July 20, 1926.

1,593,180

J. D. LAWRENCE

BUILDING CONSTRUCTION

Filed Jan. 21, 1926

2 Sheets-Sheet 1

Fig. 1

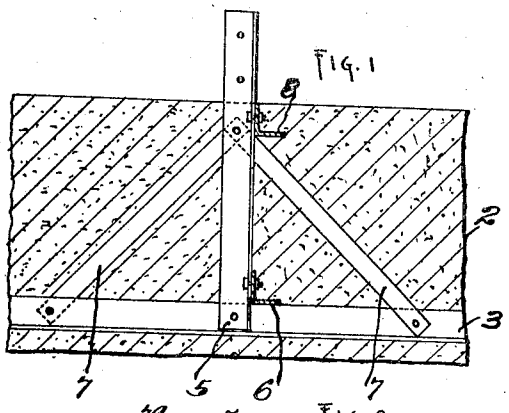


Fig. 2

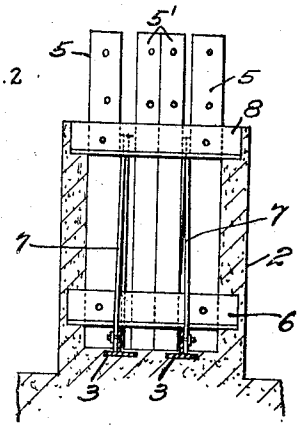


Fig. 3

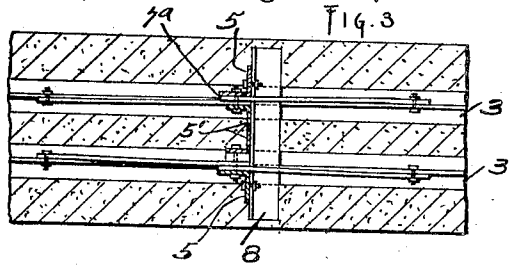


Fig. 4

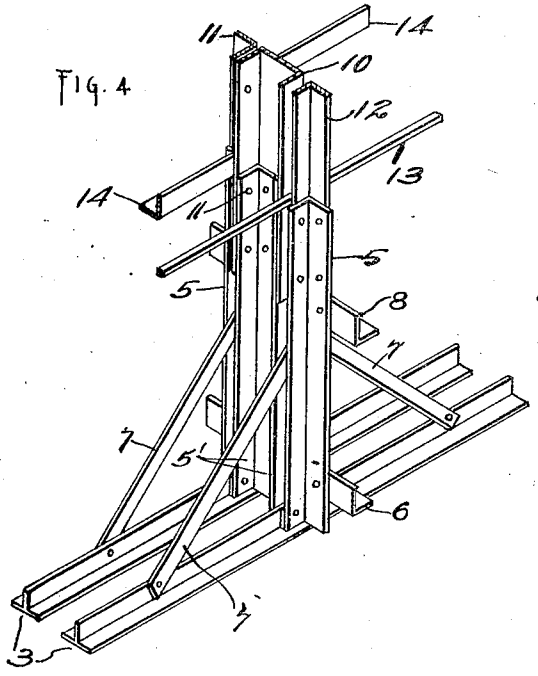
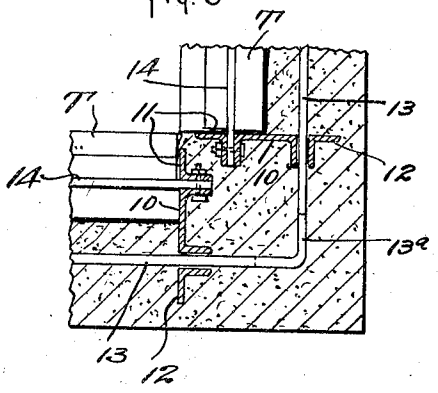


Fig. 5



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2 Sheets-Sheet 2

Fig. 7.

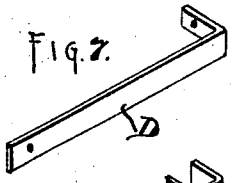


Fig. 8.

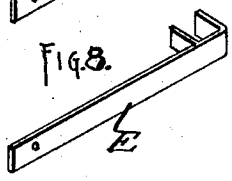


Fig. 6.

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UNITED STATES PATENT OFFICE.

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BUILDING CONSTRUCTION.

Application filed January 21, 1926. Serial No. 82,762.

This invention relates to building construction and more particularly to a structure designed to withstand the effects of earthquake shocks of such intensity as cause the collapse of common tile, stone, brick and concrete wall structure.

An object of the invention is to provide a substantial reinforced foundation with provision for direct interfabrication of a superstructure of steel.

Another object is to provide for the interlocking of block courses in a wall to a steel fabrication in such manner that the blocks will be tied in the wall fabric and cannot fall or sway out.

Another object is to provide a wall structure including inner, block sources interbonded with an anchored fabrication and which block structure constitutes a permanent wall of a form when an outer falsework structure is built up in association therewith. In other words, an object is to materially reduce the amount of temporary wooden or other form-work needed in making a concrete wall.

A further object is to provide a wall incorporating a system of vertical studs rigidly connected by horizontal bars interlocked with block courses, and including an outer wall body of concrete which is reinforced by rods interlaced in the vertical system.

An object is to obtain continuity of frame fabrication and thus obtain great structural strength and rigidity, and further to provide a plurality of sets of uprights and plural sets of horizontal reinforcements for earthquake resistance.

Numerous other objects and advantages of the present method and structure, and combination of elements will be made manifest in the ensuing specification of means embodying the invention; it being understood that modifications, variations and adaptations may be resorted to within the spirit and principle of the invention and the scope thereof as here claimed.

Figure 1 is an elevation of the anchor studding and embedded foundation reinforcement.

Figure 2 is a cross-section of the anchorage.

Figure 3 is a plan of the anchorage.

Figure 4 is a perspective of connected studding and anchorage.

Figure 5 is a plan and horizontal section of a corner of a wall and its fabrication.

Figure 6 is a plan and horizontal section of a composite block and concrete wall and an outer false form frame.

Figure 7 is a perspective of a mold frame clip.

Figure 8 is a perspective of a top wall form spreader.

In my present invention there is embedded in a foundation or still 2, a plurality of horizontal reinforcing structural iron bars 3, here shown as T's laid web upward. To the webs are rigidly fastened the lower ends of anchor-studs 5 which are here shown as of angle-iron. The anchor-studs are arranged in pairs on the bars 3 with transverse flanges all standing in a common vertical plane.

Sets of studs 5 are pitched along the foundation or sill, as may be desired, and the feet of each set of pairs of studs 5 are solidly cross connected by cross-bars 6 resting on the tops of the horizontal bars 3. Further rigidity is obtained by diagonal braces 7 pairs of which are attached firmly to the webs of bars 3.

The upper ends of the braces of a pair are overlapped at 7^a in between contiguous flanges of respective anchor-studs 5 from a common foundation bar 3.

At about the top surface of the foundation 2 there is an upper cross-tie 8 of angle iron secured to the coplanar backs of the anchor-studs 5.

The above structure, therefore, constitutes a foundation and wall anchorage complete in itself for the erection of all types of buildings, except, possibly, large affairs requiring standardized regulation size, steel frame, for which my present invention provides a supplement for locking the curtain and partition walls to the regulation frame.

According to my present invention, main, curtain and partition walls are built up as follows:

Lapped along and embracing the intermediate anchor-studs 5', in a set, are standard channel-iron wall studs 10 riveted or bolted at 11. To the remote studs 5 of a group (Fig. 4) there is secured, in lapping, upright position, inside and outside studs 11 and 12. The stud 12 is spaced far enough

from the channel stud 10 to provide room for laying a stout reinforcing rod or bar 13 which is of a length to extend along the outer system of erected studs 12.

The inner studs 11 are horizontally connected by lengths of reinforcing braces 14 of structural iron whose flanges are cut away in such manner as to allow the vertical flat end 14ª to be placed between proximate flanges of studs 10 and 11, (Fig. 4), and well fastened.

Each horizontal brace 14 extends from only one stud 11 to the next stud 11 in the wall so that as a wall of blocks or tile T is built up in courses, as usual, these courses may have broken joints at opposite sides of intervening studs 11.

As a permanent inner wall of tiles T is built up it may be used as an inner form face as shown in Fig. 6. In such case an outer false form F of any appropriate structure is tied by wires W bound over the inner braces 14 and studs 5 at the corners, and is also braced by soaped, headless bolts C and clips D. Top wall spreaders E are employed to hook over the top of the form F as it is built up. When the form is removed the bolts C may be screwed out of the concrete.

The reinforcing bars 13 are laid in place as the form work is built up and before the concrete mix for the outer wall is poured, or the bars may be laid as the wall is built up in sections.

At intersections of walls the bars 13 have their ends bent angularly at 13ª, to make an effective interlock.

The reinforcing braces 14 may be of various sections and the inner wall may be of tile or of brick. The outer wall may be of concrete as in Fig. 6.

The invention claimed is:

1. A reinforced building construction comprising a foundation having horizontal reinforcing bars, anchor-studs rigidly secured in upright position to said bars and being transversely aligned in a vertical plane, cross-means secured to the anchor-studs, and diagonal bracing secured to the studs and to the said bars.

2. A reinforced building construction comprising a foundation, laterally spaced horizontal, reinforcing bars embedded therein, anchor studs secured, in pairs, at their lower ends to a respective bar, said pairs being coplanar, cross-ties connecting the grouped pairs, and diagonal bracing connecting each pair of anchor studs to its respective bar.

3. A reinforced building construction comprising a foundation, laterally spaced horizontal, reinforcing bars embedded therein, anchor studs secured, in pairs, at their lower ends to a respective bar, said pairs being coplanar, cross-ties connecting the grouped pairs, and diagonal bracing connecting each pair of anchor studs to its respective bar; said bracing being lapped at upper ends and disposed between contiguous flanges of pairs of the anchor-studs.

4. In a building fabrication, horizontal T-bars with upstanding webs, anchor-stud elements secured in pairs to respective flanges of said studs and all in a common plane across the bars; the studs of a pair being spaced by the upstanding webs, diagonal braces secured at their upper ends to respective pairs of anchor-studs on a bar and being attached to the respective web, and cross-ties connected to the grouped studs.

5. A reinforced building construction comprising a foundation having horizontal reinforcing bars, anchor-studs rigidly secured in upright position to said bars and being transversely aligned in a vertical plane, cross-means secured to the anchor-studs, and diagonal bracing secured to the studs and to the said bars, and wall stud elements attached at their lower ends to the anchor-studs, and comprising an intermediate channel-iron and lateral angle elements.

6. A reinforced building construction comprising a foundation having horizontal reinforcing bars, anchor-studs rigidly secured in upright position to said bars and being transversely aligned in a vertical plane, cross-means secured to the anchor-studs, and diagonal bracing secured to the studs and to the said bars, and wall stud elements attached at their lower ends to the anchor-studs, and comprising an intermediate channel-iron and lateral angle elements; the web of the channel-iron and flanges of the said elements being in a common transverse plane.

7. A wall comprising anchor studs which are arranged in a series of inner pairs and a series of outer pairs so as to form an inner system and an outer system, a series of intermediate wall studs comprising channels secured to the intermediate anchor studs, and angle studs flanking the channels and secured to the extreme anchor studs; said angle studs being spaced from their contiguous channel studs, and an inner system of horizontal braces and an outer system of horizontal reinforcing bars interlocking in the spaces between the angle studs and the respective channel studs, a course built inner block wall embedding and interlocking with the system of braces, and an outer wall body embedding the reinforcing bars.

8. A wall comprising anchor studs which are arranged in a series of inner pairs and a series of outer pairs so as to form an inner system and an outer system, a series of intermediate wall studs comprising channels secured to the intermediate anchor studs, and angle studs flanking the channels and

secured to the extreme anchor studs; said angle studs being spaced from their contiguous channel studs, and an inner system of horizontal braces and an outer system of horizontal reinforcing bars interlocking in the spaces between the angle studs and the respective channel studs, a course built inner block wall embedding and interlocking with the system of braces, and an outer poured concrete wall body embedding the reinforcing bars.

9. A wall comprising anchor studs which are arranged in a series of inner pairs and a series of outer pairs so as to form an inner system and an outer system, a series of intermediate wall studs comprising channels secured to the intermediate anchor studs, and angle studs flanking the channels and secured to the extreme anchor studs; said angle studs being spaced from their contiguous channel studs, and an inner system of horizontal braces and an outer system of horizontal reinforcing bars interlocking in the spaces between the angle studs and the respective channel studs; said reinforcing bars having their ends, at corner intersections, bent at an angle for corner interlock.

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