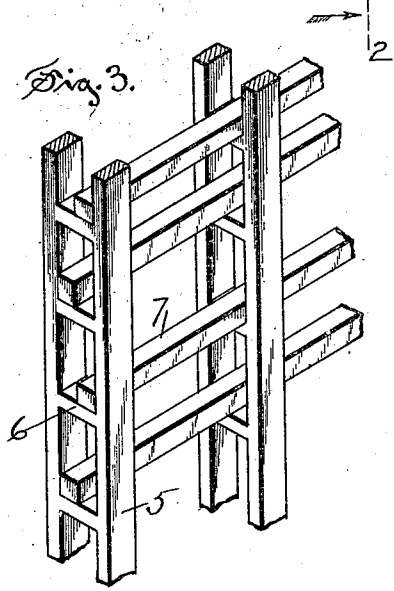
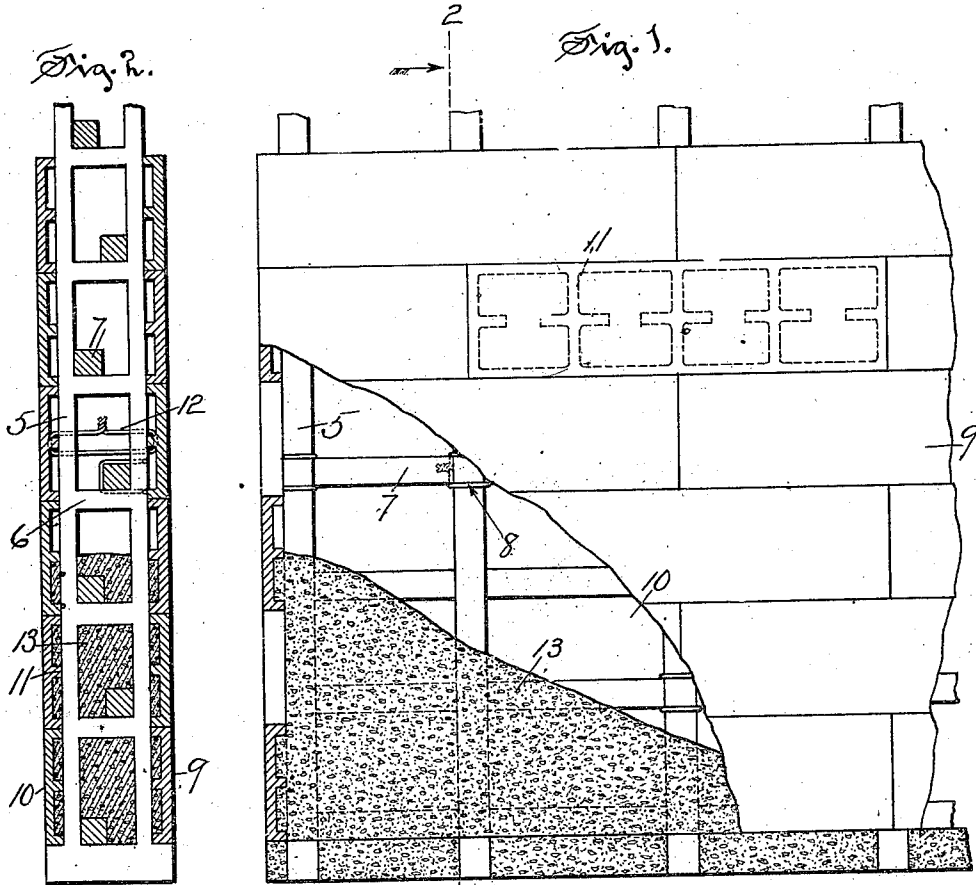


Jan. 8, 1929.

1,698,557

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CONCRETE STRUCTURE

Filed April 28, 1927



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## UNITED STATES PATENT OFFICE.

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## CONCRETE STRUCTURE.

Application filed April 28, 1927. Serial No. 137,193.

My invention relates to concrete structures and the method of forming the same, and an object of my invention, among others, is the provision of means whereby the form or forms used to receive the concrete shall constitute a part of the final structure.

One form of a structure embodying my invention and in the practice of which the objects herein set out, as well as others, may be attained, is illustrated in the accompanying drawings, in which—

Figure 1 is a face view of a portion of a concrete structure embodying my invention with parts broken away to show construction.

Figure 2 is a view in section on a plane denoted by the dotted line 2—2 of Figure 1.

Figure 3 is a detail isometric view illustrating a portion of a frame embodying my invention, but with the elements for tying the parts together omitted.

Prior to my invention it has been common practice, in the building of concrete structures, to make forms, usually of wood, within which steel or other structures being used are inclosed, these forms serving as molds within which the concrete, in a moist state, is then poured or otherwise introduced. This method is expensive, not only owing to the cost of the material of which the forms or molds are composed, but also in the time consumed in constructing such forms or molds, and it is a purpose of my invention to avoid this expense and waste of material, my invention contemplating a form which comprises a part of the structure when completed.

In carrying my invention into effect in the special manner herein illustrated and described, I first build a frame that may be composed of columns each comprising uprights 5 with cross pieces 6 arranged at suitable intervals apart and with stays in the form of bars 7 extending between the columns which are placed such distance apart as may be desired. The uprights may be composed in whole or in part of concrete or of metal, and the cross pieces may or may not form an integral part of the columns. The stay bars may be disposed in any suitable manner to answer any special construction and they may be secured in place in such way as may be desired. As one of the common means for securing the stay bars I have shown ties 8 in the form of wire wrapped about the parts, these ties being such as to temporarily hold the parts, as the structure,

when completed as hereinafter set forth, will be self-sustaining without the material aid of such ties. The stay bars may be formed of concrete, if desired, or they may be composed of metal or other suitable material, such as will be permanently lasting.

When a frame of considerable size to answer the purpose for any desired construction has been built up in the manner hereinbefore described, the space between the structures is inclosed by facing 9 and backings 10. These facings and backings are preferably in the form of comparatively thin slabs and they are composed of concrete, in such form as may be desired. In the structure herein shown these facings and backings are of rectangular form and are laid with broken joints to simulate bricks or other construction of masonry. The facings may be ornamented if desired, or they may be plain as illustrated in the drawings herein. The backings or facings may or may not be provided on their backs with ribs 11 forming stiffening members and also providing recesses into which the concrete to be hereinafter described may flow.

In placing the facings and backings in position they should be secured against displacement, and they may be secured in any suitable manner. As one of the many ways of securing them together, I have shown ties 12 that may be in the form of wire passed through holes in the ribs 11 and secured as by twisting in a manner that will be readily understood. Any other desired means for securing the backings and facings in place may be employed.

When a structure has been built up, as hereinbefore described, concrete 13 is introduced into the space between the backings and facings, the frame, as hereinbefore described, permitting the concrete to be introduced to completely fill said space, and the concrete may be introduced at any stage in the placing of the backings or facings, when such backings or facings have been partly placed in position, or when the whole structure is completed from the bottom to the top.

In accordance with the provisions of the patent statutes I have described the principles of operation of my invention, together with the device which I now consider to represent the best embodiment thereof; but I desire to have it understood that the device

shown is only illustrative and that the invention may be carried out by other means and applied to uses other than those above set out.

5 I claim—

1. A concrete structure comprising a form including columns spaced apart, said columns being of frame like form and composed of side posts and spaced cross bars extending  
10 between said posts thereby creating openings for a filling of concrete in which said bars are embedded, and facings rising from opposite sides of said columns and composed of hardened concrete, and a filling of concrete  
15 between said facings and columns and hardened for a less period than said facings.

2. A concrete structure comprising a form composed of columns spaced apart, stay bars of rigid material extending between said columns spaced from the outer edges thereof  
20 sufficiently to be inclosed within a filling of concrete, facings composed of hardened concrete resting against opposite sides of said columns, and a filling of concrete between  
25 said facings and columns and hardened for a less period than said facings.

3. A concrete structure comprising a form including a frame composed of columns spaced apart, stay bars of rigid material  
30 extending across said columns and spaced from the edges thereof sufficiently to be enveloped in a filling of concrete, means for securing the stay bars to said columns, fac-

ings composed of hardened concrete resting  
35 against opposite sides of the columns, means for securing said facings together, and a filling of concrete between said facings and hardened for a less period than said facings.

4. A concrete structure comprising a form including a frame composed of columns, each  
40 column comprising a pair of uprights united at intervals by cross pieces providing openings to receive a filling of concrete to constitute a binder extending through said openings, facings composed of hardened concrete  
45 resting against and secured to opposite sides of the columns and having spaces between the facings and the column to receive a filling of concrete, and a filling of concrete between  
50 said facings and hardened for a less period than said facings.

5. A concrete structure comprising a form including a frame composed of columns, each  
55 column comprising a pair of uprights and cross pieces evenly spaced lengthwise along the column, stay bars of rigid material resting on said cross pieces and extending through the openings formed thereby, said  
60 stay bars being arranged in staggered relation, facings composed of hardened concrete resting against opposite sides of the column, and a filling of concrete between said facings enveloping said cross pieces and stay bars, said filling being hardened for a less period than said facings.

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