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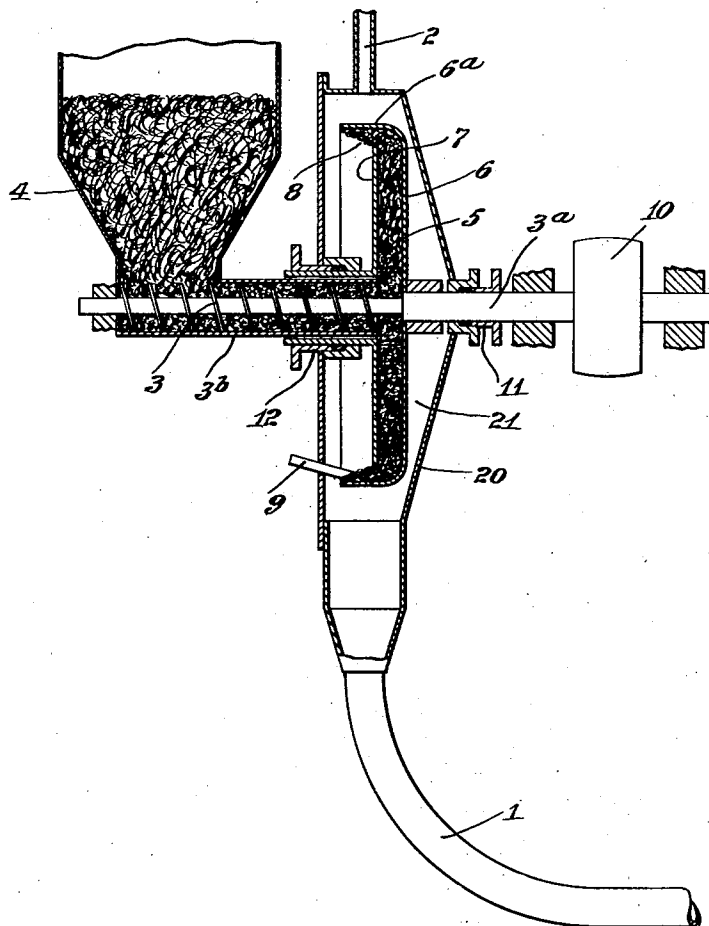
M. VOGEL-JORGENSEN
CONVEYING PULVERULENT MATERIAL

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2 Sheets-Sheet 1

Fig. 1.



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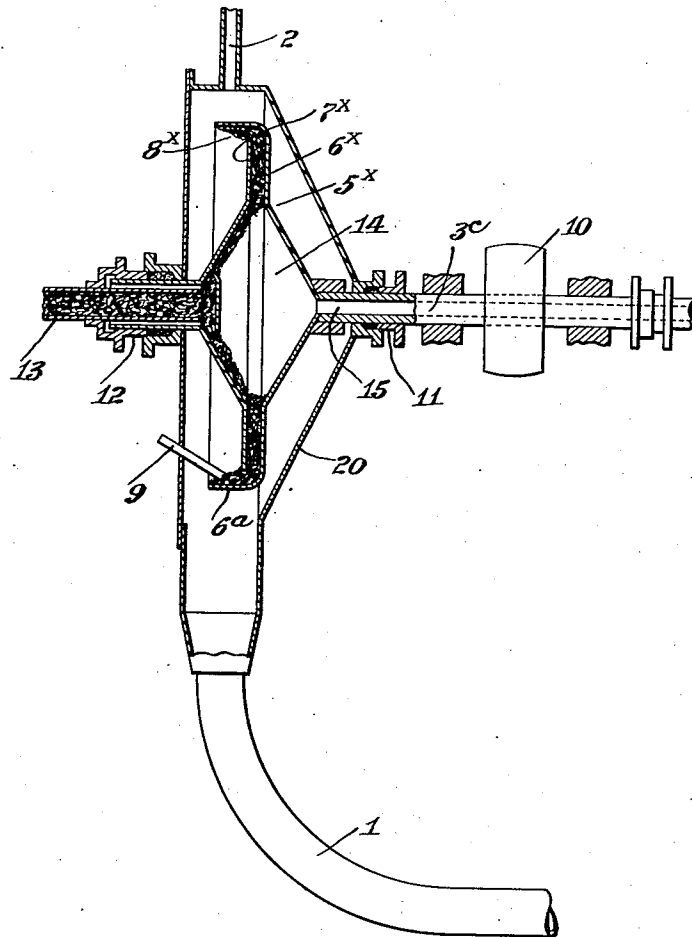
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Fig. 2.



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CONVEYING PULVERULENT MATERIAL

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 and in Great Britain November 30, 1931

4 Claims. (Cl. 302—36)

This invention relates to the conveying of pulverulent or granular material which in the mass is more or less fluent, such, for example, as cement raw meal, cement, coal dust and the like, in which a fluid under pressure, such as compressed air, is relied upon as the means by which movement of the material through a conduit is effected. In the conveying of such material by a fluid under pressure it is necessary to provide means for compacting the material at a point in advance of that at which it is subjected to the action of the fluid under pressure so as to prevent the escape of the fluid under pressure in a direction opposite that in which the material is to be conveyed. This has been accomplished heretofore by delivering the material to a point in advance of the application of the fluid under pressure by a worm conveyor, the pitch of which is reduced as the material approaches the point where the fluid under pressure is applied so that the material is compacted sufficiently to prevent the escape of the fluid under pressure in a direction opposite to that of the movement of the material. This procedure, however, involves a comparatively large consumption of power in compacting the material to the desired degree, as well as rapid wear on the worm conveyor. It is the object of the present invention to overcome the difficulties incident to the use of a worm conveyor for the delivery of the material to the point at which the fluid under pressure takes effect on the material and this general purpose is accomplished by the subjection of the material, before it is subjected to the action of the fluid under pressure, to centrifugal action whereby the material, with much less consumption of power and with much less wear of moving parts of the apparatus, is compacted sufficiently to prevent the escape of the fluid under pressure in the wrong direction and to cause the force of the fluid under pressure to be exerted in rendering the material fluent and in conveying it through the conduit in which it is conducted to the place of delivery. The apparatus in which this method of conveying the material may be practiced comprises a hollow, rotating body to the central portion of which the material to be conveyed is delivered by any suitable means, as, for example, by a worm conveyor of uniform pitch or by fluid pressure, and in which the material so delivered is caused by centrifugal action to move toward the periphery of the rotating body where it is compacted by the centrifugal action and from which it is discharged through an opening or openings into a chamber in which it is subjected

to the action of the compressed air or other fluid under pressure by which its fluent condition is maintained and it is itself caused to move through the conveyor conduit.

Two different forms of apparatus in which the invention, so far as it consists in the improved method, can be practiced and in which the invention, so far as it consists in apparatus, can be embodied, are illustrated—

Figure 1 being a view in sectional elevation of one convenient and practical form of such apparatus, and

Figure 2 being a similar view of the slightly different form of the apparatus.

In the form of apparatus shown in Figure 1 a portion of a conveyor conduit, which may be of greater or less length, is represented at 1, while a supply of air under pressure is sufficiently indicated by the pipe 2. The conduit 1 receives the material from a housing 20, forming a chamber 21 to which the air or other fluid under pressure is delivered by the pipe 2. In this instance the material is delivered by a screw conveyor 3 of uniform pitch from a hopper 4 to the inside of a hollow, rotating body 5 at its central portion. The chamber of this hollow, rotating body 5 to which the material is delivered, is formed between two plates 6 and 7, the plate 6 being preferably of slightly larger diameter than the plate 7 and formed with a flange 6^a which overlaps the periphery of the plate 7, forming therewith a somewhat constricted throat 8. The hollow body 5 is rotated at a considerable speed by any suitable means, sufficiently indicated by the band pulley 10, and in such rotation of the hollow body the material which is fed to it is by centrifugal action thrown out toward the periphery of the body and is compacted at the periphery, escaping through the constricted throat 8 upon the inner surface of the flange 6^a, from which it may be dislodged into the chamber 21 formed by the housing 20, by any suitable means, such as a scraper 9 introduced through the wall of the housing 20. As the material is thus dislodged from the rapidly rotating body 5 it falls into the chamber 21 of the housing 20 and is immediately propelled therefrom and through the conveyor conduit 1 by the air or other fluid under pressure which is supplied to the chamber 21 by the pipe 2, being at the same time mingled with the fluid under pressure and thereby maintained in a fluid condition. Packing boxes may be provided, as at 11, between the housing 20 and the extended shaft 3^a of the conveyor and as at 12, 110

between the housing and the casing 3^b of the screw conveyor 3.

The embodiment of the invention illustrated in Figure 2 is generally similar to that illustrated in Figure 1, comprising a housing 20, a conveying conduit 1, a compressed air supply indicated at 2 and a hollow rotating body 5^x formed of plates 6^x and 7^x, with a constricted discharge throat at 8^x. In this instance, the material is supplied to the hollow rotating body, at its central portion, under air pressure, through a delivery pipe 13 and the hollow rotating body is expanded in an axial direction so as to form a somewhat enlarged chamber 14. In this instance, the shaft 3^a, provided with a driving means, indicated by the pulley 10, is shown as axially bored, as at 15, so that it may be connected to an exhaust fan or other suction device, not necessary to be shown, for the purpose of creating an unbalanced air pressure under which the material is delivered to the hollow rotating body. The operation of this form of apparatus is the same as described with reference to Figure 1 and need not be further explained herein it being understood that a device 9 may be provided for the purpose of dislodging the material which, having been compacted in the constricted throat of the hollow rotating body, is discharged upon the inner face of the flange 6^a.

Other forms of apparatus in which the improved method can be practiced will readily suggest themselves and it will be understood that, except as indicated in the accompanying claims, the invention is not restricted to any particular form of apparatus.

I claim as my invention:

1. In an apparatus for conveying pulverulent material, the combination of a housing, a con-

veying conduit connected to the housing, means to supply fluid under pressure to the housing, a hollow body mounted within the housing and having a constricted opening at its periphery, means to rotate the hollow body, means to supply the material to the hollow body at the central portion thereof, and means to dislodge the material from the hollow body into the housing and conduit.

2. In an apparatus for conveying pulverulent material, the combination of a housing, a conveying conduit connected to the housing, means to supply fluid under pressure to the housing, a hollow body mounted within the housing and formed of two plates, the one overlapping the other and forming therewith a constricted throat, means to rotate the hollow body, and means to supply the material to the hollow body at the central portion thereof.

3. In an apparatus for conveying pulverulent material, the combination of a housing, a conveying conduit connected to the housing, means to supply fluid under pressure to the housing, a hollow body mounted within the housing and having a constricted opening at its periphery, means to rotate the hollow body, and a screw conveyor to supply the material to the hollow body at the central portion thereof.

4. In an apparatus for conveying pulverulent material, the combination of a housing, a conveying conduit connected to the housing, means to supply fluid under pressure to the housing, a hollow body mounted within the housing and having a constricted opening at its periphery, means to rotate the hollow body, and means to supply the material under air pressure to the hollow body to the central portion thereof.

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