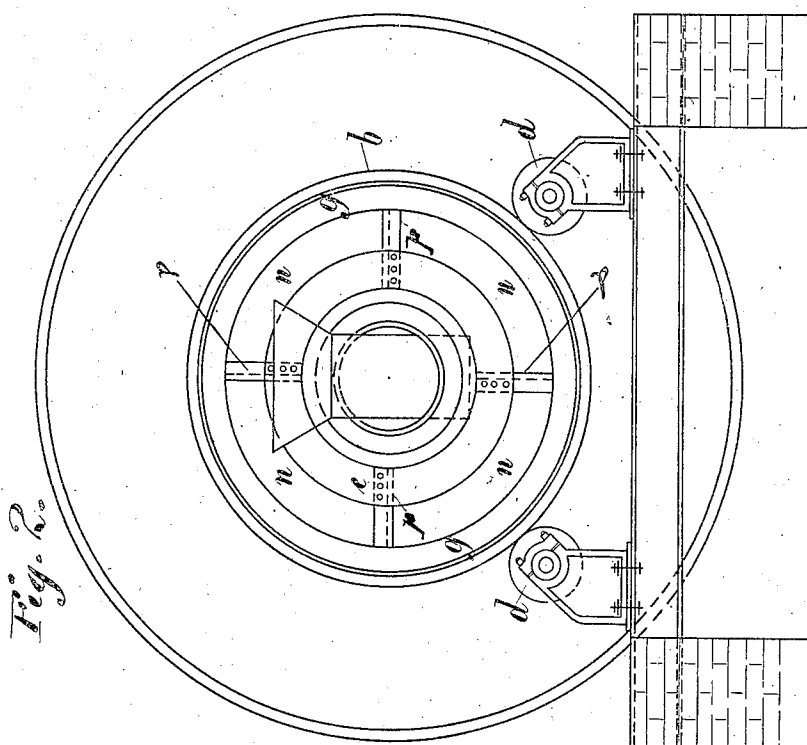


PATENTED MAR. 6, 1906.

G. RAPS.

MIXING APPARATUS FOR DRY MATERIALS.

APPLICATION FILED AUG. 19, 1905.



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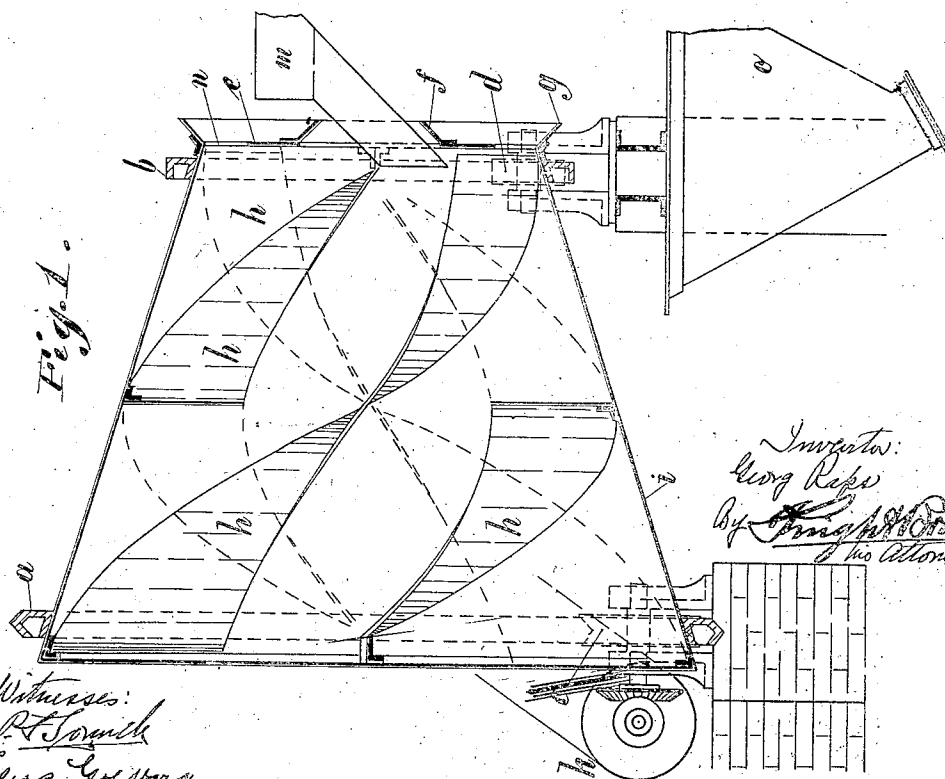


Fig 1.

Witnesses:
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 Geo. Louch

Investor:
George Rapp
By George Rapp
his Attorney

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UNITED STATES PATENT OFFICE.

GEORG RAPS, OF STOLBERG, GERMANY.

MIXING APPARATUS FOR DRY MATERIALS.

No. 814,233.

Specification of Letters Patent.

Patented March 6, 1906.

Application filed August 19, 1905. Serial No. 274,893.

To all whom it may concern:

Be it known that I, GEORG RAPS, a subject of the King of Prussia, German Emperor, residing at Stolberg, Rheinland, Germany, have invented certain new and useful Improvements in Mixing Apparatus for Dry Materials, of which the following is a full, clear, and exact description.

This invention relates to continuous-working mixing-machines—that is to say, to mixing-machines in which by turning the drum in one direction the mixing of the material is brought about and in which after the feed of the material to be mixed is completed the discharge of the same is accomplished by turning the drum in the other direction. The mixing apparatus of this kind hitherto known was not adapted for working on a large scale, because for each mixing it could only be fed with a comparatively small quantity of the material. Now according to this invention this defect is removed by the mixing-drum, which is formed tapering in the ordinary way, entirely closed at its larger end, and provided internally with spiral mixing-blades, while being rotatable on a horizontal or an approximately horizontal axis, and also by the admission and discharge apertures being situated in the same end wall of the drum. In consequence of this drum construction the material to be mixed is constantly forced to the rear on the rotation of the drum in one direction, where it accumulates at the rear wall of the drum to almost the entire height of the same and in a very short time becomes thoroughly mixed under the action of the forwarding blades or scoops, which continuously circulate it from beneath upward. If the direction of the rotation of the drum be reversed, the spiral mixing-blades cause a return of the material toward the feed-aperture and a gradual discharge therefrom. This arrangement and structural formation of the mixing-chamber permits considerably more material to be introduced into the drum during a mixing period than was hitherto possible with drums of similar size.

A mixing-machine in accordance with this invention is shown in the accompanying drawings, in which—

Figure 1 is a longitudinal section, and Fig. 2 an end view thereof.

The scoops or blades lying in the part of the drum cut-off are shown in dotted lines.

The machine consists of a large conical drum *i*, rotatably mounted in known manner

by means of two rings *a* and *b* on runners or rollers *c* and *d*. The drum is entirely closed at the larger end face, while in the smaller end face opposite it at which the feed and discharge take place a closing-ring *e*, with conical annular projection *f*, is arranged, through the central aperture of which the feed-hopper for the material to be mixed projects into the drum. The ring *e*, the outer diameter of which is somewhat smaller than the drum-aperture, serves principally as a check to the material in its discharge and allows it to emerge gradually and uniformly through a slot *n*.

An outwardly-directed angular edge *g* is mounted on the outer edge of the drum, which edge *g* serves for guiding the material discharged into a receiving-hopper *o*.

In the interior of the drum several—preferably, for instance, four—partitions or intermediate walls *h* are constructed, extending up to the fourth part of the diameter of the drum, which rest against the drum *i* and run spirally.

The drum is operated, as usual, by means of rollers *c* and with a bevel-gear. The direction of rotation may be altered by means of an open and a cross belt *k* or other suitable devices.

The method of working of the mixing-machine is as follows: When the drum is set in rotation in one direction, the materials to be mixed are introduced into the feed-hopper *m* in suitable proportions, and in consequence of the formation of the drum and the partitions *h* are propelled to the closed rear wall of the drum. Here the material is piled and constantly tumbled over and over. As the material slips down on each of the partitions toward the entrance it falls into the next compartment, in which it is again conveyed to the rear of the drum. By this movement of the material a thoroughly uniform mixture is obtained in a short time. In order to discharge the drum, its direction of rotation is altered. By the spiral action of the partitions the material is conveyed toward the discharge end. The conical form of the drum acts somewhat against this movement, so that too sudden a discharge is prevented. The material gradually comes to the front and falls uniformly through the slotted aperture *n*, formed between the closing-ring and annular edge *g*. The closing-ring *e*, which operates to retard the discharge of the material, is held in position by the radial support

ing-bars *p p*. A constant mixing action also takes place during the discharge.

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

1. The combination of a horizontally-arranged tapering drum having its larger end entirely closed and provided with feed and discharge openings at its smaller end, of rotatable means arranged within the drum to feed the material from the feed-opening toward the closed end to mix the material and from the closed end toward the discharge.

2. The combination of a horizontally-arranged tapering drum rotating on an approximately horizontal axis, having its larger end entirely closed and provided with feed and discharge openings at its smaller end, of means arranged within the drum to feed the material from the feed-opening toward the closed end to mix the material and from the closed end toward the discharge.

3. The combination of a tapering drum,

rotatable about an axis approximately horizontal, entirely closed at its larger end and provided with an inlet and a discharge at its smaller end, spiral mixing-blades arranged within and connected to the drum and means for rotating the drum.

4. The combination of a tapering drum entirely closed at its larger end, and rotatable about an axis approximately horizontal, means for mixing the material therein placed, an outwardly-turned flange on the other or open end of the drum, a ring fitted in the open end and spaced from the walls of the drum to provide inlet and discharge openings for the drum, means for supporting the ring and means for rotating the drum.

In witness whereof I hereunto subscribe my name this 5th day of August, A. D. 1905.

G. RAPS.

Witnesses:

HENRY QUADFLIEG,
F. M. BRUNDAGE.