Dec. 1, 1942. S. GURBER 2,303,837

BUILDING CONSTRUCTION

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Fig. 1

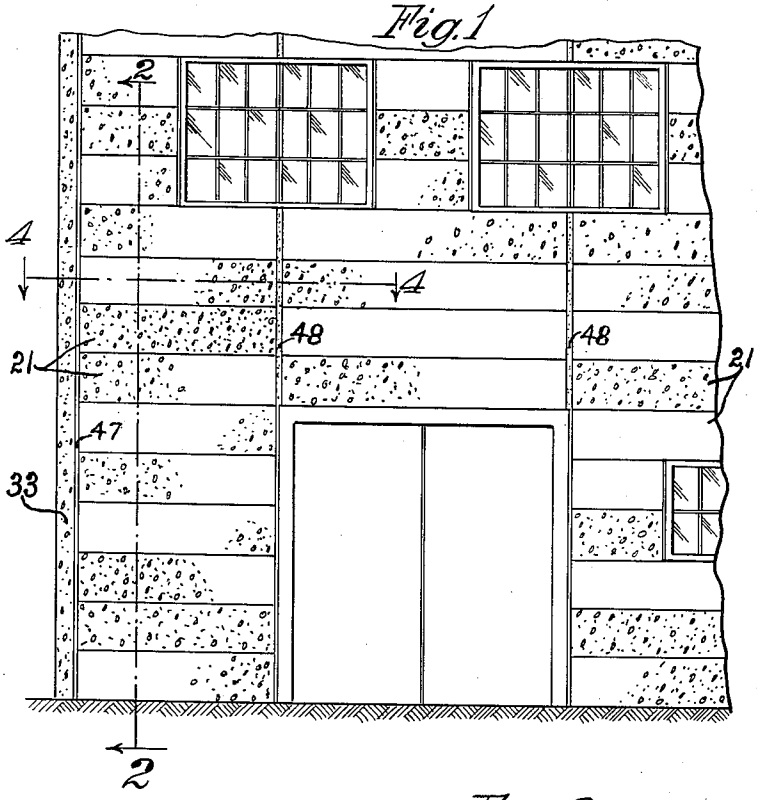


Fig. 2

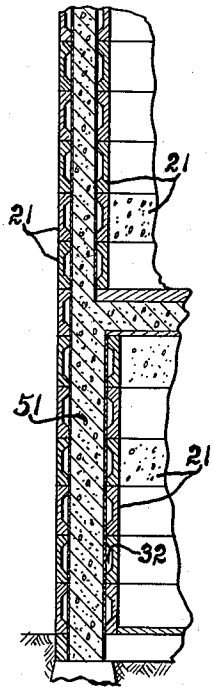
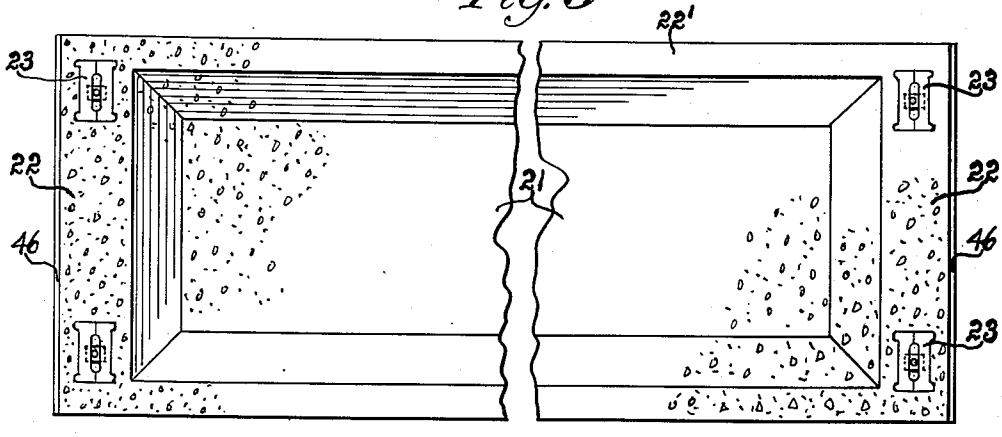


Fig. 3



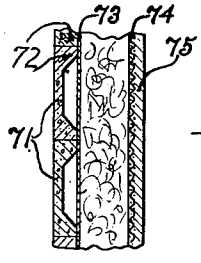


Fig. 13

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BUILDING CONSTRUCTION

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Fig. 5

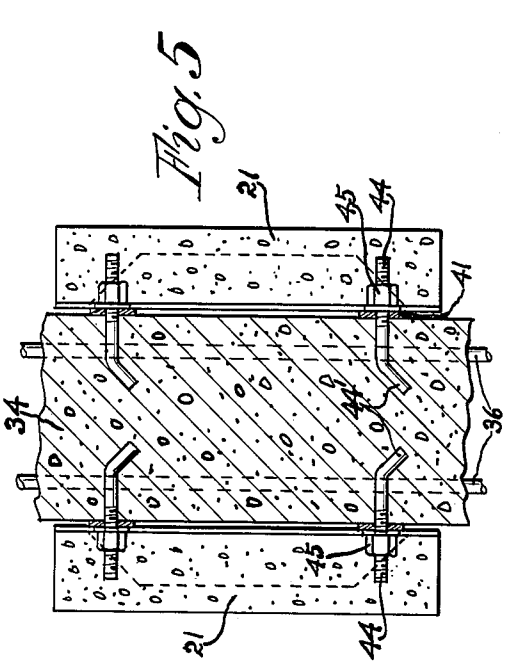


Fig. 4

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BUILDING CONSTRUCTION

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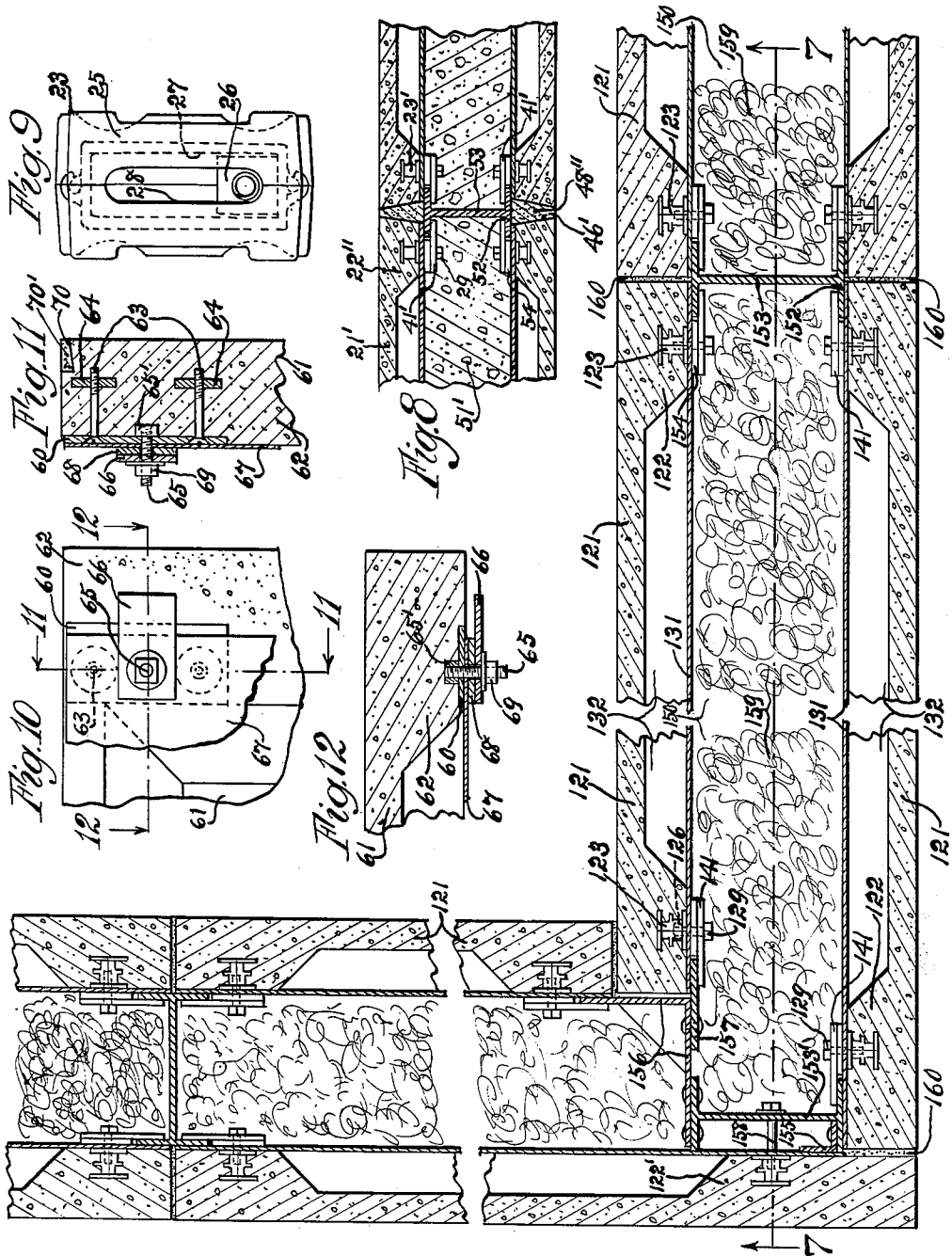


Fig. 6

Fig. 8

Fig. 9

Fig. 10

Fig. 11

Fig. 12

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BUILDING CONSTRUCTION

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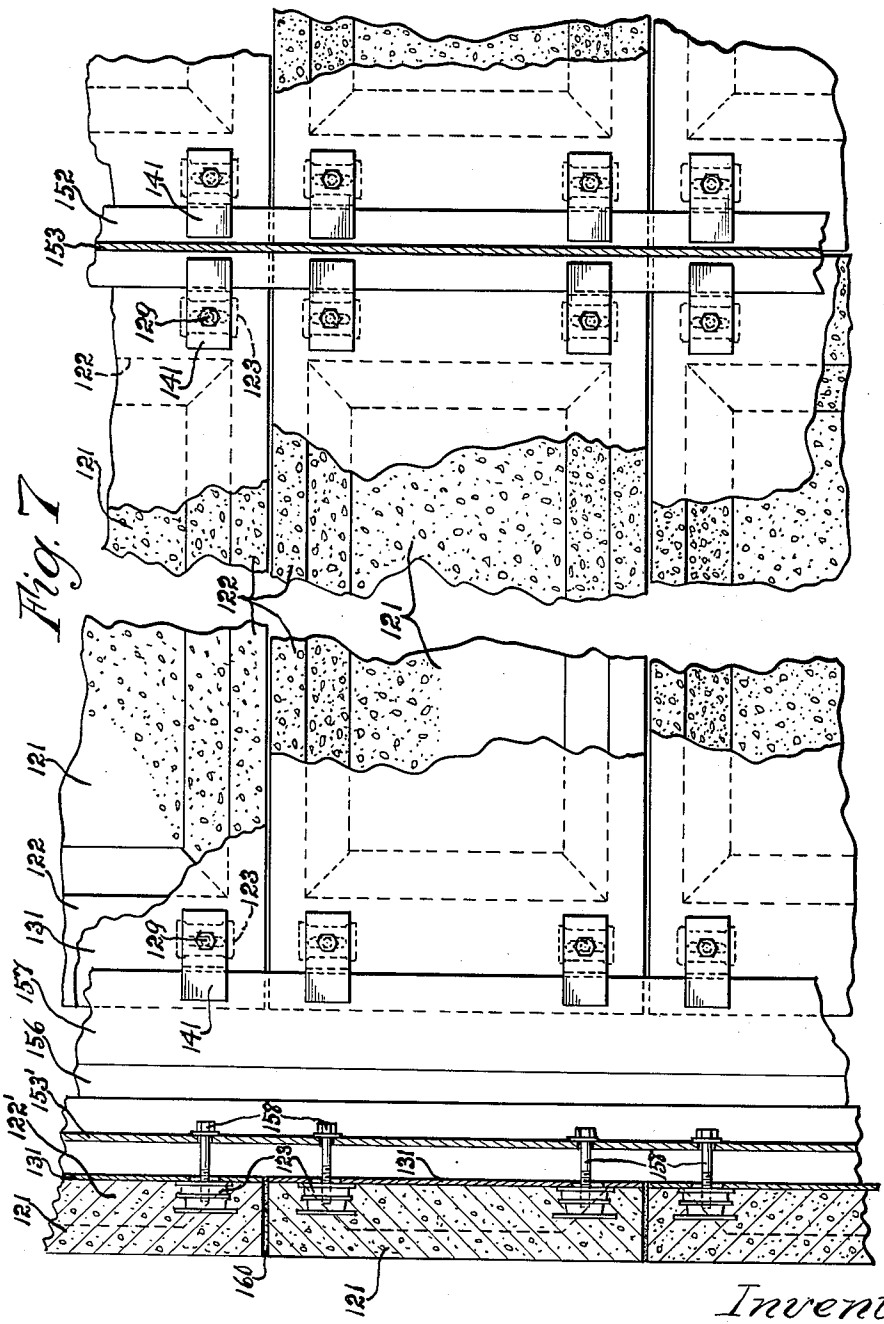


Fig. 7

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UNITED STATES PATENT OFFICE

2,303,837

BUILDING CONSTRUCTION

Samuel Gurber, West Tulsa, Okla.

Application April 30, 1941, Serial No. 391,116

9 Claims. (Cl. 72—16)

This invention relates to improvements in building construction.

The building construction presented herein constitutes an improvement over the forms previously disclosed in my prior patents on Concrete building construction, No. 2,012,191, of August 20, 1935, and No. 2,115,949, of May 3, 1938.

One of the main objects of the present invention is to provide an improved building construction of concrete and metal, which is so arranged that it can be erected readily, without any need of using temporary frame work for pouring the concrete for the walls therebetween; and which is furthermore insulated against temperature changes, in order to render the building more comfortable.

A further object of this invention is to provide such a construction wherein precast concrete panels are utilized which are mounted on both the inward sides and the outward sides of the columns or posts, thus providing a space therebetween, so that a concrete wall can be poured in this intermediate space without the use of any temporary frame work, for providing a readily erectable permanent structure.

Another object of this invention is to provide a construction of this kind comprising precast concrete panels which are arranged to be readily mounted on the columns or posts and are also equipped with companion metal sheet means thereby providing hollow chamber means or air spaces in the wall, to aid in maintaining the desired temperature in the building, and which spaces are adapted to receive heat insulating means therein.

Another object of this invention is to provide a concrete building construction wherein precast concrete panels are utilized which are arranged to be mounted readily in position on the columns or posts, and wherein the several parts may also be readily disassembled, where a temporary structure is desired.

These and various other objects and advantages are attained with this invention, as will become apparent from the following description, taken in connection with the accompanying drawings wherein it is shown in a few of its various forms, it being apparent that other arrangements and forms of construction may be resorted to for carrying out the objects and purposes of this invention.

In the drawings:

Fig. 1 is an elevational view illustrating a corner portion of a building constructed in accordance with this invention.

Fig. 2 is a vertical sectional view thereof, taken on line 2—2 of Fig. 1, showing the intermediate space between the two sets of panels filled with concrete.

Fig. 3 is a view showing the inward side of my improved panel, being partly broken away.

Fig. 4 is an enlarged horizontal sectional view, taken on line 4—4 of Fig. 1, showing a corner portion of this form of construction.

Fig. 5 is a partial vertical sectional view, taken on line 5—5 of Fig. 4, but omitting the mortar fillings at the ends of the panels.

Fig. 6 is a horizontal sectional view, showing metal I-beams used for the uprights or posts, and the space between the two sets of panels filled with heat insulating fibre, providing a separable structure adapted for temporary use.

Fig. 7 is a vertical sectional view thereof, taken on line 7—7 of Fig. 6.

Fig. 8 is a partial horizontal sectional view, showing the structure as in Fig. 6, but with concrete placed between the two sets of panels, thus providing a stronger and more permanent structure.

Fig. 9 is an elevational view of an anchor, in its preferred form, which I embed in the improved panel.

Fig. 10 is a detail view, showing another form of anchoring means adapted for use with this invention.

Figs. 11 and 12 are sectional views thereof, taken respectively on lines 11—11 and 12—12 of Fig. 10.

Fig. 13 is a partial sectional view, showing this form of wall construction utilizing panels on the outer side, but metal lath with plaster on the inner side.

My invention as disclosed in this application presents an improved form of building construction wherein precast concrete panel members are provided and utilized, which along with the associated members and parts are all arranged so that they can be readily combined in erecting the building; and which construction is arranged and adapted for erecting permanent buildings, as indicated in Figs. 4 and 8, wherein these panel members are utilized for pouring the concrete wall directly therebetween, thus avoiding the use of temporary frame work; and is also well adapted for constructing temporary buildings, as indicated in Fig. 6, since the panel members can herein be readily detached from the uprights or posts and the connected parts dismantled.

In this invention I provide and utilize a precast panel 21 which is made of suitable length

and width best adapted for the particular building involved. These panels are generally about eighteen inches wide and are from three to nine feet long, to suit the space in which used, substantially as indicated in the drawings. Each panel has projecting ridge means 22 provided at its two ends, which extend inwardly in the wall when the panel is mounted in position therein; and it is preferably also provided with similar inwardly projecting ridge means 22' on the upper and the lower ends thereof, as shown in Fig. 3.

For readily mounting the panels in position in the wall, and to adapt them for being also readily detached, where the building is a temporary one, these panels are provided with securing members or anchors 23 which are embedded in the ridge means 22; and the preferred form of anchor is in the shape of a casing, as shown in Fig. 9, including inner flange means 24 to anchor it in the concrete and outer flange means 25 which is placed flush with the face of said ridge means 22. A nut 26 is seated in a runway 27 in the anchor adapted to slide longitudinally therein, while the threaded opening in said nut registers with and is movable along a slot 28 provided in the face of the anchor. Hereby the nut 26 can be readily moved along the slot 28, to suit the position of the securing bolt 29 whereby the panel is secured in place.

Metal sheets or plates 31 are positioned against the ridge means 22 and 22', on the inward side of each panel, and are provided with suitable apertures for receiving the bolts 29 therethru in securing said plates to the panels. A hollow chamber or dead air space 32 is hereby provided between the main part of the panel 21 and its ridge means 22 and 22' and the plate 31 secured to said ridge means, as indicated in the drawings. These panels and plates together are mounted in position on the inner sides and on the outer sides of the posts or columns used in the particular construction involved, and they are extended longitudinally of the wall, and are secured to the posts or columns by the anchors and companion elements, to close the spaces therebetween.

The form of upright post or column used herein may vary, and it may be like that shown in my above identified prior Patent No. 2,115,949; and for the permanent form of construction they may consist of precast reinforced concrete posts as shown in Fig. 5 in the present application, including corner posts 33 and intermediate posts 34, which are provided with metal reinforcing rods 35 and 36, respectively. This corner post has recessed or stepped portions on its outward sides including a bearing shoulder 37 and a slanting side wall 38; and it has an inner notch or recess forming a pair of bearing shoulders 39, adapted to seat the panels thereon and provide a smooth wall.

The means for securing the panels to the posts comprises connecting elements 41, which are shown herein in the shape of small metal plates or straps, that are readily secured to the panels by the bolts 29 extended thru apertures provided in said straps and thru the apertures in said plates 31, these bolts being threaded into the nuts 26 in the anchors, thus securing the straps 41 and the plates 31 to the panels. Said straps 41 extend beyond the ends of the panel and are apertured to engage over anchor bolts 42 which project from the shoulder 37 and are embedded in the post with their turned ends 42', while nuts 43 on the threaded ends of the bolts secure the plates and panels in position. Such small metal plates or straps 41, which project from the other end of the panel and are secured thereto by the bolts 29, have their outer apertured ends extending along the outer side of the intermediate post 34, being engaged over anchor bolts 44 embedded with their bent ends 44' in the post, while nuts 45 on the threaded ends of the bolts secure the panels and plates in position on this post.

The ends of these panels are beveled, as shown at 46 in Fig. 4, and as the adjacent shoulder 38 of the corner post 33 is likewise beveled or slanted, a dovetailed groove is hereby provided between said shoulder 38 and the beveled ends 46 of the connected panels; and a similar dovetailed groove is likewise provided between the two sets of adjacent beveled ends 46 positioned on said post 34. Mortar or other suitable waterproof material is placed in these grooves, as shown at 47 and 48 in Fig. 4, being thus securely anchored therein and closing said grooves, and thereby covering the ends of the bolts 42 and 44 and providing a sealed and smooth surface of this wall. The dovetailed spaces between the beveled ends of the panels at the inner sides of the walls are likewise filled with suitable mortar, plaster, or the like, as shown at 47' and 48' herein, to provide a smooth wall.

The hollow chamber or space 32 which is provided between the panel 21 with its ridge means and the metal plate 31 mounted thereon may also be provided with heat insulating means 49 therein, as shown in Fig. 4, thus aiding in maintaining the desired temperature in the building.

Where the building is to be of a permanent nature and a strong structure with a concrete intermediate wall is also desired, there this form of construction is found to be especially convenient and appropriate, as these two sets of concrete panels with the sheet metal plates thereon, positioned at the inner side and the outer side of the wall, will hereby provide an intermediate space or chamber 50 between these metal plates and the posts, to have the concrete mixture poured directly therebetween and form an intermediate wall 51; thereby providing a strong structure, and without the use of any temporary frame work for erecting or pouring this wall as is ordinarily required.

This readily erectable form of construction is also well adapted to be employed where steel I-beams are used for the posts or columns, as indicated in Figs. 6, 7 and 8; and as shown in Fig. 8, the panels 21' with their ridge means 22'' carrying the anchors 23' and having the plates 31' secured thereto by the anchor bolts 29' are substantially the same as in the above described form, and bear against the outer face of the flange means 52 of the I-beams 53. The connecting elements or straps 41' herein bear against the inner sides of the flange means 52 and have apertures thru which said bolts 29' extend, thus securing the panels 21' and plates 31' to the I-beams, spacing washers 54 being used to equal the thickness of said flange means 52. The spaced beveled ends 46' of the panels also provide dovetailed grooves, and suitable mortar or the like is anchored therein, as shown at 48'', thus providing a sealed and smooth wall surface. An intermediate concrete wall 51' is also readily provided herein by pouring the concrete in the space 50' between the metal plates 31', like in the preceding form.

In Figs. 6 and 7 a further embodiment of this invention is disclosed, using I-beams for the posts or uprights, and this indicates how my structure

is adapted to be readily erected and likewise readily dismantled, where a building of a temporary nature is desired. Herein the precast concrete panels 121 include ridge means 122 carrying anchors 123 having nuts 126 slidable therein; and sheet metal plates 131 are mounted against said ridge means 122, and along with straps 141 and spacing washers 154 are secured in place by bolts 129. These plates and panels are mounted against the outer faces of the flange means 152 of the I-beams 153, and these straps clamp against the inner sides of said flange means, thus securing these parts together in the wall.

The corner structure herein also requires suitable angle members in addition to the I-beam, as indicated by the angle-bar 155 secured to the outer flange of the corner I-beam 153', and an angle-bar 156 secured to the inner flange thereof and having a plate 157 projecting therefrom, adapted to have the panel and plate with the connecting strap clamped thereto. A bolt 158 may be extended thru the I-beam 153' to engage in the anchor 123 embedded in the corner ridge 122' of the corner panel; or other means may be used to secure these corners to the I-beam.

The middle space or chamber 150, which is provided between the two sets of plates 131 and the I-beams, may have mineral fibre or other suitable fibrous material 159 packed therein, for temperature insulation, instead of having the concrete poured therein for wall 51 as set forth above; thereby retaining this form as a temporary structure adapted to be readily dismantled if desired. The hollow space 132, between the panel 121 and its ridge means 122 and the metal plate 131 mounted thereon, is likewise adapted to have heat insulating material packed therein if desired, as has been indicated in Fig. 4.

Caulking cement or other suitable weather-proofing material 160 is also forced between the joining edge means of the panels, to provide a sealed and weather-tight structure.

In Figs. 10, 11 and 12 is shown an inexpensive anchor means adapted for use with this invention, and it comprises a plate 60 set into the face of ridge means 62 on panel 61 and having screws 63 extending thru it into washers 64 embedded in the ridge means. A threaded element 65 has its head 65' seated in said ridge means, said element being preferably threaded in the head to be detachable therefrom; and it extends outward thru said plate 60, adapted to have one of the straps 66 fastened thereon, over a sheet metal plate 67 and a spacing washer 68, by means of a nut 69 threaded onto the outer end of said element 65.

In Fig. 11 it is further illustrated how I provide my improved panels with a beveled or dovetailed notch 70 at the outer top corner portion, wherein mortar 70' is then packed when positioned in the wall, wherever a stronger and more positively sealed junction between the superposed panels is desired, as in a permanent structure.

Fig. 13 illustrates this building construction as comprising the precast panels 71 with their ridge means 72 and the metal plates 73 thereon mounted only on the outside of the wall, when it is preferred to have metal lathing 74 with plaster 75 thereon used on the inner side of the wall, to provide a smoothly finished appearance on the inside face of the wall structure.

I claim:

1. A building construction comprising uprights and panel means positioned on the inside and on the outside thereof, each panel means including a precast concrete panel having integral ridges projecting inwardly and containing anchors embedded in the ridges, also plate means seated against the inward sides of the ridges, thereby providing a space between the panel and the plate means thereon, and securing means including members extending from the panel and connected to the adjacent uprights and also elements which extend thru said members and thru said plate means into said anchors, whereby to readily secure the panel means on both the inside and the outside of the uprights and also provide a space between the two sets of plate means adapted to have concrete poured directly therebetween for providing an intermediate wall.

2. The subject matter set forth in claim 1, wherein each panel has ridges provided entirely around its edge portion to project inwardly and the plate means consist of sheet metal and each is of substantially the same area as the panel to which it is secured, thus providing a unit having a hollow chamber therein.

3. A building construction comprising uprights and panel means mounted thereon, each panel means including a precast concrete panel having ridges projecting inwardly and containing anchors embedded therein, sheet metal plate means seated against the ridges and providing a space between the panel and the plate means, and securing means including strap members extending from the panels and secured to the adjacent uprights and also threaded elements extending thru the members and the plate means and into said anchors, for securing the several means and members together into a readily erectable and separable wall structure.

4. A wall construction comprising uprights having faces on both the inward and the outward parts thereof and being provided with means protruding from said faces, panel means mounted on said faces on both said inward and said outward parts of the wall and each composed of a precast concrete panel including ridges projecting inwardly and containing anchors embedded therein, metal plate means seated against said ridges and providing a space between the panel and plate means, and securing means including strap members connected to said protruding means and having each an apertured part provided with a threaded element extending thru it and thru one of said plate means into one of said anchors, thereby securing the panel means onto the two faces on the uprights and also providing an intermediate chamber between the two sets of plate means.

5. The subject matter set forth in claim 4, wherein the end portions of the panels are beveled and provide dovetailed groove means thereby, and sealing means is packed therein providing a tightly closed and smooth wall surface.

6. The subject matter set forth in claim 4, wherein said intermediate chamber is filled with concrete providing a middle wall, and the panels have beveled edges providing dovetailed grooves containing mortar therein, providing a tightly closed and strong structure.

7. A concrete building construction comprising precast concrete uprights provided with level faces on the inward and the outward parts thereof and having threaded rods protruding out from said faces and anchored in the uprights, panel means mounted on both said inside and outside faces, each panel means comprising a precast concrete panel composed of a main portion including ridges extending inwardly therefrom and

containing anchors embedded therein, also a sheet metal plate seated against the ridges of each panel and providing a space thereby between the plate and panel, securing means including straps secured on said rods and having each an apertured part provided with a bolt extending thru it and thru an aperture in one of said plates and into one of said anchors, for securing the panel means on the two sides of the uprights, and concrete positioned between the inner and the outer plates and providing an intermediate wall thereby.

8. The subject matter set forth in claim 7, wherein the panels have beveled end portions and some of the uprights are provided with similar beveled portions located in juxtaposition to said end portions, thereby producing dovetailed grooves into which the outer ends of said rods project, and mortar is packed in said grooves to cover the rod ends and provide a closed and even wall surface.

9. A building construction comprising uprights and precast concrete panels mounted vertically superposed thereon, each panel including ridges projecting inwardly and containing anchors embedded therein, plate means seated against the ridges and providing a space between said plate means and panel adapted to receive heat insulating means therein, securing means including members extending from the panels and secured to the adjacent uprights and also threaded elements extending thru said members and plates and into said anchors, thereby securing the panels onto the uprights, and dovetailed groove means provided on the outer edge portion of each panel and having cementitious material anchored therein to produce a sealed and strong junction between the panels.

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