

Sept. 8, 1925.

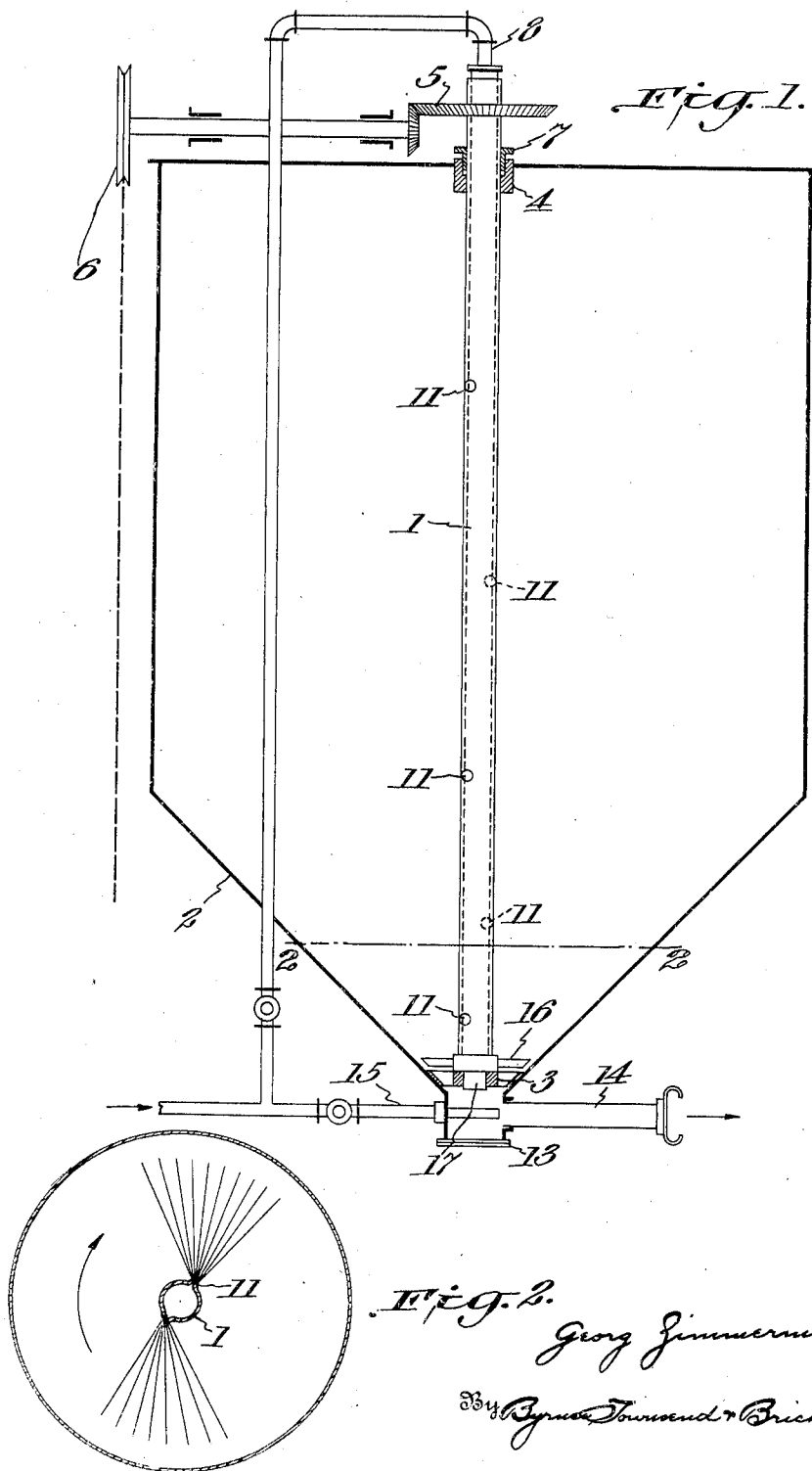
1,552,905

G. ZIMMERMANN

CONTAINER AND MEANS FOR EMPTYING IT

Filed March 18, 1925

2 Sheets-Sheet 1



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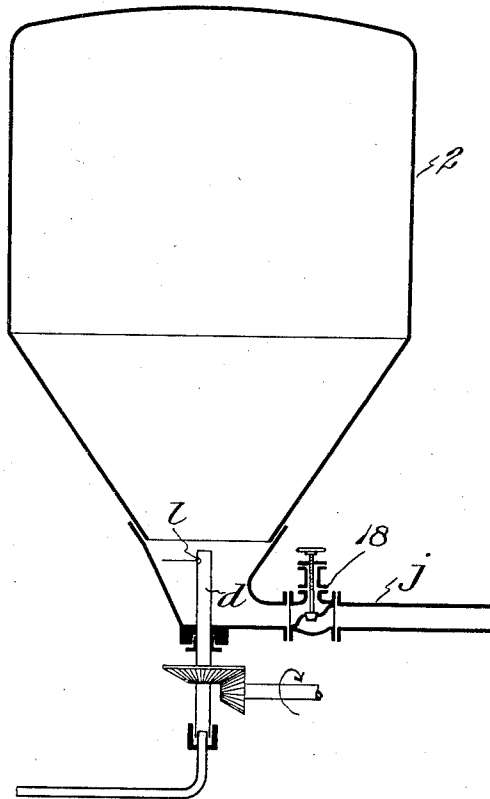
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2 Sheets-Sheet 2

Fig. 3.



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UNITED STATES PATENT OFFICE.

GEORG ZIMMERMANN, OF LEVERKUSEN, NEAR COLOGNE, GERMANY, ASSIGNOR TO
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CONTAINER AND MEANS FOR EMPTYING IT.

Application filed March 18, 1925. Serial No. 16,584.

To all whom it may concern:

Be it known that I, GEORG ZIMMERMANN, a citizen of Germany, residing at Leverkusen, near Cologne, State of Prussia, Germany, have invented new and useful Improvements in Containers and Means for Emptying Them, of which the following is a specification.

This invention relates to containers and means for emptying them.

When containers are filled with products in dust form, they are difficult to empty owing to the coherence of the dust particles.

According to this invention they are emptied by the aid of a rotary jet of air directed towards the walls of the container.

According to one feature of this invention, a container adapted to be closed airtight has in it a vertical rotatable pipe extending the height of the container or substantially so, and provided with an outlet where the outgoing dust can be acted upon by a jet of air.

According to another feature of the invention, the container is made to withstand a considerable pressure, while a rotatable member extends into the container a short distance only, the delivery of the dust to a distance being effected by the pressure within the container.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a schematic view of a container in accordance with this invention, and Figure 2 is a diagrammatic view showing the relative arrangement of the air pipe, nozzles and the container as they would appear at the line 2-2, Figure 1. Figure 3 is a schematic view of a modified construction.

Referring to Figures 1 and 2, 2 is a container adapted to be closed airtight and having in it a pipe 1, provided with tangential nozzles 11. The bottom wall of the container 2 is provided with an outlet which is spanned by a step bearing 3, the latter being provided with apertures for the passage of dust. The pipe 1 is closed at its lower end by a plug 17 mounted in the bearing 3, and the upper end of the pipe is supported in a bearing 4, which latter is made air-tight by a gland 7. The pipe 1 may be rotated by the bevel gearing 5 which is driven by the chain wheel 6, and air is supplied to the pipe 1 from a suitable source of pressure

through the union 8. An open topped dust receiver 13 is positioned in direct communication with the outlet opening of the container 2, the dust receiver being provided with a discharge pipe 14 leading from one wall thereof. A compressed air pipe 15 projects into the dust receiver and in horizontal alignment with the discharge pipe 14 with which it cooperates to form an ejector. The lower end of pipe 1 is provided with stirrers 16 immediately above the bearing 3, which stirrers prevent large particles from obstructing the outlet.

When container 2 is being filled with cohering dust, a free passage to the dust receiver 13 is maintained by leading air into pipe 1 and rotating it.

When it is full of dust, and it is desired to empty the container, the diameter of the clear passage through the container to the dust receiver 13 is enlarged by the air pressing out of the rotating nozzles 11, the dust becomes mixed with the whirling air and passes out of the container into the dust receiver 13, where it is acted on by air passing out of pipe 15 and is delivered through pipe 14.

Referring to Figure 3, the container 2 is of a shape and construction to withstand air pressure d is a rotary pipe supplied with air under pressure which issues from the tangential nozzle 7. In this construction pipe d extends a short distance only in the receiver, the projection of the dust through pipe j being caused by the pressure in the receiver which may, for example, rise to three atmospheres. The cock 18 preventing outlet of air from the bottom of the container is preferably situated as near as possible thereto in order that the container may be brought to the required pressure as quickly as possible at the commencement of the emptying operation.

I claim:—

1. The combination with a container having a discharge opening, of apparatus for loosing material within said container, said apparatus comprising a pipe positioned in axial alignment with said opening, transversely directed nozzles on said pipe and means for rotating said pipe about its axis.
2. The combination with a container adapted to hold material in the form of cohering dust, of apparatus for loosing the ma-

terial contained therein for the purpose of permitting its removal from said container, said apparatus including means for producing a jet of air in a plane above and substantially parallel to the plane of the discharge opening of said container, and means for rotating jet-producing means to traverse said jet of air over said discharge opening.

3. The combination with a container having an outlet at the bottom thereof and adapted to be closed airtight, of a vertically disposed rotatable pipe extending longitudinally of said container, said pipe being provided with tangential outlets and having a closed lower end, and means for delivering compressed air to said pipe.

4. The combination with a container adapted to hold material in the form of cohering dust and having an outlet opening in the bottom thereof, of an open topped dust chamber in direct communication with the

outlet opening of said container, a vertically disposed pipe in axial alignment with said outlet opening, means for rotating said pipe about its axis, means for delivering laterally directed streams of compressed air from said rotatable pipe, and a pipe in said dust chamber for delivering compressed air thereto, said pipe cooperating with said outlet opening to form an ejector operative to remove dust from said dust chamber.

5. The combination with a dust chamber adapted to withstand considerable pressure and having a discharge opening at the bottom thereof, of a rotatable pipe in axial alignment with said opening, said pipe having a transversely directed nozzle positioned above and adjacent to said opening.

In testimony whereof I have hereunto set my hand.

GEORG ZIMMERMANN.