeletonized joist.

6. The method of supporting laterally the top bars of a bar-joist which consists in laying lath upon said bar joist introducing vertically through said lath and between said bars a hollow, open ended pin to deform said pin and then adding a concrete fill so that a portion thereof enters said pin to effect a bond of said parts.

7. The method of supporting laterally the top bars of a bar-joist which consists in laying lath upon said bar joist introducing vertically through said lath and between said bars a hollow, open ended pin of rectilinear shape to deform said pin and then adding a concrete fill so that a portion thereof enters said pin to effect a bond of said parts.

8. The method of supporting laterally the top bars of a bar-joist which consists in lay ing lath upon said bar joist introducing vertically through said lath and between said bars a hollow, open ended pin of rectilinear shape having a tapered lower end to de-

form said pin and then adding a concrete fill so that a portion thereof enters said pin to effect a bond of said parts.

9. The method of forming a floor which consists in placing in spaced relation skeletonized joist, applying lathing between and supporting the same on the joist, of driving hollow open ended pins through the lath and into the joist, thereby deforming the pins, and then applying concrete to form a floor, the concrete entering the hollow pins and the deformations, thereby bonding the structure together.

In testimony whereof, I have hereunto signed my name.

GEO. F. PAWLING.