May 27, 1930. E. A. MARSH 1,760,425

DISCHARGING PROPELLER

Filed Oct. 10, 1928

Fig. 2.

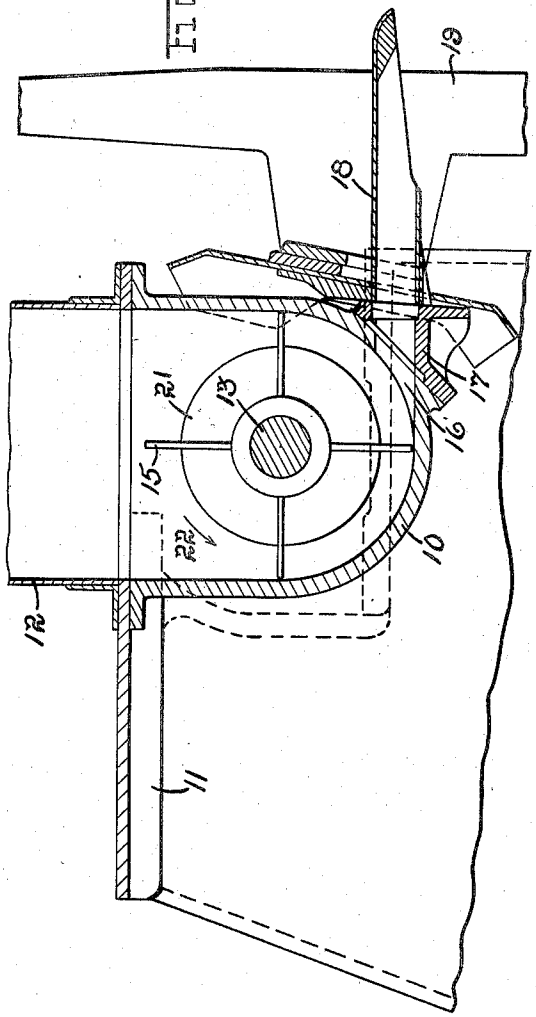
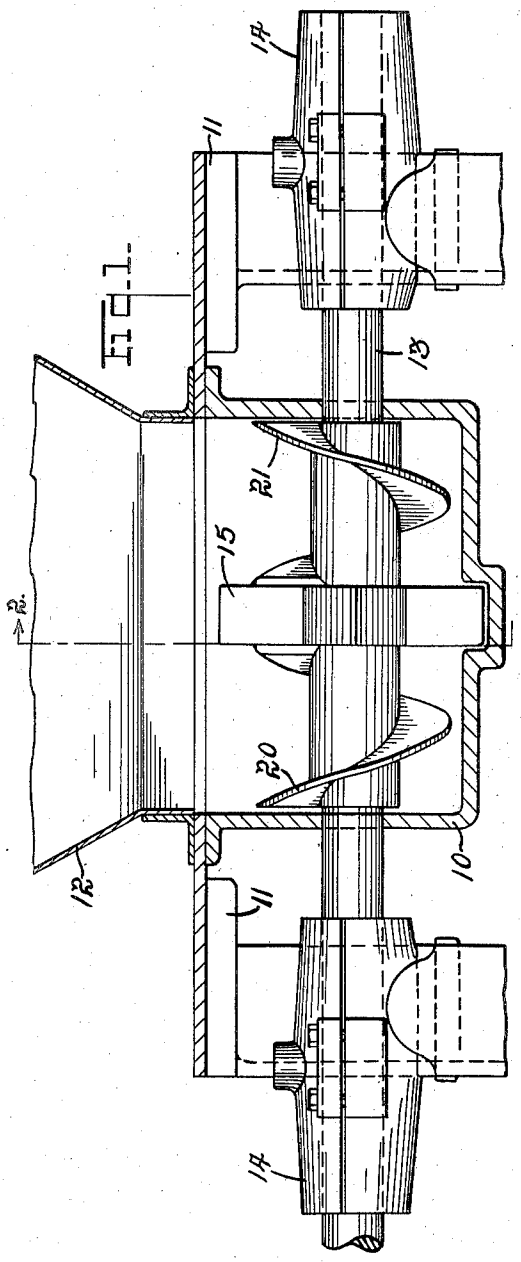


Fig. 1.



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UNITED STATES PATENT OFFICE

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DISCHARGING PROPELLER

Application filed October 10, 1928. Serial No. 311,518.

This application relates to a discharging propeller and more particularly to a propeller adapted to discharge powdery or granular material from a casing through a feeding opening into a receptacle.

The purpose of the invention is to provide a propeller which will discharge material continuously and in a fairly even manner. A further object is to provide a propeller which will discharge powdery material without any excess accompaniment of air. The detailed construction and further objects of the device will appear as the description proceeds.

In the accompanying drawings forming a part of this specification, Figure 1 is a longitudinal vertical section through one form of apparatus embodying the invention; and Fig. 2 is a section substantially on the line 2—2 of Fig. 1.

The construction disclosed comprises a casing 10 mounted upon a frame 11 and having a feeding hopper 12 for guiding material thereinto. Passing transversely through the casing there is a shaft 13 mounted in suitable bearings 14 supported upon the frame. Centrally within the casing there is mounted upon the shaft a propeller member 15 comprising radially extending blades. In alinement with propeller 15 there is a discharge opening 16 leading into a discharge spout 17. A filling tube 18 is mounted upon a suitable framework 19 which may be a part of a weighing device, if desired. Filling spout 18 is adapted to enter the valve of a bag and to aline with spout 17 and receive material therefrom and feed it into a bag.

Upon the shaft on the two sides of propeller 15 are mounted screw blades 20 and 21 reversely pitched and arranged so that when the propeller turns in the direction indicated by the arrow 22 in Figure 2, the screw blades press material towards propeller 15. It will be readily seen that propeller 15 tends to force material out through discharge opening 16. At the same time, screw blades 20 and 21 press material towards the central portion of the propeller to take the place of material which is discharged. The hopper is preferably open above propeller 15 so that air may escape freely from the material which is fed into the propeller by the screw blades. It has been found that this construction makes possible the compression of powdery materials to such an extent as to eliminate much of the air therefrom without compressing the material excessively even when the discharge spout is closed. The compression is automatically limited by the centrifugal force applied to the material and the pressure in the hopper above the propeller. If screws are used without some means of relief, the compression is likely to become too great, especially if the propeller continues to run while the discharge opening is closed or partially closed for any reason. On the other hand, a propeller such as propeller 15 without the addition of feeding screws does not operate with sufficient positiveness to prevent caking of powdery material in the discharge outlet, especially when the discharge spout is temporarily closed, and at the same time such a propeller does not compress the material in such a way as to reduce the air content thereof. The combination of the screw blades with the centrifugal propeller avoids these various difficulties, compresses the material sufficiently to eliminate excess air, insures a positive feed, and at the same time avoids excessive pressure.

While one form of the device has been disclosed in some detail, it will be readily understood that modifications may be made within the scope of the appended claims.

What I claim is:

1. In apparatus for feeding pulverulent or granular material, a casing having a discharge opening adjacent the bottom thereof, a centrifugal propeller having its discharge side in alinement with said discharge opening and mounted rotatably upon an approximately horizontal axis and having radially extending blades, and a member at one side of said propeller adapted to force material laterally into the spaces between the propeller blades, there being an opening above the path of said propeller blades allowing the escape of air.

2. In apparatus for feeding granular or pulverulent material, a casing having a discharge opening in the wall thereof adjacent the bottom, a centrifugal propeller having

its lower side in alinement with the opening and mounted on a substantially horizontal axis and having substantially radially extending propeller blades and a screw member attached to one side of said propeller and adapted to force material into the spaces between said propeller blades, the casing being open above said propeller.

3. In apparatus for feeding granular or pulverulent material, a casing having a semi-cylindrical bottom portion with a discharge opening tangential of said portion, a propeller mounted substantially concentrically with said semi-cylindrical portion and having radially extending blades, said propeller being in position to discharge material through said opening, and screw members on opposite sides of said propeller, said screw members being rotatable in the same direction as the propeller and having blades inclined so as to feed material towards said propeller.

4. In apparatus for feeding granular or pulverulent material, a casing having a semi-cylindrical bottom portion with a discharge opening tangential of said portion, a propeller mounted substantially concentrically with said semi-cylindrical portion and having radially extending blades, said propeller being in position to discharge material through said opening, screw members on opposite sides of said propeller, said screw members being rotatable in the same direction as the propeller and having blades inclined so as to feed material towards said propeller, the casing being open above said propeller and screws.

In testimony whereof I have hereunto signed my name to this specification.

ESLI A. MARSH.