No. 866,712. PATENTED SEPT. 24, 1907.

C. D. CAMPBELL.

CENTRIFUGALLY MADE COLUMN.

APPLICATION FILED JULY 18, 1906.

Fig. 1.

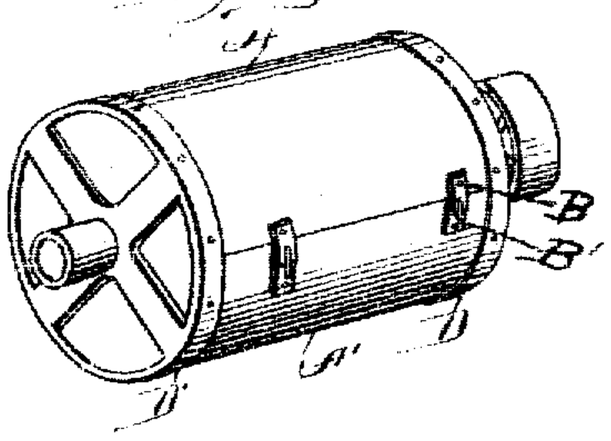


Fig. 3.

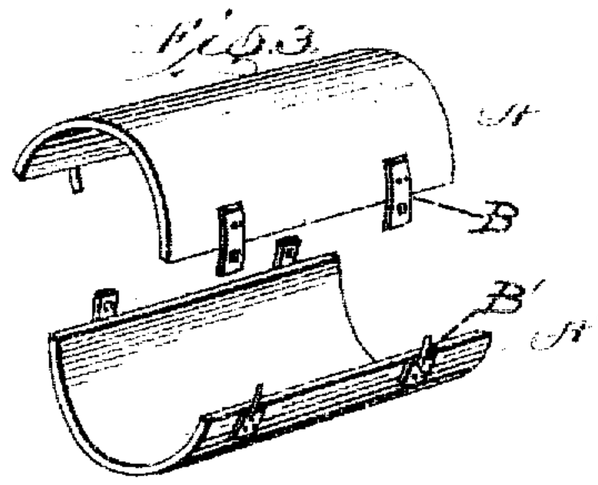


Fig. 2.

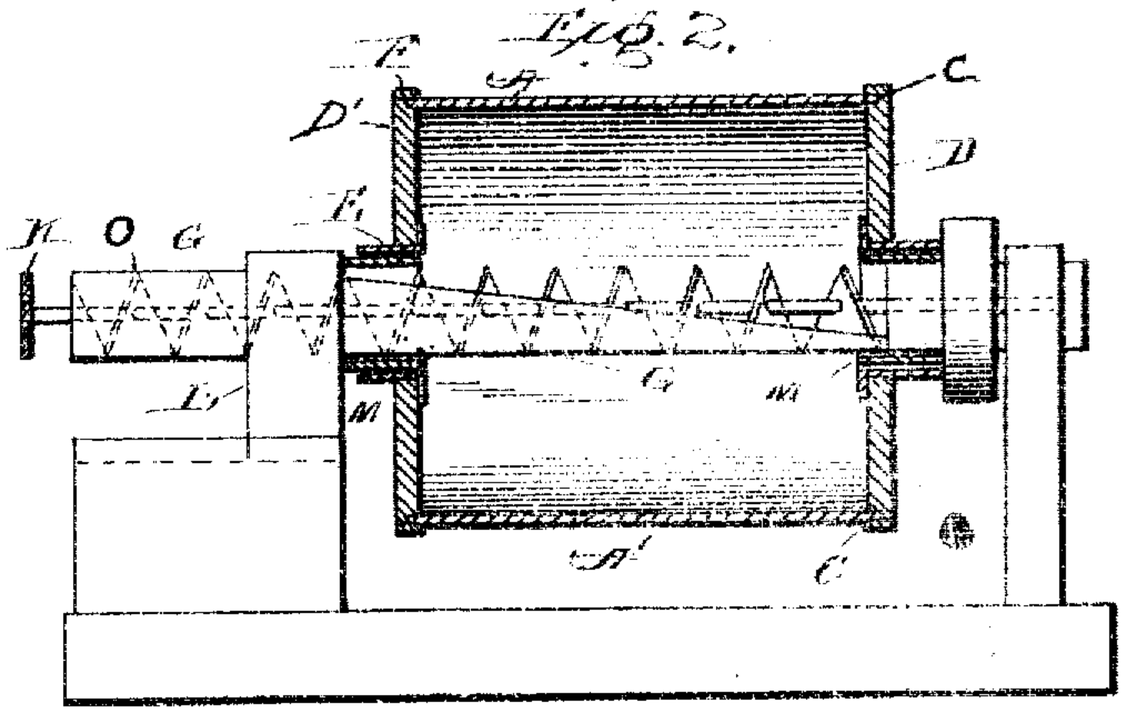


Fig. 4.

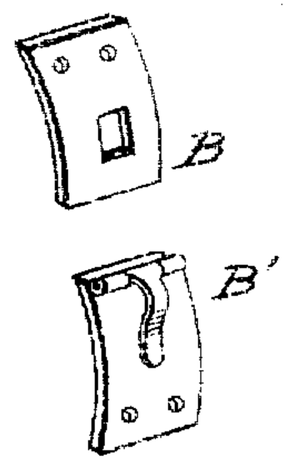


Fig. 5.

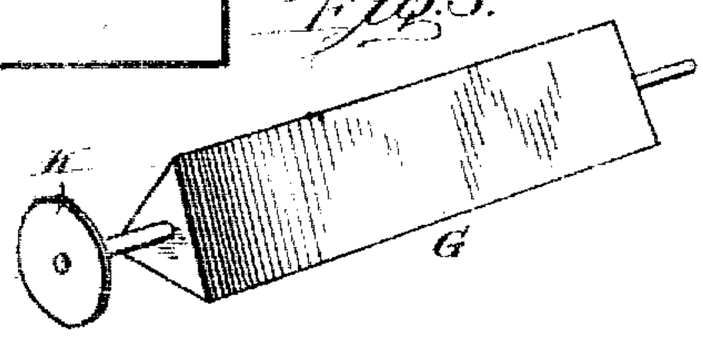


Fig. 7.

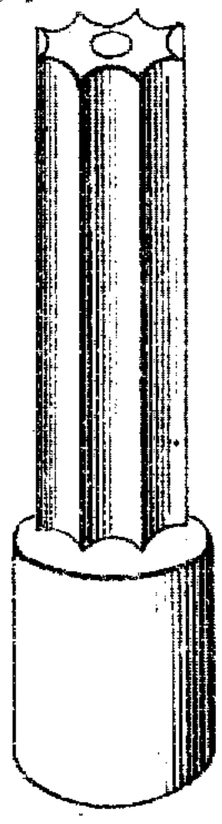
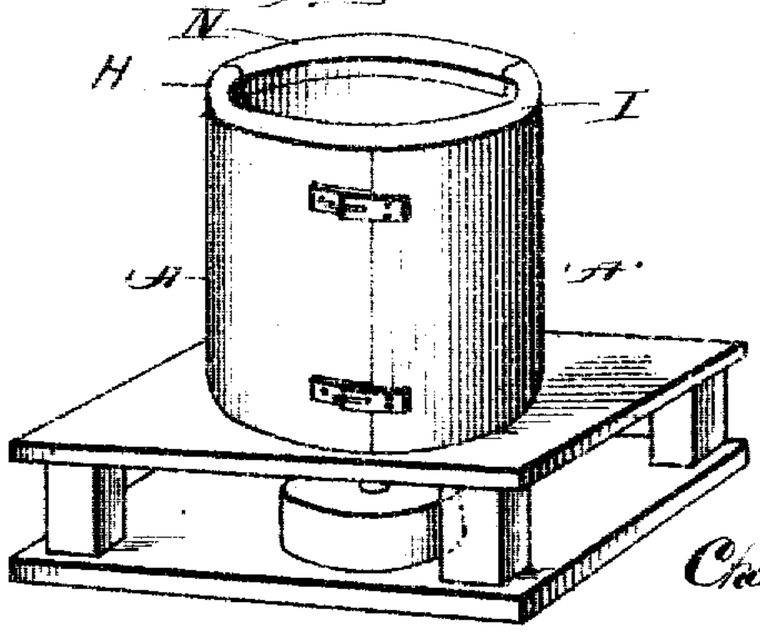


Fig. 6.



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CENTRIFUGALLY-MADE COLUMN.

No. 866,712. Specification of Letters Patent. Patented Sept. 24, 1907.

Application filed July 18, 1906. Serial No. 326,959.

To all whom it may concern:

Be it known that I, CHARLES D. CAMPBELL, a citizen of the United States, residing at Bellefontaine, in the county of Logan and State of Ohio, have invented a new and useful Improvement in Centrifugally-Made Columns, of which the following is a specification.

My invention relates to certain improvements in cement columns and other cylindrical bodies, that need tamping from the inside, outwardly, to unite their component parts, and to give their outer surface a smooth, and finished appearance, and in devices for making the same.

Figure 1 is a perspective view of my cylindrical mold for plain cylinders. Fig. 2 a sectional view showing beveled feed trough and endless feeding screw. Fig. 3 detached view of the two halves of the wall of my mold. Fig. 4 detached view of fasteners that unite the walls of the cylinder. Fig. 5 detached view of batch feed trough. Fig. 6 view of upright mold with double walls,—a modification. Fig. 7 front view of column molded by my process.

The construction of my device is as follows:—A cylinder is made in two parts A, A′, and the ends left open. On the edge of each half is a hasp B, and on the corresponding edge of the other half pivoted cam latches B′ that slip through the hasps and turning backward lock the halves together tightly. In putting the cylinder together, one end of the lower half is inserted in the groove in headblock D, and the adjustable headblock D′ moved up to fit the other end in the slot in it. The upper part of the cylinder is then fitted into the top part of groove in D and the sliding clamp F secured on the other end, and the two parts of the cylinder locked together with the latches B′. The headblocks are open as shown in Fig. 1, for observation and to allow concrete to be thrown in if desired.

The headblock D′, hollow axle E, and the feed trough G, are mounted on a sliding block L to allow them to move endwise out of the column so it can be taken out of the mold when formed.

The feed trough shown in Fig. 5 or that in Fig. 2, can be used as desired. In that shown in Fig. 2 one end rests in the hollow bearing M, and extends through the cylinder at the other end far enough to receive a batch of the mixed material. The sides of the trough inside the cylinder taper down as shown, and an endless screw O, operated by hand wheel K, on the outside, forces the material forward, crowding it over the sloping edges of the trough evenly, from one end to the other. A light interior coat or face of finer material can be given the column by inserting in the cylinder, just before completion of the column a small amount of fine mixture. With the endless screw feed the different grades of mixture can be fed in at will, they being readily inserted in the feeding trough, while the machine is in operation.

With large or very heavy articles that do not require an absolutely fine finish I inclose a cylinder H within a perforated cylinder A, Fig. 6, leaving a chamber I between them for the concrete, which I mix thinner than usual, so that it will pour from a reservoir above it. These cylinders are mounted to revolve vertically, but may be made to revolve horizontally by having a hinged door in the top of the cylinder to feed the material in. In the present form the material is poured into the chamber I, which is a little wider than the column to be made is thick. A cap N is placed over the chamber and the cylinder revolved rapidly, the excess of water in the mixture being thrown off through the holes in the outer cylinder, and squeezed out upon the inner face of the tile or column, by the pressure of the sand and cement, the centrifugal pressure tamping the material against the outer wall, and compressing it until there is a space between the inner face of the tile and the inner cylinder.

The operation of my device is as follows: One end of the lower half of the cylinder is inserted in the groove in the headblock D, and the headblock D′ is moved up until the other end rests in groove C therein. Enough cement and sand, dampened and mixed,—say one part cement and two parts sand—to make an outer shell of ⅛, ¼, or ½ inch, or the thickness desired, is placed in the bottom half of the cylinder. The top half is then put in place and the flange or rim F moved over it and secured by screws. The parts are locked together by latches B′. The feeding trough containing enough concrete to finish the column is then placed in position inside the cylinder. This concrete is coarser than that placed in the bottom of the cylinder, say one part cement to five parts sand. The cylinder is then revolved a short time, distributing the first and finer mixture on the inside surface of the cylinder or mold, when the feed trough G is turned over by means of the hand wheel K, without stopping the cylinder, and the material is dumped in the cylinder where it is speedily distributed around its inner surface, uniting with that already therein, forming part of the column, the centrifugal force tamping the material into a solid shell or column, and acting on each particle of the same, gives a more even pressure, or tamping, than can be secured in any other manner.

On account of the fineness of the cement, and because of the different specific gravity of the cement and sand, a greater proportion of the cement is forced to the outer face, than there is in the rest of the body, forming a fine smooth finish to the face, and giving the greatest strength in the outer portion, where it is needed most.

In ordinary work it is not necessary to make two lots, one finer than the other, as enough of the cement will crowd to the outer surface to give it a good finish and make the cylinder the strongest at the outer part.

But where extra fine, smooth finish is desired, I prefer first putting in a fine mixture and then a coarse one.

In making cylinders of small diameters it is not necessary to use the feed trough, as the proper amount of concrete can be placed in the cylinder or mold before closing it. But with larger articles the bulk is so heavy as to require too much force to start the revolution of the cylinder.

With articles that do not require a perfectly smooth finish to their face I use a perforated cylinder to allow some of the water to be thrown off, outwardly. But as this is liable to leave specks on the outer surface, for fine finish I use a smooth, tight, cylinder, and the sand and the cement being heavier than the water, eject or squeeze the excess of water, should there be any, out onto the inside of the column.

When the column is completed, a truck is run beneath the cylinder to support it, the headblock D' and feed trough are slid back, the upper half of the cylinder removed, and the column wheeled to the drying ground.

The inner face of the mold may be corrugated or fluted to make a column to correspond, or it can be made with recesses or projections, to make bands, molding, or other designs on the face of the column.

To take up the water forced to the inner face of the column, fine, dry cement and sand may be inserted in the interior, which, mixing with the water on the inner face of the column, gives it a fine, smooth finish.

What I claim is:

1. As a new article of manufacture, an integral hollow body constructed of a plurality of concentric layers of centrifugally laid, graded cement mixtures.

2. As a new article of manufacture, an integral hollow body constructed of a plurality of concentric layers of centrifugally laid, graded cement mixtures, the layers being arranged so that the material becomes coarser from the surface inward.

3. As a new article of manufacture, an integral hollow body constructed of a plurality of concentric layers of centrifugally laid, graded cement mixtures, a layer having an excess of finer material being located near the surface whereby a smooth and less pervious surface is obtained.

4. As a new article of manufacture, an integral hollow body constructed of a suitable cement mixture, centrifugally tamped, graded according to degree of fineness, with an excess of finer material near the exterior surface, whereby a smoother and more impervious outer surface is obtained, and with the inner surface of said wall also produced by a material of relatively finer texture than the main body.

5. As a new article of manufacture, a hollow body having walls constructed of a suitable cement mixture centrifugally laid, with an inner surface separately laid, centrifugally.

6. As a new article of manufacture, a hollow cement body having a main centrifugally laid wall with the finer portions of the constituent material collected at or near the exterior surface of said walls and having a separately laid inner surface of said walls and having a separately laid inner surface of relatively fine material.

7. As a new article of manufacture, a hollow cement body having its wall made up of a plurality of centrifugally laid layers.

8. The process of producing hollow bodies of cement, which consists in feeding a suitable cement material in plastic state into a molding receptacle, while the latter is rotating and causing said material to pass by centrifugal force outwardly and forcibly against molding surfaces in said receptacle.

9. The process of producing hollow bodies of cement, which consists in feeding a suitable cement material in plastic state into a molding receptacle, while the latter is rotating and causing said material to pass by centrifugal force outwardly and forcibly against molding surfaces in said receptacles, said rotation and feeding continuing simultaneously until the desired thickness of body is built up.

10. The process of producing bodies of cement, which consists in feeding a suitable cement material in plastic state into a revolving receptacle and causing said material to pass by centrifugal force outwardly and forcibly against molding surfaces in said receptacle and continuing the feeding of the material until the desired thickness of material is produced.

11. The process of producing hollow bodies of cement, which consists in introducing a suitable cement material in plastic state into a revolving receptacle and causing said material to pass by centrifugal force outwardly and forcibly against outer molding surfaces in said receptacle, and continuing the feeding of the material until a wall of desired thickness is produced but varying the character of the material fed into the receptacle for the purpose of producing a wall of varying texture.

12. The process of forming hollow bodies of cement, which consists in feeding a suitable composition of granular and binding materials into and throughout the length of a rapidly revolving mold and radially tamping said material by centrifugal force against the inner surface of the outer walls of the mold to impart form to the material.

13. The process of laying plastic material which consists in gradually feeding it into a revolving receptacle and gradually building up the body by the action of centrifugal force, whereby the successive layers develop in an unbroken spiral during the molding of such material.

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Attest:
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