July 19, 1938. E. P. ALSTED 2,123,923

JOIST

Original Filed March 21, 1929

Fig. 1

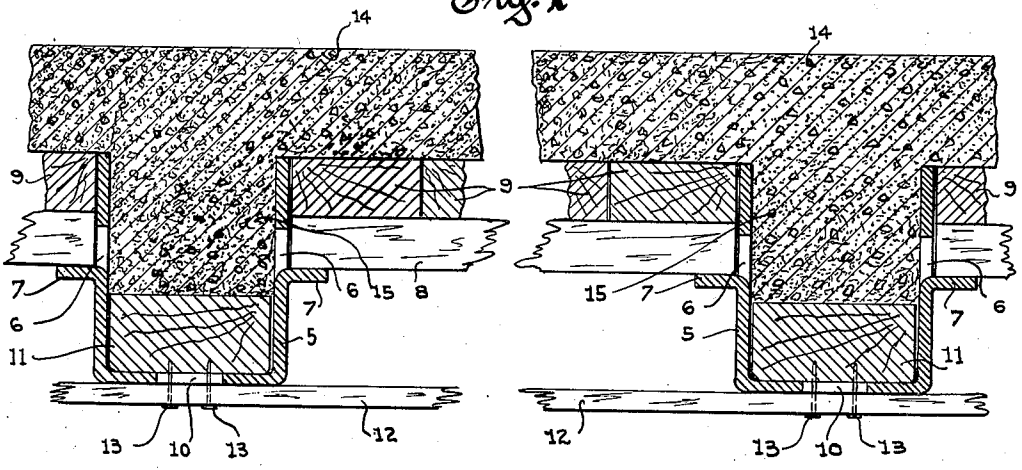


Fig. 2

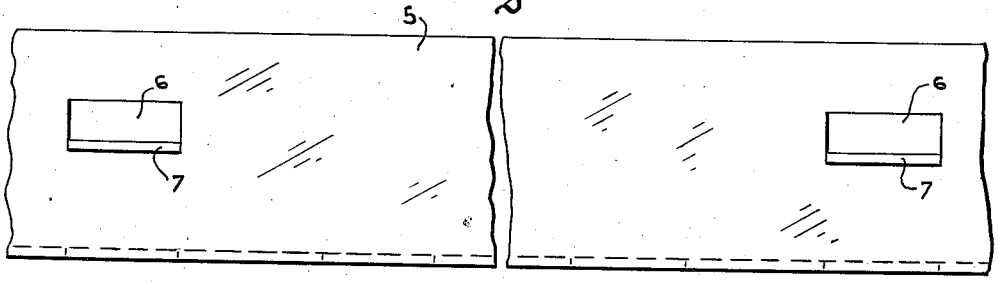


Fig. 3

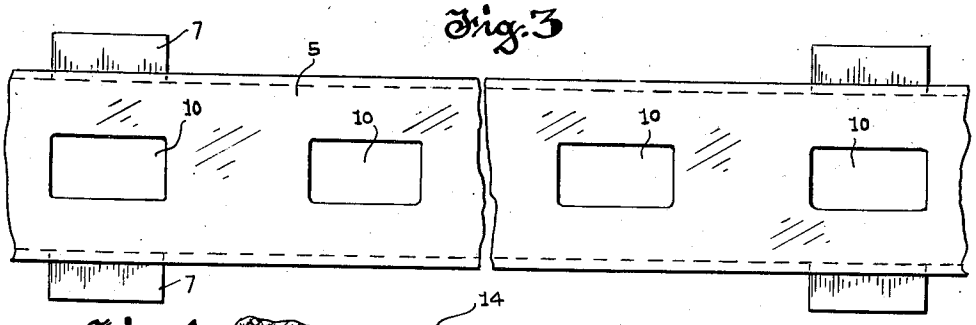
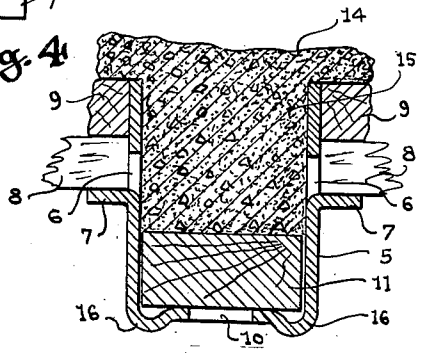


Fig. 4



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JOIST

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Refiled for abandoned application Serial No. 348,825, March 21, 1929. This application October 18, 1937. Serial No. 169,659

6 Claims. (Cl. 72—60)

My invention has relation to improvements in joists.

An important object of my invention is the provision of an improved form of joist of U-shape in cross-section, upon which the flooring or other device to be supported is placed, said U-shaped formation providing a pocket or receptacle for a filling extending downwardly from the under side of the floor or device to be supported, and which filling, of course, strengthens the joist, and assists said joist in performing its supporting function.

Another important object of the invention is to provide a construction which performs the double function of serving both as a floor joist and a ceiling joist.

A still further object is the provision of a U-shaped joist provided on opposite sides thereof with laterally-extending flanges adapted to form shelves for supporting timbers disposed beneath the flooring.

With the above objects, and other incidental objects, in view, which will be made clear from the description which follows, the invention consists of the devices and parts, or the equivalents thereof, as herein set forth.

In the accompanying drawing, Fig. 1 is a cross-sectional view through two of the joists, and showing the application of the joists as supports for a monolithic concrete flooring;

Fig. 2 is a side elevation of one of the sides of the joists, parts being broken away;

Fig. 3 is a bottom view of a fragment of one of the joists, broken away at the center; and

Fig. 4 is a cross-sectional view through the joist and related parts, showing a modified form of the joist.

Referring to the drawing, the numeral 5 indicates the improved metallic joist, two of the same being shown. It is obvious that as many of these joists are provided as are necessary to properly support the particular flooring to which they are applied. Each of these joists is of elongated U-shaped formation.

It is desirable, although not absolutely necessary, to provide each joist on opposite sides thereof with supporting flanges. These flanges are preferably formed by cutting out the metal, as indicated by the numeral 6, the cuts being positioned a desired distance apart throughout the length of the side pieces of the joists. The lips formed by the cut out portions are bent downwardly and outwardly to provide flanges 7. The opposed flanges of a pair of the joists support wooden cross-timbers 8, and these cross-timbers 8, in turn, support longitudinally extending timbers 9.

It will be observed that the bottom of each U-shaped joist is formed at desired distances apart with openings 10, for a purpose hereinafter to be referred to.

Located in the bottom of each joist is a wooden beam 11.

Below the joists is shown a ceiling strip 12.

By forming the openings 10 in the bottom of each U-shaped joist, provision is made for the passage of nails 13 for uniting the ceiling strip 12 to the beam 11.

The monolithic concrete flooring is indicated by the numeral 14. Some of the concrete necessarily enters the U-shaped joists, as indicated by the numeral 15, and fills the space of said joists above the wooden beam 11. Therefore, it will be evident that in cases where the joists are used as supports for a concrete flooring, as disclosed in the drawing, it is requisite that the beam 11 be placed within the lower portion of the joist to receive the nails 13. If the concrete extended clear to the bottom of the joists it would be difficult, if not impossible, to drive said nails into the concrete.

While the concrete is setting and hardening, it is supported by the timbers 8 and 9. After the hardening process has been completed, the timbers 8 can be knocked out and removed, and this will of course also permit of the removal of the timbers 9, whereby said timbers can be saved or salvaged. The flanges 7, therefore, make it possible for this desirable function to be carried out, i. e. the supporting of the timbers, which latter, in turn, temporarily support the concrete flooring during the time the latter is hardening. However, it is obvious that the flanges 7 might be dispensed with under certain circumstances, especially if the joists are used for supporting a wooden flooring. In this latter application of the invention, the space within the joist is filled with a wooden beam, which at its upper end supports the wooden flooring, and the lower end of this beam receives the nails 13, which are driven through the ceiling timber 12 and through the opening 10, finally entering the lower end of the wooden beam.

In the Fig. 1 construction, in order to permit of the ready insertion of the wooden beam 11 into the space of the joists, it is necessary to round the lower corners of said beam. Fig. 4 of the joist shows a modification wherein the bottom of the joist is flat only at its central portion, in which central portion the opening 10 is formed. On opposite sides of the flat central portion the bottom

is provided with downwardly extending rounded projections 16—16 which permit the lower corner edges of the beam 11 to be made square instead of rounded.

From the foregoing description it will be seen that the U-shaped formation of the joist provides a pocket or receptacle for a filling extending downwardly from the under side of the floor or supported device, and which filling of course strengthens the joist, and assists said joist in performing its supporting function.

Also from the foregoing description, it will be obvious that I provide a construction of joists which is not only capable of forming a support for the flooring of a room, but furthermore the U-shaped formation thereof permits of openings, such as 10, being formed in the bottom of the joist, which enables the joist to serve also as a means for the connection of a ceiling timber, through the medium of the nails 13 passing through said timber and through the opening 10 and entering the beam, which is supported in the bottom of the joist.

It will furthermore be seen that by the provision of the laterally extending flanges another important function is accomplished by my improved construction, i. e., the said flanges serve to temporarily support timbers, which latter in turn support a concrete flooring during the time said flooring is setting and hardening.

This case is a substitution for application No. 348,825, filed March 21, 1929.

What I claim as my invention is:

1. As a new article of manufacture, a joist rectangular and substantially U-shaped in cross section to provide side pieces and a bottom piece, the side pieces provided with flanges extending laterally outwardly at intermediate points of said side pieces to form supporting ledges outwardly beyond the sides of the joists and below the upper portion thereof.

2. As a new article of manufacture, a joist of U-shaped, elongated form having a bottom piece and straight side pieces extending at substantially right angles upwardly from said bottom piece, the side pieces being cut out at a plurality of intermediate points, the lips formed by said cut out portions being bent outwardly and downwardly to form laterally extending flanges.

3. The combination of joists, each of elongated, U-shaped form, to provide side pieces and a bottom piece, the said bottom piece provided with spaced apart openings, a flooring supported by the joists, a beam resting on the bottom of each joist, a ceiling strip or timber, and nails extending through the ceiling strip, through the openings in the bottoms of the joists and entering the beam.

4. The combination of joists, each of elongated U-shaped form, to provide side pieces and a bottom piece, the bottom piece provided with spaced apart openings, a beam resting on the bottom of each joist, a ceiling strip or timber, nails extending through the ceiling strip and through the openings in the bottom of the joist and entering the beam, and a concrete flooring extending over the joists, and having portions thereof entering the joists and filling the spaces thereof above the beams seated in the bottom of the joists.

5. The combination of joists, each of elongated form having openings in the bottom thereof, a flooring supported by the joists, a beam carried by the joists over the openings in the bottom thereof, a ceiling strip, and fastening means extending from the ceiling strip through the openings in the bottom of the joists to said beam.

6. The combination of joists, each of elongated form, having openings therein and flooring supported by the joists, a beam positioned adjacent one side of the joists adjacent the openings therein, another section of material positioned on the other side of the joists, and fastening means extending from said last mentioned section of material through the openings in the joists to the said beam.

EDWARD P. ALSTED.