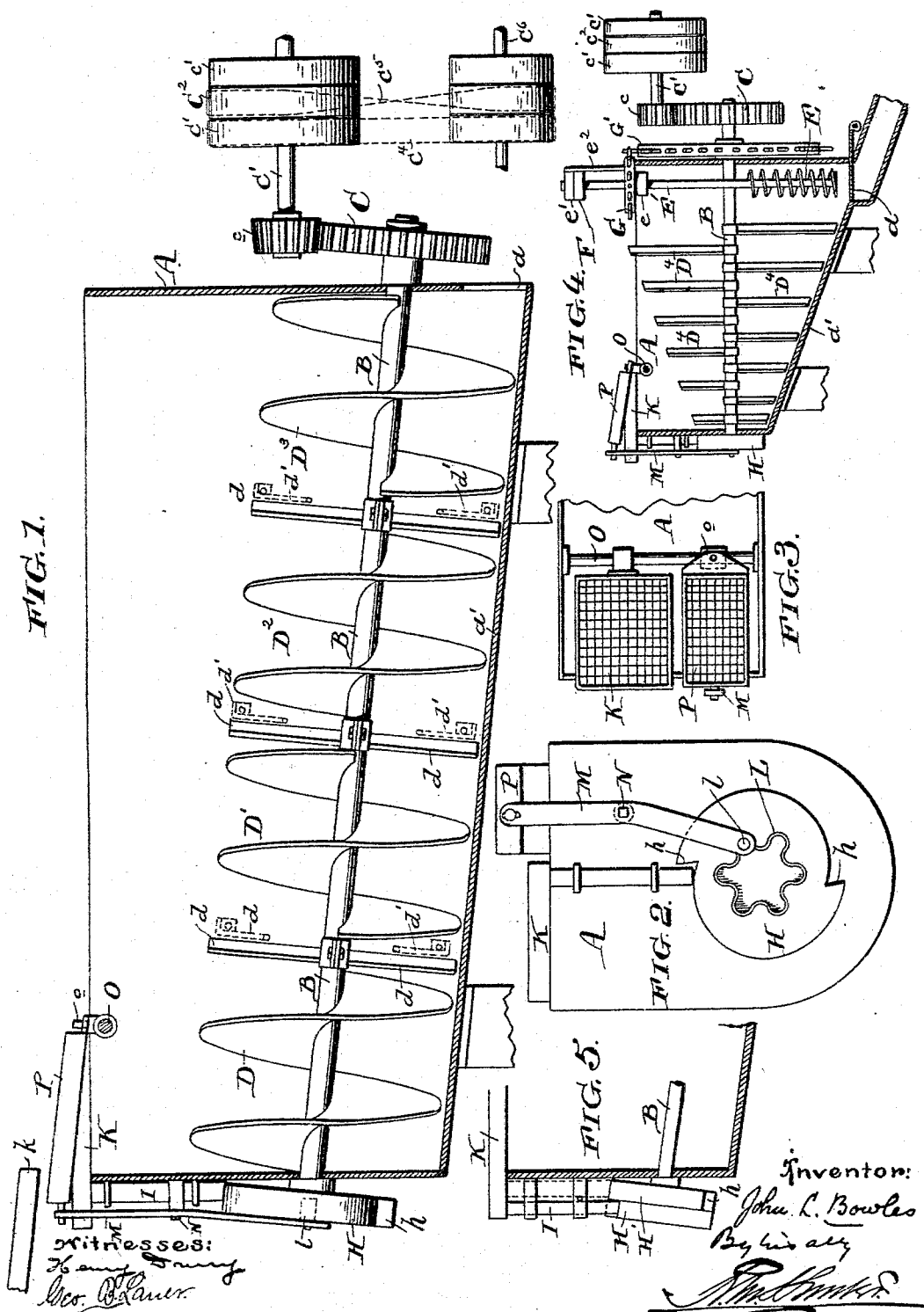


(No Model.)

J. L. BOWLES.
MORTAR MIXING MACHINE.

No. 515,463.

Patented Feb. 27, 1894.



UNITED STATES PATENT OFFICE.

JOHN L. BOWLES, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO JULIA H. RAE, OF MILFORD, DELAWARE.

MORTAR-MIXING MACHINE.

SPECIFICATION forming part of Letters Patent No. 515,463, dated February 27, 1894.

Application filed April 11, 1892. Serial No. 428,563. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. BOWLES, of the city and county of Philadelphia and State of Pennsylvania, have invented an Improvement in Mortar-Mixing Machines, of which the following is a specification.

My invention relates to machines for mixing mortar and other compositions of matter, and consists of certain improvements which are fully set forth in the following specification and are shown in the accompanying drawings which form a part thereof.

The object of my invention is to accomplish the mixing together of the constituents of mortar, or other compositions of matter, by machinery in a thorough, quick and economical manner.

It is also an object of my invention to accomplish the easy delivery of the mixed mortar from the machine.

In carrying out my invention I employ the apparatus illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal view partly in section of my improved mixing machine. Fig. 2 is a front end elevation of the same. Fig. 3 is a plan view on a reduced scale of the front end of the machine. Fig. 4 is a view similar to Fig. 1 upon a reduced scale, showing a modified form of the machine, and Fig. 5 is a side elevation of the front portion of the machine showing a modification of the devices for rocking the lime screen.

A is the mixing tank or vessel and may be of any desired construction. The mixing tank is provided with a suitable discharge outlet *a* at one end and has, preferably, an inclined bottom *a'*, inclining toward the outlet *a*.

Journalled longitudinally in the tank or vessel A is a rotary mixing device carried upon the shaft B and rotated through the gearing C, *c*, or in any other suitable manner. I prefer to employ for this mixing device the construction shown in Fig. 1, in which the shaft B is provided with a spiral conveyer made in sections D, D', D², D³, with projecting arms or blades *d* carried by the shaft between the adjacent sections of the spiral conveyer. Any desired number of arms or blades *d* may be employed and they may be bolted or oth-

erwise fastened to the shaft B. The shaft B is preferably arranged at an incline corresponding with the inclination of the bottom *a'* of the tanks so as to bring the edge of the spiral conveyer adjacent to the inclined bottom. The spiral conveyer acts to thoroughly mix the ingredients in the tank or vessel A and at the same time to feed them along to the outlet *a* and to discharge the mixture therefrom. The arms or blades *d* assist materially in mixing together the constituents of the mortar or other composition; and their action may be materially assisted if desired by employing projecting arms or blades *d'* carried upon the inner surface of the tank or vessel A and arranged adjacent to the rotary blades or arms *d*, as shown in dotted lines in Fig. 1.

H is a cam wheel upon the end of the shaft B provided with one or more cam projections *h*.

K is a screen for the lime, or one of the elements of the composition to be formed, hinged at one end upon a rod or bar O over the forward end of the tank A and having its free end resting upon and supported by a movable rod I which rests upon the cam H and is guided in suitable guides *i*. When the cam H rotates the rod I will be raised and lowered by the action of the cam projections *h* and this will cause the screen K to be lifted up and down. This movement of the screen K will cause the slaked lime (which is in a thick liquid state) to pass more freely through interstices of the screen and will also prevent them from becoming clogged up. To most effectively accomplish this result I prefer to have the screen K descend or fall with a sudden jerk or jar and to produce this result the cam projection *h* may be made of a gradually increasing size terminating in a sharp offset or shoulder as shown. It will then act to slowly raise the screen K and then suddenly drop it with a jar.

While I have shown the cam H provided with two cam projections *h* it is understood that one or any number may be employed according to the frequency with which it may be desired to operate the screen K. The screen K may be operated by the cam H through a lever instead of the rod I.

P is a second screen adapted to receive and screen the sand which is introduced into the

vessel A. The screen is arranged above the tank A and is pivotally supported at its inner end upon the rod or bar O as shown at o, so as to be free to move laterally.

- 5 M is a bell crank lever pivoted as at N to the end of the tank and having one end connected with the free end of the screen P and the other end provided with a projection l working in an irregular or serpentine cam
10 groove L in the cam H. When the cam H rotates this cam groove L will impart a rocking movement to the lever M thereby rocking the screen P laterally upon its pivot point. This rocking movement serves to sift or screen the
15 sand and prevent the clogging of the meshes of the screen.

The slaked lime may be delivered to the lime screen K from a trough k.

- In using the apparatus the lime and sand
20 are supplied to their respective screens K and P in the proper proportions and pass thence into the vessel A where they are intimately mixed and worked together by the mixing devices, which also serve to carry the mixed
25 mortar out through the outlet a. This outlet may be closed by a door or slide until it is desired to permit the mortar to pass out of the machine.

- As it may be found desirable in starting the
30 machine to reverse the rotation of the shaft B so as to cause the mixing devices to operate in the reverse direction for the purpose of mixing up the material when the machine is started, the driving mechanism shown in
35 Fig. 1 may be employed. In this construction the pinion or gear c is carried by a counter shaft C' provided with a fast pulley c² and two loose pulleys c', c'.

- c⁶ is a second counter shaft carrying a band
40 pulley driving a straight belt c⁴ and a crossed belt c⁵, so that by throwing either the straight belt or crossed belt upon the fast pulley c² of the shaft C' the machine may be operated in either direction. When the rotation of the
45 shaft B is reversed the rod I by which the screen K is operated may be drawn out of the path of the cam H, so as not to obstruct the rotation of the shaft, or the cam may be thrown out of connection with the shaft B in any
50 well known manner. If it be desired however during this reversed operation of the shaft B to operate the screen K, a second cam H' may be employed corresponding with the cam H but having the direction of the cam
55 projections h reversed and the rod I may be shifted so as to be brought in position to be operated by this second cam, and a pin j or other device may be employed to hold the rod I in either adjusted position. This construction
60 is shown in Fig. 5.

- In the modification shown in Fig. 4 the mixing devices consist of a series of radial arms or blades D⁴ carried by the shaft B and arranged at such an angle to the line of their
65 rotation as not only to thoroughly mix the contents of the vessel A but also to feed the mixture toward the conveyer screw E, which

is arranged adjacent to the outlet end of the vessel and is adapted to force the mixed mortar out through the outlet a. This screw conveyer is mounted upon a vertical shaft E' journaled in bearings e, e', the former of which is secured to the end of the vessel and the latter carried by the bracket e². 70

F is a collar carried by the shaft E' which 75 bears against the bearing e', and resists the upward pressure upon the screw.

G is a spur wheel carried by the shaft E', the teeth of which engage with the teeth of the spur wheel G' mounted on the shaft B and 80 rotating therewith by this means the screw E is rotated and acts to force the mixed mortar out of the outlet a. While I have shown this screw conveyer applied to the modified construction shown in Fig. 4, it is apparent that 85 it may also be employed with the construction shown in Fig. 1 if desired. Ordinarily however the action of the spiral conveyer D, D', &c., will be sufficient to force out the mixed mortar without the assistance of the screw 90 conveyer E.

It will be observed that with the exception of the bearings of the shaft B all of the bearings and working parts of the machine are so located as not to come in contact with the 95 mortar.

While I prefer the minor details of construction that have been shown they are not to be taken as limitations of my invention, as it is apparent that they may be varied without any departure from the invention. 100

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the vessel A, having an outlet a and provided with the shaft 105 B having a series of projecting blades and the spur wheel G', of the conveyer screw E within the vessel A adjacent to the outlet a, shaft E' and spur wheel G, carried by the shaft E' and meshing with the spur wheel G', 110 whereby the conveyer screw E is operated to convey the mixed material out of the vessel A through the outlet a.

2. The combination with the vessel A, shaft B and projecting arms or blades carried by 115 the shaft, of the cam H having one or more cam projections h, the rod I and screen K, as and for the purposes set forth.

3. The combination with the vessel A, shaft B and projecting arms or blades carried by 120 the shaft, of the cams H and H' having one or more cam projections h the projections of the cams H and H' being relatively reversed, the rod I and screen K, as and for the purposes set forth. 125

4. The combination with the vessel A, shaft B, and projecting arms or blades carried by 125 the shaft, of the cam H, having the cam groove L, the lever M and sand screen P, as and for the purpose set forth.

5. In a machine for mixing mortar, &c., the combination of a suitable vessel to contain the materials to be mixed, a rotary shaft journaled in the vessel provided with projecting 130

portions to act upon the materials, a vertically rocking screen located over the vessel and power transmitting connections between the shaft of the mixing devices for rocking the screen vertically.

5 6. In a machine for mixing mortar, &c., the combination of a suitable vessel to contain the materials to be mixed, a rotary shaft journaled therein carrying projecting portions to act upon the materials in the vessel, a laterally vibratory screen and power transmitting connections between the rotary shaft and the vibratory screen to vibrate the same laterally.

15 7. In a machine for mixing mortar, &c., the combination of a suitable vessel to contain the materials to be mixed, a rotary shaft journaled therein carrying projecting portions to act upon the materials in the vessel, a later-

ally vibratory screen located over the vessel, 20 a vertically rocking screen also located over the vessel, and power transmitting connections between the rotary shaft and the vibratory screen and vertically rocking screen respectively to vibrate the one laterally and 25 rock the other vertically.

8. The combination with the mixing vessel A of the transverse bar O, the vertically rocking screen K hinged upon said transverse bar, and the laterally vibratory screen pivot- 30 ally connected with said bar.

In testimony of which invention I have hereunto set my hand.

JOHN L. BOWLES.

Witnesses:

C. E. BAIRD,

ERNEST HOWARD HUNTER.

It is hereby certified that the name of the assignee in Letters Patent No. 515,463, granted February 27, 1894, upon the application of John L. Bowles, of Philadelphia, Pennsylvania, for an improvement in "Mortar-Mixing Machines," was erroneously written and printed "Julia H. Rae," whereas said name should have been written and printed *Julio H. Rae*; and that the said Letters Patent should be read with this correction therein that the same may conform to the corrected files and records of the case in the Patent Office.

Signed, countersigned, and sealed this 27th day of March, A. D. 1894.

[SEAL.]

JNO. M. REYNOLDS,
Assistant Secretary of the Interior.

Countersigned:

JOHN S. SEYMOUR,
Commissioner of Patents.