

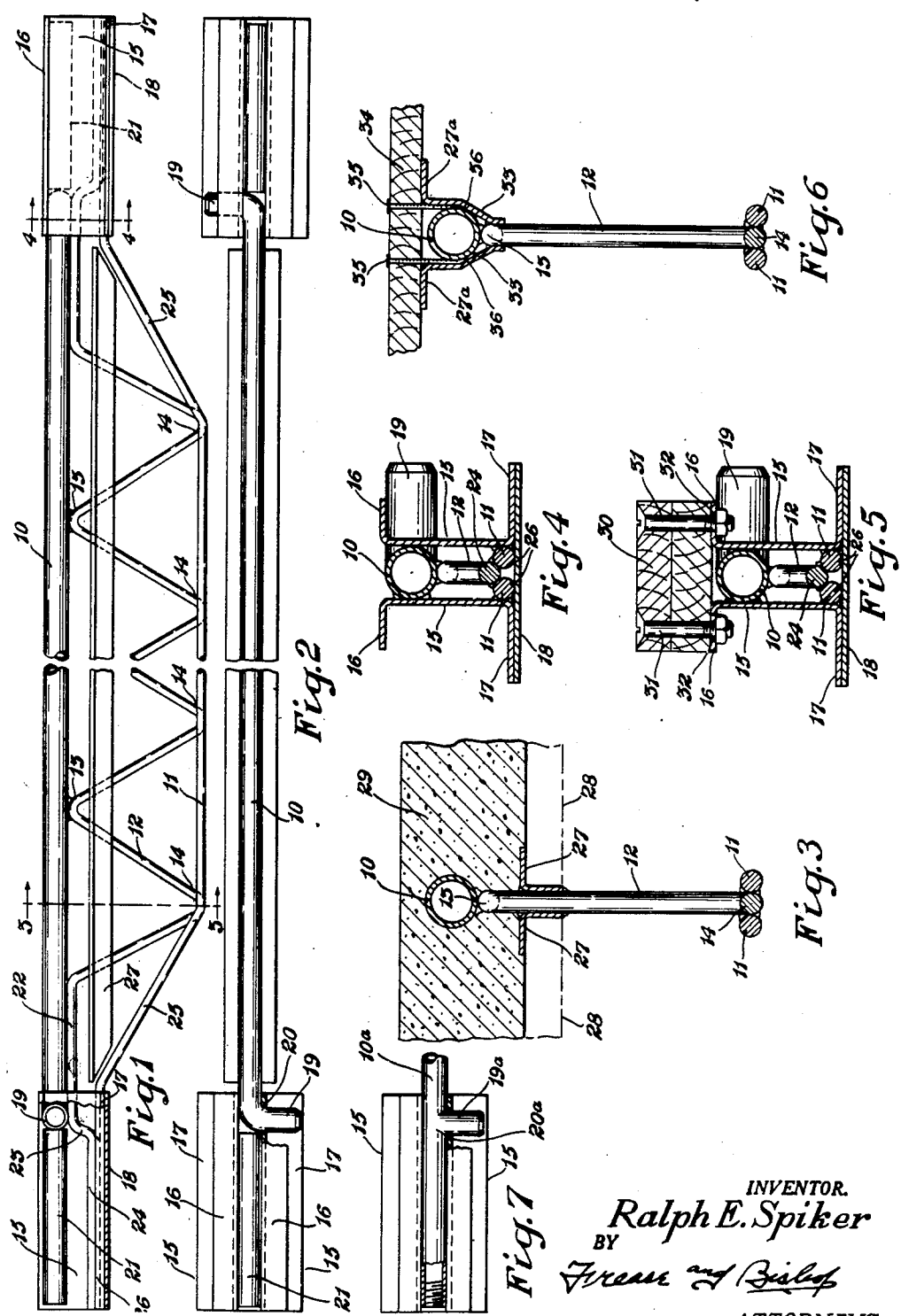
July 26, 1949.

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2,477,394

RADIANT HEATING BAR JOIST

Filed July 18, 1946



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X 1397
X 1404
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Patented July 26, 1949

2,477,394

UNITED STATES PATENT OFFICE

2,477,394

RADIANT HEATING BAR JOIST

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Application July 18, 1946, Serial No. 684,628

2 Claims. (Cl. 189—37)

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The invention relates to bar joists and more particularly to a load bearing, radiant heating joist in which the top chord of the joist is a tubular member through which heating fluid may be circulated in order to heat the floor which the joist supports.

It is an object of the invention to provide a bar joist comprising a tubular upper chord or compression member, a bar or rod lower chord, or tension member, and an angularly bent, or zig zag web bar or rod connecting the upper and lower chords and attached thereto at intervals as by welding.

Another object is to provide a joist of the character referred to in which the tubular top chord is provided at opposite ends with angular nipples or pipe fittings adapted to be connected by lengths of pipe with the tubular top chords of adjacent joists.

A further object is to provide such a bar joist in which these angular nipples or fittings are formed by bending opposite ends of the tubular top chord.

A still further object is to provide such a joist in which these angular extensions are in the form of T's integrally formed upon end portions of the tubular top chord.

Another object of the invention is to provide a bar joist of the character referred to in which longitudinally disposed angle irons are attached to opposite sides of the joists for locating a floor structure thereon.

A further object is to provide such a joist in which the angle iron members are located around opposite sides of the tubular top chord member and attached thereto at intervals to provide nailing grooves.

A still further object is to provide a joist of the character referred to having bearing plates at opposite ends to which the top and bottom chords and web member are connected, the web member being so shaped that it supports the end portions of the tubular top chord within the bearing plates.

The above objects together with others which will be apparent from the drawing and following description, or which may be later referred to, may be attained by constructing the improved bar joist in the manner hereinafter described in detail and illustrated in the accompanying drawing, in which:

Figure 1 is a side elevation of a load bearing radiant heating bar joist embodying the invention, parts being broken away for the purpose of illustration;

Fig. 2 a top plan view of the bar joist shown in Fig. 1;

Fig. 3 an enlarged, transverse, vertical section taken as on the line 3—3, Fig. 1, and showing the manner in which the tubular top chord

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of the joist may be enclosed in a floor structure of concrete or the like;

Fig. 4 an enlarged, vertical, transverse section through the bearing plate, taken as on the line 4—4, Fig. 1;

Fig. 5 a view similar to Fig. 4 showing the manner in which wood nailing strips may be attached to the bar joist;

Fig. 6 an enlarged, transverse, vertical section through a slightly modified form of bar joist showing the manner in which a wooden floor may be nailed to the bar joist; and

Fig. 7 a fragmentary plan view of one end portion of a modified form of bar joist with parts broken away for the purpose of illustration.

The top chord 10 of the improved bar joist is of tubular cross section and may be a suitable length of wrought iron pipe or the like. The joist includes generally this tubular top chord 10, two parallel straight bars or rods 11 that compose the lower chord, and another bar or rod 12 constituting the web member of the structure and being bent reversely to form a successive series of oppositely directed V's, the upper angles 13 of which are connected to the tubular top chord 10 as by welding, and the lower angles 14 of which are located between and connected to the bottom chord rods or bars 11 as by welding.

A bearing plate is connected to each end portion of the joist and may comprise a spaced pair of channels 15 which are welded to opposite sides of the tubular upper chord 10, near their upper ends. Each of these channels has the outturned flanges 16 at its upper end and outturned channels 17, preferably of greater width, at its lower end, a flat plate 18 being welded or otherwise connected to the under surfaces of the lower flanges 17.

As shown in Figs. 1 and 2, the ends of the tubular top chord 10 may be bent outwardly in opposite directions forming nipples or pipe connections 19 which extend through suitable openings 20 in the channel members 15 and provide means for welding or otherwise attaching pipe sections for connection to the tubular top chords of adjacent joists so as to form a continuous radiant heating coil in the floor supported by such joists. If additional radiation is required the pipe sections attached to said nipples may be in the form of additional coils.

A short filler, as indicated at 21, may be welded between the upper portions of the channel 15 extending from the nipples 19 to the outer end of the bearing plate.

As shown in Fig. 7, this structure may be slightly modified, the tubular upper chord 10a extending through between the channel members 15 to the outer ends thereof and provided with a T nipple 19a formed integrally with the pipe chord

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member and located through a suitable aperture 20a in the adjacent channel member.

In order to reinforce and support the end portions of the tubular upper chord 10 at the point where the nipples 19 are provided, the opposite ends of the web rod 12 may be bent longitudinally as shown at 22 and welded or otherwise attached to the under side of the upper chord 10, the end portion of the web rod being then bent downwardly as at 23, beyond the nipple 19, and extended longitudinally as indicated at 24.

Opposite ends of the bottom chord rods or bars 11 are bent upwardly and outwardly at an angle, as indicated at 25, terminating in the horizontal portions 26 which rest upon the plate 18 and are welded thereto and to the lower portion of the channels 15 and also to the horizontal portion 24 of the web bar which is located between the portions 26 of the bottom chord bars or rods.

The top and bottom chords and the web member of the bar joist are thus secured together and to the bearing plates at opposite ends of the joist by means of which the joist may be suspended at its ends upon masonry or other supports.

Longitudinally disposed angle irons 27 may be located parallel to the tubular top chord 10 at a point spaced below the same and welded or otherwise secured to the web bar or rod 12. In constructing a concrete or similar floor supported by these joists, as shown in Fig. 3, wood or metal forms as indicated at 28 may be butted against the under sides of the angle irons 27 and a floor composed of cement or the like as indicated at 29, may be built upon said forms, embedding the tubular top chords 10 and the upper portions of the web rod 12 therein.

In the event wood nailing strips, as indicated at 30 in Fig. 5, are desired upon the top of the joist for nailing a wooden floor thereto, these nailing strips may be attached to the top of the joist as by bolts 31 located through suitable apertures 32 in the upper flanges 16 of the channel members 15.

In Fig. 6 is shown a slight modification in which the joist is otherwise made in the manner illustrated and described above, but the angle irons 27a are located on opposite sides of the tubular top chord 10, the lower edges of these angle irons being bent inwardly toward each other as indicated at 33 and welded to the upper angles 13 of the web rod or bar 12. These angle irons may also be welded at spaced points to opposite sides of the tubular top chord 10.

A wood floor as indicated at 34 may be placed upon the joist, resting upon the angle irons 27a, and attached to the joist as by nails 35, which may be driven down between the opposite sides of the tubular top chord 10 and the angle irons 27a, the nails being bent and clinched in the nailing groove thus formed as indicated at 36.

From the above it will be evident that a simple, inexpensive and efficient load bearing, radiant heating bar joist is produced, the top chord thereof being in the form of a radiant heating pipe with means for connecting the same to the tubular top chords of adjacent joists in order to provide a heating coil throughout the floor supported by such joists. Hot water or other heating fluid may be circulated through the heating coil thus formed, in order to heat the floor.

I claim:

1. A fabricated floor supporting joist compris-

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ing a tubular top chord adapted to provide a conduit for heating fluid, a bottom chord spaced below the top chord, a reversely bent web member connected to both chords, end bearings comprising a pair of channel members connected near their upper edges to opposite sides of the tubular top chord at each end of the joist and having out-turned flanges at their upper and lower edges, a bearing plate connected to the under sides of the lower flanges of each pair of channel members, opposite ends of the lower chord and web member being connected to said end bearings, and oppositely disposed means at opposite end portions of the tubular top chord located through apertures in the inner ends of the corresponding channel members under the upper flanges thereof for connection to the top chords of a parallel series of similar joists so as to provide a continuous radiant heating coil in a floor supported by such joists.

2. A fabricated floor supporting joist comprising a tubular top chord adapted to provide a conduit for heating fluid, a bottom chord spaced below the top chord, a reversely bent web member connected to both chords, end bearings comprising a pair of channel members connected near their upper edges to opposite sides of the tubular top chord at each end of the joist and having out-turned flanges at their upper and lower edges, a bearing plate connected to the under sides of the lower flanges of each pair of channel members, opposite ends of the lower chord and web member being connected to said bearing plate and channel members, and oppositely disposed means at opposite end portions of the tubular top chord located through apertures in the inner ends of the corresponding channel members under the upper flanges thereof for connection to the top chords of a parallel series of similar joists so as to provide a continuous radiant heating coil in a floor supported by such joists, the tubular top chords of the joists being adapted to be embedded in the floor, and angle irons parallel with the top chord and welded to opposite sides of the web bar for contact with the under side of the floor.

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