Feb. 6, 1951 F. G. LANGENBERG 2,540,622

ADJUSTABLE FOUNDATION STRUCTURE

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Fig. 1.

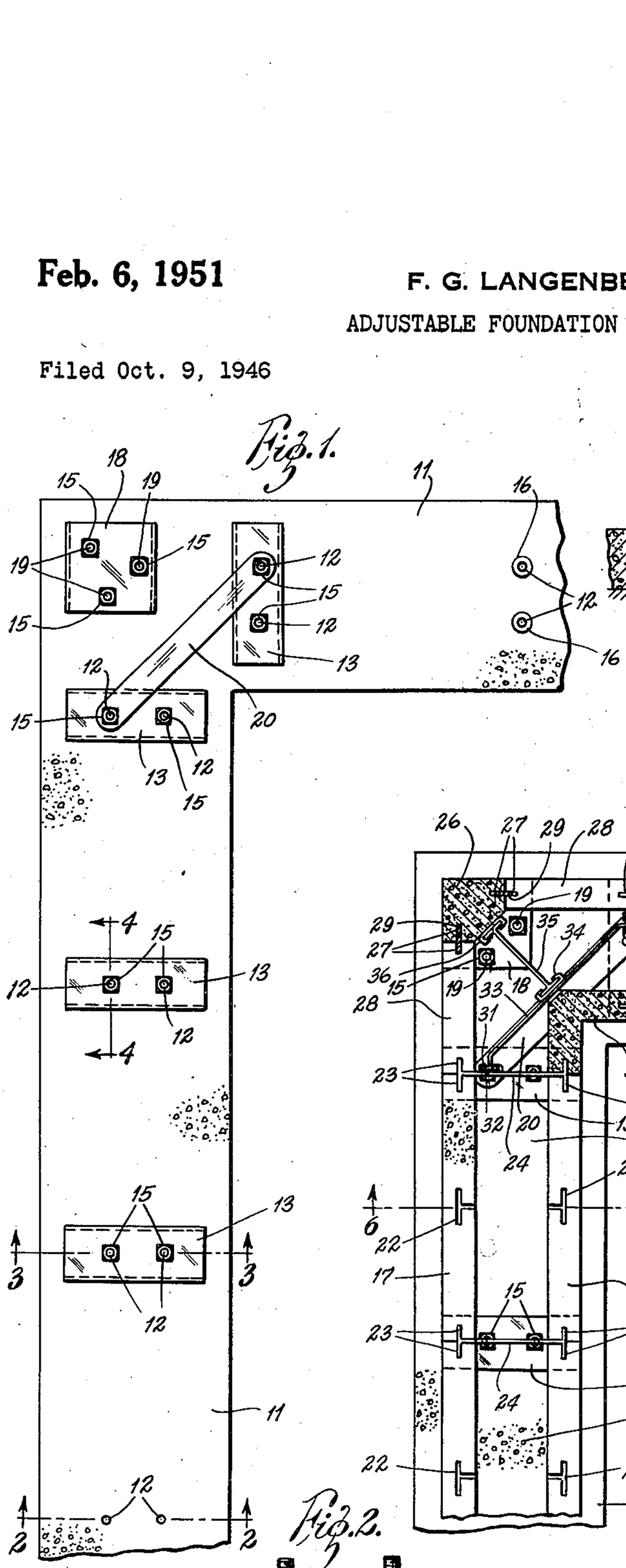


Fig. 4.

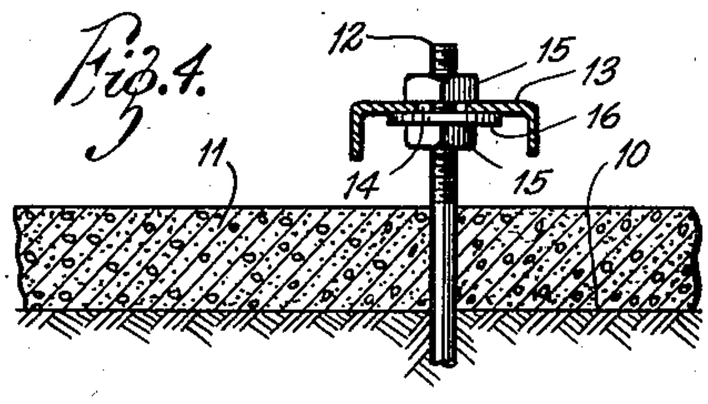


Fig. 5.

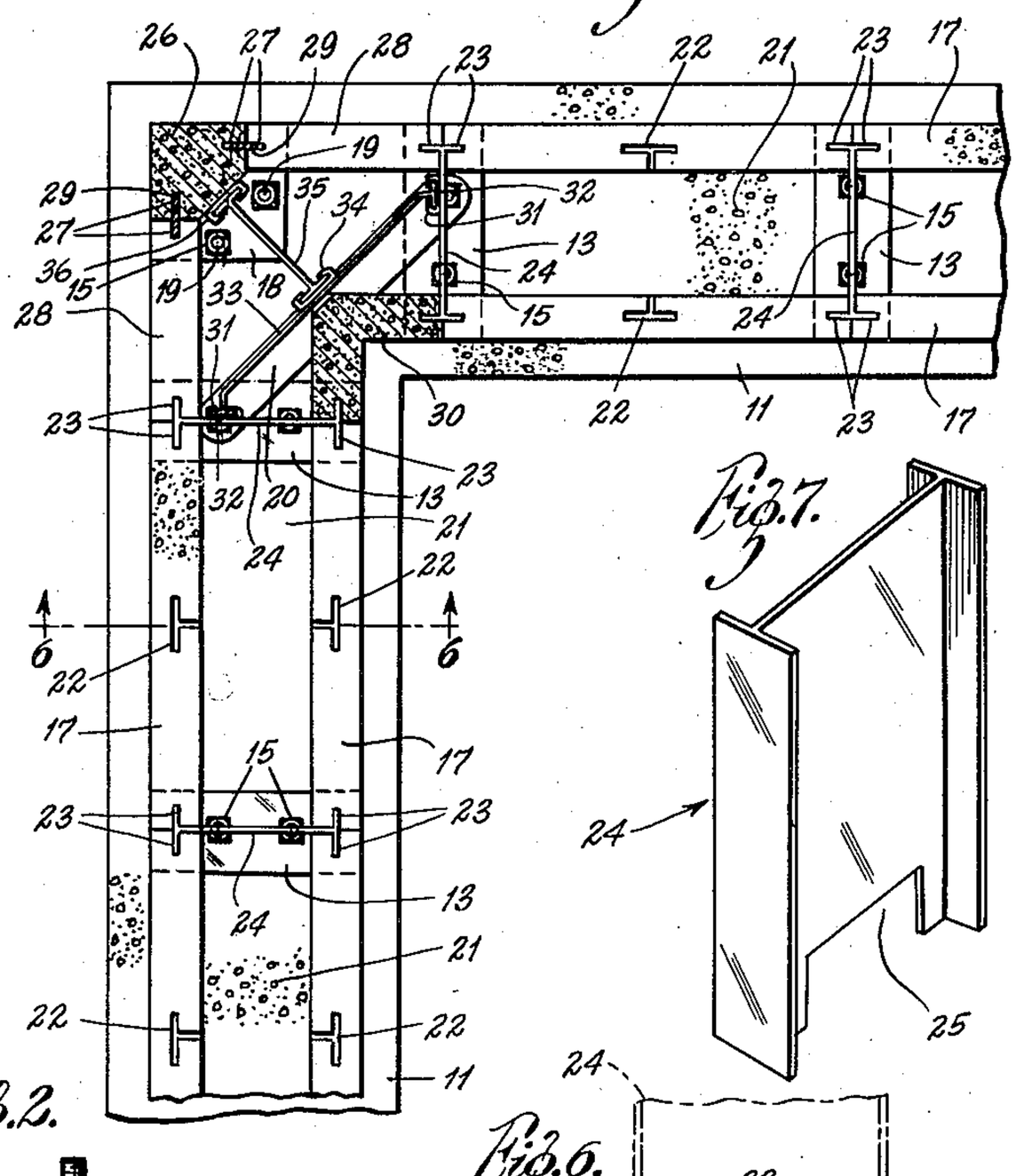


Fig. 7.

Fig. 2.

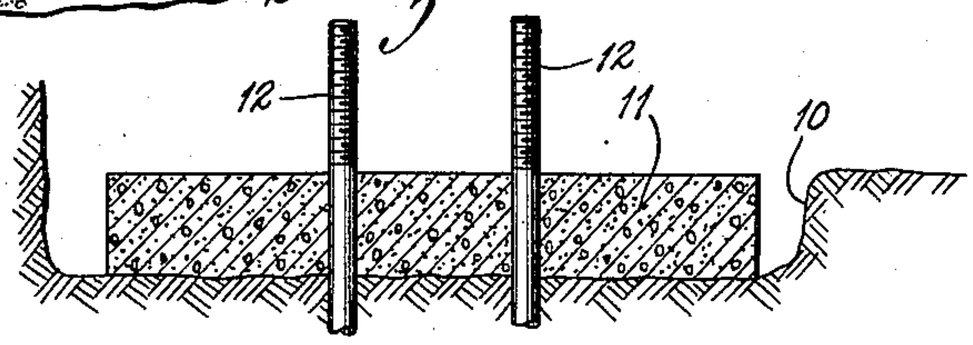


Fig. 3.

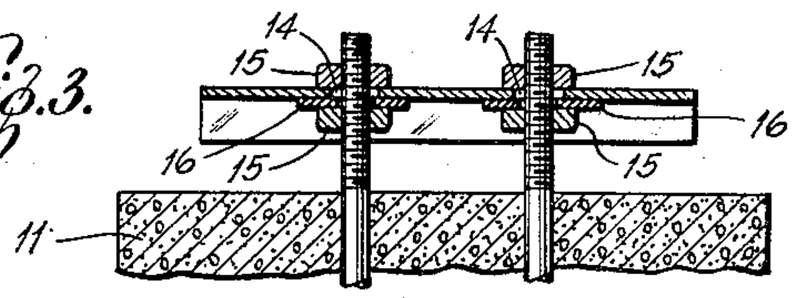
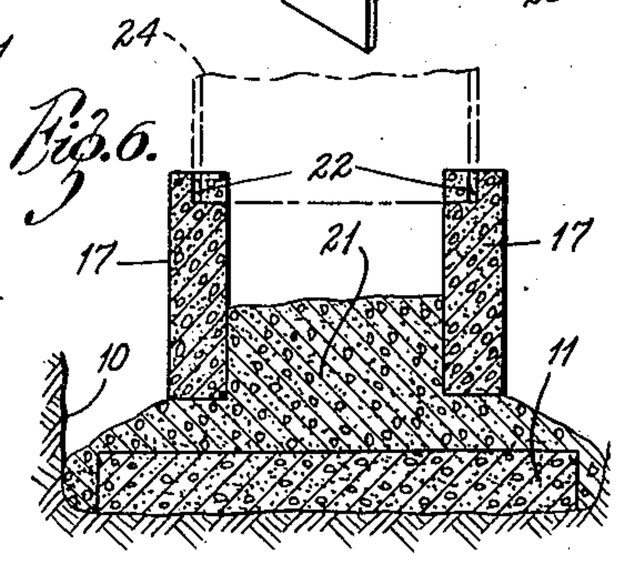


Fig. 6.



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Feb. 6, 1951 F. G. LANGENBERG 2,540,622

ADJUSTABLE FOUNDATION STRUCTURE

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Fig. 8.

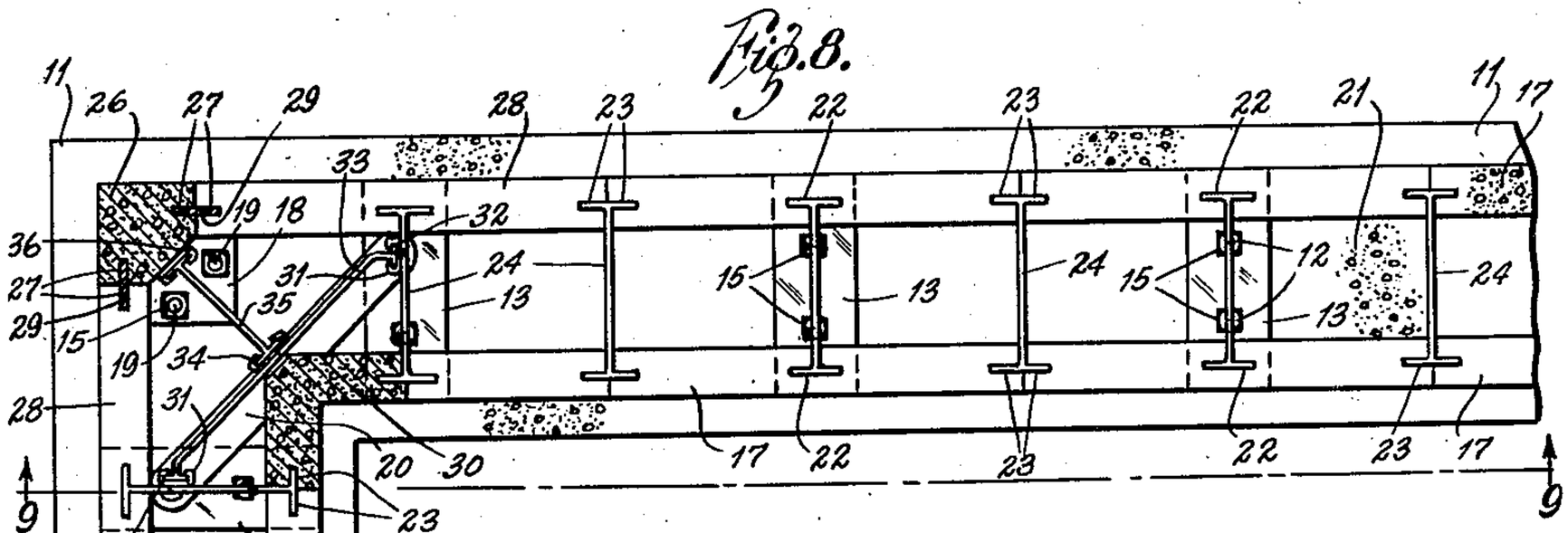


Fig. 9.

Fig. 10.

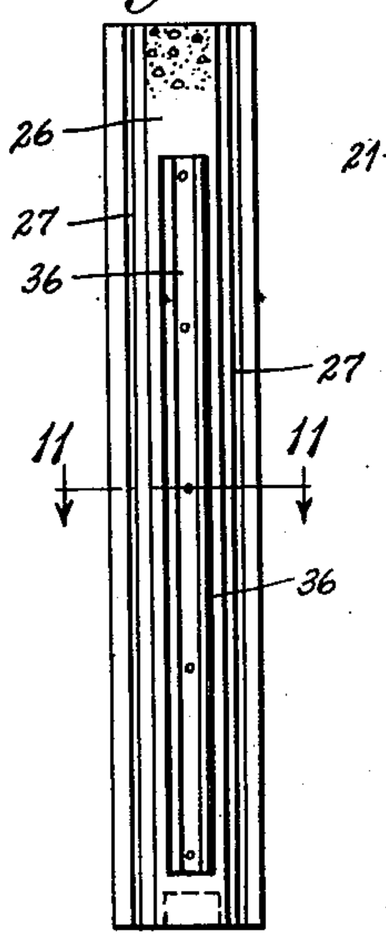


Fig. 11.

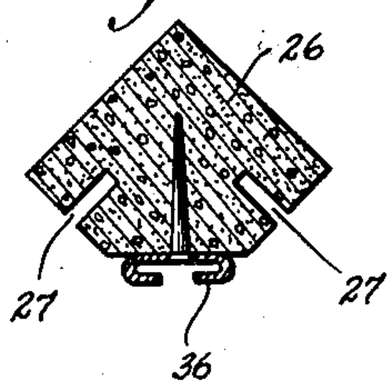
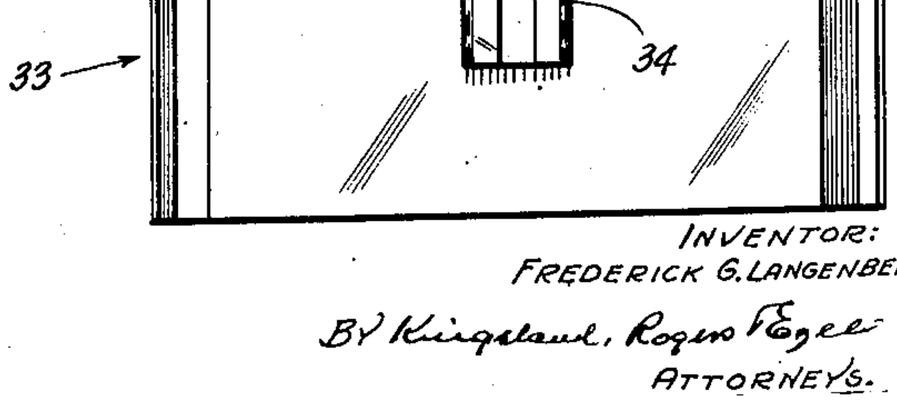


Fig. 12.



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Feb. 6, 1951 F. G. LANGENBERG 2,540,622

ADJUSTABLE FOUNDATION STRUCTURE

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Fig. 13.

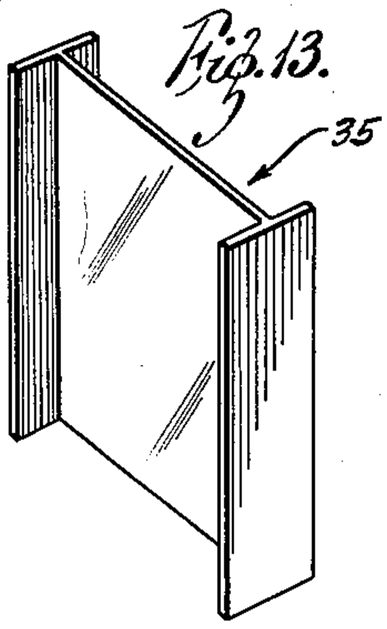


Fig. 14.

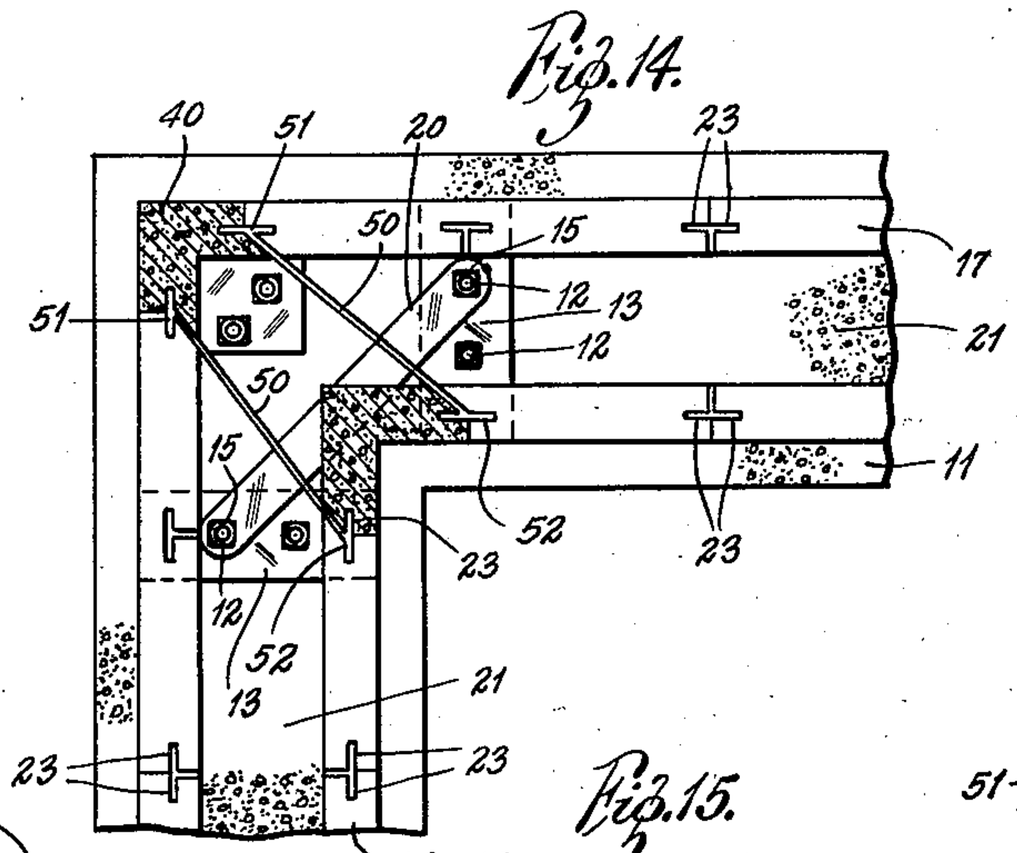


Fig. 17.

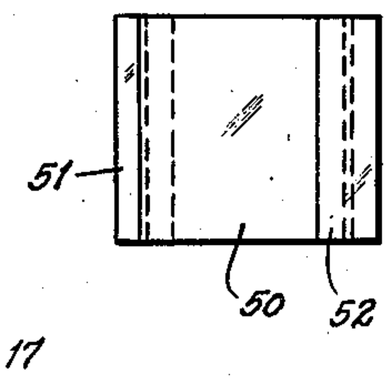


Fig. 16.

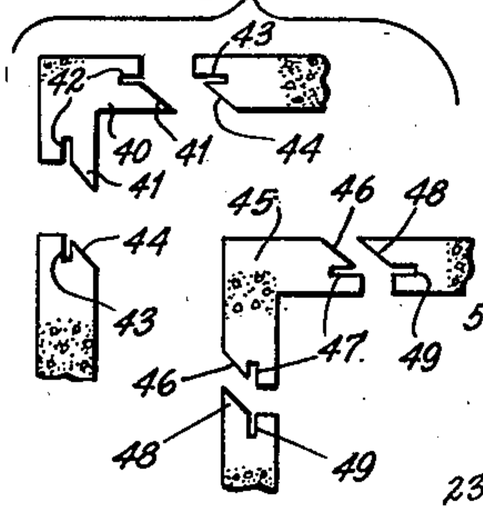


Fig. 15.

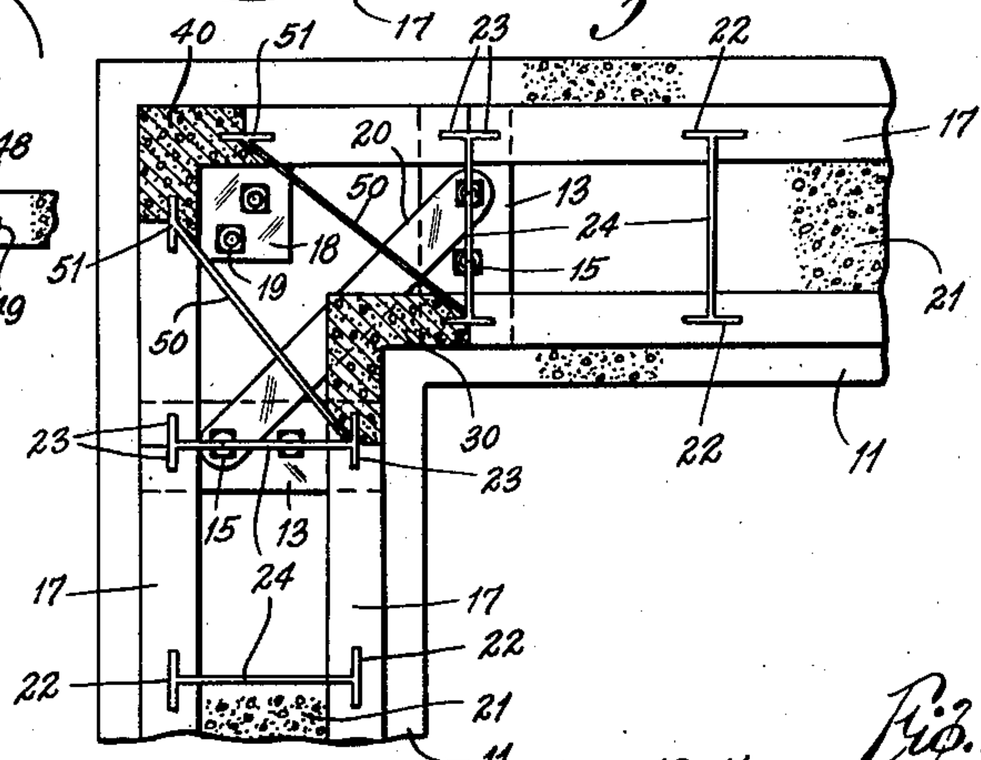


Fig. 18.

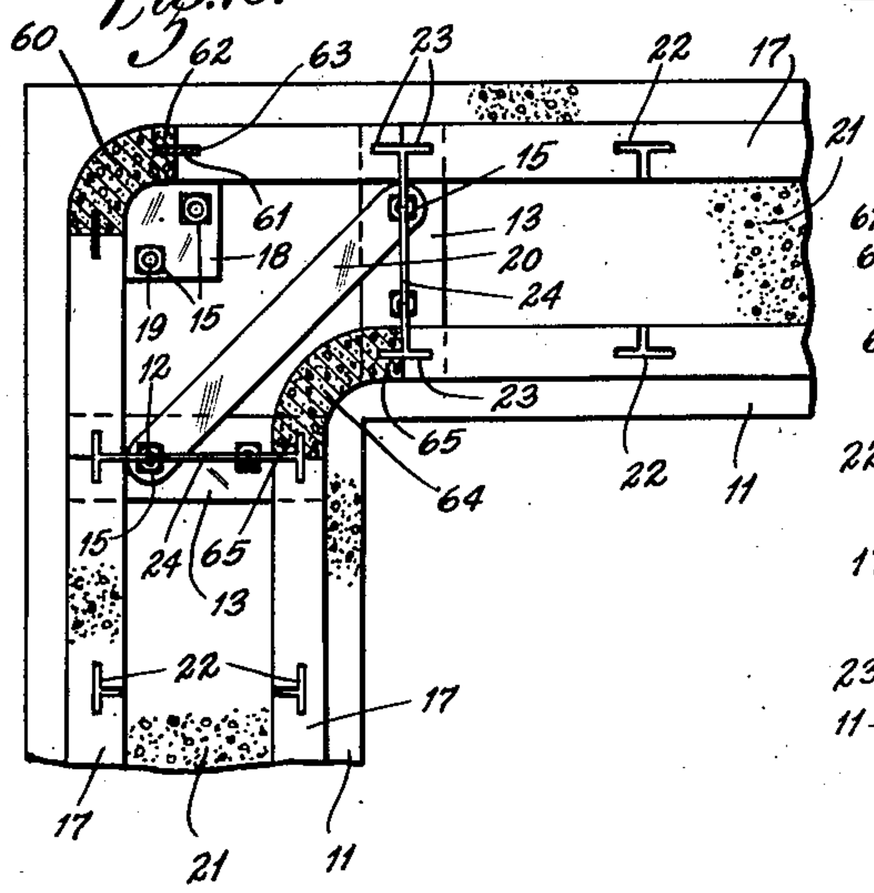
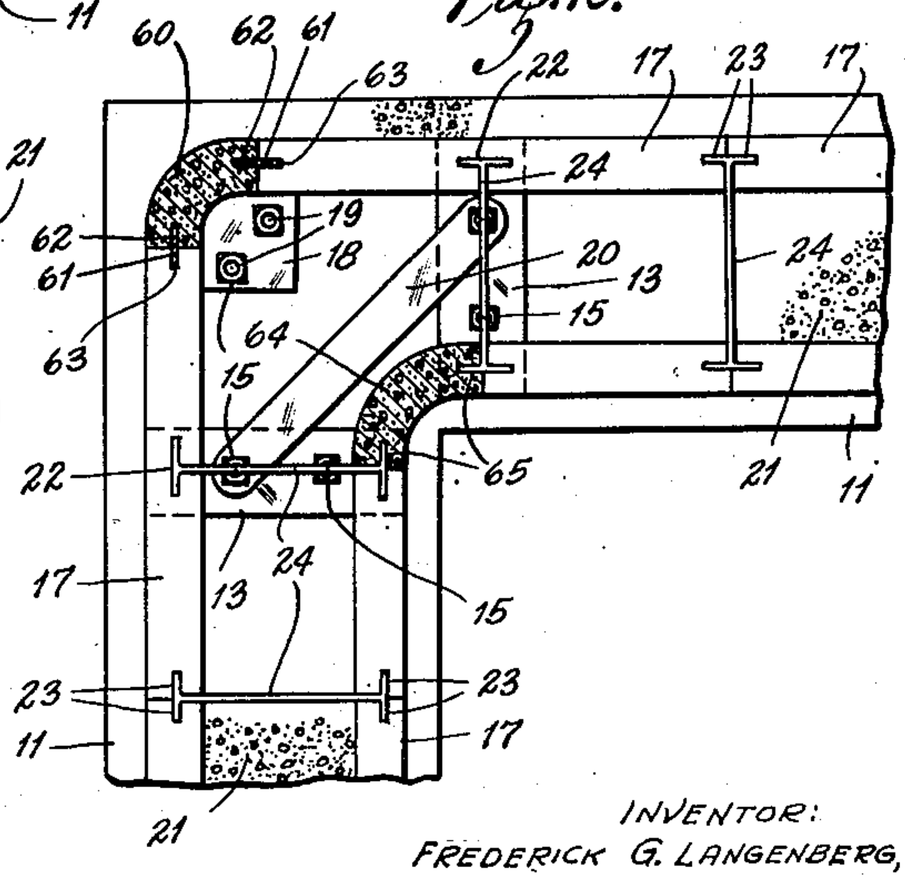


Fig. 19.



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UNITED STATES PATENT OFFICE

2,540,622

ADJUSTABLE FOUNDATION STRUCTURE

Frederick G. Langenberg, University City, Mo.

Application October 9, 1946, Serial No. 702,230

7 Claims. (Cl. 72—77)

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This invention relates to improvement in wall construction, and particularly to such construction formed from precast units of concrete, or like material, and the method of erecting the same.

An object of the invention, generally, is to provide a wall construction that may be economically erected into building structures of various designs, and which, when assembled, provides a rigid and permanent structure at a relatively low material and erection cost.

A more specific object is to provide a wall structure comprising spaced parallel walls formed from slabs of preformed cast concrete, or equivalent material, the slabs of the main wall structure being generally rectangular with especially formed corner members that cooperate with the side wall members to form a continuous angle wall section, whereby the structure may be tied together in such manner as to provide rigidity and strength when the building structure is erected.

Another object of the invention is to provide a wall structure of the type mentioned with a foundation or footing so constructed and coordinated with the superstructure so that the entire assembly of parts may be accurately leveled, thereby avoiding any strain or stress on any part of the structure when the superstructure is erected.

Another object of the invention is to provide in such a structure an improved means for tying together the separate units in order that the several courses, constituting the building structure, will be integrally united and strengthened both in a lateral and vertical direction.

Another object of the invention is to provide an improved method of erecting a wall structure utilizing the structural parts hereinafter more particularly described.

Additional novel structural advantages and method steps attained by the invention will appear from the following detailed description thereof taken in connection with the accompanying drawings, in which:

Fig. 1 is a plan view of a section of a building structure illustrating the tying together with the means for supporting the leveling of the first or lower course of the superstructure;

Fig. 2 is a cross section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a cross section taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a vertical sectional view taken substantially on the line 4—4 of Fig. 1;

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Fig. 5 is a plan view similar to Fig. 1, but with the first course of the superstructure assembled together with the structure constituting the tie for the corner section;

Fig. 6 is a cross section taken substantially on the line 6—6 of Fig. 5, but with the tying completed by a poured concrete layer which is poured subsequently to the leveling of the first course of the wall structure;

Fig. 7 is a perspective view of one of the tie plates for tying together the parallel spaced walls, the illustration in Fig. 7 being the form of tie plate used in tying the first course;

Fig. 8 is a view similar to Fig. 5, but illustrating the structure after the second course has been assembled;

Fig. 9 is a vertical section taken substantially on the line 9—9 of Fig. 8;

Fig. 10 is an inner edge view in elevation of the external corner brace member with which the corner tie construction is assembled;

Fig. 11 is a horizontal section taken substantially on the line 11—11 of Fig. 10;

Fig. 12 is an interior face view of an inner tie member constituting an element of the general tie structure for the corner section of the wall;

Fig. 13 is a perspective view of a tie plate member by which the elements shown in Figs. 10 and 12 are tied together, substantially the same form of tie member being employed for the cross-tie of the parallel side walls;

Fig. 14 illustrates a section similar to that illustrated in Fig. 5 with modified corner units and tie construction;

Fig. 15 is a view similar to Fig. 14, but illustrating the structure after the second course has been assembled;

Fig. 16 is a detail view of the wall corner units of the structure shown in Figs. 14 and 15, the units being separated for clearness;

Fig. 17 is a detail view of the strut or tie members employed in the corner tie construction illustrated in Figs. 14 and 15;

Fig. 18 is a view similar to Fig. 5, but with a further modification of the corner construction and of the corner tie structure; and

Fig. 19 is a view similar to Fig. 18, but illustrating the structure after the second course has been assembled.

In accomplishing the objects of the invention, the progressive steps in the erection of a simple angular wall building structure are illustrated. In each of the embodiments of the invention, the foundation or footing is of the same construc-

plates 18 by a tie bar or rod 20 secured, as shown in Fig. 1 of the drawings, to the adjacent outside rods 12 of the pair of rods that support the plates 13 adjacent to the corner of the structure.

After the footing has been prepared as described and all first course slabs leveled, a massed irregular layer of concrete 21 is filled in around the base of the lower course slabs and over the leveling plates, the lower portion of the first course slabs being partially embedded in the poured layer of concrete, as best illustrated in Fig. 6. The upper portion of the laterally spaced parallel slabs, forming the inner and outer wall of the wall structure, are tied together by a specially formed tie member illustrated in perspective in Fig. 7.

It will be noted that the inner surface of the unit slabs 17 are formed with T slots 22, the head of the T extended longitudinally of the slab and the vertical stroke of the T being inset in the inner surface of the wall slab. These T slots are provided at the center of the longitudinal length of each slab, and at the end of each slab are matching recesses 23 which form, when the ends of the slabs are abutted, the same T formation, half of which is carried by the end of one slab and half by the other. The specially formed tie member in the form of an I plate 24 is seated in the slots 22 and 23 and extends the full depth of each slab and is of a sufficient height to extend above the top edge of the lower course of slabs. It will be noted that the tie members 24 for the lower course have cutout sections 25 in the web so that they will fit over the plates and will extend downwardly to be embedded in the poured concrete layer 21. This method of tying the lower course of slabs gives added strength at the foot of the structure. The tie members 24 for the course above the base course are the same as illustrated in Fig. 7, except they need not have the cutout 25, and are preferably of the form shown in Fig. 13.

It should be noted that the tie members 24 are of sufficient height so that they extend the full height of the slabs and beyond the horizontal edges thereof so that, when the tie members are in place, they serve to tie the slabs forming three horizontal courses of the wall structure together.

After the poured layer 21 has set, the footing is in condition so that erection of the building may be proceeded with. It will be noted that, as I have illustrated the outer corner wall section particularly in Fig. 5, a specially formed wall unit specifically illustrated in Fig. 11 is fitted into the right angle at the corner of the outside wall course. This member comprises an angle block 26 which, for the lower course, is carried at the upper outside angle of the plate 18 as viewed in Fig. 1 of the drawings. Straight slots 27 are formed in this block and in the adjacent side wall units. The adjacent angle side wall units indicated by 28 are approximately half the normal length of the unit 17. Therefore, since the spacing of the plate 18 and the adjacent plates 13 is coordinated with the length of the units 28 and the outer walls of the unit 26, one end of each of the units 28, as well as the unit 26, is carried by the plate 18, and the units 28 are connected with the unit 26 by straight tie members 29 that seat in the slots 27, and serve to tie the units forming the corner of the wall structure together. The other end of the side wall units is carried respectively by the adjacent base supporting and leveling plates 13.

Inner corner units 30 form the angle of the

inner wall and are connected with the inner wall slabs by the tie members 24. The lower course tie members are formed as illustrated in Fig. 7. These corner tie members have attached to the inner face of the webs thereof inwardly opening U-shaped brackets 31, and the heads 32 of generally I-shaped plates 33 seat in said brackets 31. The connecting webs of the I-shaped plates 33 have attached to their inner face a U-shaped bracket 34 in which the inner heads of the I-shaped plates 35 seat. The unit 26 has attached to its inner flattened face a U-shaped bracket 36, and the outer end of the members 35 seat therein.

It will be noted particularly by reference to Figs. 10 and 12 that the member 26 that ties the bracket 36 is the height of two standard courses, and that the bracket 36 overlaps the horizontal parting line between the courses, while the plate 33 and the bracket 34 carried thereby are of a reduced height so that the bracket 36 supports two tie members 35, the inner ends of which are carried by separate brackets 34.

This brace structure constitutes, as will be readily appreciated, a strong connection between the corner units of the wall structure and is so constructed that it may be very readily and rapidly assembled.

In Figs. 14, 15 and 16, there is illustrated a modification of the corner unit constructions and also of the tie members for bracing and connecting the corners of the wall. The outer corner unit 40 is in the general form of a right-angle block having bevelled extensions 41 and having a slot 42 formed in each outer face. The adjacent wall units have the faces that match the corner unit 40 formed with a slot 43 and a bevelled face 44 complementary to the face 41 of the corner unit 40. The inner wall corner unit 45 is provided with bevelled end faces 46 and with vertical slots 47, the inner adjacent wall slabs having the faces adjacent to the corner unit 45 formed with a bevelled extension 48 and with slots 49. Instead of using the generally formed T-shaped strut structure of Fig. 5, the modification of the corner structure being described employs a pair of plates 50 having an outer angularly deflected T-shaped extension 51 that seats in the slots 42 and 43, the web of the plate extending between the adjacent faces of the member 40 and the contiguous slab units, and an angularly deflected T-shaped extension 52 that seats in the slots 47 and 49, the web extending between the unit 45 and the adjacent slab units.

This construction provides a very substantial corner reinforcement which, like the structure of Fig. 5, may be very rapidly and readily assembled. It has an advantage in that, by tying the complementarily bevelled faces of the corner units and the adjacent wall slabs, the opposed surfaces tend to lock together to prevent displacement of the corner units and, when tied together by the tie members illustrated and described, the corner units form in effect a keystone arch construction preventing longitudinal or lateral displacement of the units forming the corner of the wall structure. In other respects, the wall construction is erected in the same manner as hereinbefore described.

In Figs. 18 and 19, I have illustrated an additional modification in which is provided an outer wall corner unit 60 having a convex curved outer surface, the inner surface being concave, with the end faces thereof matching in parallel alignment the adjacent edges of the contiguous wall slab units. When this construction is employed, the

tie between the outer corner unit 60 is by means of a straight tie plate 61 that seats in vertical slots 62 in the unit 60 and in vertical slots 63 formed in the matching face of the adjacent wall slab unit.

The inner wall corner unit of the modification being described comprises a curved unit 64 having its outer surface concavely curved and its inner surface convexly curved. This unit has straight vertical slots 65 in its outer vertical faces and is directly crosstied by the tie member 24 in the form illustrated in Fig. 7 for the lower course and in the form illustrated in Fig. 13 for the upper courses. With the exception of these modifications, the wall structure is the same as has already been described in connection with the other views of the drawings.

The advantage of the modification shown in Figs. 18 and 19 is that it has a degree of simplicity greater than in the other illustrations, and for some structures will be preferred because of this and also because it provides a rounded line at the corner of both the exterior and the interior of the building.

In view of the above description, it will be readily understood that I have provided a wall construction which fully accomplishes the purposes of the invention and which results in a strong building structure that may be readily adapted to different designs. The structure economizes in cost of material as well as in cost of labor and erection because the assembly of the preformed units may be performed rapidly and efficiently without the exercise of a high degree of skill.

I have illustrated the several modifications in order to make a complete disclosure of the best forms in which the invention may be exemplified. It should be understood, however, that the detailed illustrations and description are not to be taken as limitations upon the scope of the invention except as expressed in the claims.

What is claimed is:

1. A wall structure comprising a poured footing of concrete, threaded rods embedded in said footing and extending above the top face of the footing, adjustable base supports carried by said rods, means associated with said rods and supports for independently adjusting said supports, and a wall structure including inner and outer wall slabs arranged in horizontal courses the base course of which is supported on said adjustable base supports.

2. A wall structure comprising a footing of poured concrete having a generally flat upper face, supporting rods embedded in said footing and extending above the upper face thereof, adjustable base plates carried by said rods, means associated with said rods and plates for independently adjusting said base plates, a wall structure mounted on said footing including inner and outer slabs arranged in horizontal courses the initial course of which is supported by said base plates, and a layer of binding material embedding said base plates after the same have been adjusted for leveling the initial course of the wall slabs.

3. A wall structure comprising a footing of poured concrete having a generally flat upper face, supporting rods embedded in said footing and extending above the upper face thereof, adjustable base plates carried by said rods, means associated with said rods and plates for independently adjusting said base plates, a wall structure mounted on said footing including in-

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ing larger than the rods so that the plates can be adjusted horizontally, and nuts mounted on the rods above the plates.

7. A wall structure, comprising a poured footing of material that sets to form a monolithic wall, rods embedded in said footing and extending above the upper face thereof, the upper ends of said rods being threaded, nuts threaded on the tops of the rods, plates having openings formed therein disposed over the rods above the nuts, the openings in the plates being larger than the rods so that the plates can be adjusted horizontally, nuts mounted on the rods above the plates, a wall structure mounted on said plates including inner and outer members arranged in horizontal courses, the base course of which is supported on said plates, and a layer of binding material embedding the upper face of the footing, the plates and the lower section of said base course.

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