

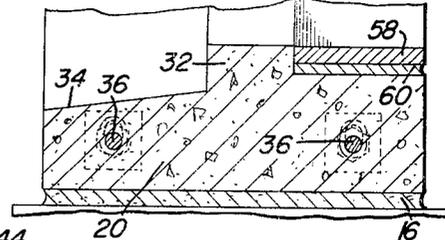
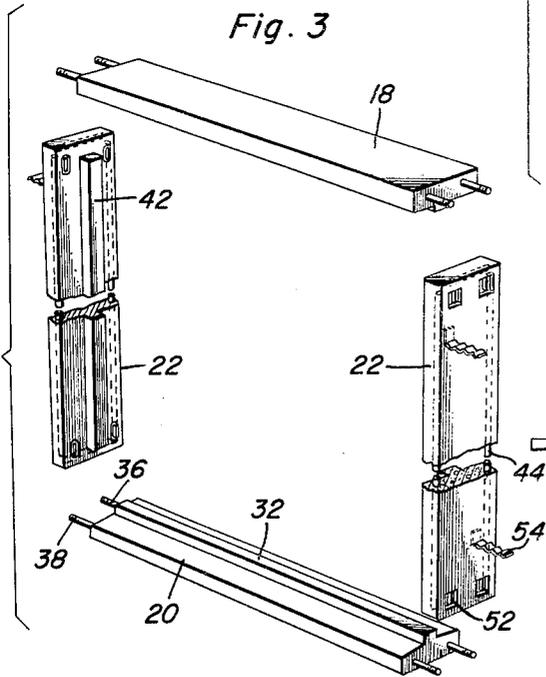
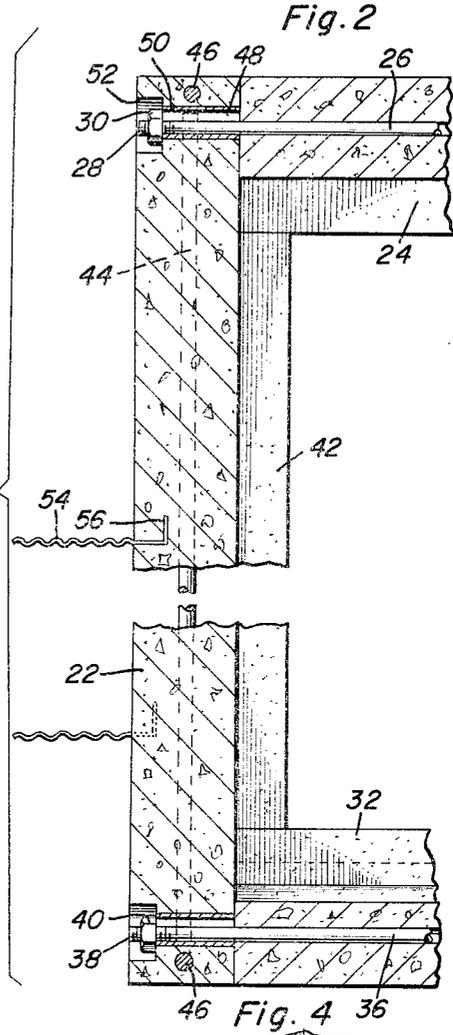
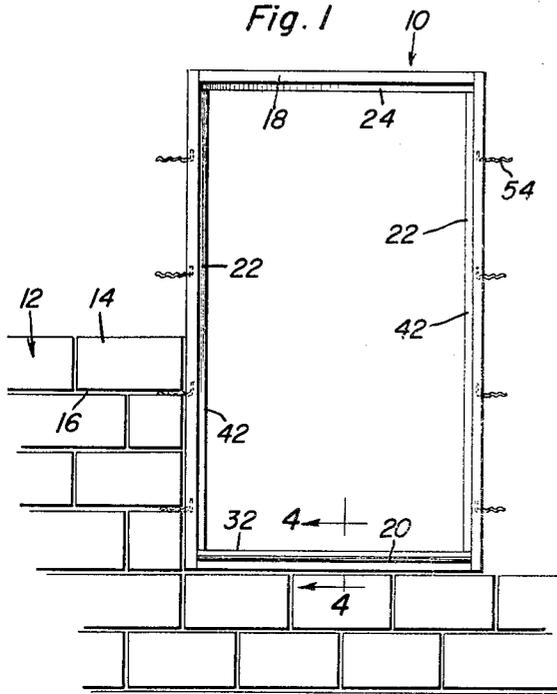
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POST-TENSIONED CONSTRUCTION FRAME

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3,230,676

POST-TENSIONED CONSTRUCTION FRAME

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2 Claims. (Cl. 52-204)

The present invention generally relates to a construction frame of concrete capable of being used with various building openings such as window, door, air-conditioner frame or any other openings requiring a frame.

It is an object of the present invention to provide a construction frame of concrete which is manufactured and transported while in its knocked down condition and assembled at the site of construction with the concrete components of the frame being post-tensioned.

Another very important object of the present invention is to provide a construction frame of lightweight concrete of various commercially available types in which various aggregates, such as pearlite, may be used which enables nails to be more readily driven into the frame when desired.

Another object of the present invention is to provide a lightweight concrete construction frame which may be used either indoors or outdoors and, of course, avoids rotting which occurs when wood frames are used. Further, the frame is rigid but since no weight is directly applied thereto, the frame need not be particularly structurally strong.

Yet another important feature of the present invention is to provide a concrete construction frame including a bottom sill member, a top header and two side members or jambs in which the sill and header butt into the side members or jambs rather than just resting thereon.

Still another important feature of the present invention is to provide a concrete construction frame constructed of lightweight concrete and including reinforcing rods in each component thereof with the reinforcing rods in the sill and header having threaded ends and projecting through suitable metallic or plastic sleeves in the side members for enabling the components of the frame to be rigidly secured together with enough tension to hold the frame rigid. The openings which receive the threaded ends of the reinforcing rods on the header and sill are oval-shaped for assisting in aligning and plumbing the components with relation to each other.

Yet another feature of the present invention is to provide a concrete construction frame in which the threaded nuts engaging the ends of the reinforcing rods are recessed into pockets formed in the outer surface of the side members. Also, the side members are provided with brick ties orientated in a particular spatial relationship for reception in the mortar joints between adjacent courses of building blocks such as bricks or the like.

Still another important feature of the present invention is to provide a construction frame of concrete having a sill of particular configuration enabling tile or other covering material to be readily applied to the interior thereof.

Another particular feature of the invention is the provision of a lightweight construction frame that is manufactured and transported in its knockdown condition and is quickly and easily assembled at the point of installation for providing a rigid frame of lightweight construction that is relatively easy to install and relatively inexpensive to manufacture.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accom-

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panying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is an elevational view of the frame of the present invention installed in an opening in a building wall;

FIGURE 2 is a vertical sectional view illustrating the construction of the frame;

FIGURE 3 is an exploded perspective view illustrating the relationship of the components of the frame; and

FIGURE 4 is a detailed sectional view on an enlarged scale taken substantially upon a plane passing along section line 4-4 of FIGURE 1 illustrating the structural details of the sill of the frame.

Referring now specifically to the drawings, the numeral 10 generally designates the construction frame of the present invention which is illustrated as being installed in an opening in a building wall 12 constructed of a plurality of courses of building blocks such as bricks 14 or the like which are joined together by a conventional mortar joint 16.

The construction frame 10 includes a header 18, a sill 20 and a pair of side members or jambs 22 which are interconnected to form a rigid open frame for windows, doors, air conditioners or the like.

All of the components of the construction frame are constructed of a lightweight concrete. Various aggregates may be employed in conjunction with the lightweight concrete depending upon the use of the frame. For example, pearlite may be used as an aggregate and with such aggregate, nails or other fastening devices may be readily inserted into the frame when desired.

The header 18 is generally rectangular in cross-sectional configuration but is provided with a depending longitudinal projection 24 on the underside thereof. A pair of elongated reinforcing rods 26 are embedded in the header 18 adjacent the vertical center thereof and spaced on either side of the lateral center. The ends of the reinforcing rod 26 project beyond the ends of the header 18 and each of the rods 26 is provided with a threaded end portion designated by numeral 28 for receiving a retaining nut 30 thereon.

The sill 20 is also of generally rectangular configuration and is provided with an upwardly extending projection 32 extending throughout the length of upper surface thereof. The upper surface of the sill disposed outwardly of the longitudinal projection 32 is downwardly inclined as designated by numeral 34 whereby any rain or water engaging this surface will run downwardly and off of the sill in a conventional manner for frames employed in conjunction with windows, doors and the like. The sill 20 is provided with a pair of reinforcing rods 36 embedded therein which extend beyond the ends of the sill 20 and terminate in threaded end portions 38 for receiving retaining nuts 40 thereon.

Each of the side members or jambs 22 is also generally rectangular in cross-sectional configuration and provided with a longitudinal projection 42 on the inner surface thereof with the ends of the projection 42 being spaced inwardly of the ends of the side members 22 a distance equal to the height of the header and sill and the projections 24 and 32 thereon respectively thereby enabling the ends of the header 18 and sill 20 to butt against the inner surface of the side members 22. Each of the side members 22 has longitudinal reinforcing rods 44 embedded therein and also transverse or lateral reinforcing rods 46 in the end portions thereof.

The side members 22 include openings 48 extending through each end portion thereof for receiving the threaded end portions 28 and 38 of the reinforcing rods 26 and 36 respectively. Each opening 48 is defined by a sleeve 50 of metallic or plastic material and the opening

communicates with a recess or pocket 52 at the outer end thereof which is of sufficient depth to receive the retaining nuts 30 and 40 respectively. The opening 48 and the sleeve 50 in each instance is oval-shaped in configuration as illustrated in FIGURES 3 and 4 for self-centering or plumbing the components of the frame when they are assembled. As illustrated in FIGURE 2, the ends of the header 18 and sill 20 butt against the inner surface of the side members 22 and the retaining nuts 30 and 40 are tightened sufficiently to hold the frame components in rigid relation to each other and this also will post-tension the sill and header by compressing the same to a slight degree. The butt engagement of the ends of the sill and header against the inner surface of the side members will rigidify the frame and retain the components thereof in perpendicular relation to each other. Recessing the retaining nuts and the threaded ends of the reinforcing rods enables the external surface of the frame to be maintained in a smooth condition insofar as projections of a rigid nature are concerned. Also, the transverse reinforcing rods 46 are orientated immediately above the opening 48 where the side members would be the weakest structurally thereby reinforcing this area where the greatest stress is applied in view of the location of the tensioning rods 26 and 36.

Brick ties 54 are provided in the side members with the inner ends of the brick ties having an offset end portion 56 embedded in the concrete of the side members 22. The free end portion of the brick ties 54 are corrugated or undulated for reception in the mortar joint 16 in the manner illustrated in FIGURE 1. The brick ties may be orientated at predetermined space relationships for association with different types of building blocks whereby the ties will be aligned with and received in the masonry joint between adjacent courses of such blocks.

The inner top surface of the sill 20 is flat and provides a support for mastic and tile so that the application of tile to the frame is easily completed. This eliminates the extensive bed normally provided on the sill for supporting tile.

Also, when installing the frame there is no requirement to pour concrete around the frame in order to secure the frame in the building opening. In fact, the frame is assembled in the building wall prior to completion of the wall thus actually building the wall around the frame as illustrated in FIGURE 1.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A construction frame comprising a pair of generally parallel side members, a sill and header all constructed

of cementitious material, the ends of said sill and header being butted against the inner surface of the side members adjacent the ends thereof, each end of the sill and each end of the header having a projecting threaded rod extending axially therefrom, each side member having openings formed therein adjacent the ends thereof receiving the projecting rods, said openings in said side members being of oval-shaped configuration and provided with an oval-shaped sleeve for self-centering of the rods, the diameter of the rods being less than any diameter of said oval-shaped openings, and a retaining nut on the threaded end of each projecting rod securing the side members and the sill and header in rigid assembled relation, each of said side members having a longitudinal projection on the inner surface thereof, said longitudinal projection being disposed intermediate the front and back surfaces of the side members, said longitudinal projections terminating in spaced relation to said openings adjacent the ends of the side members, the sill and header each having a longitudinal projection on the inner surface thereof terminating flush with the ends thereof and butting against said inner surfaces of the side members, each said longitudinal projection on said sill and header being disposed intermediate the front and back surfaces thereof and having an inner edge surface spaced from said sill and header inner surface, the distance from the ends of the projection on said side members to the nearest wall portion defining a part of an adjacent opening being no greater than the distance from said inner edge surface of the longitudinal projection on said sill and header to the nearest surfaces of the rods projecting from the ends thereof, the ends of the projections on the side members abutting against the inner edge surface of the projections on the sill and header, thereby rigidifying the frame in perpendicular planes.

2. The structure defined in claim 1 wherein said side members are each provided with a plurality of brick ties embedded therein and extending laterally therefrom.

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