Sept. 18, 1923. 1,468,285

G. F. DAMPNEY

CONCRETE SLAB BUILDING CONSTRUCTION

Filed Sept. 28, 1921

Fig. 1

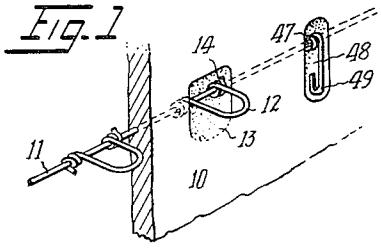


Fig. 2

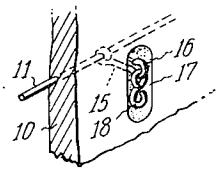


Fig. 5

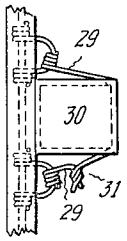


Fig. 4

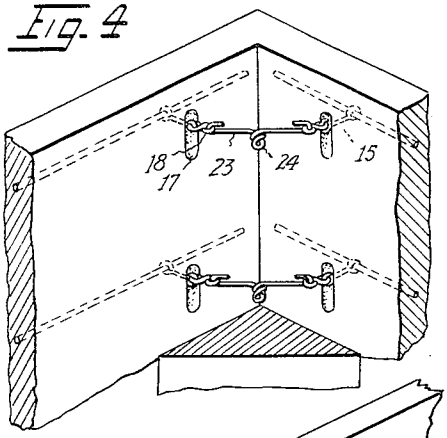
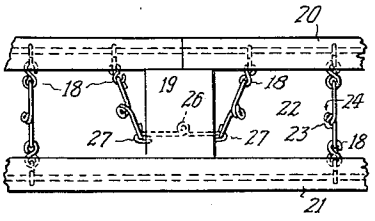


Fig. 3



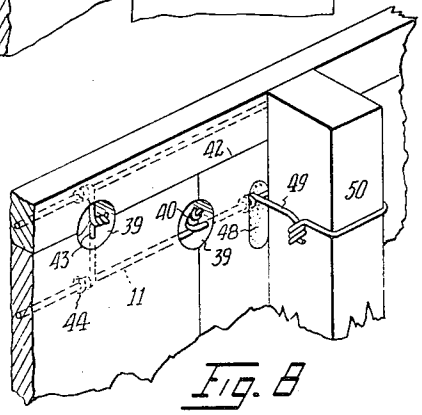


Fig. 8

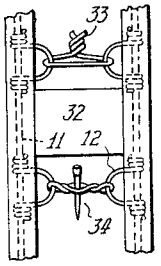


Fig. 6

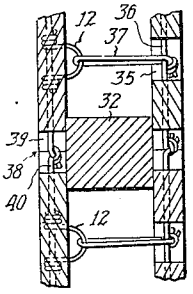


Fig. 7

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UNITED STATES PATENT OFFICE.

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CONCRETE-SLAB BUILDING CONSTRUCTION.

Application filed September 28, 1921. Serial No. 503,924.

To all whom it may concern:

Be it known that I, GERALD FRANCIS DAMPNEY, a subject of the King of Great Britain and Ireland, residing at Sydney, New South Wales, Australia, have invented certain new and useful Improvements in Concrete-Slab Building Constructions, of which the following is a specification.

This invention relates to improvements in concrete slabs for that type of building construction in which slabs or panels of concrete are erected about a timber or concrete stud frame and are fixed to the studding and to each other by wire ties. Low cost is the chief demand in that type of construction, the first cost of the slabs delivered on the work ready for erection being one element in that total and the builders' cost for setting the slabs in the work representing the balance of the total.

In order to minimize the cost of the slabs before erection it is necessary that in the manufacturing operation and in the packing and freightage, waste shall be eliminated. Costly waste is involved in packing and in freight costs and in breakage in transit when the slab structure is such that the slabs cannot be set closely in contact and crated side by side in contact. Such close packing is impracticable when the slabs have wire tags or loops projecting from them, for the projection of the exposed wires necessitates additional packing and increase in overall size of the enclosing crates. Inconvenience in the manufacturing of the slabs is also caused when reinforcing members protrude from the slab, and such protruding pieces are also a cause of inconvenience in the handling and stacking of the slabs and in their erection.

The present invention has therefore been devised with the object of producing concrete building slabs having reinforcement members and attachment members disposed to facilitate manufacture and erection and adapted to permit of close packing, crating and stacking of the slabs and also adapted to permit convenient handling and tying of the slabs in erection.

The slabs are moulded with a plurality of reinforcing wires or light bars embedded in their mass and extending from end to end thereof; attachment members are secured to these through reinforcements, and pockets are formed in the slabs to accommodate these attachment members and permit them to lie within the slab surface. The slabs may therefore be packed closely together without interference with the attachments. In the finishing operations the attachment pockets when in exposed position may be filled in with cement and uniform flatness of the wall structure thus procured. The lateral attachment members are links hooked or anchored back to the through reinforcements and the pockets for them are depressions formed in the inner sides of the slabs in the moulding operation. The ends of the through reinforcing wires or rods are brought into notches cut in the ends of the slabs and form binding ties for attachment by twisting with corresponding reinforcement ends from the contiguously placed slabs. Ties for horizontal joints are constituted of tag wires looped back to one or other of the through reinforcing wires and brought out into notches formed in the horizontal edges of the slabs. Corner ties are made by looping together with diagonally disposed tie wires the lateral attachments located near the corner angle and embedding the loops in plaster filleting set in the angle to close the slab joint. A direct anchorage for cross tie wire loops is provided by exposing the through reinforcement by forming a hole through the slab.

The major essential feature of the invention is the provision in concrete moulding slabs of lateral and edge tie and bonding elements so accommodated in pockets or notches in the slabs that they do not protrude or interfere with the close packing of the slabs, and are protected from breakage and mutilation in the handling of the slabs in transit and during erection.

In the accompanying drawing,

Fig. 1 is a perspective sectional elevation illustrating the anchorage of lateral tie attachments to a through reinforcing member so that said attachments may be accommodated in pockets sunken in one surface of the slabs; two forms of attachment are shown, the one a loop form and the other a tag wire.

Fig. 2 is a fragmentary perspective view showing a lateral tie attachment of link type hooked back to a main reinforcing member and accommodated in a pocket sunken in the inner side of the slab.

Fig. 3 is a top plan view of portion of a cavity wall and a supporting and spacing stud therein, illustrating the method of

bonding the slabs across the wall cavity and also the method of securing the slabs to the stud by means of lateral tie attachments;

Fig. 4 is a perspective elevational view of a wall angle illustrating the method of tying the corner by means of lateral tie attachments united by a diagonally disposed connecting wire;

Fig. 5 is a sectional plan showing the utilization of lateral tie attachments for securing slabs to framing;

Fig. 6 is a plan view showing method of cross tying lateral attachment members (Fig. 1) across a wall cavity to hold the slabs forming the inner and outer surfaces of the wall in structural relation to a frame stud;

Fig. 7 is a horizontal section through portion of a cavity wall showing a method of utilizing the attachments for tying the slabs across a wall cavity and for bonding them edgewise to each other; and

Fig. 8 is a fragmentary perspective view showing a vertical joint and a horizontal joint and the contiguous slab edges bonded by ties accommodated in registering notches in the edges of the respective slabs.

In Fig. 1, 10 is the slab, 11 a reinforcing wire or rod embedded in the substance of the slab and extending from end to end of the slab, 12 is a wire tie attachment loop, having its ends 14 curled round the reinforcing member 11, and 13 is a pocket or cavity formed in one side of the slab 10 offering accommodation for the attachment loop 12 to be swung back therein so that it does not protrude beyond the surface level of the slab. The attachment loop ends 14 being only curled round the member 10, the loop may be readily swung back to set in the pocket, or swung outward (see Figs. 5, 6 and 7) to offer an anchorage for a tying wire looped through it.

In Fig. 2, another form of attachment is used in place of the swing loop 12 shown in Fig. 1. In this case a link 15 is hooked to the through reinforcing member 11, and an eye 16 formed on the outer end of this link is located below the surface level of the slab 10. The pocket 17 accommodates a loose link 18, which is hooked in the eye 16. As in the case of the loop 12 shown in Fig. 1, the parts 16 and 18 are accommodated in the pocket in the face of the slab and whilst they do not offer any obstruction they are readily accessible for extension, as seen in Figs. 3 and 4, for engagement by tie wires to tension related slabs together in a building structure.

In Fig. 3, 19 is a stud, and 20 and 21 are slabs positioned at either side of it to form between them a cavity 22. Across this cavity the slabs 20 and 21 are secured by passing a tie wire 23 having hooked ends, through the links 18—18 and twisting up the tie wire 23 as shown at 24 to tension up the connection. Similarly the slabs on either side of the studs 19 are secured to the stud. In practice these studs are preferably constructed of concrete with anchor members 26 embedded therein, these anchor members exposing at either side of the stud an eye 27. Ties similar to the ties 23 are used to connect up the eyes 27 to the links 18, the necessary tension being put on these ties by twisting them up centrally as already described. The method of twisting up the cross ties is clearly shown in Figs. 4 and 6, the ties being formed with an initial twist to form an eye in which a nail may be placed to obtain the necessary leverage to tension up the connection by a tourniquet action.

In Fig. 4, the tie attachments as shown in Fig. 2 are utilized for bracing the corners of a structure, the slabs meeting at the angle and being held together by means of ties 23 similar to the ties bearing the same reference number already described with reference to Fig. 3.

In Fig. 5, the infolding loop tie shown in Fig. 1 is used to form holdfasts for tie wires 29 to connect a slab to a stud 30, the wires 29 being tautened up by twisting their ends together as shown at 31.

In Fig. 6, the same type of attachment is illustrated in use in a cavity wall for holding the slabs at either side of the stud 32, two forms of tying being here illustrated. In one form, shown at 33, a wire is looped through the opppositely disposed loops 12 and its ends twisted up together, thereby bringing the parts into tension. In the attachment means shown at 34 tightening is effected by a tourniquet, a nail being passed through the loop and used as a tourniquet lever.

Fig. 7 shows another modification involving the same principles. In this case holes 35 are formed through one of the slabs to expose portions 36 of the longitudinal reinforcement. The oppositely disposed slab on the other side of the wall cavity is armed with attachment loops such as 12 or links such as 18 a tie wire 37 is passed through the loop 12 and the two ends brought back through the hole 35 and twisted about each other so as to embrace the reinforcement member 36, thus drawing the slabs together across the cavity. The tie 37 may engage the exposed reinforcement 36 in both slabs where both slabs are eyed in opposite locations as at 35 Fig. 7. The end abutments 38 of the slabs are bonded by means of the reinforcing members 11, the ends of which are twisted together in the notches 39 formed in the slab ends. To offer length sufficient for this twisting up of the ends of the reinforcements 11, these members 11 are left longer than the slab

length but the surplus length is bent back into the cavity 39 so that it does not protrude from the slab and thus does not form an interference or obstruction in the packing or handling of the slabs. The inbent end may be readily pulled outward to be grasped by the twisting tool when the slabs are in situ, for the purpose of making the twisted bond shown at 40. The notches 39 when set in register form a hole through the slab face and are filled and grouted in and plastered over after the tying has been effected, so that the exposed surface of the slabs presents a flat appearance. This arrangement is seen in Fig. 8. In that figure also is shown the application of the same method for tying the slabs across the horizontal joint 42. In this case the attachments are tags of wire 43 curled at one end 44 around the through reinforcement member 11, with the exposed portion incurled into the notch pocket 39 and available for twisting up with the corresponding attachment tag from the adjoining slab. This figure also shows the method of using wire attachment members for embracing slabs to studs. The tag wire attachment for studs is shown in the right hand portion of Fig. 1; it consists of a length of wire having one end 47 curled upon the reinforcing member 11 and its free end doubled up and set back in the cavity 48. In Fig. 8 this tag wire member 49 is shown forming part of a binding attachment for connecting slab to the stud 50.

What I claim as my invention and desire to secure by Letters Patent is:—

1. A concrete building slab having reinforcement members embedded therein and tying attachments connected to said members, said slab being provided with cavities to accommodate said tying attachments whereby the latter may be extended beyond the surface of the slab to facilitate the tying of opposite and contiguous slabs in the erection of the same.

2. A concrete building slab as claimed in claim 1, in which the said tying attachments are loosely connected to said reinforcement members, substantially as described.

3. A concrete building slab, as claimed in claim 1, in which the tying attachments comprise wire links secured at one end to said reinforcement members and having the other end thereof disposed below the surface of the slab, said cavities in the slab being adapted to accommodate said links about their ends and below the level of the slab surface, substantially as described.

4. A concrete building slab, as claimed in claim 1, in which the reinforcing members are disposed longitudinally in said slab, the said tying attachments comprising link connections and the said cavities form pockets adapted to enable the said link connections to lie below the surface level in said pockets, substantially as described.

5. A concrete building slab having reinforcement members embedded longitudinally therein and tying attachments comprising links loosely connected to said members, said slab being provided with pockets to accommodate said tying attachments below the surface of the slab, said links comprising wire members secured at one of their ends to said reinforcement members and with their outer ends disposed below the surface of the slab, and coupler links articulated to said last ends, substantially as described.

6. Concrete slabs disposed in angular relation in a building structure, having reinforcements embedded therein, and tying attachments anchored to said reinforcements, said attachments adapted to set in pockets formed in the slab surface; with wire ties connecting said attachments diagonally and holding said slabs positioned, and the corner angle filleted to seal the joint therein and embed said ties and attachments.

In testimony whereof I affix my signature.

GERALD FRANCIS DAMPNEY.