

W. J. MARSH.
FEED MIXING MACHINE.
APPLICATION FILED MAR. 28, 1921.

Patented June 13, 1922.
3 SHEETS—SHEET 1.

1,419,397.

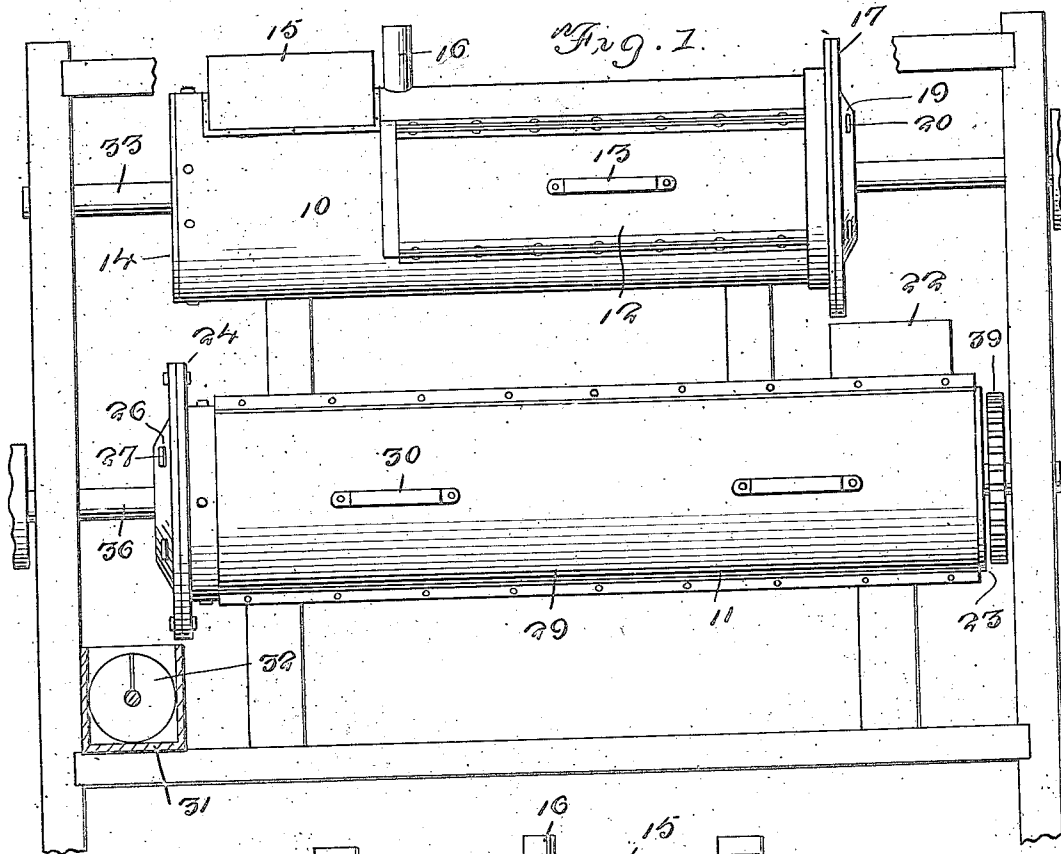
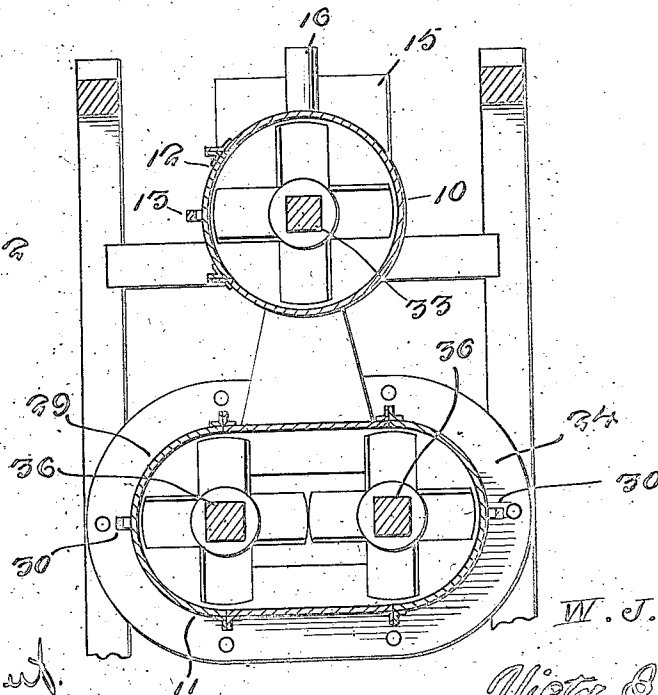


Fig. 2.



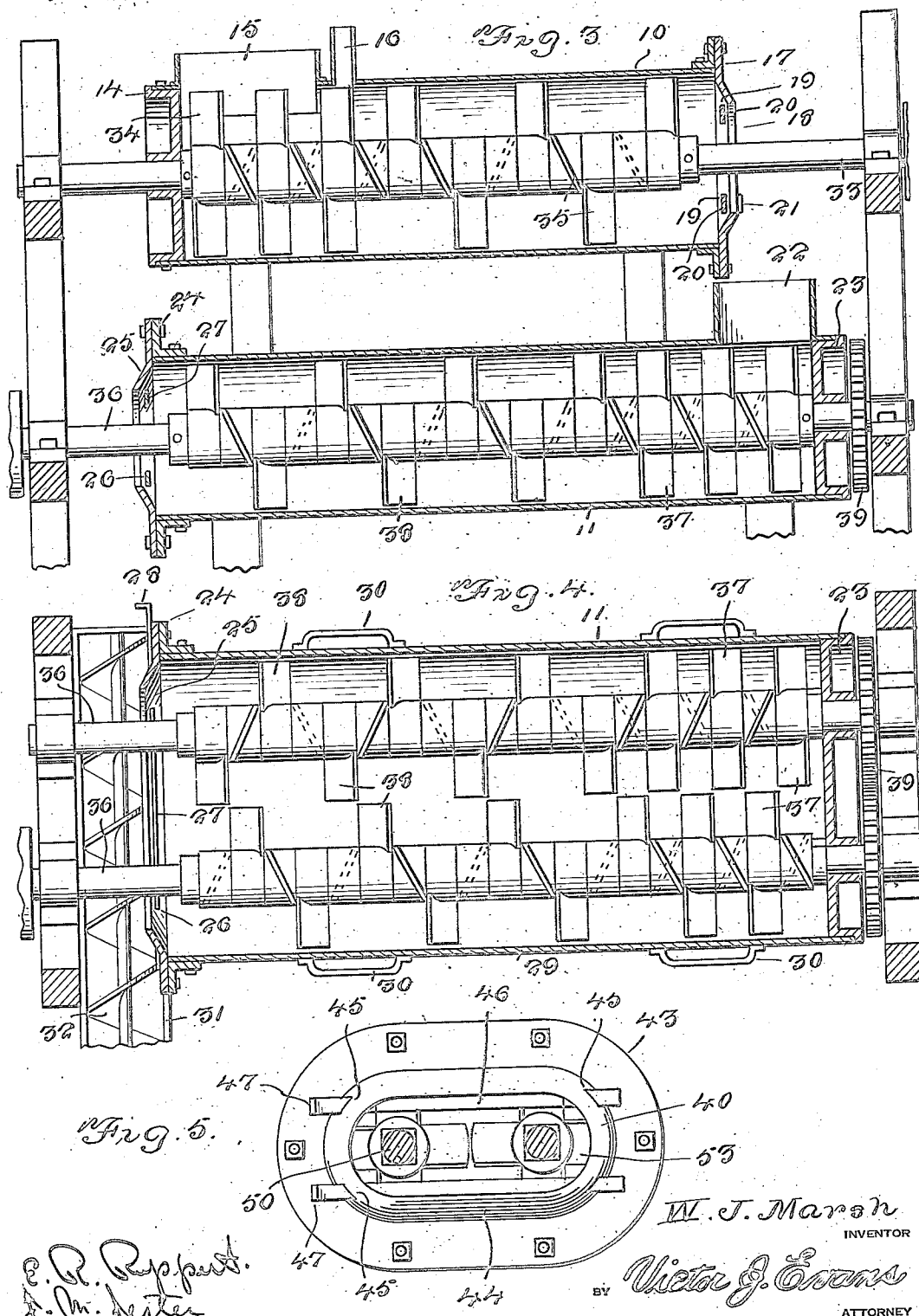
E. R. Ruppert.
J. M. Foster.
WITNESS:

W. J. Marsh
INVENTOR
BY Victor J. Evans
ATTORNEY

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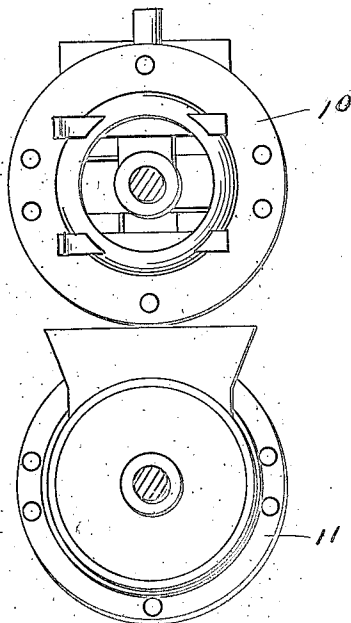
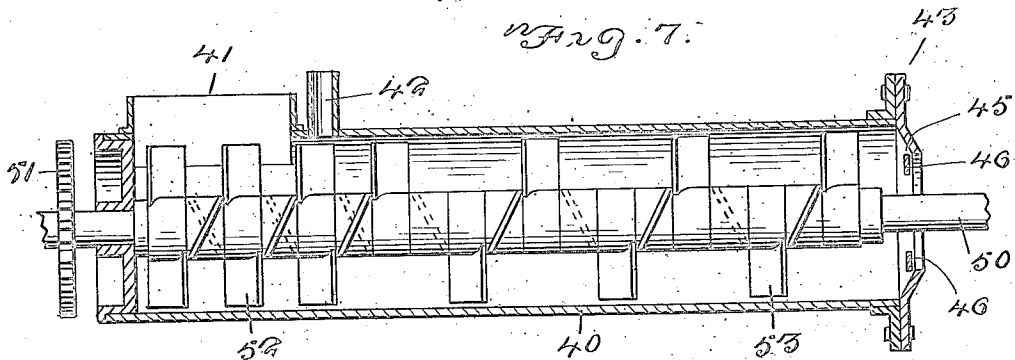
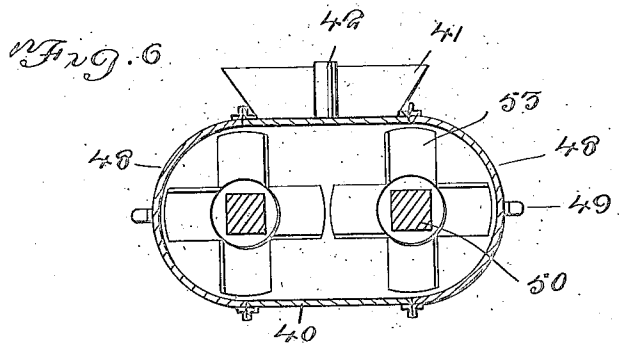
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UNITED STATES PATENT OFFICE.

WARREN J. MARSH, OF SEATTLE, WASHINGTON.

FEED-MIXING MACHINE.

1,419,397.

Specification of Letters Patent. Patented June 13, 1922.

Application filed March 28, 1921. Serial No. 456,433.

To all whom it may concern:

Be it known that I, WARREN J. MARSH, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented new and useful Improvements in Feed-Mixing Machines, of which the following is a specification.

This invention relates to mixing machines and has for its object the provision of a machine for mixing preferably hot molasses with alfalfa meal or other ground food stuff whereby to form a feed for cattle.

An important object is the provision of a device of this character which is peculiarly constructed and whereby the different ingredients of the feed will be thoroughly mixed, the construction being furthermore such as to retard the passage of the material through the device in order to insure thorough mixing.

Another object is the provision of a device of this character including a rotary shaft operating within a casing and carrying a series of mixing blades spirally arranged and disposed gradually closer together toward the discharge end so as to cause the exertion of pressure at the discharge end which will effect the retardation of the discharge.

Another object is the provision of a device of this character which has its discharge end slightly constricted for the same purpose, to effect retardation, and which has a sliding plate associated with the discharge end whereby the outlet opening may be still further decreased in size when desired.

An additional object is the provision of a device of this character which will be comparatively simple and inexpensive in manufacture, highly efficient in use, durable in service, and a general improvement in the art.

With the above and other objects and advantages in view, the invention consists in the details of construction to be hereinafter more fully described and claimed and illustrated in the accompanying drawings in which—

Figure 1 is a side elevation of one form of my device,

Figure 2 is a cross sectional view there-through,

Figure 3 is a vertical longitudinal sectional view,

Figure 4 is a horizontal longitudinal sectional view,

Figure 5 is an end elevation of a modified form,

Figure 6 is a cross sectional view there-through,

Figure 7 is a vertical longitudinal sectional view therethrough, and

Figure 8 is a similar view through a further modified form.

Referring more particularly to the drawings, the numeral 10 designates a horizontally disposed casing of suitable length and circular in cross section, and 11 designates a horizontally disposed casing located below the casing 10 and of greater length whereby to extend beyond one end thereof. The casing 10 is formed in one side with a removable cover 12 having a handle 13 whereby access may be had thereto. One end of the casing 10 is closed by a head 14 and near this end the casing is provided with a hopper 15 into which the alfalfa meal or other ground feed is introduced. Adjacent the hopper 15 I provide an inlet pipe 16 for conducting hot molasses into the casing. The other end of the casing 10 has secured thereon a head 17 which has a central opening 18 of somewhat less diameter than the diameter of the casing 10 and this head 17 is provided with spaced guides 19, between which is slidable a plate 20 having a handle 21 and which is adapted to close the opening 18 to a greater or less extent, as desired. This end is of course the discharge end of the casing.

The casing 11 is of oval shape in cross section and the end thereof which extends beyond the casing 10 is provided with a hopper 22 adapted to receive material discharged from the casing 10. This end of the casing 11 is closed by a head 23 and the other end has secured thereon a head 24 having a central opening 25 of less diameter than the bore of the casing. Secured upon the head 24 are guides 26 between which is slidable a blade 27 having a handle 28 and which is for the purpose of regulating the discharge from the casing 11. The casing 11 has one or both sides formed as removable plates

29 having handles 30, the purpose of these plates being to permit access to the interior of the casing 11. Located beneath the discharge end of the casing 11 is a trough 31 within which is located a screw conveyor 32 whereby the material discharged from the casing 11 may be conducted to any desired location.

Journalled centrally within the casing 10 is a shaft 33 upon which is mounted a plurality of blades 34 and 35. The blades 34 are comparatively close together and are arranged at equal distances apart at the inlet end of the casing. These blades are formed double whereas the blades 35 are single and are arranged spirally around the shaft. Any suitable means may be provided for rotating the shaft 33. Journalled within the casing 11 is a pair of shafts 36 which carry blades 37 and 38 arranged in identically the same manner as the blades 34 and 35 and of the same construction. The shafts 36 carry intermeshing spur gears 39 whereby when one shaft is rotated by any suitable means, not shown, they will both be rotated in opposite directions.

In the operation of this form of the device the feed is introduced through the hopper 15 and the molasses is introduced through the pipe 16. When the shaft 33 is rotated the blades 34 immediately beneath the hopper 15 will agitate and churn together the feed and molasses. As these blades are not spirally arranged they will exert a thorough mixing action upon the material and as they are inclined they will cause the material to be advanced slowly along the casing 10. After leaving the blades 34 the material is engaged by the blades 35 and mixed further thereby. As these blades 35 are spirally arranged upon the shaft 33 they will advance the material toward the discharge end of the casing but as the opening 18 at this discharge end is of less diameter than the internal diameter of the casing 10 there will ensue a retardation of the discharge through the opening 18 which will result in a back pressure in the casing which will prevent too free discharge and insure thorough co-mingling of the ingredients. When necessary, the sliding plate 20 may be moved to constrict this opening still further so as to increase the retarding action. Material discharged from the casing 10 will drop into the hopper 22 and pass into the casing 11 in which the operation is continued in the same manner, the material being carried along in the casing 11 and being discharged therefrom into the conveyor trough 31. The mixing within the casing 11 should be very thorough as the two sets of blades are provided on the separate shafts working in opposite directions.

While I have shown and described the casing 11 as being oval in cross section and provided with two shafts carrying paddles

or blades, it will be readily apparent that the section 11 might be of the same construction as the casing 10, that is circular in form and provided with a single shaft, as shown in Figure 8.

Referring more particularly to the form shown in Figures 5, 6 and 7, I provide a single casing 40 which is provided at one end with a hopper 41 and a molasses inlet pipe 42 and which has this end otherwise closed and which has its other end provided with a head 43 formed with an opening 44 at the sides of which are disposed guides 45 between which is slidable a plate 46 having a handle 47. This casing is somewhat oval in cross section and elongated in a horizontal plane. The casing has portions 48 removable and provided with handles 49. Journalled longitudinally within the casing 40 are shafts 50 disposed one beside the other and these shafts carry intermeshing gears 51 whereby they may be rotated simultaneously in opposite directions when their shaft is rotated by any suitable means, not shown. Secured upon the shaft 50 are paddles or blades 52 and 53, identical in construction and arrangement to the previously described blades 34 and 35.

In the operation of this form the molasses and feed introduced at the inlet end of the casing will be thoroughly mixed and passed along the casing by the paddles 53 to the discharge end thereof, the discharge being retarded so that the material will back up and be under pressure so that all parts of the dry material will be moistened with the molasses. The mixed matter of course discharges through the opening 44 in the head 43.

While it is not illustrated, it is readily conceivable that use might be made of a single cylindrical casing such as the casing 10 or 11 with the single shaft carrying the blades or paddles.

From the foregoing description and a study of the drawings it will be apparent that I have thus provided a simply constructed and easily operated device for mixing dry feed with molasses or the like so as to produce a feed designed for use by cattle or other animals. It will be readily apparent that the construction is such that the mixing action will be thorough and that the device will in every way efficiently perform all the functions for which it is intended.

While I have shown and described the preferred embodiment of my invention, it is of course to be understood that I reserve the right to make such changes in the form, construction, and arrangement of parts as will not depart from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. A mixing machine comprising a casing

provided at one end with an inlet hopper and an inlet pipe, said end of the casing being closed, a head secured upon the other end of the casing and provided with an opening, 5 a plate slidably associated with said head whereby to partially cover said opening, a shaft rotatable within said casing, and a plurality of mixing blades carried by said shaft.

10 2. A mixing machine comprising a casing provided at one end with an inlet hopper and an inlet pipe, said end of the casing being closed, a head secured upon the other end of the casing and provided with an opening, 15 a plate slidably associated with said head whereby to partially cover said opening, a shaft rotatable within said casing, and a plurality of mixing blades carried by said shaft, the blades at the end of the casing beneath

the hopper being formed, double and the 20 blades toward the other end of the casing being formed single.

3. A mixing machine comprising a casing provided at one end with an inlet hopper and an inlet pipe, said end of the casing, 25 being closed, a head secured upon the other end of the casing and provided with an opening, a plate slidably associated with said head whereby to partially cover said opening, a shaft rotatable within said casing, 30 and a plurality of mixing blades carried by said shaft, the blades at the end of the casing beneath the hopper being formed double and the blades toward the other end of the casing being formed single, said last named blades 35 being arranged spirally upon the shaft.

In testimony whereof I affix my signature.

WARREN J. MARSH.