

No. 634,416.

Patented Oct. 3, 1899.

S. P. McKELVEY.
CONCRETE MIXER.

(Application filed Dec. 23, 1898.)

(No Model.)

2 Sheets—Sheet 1.

FIG. 1.

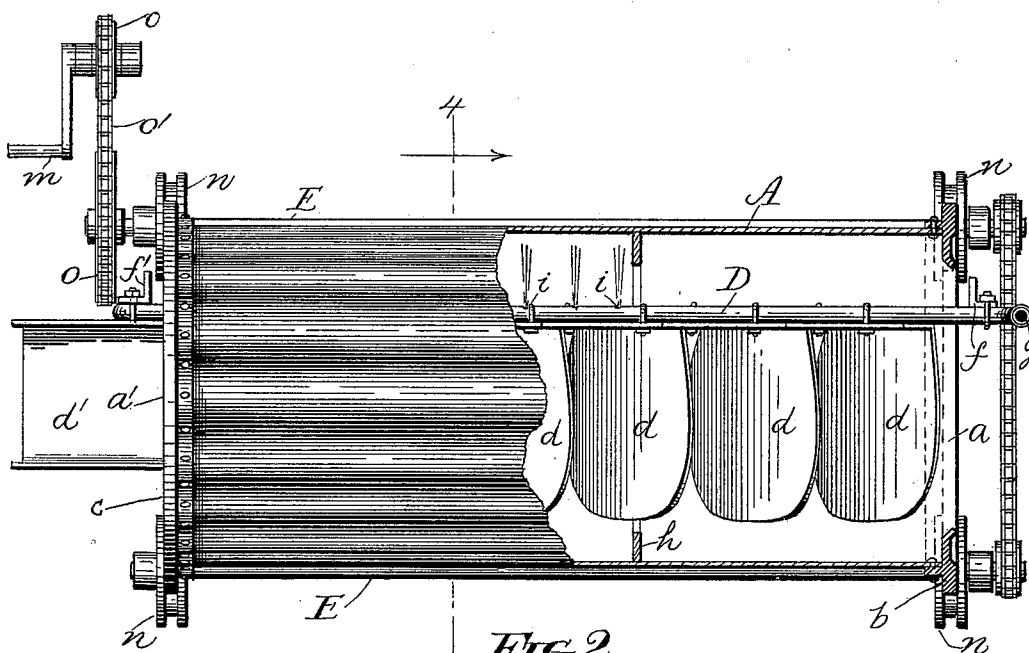
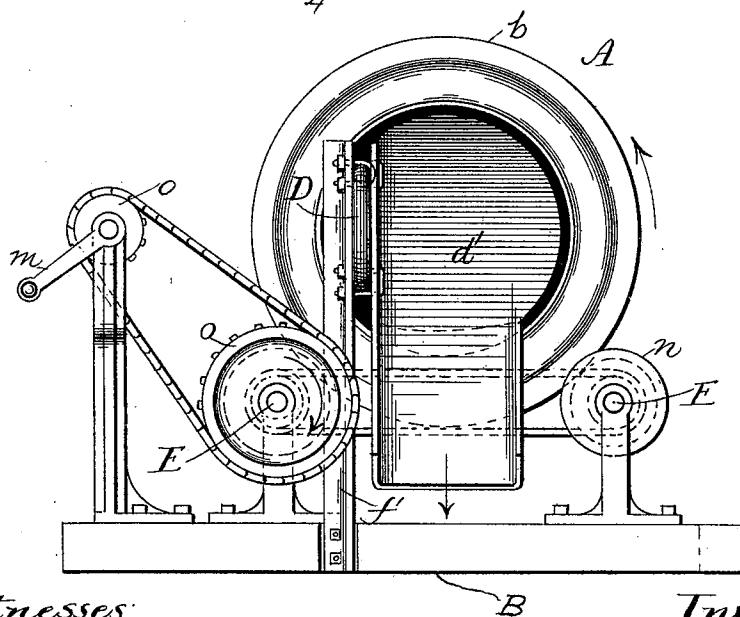


FIG. 2.



Witnesses:
J. Halpermy
A. B. Batchelder

Inventor.
Samuel P. McKelvey
By H. C. Hunzberger
att

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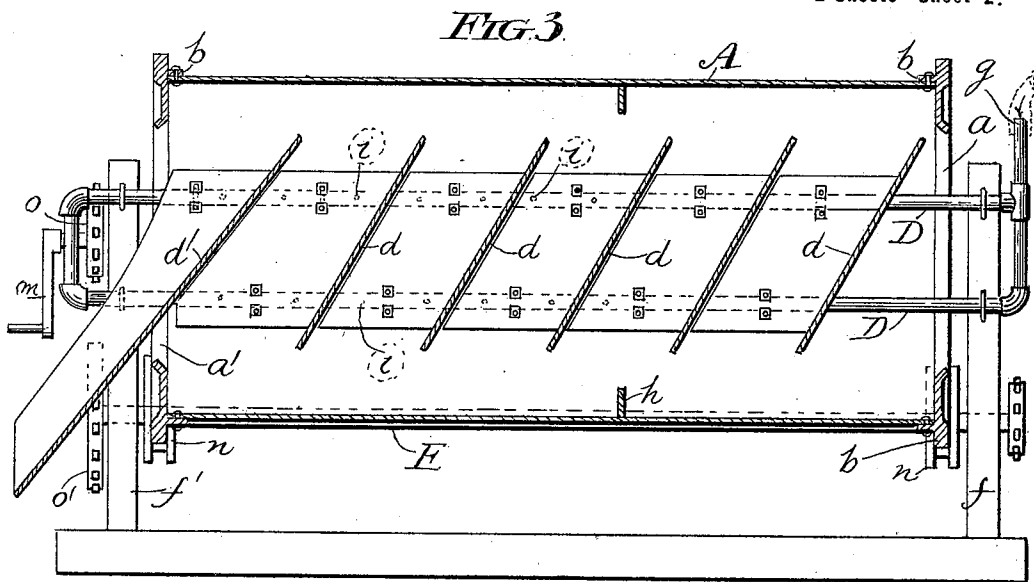
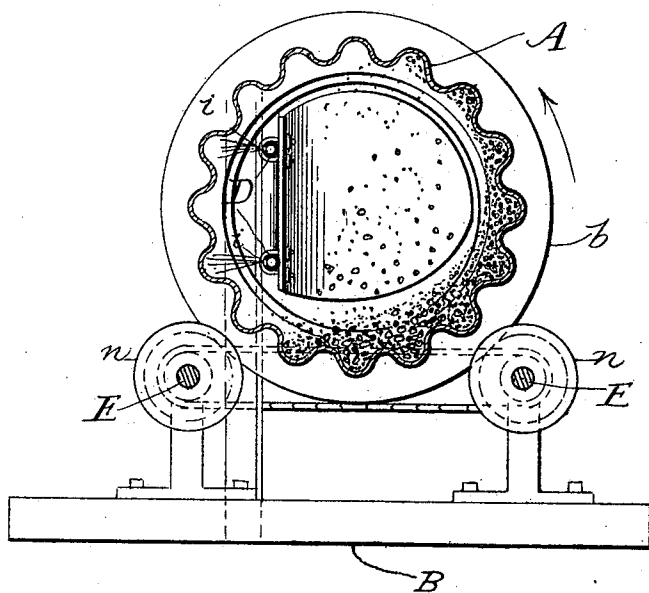


FIG. 4.



Witnesses:
J. Halpermy.
A. B. Barchelder

Inventor:
Samuel P. McKelvey
By H. C. Hensberger
att

UNITED STATES PATENT OFFICE.

SAMUEL P. McKELVEY, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO
O. G. HURSEN, OF SAME PLACE.

CONCRETE-MIXER.

SPECIFICATION forming part of Letters Patent No. 634,416, dated October 3, 1899.

Application filed December 23, 1898. Serial No. 700,171. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL P. McKELVEY, a citizen of the United States, residing at Chicago, county of Cook, and State of Illinois, have invented a new and useful Improvement in Concrete-Mixers, of which the following is a specification.

The objects of my invention are to provide a concrete-mixing machine adapted for either hand or steam power, by means of which the material composing the concrete in proper proportions may be fed into the machine by any ordinary means at one end of a revolving drum, and in the process of mixing passing it through the drum and discharging it automatically at the opposite end of the drum, and during the process and the passage of the concrete through the machine avoiding the friction usually attending this process, thereby reducing the wear and tear on the machine to a minimum. I attain these objects by means of a drum provided with an aperture at each end and having its shell or periphery corrugated longitudinally. The corrugations serve several different purposes. First, they add to the lateral strength of the drum; second, by providing an undulating surface they aid in the mixing, and, third, they more evenly distribute the water introduced into the drum, which seeks the lowest level, by dividing up the pool which is apt to be formed in the lower portion of the drum. I also introduce into the drum a series of deflectors provided with an independent and stationary support mounted transversely at an angle of about sixty degrees and having the lower point of declination toward the discharge-outlet of the drum or opposite the feed-aperture. The deflectors receiving the droppings from the side of the drum where the material is carried by the centrifugal force deflect the masses toward the outlet. The deflectors are six or more in number and mounted in a line through the center of the drum. The mass carried upward by the drum partially rolls back upon itself and keeps rolling while the drum is in motion until evenly spread upon the inner surface of the drum, then drops portions of it on the first deflector, is moved forward, and is brought in line with the second deflector, and so continues

until the last deflector discharges it into the spout extending beneath it. A portion of the drum—about one-third—is devoted to mixing the material in its dry state, water being introduced into the other portion of the drum. A partition through the corrugations divides the wet from the dry compartment.

The device is illustrated in the accompanying drawings, in which—

Figure 1 is a plan or top view of the drum with a portion taken away. Fig. 2 is an end elevation of the drum. Fig. 3 is a longitudinal section. Fig. 4 is a transverse section on line 4 4, Fig. 1.

Similar letters refer to similar parts throughout the several views.

A is the drum or cylinder, the shell or periphery being corrugated longitudinally, as shown, mounted horizontally upon the base B, and adapted to be rotated by the gearing hereinafter described. The drum A is provided with the apertures *a* and *a'* at the ends. The aperture *a* is the feed-inlet, and *a'* the outlet. The drum is approximately seven feet in length and is provided with a metal band or collar *b* on each end to provide a track *c*, by which it may revolve on the friction-wheels placed beneath it as bearings. A series of stationary deflectors *d d*, &c., are mounted transversely in the drum in a direct line throughout its length at an angle of about sixty degrees and having the point of declination in all the deflectors toward the discharge end of the drum. These deflectors may be simply flat sheets of steel or may have one of the sides slightly turned or curved forward, as shown in the illustrations, their object being to break up the lumpy portions in their fall and facilitate the mixing and at the same time to deflect the mass forward in line with the next deflector, and so continuously until the last deflector discharges it into the depending spout, which is simply an extension of the last deflector and projects from the outlet *a'*.

The deflectors are rigidly attached to the circulating pipe or tube D D, passing through the drum and projecting from the end apertures, where it is provided with an independent supporting bracket or posts *f* and *f'*, erected on the base of the machine. At the

point *g* at the outer end of the pipe is an inlet-valve, by means of which water may be introduced into the pipe and discharged into the drum at the points *i i i*. I prefer to discharge the water against the descending side of the drum or the emptied corrugations, so that the dry material as the drum revolves may roll back on the water, by which I achieve better results than by spraying on the dry material. The water in the corrugations also has a tendency to loosen the concrete from the sides, so that it drops more freely. The drum is provided internally with a partition *h*, about the height of the undulations, dividing it into two compartments—a wet and dry. The circulating water-pipe *D D* has spraying-apertures only at *i i i* over that portion of the concrete between the partition *h* and discharge-aperture *a'*. By this arrangement the material is mixed in its dry state first and is then carried forward into the wet compartment and the process continued.

Upon the base *B* of the machine I mount in suitable bearings the two shafts *E E*, provided at each end with a friction gear-wheel *n*. These gear-wheels are adapted to carry the drum. The collar or band *b* on the drum is adapted to engage with the friction gear-wheels *n n* and be revolved on them as a bearing by means of the cranks *m m* and sprocket-wheels *o* and chain *o'*. Any other method for revolving the drum may be employed.

I do not limit my device to any special mechanical means for its propulsion. In the operation of the machine the cement, sand, and crushed stone in proper proportions to form the concrete are introduced into the machine at the aperture *a* in their dry state. The revolving drum carries the mass up a little way, where the larger portion rolls back into the empty corrugations, the smaller portion carried upward depending upon the speed of the revolving drum, to the point where gravity overcomes the centrifugal force, when it drops upon the first deflector and is deflected forward, when the drum again rolls it over and over. As the material spreads, the centrifugal force carries it up, where it again drops on the second deflector and is moved another step forward, and so continues, the object being to cause the mass as it is gradually elevated on the side of the drum, which always turns in one direction, to repeatedly fall back on itself, thus mixing the material uniformly and with little or no friction, the stone thereby being thoroughly coated with the cement and with the sand equally distributed through it.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a concrete-mixer a rotatable drum mounted horizontally on external bearings,

the periphery of the drum corrugated longitudinally, apertures in each head of said drum, a partition transversely through the corrugations therein, a circulating water-pipe longitudinally through said drum and provided with an external support independent of said drum and imperforate over that portion of the drum between the partition and feeding-aperture adapted to provide a dry and wet mixing in said drum.

2. In a concrete-mixer a rotatable drum mounted on external bearings and provided with a feeding-aperture in one head and a discharge-aperture in the other, a circulating water-pipe longitudinally through said drum and provided with an external support independent of said drum, a series of stationary deflectors carried on said water-pipe in a direct line through the drum the lower portion of the last deflector in the line projecting from the discharge-aperture, said deflectors adapted to deflect the matter forward from the feeding-aperture to the outlet as the drum revolves.

3. In a concrete-mixer a rotatable drum mounted on external bearings, a feeding-aperture in one head an outlet in the other, longitudinal corrugations in the periphery thereof, a partition therein transversely through said corrugations, a circulating water-pipe longitudinally through said drum and provided with an external support independent of said drum and imperforate over that portion of the drum between the partition and feed-aperture, a series of stationary deflectors mounted transversely upon said water-pipe in a line through said drum and adapted to deflect forward the matter dropping upon them the last deflector carrying it through the discharge-aperture of the drum as the drum revolves.

4. In a concrete-mixer the combination of a rotatable drum mounted horizontally on external bearings, with a feeding-aperture in one head and an outlet in the other, longitudinal corrugations in the periphery of said drum, a transverse partition therein through the said corrugations, a circulating water-pipe longitudinally through said drum and provided with an external support independent of said drum, spraying-apertures in said pipe to provide water in that portion of the drum between the partition and outlet, a series of deflectors mounted transversely on said water-pipe in a line through the drum, the last deflector in the line projecting its lower part through the outlet, and terminating in a spout, means for rotating the drum.

SAMUEL P. MCKELVEY.

Witnesses:

H. C. HUNSBERGER,
A. B. BATCHELDER.