Aug. 19, 1941. V. C. ADLER 2,252,956

BUILDING CONSTRUCTION ELEMENT

Filed Jan. 3, 1939 2 Sheets-Sheet 1

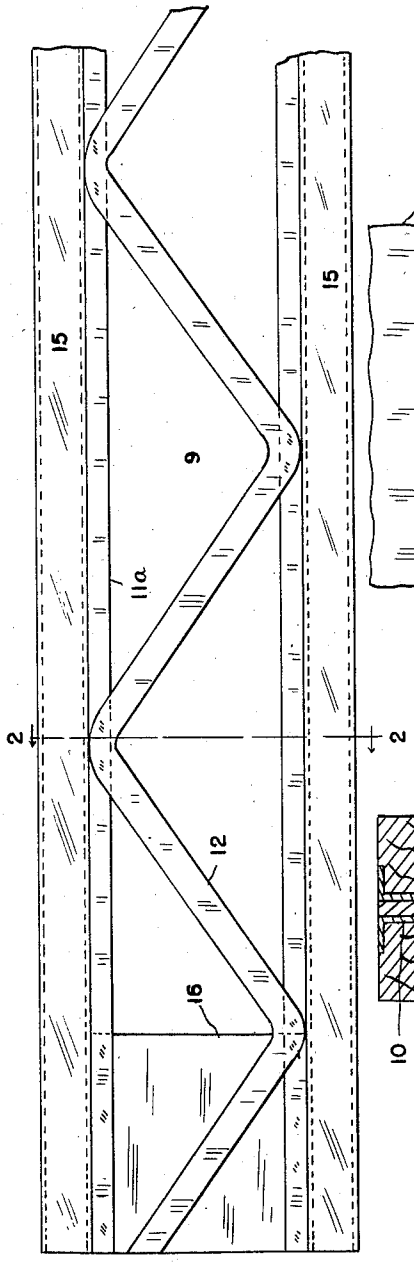


FIG. 1.

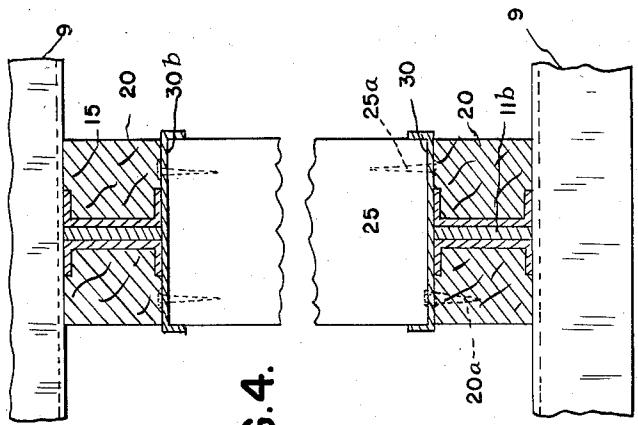


FIG. 4.

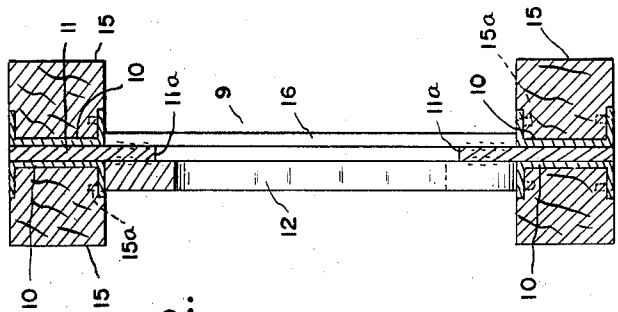


FIG. 2.

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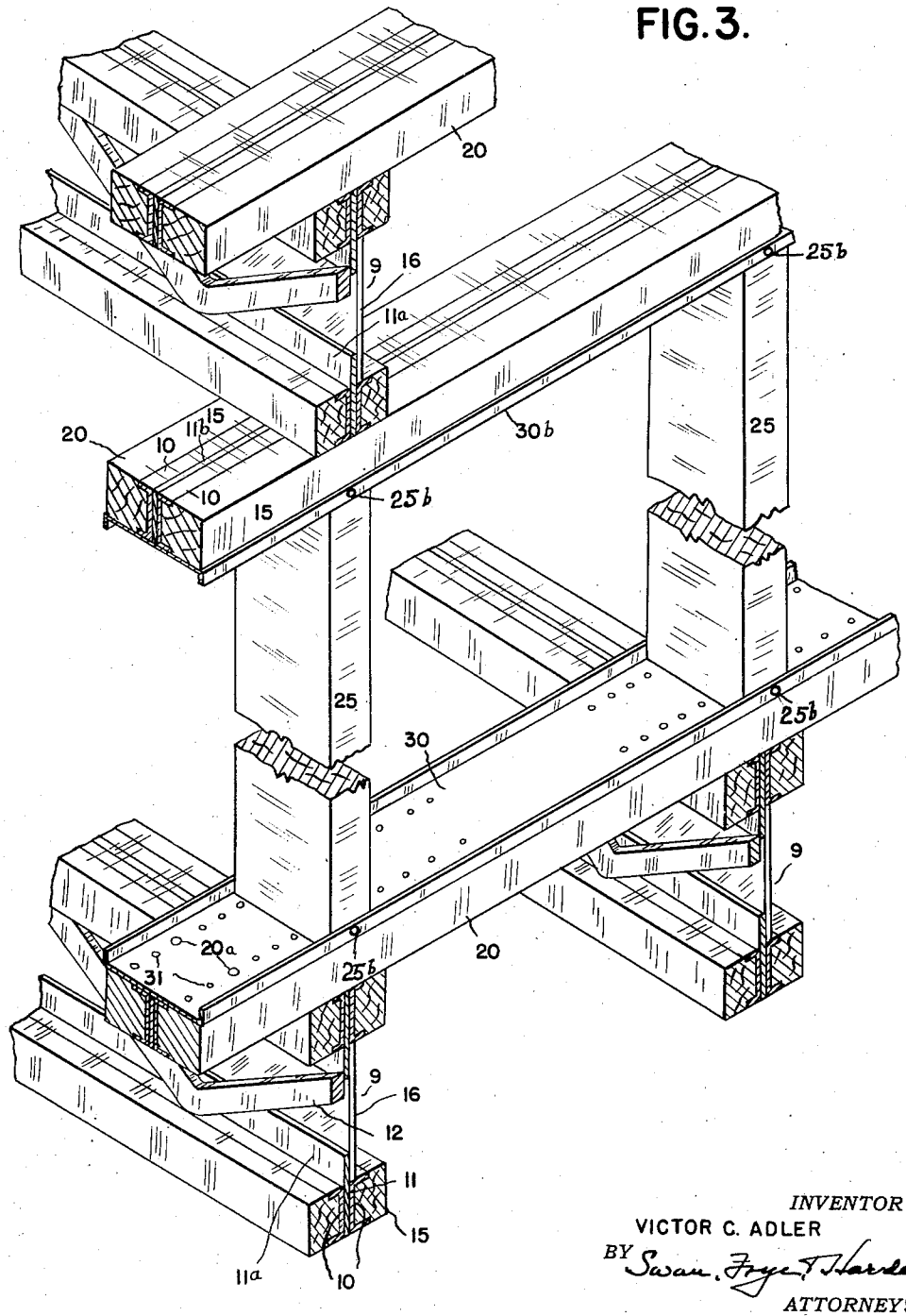
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FIG. 3.



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Patented Aug. 19, 1941

2,252,956

UNITED STATES PATENT OFFICE

2,252,956

BUILDING CONSTRUCTION ELEMENT

Victor C. Adler, Detroit, Mich.

Application January 3, 1939, Serial No. 248,926

5 Claims. (Cl. 189—40)

The present invention relates to building structures and structural elements therefor, and more specifically to elements for use in the place of joists, plates, etc.

Heretofore it has been proposed to use, in the place of the conventional wood members, various forms of fabricated elements, of them made entirely of metal, such as rolled I-beams or the like, or elements of I-beam section made up of light gauge channels spot-welded, or combinations of metal with wood strips, the latter intended to receive nails.

To date, however, all of these proposed forms have been open to many objections. For example, the all-steel and composite elements as heretofore proposed are difficult and frequently impracticable to cut to exact length at the place of building. Again, the all-steel members must be drilled or punched and this must be carefully and accurately done in order that the proper holes will register. And in the case of the composite elements, much of the advantage due to the steel present, is lost because of shrinkage of the wood parts where such parts furnish the bearing between load supporting surfaces.

Among the objects of the present invention is the production of a structural element which will overcome these objections and provide one in the use of which metal-to-metal load supporting surfaces may be had.

Another object is an element which may be substituted for ordinary wood joists, etc., and be nailed and otherwise treated as wood, with the exercise of no more than the ordinary precautions and care.

Another object is an element which, though skeletonized for lightness, is provided with reinforcement to resist shearing.

Still other objects will readily appear to those skilled in the art upon reference to the following description and the accompanying drawings, in which

Figure 1 is a side elevation of a portion of a joist element.

Figure 2 is a section on line 2—2 of Figure 1.

Figure 3 is a perspective view showing a portion of a building framing and illustrating the use of the structural elements.

Figure 4 is a sectional view through the plate elements, showing the method of placing studding.

Referring first to Figures 1 and 2 showing the joist construction, it will be seen that this consists of a built-up I-beam, indicated as a whole at 9, of which the upper and lower bearing portions are each composed of two shallow channels 10, preferably of light gauge sheet steel, placed back-to-back with an interposed strip 11 of somewhat heavier gauge and the three elements welded together. The strip 11 is sufficiently wide to extend beyond the channels 10 at one side as shown at 11*a*.

Two of these composite members are then provided with a web by welding to the projecting portions 11*a* of the strips 11, any suitable skeleton element, such as the zigzag bar 12, which will provide a light weight web portion having suitable transverse and diagonal strength.

The nail receiving elements consist of wood strips 15 placed in the channels 10 and held by any suitable means such as the turned in tongues 15*a*.

It is proposed to make such I-beams in suitable lengths for cutting off to the required dimensions and to add at suitable intervals short plates 16 serving to resist shear stresses at the ends and also serving to support bearing loads if the element is cut at a point between the points of attachment of member 12. These plates will fit between upper and lower channels 10 and be welded to the strip portions 11*a*, on the opposite side from member 12.

In addition to the joist element 9, it is proposed to form a "plate" element 20, which is of the same construction as either one of the bearing portions of the joist except that the intermediate strip 11*b* does not project. Such a plate will of course have the metal portions extending through from one face to the other and provide a metal bearing surface on both faces.

The wood strips 15 may be, if desired, treated with preservative material to inhibit decay or render the wood resistant to fire or insects or all or any of them.

The use of the described elements for framing is illustrated in Figure 3 of the drawings. In this figure, the ends of joists 9 are shown as supporting a plate member 20 and in turn may rest upon a suitable support such as a foundation wall (not shown). This plate 20 may be secured in place upon joists 9 in the usual fashion by nailing the wood strips. The studs 25, which may be either the conventional wood studs as shown or studding similar in make-up to the plate members themselves, may be set directly upon the plates 20 and nailed thereto, but it is preferred to interpose a shallow sheet metal channel 30 between the studs and plate, which channel 30 is first nailed to the properly spaced studs, as indicated at 25*a*, and, when these have been

erected upon the plate **20**, the channel **30** nailed to the plate as indicated at **20***a*. Suitable holes for this nailing are indicated at **31**.

Instead of nailing through the channel **30** into the ends of the studs to fix them in properly spaced relation, their proper spacing may be maintained by nailing through the sides of the channel **30** as indicated at **25***b*, or both methods may be used if desired.

At **30***b* is indicated a similar channel upon the top of studs **25** and upon this a second member **20** upon which may rest the ends of other joists **9**.

Now having described the invention and the preferred embodiments thereof, what I claim is:

1. A composite wood and steel I-beam having compression and tension elements consisting of steel channels arranged back to back with an interposed steel strip of sufficient width to project beyond said channels at one side, the channels and strip being welded together, a skeleton web-element welded to said projecting strip portions, and wood strips fixed in said channels.

2. A composite wood and steel I-beam having compression and tension elements consisting of steel channels arranged back to back with an interposed steel strip of sufficient width to project beyond said channels at one side, the channels and strip being welded together, a skeleton web-element welded to said projecting strip portions, and wood strips fixed in said channels, the so constructed I-beam having at intervals reinforcing plates also welded to said projecting portions.

3. In building construction, an I-beam consisting of compression and tension components fixed to a web, each of said components consisting of channel members arranged back to back and having fixed therein wood nailing strips, a "plate" fixed upon such I-beams and of substantially the same construction as either of said components, and studding mounted on said plate.

4. In building construction, an I-beam consisting of compression and tension components fixed to a web, each of said components consisting of channel members arranged back to back and having fixed therein wood nailing strips, a "plate" fixed upon such I-beams and of substantially the same construction as either of said components, and studding mounted on said plate, there being a separable metallic bearing member fixed upon said plate to receive the lower ends of the studding.

5. A wood and steel construction member consisting of a metallic web member having chord portions affixed thereto, and having each chord portion consisting of a pair of steel channel members in back to back relation with said web member therebetween, said channel members being of sufficient depth to provide a load-supporting surface, and wood nailing strips fixed in the channels, said strips projecting from the channel and shaped to present a surface substantially flush with the outer surface of the channel walls.

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