No. 722,782. PATENTED MAR. 17, 1903.

C. R. WEAVER.

APPARATUS FOR MAKING CONCRETE.

APPLICATION FILED JUNE 6, 1902.

NO MODEL. 2 SHEETS—SHEET 1.

Fig 1a

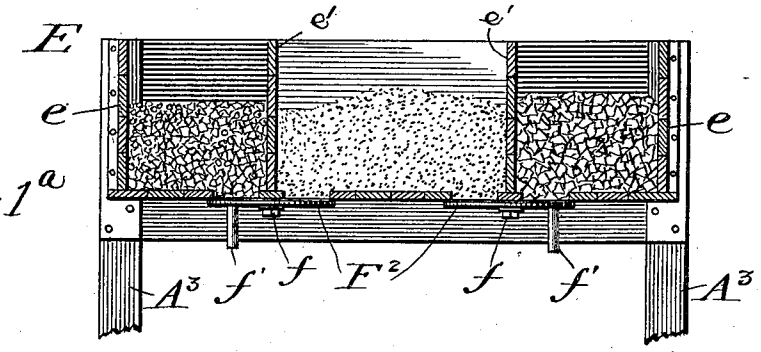
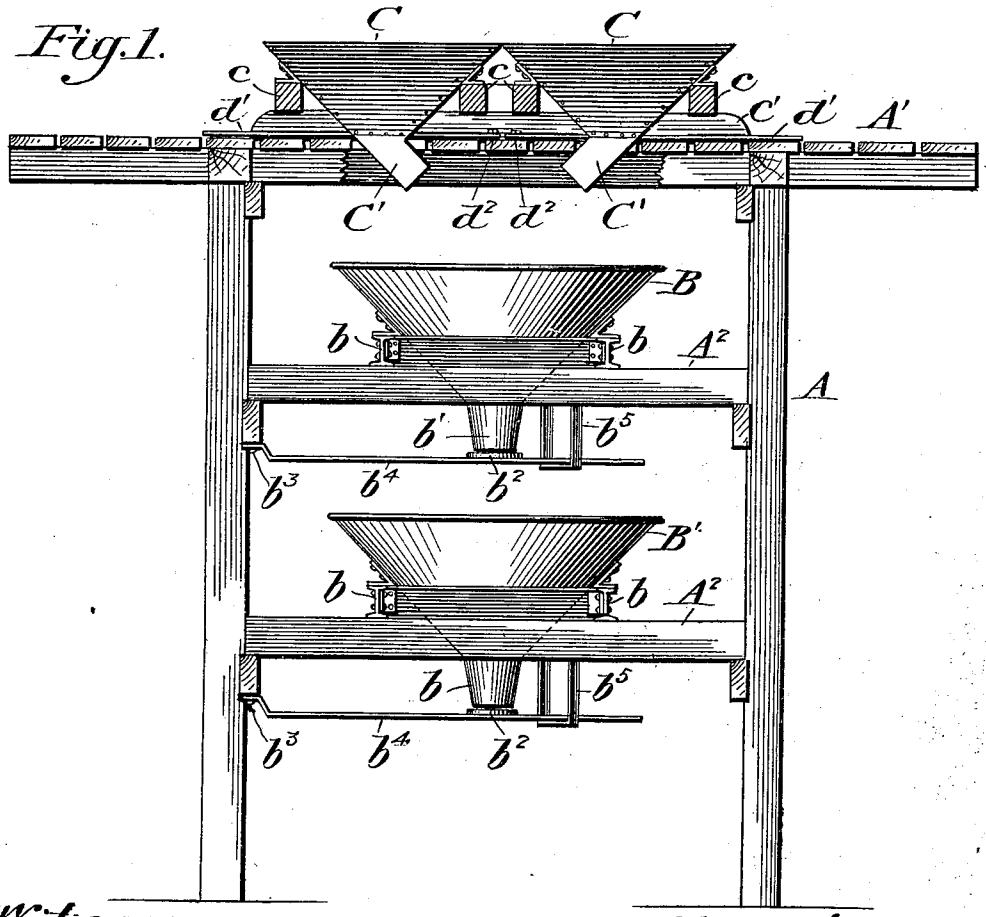


Fig. 1.



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NO MODEL. 2 SHEETS—SHEET 2.

Fig. 2.

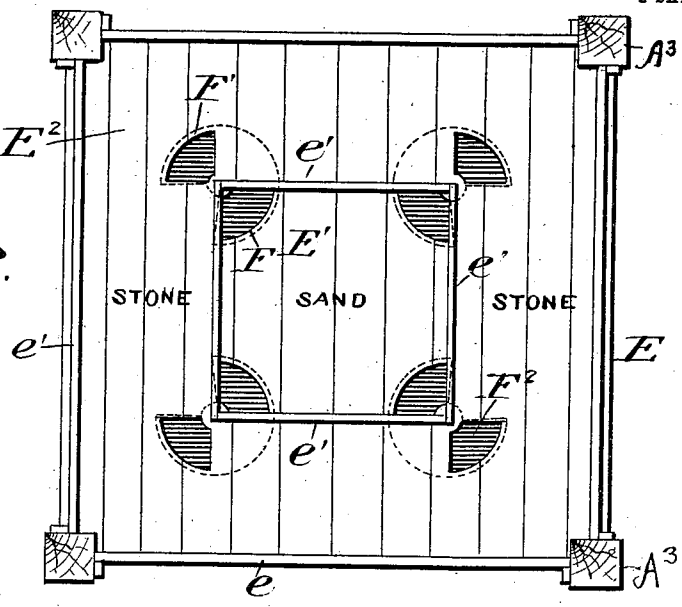
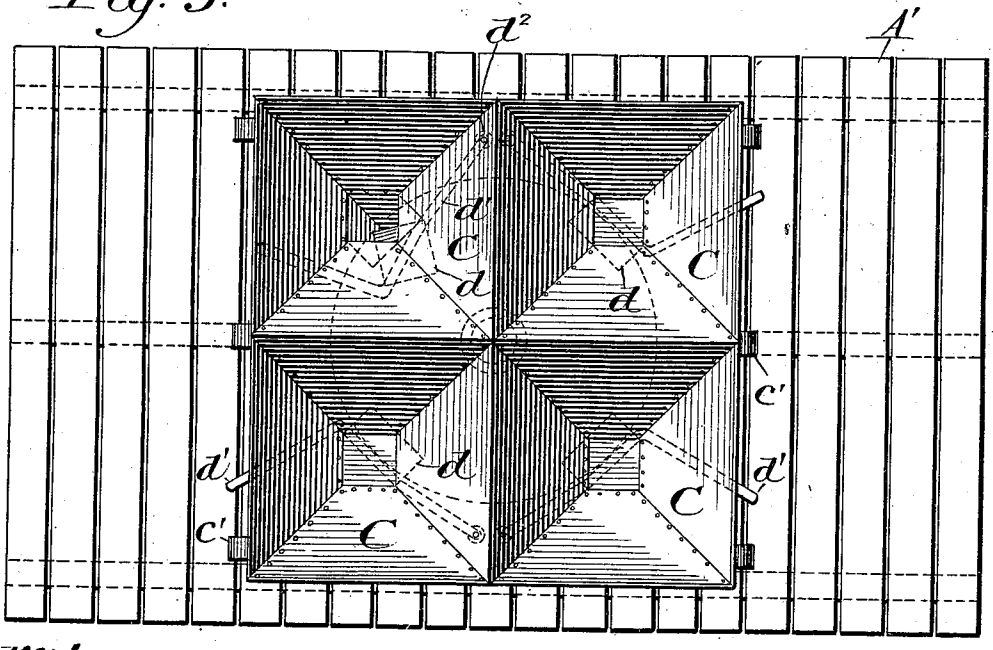


Fig. 3.



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UNITED STATES PATENT OFFICE.

CHARLES R. WEAVER, OF BALTIMORE, MARYLAND, ASSIGNOR TO PETER C. HAINS, JR.

APPARATUS FOR MAKING CONCRETE.

SPECIFICATION forming part of Letters Patent No. 722,782, dated March 17, 1903.

Application filed June 6, 1902. Serial No. 110,528. (No model.)

To all whom it may concern:

Be it known that I, CHARLES R. WEAVER, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Apparatus for Making Concrete, of which the following is a specification.

The invention to be hereinafter described relates to an apparatus for making concrete, and is designed more especially as an improvement over the apparatus described in Letters Patent No. 633,313, dated September 19, 1899, wherein concrete is prepared or mixed in a suitable receptacle in such manner that by discharging the ingredients of the mixture through a narrow aperture from the bottom of the receptacle the thorough mixing of the various materials will be effected without the necessity of agitation by hand or by mechanical means, thus facilitating and expediting the preparation of concrete and at the same time securing the most thorough and perfect mixing of the ingredients possible.

In the present embodiment of my invention I have sought to improve and simplify the construction set forth in the patent hereinbefore referred to, all as will be hereinafter described and then definitely pointed out in the claims.

In the drawings, Figure 1 is a side elevation, parts being shown in section, of an apparatus embodying my invention. Fig. 1^a is a detached sectional view of the storage-bins and their supports, the latter being broken away. Fig. 2 is a plan view of the storage-bin; and Fig. 3 is a plan view of the top hoppers, showing their relative arrangement.

In the drawings, A represents any usual or desired form of supporting-framework carrying a platform A′ and provided with cross-pieces A^2, upon which cross-pieces are suitably supported what I will term "mixing-hoppers" B B′, said hoppers being sustained upon the cross-pieces A^2 by any usual form of supporting devices, as the beams *b*. These mixing-hoppers B B′ may be of any desired form in cross-section; but in the present illustration I have shown them as funnel-shaped, having a wide upper portion and a contracted discharge-neck *b*′, normally closed by a sliding door b^3, mounted upon an arm b^4, pivoted at b^3, the free end of said arm b^4 resting upon a sustaining-yoke b^5, whereby the door b^3 when under the discharge-mouth of the hopper will be held up close against the same and prevent material from being discharged therefrom. It will be evident, of course, that the number of these mixing-hoppers B B′ may be varied as desired; but I have found in practice that the construction herein illustrated is well adapted for the purpose in view.

Supported upon the top of the framing A, I provide a plurality of top hoppers C, four being shown in the present form of my invention, arranged above the platform A′ and supported by any desirable form of frame-pieces, as *c c*′. The top hoppers C, as designated in Fig. 3, are arranged with their adjacent upper edges preferably in contact, and each of said hoppers C is provided with a contracted discharge-chute, as C′, the opening into which from each respective hopper is controlled by a suitable sliding door *d*, which, as shown in Figs. 3 and 1, is mounted upon an operating-arm *d*′, pivoted at d^2, and passes through a slot or opening in one side of the chutes C′ in a diagonal direction under the action of the operating-arms. It will be understood, of course, that it is only necessary to provide a slot for the doors *d* in two sides of the upper part of the chutes C′, the other sides thereof serving as an abutment against which the edges of the doors *d* may abut to effectually cut off the flow of material from the hopper through the chute, as desired.

Mounted above the platform A′, and preferably upon extensions A^3 of the framing A, are the storage-bins, (designated as a whole by the letter E and shown more clearly in Figs. 1^a and 2.) The storage-bins are for the purpose of containing the stone and sand which enters into the concrete mixture as a part of the ingredients thereof. As set forth in Patent No. 633,313, hereinbefore referred to, it is necessary in making concrete by this form of apparatus that the component parts of the concrete shall be arranged in layers in the top bins—that is, each top bin should contain cement, sand, and stone of the desired proportions, arranged from the bottom of the hopper upward in the order named; and to secure the ready introduction of the sand

and stone into the top hoppers in the present form of my invention I have divided the storage-bin E into two portions—namely, a central portion E′ for containing sand and a surrounding portion E^2 for containing the cracked stone. The general size and shape of the storage-bin may be varied, of course, as desired; but in the present embodiment of my invention it comprises rectangular form of receptacles, one within the other, the outer receptacle E^2 comprising the side walls *e*, preferably secured to the uprights A^3, while the receptacle E′ for sand comprises the side walls *e*′, suitably secured within the central portion of the receptacle E^2. The bottoms of the receptacles or inner and outer storage-bins E′ E^2 are provided with discharge-openings F F′, respectively, preferably arranged as shown in Fig. 2—that is, in close proximity to each other and at the corner portions of the inner receptacle or bin E′. Mounted upon suitable pivotal supports *f* are the doors F^2, formed in the present embodiment of my invention as a plate, preferably in circular form, said plate comprising approximately three-quarters of a circle, the other approximate quarter of the circle being omitted from the plate, so that when the same is brought below either of the openings F F′ in the bottoms of the inner or outer bins E′ E^2 it will permit material contained in said bin to be discharged through the opening thereof, and when said circular plate is thus moved to discharge material from one bin it serves to close the discharge-opening of the other bin, as will be evident, an operating-handle *f*′ being provided for the purpose of moving the door F^2 upon its pivotal support *f*. Thus it will be seen that when it is desired to discharge sand into any one of the top hoppers C the door F^2 immediately above said top hopper is moved to bring the opening of said door into coincidence with the discharge-opening in the bottom of the hopper E′ E^2, and when sufficient material has been discharged from one of said hoppers into the top bin the door F^2 is swung around to bring the opening thereof into coincidence with the discharge-opening of the other bin, as is obvious.

In the present embodiment of my invention I have shown four top hoppers for receiving material from the storage-bins, and I have arranged the storage-bins in relation to said hoppers so that the discharge-doors F^2 thereof may be disposed only directly above each top hopper; but it is evident that the number of top hoppers and the size, character, and general form thereof and of the storage-bin disposed above the same may be varied within wide limits without departing from the spirit of my invention, which contemplates the provision of a simplified form of storage-bin so disposed above the top hoppers that the different ingredients to be fed to said hoppers may be discharged thereinto separately as desired, and while in the device of Patent No. 633,313 are shown mixing or interrupting cones G below the top and subsequent hoppers, for the purposes of deflecting and mixing the material as it passes from said hoppers, in the present form of my invention I have not deemed such mixing or interrupting cones as necessary, but discharge the material from the top hoppers C directly into a hopper B, disposed below the same, the said hopper B being preferably formed of suitable size to contain all the material that may be discharged thereinto from all of the top hoppers. It will be noticed also that the discharge-chutes C′ from the top hoppers C are inclined, so as to more accurately discharge material into the mixing-hopper B. However, such inclined forms of discharge-chute may not in all cases be necessary, and my invention is not limited thereto.

The operation of my device may be briefly stated as follows: Each of the four top hoppers, if four be the number employed in any particular construction of my invention, are charged in the desired proportion by first depositing therein the cement, which may readily be done by an attendant from the platform A′. The doors F^2 of the storage-bin E are then manipulated to allow the desired quantity of sand to be deposited upon the top of the cement, and when sufficient sand has been placed in the top hopper the door is swung around to deposit upon the sand the desired quantity of stone, the amount of the cement, sand, and broken stone being gaged by any suitable marks upon the hopper. The desired quantity of water is then sprayed or dashed over the top of the stone in the hoppers C, care being taken to equally distribute it, so as to thoroughly wet the stone and sand. The cement being in the form of an impalpable powder acts as a dam and remains dry, the top surface only becoming wet. The bottom doors or gates of the top hoppers are then opened, either simultaneously or in quick succession, whereupon the material in the top hoppers C passes through the discharge-chutes C′ into the mixing-hopper B, the material in its descent from the top hoppers becoming thoroughly mixed, the material in the hoppers passing therefrom under much the same action as the sand in a sand-glass. When the hopper B has thus received the material from the top hoppers, the door b^2 thereof is opened, and the material may drop therefrom in the same manner as from the top hoppers into another hopper B′, or, if desired, directly to place or into a suitable carrier for transporting the material to the place of use. It is thus seen that the concrete does not run continuously through the hoppers, but is dropped from one tier to another, the hopper last emptied being always ready to receive a charge from the one above, so that the process of mixing becomes one of rapid succession of steps, the limit of its rapidity to be mixed being determined by the speed of handling the ingredients.

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

1. In an apparatus for mixing concrete, the combination of a plurality of top hoppers to receive and hold material arranged in layers, each of said top hoppers being provided with a discharge-opening, a storage-bin arranged above the top hoppers and having a plurality of compartments for holding different materials, a discharge-opening for each compartment and means for discharging material from the compartments of the bin into any one of the plurality of top hoppers.

2. In an apparatus for mixing concrete, the combination of a plurality of top hoppers to receive and hold material arranged in layers, each of said top hoppers being provided with a discharge-opening, a storage-bin arranged above the top hoppers and having an inner and outer compartment, said compartments each being provided with a discharge-opening, and a door common to a discharge-opening in the inner and outer compartments for successively discharging material from each of said compartments.

3. In an apparatus for mixing concrete, the combination of a plurality of top hoppers to receive and hold material arranged in layers, each of said top hoppers being provided with a discharge-opening, a storage-bin arranged above the top hoppers and having an inner and an outer surrounding compartment, said compartments each being provided with a plurality of discharge-openings, an opening of each compartment being disposed above each of the top hoppers, and means for controlling the discharge of material from said compartments into said top hoppers.

4. In an apparatus for mixing concrete, the combination of a plurality of top hoppers to receive and hold material arranged in layers, each of said top hoppers being provided with a discharge-opening, a storage-bin arranged above the top hoppers and having an inner and an outer surrounding compartment, said compartments each being provided with a plurality of discharge-openings, an opening of each compartment being disposed above each of the top hoppers, and a door common to a discharge-opening of the inner and outer compartments for successively discharging material from each of said compartments.

5. In an apparatus for mixing concrete, the combination of a plurality of top hoppers to receive and hold material arranged in layers, each of said top hoppers being provided with a discharge-opening, a storage-bin arranged above the top hoppers and having an inner and an outer surrounding compartment, said compartments each being provided with a plurality of discharge-openings, an opening of each compartment being disposed above each of the top hoppers, and a door common to a discharge-opening of the inner and outer compartments, said door having a portion adapted to cover the opening of both of said compartments, and an aperture that may be brought into register with either of said openings as desired.

6. In an apparatus for mixing concrete, the combination of a plurality of top hoppers to receive and hold material arranged in layers, each of said top hoppers being provided with a discharge-opening, a storage-bin arranged above the top hoppers and having an inner and an outer surrounding compartment, said compartments each being provided with a plurality of discharge-openings, an opening of each compartment being disposed above each of the top hoppers, and a door pivotally supported below a discharge-opening of the inner and outer compartments and having a portion adapted to cover both of said discharge-openings and an aperture that may be brought into register with either of said discharge-openings successively to discharge material first from one and then from the other of said compartments into each of the plurality of top hoppers.

7. A storage-bin for a concrete-mixer, comprising a plurality of receptacles for different materials, a separate discharge-opening for each of said receptacles, and a single door controlling the discharge-opening from said several receptacles.

8. A storage-bin for a concrete-mixer, comprising an inner and an outer portion, an adjustable opening for each of said portions, said adjustable openings being arranged adjacent each other, and a single door for controlling the discharge of material through each of said adjacent discharge-openings.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES R. WEAVER.

Witnesses:
MALCOLM VARNELL,
FRANK H. BAXTER.