FLOOR CONSTRUCTION FOR BASEMENTLESS BUILDINGS AND THE LIKE

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This invention relates to floor construction for buildings, and more particularly to a floor construction for homes of the type having no basement.

An object of the invention is to provide highly simplified, compact and economical means for constructing floors above concrete base slabs in basementless homes and utilizing the novel floor construction to facilitate the installation in the home of a simplified heating system.

Another object of the invention is to provide a lightweight adjustable sheet metal support structure for floor joists and the like, and which structure is adapted to rest directly upon the concrete slab underlying the floor and compensating for the usual irregularities in the concrete slab, so as to maintain the floor levels.

A further object is to provide a floor construction of the above mentioned character adapted to permit the free flow of warm air in a relatively shallow plenum chamber between the finished floor and concrete slab in all directions and substantially unobstructed.

Still another object is to provide a floor construction of the above mentioned character which simplifies the installation of heating, plumbing and electrical equipment and the like within the home, and renders the home less expensive to build and increases usable space within the home.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings, forming a part of this application, and in which like numerals are employed to designate like parts throughout the same:

FIG. 1 is a plan view, partly diagrammatic and partly in section, of a building embodying the floor construction according to the invention;

FIG. 2 is an enlarged fragmentary vertical section taken on line 2—2 of FIG. 1;

FIG. 3 is a similar section taken on line 3—3 of FIG. 1; and

FIG. 4 is a perspective view of a floor support member according to the invention.

In the drawings, wherein for the purpose of illustration is shown a preferred embodiment of the invention, the numeral 10 designates a concrete slab or base for a building of the type having no basement and adapted to rest directly upon the ground. Such concrete slabs are generally level, but are commonly somewhat irregular upon their upper faces and the slab may not present a truly level surface upon which to construct the finished flooring of the building. One important feature of the invention is to utilize means in the construction of the finished flooring which will compensate for the inherent irregularities in the concrete slab.

In constructing the floor upon the slab 10, a plurality of equidistantly-spaced parallel horizontal floor joists 11 are employed and these joists may be conveniently formed from two-by-four lumber or the like. As indicated in the drawings, the floor joists 11 span the base slab 10 traversely thereon in one direction.

In order to support the several joists at the same elevation, and in a level manner, preferably a few inches above the base slab 10, there is provided beneath each joist 11 in the desired longitudinally spaced relation a plurality of generally W-shaped sheet metal truss members 12, preferably formed of aluminum, steel, or the like.

Each truss member 12 comprises a pair of top horizontally outwardly projecting end flanges 13 and an intermediate horizontal plate portion 14 arranged at the elevation of the end flanges. The truss further includes a pair of flat horizontal bottom plate portions, or feet 15, spaced intermediate the plate portion 14 and flanges 13 and parallel thereto and below the latter. Diagonal legs 16 interconnect the elements 13, 14 and 15, and are preferably integral therewith as shown in FIG. 4. Upwardly projecting parallel side flanges 17 on the diagonal legs 16 serve to render the legs more rigid so that the truss is capable of supporting a maximum possible load. The legs 16 may also be stiffened by other suitable means such as by ribbing or corrugating the same in a preferred manner.

Several of the trusses 12 are arranged below each floor joist 11, as shown, and the joists may rest directly upon the flanges 13 and intermediate plate portion 14 and the upper corners of flanges 17 will serve to center the joint 11 upon the truss, as indicated in FIG. 3. The feet 15 of the truss rest directly upon the concrete slab 10 and are not secured to the slab by fastener means. The intermediate plate portion 14 of the truss is likewise free of positive attachment to the floor joist 11 and the latter rests upon the plate portion 14 and the end flanges 13 as stated. The end flanges 13 are fixedly secured to the bottom of the joint 11 by means of nails 13', or like fasteners.

The arrangement is such that each W-shaped truss 12 is substantially self-adjusting to compensate for surface irregularities of the slab 10. That is to say, where the upper surface of the concrete slab 10 is irregular, one or more feet 15 of the truss may be at a different elevation from the other foot 15 by as much as one-half to three-quarters of an inch. When this condition prevails, the intermediate plate portion 14 is free to shift longitudinally of the joint 11, FIG. 2, to the right or to the left so that the truss will adjust itself automatically under load to compensate for the difference in elevation of the truss feet 15. In FIG. 2, if the right hand foot is at an elevation above the left hand foot 15, due to a surface irregularity in the slab 10, the intermediate plate portion 14 will automatically adjust itself to the left along the joint 11. Likewise, if the left hand truss foot 15 is elevated relative to the right hand truss foot, the intermediate plate portion 14 will shift or slide somewhat to the right to automatically compensate for the difference in elevation between the truss feet. The legs 16 connected with the intermediate plate portion 14 will flex or bend at their junctions with the plate portion 14 and feet 15 to permit this automatic adjustment. Additionally, at the time of installation, each truss may have its overall height adjusted somewhat, if necessary, by extending or shortening the entire truss according to the condition prevailing at the joints of the flanges 13 to the bottom of the joint. This is a means of ensuring that the joists 11 are all mounted at a uniform elevation above the slab 10. When the truss 12 is properly installed and the self-adjustment of the intermediate plate 14 has taken place, the bottom of the joint 11 will be firmly supported upon the flanges 13 and intermediate plate portion 14 at three points and both truss feet 15 will firmly engage the top of the slab 11 whether the same is smooth and regular or somewhat irregular, as the case may be.

By this means all of the floor joists 11 may be installed in the desired spaced relation, and in a level manner, at the desired height, such as four or five inches above the concrete slab 10. The rough flooring 17 and finished flooring 17a, FIG. 1, may then be applied directly to the tops of the joists 11, in a conventional manner, to complete the flooring of the building.

The described floor construction readily enables the builder to place plumbing pipes 18, electrical conduits 19, and other such fixtures, in the shallow chamber between the joists 11 and the base slab 10, as indicated in...
the drawings. This simplifies the overall construction of the building; reduces the expense of plumbing, and utilities installation; and encourages the use of prefabricated plumbing systems, wiring and the like.

Additionally, the floor construction renders possible the use in the building of a simplified heating system embodying a downstream warm air furnace shown diagrammatically in Fig. 1 and adapted to be installed in registration with a simple opening formed in the floor above the slab 10 at one end of the building or room.

Warm air is discharged from all sides of the furnace 20, at its bottom, as indicated by the arrows in Fig. 1, and below the finished flooring, and this warm air is free to circulate in all directions in the shallow plenum chamber between the finished flooring and the concrete slab 10, as should be obvious. The trusses 12 being open in construction do not appreciably interfere with the free circulation of warm air in all directions in the chamber between the flooring and slab 10. The arrangement affords a simplified and inexpensive means to partially heat the building by radiant heat over the entire area of the floor constructed upon the several joists 11.

Additionally, warm air registers 21 of any conventional type are installed at the ends or sides of the building to convey a certain amount of the warm air upwardly into the space above the finished flooring to heat such space by convection.

It is to be understood that the form of the invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the structure and arrangement of parts may be resorted to without departing from the spirit of the invention or scope of the sub-joined claims.

Having thus described my invention, I claim:

1. In a floor construction, a base slab having surface irregularities, a plurality of spaced substantially parallel floor joists spaced above said slab for supporting flooring, a plurality of generally W-shaped adjustable trusses formed of sheet material interposed between each joist and said slab in spaced relation longitudinally of the joist and having spaced upper end portions and an intermediate upper portion engageable with the bottom of the joist and spaced bottom feet freely engageable upon said slab, means for attaching said upper end portions of the truss to the joist, inclined leg portions respectively interconnecting said feet with said end portions and intermediate upper portion through bight portions constructed to bend under load applied to said end portions, whereby said upper intermediate portion is free to shift automatically longitudinally of the joist in either direction to compensate for a difference in elevation between said truss feet caused by said surface irregularities.

2. In a floor construction for a basementless building, a concrete base slab, a plurality of spaced substantially parallel horizontal floor joists spaced above said slab and adapted to support flooring, and a plurality of adjustable sheet metal trusses individual to each joist arranged between each joist and said slab in spaced relation along the joist and having spaced end and intermediate top supporting parts engaging the bottom surface of the joist and spaced bottom supporting parts freely engaging said slab, inclined leg portions respectively connecting said spaced bottom supporting parts with said end top supporting parts and said intermediate top supporting part through bendable bight portions, said spaced end top supporting parts of each truss being fastened to the bottom surface of the joist, each intermediate top supporting part of each truss being slidably self-adjusting longitudinally of the floor joist by bending of the bight portions under load to compensate for surface irregularities in said concrete base slab and differences in elevation of said bottom supporting parts caused by said surface irregularities.

3. In a floor construction for a basementless building, a concrete base slab, a plurality of spaced floor joists spaced above said slab, and a plurality of sheet metal trusses individually adjustable under load arranged between each floor joist and said slab in longitudinally spaced relation and engaging the slab and floor joist to support the latter, each truss being of zig-zag configuration and including spaced end and intermediate top supporting parts and spaced bottom supporting parts, inclined leg portions respectively connecting said spaced bottom supporting parts with said spaced end and intermediate top supporting parts through bendable bight portions, and means for attaching the end top supporting parts only of each truss to the bottom of the floor joist to allow a longitudinal movement of said intermediate top supporting part along the floor joist by flexure of the bendable bight portions under load to adjust the elevation of the spaced bottom supporting parts to compensate for surface irregularities of said base slab.

4. A truss for use in floor construction comprising a generally W-shaped body portion formed of relatively thin sheet material, said body portion comprising a pair of top substantially horizontal end flanges adapted for attachment to the bottom of a floor joist and an intermediate substantially horizontal plate portion arranged at the elevation of said end flanges and slidably engageable with the bottom of the joist and free to shift somewhat lengthwise of the joist to render the truss self-adjusting, substantially horizontal feet spaced below said end flanges and plate portion and intermediate the same and adapted to rest freely upon a base slab, diagonal legs extending between said feet and said end flanges and intermediate plate portion, bendable bight portions connecting said diagonal legs with said feet and said end flanges and intermediate plate portion for shifting said intermediate plate portion to compensate for a difference in elevation between said feet, upwardly directed side flanges on said diagonal legs to render the same rigid and said side flanges having corner portions projecting upwardly above said top end flanges and intermediate plate portion for centering floor joists which rest upon said top end flanges and plate portion.

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