

Feb. 7, 1928.

G. F. PAWLING

1,658,613

SYSTEM OF BUILDING CONSTRUCTION

Filed March 9, 1925

2 Sheets-Sheet 1

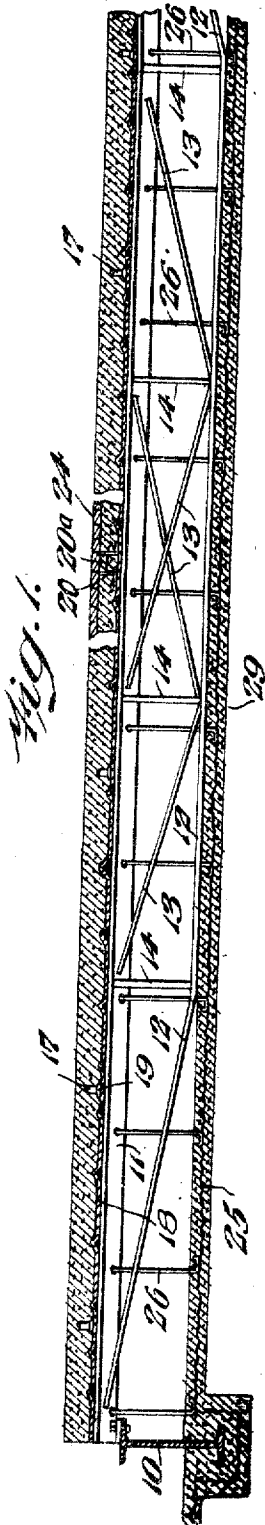


Fig. 4.
ON LINE 4-4
FIG. 2.

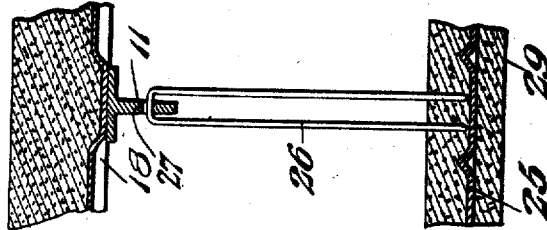


Fig. 3.
ON LINE 3-3
FIG. 2.

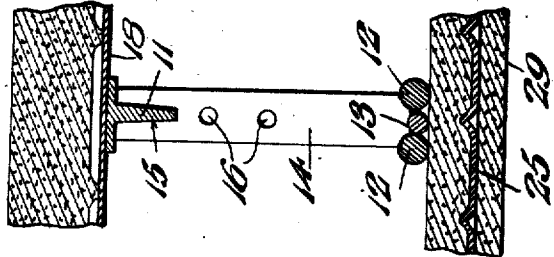
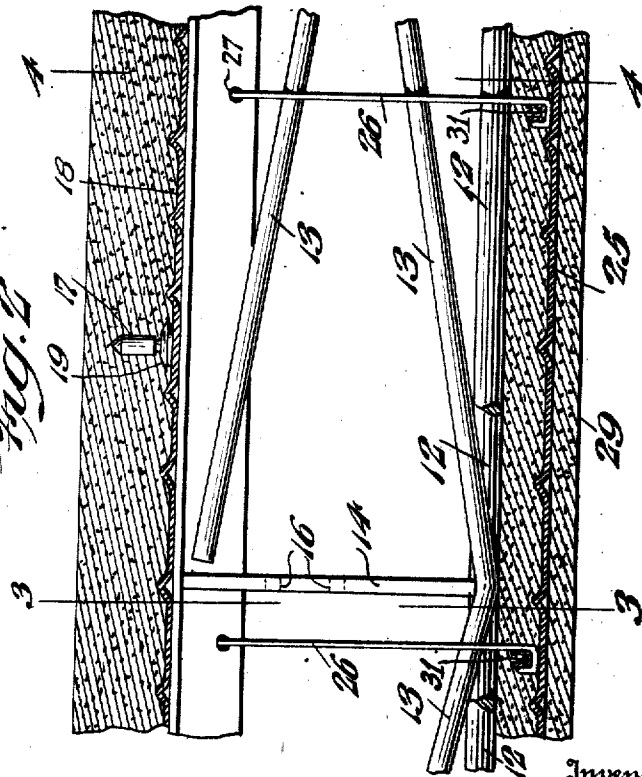


Fig. 2.



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2 Sheets-Sheet 2

Fig. 5.

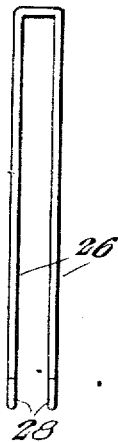


Fig. 6.

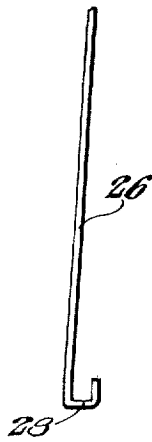


Fig. 7.

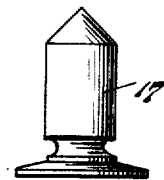


Fig. 8.

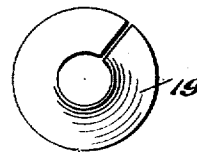


Fig. 9.

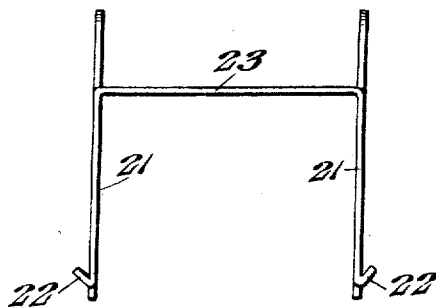
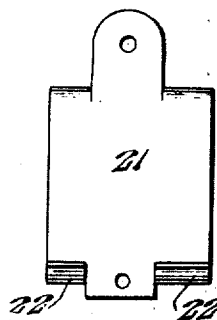


Fig. 10.



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Patented Feb. 7, 1928.

1,658,613

UNITED STATES PATENT OFFICE.

GEORGE F. PAWLING, OF PHILADELPHIA, PENNSYLVANIA.

SYSTEM OF BUILDING CONSTRUCTION.

Application filed March 9, 1925. Serial No. 13,972.

This invention, stated in its most general terms, relates to building construction, and has more especial relation to a system of floor and ceiling structure in which are employed skeletonized joist, bar joist, or steel joist.

The leading object of the present invention is to simplify, cheapen and provide a more efficient structure of the character stated and one in which the employment of skilled labor is reduced to a minimum. Another object is to provide a structure of the character stated in which the structural parts are materially lightened without, however, tending to reduce structural efficiency. Another object is to provide for both a floor and ceiling construction in which metal lath may be more conveniently, more expeditiously, and more uniformly secured with respect to the joist. Other and further objects not at this time particularly pointed out will be referred to hereinafter.

The invention consists of the novel system hereinafter 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 of a floor and ceiling structure embodying the invention.

Fig. 2, is a fragmentary view in longitudinal section, drawn to an enlarged scale and illustrating details of construction.

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

Fig. 4, is a view taken upon line 4—4 of Fig. 2.

Fig. 5, is an end view of a ceiling lath clip.

Fig. 6, is a side view of Fig. 5.

Fig. 7, is an elevational view of a floor lath receiving peg.

Fig. 8, is a view of a split washer used in conjunction with such peg.

Fig. 9, is an end view of a nailing strip; and

Fig. 10, is a side view of Fig. 9.

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 described and shown.

Referring to the drawings in detail the reference numeral 10 designates suitable supports, as spaced I-beams, spanning which are skeletonized joist, bar-joist, or steel joist, as desired. The joist I prefer to employ is skeletonized joist and is much lighter in structure than that now in common use, yet possessed of great structural strength. Each joist comprises an upper chord 11 of T-shaped cross-section; a lower chord composed of a pair of members 12 the cross-section of which is round; diagonal struts 13 of circular cross-section; and vertical struts 14 of flat metal, which parts in practice are welded together and shipped ready for installation. The vertical struts are forked as at 15 at their tops in order to straddle the vertical bar of the upper chord, see Fig. 3, and are apertured as at 16 for a purpose to presently appear. At the time of manufacture a joist has welded thereto upon the upper surface of the upper chord a plurality of vertically disposed, properly spaced, metal pegs 17. The joist construction just described is specifically claimed in my pending application, Serial Number 42,118, filed July 8th, 1925.

I will now describe the manner of assembling the various ceiling and floor parts of my structure in accordance with the system I have perfected. Referring now to the ceiling structure which is the first step in my system after the joist have been positioned, I make use of ceiling lath 25 which I suspend by means of clips best seen in Figs. 5 and 6. Each clip is of inverted U-shape and is designated 26. At the time of manufacture the upper chord of the bar-joist is apertured as at 27 throughout its length in spaced relation. Thus the erectors merely have to separate the two hooked ends, pass an end of a clip 26 through an aperture 27 of the upper chord to suspend a clip and pass the hooked ends 28 of a clip beneath a furring strip 31 to retain the latter in position. Since the upper chord thus supports the ceiling lath it is obvious that the said

lath may be supported throughout the entire length of the span which heretofore in joist has not been possible. It is to be understood in this connection that the furring strips 31 are interposed between the bottoms of the joist and the upper face of the metal lath and properly secured to the lath in any desired manner at the time of suspending the lath with respect to the upper chords of the joist. This structure is known in the building trade as a steel centering. I next pour from above fire proofing material upon the steel centering. Heretofore in a structure which consists of a floor slab and a ceiling, the floor slab is always poured before the ceiling is constructed, the ceiling being made by attaching to the skeletonized joist or any other joist metal lath and applying thereto a plaster covering from below. This method permits the placing of only a comparatively thin protection under the joist and it is not reinforced. The ceiling construction therefore is only fire resisting and not fire proof.

The pouring from above of fire proofing material on steel centering before the floor slab is poured is a new and efficient method of constructing a ceiling structure.

The following advantages are derived therefrom:

1. Provides a slab of any thickness that may be desired and which could not be accomplished by plastering.
2. Permits the incorporating of furring and hangers in the fire proofing material.
3. The upper projecting parts of the steel centering accept the poured fire proofing and thus reinforcing of the ceiling structure is provided.
4. On account of the fact that the centering remains permanently in the ceiling structure a continuous armor of steel is provided between the ceiling plaster and floor structure above.
- Thus a ceiling structure of any thickness desirable to prevent the transmission of heat to the structure above, and reinforcing and armoring the same so that it cannot be destroyed by the action of heat and high water pressure from below is provided.

The next step in my system is that of preparing a floor construction. In making a floor construction metal lath 18 is forced down over the pointed tops of pegs 17 and split washers 19 are then forced over the pegs to secure the lath in position. If a wood floor is to be employed for receiving nailing strips clips 20 are then attached to the metal lath. These clips are best seen in Figs. 9 and 10 and each comprises members 21 of H-shaped cross-section the legs of which are each provided with prongs 22 for engaging the apertured parts of the lath. The legs are connected by cross-bar 23 upon which rests a nailing strip 20*. If plain

concrete floor is desired these clips are not used. The concrete fill 24 is then poured flush with the nailing strips (if employed) as usual. Should it be necessary to leave an opening in the floor for stairs, well, elevator, vent or the like the vertical struts 14 are employed in the connection since supporting or other structural parts may be bolted thereto, the apertures 16 being used to accommodate the bolts. This is a very important feature not previously used in connection with skeletonized joist, steel joist, or bar-joist.

By the above described system of floor and ceiling structure I am enabled not only to more cheaply, quickly and efficiently provide a good engineering job but it is not necessary to employ skilled mechanics so that with the shipment of joist and accessories a customer may have erection completed by unskilled labor in an efficient manner. Since the proper spacing of flooring and ceiling lath supporting parts have been previously and accurately determined it is merely necessary to erect and not calculate or guess at structural support.

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 the herein described system of fire proof building construction, the steps which consist in positioning joists, in suspending therefrom a self-centering ceiling form and reinforcement, and in pouring thereon and incorporating therewith from above a fill of fire proofing material adapted to harden into a slab.
2. In the herein described system of fire proof building construction, the steps which consist in positioning joists, in suspending therefrom a self-centering ceiling form and reinforcement, in pouring thereon and incorporating therewith from above a fill of fire proofing material adapted to harden into a slab, and then in applying a flooring upon said joists in spaced relation to said fire proofing material.
3. In the herein described system of fire proof building construction, the steps which consist in positioning joists, in suspending therefrom a self-centering ceiling form and reinforcement, in pouring thereon and incorporating therewith from above a fill of

fire proofing material adapted to harden into a slab, then in applying a flooring upon said joists in spaced relation to said fire proofing material, and finally applying plaster to the under side of said self-centering ceiling form.

4. In the herein described system of fire proof building construction, the steps which consist in positioning skeletonized joists, in suspending a self-centering ceiling form and reinforcement from the upper chords thereof and incorporating therewith, and in pouring thereon from above a fill of fire proofing material adapted to harden into a slab.

5. In the herein described system of fire proof building construction, the steps which consist in positioning skeletonized joists, in suspending a self-centering ceiling form and reinforcement from the upper chords thereof and incorporating therewith, in pouring thereon from above a fill of fire proofing material adapted to harden into a slab, and then in applying a flooring upon said joists.

6. The herein described system of ceiling and flooring construction which consists in positioning skeletonized joists of T-shaped cross-section, the flat, upper face of each joist having formed integral therewith rigid, fixed pegs, securing furring and metal lath with respect to the lower chords of said joist by suspension from the upper chords of the joist to form a steel centering, pouring from above fire proofing material upon said steel centering, forcing metal lath over said pegs and applying a fill of concrete to form the floor.

7. The herein described system of ceiling and flooring construction which consists in positioning skeletonized joists of T-shaped cross-section, the flat, upper face of each joist having formed integral therewith rigid, fixed pegs, securing furring and metal lath with respect to the lower chords of said joist by suspension clips from the upper chords of the joist to form a steel centering, pouring from above fire proofing material upon said steel centering, forcing metal lath over said

pegs and applying a fill of concrete to form the floor.

8. The herein described system of ceiling and flooring construction which consists in positioning skeletonized joists of T-shaped cross section, the flat, upper face of each joist having formed integral therewith rigid, fixed pegs, securing furring and metal lath with respect to the lower chords of said joist by suspension from the upper chords of the joist to form a steel centering, pouring fire proofing material upon said steel centering, forcing metal lath over said pegs, securing said lath by means of washers fitted over said pegs, and applying a fill of concrete to form the floor.

9. The herein described system of ceiling and flooring construction which consists in positioning skeletonized joist of T-shaped cross section, the flat, upper face of each joist having formed integral therewith rigid, fixed pegs, securing furring and metal lath with respect to the lower chords of said joist by suspension from the upper chords of the joist to form a steel centering, pouring from above fire proofing material upon said steel centering, forcing metal lath over said pegs, applying nailing strip receiving clips to said lath, and applying a fill of concrete to form the floor.

10. In building construction, the combination of spaced supports, a series of skeletonized joists spanning the space with their upper chords resting upon the supports and the lower chords bent upwardly to meet the upper chords substantially at the points of support, a self-centering ceiling form and reinforcement suspended from said joists, a hardened slab of fire proof material carried on the upper side and incorporated with said self-centering ceiling form and reinforcement, and a flooring carried upon said joists in spaced relation to said slab.

In testimony whereof, I have hereunto signed my name.

GEORGE F. PAWLING.

fire proofing material adapted to harden into a slab, then in applying a flooring upon said joists in spaced relation to said fire proofing material, and finally applying plaster to the under side of said self-centering ceiling form.

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CERTIFICATE OF CORRECTION.

Patent No. 1,658,613.

Granted February 7, 1928, to

GEORGE F. PAWLING.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, line 12, claim 4, strike out the words "and incorporating therewith" and insert the same to follow after the word "thereon" line 13, same claim; same page, line 20, claim 5, strike out the words "and incorporating therewith" and insert the same to follow after the word "thereon", line 21; and that the said Letter Patent should be read with these corrections therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 6th day of March, A. D. 1928.

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