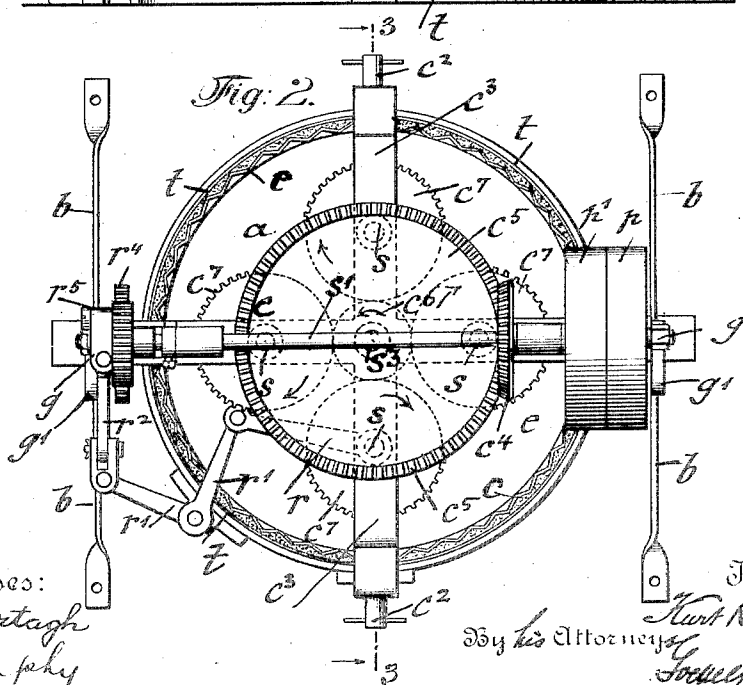
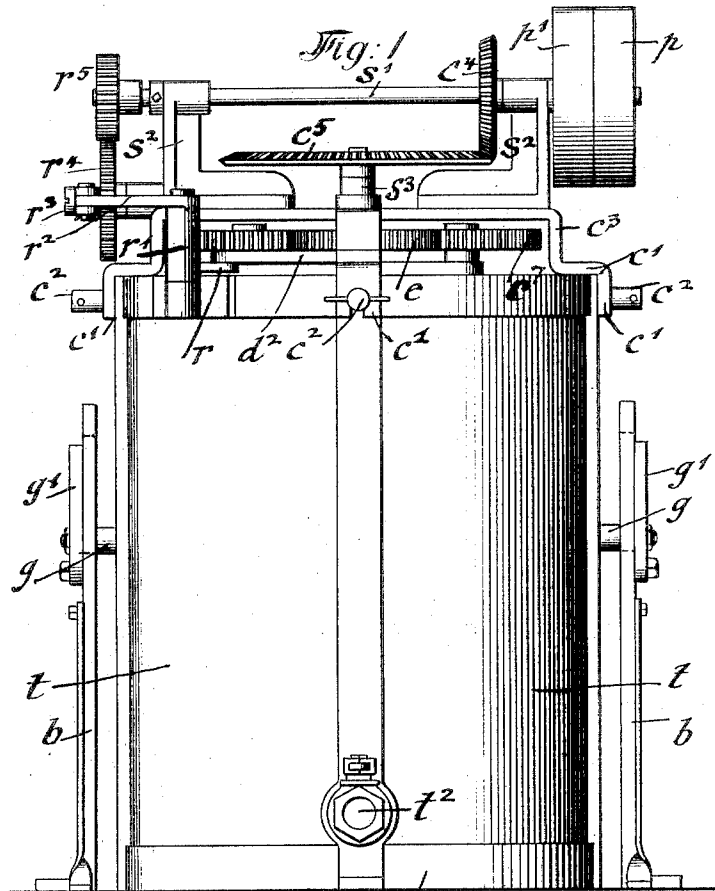


K. R. STERNBERG.
MIXING MACHINE.
APPLICATION FILED OCT. 14, 1910.

1,009,802.

Patented Nov. 28, 1911.

3 SHEETS—SHEET 1.

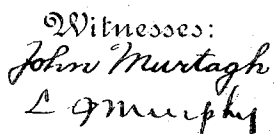


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3 SHEETS—SHEET 2.



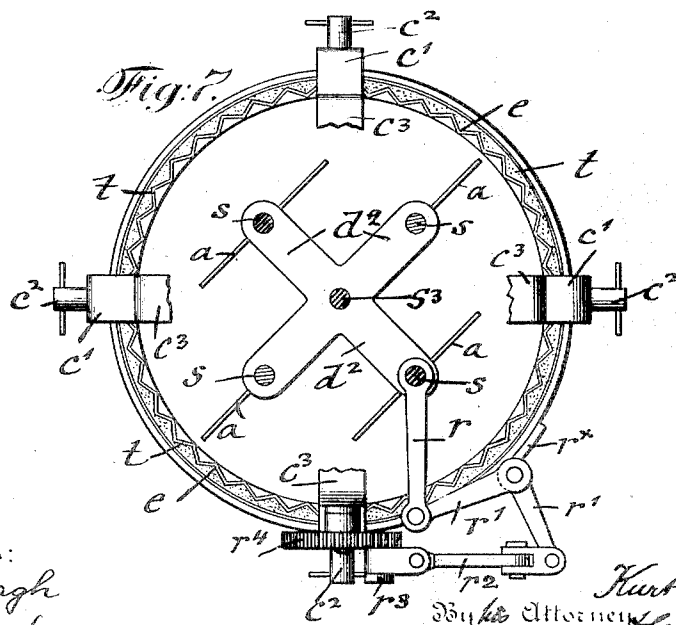
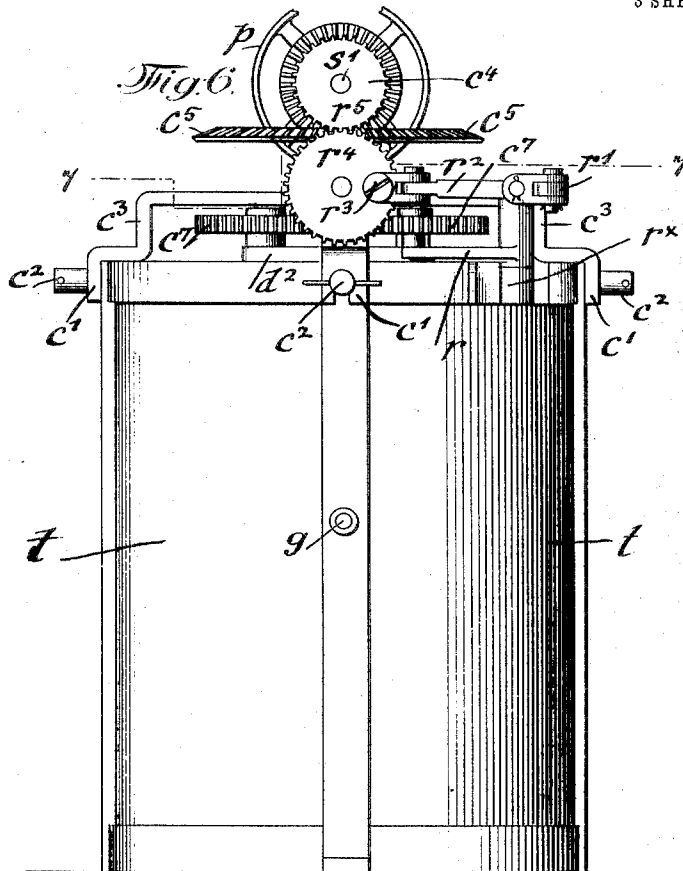
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UNITED STATES PATENT OFFICE.

KURT R. STERNBERG, OF SPRINGFIELD, MASSACHUSETTS.

MIXING-MACHINE.

1,009,802.

Specification of Letters Patent.

Patented Nov. 28, 1911.

Application filed October 14, 1910. Serial No. 586,963.

To all whom it may concern:

Be it known that I, KURT R. STERNBERG, a citizen of the United States of America, residing in the city of Springfield, in the county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Mixing-Machines, of which the following is a specification.

This invention relates to improvements in mixing machines for plastic, dry, fluid and pulverized material, such as insulating material, composition-goods, pastes, paints, liquids, etc., the mixing machine being so constructed that a uniform and thorough intermingling of the substances forming the mass is produced in a quick and effective manner, and that the so-called dead spaces in the tank where some portions of the mass are held at a standstill, are obviated, and these portions returned within reach of the stirring mechanism, for the effective working up and mixing of the same; and for this purpose the invention consists of a mixing machine, which comprises a tank having interior slanting ribs or corrugations, upright shafts supported in said tank, said shafts being provided with radial stirrer-arms that intermesh with the stirrer-arms of the adjacent shafts, and means for imparting rotary motion to said stirrer-shafts.

The invention consists further in the combination, with the tank and stirrer-shafts, of yokes provided with step and neck-bearings for said stirrer-shafts, and mechanism for imparting to said yokes and stirrer-shafts an oscillating motion for moving the portions of the mass located in the dead spaces of the tank reached by the stirrer-arms within the reach of the same, for effectively working up and intermingling the substances composing the mass.

The invention consists further of certain details of construction and combination of parts which will be fully described hereinafter and finally pointed out in the claims.

In the accompanying drawings, Figure 1 represents a side-elevation of my improved machine for mixing materials; Fig. 2 is a plan-view of Fig. 1; Fig. 3 is a vertical central section on line 3—3, Fig. 2; Fig. 4 is a horizontal section on line 4—4, Fig. 3; Fig. 5 is a detail section, showing the intermeshing stirrer-arms, on line 5—5, Fig. 4; Fig. 6 is a side elevation of a modified construction

of the mixing machine; and Fig. 7 is a horizontal section on line 7—7 of Fig. 6, showing the mechanism for imparting oscillating motion to the yokes and stirrer-shafts.

Similar letters of reference indicate corresponding parts in the different figures of the drawings.

Referring to the drawings, t represents a cylindrical tank, which is made of boiler iron or other suitable material. The tank is provided with an inclined bottom t' , for permitting the flow of the plastic or other material mixed in the tank toward a discharge-faucet t^2 that is inserted into the tank near the lowermost end-portion of the bottom t' as shown in Fig. 3. The tank t is provided at diametrically-opposite points with gudgeons g about midway of its height, which are supported in V-shaped yokes b that are attached to the floor, said yokes being provided with slotted vertical portions at their upper ends for lifting the tank above the floor and permitting the tilting of the same. For this purpose the vertical portions of the supporting yokes are provided with pivoted stays g' , which are placed under the gudgeons g when the tank is raised, so as to support the same for tilting it for getting conveniently at the inside of the tank in cleaning it preparatory to inserting a new charge of material into the same. To the upper end of the tank is attached a cross-frame c^3 , which is provided at its ends with downwardly-bent recessed flanges c' that are firmly clamped to the upper end of the tank by screws c^2 . Between the cross-frames c^3 and a yoke d^2 at the upper end of a center-shaft s^3 , are arranged gear-wheels, by which rotary motion is imparted to four upright shafts s , which are suspended from the upper yoke d^2 and supported in step-bearings of the lower yoke d' turning freely around the center-shaft s^3 . The upright shafts s are provided with diametrically-extending stirrer-arms a , which are bent or shouldered between their inner and outer ends in such a manner that the bent or shouldered portions of one stirrer-shaft are arranged farther from the lower end of the shaft and gradually nearer to the upper ends of the shaft where the shoulders are closer to the shafts, as shown in Fig. 3, while the stirrer-arms of the second shaft are arranged in a reversed manner with the bent or shouldered portions farther from the upper end of the shaft and gradually

approaching closer to the lower end of the shafts. The stirrer-arms of the third shaft are arranged like those of the first shaft and the stirrer-arms of the fourth shaft like those of the second shaft, so that the material to be mixed is drawn by the stirrer-arms of the first and third shafts toward the upper end of the tank and by the arms of the second and fourth shafts toward the lower part of the tank. The stirrer-arms *a* are made of such a length that the ends of the arms of one shaft pass between the ends of the arms of the adjacent shafts, so that the plastic or other material to be mixed is cut up effectively by the stirrer-arms and thoroughly mixed in its course from the upper to the lower part and back again from the lower to the upper part of the tank. The inner surface of the tank is provided with downwardly-slanting ribs or corrugations *e* laterally inclined on the inner surface of the tank for guiding the material to be mixed in upward and downward direction respectively, and conducting it into the paths of the intermeshing stirrer-arms. Rotary motion is imparted to the stirrer-shafts from an overhead driving-shaft *s'*, which is supported in journal-bearings of upright standards *s''*, attached to the upper stationary cross-frame or yoke, as shown in Fig. 2, said driving-shaft being provided with a loose and a fast pulley *p, p'*, for the driving-belt. A bevel gear-wheel *c''* on the driving-shaft transmits motion to a bevel gear-wheel *c''* on the upper end of the center-shaft *s''*, while intermeshing gear-wheels *c'* of equal size, which are mounted on the upper ends of the stirrer-shafts, are driven by a pinion *c''* on the center-shaft *s''* and impart rotary motion to the stirrer-shafts, as shown by the arrows in Fig. 2. By the rotary motion of the stirrer-shafts and the cutting of the stirrer-arms through the plastic or other material to be mixed, the material is kept in continuous motion, which is assisted by the slanting ribs or corrugations on the interior of the tank, so that a thorough intermingling of the material to be mixed is obtained until the mass arrives at the required homogeneous condition required. It can then be readily drawn off through the faucet *t''*, arranged near the lowermost point of the inclined bottom of the tank, or removed from the tank by lifting the entire system of stirrer-shafts and arms with the driving mechanism bodily out of the tank by a suitable hoisting tackle applied to an overhead support and the driving-shaft, after the clamping-screws, by which the cross-frame is attached to the rim of the tank, are loosened. In this raised position, the stirrer-arms can be conveniently cleaned of the material adhering thereto, while the tank is tilted for removing its contents and then cleaned preparatory

to receiving a new charge of the same or any other material to be mixed.

For the purpose of overcoming the so-called "dead spaces" between the circumference of the tank and the sweep of the stirrer-arms, in which the material to be mixed comes to a standstill or is retarded in its motion, the construction shown in Figs. 6 and 7 is used. In this case, the stirrer-shafts are supported on the cross-frames or yokes *d'*, *d''*, one near the bottom and the other near the top of the tank *t*. Rotary motion is imparted to the stirrer-shafts from the driving-shaft *s'* by the bevel gear-wheels *c''*, *c''*, pinion *c''* on the center-shaft *s''*, and the gear-wheels *c'* on the upper-ends of the stirrer-shafts *s*, as shown in Fig. 2. One of the arms of the upper cross-frame or yoke *d''* is connected by a pivot-rod *r* with an elbow-lever *r'* that is fulcrumed to a bracket *r''* on the outside of the shaft, the connecting-rod engaging one arm of the elbow-lever, while the other arm is connected with a crank-rod *r''*, the opposite end of which is pivoted to the wrist-pin *r'''* of a gear-wheel *r''* on a stud-shaft attached to the upper part of the standard *s''*, said gear-wheel meshing with a pinion *r'''* at the end of the driving-shaft *s'*, as shown clearly in Fig. 7. The rotary motion, imparted by the driving-shaft to the gear-wheel *r''*, and the intermediate lever-mechanism, impart to the cross-frames or yokes and the stirrer-shafts an oscillating motion in addition to their continuous rotary motion, so as to move them from the normal position, shown in Fig. 4, to the second position, shown in Fig. 7, so that the stirrer-arms being moved to or fro in the tank break up those portions of the material located in the dead spaces between the stirrer-arms and tank and keep thereby the entire mass in proper motion for the thorough intermingling of the materials composing the same. By the joint action of the rotary motion of the stirrer-arms, simultaneously with the oscillating motion of the stirrer-shafts, every part of the mass is continuously subjected to the mixing action and thereby the intimate and thorough intermingling of the substances secured and a perfectly homogeneous mass obtained.

In Figs. 6 and 7 the tank is shown removed from the standards *b*, and resting on the floor. The tank in these figures is unprovided with a discharge faucet *t''*, as it is obvious that this faucet may be omitted without impairing the effective operation of the tank, and that other changes in details may be made without in any manner departing from the spirit of the invention.

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

1. In a mixing machine, the combination of a tank, upright shafts suspended in the

interior of said tank, diametrical stirrer-arms on said shafts, provided with bent shoulders between their inner and outer ends, said shoulders being arranged at
 5 gradually diminishing distances from the lower to the upper portions of two shafts, and in reverse arrangement on the other shafts, the stirrer-arms of one shaft intermeshing with the stirrer-arms of the adjacent shafts, and means for imparting rotary
 10 motion to said shafts and stirrer-arms.

2. In a mixing machine, the combination of a tank, upright shafts supported in said tank, radial stirrer-arms on said shafts, the
 15 arms of each shaft intermeshing with the arms of the adjacent shafts and being provided with bent shoulders intermediately of their ends, the shoulders on the arms of one shaft being farther from the shaft at the
 20 lower end and getting gradually closer to the shaft at the upper end, while the shoulders on the arms of the adjacent shaft are farthest from the shaft at their upper end and gradually getting closer toward the
 25 lower end, and means for imparting rotary motion to the shafts and stirrer-arms.

3. In a mixing machine, the combination of a tank provided with interior laterally-inclined ribs, upright shafts in said tank, diametrical stirrer-arms on said shafts, the ends
 30 of the stirrer-arms of one shaft intermeshing with the stirrer-arms of the adjacent shafts, and means for imparting rotary motion to the stirrer-shafts and arms.

4. In a mixing machine, the combination 35 of a tank, cross-arms or yokes in said tank, upright shafts supported in step and neck-bearings of said cross-frames, diametrical stirrer-arms on said shafts, means for imparting continuous rotary motion to the
 40 shafts and the stirrer-arms, and means connected with one of the cross-arms or yokes for imparting, simultaneously with the rotary motion, an oscillating motion to the stirrer-shafts and arms. 45

5. In a mixing machine, the combination, with a tank, of an upright rotating central driving-shaft in said tank, cross-frames or yokes supported on said central-shaft, upright stirrer-shafts supported in step and
 50 neck-bearings of said cross-frames or yokes, diametrical stirrer-arms on said shafts, a driving-shaft supported above said tank, means for imparting continuous rotary motion from the driving-shaft to said stirrer-
 55 shafts and arms, and means interposed between the driving-shaft and one of the upper cross-frames or yokes for imparting oscillating motion to said cross-frames or yokes and the stirrer-shafts supported 60 thereon.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

KURT R. STERNBERG.

Witnesses:

PAUL GOEPEL,
 JOHN MURTAGH.