April 9, 1946. R. L. GEER 2,398,219

HARDWARE FOR CONCRETE FORMS

Filed July 26, 1944 2 Sheets-Sheet 1

Fig. 1

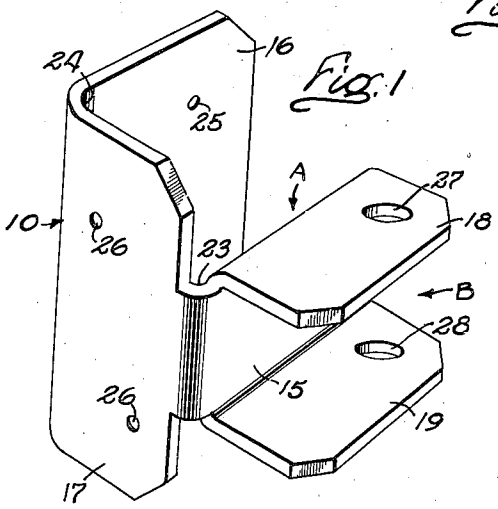


Fig. 2

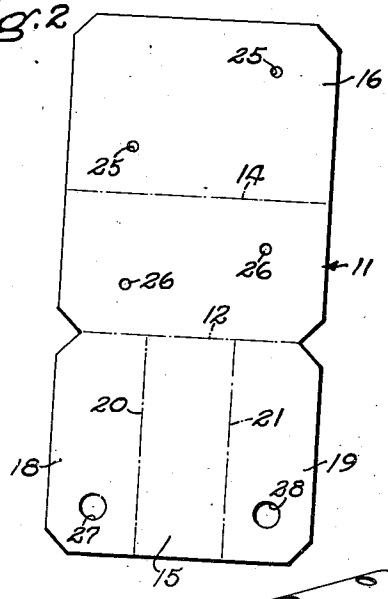


Fig. 3

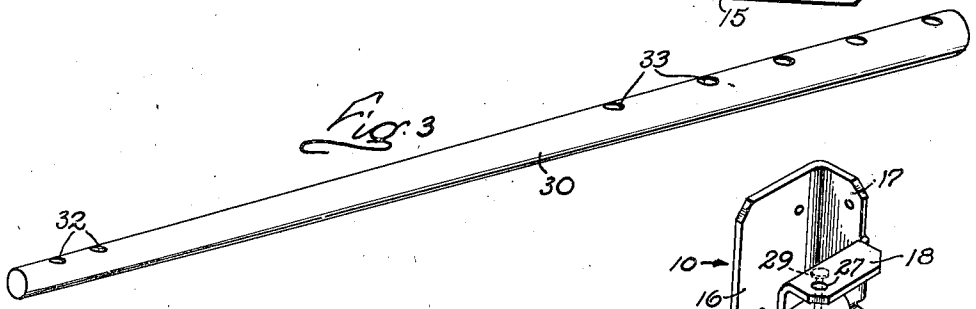
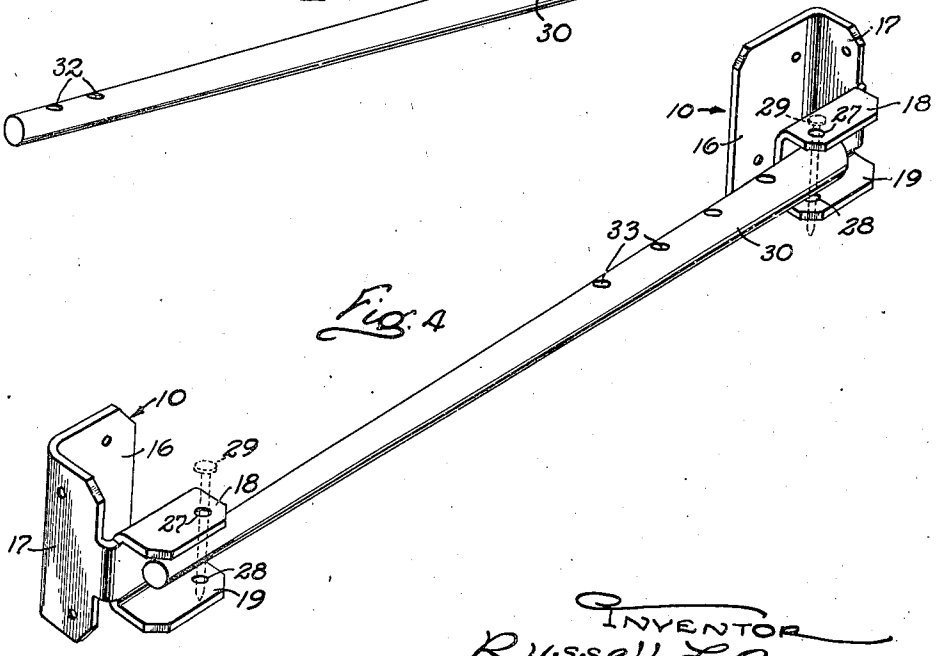


Fig. 4



INVENTOR
Russell L. Geer
By Carlson, Pitzner, Hubbard & Wolfe
ATTORNEYS

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Filed July 26, 1944 2 Sheets-Sheet 2

Fig. 5

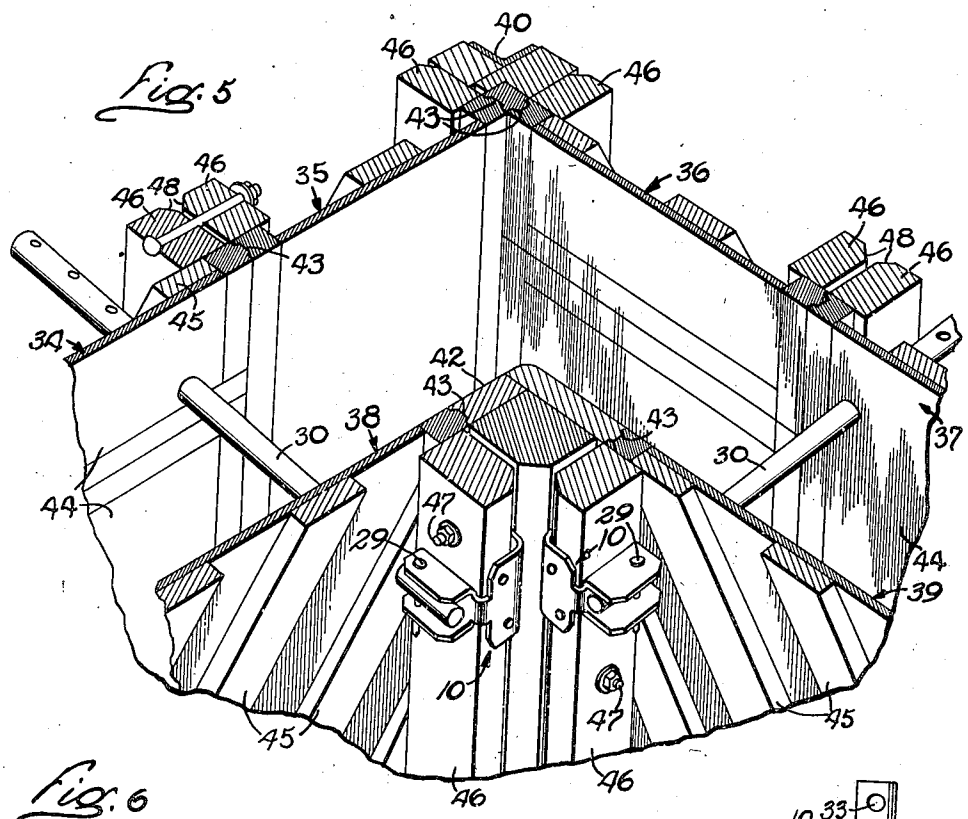
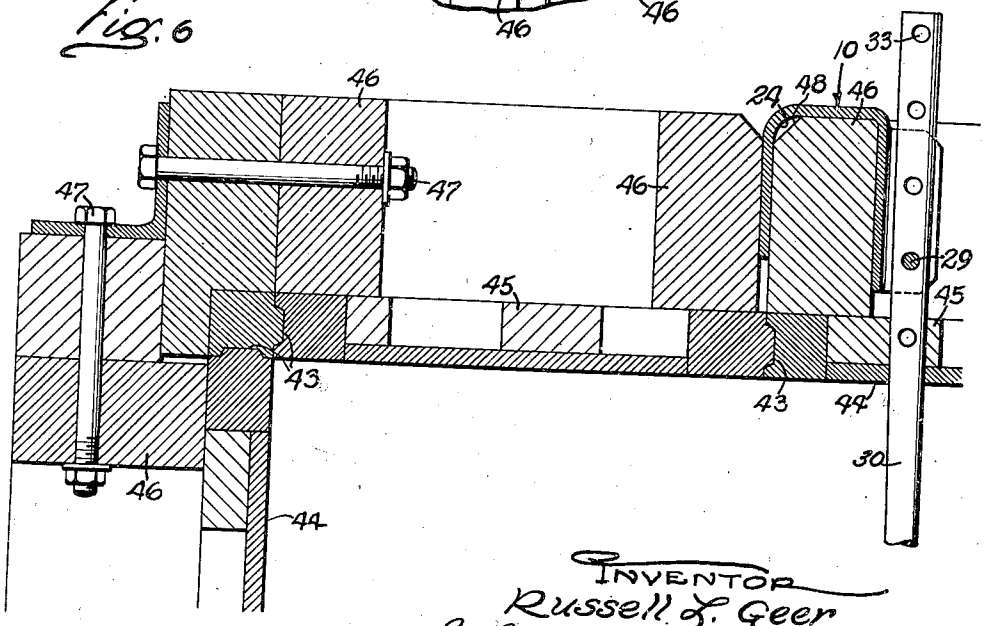


Fig. 6



INVENTOR
Russell L. Geer
By Carlson, Pitzner, Hubbard & Wolfe
ATTORNEYS

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UNITED STATES PATENT OFFICE

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HARDWARE FOR CONCRETE FORMS

Russell L. Geer, Grand Island, Nebr.

Application July 26, 1944, Serial No. 546,644

1 Claim. (Cl. 25—131)

The invention relates to hardware for concrete forms, and more particularly to such hardware adapted for repeated use on forms which may be set up for pouring a concrete wall or column or the like and then demounted for reuse.

A general object of the invention is to provide novel hardware or fittings which may be used repeatedly with demountable concrete forms and in the construction of a wide variety of sizes and shapes of such forms without damage to either the hardware or the parts of the forms.

More specifically, it is an object of the invention to provide hardware of simple and inexpensive construction and adapted to use in providing a cross connection between opposed pairs of demountable concrete forms.

Another object of the invention is to provide a novel fitting of the bracket type for use as a connection between a stud or timber and a tie rod.

Other objects and advantages will become apparent in the following description and from the accompanying drawings in which:

Figure 1 is a perspective view of a fitting embodying the invention in a preferred form.

Fig. 2 is a developed plan view of a preferred type of blank from which the fitting of Fig. 1 may be formed.

Figs. 3 and 4 are, respectively, perspective views of a preferred type of tie rod and an assembly of the tie rod with fittings such as that shown in Fig. 1.

Figs. 5 and 6 are, respectively, perspective and plan views showing the adaptation of the invention to demountable concrete wall forms.

While the invention is susceptible of various modifications and alternative constructions, I have shown in the drawings and will herein describe in detail the preferred embodiment, but it is to be understood that I do not thereby intend to limit the invention to the specific form disclosed, but intend to cover all modifications and alternative constructions falling within the spirit and scope of the invention as expressed in the appended claims.

In the exemplary adaptation of the illustrated embodiment, the hardware which embraces the invention is shown in its application to demountable forms for concrete walls. The various structural features and illustrated adaptations are suggestive of the advantages and versatility by which the invention is characterized.

Referring particularly to Figs. 1 to 4, inclusive, of the drawings, the exemplary fitting or bracket 10 (Fig. 1) is desirably formed integrally from a sheet metal blank 11 of generally rectangular form, shown in Fig. 2. Although the relative dispositions of the various formed parts of the fitting 10 might be varied to fit members of different shapes, the present form has been found quite universal in its adaptations and desirability. In the form shown, the blank 11 is cut at the two ends of a line 12 and bent along the line 12 and a line 14 to form a substantially U-shaped channel A having opposed sides or legs 15 and 16 joined by a connecting portion 17. A second substantially U-shaped channel B is formed by bending ears 18 and 19 away from one side of the originally formed channel A along lines 20 and 21. By forming the channels in this manner, their longitudinal axes are substantially perpendicular and they open outwardly in substantially perpendicular directions. The form is additionally characterized by the fact that the channel A includes the entire length of the blank; while the channel B includes the entire width of the blank, but only a portion of the length. Also, the side 15 of the channel A comprises the connecting portion of the channel B.

In forming the channel A, having sides 15 and 16 and the connecting portion 17, it is desirable that the radii 23 and 24 of the bends connecting the respective side portions to the connecting portion be different and that the radius 24 connecting the side 16 to the connecting portion 17 be greater than the radius 23 which connects the side 15 to the connecting portion. The side 16 and the connecting portion 17 are apertured at 25 and 26 respectively, for the passage of nails utilized in holding the fitting in place during use. Also, ears 18 and 19 have aligned openings 27 and 28 through which a pin or nail, such as 29 (Fig. 4), extends for connecting the fitting 10 to the end of a tie rod 30.

In order to facilitate removal of the tie rods, such as 30, from a concrete wall or structure after the concrete has been poured and is set so that the forms may be removed, the tie rod is tapered from end to end. A pair of apertures 32 and a series of apertures 33 in spaced relation near the ends of the tie rod determine the thickness of the wall between the forms. The apertures 32 are desirably spaced half the distance of that between the apertures 33, so that for each of the wall thickness settings determined by the apertures 33, a closer setting may be made by selection of one of the apertures 32.

Application of the hardware to which this invention pertains may be better understood by reference to Figs. 5 and 6 wherein the hardware is illustrated in various exemplary adaptations

to demountable concrete wall forms. Generally considered, the illustrative wall forms are made up in sections such as 34, 35, 36, 37, 38 and 39 removably joined together or to corner post sections 40 and 42 by tongue and groove joints such as 43. Each of the sections comprises an inner surfacing panel 44 of preselected dimensions reenforced by diagonally disposed backing strips 45. Each section is also additionally reenforced at its edges by studs 46. In the assembly of the sections for one side of a wall form, adjacent sections are secured together and sections are secured to adjacent corner posts by bolts 47 extending through the adjacent stud or through the corner post and an adjacent stud.

To provide for the accommodation of the fittings 10 to the studs 46, one or both of the studs 46 are set back from the edges of their respective sections to provide a space between adjacent studs which is sufficient to accommodate the thickness of the side 16 of the fitting. Also the outer edges 48 of the studs 46 are desirably beveled adjacent the corner of the fitting which has the larger radius 24. The larger radius and adjacent beveled corner on the studs limits the space required by the fittings at the corners and permits fittings to be closely associated at the same level without interference as at the inside corner illustrated in Fig. 5. Thus, it will be understood that the channel A of the fitting 10 fits over and grips the stud 46 with the side 16 extending into a space between adjacent studs.

The form sections have openings in predetermined spaced relation through which the tie rods 30 extend. The placing of the fittings 10 is selected to conform to the spacing of the tie rods, so that the ends of the tie rods extend along or through the channel formed by the ears 18 and 19. Dropping nails into place through the alined openings 27 and 28 and the ears 18 and 19 and selected openings 32 and 33 in the tie rods determines the spacing of the opposed wall form sections and the thickness of the wall. After use, the fittings 10 are removed from the studs, the tie rods 30 are driven from the poured wall, and the forms disassembled. All of the parts, including the fittings 10, may be used and reused in the same or different types of forms and in similar or different positions in the forms.

I claim as my invention:

A fitting of the type described, comprising a single generally rectangular metal plate bent into U-shape to define a first channel with the side walls of the U of substantially equal length, the lateral portions of one side wall being bent outward toward each other into substantially parallel opposed relation to define a second channel therebetween lying at right angles to the first, one of said channels being dimensioned to receive a timber of standard dimensions to which the fitting is to be secured and at least one wall of said channel being apertured for the passage of fasteners into a timber embraced by the same, and the side walls of the other of said channels having aligned apertures therein for the reception of a tie rod holding pin or the like.

RUSSELL L. GEER.