

E. GODFREY.  
 REINFORCED CONCRETE RETAINING WALL.  
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915,590.

Patented Mar. 16, 1909.

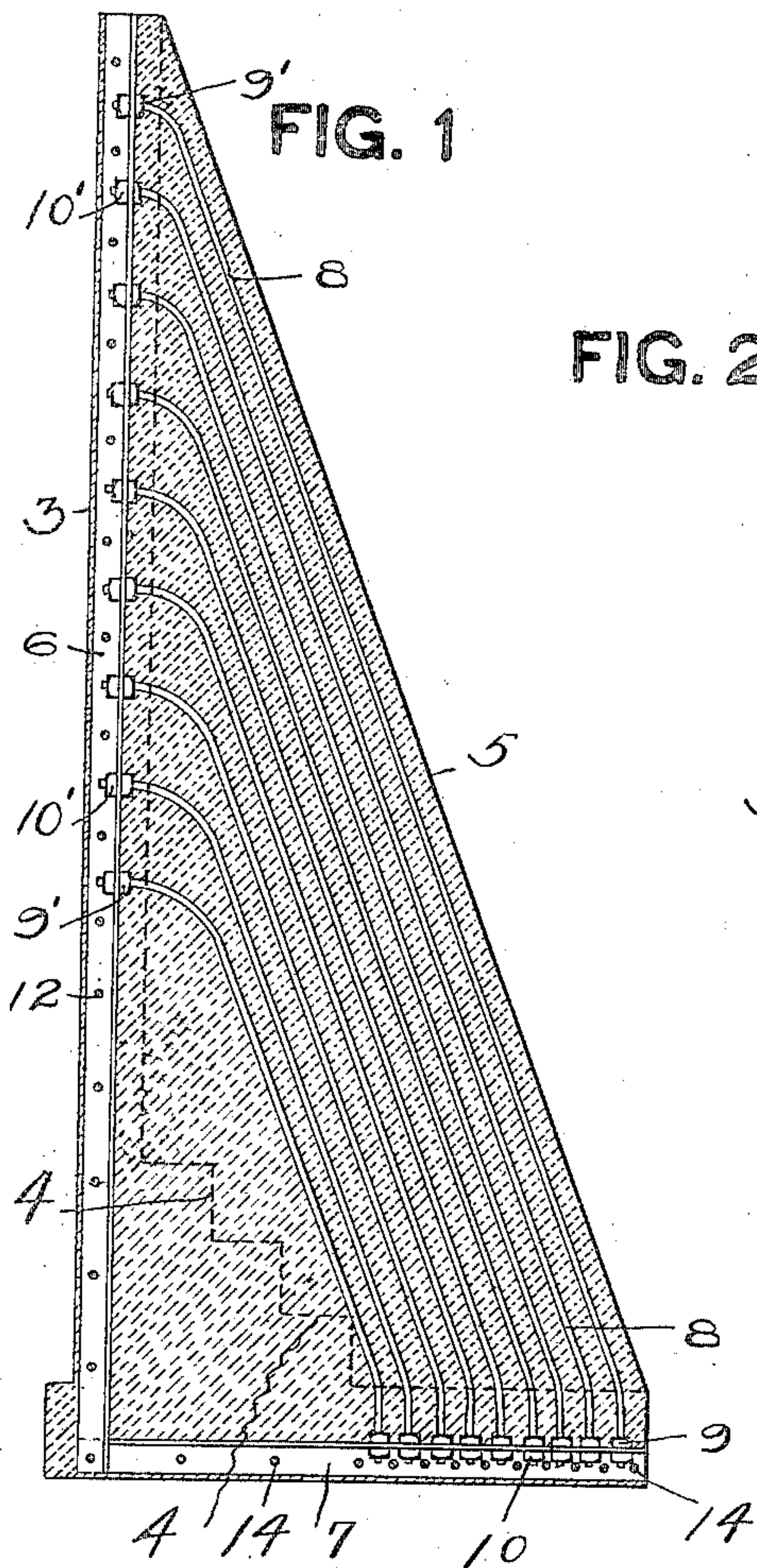


FIG. 2

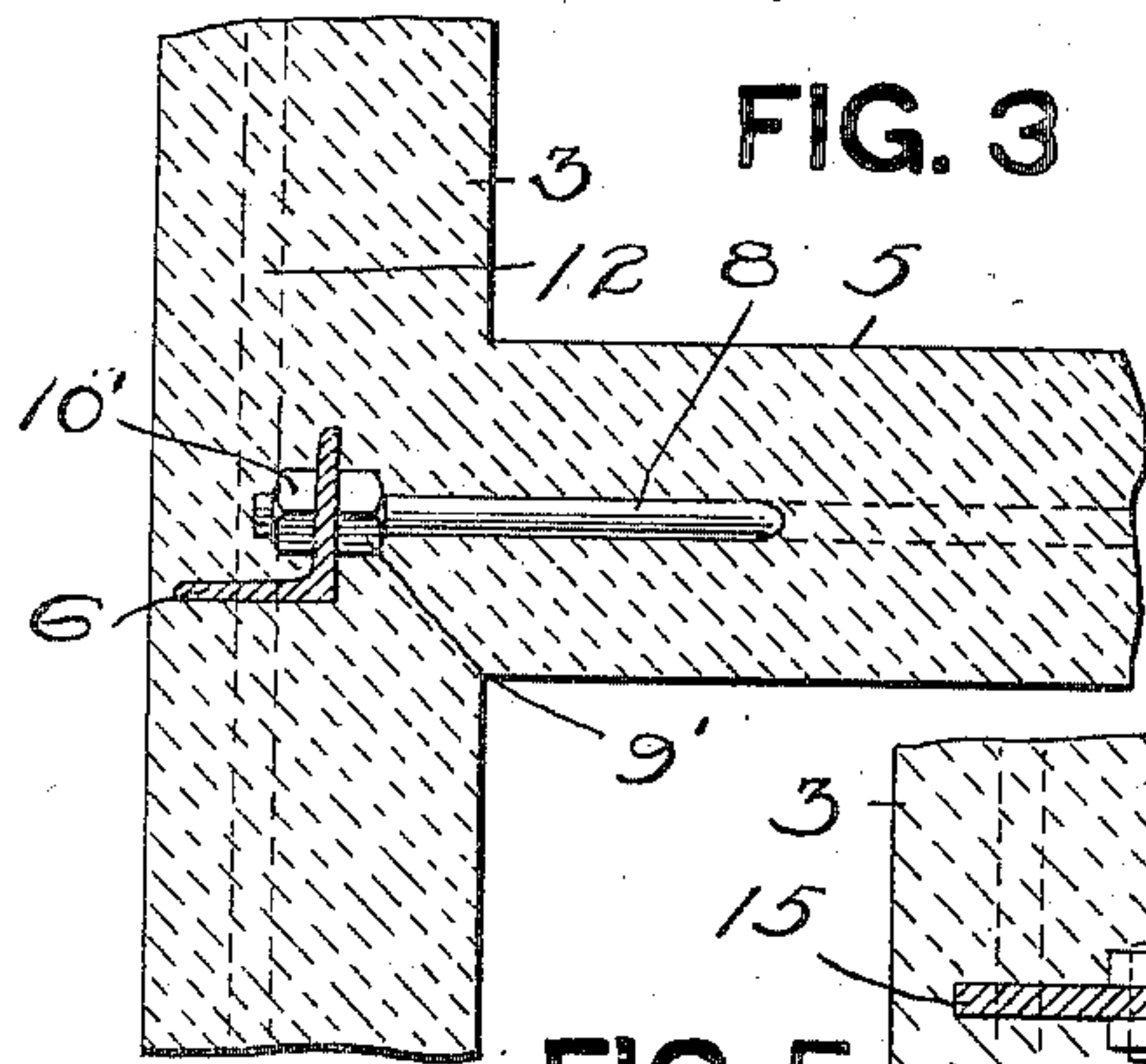
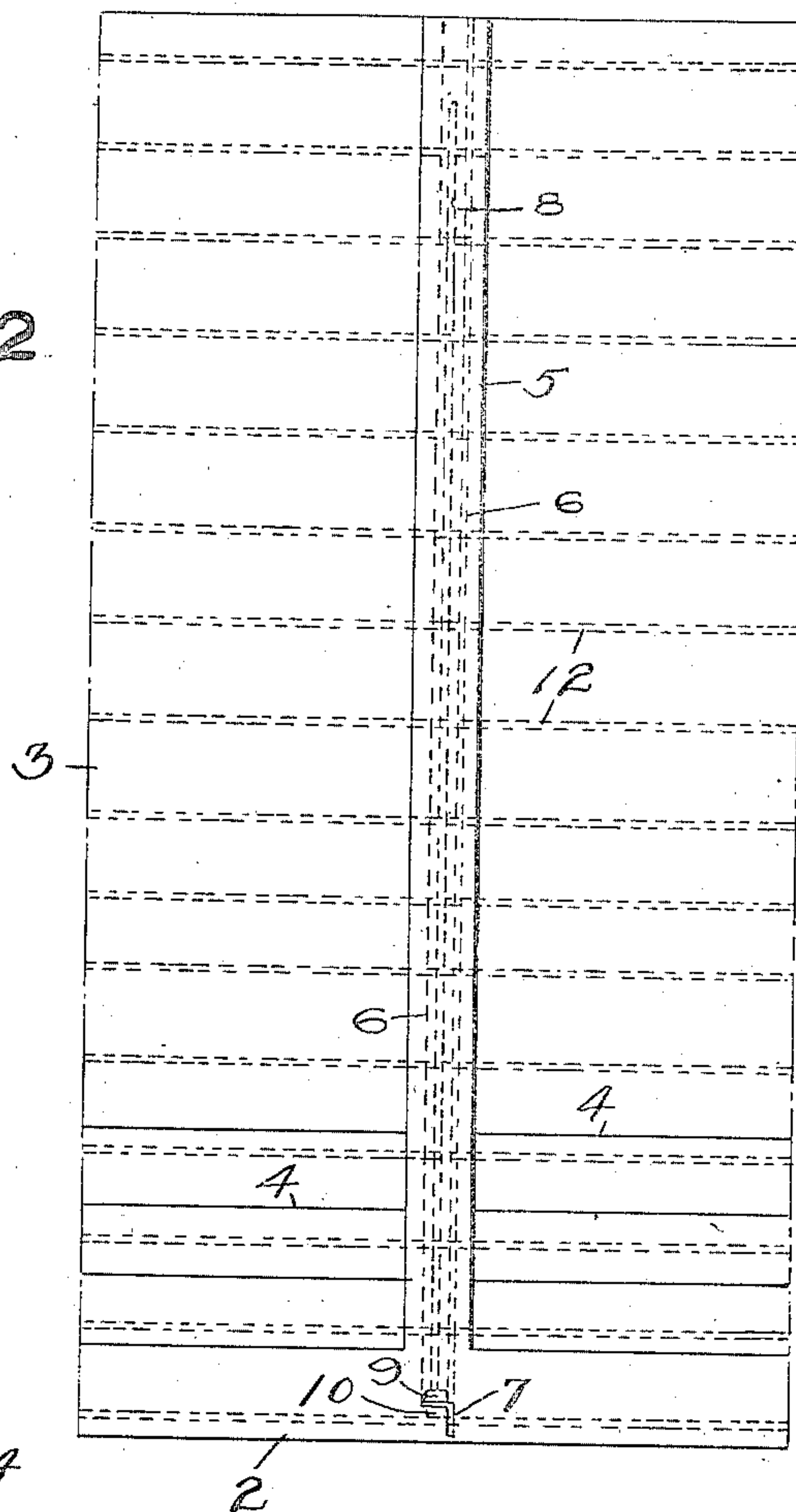


FIG. 3

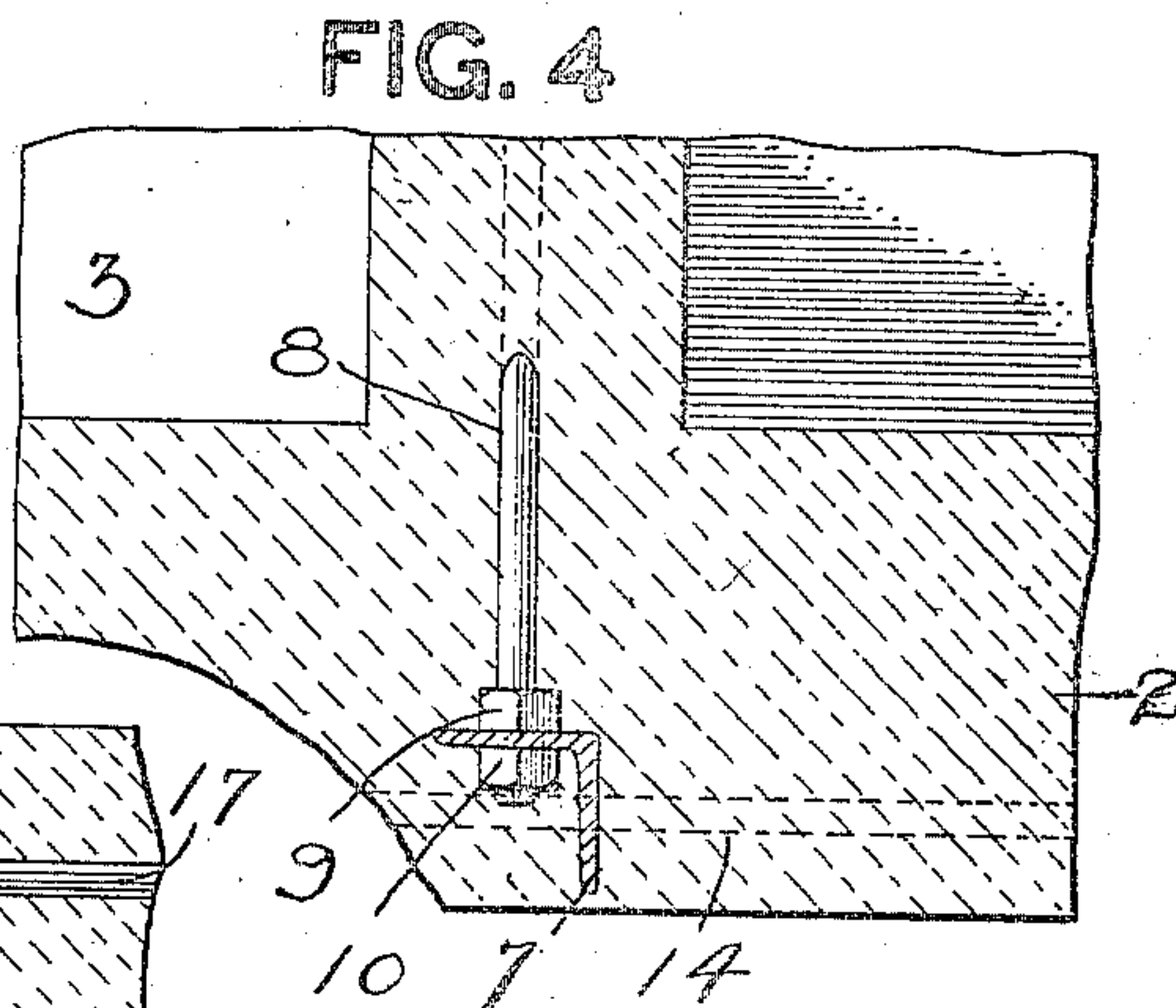


FIG. 4

FIG. 5

WITNESSES.

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# UNITED STATES PATENT OFFICE.

EDWARD GODFREY, OF PITTSBURG, PENNSYLVANIA.

## REINFORCED-CONCRETE RETAINING-WALL.

No. 915,590.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed January 30, 1908. Serial No. 413,406.

*To all whom it may concern:*

Be it known that I, EDWARD GODFREY, of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a certain new and useful Improvement in Reinforced-Concrete Retaining-Walls, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a vertical sectional view through one of the ribs or counterforts of the wall; Fig. 2 is a rear elevation of a portion of the wall, the construction being indicated by dotted lines; Fig. 3 is a horizontal sectional view of a portion of the wall; Fig. 4 is a vertical sectional view of a portion of the wall; and Fig. 5 is a horizontal sectional view of a portion of the wall illustrating a modification.

My invention relates to an improvement in reinforced concrete retaining walls, adapted to resist the lateral pressure of earth, or water where the wall is used in the construction of dams. This pressure is, as is well known, uncertain, depending upon the character of the earth and to the presence or absence of moisture. It is therefore necessary, in retaining walls and dams, to provide for pressure greater than that which might ordinarily be exerted.

To this end my invention consists in reinforcing rods secured to anchoring bars or plates embedded in a counterfort, which rods and plates act to tie the bottom slab and vertical walls together, and make a connected steel frame within the concrete.

I will now describe my invention so that others skilled in the art to which it appertains may employ the same.

In the drawings, 2 represents the bottom slab of the wall and 3 the front curtain wall. Above the slab 2 are the steps 4, the purpose of which is to obviate steel rod reinforcement to the slab in this portion. At desired intervals, extending rearwardly from the wall 3 are the counterforts 5, the outer faces of which slope at an angle from the end of the base of the slab 2 to the top of the curtain wall 3. These parts of the wall are designed to be formed of concrete to be filled in after the steel framework of the wall is erected. This steel framework is composed of vertical or approximately vertical angle bars, horizontal, or approximately horizontal angle bars, and tie-bars extending between and firmly secured to the angle-bars or plates.

In the drawings, 6 represents the vertical angle-bars or plates, located in the curtain of the wall and extending from the base of this wall to the top thereof. These vertical bars are located at each of the counterforts 5. Extending horizontally, or at an angle to the vertical bars 6 are angle-bars or plates 7. The bars 6 and 7 may be united at their adjacent or meeting ends by suitable bolts or other attachments. The flanges of the angle-bars 6 and 7 are provided with holes through which pass the ends of the round tie-bars 8, which ends are threaded and secured to the angle-bar by the front and back nuts 9 and 10, or by other suitable attachments. These rods 8 may start vertically, but begin near the foot of the wall to curve and thence extend diagonally to the vertical bars 6, curving at a point adjacent to these bars so as to enter holes in the flange of the bar 6 at substantially right angles to the vertical plane of the same. The upper ends of the rods 8 are threaded and are secured to the flange of the vertical bars 6 by front and back nuts 9' and 10', or by other suitable attachment. Horizontal rods 12 pass through the second flange of the vertical bars 6, and serve as a reinforcement to the curtain wall. They may be secured by double nuts at the two end bars, similar to the two nuts 9 and 10. Similar horizontal bars 14 pass through the flanges of the horizontal bars 7, and they may be secured in a like manner as in the case of the rods 12.

In Fig. 5 in place of the angle-bars 6 I show a plate or bar 15 and devices 16 for securing the end of the tie-rod 17 to the anchor-bar or plate. This device may be used in place of either the horizontal or vertical angle-bars 6 and 7, but I do not desire to limit myself to any specific form of anchoring bar.

The advantages of my invention will be appreciated by those skilled in the art. The rigid and resisting framework of steel does not depend on the adhesion of the concrete for its rigidity. The vertical and horizontal anchoring bars form a perfect anchorage and serve to distribute the strain equally throughout the structure.

Although I have used the words "horizontal" and "vertical" I do not desire to limit myself by these terms as they are used merely relatively in regard to the angles of the two sets of anchoring bars, which angles may be varied from acute to obtuse as the various forms of structure demand.



Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A reinforced concrete retaining wall comprising a curtain wall, a substantially horizontal bottom slab, counterfort members extending between and connecting said curtain wall and said slab, transverse anchoring bars of rigid heavy metal embedded in the face of said curtain wall and said slab, longitudinal reinforcing rods connecting said anchoring bars, and detachable means for bracing the framework of the curtain wall from the framework of the slab.

2. A reinforced concrete retaining wall comprising a curtain wall and a base slab, a framework of intersecting metal bars in said curtain wall, a framework of intersecting metal bars in said base slab detachably connected to the framework in said curtain wall and means for bracing said slab framework from said curtain wall framework.

3. A reinforced concrete retaining wall comprising a curtain wall and a base slab, a framework of intersecting metal bars in said curtain wall, a framework of intersecting metal bars in said base slab detachably connected to the framework in said curtain wall, bracing bars detachably secured to said slab framework and said curtain wall framework for bracing one from the other.

4. A reinforced concrete retaining wall comprising a curtain wall, a substantially horizontal bottom slab, counterfort members extending between and connecting curtain wall and said slab, anchoring members embedded in the said curtain wall and said slab at the intersection of the counterfort members therewith, and reinforcing rods within said curtain wall and slab and tie-rods within the counterfort members detachably secured to said anchoring members.

5. A reinforced concrete retaining wall comprising a curtain wall having a plane resisting surface, a base slab integral with said curtain wall and extending rearwardly of said resisting surface, and concrete reinforcing means at the angle of said wall and slab.

6. A reinforced concrete retaining wall comprising a curtain wall having a plane resisting surface, a base slab integral with said curtain wall, reinforced concrete counterforts bracing the rear of said vertical wall from said base slab, and concrete reinforcing means for bracing the angle of said wall and slab.

In testimony whereof, I have hereunto set my hand.

EDWARD GODFREY.

Witnesses:

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