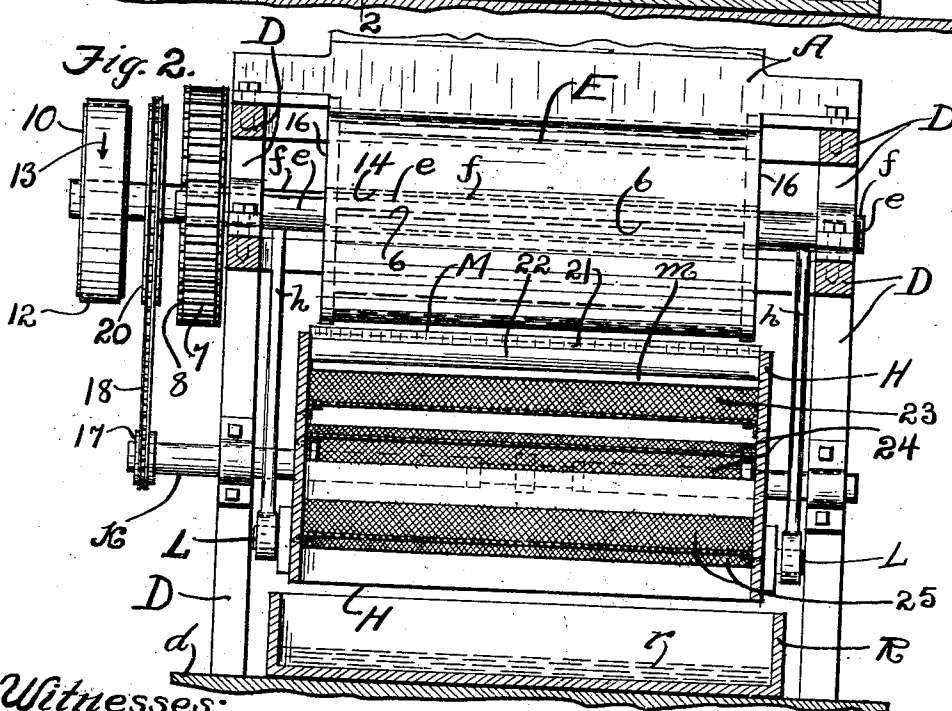
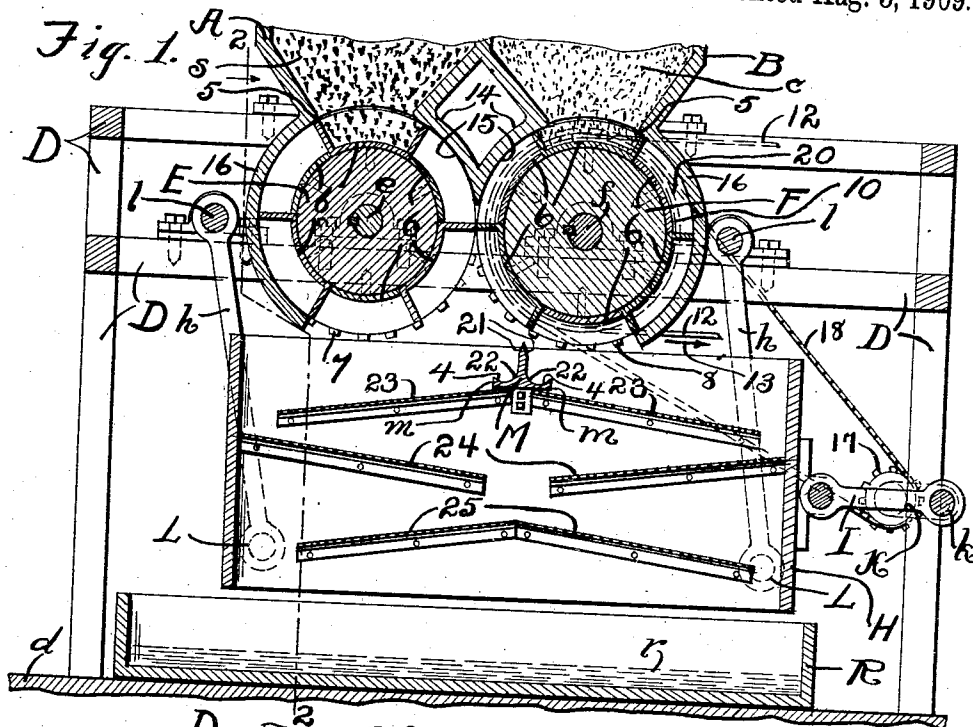


L. M. REED.
 APPARATUS FOR MAKING CONCRETE OR CEMENTITIOUS COMPOUNDS.
 APPLICATION FILED OCT. 10, 1908.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR MAKING CONCRETE OR CEMENTITIOUS COMPOUNDS.

No. 930,086.

Specification of Letters Patent.

Patented Aug. 3, 1909.

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To all whom it may concern:

Be it known that I, LEMON M. REED, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Apparatus for Making Concrete or Cementitious Compounds; and I 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 pertains to make and use the same.

This invention relates to improvements in apparatus for making concrete, mortar and the like, and pertains more especially to apparatus whereby sand and Portland or hydraulic cement are mixed in the proper proportion and in a dry state and the mixture showered into the body of water or liquid required to complete the production of the desired cementitious mass.

The primary object of this invention is to convey the sand and the cement from different hoppers respectively and to thoroughly mix the said materials while in a dry state over the aforesaid body of liquid and to cause the dry mixture to descend in a shower into said liquid and thereby result in the production of a homogeneous concrete or cementitious mass.

Another object is to provide apparatus of the character indicated which is simple in construction and efficient in its operation.

With these objects in view, and to the end of realizing any other advantages hereinafter appearing, this invention consists in certain features of construction, and combinations of parts, hereinafter described, pointed out in the claims, and illustrated in the accompanying drawings.

In the said drawings, Figure 1 is a side view in central vertical section of apparatus embodying my invention. Fig. 2 is a vertical section on line 2—2, Fig. 1, looking in the direction indicated by the arrow.

My improved apparatus comprises two hoppers A and B for supplying dry sand *s* and dry Portland or hydraulic cement *c* respectively. The hoppers A and B are arranged side by side and in the same plane horizontally and preferably in contiguity and suitably supported from stationary framework D erected upon the floor *d*. The hoppers A and B are each provided at the lower end with a downwardly discharging outlet 5.

Two laterally spaced parallel rotary conveyers E and F are arranged horizontally under the outlet of the hoppers A and B respectively. Preferably the conveyers E and F are operatively mounted on correspondingly arranged shafts *e* and *f*, respectively, which are supported from the stationary framework D. The conveyers E and F are each provided with peripheral chambers 6 which are spaced circumferentially of the respective conveyer and are arranged to successively communicate with and receive material from the outlet 5 of the superimposed or adjacent hopper during the rotation of the said conveyers.

A spur-gear 7, which is operatively mounted on the shaft *e* at one end of the shaft, meshes with a corresponding spur-gear 8 operatively mounted on the adjacent end of the shaft *f* which is operatively provided with a driving pulley 10 which is driven by a suitably actuated belt 12 in the direction indicated by the arrow 13 and as required to rotate the conveyers in the direction necessary to feed material toward each other.

Between the two conveyers E and F is arranged a guard 14 which has opposite side surfaces 15 thereof extending from the outlet of the different hoppers respectively downwardly and toward each other circumferentially of the different conveyers respectively and closely approaching each other at their lower ends. Each surface 15 is large enough in dimensions to cover a chamber 6 of the conveyer circumferentially of which the said surface extends and is arranged in close proximity to the said conveyer. It will be observed therefore that the conveyers E and F are arranged in close proximity to each other.

By this construction each chamber of each conveyer does not discharge the contents thereof until the said chamber during the rotation of the conveyer has begun to move below the lower extremities of the surfaces 15 which are preferably arranged wholly above the axes of the conveyers, and the arrangement of the chambers 6 of each conveyer is such relative to the arrangement of the chambers 6 of the other conveyer that two chambers of the different conveyers respectively during the rotation of the conveyers begin to simultaneously discharge the contents thereof under the lower extremities of the surfaces 15 so that the contents of both of the said chambers begin to mix as soon as the said chambers during the rotation of the

conveyers begin to move below the axes of the conveyers and of course below the afore-said lower extremities of the surfaces 15.

Two guards 16 are located at the outer side of the different conveyers respectively. Each guard 16 extends from the outlet of the adjacent hopper circumferentially of the adjacent conveyer in the direction opposite to the direction in which the said conveyer is rotated and is arranged in close proximity to the conveyer and large enough in dimensions to cover a chamber 6 of the said conveyer.

Upon the floor *d* below the conveyers E and F is placed a box or receptacle R, and the conveyers are arranged far enough above the said receptacle to accommodate the interposition, between the said receptacle and the conveyers, of apparatus employed in thoroughly mixing the sand and cement during the passage of the said materials downwardly from the said conveyers to the said receptacle and causing the mixture to descend into a body of water or liquid *r* contained in the said receptacle which is, of course, open at the top and closed at the bottom and supplied with the quantity of water or liquid *r* requisite to complete the formation of the cementitious mass to be produced upon the showering of the dry mixture of sand and cement into the said liquid.

The mixing and showering apparatus comprises a vertically arranged tubular casing H which is arranged between the receptacle R and the conveyers E and F. The casing H is suspended by upright links *h* from the stationary framework D. Preferably each link *h* is pivoted at its lower end, as at L, horizontally and parallel with the crank-shaft to the casing H, and pivoted at its upper end, as at *l*, horizontally and parallel with the said shaft to the stationary framework. The casing H is operatively connected by a pitman I with the crank *k* of a crank-shaft K which is arranged horizontally and parallel with the axes of the conveyers and suitably supported from the stationary framework. The crank-shaft K is operatively provided at one end with a sprocket-wheel 17 which is operatively connected by a chain 18 with a considerably diametrically larger sprocket-wheel 20 operatively mounted on one of the conveyer-bearing shafts. It will be observed therefore that during the rotation of the conveyers to feed material to the mixing and showering apparatus the casing H is rapidly reciprocated in a horizontal plane.

Centrally of the upper end of the casing H is located an inverted T-shaped cross-bar M which is arranged transversely of the said casing and parallelly with the axes of the conveyers. The upwardly projecting central member of the bar M has opposite sides of its upper portion converging upwardly and meeting at the top of the bar so as to form two surfaces 21 which slope downwardly and

laterally outwardly from the top of the bar, and opposite sides of the lower portion of the said central member of the bar slope downwardly and laterally outwardly, as at 22. Each laterally and outwardly projecting member *m* of the lower portion of the bar M has the upper surface of its outer portion sloping, as at 4, upwardly and laterally outwardly.

The bar M is attached to the casing H in any approved manner. The bar M is located centrally of the casing H, and the length of the throw of the crank and the relative arrangement of the parts are obviously such therefore that the bar is at the one or the other side of the said space into which the conveyers discharge according as the crank is at the one or the other end of its throw and near the one or the other conveyer according as the bar is at the one or the other extremity of its range of movement.

Two meshed screens 23 and 23 borne by the casing H are arranged within the upper portion of the casing H and extend and diverge downwardly from under the bar M.

Two downwardly converging meshed screens 24 are arranged under and suitably spaced from the screens 23 and in position to receive material passing over the lower ends of the screens 23. The screens 24 are supported from the casing H.

Two downwardly diverging meshed screens 25 borne by the casing H are arranged under and suitably spaced from the screens 24 and in position to receive material passing over the lower ends of the screens 24.

The bar M, the screens, the vibratory screen-support formed by the casing H and the means for actuating the said support are all instrumental in mixing and showering the material conveyed by the conveyers from the hoppers, and it will be observed that the screens are arranged to conduct material, which is too coarse to pass through the meshes of the screens, in sinuous paths to opposite ends of the receptacle R.

It will be observed that the bar M during the rapid reciprocation of the casing H moves laterally and rapidly in a horizontal plane from the one to the other extremity of its range of movement. The bar M materially participates therefore in a thorough mixing and showering of the materials discharged from the hoppers. The sloping surfaces 21, 22 and 4 of the bar tend to lift the materials during the movement of the bar and materially participate in the distribution or showering of the said materials over the screens 23. The sand and cement discharged from the conveyers E and F mix in their passage from the hoppers into the path of the bar M and the bar knocks the mixing sand and material in the one or the other direction according as the bar M moves in the one direction or the other. The mixing materials

are therefore distributed or showered by the bar M over the one or the other of the upper screens 23 according as the bar M moves laterally in the one or the other direction. Hence it will be observed that during the operation of my improved apparatus the dry cementitious mixture is caused to descend in a shower into the body of water or liquid *r*, and the showering of the said mixture into the said body of liquid results in the formation of a cementitious mass which is homogeneous and in the best possible condition for use in making cementitious products.

I would also remark that the capacity of each chamber 6 of the conveyer E and the capacity of each chamber 6 of the conveyer F bear the same proportion to each other as the quantities of sand and cement to be mixed. That is, if one part of cement is to be mixed with three parts of sand, the capacity of each chamber 6 of the conveyer F is one-fourth of the capacity of each chamber 6 of the conveyer E. The conveyers E and F are not only employed therefore in conveying material from the hoppers but in measuring the amount of material to be conveyed from the hoppers.

The receptacle R is replaced by a corresponding receptacle upon the production in the former of a batch of the desired cementitious mass.

The process carried out by the apparatus described in this specification is disclosed and claimed in application No. 457,075 filed by me in the U. S. Patent Office October 10, 1908.

What I claim is:—

1. In apparatus for making concrete, mortar or the like, the combination, with a receptacle which is open at the top and closed at the bottom and adapted to hold liquid, of a suitably supported bar arranged a suitable distance above and transversely of the said receptacle and having a range of movement laterally over the chamber of the receptacle; vertically spaced meshed screens between said receptacle and the said range of movement; means whereby the said bar is rapidly actuated laterally in opposite directions alternately, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

2. In apparatus for making concrete, mortar or the like, the combination, with a receptacle which is open at the top and closed at the bottom and adapted to hold liquid, of a suitably supported inverted T-shaped bar arranged a suitable distance above and transversely of the said receptacle and having a range of movement laterally over the chamber of the receptacle; vertically spaced meshed screens between the said receptacle and the said range of movement; means whereby the said bar is rapidly actuated laterally in opposite directions alternately, and

means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

3. In apparatus for making concrete, mortar or the like, the combination, with a receptacle which is open at the top and closed at the bottom and adapted to hold liquid, of a suitably supported bar arranged a suitable distance above and transversely of the said receptacle and having a range of movement laterally over the chamber of the receptacle, said bar having opposite sides of its upper portion converging upwardly; vertically spaced meshed screens between the said receptacle and the said range of movement; means whereby the said bar is rapidly actuated laterally in opposite directions alternately, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

4. In apparatus for making concrete, mortar or the like, the combination, with a receptacle which is open at the top and closed at the bottom and adapted to hold liquid of a suitably supported inverted T-shaped bar arranged a suitable distance above and transversely of the said receptacle and having a range of movement laterally over the chamber of the receptacle, said bar having opposite sides of the lower portion of its upwardly projecting central member sloping downwardly and laterally outwardly; vertically spaced meshed screens between the said receptacle and the said range of movement; means whereby the said bar is rapidly actuated laterally in opposite directions alternately, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

5. In apparatus for making concrete, mortar or the like, the combination, with a receptacle which is open at the top and closed at the bottom and adapted to hold liquid, of an inverted T-shaped bar arranged a suitable distance above and transversely of the said receptacle and having a range of movement laterally over the chamber of the receptacle, said bar having opposite sides of the lower portion of its upwardly projecting central member sloping downwardly and laterally outwardly and having the upper surfaces of the outer portions of its laterally projecting members sloping somewhat upwardly and laterally outwardly; vertically spaced meshed screens between the said receptacle and the aforesaid range of movement; means whereby the said bar is rapidly actuated laterally in opposite directions alternately, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

6. In apparatus for mixing concrete, mortar or the like, the combination, with a receptacle which is open at the top and closed at the bottom and adapted to hold liquid, of

an inverted T-shaped bar arranged a suitable distance above and transversely of the said receptacle and having a range of movement laterally over the chamber of the receptacle; 5 said bar having opposite sides of the upper portion of its upwardly projecting central member converging upwardly and having opposite sides of the lower portion of the said central member sloping downwardly and laterally outwardly; vertically spaced meshed screens between the said receptacle and the aforesaid range of movement; means whereby the said bar is rapidly actuated laterally in opposite directions alternately, and means 10 whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar centrally between opposite extremities of the range of movement of the bar.

7. In apparatus for making concrete, mortar or the like, a receptacle open at the top and closed at the bottom and adapted to hold liquid; a bar arranged over and a suitable distance above and transversely of the said receptacle; a vibratory support for the said bar, which support is movable to actuate the bar laterally; means whereby the said support is actuated to rapidly move the bar laterally in opposite directions alternately; vertically spaced meshed screens 15 borne by the said support and arranged between the said bar and the aforesaid receptacle, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the bar.

8. In apparatus for making concrete, mortar or the like, a receptacle open at the top and closed at the bottom and adapted to hold liquid; a bar arranged over and a suitable distance above and transversely of the said receptacle; a vibratory support for the said bar, which support is movable to actuate the bar laterally; means whereby the said support is actuated to rapidly move the bar laterally in opposite directions alternately; means whereby the constituent materials of the aforesaid mixture are fed into 20 the path of the bar; vertically spaced screens borne by the aforesaid support and arranged below and at one side of the bar between the aforesaid path and the receptacle, and vertically spaced screens borne by the said support and arranged below and at the opposite side of the bar between the said body of liquid and the said path.

9. In apparatus for making concrete, mortar or the like, a receptacle open at the top and closed at the bottom and adapted to hold liquid; an upright tubular casing arranged over the said receptacle and supported as required to render it capable of movement laterally; means whereby the said casing is rapidly actuated laterally in opposite directions alternately; a bar arranged centrally of the upper end of and supported from the casing and extending transversely 25 of the range of movement of the casing, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

10. In apparatus for making concrete, mortar or the like, a receptacle open at the top and closed at the bottom and adapted to hold liquid; an upright tubular casing arranged over the said receptacle and supported as required to render it capable of movement laterally; means whereby the said casing is rapidly actuated laterally in opposite directions alternately; an inverted T-shaped bar arranged centrally of the upper end of and supported from the casing and extending transversely 30 of the range of movement of the casing, and means whereby the constituent materials of the aforesaid mixture are fed into the path of the said bar.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

LEMON M. REED.

Witnesses:

C. H. DORER,
B. C. BROWN.