No. 818,585.

PATENTED APR. 24, 1906.

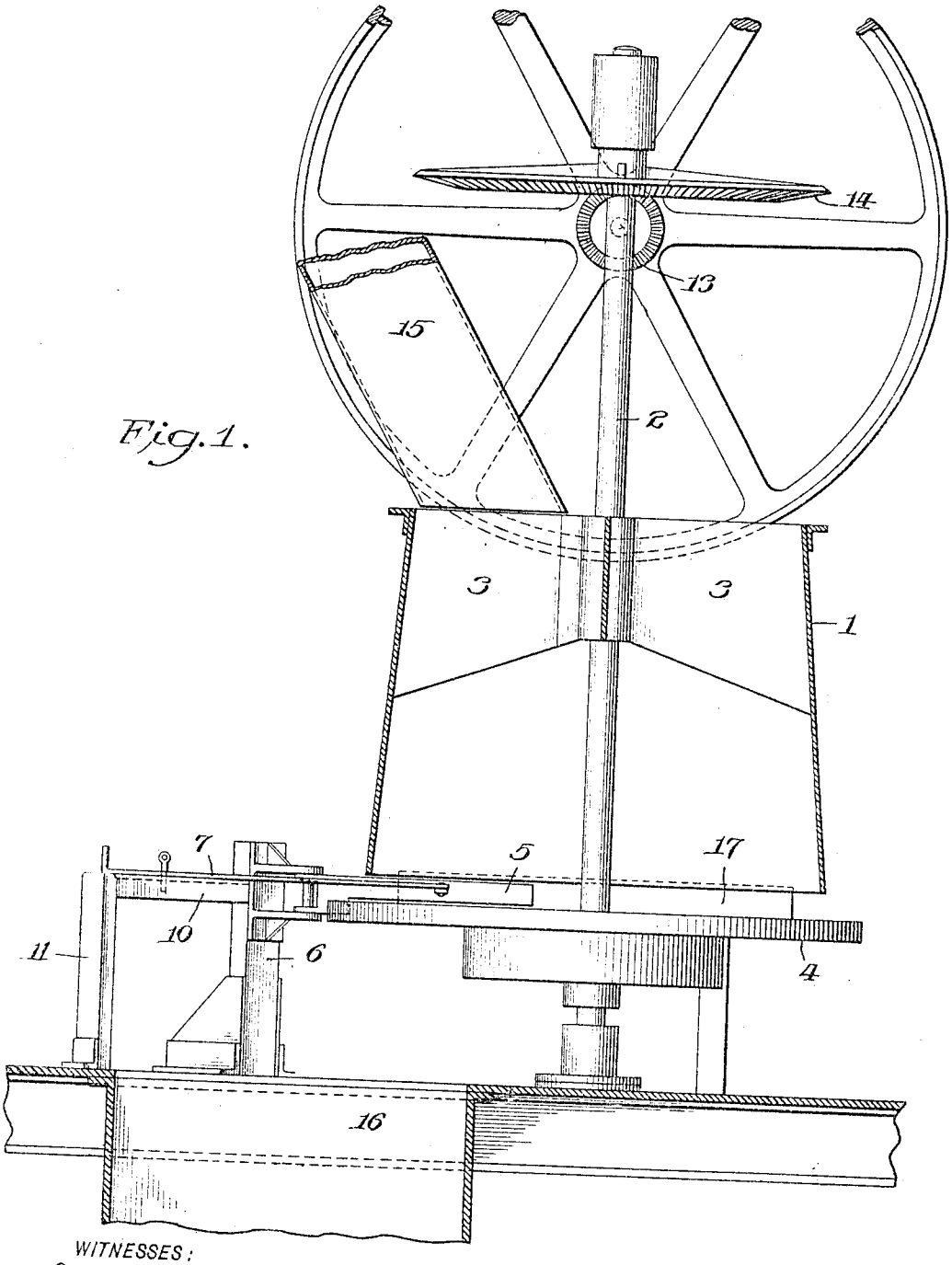
E. N. TRUMP.

FEEDING DEVICE.

APPLICATION FILED MAR. 11, 1902.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

Mae Hofmann

C. L. Ehret

INVENTOR

Edward N. Trump

BY M. Towndale

ATTORNEY

No. 818,585.

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4 SHEETS—SHEET 2

Fig. 2.

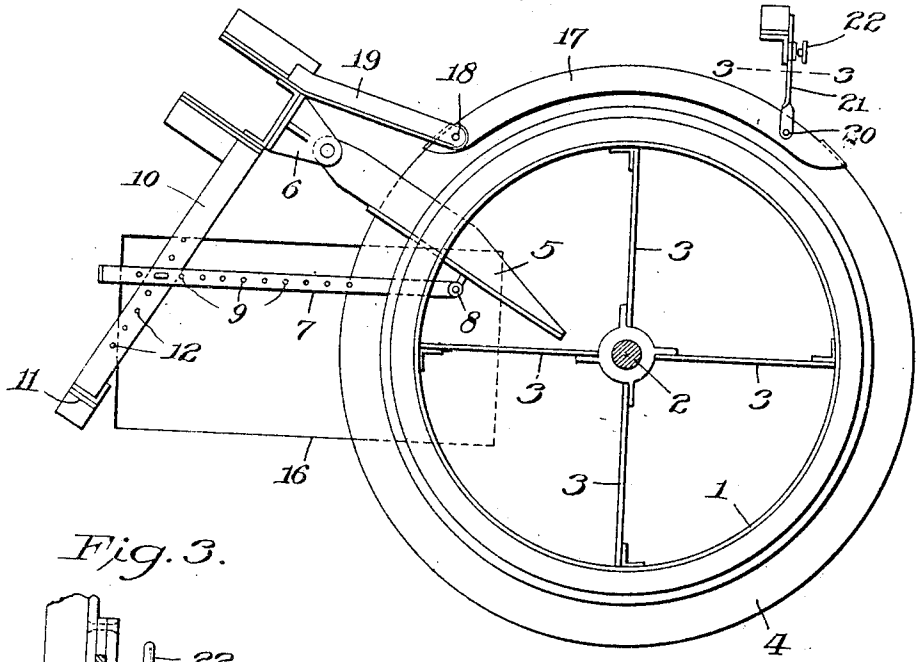


Fig. 3.

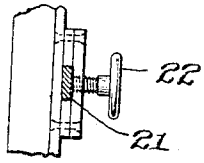
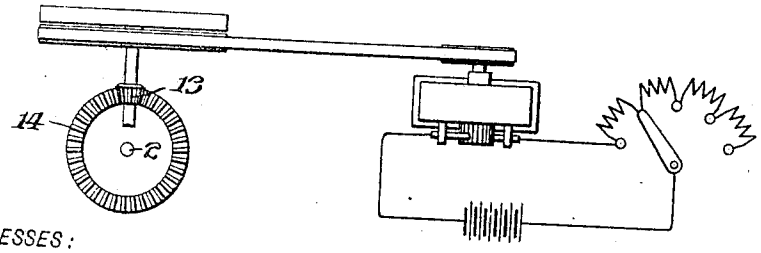


Fig. 4.



WITNESSES:

Mae Hofmann

C. L. Ehret

INVENTOR

Edward N. Trump

BY Geo. P. Goodale

ATTORNEY

No. 818,585.

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4 SHEETS—SHEET 3.

Fig. 5.

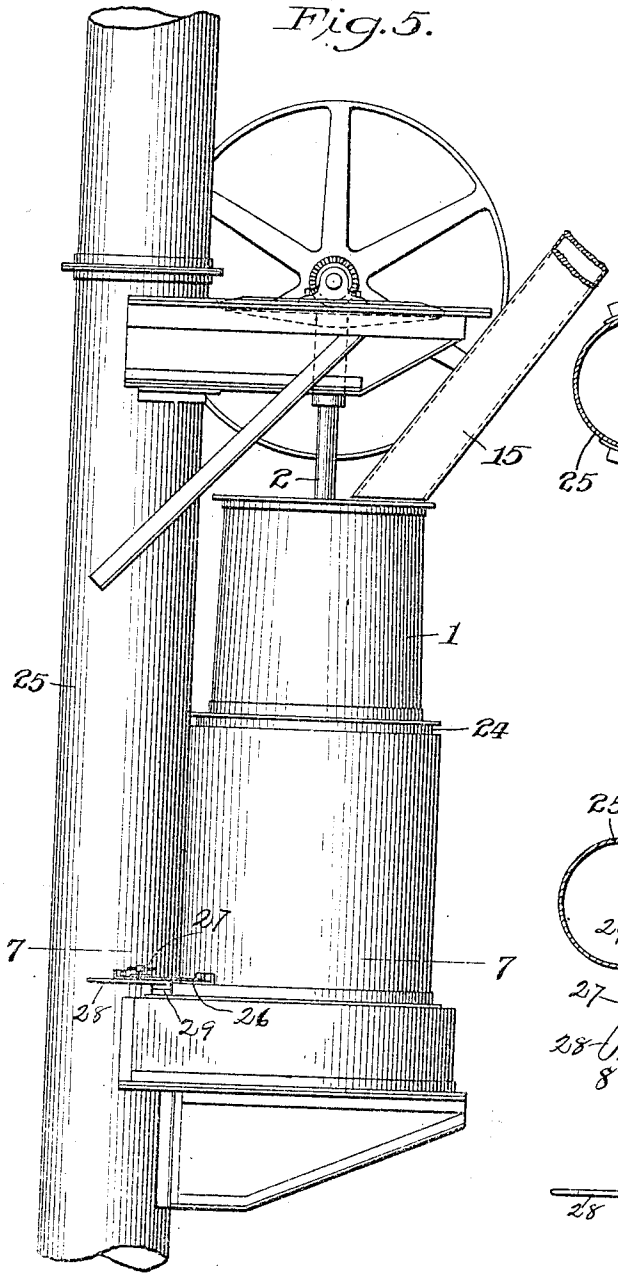


Fig. 6.

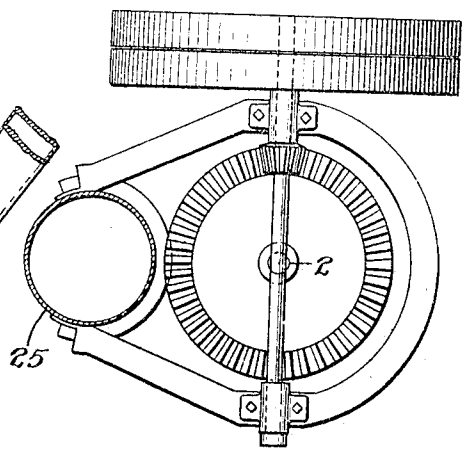


Fig. 7.

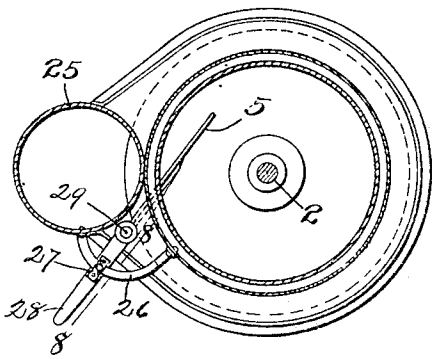
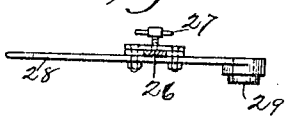


Fig. 8.



WITNESSES:

Max Hofmann

E. L. Ehret.

INVENTOR

Edward N. Trump

BY Wm Brown dab

ATTORNEY

No. 818,585.

PATENTED APR. 24, 1906.

E. N. TRUMP.

FEEDING DEVICE.

APPLICATION FILED MAR. 11, 1902.

4 SHEETS—SHEET 4.

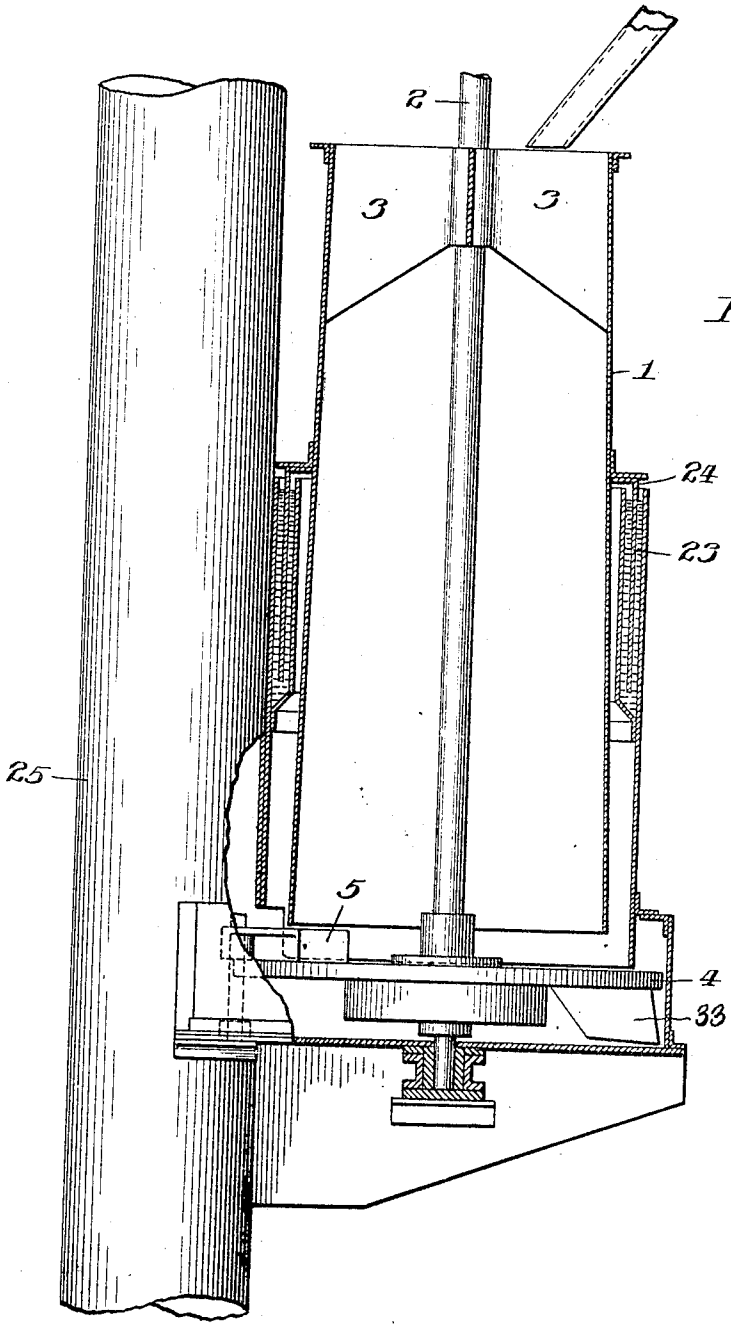


Fig 9.

WITNESSES:

Mae Hofmann

O. L. Ehret

INVENTOR

Edward N. Trump

BY Wilbur Goodale

ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD N. TRUMP, OF SYRACUSE, NEW YORK.

FEEDING DEVICE.

No. 818,585. Specification of Letters Patent. Patented April 24, 1906.

Application filed March 11, 1902. Serial No. 97,876.

To all whom it may concern:

Be it known that I, EDWARD N. TRUMP, a citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Feeding Device, of which the following is a specification.

My invention relates to mechanism for feeding or measuring materials, my object being to provide improved means for feeding material, so that the rate of said feeding may be uniform and readily controlled and regulated.

My invention also comprises means for feeding material against pressure—that is, for feeding material into a receptacle which is under pressure greater than the surrounding atmosphere.

I accomplish my object by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of my device, partly in vertical section. Fig. 2 is a plan view of said device with the omission of the driving-gear and supply-chute. Fig. 3 is a vertical section on line 3 3 of Fig. 2. Fig. 4 is a diagrammatic view of a rheostat-controlled motor for driving the beveled-gear mechanism. Fig. 5 is a side elevation of my device provided with a movable seal between the feeding mechanism and the receptacle to be fed. Fig. 6 is a top view of same. Fig. 7 is a horizontal section on line 7 7 of Fig. 5. Fig. 8 is a vertical section on line 8 8 of Fig. 7. Fig. 9 is a view similar to Fig. 5 with the rotatable cylinder and stationary chamber in vertical section.

Similar numerals refer to similar parts throughout the several views.

The essential feature of my invention consists in providing means for rotating a mass of material having a substantially constant circumferential dimension at its base, in combination with adjustable means for deflecting from the base of said rotating mass a required amount of material at each rotation.

For rotating the material I provide a receptacle comprising a vertically-disposed envelop or cylinder 1 and a table or platform 4, spaced below the lower extension of said envelop. The envelop and platform are mounted on a vertical shaft 2, having a step-bearing at 31 and a journal-bearing at 32. (See Fig. 1.) This shaft 2 is adapted to be rotated through the gears 13 and 14 from any suitable source of power, such as a rheostat-controlled motor. (Shown in Fig. 4.) The cylinder or envelop 1 may advantageously be conical in shape for certain materials. The means for deflecting material from the base of the rotating mass carried in the receptacle is the deflector-blade 5, which in Fig. 2 is secured to the supporting-post 6 and is operated by the rod 7, provided with holes 9, adapted to coöperate with holes 12 of the stationary member 10 by pin engagement to change the angular position of deflector 5 with respect to the radius of cylinder 1. Another form of adjustment is shown in Fig. 7, where the deflecting-blade 5 is pivotally mounted at 29 and provided with a clamp-screw 27 on the rear extension 28 of said blade 5, said clamp-screw being adapted to engage with the arc-shaped member 26 to secure said deflector in any desired angular position. It is obvious that the changing of the angular position of the deflector 5 with respect to the radius of the cylinder 1 serves to vary the distance between the end of the deflector and the axis of the cylinder. Other means may be employed for accomplishing this end. The deflector 5, as shown in the drawings, is adapted to project over table 4 and beneath the lower extension of cylinder 1, close to the axis of its rotation, so that when the receptacle is rotated the base or under portion of the rotating mass contained therein is pared away and deflected from said receptacle into the receiver 16, as shown in Fig. 1, or into the stack 25, as shown in Fig. 9. The horizontal extension of table 4 is greater than the periphery of the lower extension of the cylinder. This is for the purpose of supporting the material as it spreads slightly to its natural slope from beneath the lower extension of the cylinder.

In Fig. 2 I show a guard 17, pivotally secured to the stationary framework at 18 and having pivotally secured at its free end at 20 the rod 21, which is adjustably secured to another stationary part by the clamp-screw 22. This guard 17 lies upon the table near its outer periphery and back of the deflector for the purpose hereinafter to be described.

In Figs. 5 and 9 I show the cylinder and table mounted in operative relationship with a stack 25—such a stack, for instance, as is found in the drier apparatus illustrated and described in patent to me, No. 748,893, dated January 5, 1904. This patent is referred to as describing a receptacle in which there is a pressure maintained greater than the sur-

rounding atmosphere. Were it attempted to feed such a stack with powdered material in the ordinary way the same would be in most cases blown from the intake-opening of the stack by the pressure maintained in said stack. I have therefore, as shown in Figs. 5 and 9, provided a chamber 30 for inclosing the table and the lower part of the cylinder with the intake-aperture of the stack, and since the stack is stationary and the table and cylinder rotated I have provided a movable seal between said stationary surrounding chamber and the movable cylinder. This movable seal consists in the annular channel 23, which is secured to the stationary chamber 30, and the annular flange 24, which is secured to the rotating cylinder 1 and adapted to project downwardly into the channel 23. By supplying said channel 23 with water or other suitable substance an effective movable seal is provided between said chamber 30 and cylinder 1.

To the under side of the table or platform 4 (see Fig. 9) is secured the scraper 33, adapted to rotate with the platform and sweep the bottom of the inclosing chamber 30. By this means material which may in any way work to the bottom of chamber 30 will be swept into the stack 25.

Material is introduced into the stack by the chute 15 or other suitable means. It is especially to be noted that the dimensions of the cylinder with respect to the amount that can be deflected therefrom with each rotation are such as to maintain a mass of material of sufficient bulk or weight to counteract the pressure existing at the intake-port of the stack and at the same time to provide a reserve store of material which will allow fluctuations in the rate of supply from the chute without affecting the rate of feed from the rotating mass.

The operation of my device is as follows: Assuming that material has been introduced into the cylinder 1 and the cylinder rotated, the deflector 5 is adjusted to encounter with each rotation thereof the desired portion of the rotating material to divert it from beneath the cylinder and over the edge of the table into the stack or other suitable receiver. The operation is like a cutting-tool turning a groove into a piece of wood on a lathe. It peels out a section of the material as the material is revolved against it. As the rotating material is encountered by the deflector, a space is left behind the deflector corresponding to its vertical dimension and of such width, as the consistency of the material will support a bridge over the space left by the deflector. When the limit of this supporting power of the material, due to its cohesion, has been reached, the bridge breaks and the superimposed material settles down to fill the space left behind the deflector. This falling down of the material to fill said space results in the falling of all the superimposed material, and consequently results in an intermittent cleavage of said material throughout its vertical extension over said space left by the deflector. This insures by a constant, intermittent, and equal settling of the material a constant agitation of the same in the receptacle. This constant agitation, as above stated, prevents the mass of material from caking or sticking to the sides and also tends to maintain an even distribution of said material in the receptacle.

The rotating of a receptacle comprising an envelop and platform positioned as above described is an improvement over that form of feeding device in which an envelop or hopper is maintained stationary with a table or platform rotating beneath it. This is because the element of friction between the material and the walls of the envelop is eliminated, and consequently a less power is required to maintain the rotation of a whole mass. A positive rotation of the material against the deflector is assured and a more constant feed is secured. Another distinct advantage resulting from the rotation of the entire mass of material with the envelop is that the only movement of the material independent of the receptacle is the settling behind the deflector, as above described—that is, after this settling the material remains at rest with respect to said receptacle until encountered by the deflector. Where, however, the hopper or cylinder is stationary while the base rotates, there is a constant movement of the material around the entire circumference of the cylinder, due to the friction between the moving material and the stationary material, which results in a greatly-increased variation of natural slope of material. This in no inconsiderable degree affects the accuracy of the feed. The guard 17 (shown in Fig. 2) may advantageously be employed in connection with the use of some materials to check the spread of material as the same falls by the breaking of the bridge just to the rear of the deflector.

By providing the space between the envelop and the table just sufficient to accommodate a deflector the length of which is several times greater than its width and by extending this deflector close to the axis of the table a practically uniform discharge is secured. This is because the volume of the material removed from within the hopper is many times greater than the amount of material removed from without the hopper, due to the natural slope of the material. From this it results that slight variations which occur in said natural slope are so inappreciable in comparison with the total volume of the material removed that the total discharge is practically uniform. The importance of such a result becomes apparent when it is desired to feed material into a treating agent—for instance,

in connection with a drier-stack, such as described in my patent above referred to, where it is necessary to maintain an accurate adjustment between the velocity of the treating agent and the rate of feed of material thereto. This importance is emphasized where large quantities of material are being treated continuously, since by a due relative adjustment of the velocity of the treating agent and the rate of feed the maximum efficiency of the treating operation is readily secured and maintained.

What I claim is—

1. In a feeding device, the combination of means for rotating an integral mass of material with a substantially constant circumferential dimension at its base, and deflecting means projecting into said base.

2. In a feeding device, the combination of means for rotating an integral mass of material with a substantially constant circumferential dimension at its base, and adjustably-supported deflecting means projecting into said base.

3. In a feeding device, the combination of a rotatable receptacle for material comprising a cylinder and a table spaced beneath its lower edge, said table having a diameter exceeding that of the cylinder sufficient to support the material at natural slope, and means for deflecting from within the cylinder the under portion of the rotating material.

4. In a feeding device, the combination of a rotatable receptacle for dry granular or powdered material comprising a cylinder and a table spaced beneath its lower edge, said table having a diameter exceeding that of the cylinder sufficient to support the material at natural slope, and means for deflecting from within the cylinder the under portion of the rotating material.

5. In a feeding device, the combination of a rotatable receptacle for material comprising a cylinder and a table spaced beneath its lower edge, said table having a diameter exceeding that of the cylinder sufficient to support the material at natural slope, and adjustably-supported means for deflecting from within the cylinder the under portion of the rotating material.

6. In a feeding device, the combination of a rotatable receptacle, comprising an envelop and a platform spaced beneath the lower extension thereof, and an adjustably-supported deflector projecting between the platform and the envelop, the proportions and positions relatively of the envelop, the platform and the deflector, being such that the amount of material deflected, with each rotation of the receptacle, shall so preponderate the variation of deflection, due to the variation in the natural slope of material, as to render such variation inappreciable.

7. In combination with a stationary receiving device having an intake-port, a feeding device therefor, comprising a rotatable receptacle, formed by an envelop and a platform spaced below the lower extension thereof, and means for deflecting material therefrom to the receiving device, a chamber for inclosing said intake-port and a movable seal arranged between the inclosing chamber and the rotatable receptacle.

8. In combination with a stationary receiving device having an intake-port, a feeding device therefor, comprising a rotatable receptacle, formed by an envelop and a platform spaced below the lower extension thereof, and means for deflecting material therefrom to the receiving device, a chamber inclosing said intake-port, and a movable seal arranged between the inclosing chamber and the rotatable receptacle, and a scraper rotating beneath the platform, for sweeping the bottom of the inclosing chamber.

9. In combination with a receiving device having a material-intake port, such as a stack under pressure above atmosphere, means for feeding material thereto, comprising a rotatable receptacle, formed by an envelop and a platform spaced below the lower extension thereof, and means for deflecting the material therefrom to the stack, said envelop having a vertical extension sufficient to maintain a mass of material above said intake-port sufficient to counteract the said pressure.

10. In combination with a receiving device having a material-intake port, such as a stack under pressure above atmosphere, means for feeding material thereto, comprising a rotatable receptacle, formed by an envelop and a platform spaced below the lower extension thereof, and means for deflecting the material therefrom to the stack, said envelop having a vertical extension sufficient to maintain a mass of material above intake-port sufficient to counteract said pressure, a chamber inclosing said intake-port and a movable seal between the inclosing chamber and the rotatable receptacle.

11. In a feeding device the combination of a rotatable receptacle, comprising an envelop and a platform spaced below the lower extension thereof, means for deflecting the under portion of the mass of material rotated thereby, a receiver for said deflected material, a chamber inclosing the aperture of the receiver, the platform and the lower portion of the envelop an annular channel and an annular flange adapted to project therein, secured between the inclosing chamber and the rotating envelop to maintain a movable seal therebetween.

EDWARD N. TRUMP.

Witnesses:
EDWARD HARSHAW,
MAE HOFMANN.