No. 886,768. PATENTED MAY 5, 1908.

P. P. DE BOGORY.

CONCRETE MIXER.

APPLICATION FILED MAR. 21, 1907.

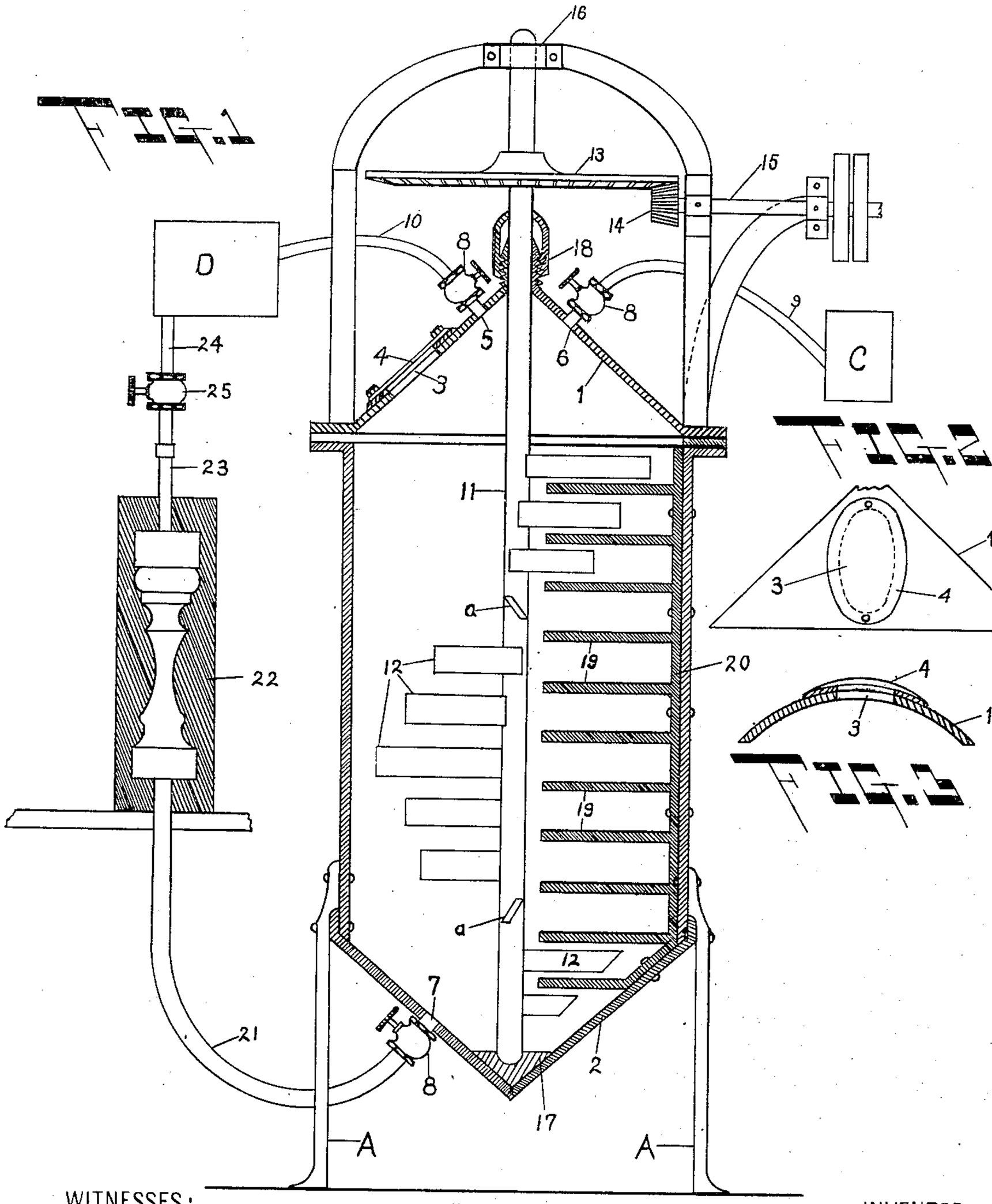

FIG. 1

FIG. 2

FIG. 3

WITNESSES:
Carl F. Bergner Jr.
Ralph S. Warfield.

INVENTOR
Peogor P. De Bogory
BY
Geo. B. Willcox
ATTORNEY

UNITED STATES PATENT OFFICE.

PROGORE P. DE BOGORY, OF LARKIN, FLORIDA, ASSIGNOR OF ONE-HALF TO WILLIAM C. OFFER, OF MIAMI, FLORIDA.

CONCRETE-MIXER.

No. 886,768. Specification of Letters Patent. Patented May 5, 1908.

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To all whom it may concern:

Be it known that I, PROGORE P. DE BOGORY, a citizen of the United States, residing at Larkin, in the county of Dade and State of Florida, have invented certain new and useful Improvements in Concrete-Mixers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to processes and means for handling cementitious materials, one object being to accomplish the mixture of the ingredients, and their discharge from the mixer, expeditiously and mechanically, without the manual handling of the mixture at any point in the process.

Another object is the provision of a novel means for commingling the ingredients.

A further object is the commingling of the ingredients in a suitable container in a partial vacuum and the discharge of the mixture from the container by means of compressed air.

A further object is the provision of a process and means for imparting a final stirring to the material as it is discharged.

My invention further consists in other novel features and combinations such as will be more fully described hereinafter and particularly set forth in the claims.

In the accompanying drawings illustrating one of the many embodiments of my invention, Figure 1 is a view in side elevation and partly diagrammatic of a plant for working out my process, and Figs. 2 and 3 are detail views of the closure for the mixing receptacle.

The drawings merely indicate one of a number of suitable mechanisms for accomplishing the results attained and its details may be varied to suit the requirements or conditions of work.

The process and means for handling cementitious mixtures is as follows—A suitable mixing receptacle capable of being made air-tight is provided, into which the ingredients (preferably sand, cement and water, in proper proportions) are introduced, the necessary amount of water being first placed in the receptacle after which the sand and cement are gradually added, the sand and cement being first thoroughly mixed before being fed to the receptacle and preferably introduced after the beaters have commenced to rotate. When the entire charge has been fed in, the cover of the receptacle is closed. The receptacle contains a beater mechanism which is operated in any suitable manner. During the operation of the beaters or paddles, the air within the receptacle is exhausted, as by means of a vacuum pump, so that the intimate commingling of the ingredients is accomplished at least in a partial vacuum to prevent the formation of lumps and air bubbles in the mixture. As soon as the ingredients have been thoroughly commingled, the vacuum pump is cut off and the mixture subjected to pressure, as from an air compressor placed in communication with the receptacle above the level of the mixture therein. The discharge opening is then opened, such opening communicating preferably with the bottom of a suitable closed mold, whereby the semi-liquid, easily-flowing contents of the receptacle is forced into the mold to fill the same. As one means for carrying out this process, I may provide suitable legs (A) adapted to support the mixing receptacle which may be stationary or portable as desired.

The receptacle comprises a cylindrical body equipped preferably with conical top and bottom (1) and (2) respectively, the top or cover being removable to permit the beater mechanism to be inspected or removed when necessary.

The cover is provided with an inlet opening (3) suitably closed by the charging door (4) suitably packed to hermetically close the opening. It is through this door that the ingredients are introduced into the receptacle.

A compressed air port (5) and a vacuum port (6) communicate respectively with the interior of the receptacle through the cover thereof, the bottom being provided with the discharge opening (7). Each of these ports and openings is provided with a valve (8) to permit them to be closed or opened at will, the vacuum pump (C) communicating with the port (6), and the air compressor (D) communicating with the port (5) by means of pipes or tubes (9) and (10) respectively.

As one means for agitating and mixing the ingredients, I have shown the following mechanism—Passing into the mixing receptacle through the cover and extending longitudinally thereof, is a beater shaft (11) carrying the paddles (12) inclined to the hori-

zontal, as shown at (*a*) and adapted to stir up the ingredients in the receptacle. The upper projecting portion of the shaft is provided with a gear (13) adapted to mesh with a gear (14) on the driving shaft (15) suitably supported in a frame (B), the upper end of the beater shaft having a bearing in the upper end of the frame, as at (16). The lower end of the shaft (11) is seated in a step-bearing (17) on the conical bottom (2), the paddles at the lower end of the shaft adapted to impart a final stirring to the mixture as it is discharged from the port (7). The shaft (11) passes into the receptacle through a stuffing box (18). Secured interiorly of the receptacle is a comb-like member comprising the teeth or stationary bars (19) projecting inwardly, the paddles adapted to pass between adjacent bars and though I have shown but one series of these bars preferably carried by a back-bone (20) of said comb-like member, it is obvious that more than one series might be employed, the bars being preferably parallel with each other and extending horizontally from top to bottom of the receptacle. The paddles are set spirally of the shaft (11), as shown, to more thoroughly mix the material which is subjected to agitation throughout its entire mass. Also, by setting the paddles spirally of the shaft, any tendency of the material to travel with the paddles is prevented, and the circular current is broken up. This may be accomplished by rotating the shaft first in one direction and then in the opposite direction. The paddles are of approximately even lengths except at the lower end where the receptacle is constricted.

The operation of the machine is simple. The charging door (4) is opened and the ingredients introduced into the chamber, in the manner heretofore set forth, preferably after which the door is closed, the beater shaft having been rotated as the sand and cement were fed in. The valve (8) controlling the communication of the vacuum pump and the port (6) is opened, whereby before the ingredients have become thoroughly commingled, the air in the receptacle is withdrawn so as to effect such commingling in at least a partial vacuum. As soon as the mixture is ready, the vacuum valve (8) controlling port (6) is closed and the compressed air valve (8) controlling the passage of the compressed air from the compressor (D) through the tube (10) to the port (5) is opened, whereby pressure is brought to bear upon the upper surface of the easily flowing contents of the receptacle to force the latter out of port (7) and through pipe (21) to the mold (22). That face of the mold opposite the inlet pipe (21) is provided with an overflow pipe (23) to which a tube (24) from the compressor (D) connects the tube (25) therein. Now, as soon as the mold is filled, the valve (25) is opened to admit pressure to the opposite face of the mold contents so that the latter is simultaneously compressed from above and below, after which the valve (8) of the inlet pipe (21) is closed, the mold contents attaining its initial set under pressure admitted through the overflow pipe.

The rate of filling of the mold may be ascertained in any suitable manner.

It is evident that many changes might be made in the form and arrangement of the several parts described without departing from the spirit and scope of my invention, and hence I do not wish to limit myself to the exact construction herein set forth.

Having thus fully disclosed my invention, what I claim as new is—

The combination in a mixer, of a receptacle having charging and discharging apertures located respectively at the opposite ends of the receptacle, a rotary shaft within the receptacle, paddles on the shaft, a comb-like member secured within the receptacle, the paddles passing between each two adjacent teeth of the member, a vacuum pump, and an air compressor, separate pipes connecting the pump and compressor with the upper end of the receptacle, separate valves controlling communication between the pump and compressor respectively and the receptacle, a closure for the charging opening and means controlling the discharge opening.

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

PROGORE P. DE BOGORY.

Witnesses:

ALEX. B. SIBLEY,

C. L. SIBLEY.