No. 875,234. PATENTED DEC. 31, 1907.

M. H. AVRAM.

MIXING MACHINE.

APPLICATION FILED DEC. 15, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

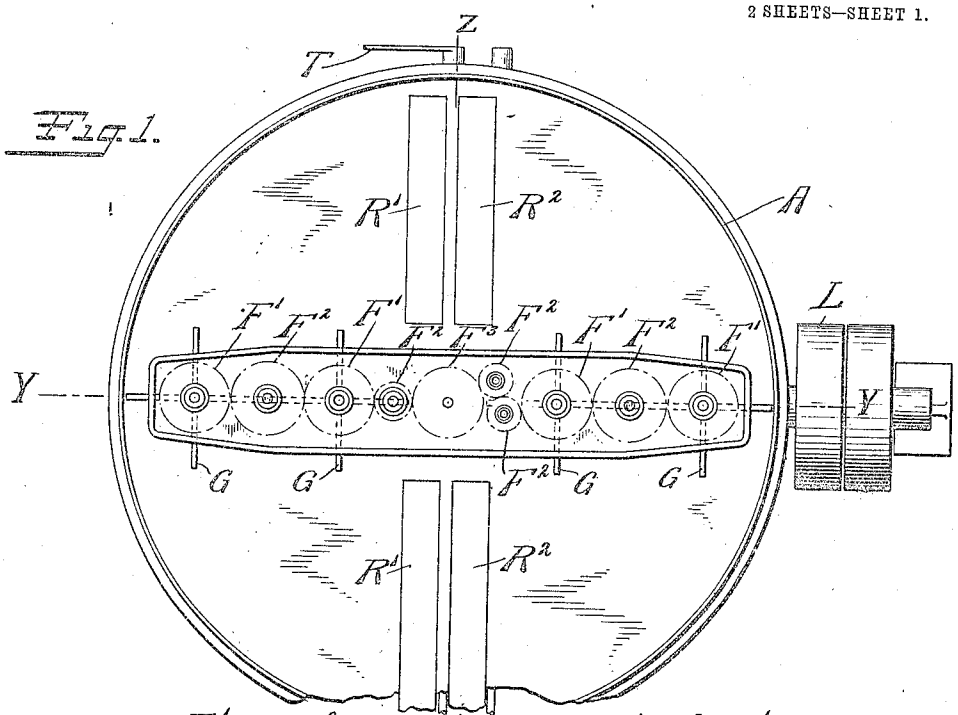
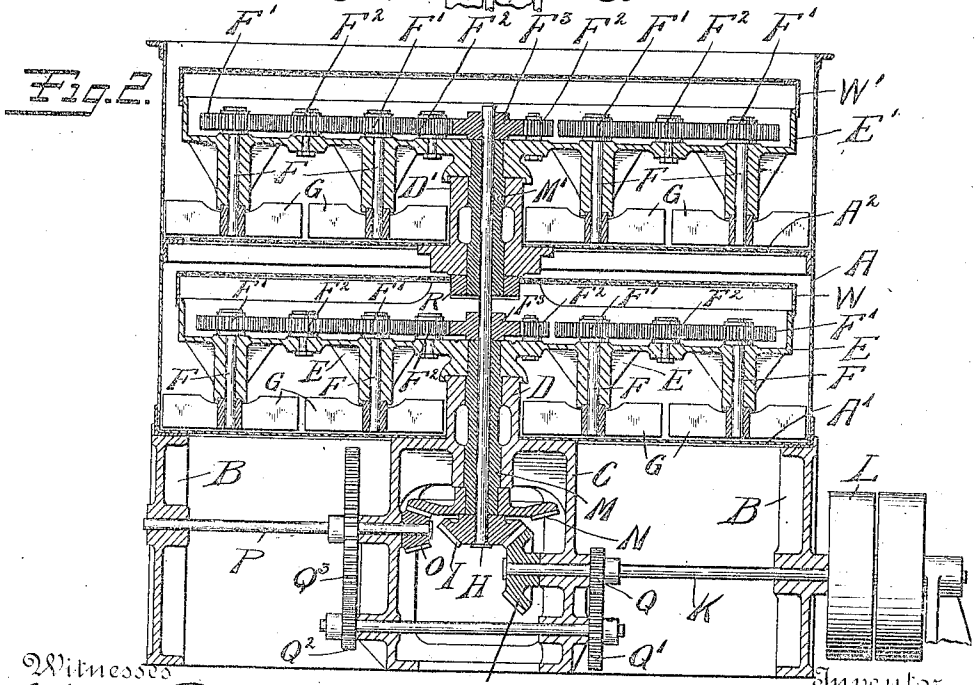


Fig. 2.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 3.

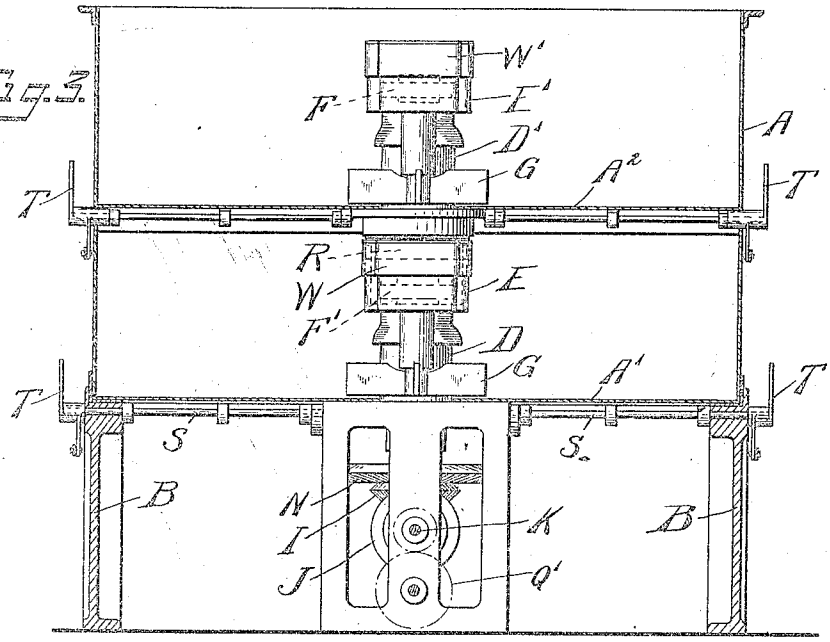
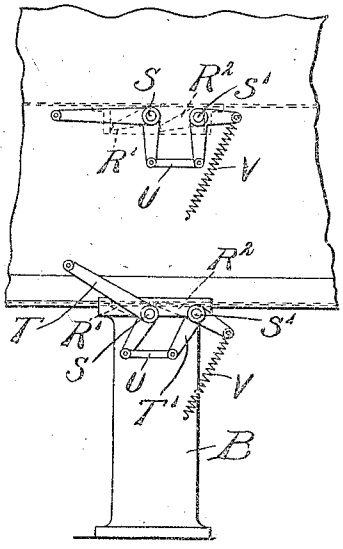


Fig. 4.



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MIXING-MACHINE.

No. 875,234. Specification of Letters Patent. Patented Dec. 31, 1907.

Application filed December 15, 1906. Serial No. 347,946.

To all whom it may concern:

Be it known that I, MOÏS H. AVRAM, a citizen of the United States, residing at New York city, New York county, New York, have invented certain new and useful Improvements in Mixing-Machines, of which the following is a full, clear, and exact description.

My invention relates to machines for mixing pulverized substances of various kinds, and is especially adapted for mixing together such substances as sand, hydrated lime and cement, and has for its object to produce an apparatus which will bring about a double mixing and from which the mixed materials can be easily discharged.

My invention also has for its object to produce an apparatus in which the material in passing through it will be subjected to dry and wet mixings in separate receptacles.

The following is a description of an embodiment of my invention, reference being had to the accompanying drawings, in which:

Figure 1 is a plan view of the apparatus, Fig. 2 is a vertical section on the line Y—Y Fig. 1, Fig. 3 is a partial vertical section on the line Z—Z, and Fig. 4 is a view of a detail.

Referring more particularly to the drawings, A is a container having a bottom A′ and a dividing partition A^2, constituting in effect two pans, the upper belonging to a dry mixer and the lower to a wet mixer. The double pan A is supported on uprights B, B, B, B at its edges, and the central support C. This central support C has a boss portion D extending up through the bottom A′. The upper surface of this boss supports and forms a bearing for a revolving frame E forming part of a compound stirrer. The frame E is keyed to a sleeve M so as to be rigidly secured thereto. To the lower end of the sleeve M is secured a miter gear N which engages with the miter gear O mounted on the shaft P, to which power is transmitted from the driving pulley L through the train of gears Q, Q′, Q^2, Q^3. The frame E is provided with a bridge R, which carries a sleeve M′ passing through the hub D′ on which bears a second frame E′ secured to the upper end of the sleeve M′.

In the frames E E′ are journaled shafts F, F, F, F having at their lower ends paddles G G, each consisting of four blades at right angles to each other. The shafts F, F, F, F are provided at their upper ends with gears F′, F′, F′, F′, which are driven by intermediate gears F^2, F^2, F^2, F^2, F^2 also carried by the frames E E′. The innermost gears F^2 F^2 engage with gears F^3 mounted on the shaft H, thus making a train of three gears between the shaft and the paddles on that side. This shaft has at its lower end a miter gear I, which is engaged by a gear J on the shaft K driven by the pulley L. The presence of the pair of intermeshing gears F^2, F^2 between the gears F′ and F^3 on the right hand side of the center (Fig. 1) thus making a train of four gears between the shaft and the first paddles on that side, and results in causing the paddles G on opposite ends of the frames to revolve in the opposite directions and to bring about a more thorough mixing action.

When power is applied to the pulley L, the two frames E E′ are made to revolve in one direction and the shaft H is made to revolve in the opposite direction. The movement of the shaft H is transmitted to the paddles G, G, G, G, so that they all revolve on their axes as well as moving about the axis of the shaft H, the paddles having planetary movements. The result is that the material in the pans within the casing A is very thoroughly mixed.

The bottom of each pan is provided with four shutters, R′ R^2, which are mounted on shafts S, S′, S, S′. The bell crank levers T, T′ are connected to the shafts S, S′, S, S′, their lower arms being connected by links U. The upper arms of the bell cranks T T are elongated so as to act as levers and the free arms of the bell crank T′ T′ are provided with springs V, or other means, for returning the levers and their shutters to their normal position.

After the material in the upper pan has been subjected to a thorough dry mixing, its shutters R′ R^2 are opened by depressing the elongated arm of the bell cranks T, as shown in Fig. 4, whereupon the material falls into the lower pan, where water is added and the mixing continued. The fact that the material must be quickly transferred from the dry to the wet pan and the wet mixing must be done in small quantities and quickly (particularly when cement is used) so as to be both mixed and pressed before the materials harden, make the advantages of my double mixer very important and valuable. When the wet mixing has been completed in the

lower pan, the shutters R′, R² of the lower pan are opened so as to discharge the mixed contents. Suitable ducts (not shown) are provided for supplying oil to the bearing surfaces. The gears are each covered with protectors W, W′ so that no dust or dirt can make any contact with them. The paddles will have some movement on their respective axes even if the shaft H is held stationary. I prefer, however, to give it a positive movement of rotation in a direction opposite to that of the frame E.

The apparatus above described runs continuously and is mixing materials in one pan or the other, or both. By reason of the dry mixing a thorough distribution and intimate intermingling of the contents is effected. The material can easily be transferred to the wet mixing pan, whenever desired. In practice it should be kept out of the wet pan until it is necessary to wet mix a fresh quantity.

The bearing surfaces are all above the material to be mixed, and are, therefore, removed as far as possible from it, so as to be kept away from the grit and the parts are easy of access should inspection or repairs be necessary.

What I claim is:

1. In a mixer, the combination of a pan, a revoluble sleeve concentric therewith, a frame carried thereby, paddles carried by said frame and revoluble relatively thereto, a shaft within said sleeve geared to said paddles said sleeve being revoluble relatively to said shaft, and means for causing said sleeve to revolve about its own axis.

2. In a mixer, the combination of a pan, a revoluble sleeve concentric therewith, a frame carried by said sleeve, paddles carried by said frame and revoluble relatively thereto, a shaft within said sleeve geared to said paddles said sleeve being revoluble relatively to said shaft, and means for causing said sleeve and said shaft to revolve relatively to one another and to the pan about the axis of said shaft.

3. In a mixer, the combination of two pans, each having a bottom, a revoluble frame in said lower pan, and a revoluble frame in said upper pan carried by the frame in said lower pan and fixed relatively to said lower frame, paddles carried by said frames and revoluble relatively thereto, a shaft concentric with the axis of revolution of said frames and revoluble relatively thereto, and means for causing said frames and said shaft to revolve independently.

4. In a mixer, the combination of a pan having a central boss arising from its bottom to a considerable distance, a frame resting thereon and having a depending sleeve extending through said boss, paddles rotatably mounted in said frame, a shaft passing through said sleeve, said shaft having a bearing supported on top of said frame and geared to said paddles, and means for revolving said shaft and said frame respectively relatively to one another and to the pan.

5. In a mixer, the combination of a pan, a frame therein, a sleeve connected thereto, a shaft passing through said sleeve, paddles carried by said frame and revoluble relatively thereto, gearing connecting said paddles to said shaft, a cover for said gearing also carried by said frame and revoluble with said frame, and means for driving said frame connected to the lower end of said sleeve.

6. In a mixer, the combination of a pan, a revoluble frame therein, a sleeve connected thereto, a shaft passing through said sleeve, paddles carried by said frame and revoluble relatively thereto, gearing connecting said paddles to said shaft, a cover for said gearing also carried by said frame and revoluble with said frame, and means for applying power to the lower ends of said sleeve and said shaft for driving the same.

7. In a mixer, the combination of a pan, a frame mounted to revolve therein, paddles carried by said frame and revoluble relatively thereto, and a shaft concentric with the axis of revolution of said frame and revoluble relatively to said frame, gearing connecting said shaft and said paddles, and means for driving said shaft and said frame independently.

8. In a mixer, the combination of a pan, a frame therein revoluble relatively to said pan, paddles carried by said frame on both sides of the center thereof and revoluble relatively thereto, a shaft concentric with the axis of revolution of said frame, gearing connecting said paddles to said shaft the gearing connecting said shaft to the first paddle on one side having an odd number of gears, and the gearing connecting said shaft to the paddles on the other side having an even number of gears so as to make the paddles on opposite sides of the center revolve in opposite directions relatively to said frame, and means for revolving said frame.

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