March 10, 1931. R. L. MacDONALD 1,795,655

WALL STRUCTURE

Filed June 30, 1927

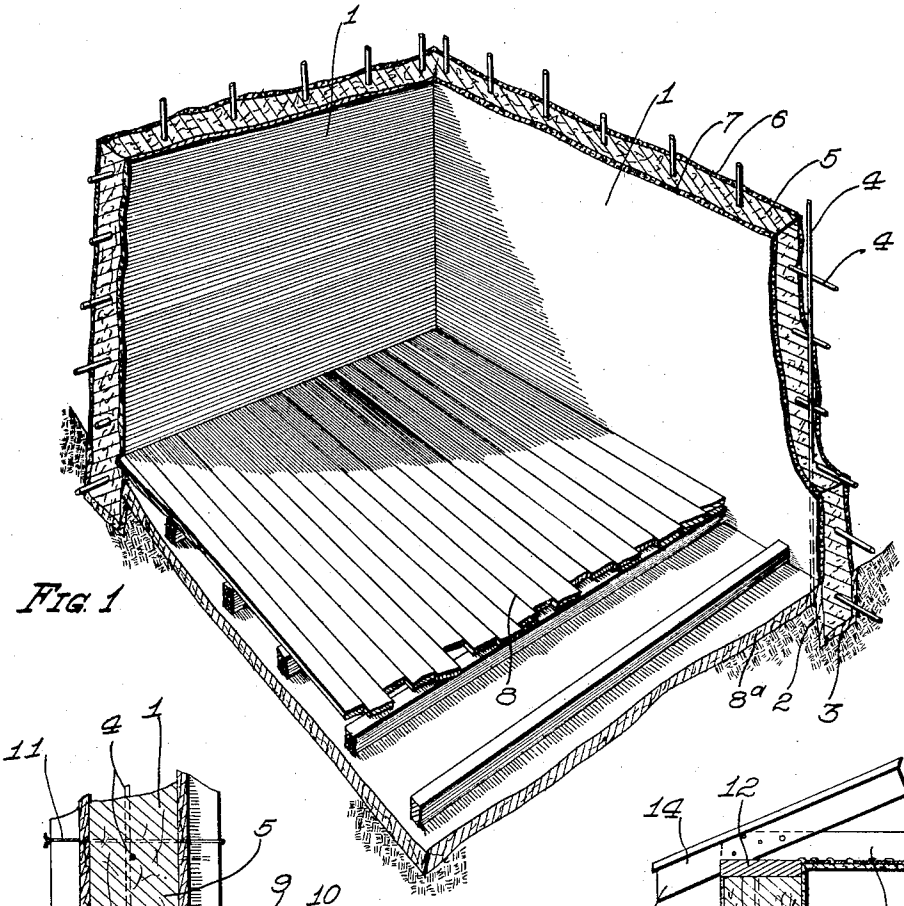


FIG. 1

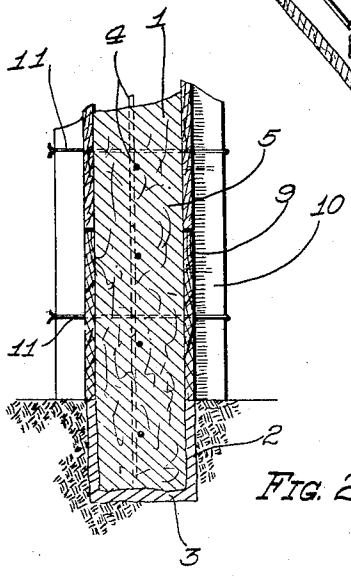


FIG. 2

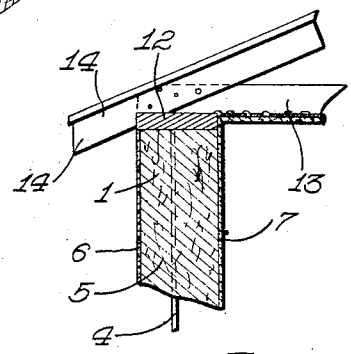


FIG. 3

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UNITED STATES PATENT OFFICE

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WALL STRUCTURE

Application filed June 30, 1927. Serial No. 202,618.

My invention relates to wall structures and the process of producing the same and in particular to walls of a monolithic structure, and the objects of my invention are first, to provide a wall structure in which ordinary earth may be employed as the principal building material; second, to provide a wall of considerable strength which may be quickly and economically constructed; third, to provide a foundation best suited for walls in which earth is used as the principal building material; fourth, to provide a wall structure in which metal in the form of filings, chips and so forth is used as a strengthening ingredient; fifth, to provide a wall of this nature having water proofing outer layers; sixth, to provide a wall particularly adapted for light and temporary buildings of fire, water, heat and sound resisting qualities; seventh, to provide as a whole a novelly constructed wall structure; eighth, to provide a process for constructing a wall composed chiefly of earth, and ninth, to provide a wall structure of particularly simple and economical construction, which will not be readily effected by weather or deteriorate.

With these and other objects in view, as will appear hereinafter, my invention consists of certain novel features of construction, combination and arrangement of parts and portions as will be hereinafter described in detail, and particularly set forth in the appended claims, reference being had to the accompanying drawings and to the characters of reference thereon which form a part of this application, in which:

Figure 1 is a fragmentary perspective view of adjoining walls forming part of a building, showing the method of reinforcing the walls and indicating the arrangement of the foundation; Fig. 2 is a fragmentary sectional view through the lower portion of a wall of this construction showing portions of the forms employed in its erection and a detailed view of the foundations; Fig. 3 is a cross-sectional view of the upper portion of my wall showing fragmentary portions of a roof and ceiling supported thereby.

Like characters of reference refer to similar parts and portions throughout the several views of the drawings.

The principal parts and portions of my novel wall structure 1 are the foundation trench 2, trench lining 3, reinforcing bars 4, wall compound 5, exterior plaster 6, interior plaster 7.

The foundation trench 2, is excavated to a suitable width and depth depending upon the character of the soil on which the walls are to be erected, size of building, climatic conditions and other considerations. The bottom and sides of the trench 2, are provided with a comparatively thin lining of waterproof cement plaster 3, or similar material, built up to grade level, which may join up on the inner side of the wall, with a concrete floor base 8*a*, on which the wooden floor 8 may rest. The channel formed by the trench lining 3, is gradually filled up to grade with moist earth, which is tamped firmly in layers, it being important to form a compact homogeneous mass. Forms, made preferably of spaced apart boards 9 supported by uprights 10, are erected with their inner surfaces flush with the inner surfaces of the trench lining 3, as illustrated in Figure 2, the oppositely positioned forms being held in correct spaced relation by means of bolts or wires 11, or in any other suitable manner. Iron reinforcing rods 4, may then be placed in a central position between the forms 9, if desired, although these may be omitted; the intervening space is then filled with a compound of moist earth and iron filings, chips, borings and similar small iron refuse from machine shop tools. Said compound is thoroughly tamped into a homogeneous mass. In erecting a wall of ordinary room height, I prefer to build up the walls in two or more stages, increasing the height of the forms as the construction proceeds. When the desired height has been reached, and sufficient time has elapsed to allow the material to dry, the forms may be removed and an outer coating 6 of waterproof plaster is then applied. Similarly, the inner wall surface 7, may be plastered in any desired manner. Sills 12, may be placed along the upper edges of the walls for supporting ceiling beams 13, and rafters 14. Although

I have not shown windows or doors in the illustrations, these may be provided by leaving the necessary apertures through the forms, as is well understood.

Though I have shown and described a particular construction, combination and arrangement of parts and portions, I do not wish to be limited to this particular construction, combination and arrangement, but desire to include in the scope of my invention the construction, combination and arrangement substantially as set forth in the appended claims.

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

1. In a wall structure, a channel shaped foundation setting in the earth, a solid earthen wall superposed and supported therein and a waterproof coating on the exterior wall surface.

2. In a wall structure, a channel shaped cement foundation lining within a trench in the earth, the wall edges thereof being flush with grade, a solid earth subwall portion supported within said cement lining forming therewith the foundation and an earthen wall supported thereon.

3. In a wall structure, centrally disposed, vertical and horizontal reinforcing rods, a wall body consisting of a mixture of earth and iron particles surrounding said rods and a waterproof coating on the exterior surface of said wall body.

4. In a wall structure, a channel shaped cement lining disposed within a trench in the earth, centrally disposed upright reinforcing bars extending to the bottom of said channel, a solid earthen sub-wall portion supported within said cement channel and a wall body composed of a mixture of earth and metal particles superposed on said sub-wall portion and surrounding said reinforcing bars.

5. In a building wall structure, a foundation set into the earth composed of a plastic channel member, and a solid earth filling the same.

6. In a building wall structure, a foundation set into the earth composed of a plastic channel member, a solid earth filling the same, and metallic reinforcing in said earth.

7. In a building wall structure, a foundation set into the earth composed of a plastic channel member, a solid earth filling the same, metallic reinforcing in said earth, and a wall body composed of a mixture of earth and metal particles superposed on said foundation and forming a continuation of said wall body.

8. In a building wall structure, a foundation set into the earth composed of a plastic channel member, a solid earth filling the same, metallic reinforcing in said earth, a wall body composed of a mixture of earth and metal particles superposed on said foundation and forming a continuation of said wall body, and perpendicular and horizontal metal reinforcing bars in the mixture in said wall body.

9. In a building wall structure, a foundation set into the earth composed of a plastic channel member, a solid earth filling the same, metallic reinforcing in said earth, a wall body composed of a mixture of earth and metal particles superposed on said foundation and forming a continuation of said wall body, perpendicular and horizontal metal reinforcing bars in the mixture in said wall body, and a waterproof covering for the sides of said wall body.

In testimony whereof, I have hereunto set my hand at San Diego, California, this 22d day of June, 1927.

RAYMOND L. MacDONALD.