No. 652,732. Patented June 26, 1900.

E. L. RANSOME.

CONCRETE CONSTRUCTION.

(Application filed Jan. 4, 1900.)

(No Model.)

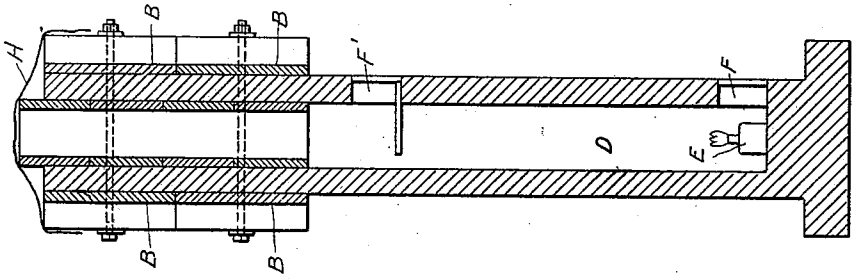

Fig. 2.

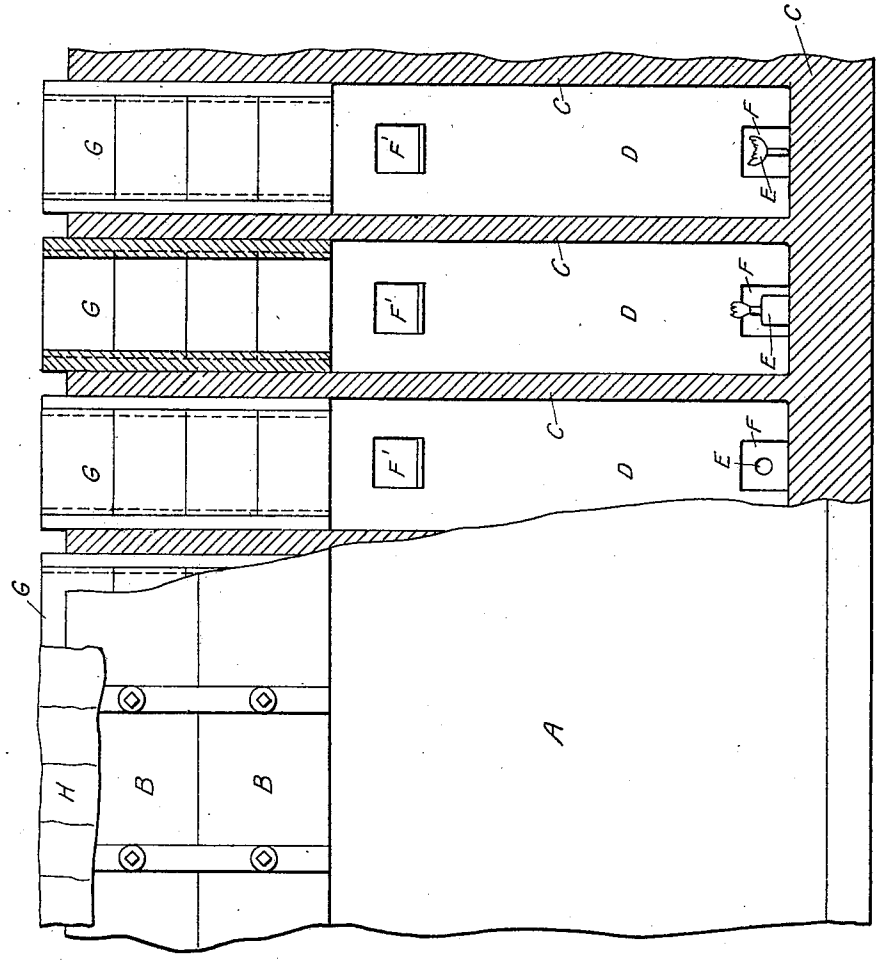

Fig. 1.

Witnesses.
Frank V. Lawrence.
Frederick G. Frost

Inventor.
Ernest Leslie Ransome

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

ERNEST LESLIE RANSOME, OF NEW YORK, N. Y.

CONCRETE CONSTRUCTION.

SPECIFICATION forming part of Letters Patent No. 652,732, dated June 26, 1900.

Application filed January 4, 1900. Serial No. 402. (No model.)

To all whom it may concern:

Be it known that I, ERNEST LESLIE RANSOME, a citizen of the United States, residing in New York, in the State of New York, have invented an Improvement in Concrete Construction, of which the following is a full, clear, and exact description.

My improvement relates to concrete walls or like structures molded *in situ*. A difficulty in the construction of these walls has been the delay occasioned by the time occupied in the initial hardening of the concrete. This difficulty is increased when, as usual, the molds by which the wall is shaped are entirely supported by a portion of the wall lately molded. It is further increased when the work is carried on in cold weather until it reaches a prohibitive stage when the cold becomes intense. The object of my invention is to reduce this difficulty to a minimum, and I accomplish this by the following method. This method is illustrated by the accompanying drawings, in which—

Figure 1 is a view, partly in elevation and partly in section, of a wall constructed in accordance with my invention; and Fig. 2 is a transverse sectional view thereof.

A represents a wall in elevation; B, the wall-mold; C, the wall in vertical longitudinal cross-section; D, a chamber or cell; E, source of heat; F and F′, openings closed by doors; G, core-mold; H, a tarpaulin.

I mold the wall A hollow, preferably with a series of chambers or cells D running vertically up inside the wall. Into each of these chambers D or into a sufficient number of them I introduce heat. This heat is preferably rendered moist and in some cases is associated with carbonic or other gases that will aid the hardening of the concrete. For example, if the concrete is made with a cement which is without free lime then no pains are taken to furnish carbonic or like hardening gases with the heat; but, on the contrary, if the concrete contains uncombined or free lime then I prefer to furnish the heat associated with carbonic gases, which can conveniently be done by conveying into the cells or creating therein the direct products of combustion—such, for example, as would be produced by the burning of coal, coke, or charcoal. The heat may be furnished in any of the well-known ways—as, for instance, by burning the fuel previously mentioned or gas or oil or by passing steam into the cells.

For convenience of working I usually make an opening F through from an exterior face of the wall to about the base of the cell, and through this opening I place in the cell the furnace, fuel, lamp, gas-jet, or pipe E used for introducing heat within the cell. The heat thus introduced passes upward along the cell, warming in its passage the contiguous concrete. If the wall being built becomes too high to obtain sufficient heat where most needed—that is, near to the working surface, where the core-molds are—I insert in the wall at any desired higher level other doors F′, through which the heat-supply is transferred from the first level or from the level previously occupied. These doorways are more or less closed, so as to regulate the amount of outer air admitted into the cells. At the top of the cell the heated current of gases is prevented from too rapid an escape by the core-mold G, which partially blocks the unfinished end of the cell and which can be closed more or less completely, as desired. Additional moisture is usually given to the atmosphere within the cell, when needed, by water admitted through or about the core-mold above and sprinkled over the concrete surfaces of the cell.

In cold weather, in order to further protect the concrete from the effect of frost, I cover the top of the work over at night and at other times when active work is stayed with covers H, such as tarpaulins or other suitable material, so as to catch and retain the heat as it leaves the cells through or by the core-molds or out at the top of the cell in cases where the core-molds are removed and distribute it along the top surface of the concrete last put in place.

I am aware that heat and carbonic acid have both been used in hardening concrete and make no broad claim for such use.

What I claim, and desire to secure by Letters Patent, is—

1. The method of building concrete walls *in situ* which consists of molding successive portions of said walls with continuous chambers or cells, forming inlets for heating means, and applying heat through said inlets directly to the concrete walls of said chambers or cells

during the process of construction, substantially as set forth.

2. The method of building concrete walls *in situ* which consists of molding successive portions of said walls with continuous chambers or cells, forming inlets for admitting gases, and applying carbonic or other hardening gases through said inlets directly to the concrete walls of said chambers or cells during the process of construction, substantially as set forth.

3. The method of building concrete walls *in situ* which consists of molding successive portions of said walls with continuous chambers or cells, forming inlets for heating means and gas, and applying heat and carbonic or other hardening gases through said inlets directly to the concrete walls of said chambers or cells during the process of construction, substantially as set forth.

ERNEST LESLIE RANSOME.

Witnesses:

FRANK V. LAWRENCE,

FREDERICK G. FROST.