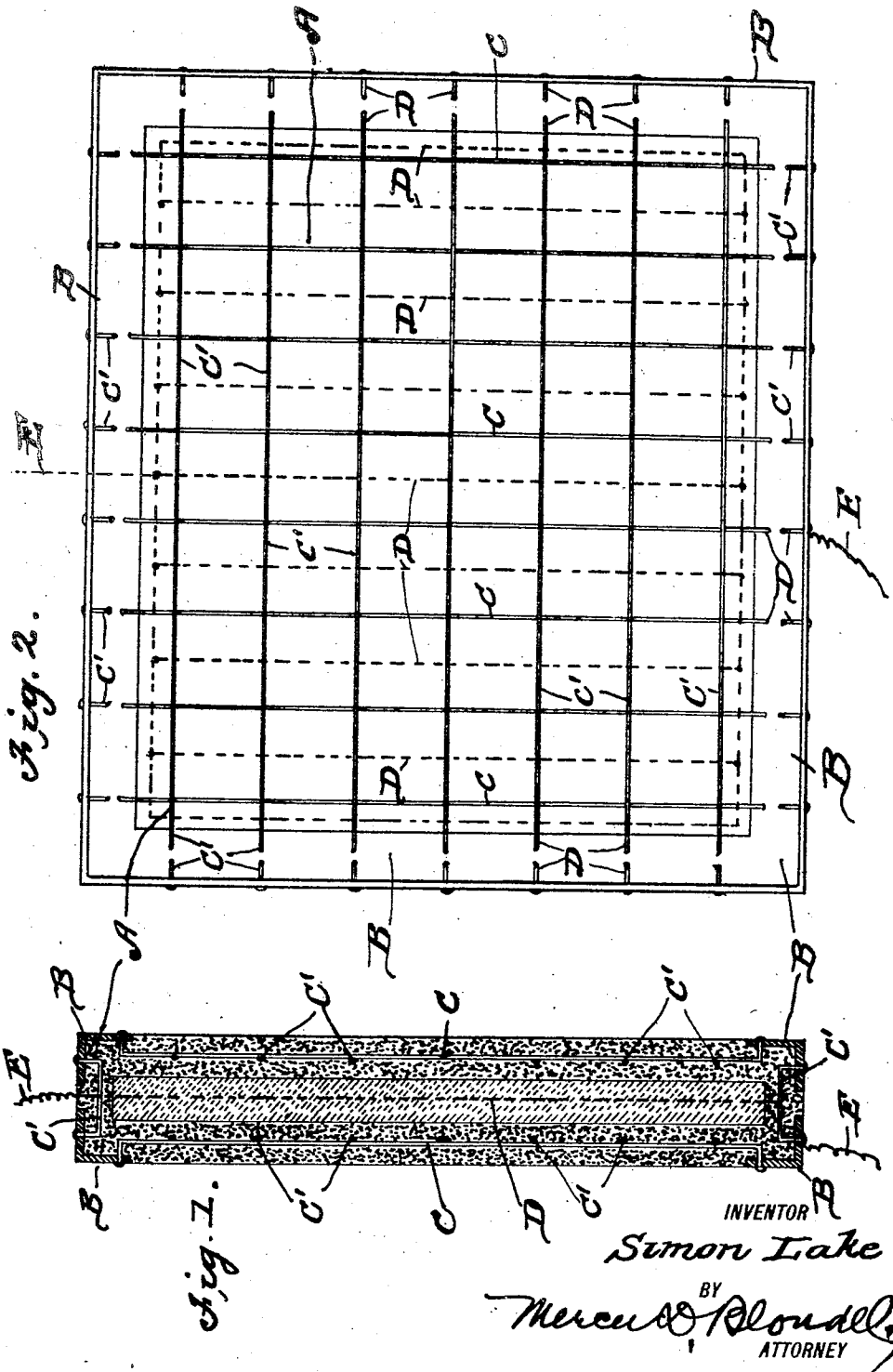


S. LAKE.
METHOD OF ERECTING CONCRETE STRUCTURES.
APPLICATION FILED JULY 15, 1918.

1,394,997.

Patented Oct. 25, 1921.



UNITED STATES PATENT OFFICE.

SIMON LAKE, OF MILFORD, CONNECTICUT.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, SIMON LAKE, a citizen of the United States, residing at Milford, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Methods of Erecting Concrete Structures, of which the following is a specification.

This invention relates to improvements in concrete building constructions, and particularly such as shown and described in my co-pending application Serial No. 153,892, filed March 10, 1917, allowed May 27, 1918 patented July 16, 1918, No. 1,273,073. In my aforesaid application I cover the formation of a double wall structure filled with an elastic fusible compound, which is soluble and adapted to be run out after the walls of the structure are cast and set. The invention further relates to my co-pending application for concrete ship construction, Serial No. 239,567, filed June 12, 1918.

In my aforesaid applications I provide a construction whereby the structures are formed of steel frames and a coating of cement or other plastic material which surrounds the steel structures and forms the inner and outer walls thereof.

The present case is particularly directed to the method of applying cement to the framework of a structure so as to avoid the necessity of building forms or molds for the formation of the walls of the structure, and the provision of an elastic plastic material arranged within the space or spaces formed between the walls of the structure which will serve not only to provide an elastic wall structure, but when the filling is subjected to heat the same will dissolve and a portion of the core or filling will run into the crevices of the walls caused by shrinkage of the material composing the walls of the structure or otherwise, thereby providing a thoroughly waterproof structure, which also is of a resilient character such as is necessary in the construction of the walls of ships and analogous constructions.

The object of my invention is to provide a construction whereby the formation of walls of a structure composed of concrete wherein forms, ordinarily used in the formation of the walls, are avoided; and the voids which frequently occur in such formations are avoided, which voids frequently occur when the cement is intended to run under obstructions such as are installed in

buildings, wherein window sills and frames are employed, and in ship constructions wherein various transverse beams or decks are formed in the construction of the vessel.

In my present construction I purpose to erect a steel framework of suitable form and to pour or otherwise blow the plastic material forming the walls of the structure onto the framework, and to build up the walls so as to provide a thoroughly compact structure wherein all blow holes or crevices are avoided.

In the drawings, forming a part of this specification, in the several figures of which like parts are similarly designated, Figure 1 represents a diagrammatic view of a section of a wall of a structure constructed after the manner of my invention. Fig. 2 is a diagrammatic face view of the framework of the wall, the construction of the framework embodying my invention.

While I have illustrated my construction only in diagrammatic form, it will be appreciated that I do not confine myself to the formation of a wall of any structure built of concrete and a framework, as shown, since the invention is applicable to buildings, vessels, or to the walls of waterways, and like structures.

As in my aforesaid applications, I apply heat to the fusible material after the cement walls have been formed; and after the walls are set, I purpose to fuse the cores for the purpose of causing the cores to melt and fill up any cracks or crevices that may have occurred through and during the shrinkage of the walls. Shrinkage of concrete construction causes cracks, which are particularly detrimental in the construction of concrete ships, because of the fact that such cracks permit of seepage of water, and when water comes into contact with the iron or steel reinforcements of a structure, there is a tendency to corrode the iron work, and hence the iron would break, and cause the cement to further crack and fall away from the steel or iron reinforcements. From experience it has been found that the iron or steel work would be eventually eaten through by rust, owing to the chemical reaction caused by the water and by the materials of which the cement is composed, hence destroying the foundation of the structure.

In my present case I set up the core in a skeleton framework and then apply the ce-

ment thereto, either by what is known as the cement gun method, or by hand power in a manner similar to that employed by masons in plastering a building, so that no voids might occur. I also purpose to pass an electric current of high amperage and of comparatively low voltage through the structure, whereby to fuse the material forming the core of the walls. In practice the fusible core may consist of paraffin, or asphaltum compounds, through which conducting wires are passed, and which are grounded to the framework, the current being taken off through the wires, as will be readily understood by those skilled in the art of electrical engineering.

In carrying out my invention I purpose to erect a framework of suitable form to conform to the shape of the structure to be erected. Since the design of the structure forms no feature of the present application, I have not deemed it necessary to show my invention other than in diagrammatic form. Referring to the drawings, the reference character A designates a metallic framework comprising edges or angles B, to which are suitably secured vertical and transverse connecting rods or wires C and C', respectively, forming tie-rods between the metallic edges or angles B. Between the vertical rods C, I arrange conducting wires or rods D, which are connected at their upper and lower ends to circuit wires E, extending from a suitable source of electric supply (not shown). It will be noted that the frame, as thus constructed, forms a framework to hold the core or cores in position so that when the plastic material is blown or otherwise formed around the core or cores, the framework will form a foundation for the material. I then purpose to pass an electric current of high amperage and comparatively low voltage through the conductors E and D so as to fuse the core or cores and thus cause the material therefrom to run off and seek any crevices that may be caused by the drying and setting of the plastic material. It will be understood, of course, that the cores are formed with suitable slots in order to facilitate the insertion of the same within the framework of the structure, and to receive the electric conducting wires.

By my improved method of forming waterproof concrete walls the fusible core is first arranged within the wire frame or form and is then fused so that the molten material will seek the crevices formed in the outer and inner walls of the structure so that the walls will be hermetically sealed and thus prevent seepage of water through them as is common both in the construction of concrete houses and concrete ships.

As already indicated, the core or filling consists of paraffin or asphaltum compounds,

and as instances of such compounds I mention either of these substances and an addition of sawdust, shavings, or, preferably, granulated cork. The unabsorbed fused material may be removed by tapping the walls and recovering it if desired.

I am aware that structures have been heretofore provided embodying an inner and an outer wall with a filler of asphalt or other compound, but I am not aware that a structure has been proposed according to my improved method of subjecting the filler to a heating medium whereby to cause the filler to flow into any crevices that might occur through the shrinkage of the walls of the structure, and I therefore desire to have it understood that I broadly claim the idea of the formation of a structure composed of inner and outer walls and an inner lining of an elastic fusible material, which, when subjected to heat will be caused to melt and flow into any crevices that may occur during the setting of the walls of the structure. I also desire it understood that I claim the novel feature of building a structure of a skeleton metallic framework without the formation of molds, whereby I may build a wall, without voids, either by blowing the material around the framework, or by applying such material by hand power, such as that now employed by masons, as in plastering a building.

It will be understood that after the core is arranged and set within the framework of the structure, the plastic material is then applied, and that after the plastic material has been allowed to set the material of the core is fused so as to cause it to run into any crevices that might occur through the setting of the plastic material.

It will be further understood that the cores are formed in sections before being placed between the framework of the structure, and are, in consequence, relatively hard so as to facilitate the erection of the cores between the frames around which the walls are formed.

I do not claim broadly the idea of providing a fusible core in the construction of a building, since this is covered in my Patent No. 1,273,073, but what I do claim and desire to secure by Letters Patent is:

1. The method of erecting a concrete structure without the intervention of molds, which consists in providing a metallic framework of suitable form and dimensions to produce the whole or a definite part of the structure, then arranging within the framework a core composed of a fusible compound, then surrounding the framework and core with plastic concrete, and then applying a melting heat to the core and allowing its fusible constituent to be absorbed in and by the concrete.

2. The method of erecting a concrete

structure without the intervention of molds, which consists in providing a metallic framework of suitable form and dimensions to produce the whole or a definite part of the structure, then arranging a fusible filler within the framework, then surrounding the framework and filler with plastic concrete, and then melting the filler and allowing a portion of the fused material to be absorbed in the concrete while retaining the unabsorbed portion as insulation.

3. The method of erecting a concrete structure without the intervention of molds, which consists in providing a metallic framework of suitable form and dimensions to produce the whole or a definite part of the structure, then arranging an elastic fusible filler centrally within the framework, then surrounding the framework and filler with concrete by projecting the plastic substance upon the framework, and then melting the

filler and allowing a portion of it to be absorbed in the concrete.

4. The method of erecting a concrete structure without the intervention of molds, which consists in providing a metallic framework of suitable form and dimensions to produce the whole or a definite part of the structure, and including in such framework an electric heating element, then arranging a fusible filler within the framework, then surrounding the framework and filler with plastic concrete, and then melting the filler and allowing a portion of it to be absorbed in the concrete.

In testimony whereof I have hereunto set my hand this 13th day of July, A. D. 1918.

SIMON LAKE.

Witnesses:

JOHN J. FISHER,
FREDERICK E. BROWN.