Aug. 19, 1930. E. O. BROSTROM 1,773,168

CEMENT OR CONCRETE CONSTRUCTION

Filed April 18, 1927

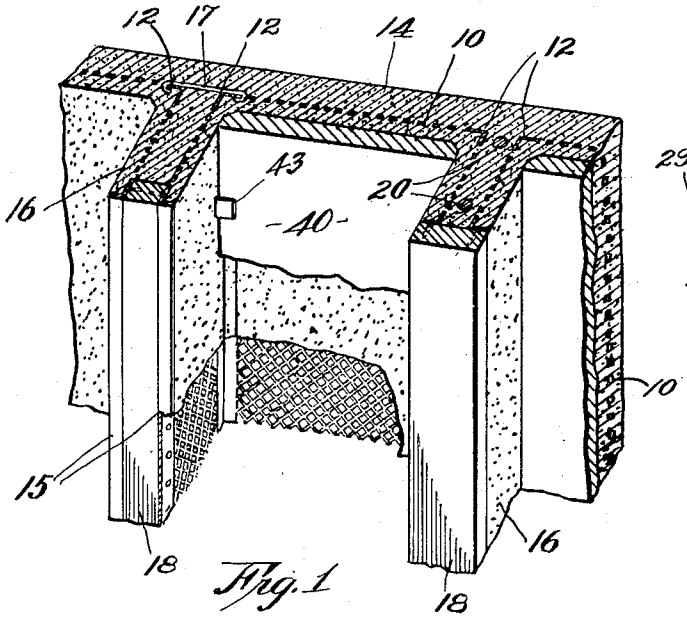


Fig. 1

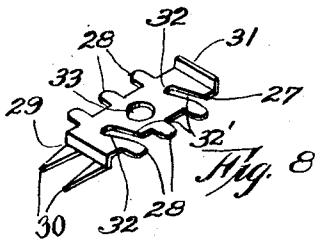


Fig. 8

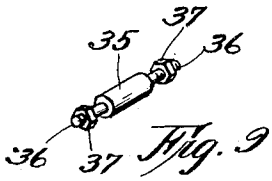


Fig. 9



Fig. 7

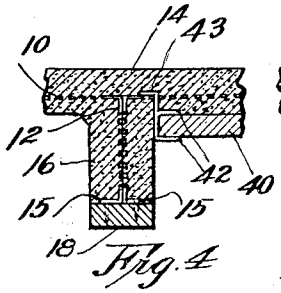


Fig. 4

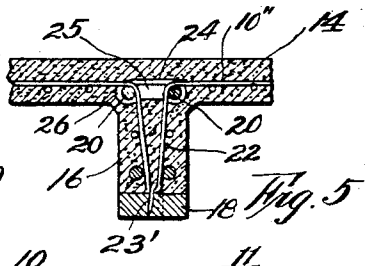


Fig. 5

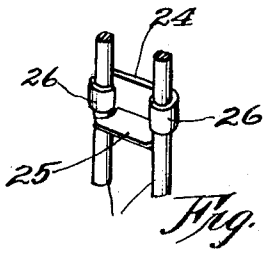


Fig. 6

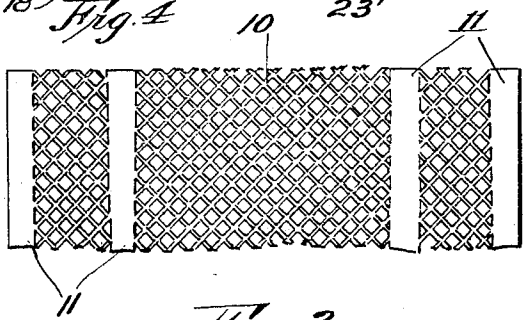


Fig. 2

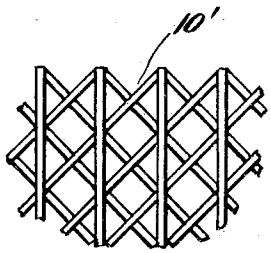


Fig. 3

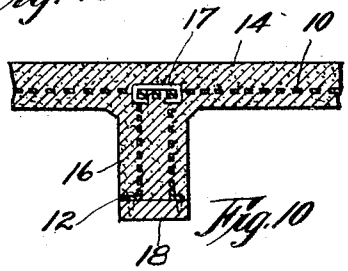


Fig. 10

Witness:

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Patented Aug. 19, 1930 1,773,168

UNITED STATES PATENT OFFICE

ERNEST O. BROSTROM, OF KANSAS CITY, MISSOURI

CEMENT OR CONCRETE CONSTRUCTION

Application filed April 18, 1927. Serial No. 184,575.

The present invention relates to improvements in cement and concrete building construction, with particular reference to that type of construction which comprises a cement or concrete slab having protruding ribs or T's acting as T studs or sills for strengthening the slab according as it is used as a wall or floor.

The primary object of the invention is to devise an improved method of construction of this character in which metal reinforcing is used of a type suitable not only for reinforcing to be permanently embedded in the slab or T or sill, but also for serving as the self-sustaining framework which is erected preliminarily to the application of the cement or concrete material, and in this connection serving also, in conjunction with suitably placed backing of insulation or other material, to impart the required shape or form to the integral slab and T structure for which the method is designed.

In carrying out this purpose, I make use of either wire mesh or expanded metal or equivalent metal network material of a character adapted to be shaped into appropriate contour for reinforcing both the slab and T units, and in the latter connection being possessed of sufficient strength and rigidity to sustain not only its own weight but also that of the superimposed load such as roof and floors, and also the weight of the concrete and cement material, until this has become permanently hardened and set in the final stage of the construction.

It is also sought to devise a construction in which furring strips may or may not be employed as a part of the framework and adapted to be left in place if desired for constituting both nailing grounds and stops to prevent a transmission of moisture from the exterior wall surface of the structure.

Convenient expedients are also provided for anchoring the parts effectively in their proper structural relation, for securing insulation material in place when used, and accomplishing various minor functions in an improved manner, all as will hereinafter more fully appear.

With these general objects in view, the invention will now be described by reference to the accompanying drawing illustrating one form of embodiment and method of carrying my invention into practice, after which the several features and combinations deemed to be novel will be particularly set forth and claimed.

In the drawing—

Figure 1 is a perspective detail view of a portion of a concrete T and slab unit constructed in accordance with the present invention;

Figure 2 is a plan view of a portion of the metal reinforcing material used in the method of construction followed in Figure 1;

Figure 3 is a similar view of a portion of a modified form of said reinforcing material;

Figures 4 and 5 are sectional detail views of the T portions of finished slab units, illustrating modified forms of construction;

Figure 6 is a perspective view showing a bonding and spacer element used in connection with the reinforcing rods;

Figures 7 to 9 are perspective views of other types of tie or bonding elements hereinafter referred to; and

Figure 10 is a sectional view similar to the views shown in Figures 4 and 5, but illustrating still another method of arranging or installing the reinforcing material.

Referring now to the drawing in detail, this illustrates in Figure 1 the reinforcing material for the slab and T structure as composed of expanded metal 10 made up from the sheet material illustrated in Figure 2 and so constructed as to leave bands 11 of uncut metal, both at the margins and also along intermediate lines parallel to said margins. This is for the purpose of adapting the metal to be shaped up to form intermediate angle corners 12 between which the expanded metal is used for reinforcing the slab 14, and also the marginal angle corners 15, the expanded metal between said corners 15 and the corners 12 being utilized for reinforcing the T or stud 16. Preferably, the metal 10 is made up in strips adapted to extend from the face of one T or stud 16 to that of the next adjoining T, thus providing two spaced webs of the metal in each T, the ad-

jacent corners 12 being conveniently tied together in this relation by clips 17 or the like, Figures 1 and 7. Where desired to use furring strips 18 as nailing grounds or the like, these may be embraced between the outer corners 15 as shown at the left of Figure 1, or such corners may be secured to the rear faces of the strips 18 as illustrated at the right in Figure 1, as preferred. Additional reinforcing in the form of rods or bars 20 may be installed, as also illustrated at the right in Figure 1. These parts, including the furring strips and the reinforcing rods 20 and metal 10, may all be erected upon the usual base or foundation work or floor (not shown) and the reinforcing embedded therein if desired.

Other forms of metal reinforcing material may be used in place of the expanded metal, one modification of such material being shown in Figure 3, illustrating a welded wire mesh material 10′ which may be shaped into the same general contour and positioned as illustrated in Figure 1 and retained in this position by means of clips 17. In Figure 5 I illustrate plain wire mesh network 10″ employed for the same purpose of reinforcing.

In the modified form of T structure shown in Figure 4, the adjacent side web portions of the reinforcing metal are brought together in contact and secured in this relation by attaching the corresponding corners 15 to the inner faces of the furring strips 18. In Figure 5 the wire mesh reinforcing 10″ is bent to form the loop 22 for reinforcing the T, this loop being secured by a staple 23 or the like to the rear face of the furring strip 18. This view in Figure 5 also illustrates an alternative arrangement for the additional rods 20 which may be used for reinforcing the T structure, the loop 22 extending between two pairs of such rods, and the rear pair located in the slab and spaced slightly farther apart than the other pair, and also spaced and tied in this relation by means of spacing and bonding elements 24 having the offset spacer portion 25 fitting between the rods 20 and the lugs 26 for embracing said rods, as clearly illustrated in Figure 6.

In the modified form of construction shown in Figure 10, the slab 14 is reinforced by a continuous sheet of expanded metal 10, and a separate section of the metal provided with the angle corners 12 is bent into substantial U-shape for reinforcing the T 16, said angle corners being attached to the strips 18 in the same manner as shown at the right in Figure 1. This U-shaped structure is bonded to the slab reinforcing by a clip 17 or the like. Such a method of construction would enable the T to be cast separately or independently of the slab and later bonded thereto, as might be desired under some conditions.

Other modified forms of spacing and bonding elements for use in the T structure are shown in Figures 8 and 9. In Figure 8, the body portion 27 of the device is adapted to be inserted between the parallel webs of reinforcing material 10 in the T, with which it is adapted to be interlocked by bending the lugs or fingers 28 into engagement with the mesh of said material. One end of the device is formed with a flange 29 provided with prongs 30 for convenience in attaching the device to the furring strip 18, and the other end of the device may be formed with an upturned flange 31 adapted to be anchored in the cement or concrete; and intermediate its ends, the body portion of the device is punched with holes 32 having entering slots 32′ for the rods 20 and with a larger hole 33 for the passage of the concrete material. The advantage of this form of spacing tie is in the greater area of support afforded concrete material for which it provides horizontal ledges at intervals along the T. In Figure 9 the device shown comprises a spacing rod or sleeve 35 adapted for insertion between the parallel webs of the reinforcing material and having the bolt extensions 36 and nuts 37 for securing the device in place by retaining engagement with said material.

The application of the cement and concrete material is intended to be carried out substantially in the same manner as set forth in my co-pending application of even date herewith. After the erection of the expanded or wire metal reinforcing material on the foundation or base structure, and attachment of the furring strips in the relation shown, any additional reinforcing bars or rods are put in place, and sheets of backing material 40, such as insulation or other material, are inserted in the spaces between the T reinforcings, as illustrated in Figures 1 and 4. The latter view shows a means of anchoring the backing in position, comprising tie or bonding elements with spaced fingers 42 engaging the backing and also a finger 43 for insertion in the reinforcing 10 of the slab. The cement or concrete materials are now applied as explained in said co-pending application, either by hand, as by troweling, or by impelling the material into place, as by a cement gun, through the metal reinforcing net work to form the wall or slab 14 and the T's 16, as well as any belts or sills or partition work which may be formed in the same manner as set forth in said application. Any back plastering at the sides of the T's which may be necessary is of course attended to during this operation, and as soon as the cement has set and hardened, the backing material 40 may be removed unless this is to be left in place as insulation material. The slab, with its reinforcing, including the T projections (ribs and sills) is now complete and ready to function as the main structural supporting frame of the

building, the only additional steps required for finishing the wall being the outer stucco or other finish coating which may be applied to the exterior face of the slab. The furring strips 18 are used as nailing grounds for the interior wall finish, and also for securing the insulation in place if preferred to bring the insulation forward some distance away from the slab.

From the foregoing it is apparent that I have devised a practical construction method for carrying out the desired purposes of the invention. It will readily be seen also that the method is equally well adapted for the construction of a floor slab, and that, in addition to eliminating the use of collapsible frame pieces, the invention as herein set forth possesses various other advantages and is adapted to effect similar economies to those characterizing the construction and method set forth in the copending application above referred to.

While I have illustrated and described what I now regard as the preferred form of construction for embodying the invention as well as the preferred method for practicing the same, I desire to reserve the right to make all changes and modifications which may fairly fall within the scope of the appended claims.

What I claim is:

1. The method of constructing a concrete slab with an integral T which consists in forming a metal reinforcing network into shape for reinforcing both the slab and T, erecting a furring strip for forming the outer face of the T, and applying the cement and concrete material to the reinforcing at the side opposite from the T and impelling said material through said network, and then back plastering the surfaces of the T side of the structure.

2. An integral concrete slab and T having expanded metal reinforcing embedded in the slab and formed with bands of uncut metal bent to provide angle corners at the base of the T, said reinforcing comprising also web portions of expanded metal extending in parallel relation through the T, and a furring strip carried by the outer face of the T and secured to said web portions.

In witness whereof I hereunto affix my signature.

ERNEST O. BROSTROM.