Dec. 13, 1949 J. C. ROBINSON 2,491,212

SECTIONAL FORM FOR CONCRETE WALL CONSTRUCTION

Filed June 5, 1947

Fig. 1.

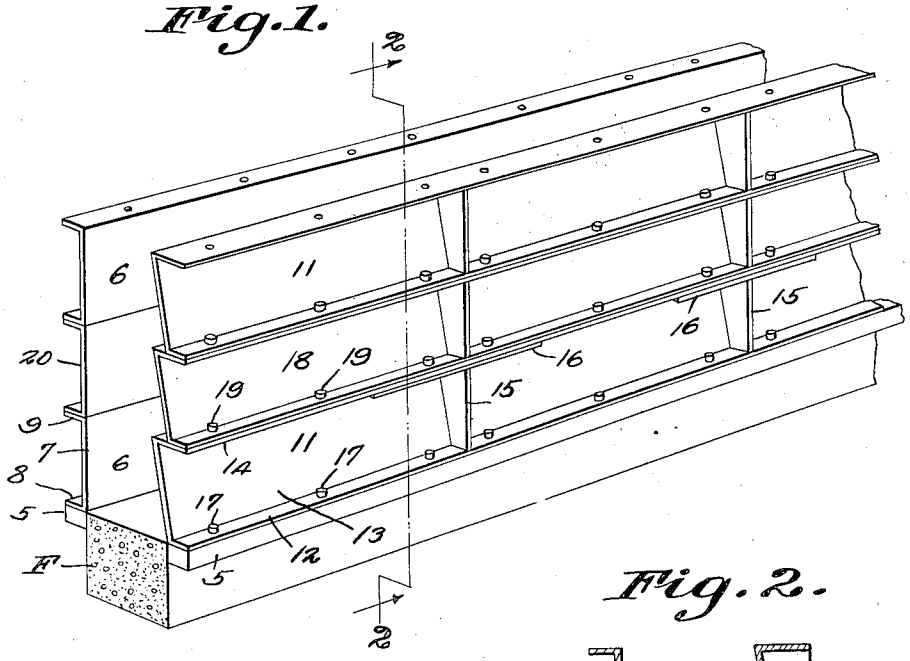


Fig. 2.

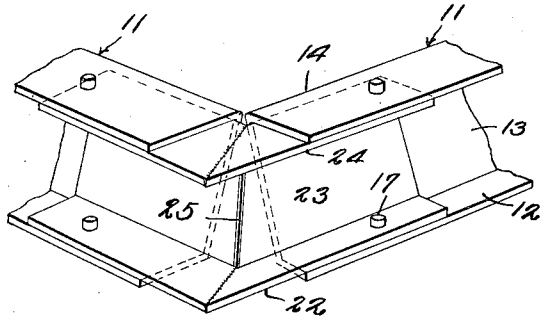
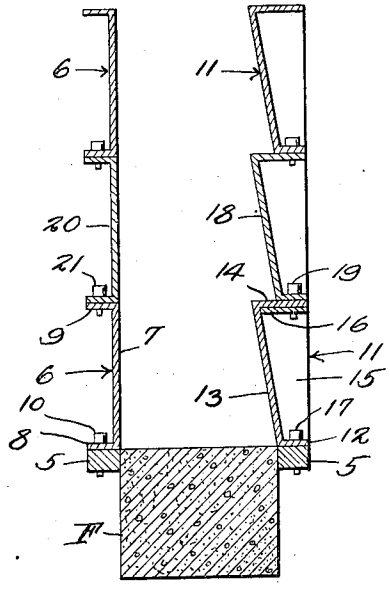


Fig. 3.



J. C. Robinson

INVENTOR

BY C. A. Snow & Co.

ATTORNEYS.

Patented Dec. 13, 1949

2,491,212

UNITED STATES PATENT OFFICE

2,491,212

SECTIONAL FORM FOR CONCRETE WALL CONSTRUCTION

John C. Robinson, Pittsburgh, Pa.

Application June 5, 1947, Serial No. 752,667

1 Claim. (Cl. 25—131)

1

This invention relates to the construction of concrete walls or the like by the employment of sectional forms of novel construction and arrangement.

An important object of the invention is to provide sectional forms for concrete wall construction that are capable of reuse both in construction of the same concrete wall, and in the subsequent construction of other walls. Thus, the number of such forms used in connection with the erection of a concrete wall is sharply reduced, by means of the novel construction and arrangement of the forms contemplated by the invention. Additionally, the use of the same forms in subsequent construction projects, over an indefinite period of time, will provide in a great saving in construction costs.

It is a further important object, by the provision of forms of the character described, to reduce materially the expense and trouble encountered in transporting forms to and from the point at which the wall is to be erected, since only a minimum number of forms constructed in accordance with the invention is required.

Another important object of the invention is to provide forms of the type stated that are capable of being constructed initially at comparatively little expense, in the light of the subsequent use to which the forms can be put, over an indefinite period of time.

Still another object of the invention is to provide a sectional form construction and arrangement that permits of unusually wide latitude as regards the designing of the domicile or other building to be erected, without the usual increase in expense to the person for whom the building is being designed, the forms being such as to permit considerable flexibility in design of separate buildings.

Another important object of the invention is to provide sectional forms of a type permitting not only flexibility in overall appearance of the building, but which permit as well considerable flexibility as to the type of facing to be employed on the concrete wall, the form faces being easily adapted in manufacture for the creation of various stone, brick, block, shingle, or clapboard impressions.

Still another object is to provide forms which are not only readily portable, and usable in minimum amount, but also are capable of ready and easy assembly.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts, hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

2

Referring to the drawings

Figure 1 is a perspective view showing one embodiment of sectional forms constructed and assembled in accordance with the invention, portions thereof being broken away.

Figure 2 is a transverse sectional view through the forms, taken on line 2—2 of Figure 1.

Figure 3 is a perspective view illustrating one embodiment of a corner form, connected to the ends of forms as shown in Figure 1, portions of the latter forms being broken away.

As will be apparent from the description of the invention to be provided hereinafter, forms constructed in accordance with the invention can be provided in a great variety of lengths, designs permitting the wall when erected to show impressions of various types, and in various embodiments as to the corners and angular turns to be taken by the wall. In view of the great number of such varying forms, the drawings are intended to illustrate only one embodiment of the great number that can be used, and the description will of necessity conform to the drawings. However, since the forms illustrated can, as will be apparent, be readily varied in the initial manufacture thereof, I do not desire to limit myself to the particular embodiment shown, this being provided purely by way of example.

Referring to the drawing in detail, the reference character F designates a foundation wall. This is formed in the conventional manner, the present invention being concerned with the erection of a poured concrete building wall, that is to be erected on the foundation.

Base guide bars 5, that are formed of a metallic material, are mounted against the sides of the foundation wall F, and have their upper surfaces flush with, and positioned on either side of, the upper surface of the foundation wall. In cross section, the guide bars 5 are preferably rectangular, and they may be of any length desired. They are mounted in position by any desired suitable means as for instance, by metal straps (not shown) or the like. It is to be noted, in this connection, that in the manufacture of these bars, they must be machined with accuracy, since, when mounted, they serve as the initial base or guide which is the starting point for the erection of the wall by use of the sectional forms.

Mounted upon one of the guide bars 5 is a rear form 6. This is constructed of metallic material of the requisite strength and rigidity, such as steel or the like, and should in manufacture be machined sufficiently accurately as to permit the erection of the concrete wall without misalignment occurring as the erection proceeds, both with reference to the foundation, and to the other walls being erected concurrently in the building.

The rear form 6 is provided with a flat rectangular main or body portion 7, that serves as a retaining member when the concrete is poured. Outwardly extended from the bottom and top edges of the body portion 7 are lower and upper longitudinal flanges 8 and 9 respectively, that are parallel to each other, and also lie in planes parallel to the upper surface of the guide bars 5 and of the foundation wall F. So far as the rear forms are concerned, it is preferred that the flanges 8 and 9 not only be parallel as stated, but also perpendicular to the body portion 7 although this is not absolutely essential to the invention, as will be apparent. However, the inner or rear walls of most buildings are most commonly fully flat, and do not generally embody the formation of impressions such as are often desirable as regards the front or outer surfaces of such walls.

In mounting my rear form 6 upon its guide bar 5, it is necessary only to connect these members by means of drop pins 10 or the like, the rear form 6 and guide bar 5 being provided in the initial manufacture thereof with accurately registering pin-receiving openings.

Opposing the rear form 6 is a front form, designated generally by the reference character 11. This is provided with a lower flange 12 lying in the same plane with the lower flange 8 of the rear form 6. It is also formed with a main or body portion 13, and with an upper flange 14 lying in the same plane as the upper flange 9 of the rear form. The body portion 13, in the embodiment shown, is disposed at an angle suitable to create a clapboard impression on the front surface of the concrete wall. This is obviously, however, only one of a great number of designs that can be used, and it is readily observed that the body portion 13 can be so formed and arranged as to permit the creation of a shingle, block, brick, or stone impression, without departure from the spirit of the invention. The clapboard type front form is shown purely for the sake of example.

As in the case of the rear forms 6, the front form 11 can be of any length desired. Additionally, it may be noted that while forms are illustrated which are straight from end to end, this being the most common concrete wall construction, both rear and front forms can be formed arcuately, as for the construction of a circular wall of a building, or angularly.

Intermediate the ends of the front form 11 are provided vertically disposed rib supports 15, extending between the upper flange 14 and lower flange 12 at spaced intervals, and these, as is apparent from Figure 2, are formed with their front edges flush with the front edges of the flanges. Reinforcement members 16 can be interposed between the top of each rib support and the upper flange. These rib supports not only serve the purpose of reinforcement of the form, but also can constitute plumbline guides, for the purpose of insuring the arrangement of the forms used relative to each other in such a way as to provide for the erection of a properly aligned wall.

The rib supports 15 can if desired also be provided in the rear forms 6, although this is not absolutely necessary.

Drop pins 17 are used to mount the front form 11 upon its guide bar 5.

When the front and rear forms have been mounted as shown, concrete is poured in the space defined between them. At this point in the construction of the wall, only the lowermost forms illustrated in the drawing, and designated by the reference characters 6 and 11, are in place, preferably. In other words, for the initial pouring of concrete, one rear form 6 and one front form 11 is mounted upon the guide bars 5, and the concrete is poured to the level of the respective upper flanges 9 and 14. Before the concrete is poured, spanner hand clamps, not shown, bridge the upper flanges 9 and 14 at desired points, and are adjusted to maintain the front and rear forms in proper and accurate spaced relation. Clamps of this type are well known in the art.

When the concrete has been poured as described, agitators or vibrators of various types known to the art are applied to the outer faces thereof for the purpose of eliminating air holes in the concrete which has been poured, this being conventional practice.

Should it be desired that a door be set in the particular wall being constructed, the necessary aperture in which the door and its frame is to be mounted is readily provided for by placing a box opening at one end of the particular sectional forms being used.

When the concrete has set to the desired extent, a second layer or tier of concrete is poured thereupon. This is accomplished by leaving forms 6 and 11 in place, mounting a second front form 18, by means of drop pins 19, upon the form 11, and mounting a second rear form 20 on the form 7 by means of drop pins 21. The spanner hand clamps would, of course, be removed prior to this operation. Concrete is then poured up to the level of the respective upper flanges of the second forms 18 and 20, and spanner hand clamps applied as before.

When this concrete has set, the drop pins 10 and 17, and 19 and 21, are removed, and the bottommost rear and front forms 6 and 11 are then mounted upon the second forms 20 and 18. It may be noted in this connection that there will be no danger of forms 20 and 18 becoming misaligned or falling, as a result of the removal of the forms 6 and 11 below them. The adhesive qualities of poured concrete are well known, and the normal air pressure exerted on the outer faces of the forms 20 and 18 fully cooperate therewith to retain said forms in proper position.

Thus, it becomes apparent that in the erection of a wall, it is not necessary that a form be provided extending from top to bottom of the wall. In the invention, two pairs of forms 6 and 11, and 20 and 18 respectively, are all that is required. As the erection of the wall proceeds, the bottom tier is progressively removed and placed above the top tier, and this operation is carried on until the wall has been erected.

In construction of a concrete wall in accordance with the invention, corner forms of various designs would be used. One embodiment of a corner form is illustrated in Figure 3, as an example, this being a right angled form used for the purpose of providing a corner for two walls disposed at right angles to each other. Arcuate corner forms, or other corner forms of various angular formation can as well be used.

The corner form illustrated is provided with a lower flange 22, a body portion 23, and an upper flange 24. The lower and upper flanges fit between the lower and upper flanges of the sectional forms described hereinbefore, and a drop pin or drop pins are used to connect the same. In the embodiment illustrated, the corner form is formed with a right angle 25, but this particular design can be varied.

Using forms of this type, sets of forms can be manufactured of various lengths and design as to the impression desired. Where window apertures are desired, shorter forms can be placed on either side thereof, and box openings inserted, while the pouring operation continues. The range of overall building design, door and window placement, and wall arrangement, is thus greatly broadened, and considerable flexibility of design permitted at a minimum of expense. The forms, as will be obvious, are required in minimum amount so far as the erection of any designated wall is concerned, are readily portable, easily assembled, and usable indefinitely thus attaining the object of the invention.

Circumstances will arise, where opposed parallel walls are being erected, where it will be desirable to further insure the erection thereof in proper alignment in parallel relation. In such cases, as the erection of each wall proceed concurrently, it is well within the spirit of the invention to employ the use of a type of longitudinally adjustable form clamp, extending between the forms of the respective walls. This can be provided with clamp ends that will readily clamp to the flanges of the opposed forms used in erecting the opposed walls, with proper longitudinal adjustment being effected and retained during the erection.

It will be observed in the illustrated form that the lower flange 12 is narrower than the upper flange 14. Since the outer longitudinal edges of the flanges are flush, body portion 13 extended between the inner longitudinal edges is disposed

obliquely to the flanges to give the clapboard effect. In achieving this simulation, it is to be noted that since the body portion of one form will intersect with the plane of the upper flange of the next lower form at a point forward of the inner longitudinal edge of said flange of the lower form, the flange will itself be partially exposed to the poured concrete to mold the same. The flange thus serves not only as a support for the superposed form, but also contributes to complete the clapboard simulation. Ribs 15, meanwhile, not only prevent outward flexing of the body portion, but support said flange 14 against downward flexing under the weight of the concrete taken on thereby.

What is claimed is:

In a sectional form for use in poured concrete wall construction, upper and lower flanges disposed in parallel planes, the lower flange being narrower transversely than the upper flange and the outer longitudinal edges of the flanges being flush, a body portion integral with and extending between the inner longitudinal edges of the respective flanges, whereby the body portion of one form superposed upon a second form will intersect the plane of the upper flange of the second form along a line disposed between the inner and outer longitudinal edges of the second form, and vertical bracing ribs rigid with the body portion and flanges, and extending between the flanges.

JOHN C. ROBINSON.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
946,315	Barnes	Jan. 11, 1910
1,579,822	Knickerbocker	Apr. 6, 1926
2,055,977	Hayes	Sept. 29, 1936
2,150,830	Hallisy	Mar. 14, 1939