

Sept. 22, 1925.

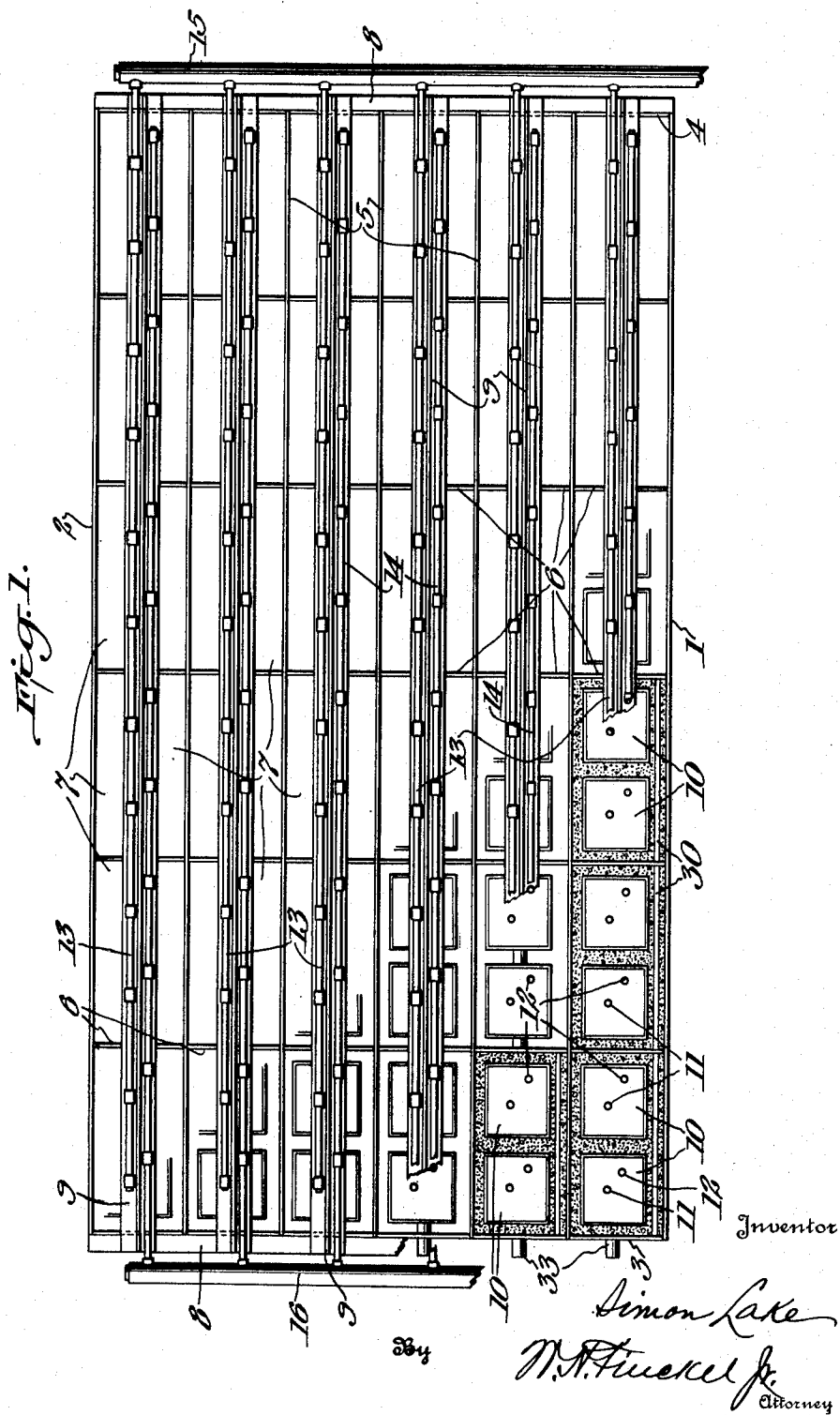
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S. LAKE

MOLDING APPARATUS

Filed March 17, 1925

2 Sheets-Sheet 1



Sept. 22, 1925.

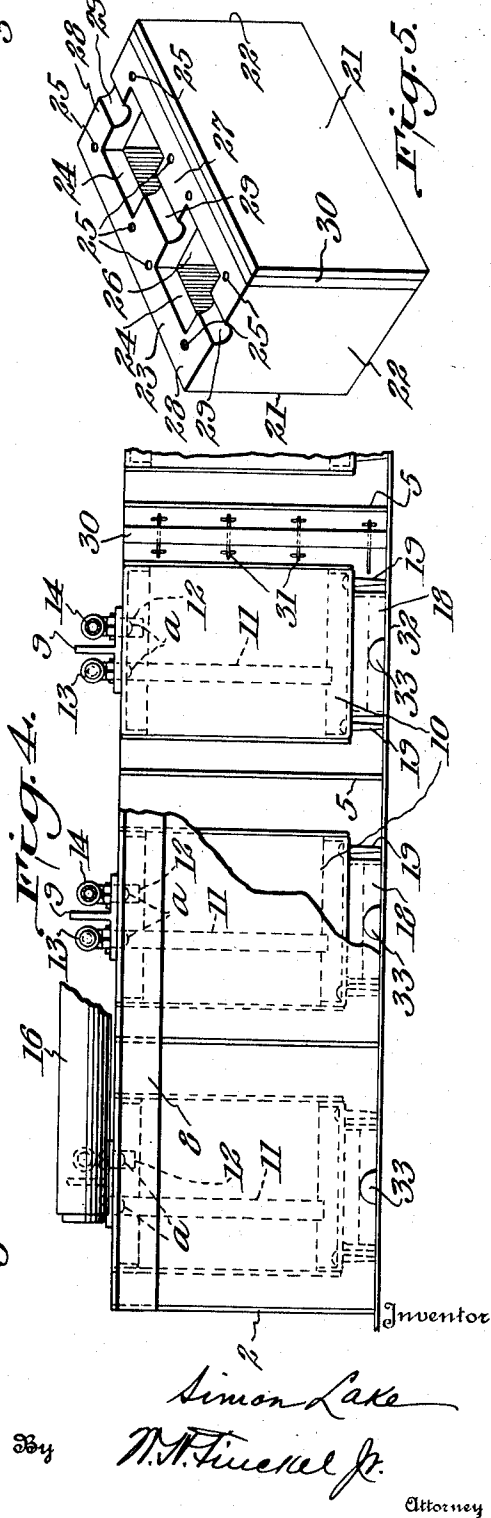
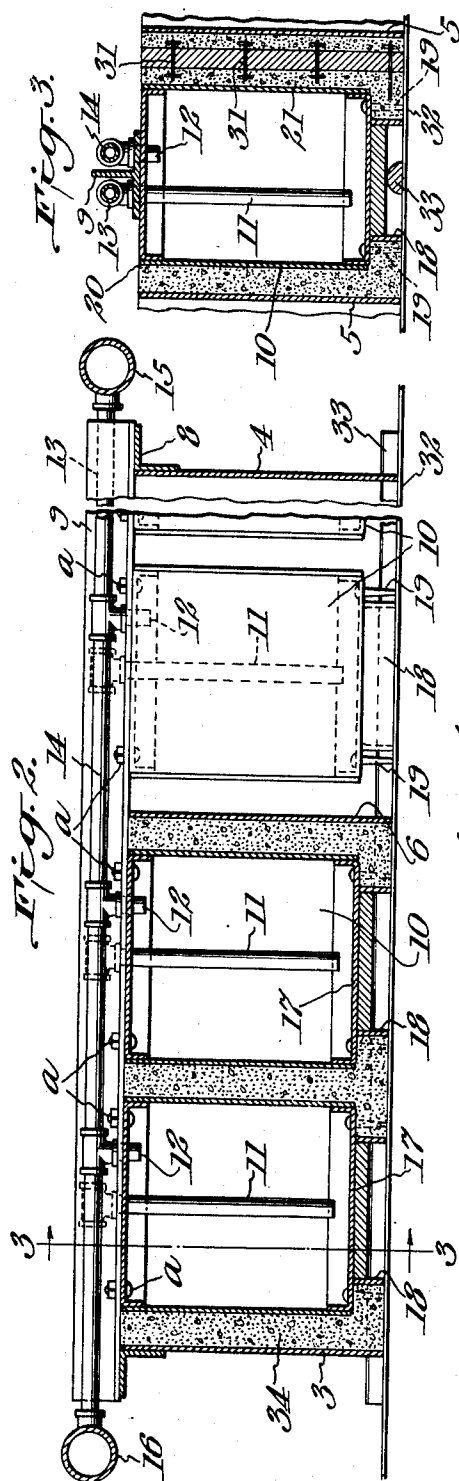
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2 Sheets-Sheet 2.



UNITED STATES PATENT OFFICE.

SIMON LAKE, OF MILFORD, CONNECTICUT.

MOLDING APPARATUS.

Application filed March 17, 1925. Serial No. 16,140.

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 a certain new and useful Improvement in Molding Apparatus, of which the following is a full, clear, and exact description.

This invention relates to molding apparatus, and particularly to such apparatus for use in molding concrete building blocks.

The object of the invention is to provide an apparatus in which a large number of blocks may be simultaneously molded, means being associated with the apparatus for artificially accelerating the drying of the molded material whereby the time required for drying is materially lessened as compared with the time required where other apparatus with which I am familiar is used, and thus making it possible to quickly obtain an initial set in the molded material sufficient to permit the removal of the blocks from the apparatus, thereby permitting use of the apparatus for many more molding operations within a certain time period than has heretofore been found expedient.

The invention consists essentially in a molding apparatus comprising a cellular mold box, the cells thereof providing a plurality of similar mold chambers; and a plurality of similar cores, preferably though not necessarily two for each chamber, these cores being carried by a suitable framework arranged for cooperation with the mold box and acting in addition to its core carrying function as an agent for supporting means for providing circulation of a heating medium in said cores for the purpose of drying the material being molded, as I will proceed now to explain and finally claim.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a plan view of the apparatus of my invention, certain parts thereof being broken away and omitted. Fig. 2 is a fragmentary sectional elevation on a larger scale, taken longitudinally of the apparatus, substantially centrally of one of the longitudi-

nal series of mold chambers. Fig. 3 is a fragmentary section taken on the line 3—3 of Fig. 2. Fig. 4 is a fragmentary sectional end view of the apparatus. Fig. 5 is a perspective view illustrating the type of block which the apparatus illustrated is designed to mold or cast.

The mold box comprises sides 1 and 2 and ends 3 and 4, and is divided transversely by a plurality of longitudinally extending partition members 5 suitably secured to the ends 3 and 4 as by welding, and it is divided longitudinally by a plurality of transversely arranged partition members 6 suitably secured to the sides 1 and 2 and members 5. It will be seen that the members 5 and 6 divide the mold box into a plurality of similar cells or mold chambers 7 having open tops and bottoms.

A framework comprising end members 8, which may be in the form of angle irons (Fig. 2), connected by longitudinally extending members 9 preferably in the form of T irons, (Figs. 3 and 4), is removably fitted over the top of the mold box. This framework carries, suitably secured to it, as by bolts *a*, a plurality of hollow cores 10, preferably two for each mold chamber, provided with pipes 11 extending down into the cores and terminating adjacent to the bottoms thereof, and pipes 12 also extending into the cores but terminating adjacent to the tops thereof. The pipes 11 and all of the cores in each longitudinal row are connected with conduits 13, and the pipes 12 of all of the cores in each longitudinal row are connected with conduits 14. All of the conduits 13 communicate with a header 15, arranged at one end of the framework, and all of the conduits 14 communicate with a header 16 arranged at the other end of the framework. As will be seen particularly by reference to Figs. 2, 3 and 4, the conduits 13 and 14 are arranged upon opposite sides of the T members 9 and are carried and supported thereby.

Referring now particularly to Figs. 2, 3 and 4, it will be seen that the bottoms 17 of the cores are provided with rectangular extensions 18 adapted to form openings in the articles cast or molded, as will be herein-

after more particularly pointed out, and they are also provided with dowels or pins 19 adapted to form a plurality of suitably spaced holes in the articles. The dowels or pins 19 are preferably tapered to facilitate their withdrawal from the articles.

The type of block which the apparatus illustrated is particularly designed to mold, as shown in Fig. 5, is that forming the subject in part of my application for patent for concrete building construction, filed February 14, 1925, Serial No. 9172, and comprises an open bottom 20 (Figs. 2 and 3), sides 21, ends 22, and a top 23 provided with openings 24 and holes 25. The block is divided transversely substantially midway of its length by a web 26, and over the web 26 and the ends 22 are portions 27 and 28 respectively, each of which is formed with a half-round groove 29.

If desired, a strip of heat, sound and moisture-proof material 30 may be incorporated in one of the sides 21, and anchored to the adjoining portions thereof by means of suitable dowels or tying members 31 (Fig. 3).

In molding blocks of the type just described, my apparatus is used as follows:—A steel curtain 32, similar to that shown and described in my copending application for patent for apparatus for molding concrete, filed May 6, 1924, Serial No. 711,419, is suitably prepared and spread upon a casting table of any desired type. A steam heated table such as that shown and described in my copending application last above mentioned is suitable for this purpose. Then half-round rods 33 are laid upon this curtain in such even spaced relation thereon as to directly underlie the longitudinal centers of the rows of mold chambers 7. These half-round rods fit into complementally formed notches provided in the ends 3 and 4 and members 6, and in the rectangular extensions 18, for the purpose of forming the half-round grooves 29 in the portions 27 and 28 of the tops of the blocks.

Then the framework carrying the cores, conduits and headers may be positioned over the mold box with the angle members 8 embracing its ends, or the framework may be positioned upon the mold box before the mold box is placed upon the curtain, as desired. With the mold box thus arranged, the concrete mix may be introduced into the spaces 7 around the cores as shown at 34 (Fig. 2), and suitably tamped or agitated to cause it to solidly settle around the cores. As will be seen, particularly by reference to Figs. 2 and 3, the concrete mix flows around and under the cores and is stopped by the members 18, thereby forming the openings 24 in the tops of the blocks. The pins or dowels 19 form the holes 25 in the tops of the blocks.

After the mold is filled, live steam may

be introduced into the header 16, from which it will be distributed through the conduits 14 to the pipes 12 and thence into the cores to heat same and gradually artificially drive off the moisture from the concrete mix to hasten its acquiring its initial set, the exhaust steam escaping through the pipes 11 and conduits 13 to the header 15.

It may be found in practice that this system of heating the cores with live steam may dry out the concrete more rapidly than is desired, and if such be the case, the steam may be introduced through the header 15, conduits 13 and pipes 11 to the bottom portions of the cores, where, coming in contact with the relatively cold walls thereof, it will be condensed and the water of condensation gradually filling the cores will escape through the pipes 12, conduits 14 and header 16, the relatively hot water of condensation serving to dry out the concrete but less rapidly than is the case when live steam is introduced through the pipes 12 as first described.

I prefer, before filling the mold chambers 7 with concrete, or before positioning the framework carrying the cores thereover, to coat the cores with some substance such as paraffine, asphaltum or the like, which will be melted by the heat of the steam or water introduced into the cores, and will provide a slight clearance between the concrete and the cores when so melted.

This paraffine or asphaltum will, moreover, permeate the concrete of the block and tend to produce a waterproof coating on the interior portions of same.

In the ordinary process of molding concrete, where natural heat is relied upon for drying, and even in summer, it is not safe to withdraw the molds in less than twenty or twenty-four hours, but by artificially heating, as described, I am enabled to withdraw the molds in about one hour, the concrete having by that time attained its initial set and become self-supporting.

After the concrete has attained its initial set, the cores and mold box may be raised bodily from the plurality of blocks molded therein, and is then immediately available for a subsequent similar molding operation.

I have spoken of coating the cores with a substance which will be melted by the action of the heating medium introduced thereinto, and if desired, the sides, ends and longitudinal and transverse partition members of the mold box may also be coated with such a substance, though this is not essential.

I have herein before described the use of live steam as a medium for heating the cores, but, if desired, other heating mediums may be employed, such, for example, as warm or hot water, depending upon the period of time within which it is desired to

procure an initial, self-sustaining set in the concrete.

It will thus be seen that I provide an apparatus which lends itself readily to rapid quantity production of molded or cast concrete articles and which is available for frequent re-use, thereby making unnecessary, the provision of a great number of molds, as is customary and necessary in the production of molded articles where, in order to produce in large quantities a great many molds must be out of service for considerable periods, due to the fact that they must remain with the articles cast or molded in them throughout the rather protracted drying or curing period.

Although I have described the apparatus as particularly designed to cast blocks of the type shown in Fig. 5, it will be understood that it is susceptible of changes to adapt it for casting blocks of other types.

Various other changes and modifications are contemplated as within the spirit of the invention and the scope of the following claims.

What I claim is:—

1. A molding apparatus, including a mold box having a plurality of longitudinally and transversely arranged partition members providing a plurality of mold chambers in said mold box, a core arranged for cooperation with each of said chambers, and means for introducing a heating medium into all of said cores substantially simultaneously.

2. A molding apparatus, including a mold box having a plurality of longitudinally and transversely arranged partition members providing a plurality of mold chambers with open tops and bottoms, a core arranged for cooperation with each of said chambers, means for closing the bottoms of all of said chambers, means for introducing a heating medium into all of said cores substantially simultaneously, and means for exhausting said heating medium from all of said cores substantially simultaneously.

3. A molding apparatus, including a mold box having a plurality of longitudinally and transversely arranged partition members providing a plurality of mold chambers in said box, a framework arranged to be removably supported upon said mold box and carrying a core for cooperation with each of said chambers, and means carried by said framework and removable therewith for introducing a heating medium into all of said cores substantially simultaneously.

4. A molding apparatus, including a portable mold box provided with a plurality of mold chambers, a framework removably associated with said mold box and carrying a plurality of hollow cores for cooperation with said mold chambers to form cored articles therein, and means carried by said framework and removable therewith and

communicating with the interiors of said cores for introducing a heating medium thereinto.

5. A molding apparatus, including a mold box comprising a plurality of mold chambers, a framework removably associated with said mold box and carrying a plurality of hollow cores cooperating with said mold chambers to form cored articles therein, and means comprising pipes communicating with the interiors of said cores and connected with a common source of supply for introducing a heating medium into the interiors of all of said cores substantially simultaneously, said pipes being carried by said framework and being removable therewith with said cores from said mold box.

6. A molding apparatus, including a mold box comprising a plurality of mold chambers, a framework removably associated with said mold box and carrying a plurality of hollow cores cooperating with said mold chambers to form cored articles therein, means comprising pipes communicating with the interiors of said cores and connected with a common source of supply for introducing a heating medium into the interiors of all of said cores substantially simultaneously, said pipes being carried by said framework and being removable therewith with said cores from said mold box, and means similar to the heating medium introducing means and carried by said framework for exhausting said heating medium from all of said cores substantially simultaneously.

7. A molding apparatus, including a mold box comprising a plurality of rows of mold chambers, a plurality of rows of hollow cores arranged for cooperation with said mold chambers, an inlet pipe and an exhaust pipe communicating with the interior of each of said cores, an inlet conduit for each row of cores and to which all of the inlet pipes of a row of cores are connected, an exhaust conduit for each row of cores and to which all of the exhaust pipes of a row of cores are connected, a header with which all of said inlet conduits communicate, and a header with which all of said exhaust conduits communicate, whereby a heating medium may be introduced into and exhausted from all of said cores substantially simultaneously.

8. A molding apparatus, including a mold box comprising a plurality of rows of mold chambers, a plurality of rows of hollow cores arranged for cooperation with said mold chambers, an inlet pipe and an exhaust pipe communicating with the interior of each of said cores, an inlet conduit for each row of cores and to which all of the inlet pipes of a row of cores are connected, an exhaust conduit for each row of cores and to which all of the exhaust pipes of a row of cores are connected, a header with which

all of said inlet conduits communicates, a header with which all of said exhaust conduits communicate, whereby a heating medium may be introduced into and exhausted from all of said cores substantially simultaneously, and a framework arranged in cooperative relation to said mold box for re- movably supporting said cores, pipes, conduits and headers with respect to said mold chambers. 10

In testimony whereof I have hereunto set my hand this 16th day of March, A. D. 1925.

SIMON LAKE.