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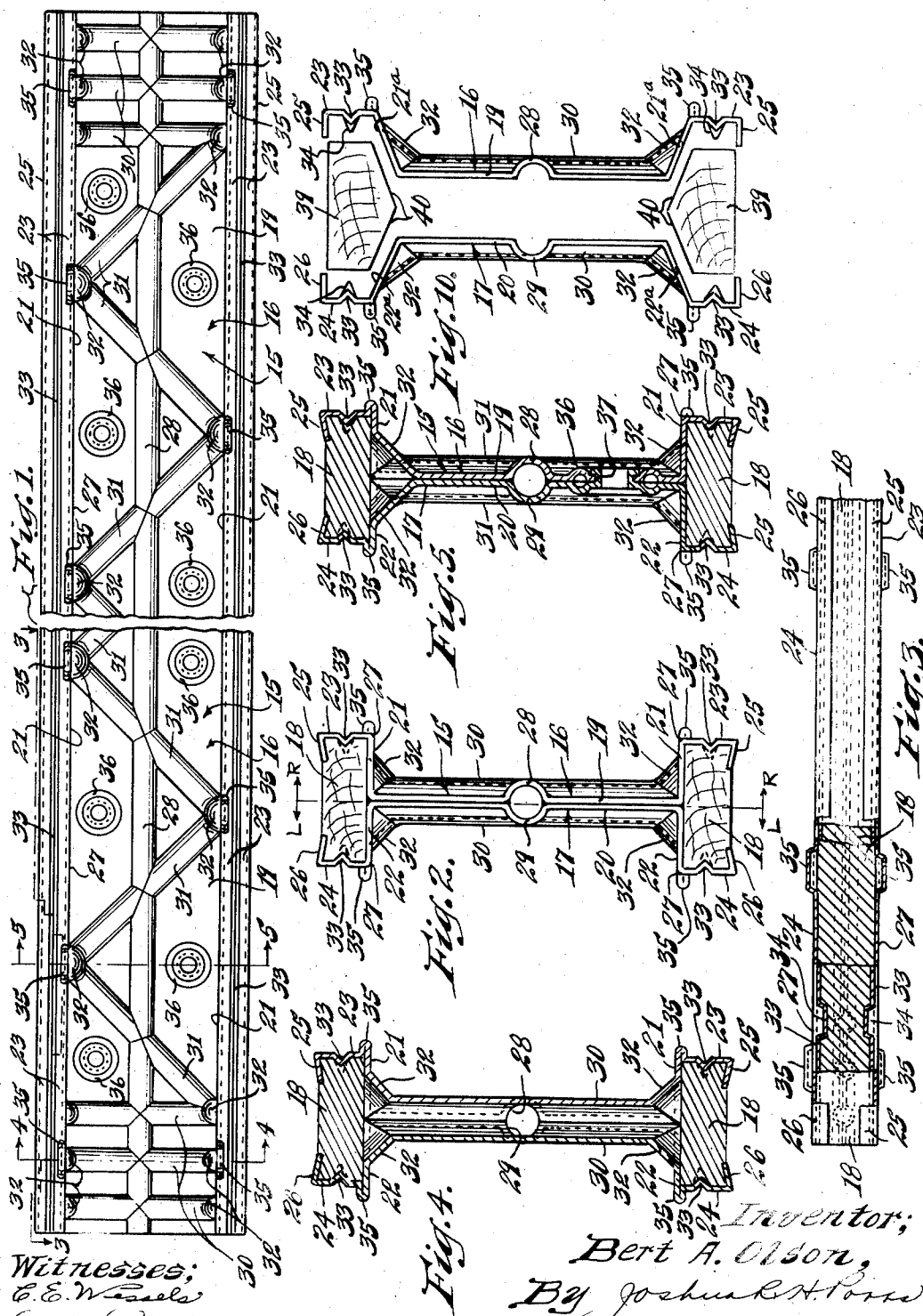
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2,187,280

BEAM

Filed March 11, 1938

2 Sheets-Sheet 1



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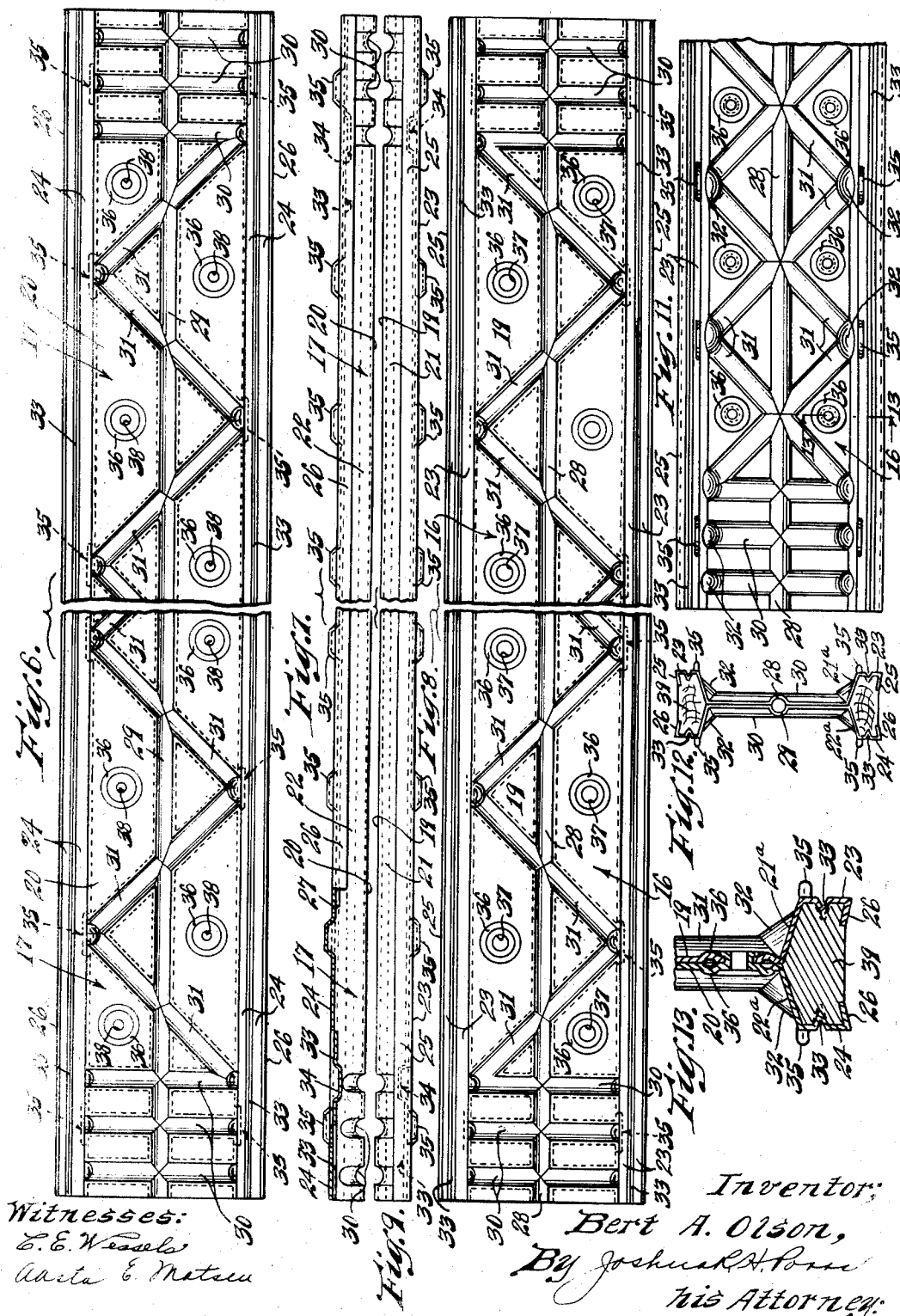
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UNITED STATES PATENT OFFICE

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BEAM

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9 Claims. (Cl. 189—37)

This invention relates to improvements in building beams and the like and, more particularly, it relates to providing a strong, light-weight, inexpensive beam for use in house building and the like.

With the development of house building, especially with the development of larger rooms in houses, the wooden beam heretofore used has been found to be less and less desirable for this reason and other reasons and there has been a need for the development of a beam having a metal element of minimum weight and requisite strength and low cost.

One of the objects of my invention has been to provide such a beam or structural element with such minimum weight and with all the strength required.

Another object has been to provide such a beam as can be manufactured inexpensively. To that end I have provided a metal beam made preferable in two sections with wooden strips, the metal sections being provided with important improvements in respect of reinforcement and in respect of securing the elements to each other.

As a result of my invention, I have invented a beam such as described which is far lighter in weight than anything of the kind ever produced and which has by virtue of the reinforcing improvements made by me far more strength than will ever be required of it.

The foregoing and other advantages will be more clearly apparent from what follows hereinafter. The invention will be best understood by reference to the accompanying drawings, in which:

Fig. 1 is an elevation of a beam;
Fig. 2 is an end view of the same;
Fig. 3 is a view taken on the line 3—3 of Fig. 1;
Fig. 4 is a view taken on the line 4—4 of Fig. 1;
Fig. 5 is a view taken on the line 5—5 of Fig. 1;
Fig. 6 is an inside view of the left side member of the two side members of the beam, looking to the left as in Fig. 2;

Fig. 7 is a plan view of the subject matter of Fig. 6 partly broken away;

Fig. 8 is an inside view of the right side member of the two side members of the beam, looking to the right as in Fig. 2;

Fig. 9 is a plan view of the subject matter of Fig. 8;

Fig. 10 is an exploded end view of a modified form;

Fig. 11 is an elevation view of the modified form;

Fig. 12 is an end view of the same; and

Fig. 13 is an enlarged view taken on the line 13—13 of Fig. 11.

Referring more particularly to the drawings, I have selected for the purpose of illustrating the principle of my invention a form 15 of beam shown in Figs. 1-5 having a right side member 16 and a left side member 17 as viewed looking at Fig. 2. When these right and left side members 16 and 17 are assembled, they have located between them a pair of filler rails 18 one being located at the top and one at the bottom, as will be clearly understood from the drawings.

Each of the side members 16 and 17 has a central web, there being a central web 19 for the right side member and a central web 20 for the left side member. Integrally formed with the central webs 19 and 20 are outturned angular or horizontal flanges 21 and 22 for the webs 19 and 20, respectively, there being flanges at the top and bottom of each web. Each of the flanges 21 and 22 has a vertical flange integrally formed therewith, there being vertical flanges 23 for the right web and vertical flanges 24 for the left web. Each of the vertical flanges 23 and 24 has an inturned extension or substantially horizontal top or edge flange, there being inturned extensions 25 for the right web 19 and inturned extensions 26 for the left web 20. It will be seen that the horizontal flanges 21 and 22 intersect with the vertical flanges 23 and 24 to form edges 27, and it will be readily understood from the drawings that when the right hand member 16 is placed opposite the left hand member 17, as shown for example in Fig. 2, the horizontal and vertical flanges and the inturned extensions will form channels at the top and bottom of the right and left side members 16 and 17 for receiving the filler rails 18.

The webs 19 and 20 are provided with concave horizontal central beads, there being one bead 28 for the web 19 and another bead 29 for the web 20. When the webs are placed opposite each other, as shown in Fig. 2, it will be seen that these beads 28 and 29 register with each other in the form shown.

In addition to the central beads just described, the beam in the form shown is provided with vertical beads 30 at the ends of both webs and also the right and left members 16 and 17 are provided with diagonal beads 31, as can be clearly seen in Fig. 1. All of the beads 30 and 31 are provided with flared boots 32 at their ends. It will be seen that these flared boots are provided at the intersections of the diagonal beads 31 where they merge into the horizontal flanges 21 and 22, and also where said diagonal beads 31 intersect with the vertical beads 30. It will also be understood

that where the diagonal beads intersect with the central bead 28 they merge with this bead.

The vertical flanges 23 and 24 are provided with V-shaped depressions 33 and 34, the depressions 34 being deeper than the depressions 33 so as to provide an irregular interior surface for more securely locking the filler rails 18 in place. The edges of the flanges 21, 22, 23 and 24 of the right and left side members have re-inforcing extensions 35 as can be clearly seen particularly in Figs. 1, 2 and 5. The webs are provided with circular beads 36. Each of these beads surrounds an aperture, there being apertures 37 in the web 19 and apertures 38 in the web 20. It will be seen that the apertures 38 are smaller than the apertures 37. When the right and left side members are placed in the position shown in Fig. 5, for example, the portion of the web member 20 surrounding the aperture 38 is punched through the aperture 37 and crimped on the opposite side of the web member 19 to secure the two web members together, as will be readily understood without further description. It will be seen too that the intumed extensions 25 and 26 are turned downwardly into the filler rail so as to further secure the filler rail in place.

In Figs. 10-13, I have shown a modified form of beam. This form of beam is the same as the form shown in the other figures excepting that, as clearly shown in Fig. 10, instead of the outturned angular or horizontal flanges 21 and 22 of the first form, there are provided outturned inclined flanges 21a and 22a. Instead of the filler rail 18, which is four-sided as shown in Fig. 2, there is provided a pair of filler rails 39 which are five-sided having inclined inner sides, that is, upper sides at the bottom and lower sides at the top 40 to conform to the inclined flanges 21 and 22a of the form shown in Figs. 10-13. It will also be seen that in the form shown in said figures, the diagonals are arranged after a diamond pattern instead of the angular pattern of the first form.

It will be manifest that the arrangement of the flanges will provide for securely holding the wood strips in place, particularly in view of the intumed extensions of the vertical flanges and the V-shaped depressions on the vertical flanges.

It will also be seen that the sections will have extraordinary strength despite their lightness, said strength being afforded by the reinforcement due to the arrangement of the central and vertical and diagonal beads with their flared boots merging with the horizontal flanges.

It will also be seen that means have been made for providing for effectively securing the sections together. The advantages of the arrangement will be manifest to those skilled in the art without further elaboration. An experience with my arrangement will show its advantages over beams heretofore provided.

It will be understood that my invention is not to be limited to the structures shown, such as the flanges and beads and extensions and depressions, etc. What I have shown are merely forms of my invention. The sections may be made of steel or equivalent material.

While I have illustrated and described the preferred form of construction for carrying my invention into effect, this is capable of variation and modification without departing from the spirit of the invention. I, therefore, do not wish to be limited to the precise details of construction set forth, but desire to avail myself of such variations and modifications as come within the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A structural unit having two metal sections, a filler rail secured by said sections, each section having a web provided with central beads and vertical and diagonal beads intersecting said central beads and each other with flared ends, and means for securing said sections together.

2. A structural unit including two metal sections, a filler rail secured by said sections, each section having a web and a horizontal flange, a vertical flange extending from said horizontal flange, said vertical flange having an intumed extension extending at an acute angle to the vertical flange and depressions of varying depth, and means for securing said sections together.

3. A structural unit including two metal sections, wood strips secured by said sections, each section having a web, the webs being provided with vertical and diagonal beads with flared ends, said diagonal beads meeting at the flared ends thereof, and means for securing said sections to each other.

4. A structural unit including two metal sections, wood strips secured by said sections, each section having a web provided with central beads and with vertical and diagonal beads with flared ends, reinforcing extensions at the ends of certain of said beads and flared ends and means for securing said sections to each other.

5. A structural unit including two metal sections, wood strips secured by said sections, each section having a web and outturned flanges, vertical flanges extending from said outturned flanges, the juncture of said outturned flanges and vertical flanges forming edges, said edges being provided with reinforcing extensions at spaced points, and means for securing said sections together.

6. A structural unit including two metal sections, wood strips secured by said sections, each section having a web and horizontal flanges, vertical flanges extending from said horizontal flanges, said vertical flanges having intumed extensions, said horizontal and vertical flanges forming edges provided with reinforcing extensions, the webs being provided with vertical and diagonal beads with flared ends merging with the horizontal flanges, the vertical flanges having depressions of varying depth, one of said webs having apertures and beads located about said apertures, said sections being secured to each other by extending portions of one of the webs through the apertures of the other web and crimping the same.

7. A structural unit including two metal sections, wood strips secured by said sections, each section having a web and angular flanges, vertical flanges extending from said angular flanges, said vertical flanges having intumed extensions, said angular and vertical flanges forming edges provided with reinforcing extensions, the webs being provided with vertical and diagonal beads with flared ends merging with the angular flanges, the vertical flanges having depressions of varying depth, one of said webs having apertures and beads located about said apertures, said sections being secured to each other by extending portions of one of the webs through the apertures of the other web and crimping the same.

8. A structural unit comprising two opposed metal sections each having a web and opposed inwardly facing channels at the top and bottom edges thereof offset outwardly, said channels com-

prising outturned flanges, vertical flanges extending from said outturned flanges and inturned flanges at the edges of said vertical flanges, filler rails in said channels, said webs having opposite
5 diagonal beads with flared portions spanned by the rails, said inturned flanges being imbedded in the faces of the filler rails, said vertical flanges having inward depressions of different depths imbedded in the filler rail, and means forming
10 part of the webs to secure the sections together.

9. A structural unit having two opposed metal

sections, each having a web and opposed inwardly facing top and bottom channels, filler rails in said channels, said webs having central longitudinal beads, diagonal beads extending above
5 and below the central longitudinal beads and parallel vertical beads at the end portions, certain of said beads registering to form tubular members, and means carried by the webs to reinforce and connect the same.

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