H. ROOT.

SKELETON STRUCTURE FOR CONCRETE WALLS.

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956,424.

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Fig. 1.

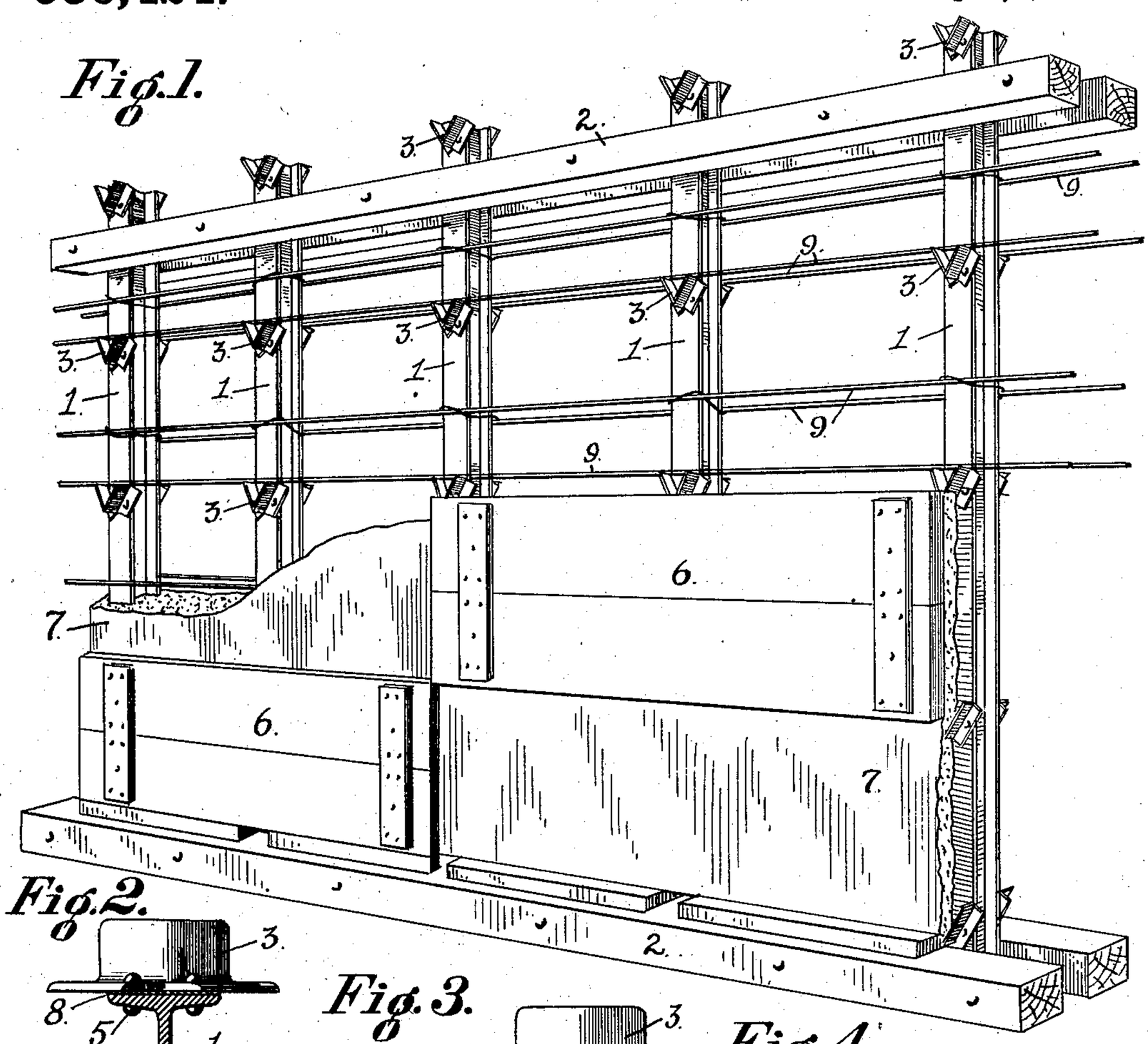


Fig. 2.

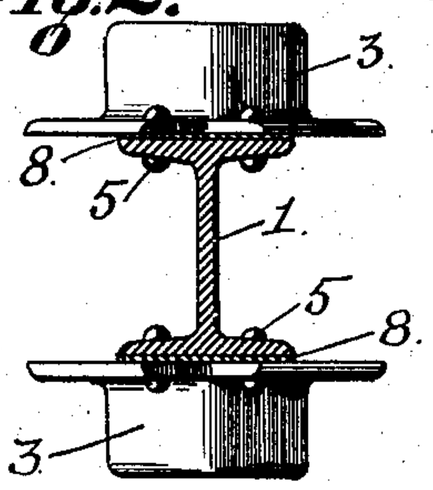


Fig. 3.

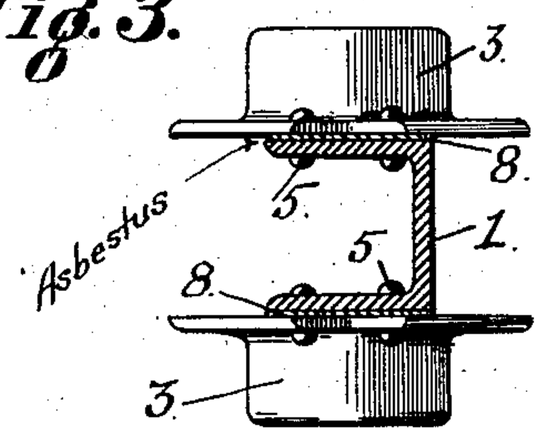


Fig. 4.

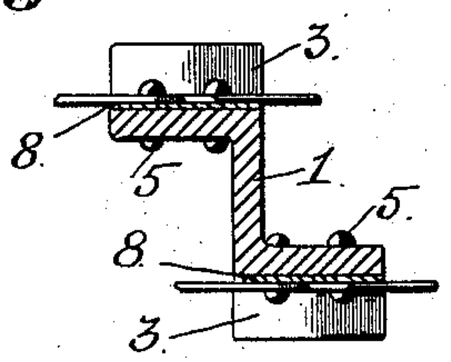


Fig. 5.

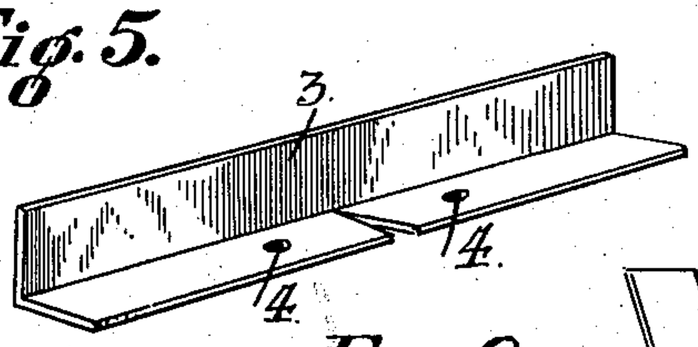
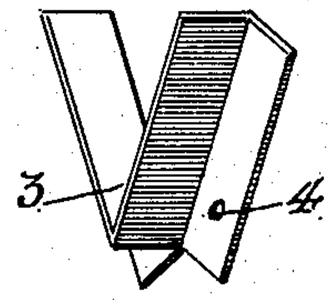


Fig. 6.



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SKELETON STRUCTURE FOR CONCRETE WALLS.

956,424. Specification of Letters Patent. Patented Apr. 26, 1910.

Application filed December 26, 1908. Serial No. 469,234.

To all whom it may concern:

Be it known that I, HENRY ROOT, a citizen of the United States, residing in the city and county of San Francisco and State of California, have invented certain new and useful Improvements in Skeleton Structures for Concrete Walls, of which the following is a specification.

My invention relates to that class of fire-barrier walls in which a rigid skeleton-structure is embedded in a non-inflammable material.

My invention consists in the novel rigid skeleton-structure which I shall now fully describe, by reference to the accompanying drawings in which—

Figure 1 is a perspective view of the skeleton-structure, showing it in connection with form-panels in which the non-inflammable material, such as concrete, is molded to embed the structure, and make the completed wall. Fig. 2 is a view showing an I-beam cross-section, which is the preferred form for the main-members or studs of the skeleton-structure, and showing also, the spacing-members or pieces secured to the faces of the main-members or studs. Fig. 3 is a similar view showing a channel-section as a form for the main-members or studs. Fig. 4 is a similar view of a Z-section for the same purpose. Fig. 5 is a perspective view showing the preferred form of the spacing-members or pieces before they are bent to shape. Fig. 6 is a view showing one of said spacing-members or pieces after it is bent and ready for use.

1 are the main members or studs of the skeleton-structure. They are best formed of some rolled section of metal, the preferred section being an I-beam, as shown in Fig. 2. They may, however, be made of other rolled sections, as, for example, the channel-section of Fig. 3, or the Z-section of Fig. 4. These studs are spaced or separated as shown in Fig. 1, and may be temporarily held by clamps 2 at the top and bottom.

3 are the spacing members or spacing-pieces. These are made of angle iron, and may have any suitable contour. In their best form they are V-shaped as shown in Fig. 6. In this shape they are prepared from blanks as shown in Fig. 5, with holes 4 punched in one of their flanges. These spacing-pieces are set with their punched flanges flat against the opposite exterior faces or edges of the studs 1; and rivets 5, through their holes, hold them to said main-members. They are fitted with their open-bases upward, that is, in the direction from which the concrete is fed, so that the latter may enter between their legs and fill them; and said spacing pieces are best made of a base-width sufficient to let their extremities overlap or project beyond the edges of the faces of the studs, as seen in Figs. 2, 3 and 4, so that said extremities, projecting into the concrete, serve to better bind it and avoid a weakened line along the edges of the studs.

The unpunched flanges of the spacing-pieces extend outwardly at right angles from the faces of the studs; and against the edges of said flanges, the form-panels 6 are placed, thereby giving the necessary space to fill in with concrete.

When the form-panels are removed, as seen in two instances in Fig. 1, the concrete 7 will have embedded the skeleton-structure, leaving only the thin edges of the spacing pieces, at or near the surface. The angle-section of the spacing pieces affords both a firm, stable bearing against the studs, and provides means for firmly securing them to said studs, both of which are of advantage in this work. The V-shape of the spacing-pieces is also of advantage in affording a bearing for the adjacent corners of four form-panels 6.

If desired a sheet 8 of non-conducting material, such as asbestos, may be placed between the spacing-pieces and the faces of the studs. This, when used, will be of advantage in separating said spacing pieces from the studs, with regard to heat conductivity. As before stated, the only portions of the skeleton structure which are not deeply embedded in the concrete are the edges of the spacing-pieces. Such heat as these may be subjected to will not under ordinary circumstances be conducted to any extent to the studs, which form the back-bone of the structure, but if it be likely to be so conducted, and for extra precaution, the asbestos sheets 8 may be used, as stated.

The spacing pieces not only provide the necessary space for filling in the concrete but also provide for embedding in said concrete the horizontal reinforcement rods 9, Fig. 1, which are wired to the faces of the

studs; and in such position are thus embedded deeply in the concrete.

The whole skeleton-structure is deeply and uniformly embedded in the concrete; it does not spring under the ramming of the concrete from each side; remains rigid in the finished wall, and is not subject to the expansive strains or effects of heat. The term "wall" as used herein, includes floors, ceilings, partitions and the like.

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

1. A skeleton structure for concrete walls comprising studs having exterior flanges; and metallic spacing pieces bent to a V-shaped, cross section having angled flanges, and means for securing the spacing pieces at intervals to the exterior flanges of the studs through said angled flanges, the V-shaped walls projecting outwardly from said flanges.

2. A skeleton-structure for concrete walls comprising studs; and metallic spacing-pieces bent to a V-shape and having an angled extension secured at intervals through said extension to the exterior faces of the studs, the ends of said spacing pieces extending beyond the edges of said faces.

3. In a concrete wall structure, a stud comprising an elongated member having a flange at one edge thereof, and a plurality of separate metallic spacing pieces projecting outwardly from one surface of said flange and extending at an angle to the longitudinal axis of said surface, an off set flange on said pieces, and means for securing the flange to said surface of the stud.

4. In a concrete wall structure, a stud comprising an elongated substantially flat member, a longitudinally extending angled flange on one edge of a plurality of separated relative short metallic spacing pieces projecting outwardly from one surface of said flange and extending at an angle to the longitudinal axis of said surface, offset flanges on opposite sides of said pieces, and means for securing said flanges to the stud.

5. In a concrete wall structure, a stud comprising an elongated member having a flange at one edge, spacing members applied to said flange, said spacing members each comprising an outwardly projecting relatively thin flat piece extending longitudinally of the stud at an incline, and means including an angled flange for securing one edge of said piece to the stud.

6. In a concrete wall structure, the combination of a plurality of separated vertically extending studs comprising elongated members with a flange upon the front and rear edge thereof, separated superimposed spacing members on each stud, comprising angled pieces and means for securing the same by one of their flanges to a flange of the stud, the spacing members of each stud being in substantially horizontal alinement with a spacing member on an adjacent stud, and rods supported on a plurality of the alined spacing members.

7. In a concrete wall structure, a substantially flat stud having a flange extending longitudinally of its outer edge, a spacing device comprising a substantially V-shaped member having an angled flange on one of its walls secured to said longitudinally extending flange.

8. In a wall, a stud comprising an elongated member having a flange at one edge, and a plurality of separated spacing members each comprising a substantially V-shaped piece having a flange on one of its walls, and means for securing said flange to said flange of the stud.

9. In a concrete wall structure, the combination of a stud having a flange extending longitudinally of one edge thereof, spacing means carried by said flange comprising a plurality of separated V-shaped members with flanges on both walls thereof, whereby they are secured to the flange of the stud.

10. In a concrete wall structure, a stud comprising an elongated member having a flange extending along one edge thereof, spacing means upon said flange comprising a plurality of separate V-shaped pieces, the opposite walls of which have projecting flanges, means securing said flanges to the flange of the stud, and said spacing members having a part projecting beyond the opposite sides of the flange of said stud.

11. In a concrete wall structure, the combination of a stud comprising an elongated member having a flange extending longitudinally of opposite edges thereof, a plurality of spacing members upon each flange of the stud, said members comprising a substantially V-shaped piece, each of the walls of said pieces having a projecting flange extending beyond the adjacent wall of the flange of the stud, and means for securing said flanges to the stud.

12. In a concrete wall structure, a stud comprising an elongated member having a flange at one edge, spacing members applied to said flange, said spacing members each comprising an outwardly projecting piece extending longitudinally of the stud at an incline to the longitudinal axis of the flange, and means for securing one edge of said piece to the flange of the stud.

13. In a concrete wall structure, a stud comprising an elongated member having an edge adapted for the reception of spacing members, spacing members applied to the edge of said elongated member, said spacing members each comprising a piece extending outwardly from the edge of said member and extending longitudinally of said edge

at an incline to the longitudinal axis of said edge and means for securing said pieces to the stud including an angled flange carried by the spacing members.

14. In a concrete structure, the combination of a plurality of vertically extending studs having a flange at one edge, spacing members extending outwardly from the flanges of the stud, the spacing members having an angled flange secured directly to the flange of the stud, and a filling extending between the studs and over said spacing members.

15. In a concrete structure the combination of a plurality of vertically extending studs having a flange for the reception of spacing members, spacing members extending outwardly from the flanges of the stud, the spacing members having an angled flange secured directly to the flange of the stud, a transverse rod resting upon the spacing member of each stud and extending between the studs, and a filling extending between the studs and over said spacing members and rods.

16. In a skeleton structure for concrete walls, a stud comprising an elongated relatively flat member and a series of spacing members separated one from the other and secured in superimposed relation on one edge of the stud member, the spacing members each being of angular cross section with one of its flanges secured directly to the edge of the stud and the other flange projecting outwardly from said edge.

17. In a skeleton structure for concrete walls, a stud comprising an elongated relatively flat member having a longitudinally extending edge flange, and a series of spacing members separated one from the other and secured in superimposed relation on said flange of the stud member and projecting laterally beyond the side of said flange.

18. In a skeleton structure for concrete walls, a stud comprising an elongated relatively flat member having integral laterally extending flanges at its respective edges, the flange being coextensive with said edges, and a series of spacing members separated one from the other and applied to the exposed surface of said flanges of the stud, the spacing members each comprising a member projecting outwardly from the exposed surface of the stud flange and oppositely disposed angular flanges secured directly to said exposed surface of the flange, and each of said angular extensions projecting laterally beyond the edges of the stud flange.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

HENRY ROOT.

Witnesses:
WM. F. BOOTH,
D. B. RICHARDS.