Feb. 20, 1962 F. J. URUBURU 3,021,586

CONCRETE MOLD FORMS

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Fig. 1.

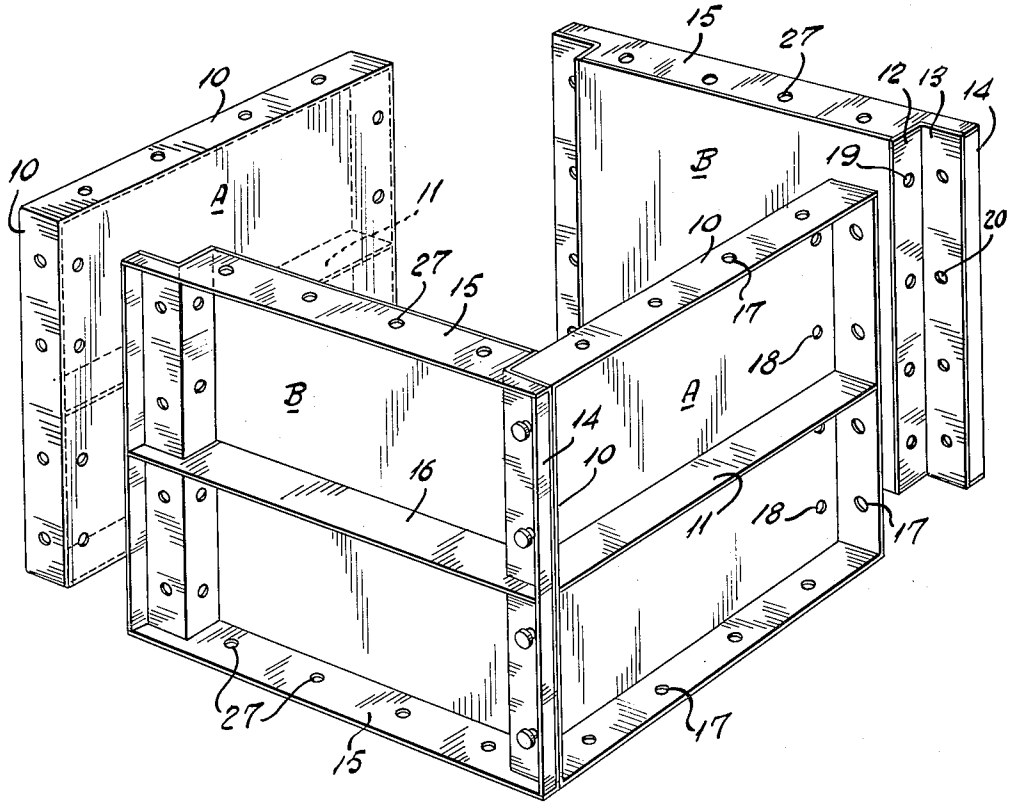
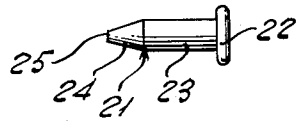


Fig. 4.



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Fig. 2.

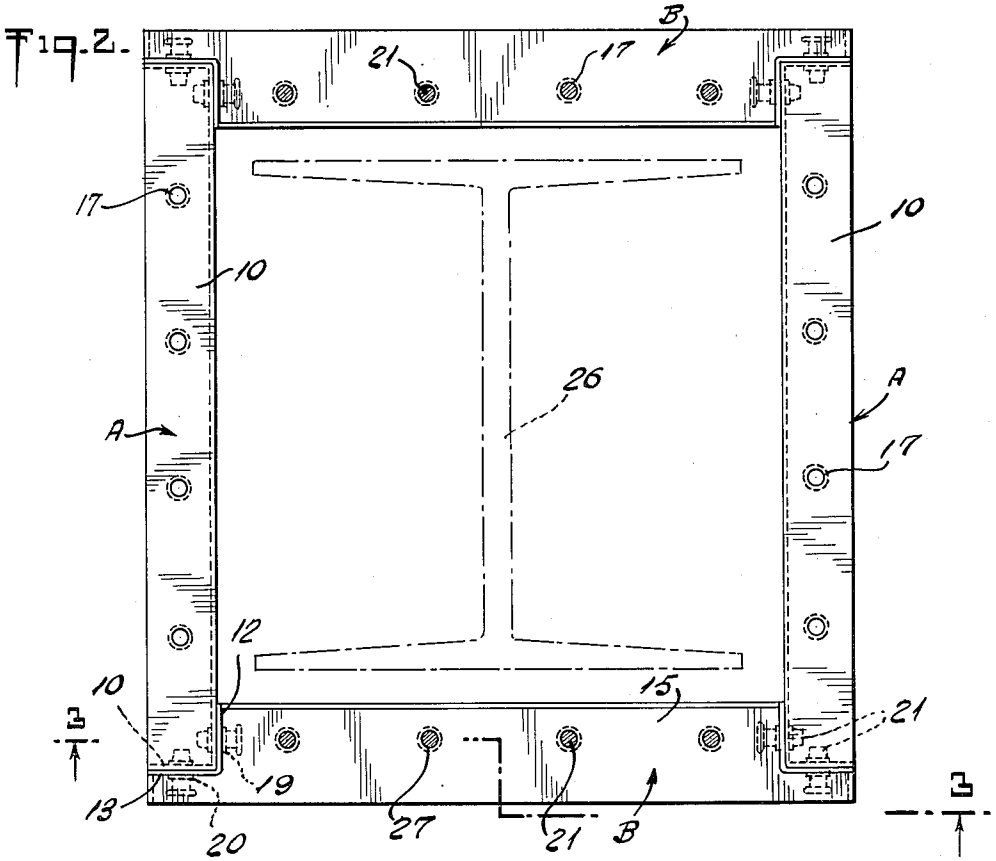
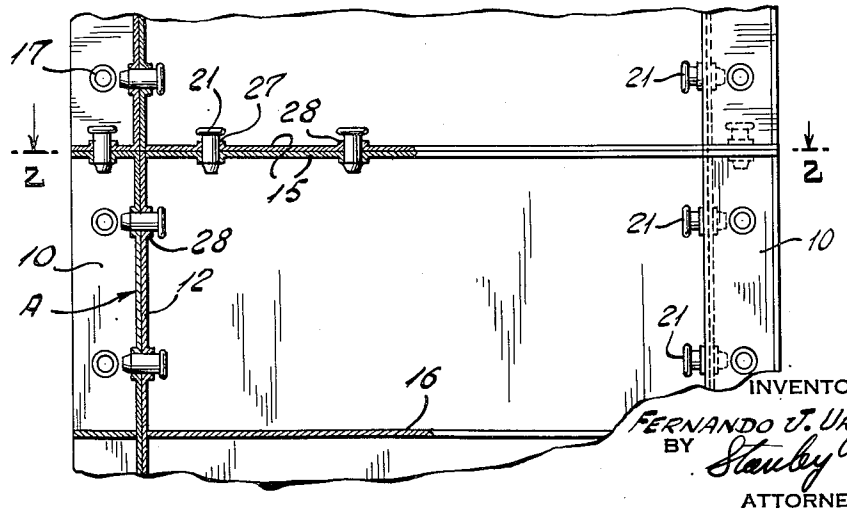


Fig. 3.



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CONCRETE MOLD FORMS

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The present invention relates to forms for building concrete structures and, in particular, to those forms which are specifically adapted for use in column construction.

The encasing of "I" beams steel work in cement, as by forming columns and the like, is a problem which is met in the erection of substantially every steel structure from time to time. Various solutions have been proposed ranging from the erection of special wooden molds which may be used only in one application or, perhaps, reused a few times, to rather elaborate permanent type mold devices which incorporate modular elements to permit reuse in various combinations of such elements. The latter, in particular are difficult to work with and have become unduly complex.

It is an object of the present invention to provide forms or molds for concrete structures, and particularly for concrete columns, which may be variously assembled and sufficiently sturdy in construction to withstand continued reuse.

A further object of the present invention is to provide such forms made of a relatively light gauge metal so as to be easily handled and to reduce the cost thereof.

It is still another object of the present invention to provide such forms which may be readily assembled preparatory to the pouring of concrete and easily disassembled after such concrete has set.

The above and other objects may be attained in the preferred illustrated embodiment of the present invention which includes two types of form elements; one comprising a rectangular sheet of metal having a linear skirt or flange depending from all four sides, there being apertures formed along each of said flanges and along a pair of opposed margins of said sheets, and the other type of said member comprising a rectangular sheet having stepped flanges depending from a pair of opposite sides, and linear flanges depending from the remaining pair of sides, said last mentioned linear flanges having apertures formed therein and said stepped flanges having apertures formed along both walls of the steps thereof, said forms being assembled by opposing like forms and nesting the first mentioned forms within the corners of the steps in the second mentioned forms and then pinning the forms together by means of tapered pins which are hammered through confronting apertures in the members.

The height of the forms may then be increased by assembling like structures and superimposing them upon one another, connecting such like structures or horizontal units by pinning.

Other objects and a fuller understanding of the present invention may be had by referring to the following detailed description and claims, taken in conjunction with the accompanying drawing which illustrates the preferred embodiment thereof, it being understood that the foregoing statement of the objects of the invention and the brief summary thereof is intended to generally explain the same without limiting it in any manner.

FIG. 1 is a perspective view of mold elements embodying the present invention shown partially assembled.

FIG. 2 is a top sectional view of vertically stacked assembled horizontal units shown about an I beam taken along line 2—2 of FIG. 3.

FIG. 3 is a fragmentary elevational view partly in section, taken along line 3—3 of FIG. 2.

FIG. 4 is a plan view of a pin used to secure mold elements to one another.

Referring now to the drawings wherein the preferred form of the present invention is illustrated, one horizontal unit of the same includes a pair of opposed rectangular plates A, each of the same having a skirt or flange 10 depending or extending normally from the four sides of said plates (away from the inner faces thereof) and meeting at the corners thereof, there being a reinforcing rib 11 extending medially between a pair of opposed flanges and a pair of opposed rectangular plates B, from a pair of opposed sides of which there extends normally (away from the inner faces thereof) a right angle step consisting of a wall 12 normal to the face of plate B, and a wall 13 extending parallel to the face of plate B. There may also be a reinforcing rib or skirt 14 extending from wall 13, normal thereto, i.e. parallel to wall 12.

The width of wall 13 in the stepped flange of plate B is preferably equal to the width of flange 10 of plate A so that as said plates are brought together, as shown in FIGS. 1 and 2, the end portions of plates A nest within the stepped flanges of the adjacent plates B.

There also extends, normal to the face of plate B from the remaining opposing two sides thereof, a linear flange 15 which at its sides borders the ends of wall 12 and is itself laterally stepped so as to border walls 13 and 14 as well. As in the case of plate A, there may extend between opposed flanges a reinforcing rib 16. In flanges 10 of plates A there are formed, at predetermined intervals, a series of apertures 17. Along the pair of opposed margins of plates A, which margins confront walls 12 of plates B when the plates are nested, there is formed another series of spaced apertures 18.

Similar lines of apertures 19 and 20 are formed respectively in walls 12 and 13 at intervals and positioned from the edges thereof so as to register with apertures 18 and 17 respectively in the confronting margins of plates A and flanges 10. After nesting opposed plates A within the corners of the steps in the flanges depending from the sides of opposed plates B, the assembly of a horizontal unit is completed by inserting pins 21 within each of the sets of registering apertures.

Pins 21 may be as shown in FIG. 4, formed with a broadened head 22, an elongated shank 23 and a tapered forward portion 24 ending in a blunt end 25. The pins are dimensioned to seat snugly within said apertures and, hence, frictionally retain the plates in connection with one another, as shown in FIG. 2.

The completed horizontal unit, as shown in FIG. 2, is ordinarily constructed about an I beam 26. Where, as is usually the case, it is desirable to form a concrete column about beam 26 from floor to ceiling, vertical extension of a horizontal unit may be obtained by placing another horizontal unit on top of the same. A series of apertures 27 are formed in top and bottom flanges 15. When one horizontal unit is seated upon the other, apertures 17 of top flange 10 register within the corresponding apertures 17 of the bottom flange 10 of the upper unit.

Similarly, when horizontal units are placed one upon the other, apertures 27 of top flanges of plates B of the lower horizontal unit register with the apertures 27 of the bottom flanges 15 of plates B of the upper horizontal unit. Pins 24 may then be hammered into the registered apertures 17 and 27 to securely fix an upper horizontal unit to a lower horizontal unit, providing a mold of increased vertical extent. The procedure may be repeated with additional horizontal units until the desired height is obtained. Normally, of course, each upper horizontal unit will be "built" upon the lower

horizontal units by assembling its parts in place on the lower units.

Each of apertures **17, 18, 19, 20** and **27** may be formed by piercing from the outside inward and then swaging the displaced metal into reinforced inner margins **28**. Such reinforcement of the apertures contribues materially to the longer useful life of the plates. Obviously, the reinforced margins may be made by means other than those indicated.

The provision of pins as distinguished from screws and nuts and other closure means substantially reduce set-up and break-down time.

The molds thus formed by assembling one or more horizontal units are rigid and durable and may be readily assembled and disassembled. By reason of the particular form of the molds, i.e. the provision of depending skirts and stepped flanges, and reinforced ribs as well, a much lighter gauge of metal may be employed than would be the case if such improvements were not incorporated. While the material of which the plates are made has been described as being a metal, and indeed it is preferred that they be made of steel, there would be no departure from the present invention should other materials be employed, such as, for example, durable plastics and the like.

It will be noted that the horizontal dimensions of the mold formed by the assembly of plates A and B, as described, are fixed by the length of the sides of plates B, and the length of the top and bottom flanges **10**, less twice the width of walls **12** of plates B.

The height of the plates A and B may be varied so as to provide plates of different heights and hence enable the construction of horizontal units of different heights which may then be assembled to form molds of desired dimensions.

On the other hand, the width of the plates may be varied so that, if it is desired to depart from a square beam, plates A, for example, may be made longer than plates B in a given horizontal unit.

While it has been indicated that horizontal units may be stacked one upon the other so that B plates, for example, lie over B plates, a staggered or alternate type of vertical construction may be used, i.e. wherein, vertically, B plates lie over A plates so that reading down a column one would find a series of plates BABA etc. Such staggered construction provides a somewhat stronger mold.

Although the present invention has been described with a certain degree of particularity, it is understood

that the present disclosure has been made only by way of example and that numerous variations may be employed without transcending the scope of the invention as hereinafter claimed.

What is claimed is:

1. A mold unit comprising a first opposed pair of rectangular plates, a second opposed pair of rectangular plates abutting said first plates normally and enclosing a volume of rectangular section between the inner faces of said plates, stepped flanges extending from and along the lateral opposed sides of said first plates, said stepped flanges including a first wall normal to the inner face of said first plates and a second wall extending normally outwardly from said first wall, planar flanges extending normally from the remainder of the sides of the inner faces of said plates, the lateral margins of the inner faces of each of said second plates abutting said first walls, and the lateral flanges of said first plates abutting said second walls of said stepped flanges, each of said walls of said stepped flanges and the abutting margins and lateral flanges of said second plates having formed therein a vertically extending line of registering apertures, and pins detachably positioned within said apertures to detachably secure said first and second plates to one another.

2. A mold structure comprising a plurality of mold units as described in claim 1, said units being vertically stacked, vertically abutting flanges extending from said plates having formed in each of them a horizontally extending line of registering apertures and pins detachably positioned within said apertures to detachably secure said units to one another.

3. A mold unit as described in claim 1, said pins detachably frictionally securing said first and second plates to one another.

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