Aug. 16, 1949. E. W. GARNIER 2,479,106

STEEL CONCRETE FORM

Filed May 3, 1948 2 Sheets-Sheet 1

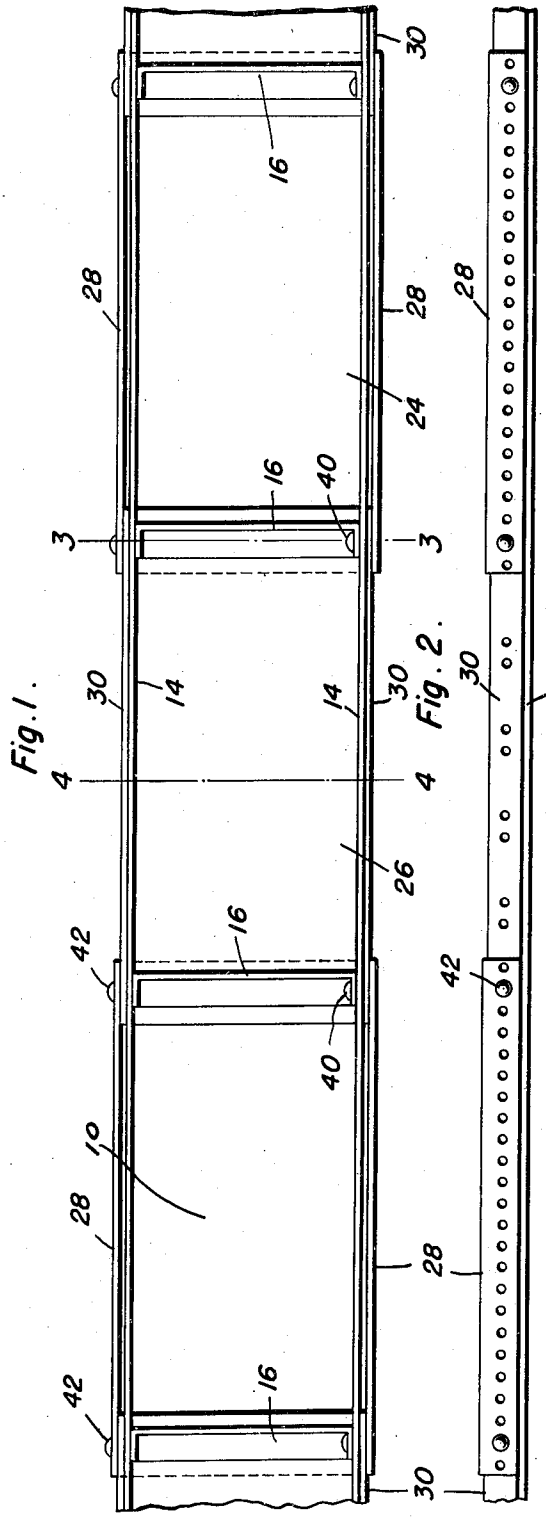


Fig. 1.

Fig. 2.

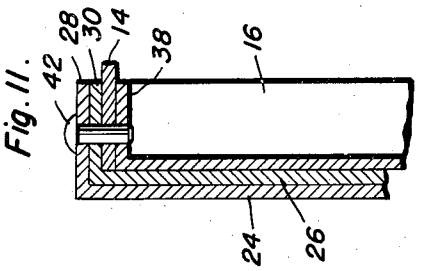


Fig. 11.

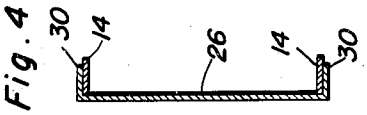


Fig. 4.

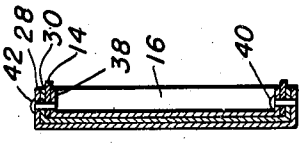


Fig. 3.

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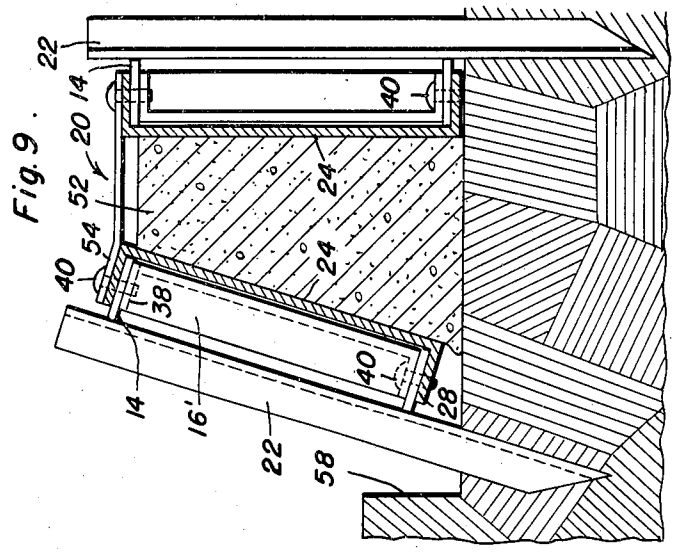


Fig. 9.

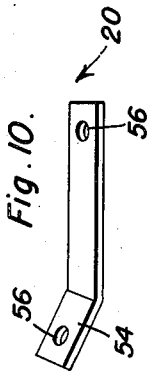


Fig. 10.



Fig. 8.

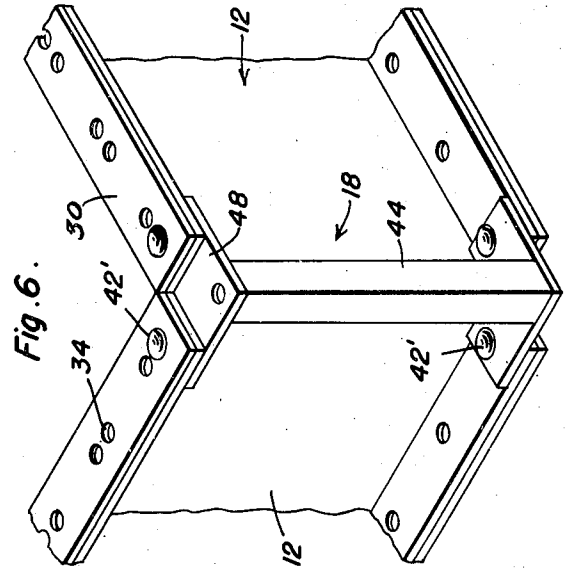


Fig. 6.

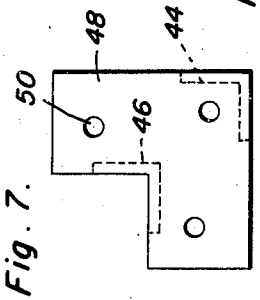


Fig. 7.

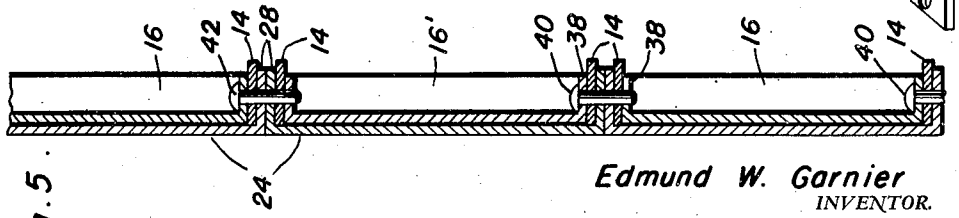


Fig. 5.

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STEEL CONCRETE FORM

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Application May 3, 1948, Serial No. 24,850

5 Claims. (Cl. 25—131)

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This invention relates generally to building constructions, and more particularly to steel concrete forms for use in the construction of walls, piers, foundation columns, slabs and the like.

A primary object of this invention is to provide forms which are fully adjustable as to length, and which may be erected in tiers in order to attain any desired width or height.

Another object of this invention is to provide novel means for keying or locking the different sections of the forms together, this means allowing for absolutely rigid connection of the different sections and allowing a great saving in time and labor required to erect a set of forms.

Still another object of this invention is to provide concrete forms which when connected leave no holes or cracks, at the corners or otherwise, thus enabling a more perfect wall formation.

And a last object to be mentioned specifically is to provide concrete forms which are relatively inexpensive and practicable to manufacture, which are extremely safe, simple and convenient to use in a wide variety of construction, and which will give generally efficient and durable service.

With these objects definitely in view, this invention resides in certain novel features of construction, combination and arrangement of elements and portions as will be hereinafter described in the specification, particularly pointed out in the appended claims, and illustrated in the accompanying drawings which form a material part of this application, and in which:

Figure 1 is an elevational view showing those sections which will be hereinafter referred to as outer pans, a pair of walers, inner pans and transverse members with pins at the ends of these transverse members locking the pan and walers in operative position;

Figure 2 is a top plan view of the structure shown in Figure 1;

Figure 3 is a vertical transverse sectional view, taken on the line 3—3 in Figure 1;

Figure 4 is a similar view, taken on the line 4—4 in Figure 1;

Figure 5 is a transverse sectional view of a number of sections arranged in tiers, the figure being designed to illustrate how these forms are used to construct a wall of a height considerably greater than the width of one of the outer pans;

Figure 6 is a three dimensional fragmentary view of a corner form construction;

Figure 7 is a plan view or end view of what will be referred to herein as a corner lock such as is illustrated in Figure 6;

Figure 8 is a three dimensional view of a waler;

Figure 9 is a vertical transverse sectional view of forms set up for construction of a foundation;

Figure 10 is a three dimensional view of what will be referred to herein as a form tie;

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Figure 11 is an enlarged fragmentary view of the upper end of the structure shown in Figure 3.

Similar characters of reference designate similar or identical elements and portions throughout the specification and throughout the several views of the drawings.

Referring now to the drawings in detail, this invention includes a plurality of outer elongated channel pans 10, inner elongated channel pans 12 and walers 14, together with transverse members 16, corner locks 18, form ties 20 and a complement of supporting stakes 22.

The outer and inner elongated channel pans 10 and 12 are very similar, each having a bed plate 24 and 26 and parallel laterally disposed flanges 28 and 30. The flanges 28 are preferably apertured at regularly spaced close intervals, while the flanges 30 may be similarly apertured but need not have an equal number of apertures, that is, the apertures in the flanges 30 may be irregularly spaced as indicated at 34 in Figure 6. The walers 14 are of simple strap form and may be apertured as at 36 similarly to the inner pans, and it should be carefully noted that the pans and walers are so dimensioned and the apertures are so positioned that the apertures in adjacent flanges and walers, when the inner pans are inserted within the outer pans and the walers are inserted within the flanges of the inner pans, may be made to register. It will be obvious that this construction allows the length of a built up form to be varied at the will of the operator.

A plurality of transverse members are provided, these transverse members having been referred to by the numeral 16 and each preferably comprising a length of angle iron with end plates 38 rigidly secured thereto. One end plate 38 has a pin 40 inserted therethrough and rigidly secured thereto, while the other end plate 38 is apertured to receive a loose pin 42 which may be of similar dimensions. It will be clear how the transverse member may be inserted within the inner pan, with the pin 40 inserted through registering apertures in the adjacent flanges 28 and 30 and the walers 14, while the pin 42 is similarly inserted after the transverse member is positioned, or roughly positioned, by the fixed pin 40. The transverse members 16 to be used inside the inner pans as in Figures 1, 2 and 3 are slightly shorter than the transverse members 16' which are used inside the walers 14, as in Figures 5 and 9.

The corner key 18 is comprised of two angle irons 44 and 46 and two relatively large end plates 48 which are apertured as at 50. A plurality of pins 42' are used to connect the corner key 18 within abutting portions of the adjacent pins of inner pan 12 and outer pan 10, as clearly indicated in Figure 6, when a corner construction is to be erected.

When the forms are used, as in Figure 9, for the construction of a batter wall or foundation **52**, the form tie **20** comprising a strap with an inclined portion **54**, apertured as at **56** at both ends, is used to tie the upper ends or sides of the forms, the pins **40** and **42** of the transverse members **16** being inserted through the apertures **56** of the form tie and through registering apertures in the outer pans and apertures **36** in the walers. It will be noted that the walers **14** are used to abut stakes **22**, the stakes on one side of the forms being shown inclined according to conventional practice, as when a foundation **52** is being poured in an excavation **58**.

The operation of this invention will be clearly understood from the foregoing description of the mechanical details thereof, taken in connection with the drawings and the above recitation of the objects sought to be achieved by this invention. In recapitulation and by way of further explanation of the uses to which the invention may be placed, reference may be had to Figure 5 wherein it is depicted how the forms may be used in tiers, walers being provided in pairs between the transverse members and the flanges of the pans. It will be clear how a wall of considerable height may be constructed by the use of these forms in tiers. It may be well to note that the transverse members **16** function as supporting members and as dividing walls or end walls when and as desired.

Many minor variations in the exact construction and proportionment of the various elements of this invention may be resorted to without departing from the spirit and scope thereof and the scope of this invention should be determined only as limited by a proper interpretation of the terminology used in the subjoined claims.

Having described the invention, what is claimed as new is:

1. Concrete forms comprising outer elongated channel pans having laterally disposed parallel flanges with regularly spaced transverse apertures therein, elongated inflexible strap walers with similarly spaced apertures therein, inner elongated channel pans having similar parallel flanges with similarly spaced apertures therein, the dimensions of said pans and walers being such that the said outer and inner pans may fit together and the inner pans may abut the said walers so that certain of said apertures in the pans and walers register, and locking means removably connectible in said certain apertures, said means including transverse members having a length less than the distance between the flanges on the outer pans, and pins disposed longitudinally of and at the ends of said members and insertible in said certain apertures.

2. Concrete forms comprising outer elongated channel pans having laterally disposed parallel flanges with regularly spaced transverse apertures therein, elongated inflexible strap walers with similarly spaced apertures therein, inner elongated channel pans having similar parallel flanges with similarly spaced apertures therein, the dimensions of said pans and walers being such that the said outer and inner pans may fit together, and the inner pans may abut the said walers so that certain of said apertures in the pans and walers register, and locking means removably connectible in said certain apertures, said means including transverse members having a length less than the distance between the flanges on the outer pans, and pins disposed longitudinally of and at the ends of said members and insertible in said certain apertures, one of said pins being fixed to one end of each member, and another pin being insertible through said apertures and into the other end of said member.

3. Concrete forms comprising outer elongated channel pans having laterally disposed parallel flanges with regularly spaced transverse apertures therein, elongated inflexible strap walers with similarly spaced apertures therein, inner elongated channel pans having similar parallel flanges with similarly spaced apertures therein the dimensions of said pans and walers being such that the said outer and inner pans may fit together and the inner pans may abut the said walers so that certain of said apertures in the pans and walers register, and locking means removably connectible in said certain apertures, said means including transverse members having a length less than the distance between the flanges on the outer pans, and pins disposed longitudinally of and at the ends of said members and insertible in said certain apertures, said members comprising transverse walls for said forms.

4. Concrete forms comprising outer elongated channel pans having laterally disposed parallel flanges with regularly spaced transverse apertures therein, elongated inflexible strap walers with similarly spaced apertures therein, inner elongated channel pans having similar parallel flanges with similarly spaced apertures therein, the dimensions of said pans and walers being such that the said outer and inner pans may fit together and the inner pans may abut the said walers so that certain of said apertures in the pans and walers register, and locking means removably connectible in said certain apertures, said means including transverse members having a length less than the distance between the flanges on the outer pans, and pins disposed longitudinally of and at the ends of said members and insertible in said certain apertures, and corner locks equal to said members in length and having end plates securable to flanges of said inner pans when the latter are set at right angles.

5. Concrete forms comprising elongated channel pans having laterally disposed parallel flanges with regularly spaced transverse apertures therein, elongated inflexible strap walers with similarly spaced apertures therein, the dimensions of said pans and walers being such that certain of said apertures in the pans and walers register, and transverse members comprising elongated angle members having end plates, a pin fixed to one of said plates and extending outwardly and longitudinally thereof, an aperture in the other of said plates, another pin insertible through the apertures in said plate and through the apertures in said flanges and walers, said pins being of sufficient length to span two walers and two pairs of adjacent flanges when said forms are combined in tiers.

EDMUND W. GARNIER.

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