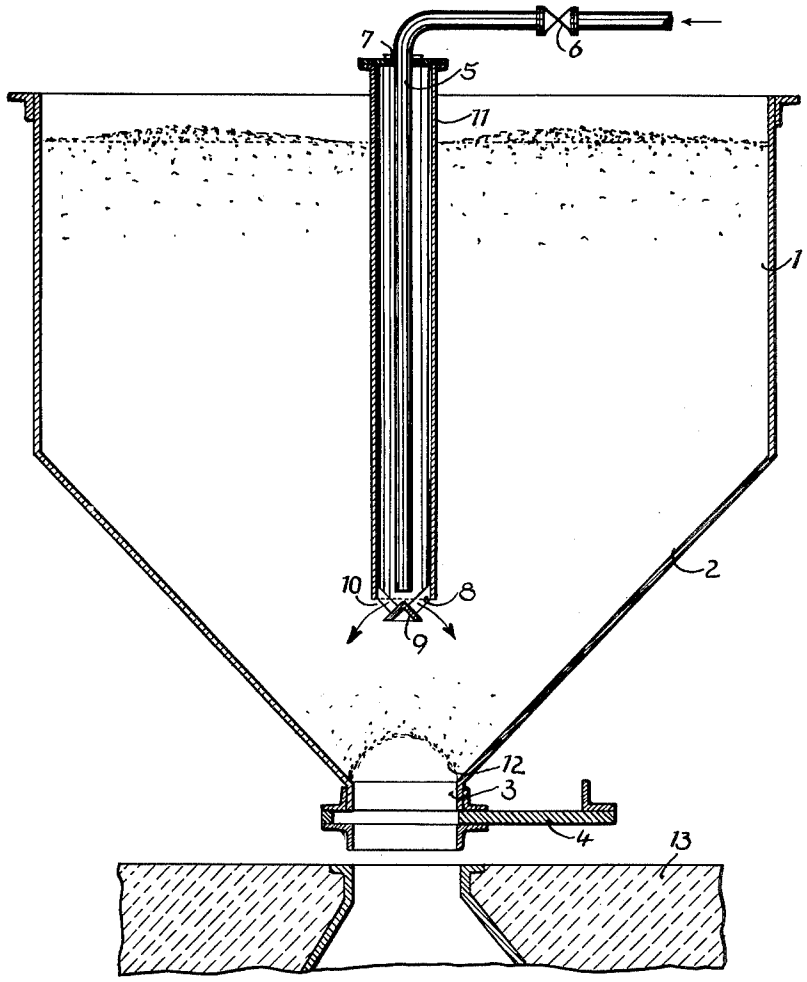
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CONTAINER FOR MOIST OR STICKY MATERIALS, FOR EXAMPLE COAL

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CONTAINER FOR MOIST OR STICKY MATERIALS, FOR EXAMPLE COAL

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The present invention relates to supply containers for moist or sticky materials, for example coal, which containers are formed or equipped to provide a hopper having an outlet opening, as for top charging coking chambers of oven batteries.

The cross-sectional area of this discharge outlet opening in supply containers is limited according to the purpose for which the discharged material is to be used. Thus, for example the discharge outlet openings of supply containers for coal which is to be charged into oven chambers to be coked therein can only have a relatively small cross-sectional area in view of the narrow width of the oven chambers themselves. Where such containers or bunkers are used for the accommodation of coal of moist or sticky characteristics, the latter cannot be passed unassisted through the narrow outlet opening. A series of prior proposals have therefore been made which consist in the arrangement of more or less complicated mechanical pusher or poker devices inside the supply container.

To discharge moist or adhesive materials from a supply container with a narrow outlet opening it is of primary importance to clear the materials which become packed so as to form a sort of plug for this opening, in the lower part of the hopper, above the outlet opening, and under the weight of the super-imposed material, whereby the material can subsequently flow out in a continuous stream. The invention is based on this principle and consists substantially in the arrangement in the passageway to the outlet opening of the container a conduit for the supply of a gaseous pressure medium. Advantageously this pressure medium conduit terminates at a distance from the outlet opening of the supply container which is such that, when the plug-forming pack of coal or the like located therebelow is blown out under pressure, the coal is able to run down from the upper part of the container and be discharged.

In carrying the invention into effect a deflector member is conveniently arranged in association with the pressure medium discharge aperture from said conduit and is adapted to spread the issuing medium over a wider area than the cross-sectional area of the lower hopper discharge outlet opening. As a result coal which has become tightly compressed in the lower part of the hopper-form bottom of the container will also be positively discharged, as that surmounted coal can readily run down the inclined surface of the hopper for subsequent discharge.

The deflector member in question may be preferably in the form of a cone which is arranged in spaced relationship with said discharge aperture.

According to a further feature of the invention the pressure medium conduit is disposed in an outer conduit of larger cross sectional area than the pressure medium conduit which outer conduit acts as an air chamber.

A preferred embodiment of the invention is illustrated by way of example in the accompanying drawing, which

is a vertical cross section through a supply container of hopper-like form embodying the invention.

At its lower part, the supply container **1** illustrated tapers to form a hopper-form bottom **2** having an outlet opening **3** closed by a sliding plate **4**.

Projecting into the container **1** in superposed spaced relation above the outlet **3** is an inner conduit **5**, the discharge outlet of which terminates above the outlet opening **3** and is located approximately in the vertical medial plane of the latter. The conduit **5** is connected externally of the container to a line through which compressed air is supplied, this supply line being regulated by a valve **6**. Disposed around conduit **5** is an outer conduit **11** of a larger diameter which is closed at the top by a flange **7**.

At its lower end the conduit **11** is connected by stays **8** with a conical deflector **9**. This deflector **9** is situated a short distance from the lower discharge outlet end of the inner pressure medium conduit **5** and is so dimensioned and has its surfaces so inclined that the compressed air issuing from the pipe conduit **5** flows downwardly and outwardly, through openings **10** between the end of conduit **11** and the deflector cone **9**, in the direction of the arrows and forcibly against the lower hopper-forming surfaces of the container bottom **2**.

On opening the closure plate **4** it is generally found that only a small part of a stored quantity of caking-type coal becomes detached above the sliding plate and falls through, the rest remaining in situ as indicated by the arch **12** in dotted lines in the drawing. The packed coal located in the lower part of the hopper-form bottom **2** is now, however, blown out by the compressed air introduced through conduit **5**. When the coal is consequently broken up and starts to run down from the upper part of the hopper and pass through the opening **3**, the supply of compressed air can be interrupted.

In the case of charging mechanisms which are adapted to be driven, as conventional in top charging of horizontal coke oven batteries, from chamber to chamber along the tops of coking chamber ovens **13**, a compressed air connection, as required for the above inner conduit **5**, can readily be provided by a hose connection of the line external to the container with a compressed air pipe arranged on the oven battery.

What I claim is:

1. A supply hopper for gravity discharge of moist or adherent materials, e. g., coal, comprising: a feed hopper with a lower gravity discharge outlet opening of small cross-sectional area as compared with the upper reservoir portion of the hopper, and a stationary pneumatic inlet conduit for the supply of gaseous pressure medium having an open ended lower discharge outlet disposed at a fixed region at a spaced distance, and axially, above the lower discharge outlet opening of the hopper, combined with a deflector member in said hopper, said deflector member being disposed below the lower open discharge outlet of the pneumatic inlet conduit with a continuous free space therebetween which opens unrestrictedly into the surrounding area of the hopper, and said deflector having a maximum horizontal dimension that is but a minor portion of the horizontal area of the portion of the hopper in which the deflector member is disposed, and being arranged in such close spaced relation beneath the pressure medium discharge outlet of the conduit that fluid on issuing from the discharge outlet opening of the conduit must first strike the deflector and be spread laterally outwardly by the deflector over a wider area of the container interior than the cross-sectional area of the lower hopper outlet opening, before contacting material in the container, and said deflector and the lower discharge outlet of the pneumatic inlet conduit being disposed above the lower outlet from the hopper at an elevation relative thereto at which the fluid from said conduit

is forcibly deflected by the deflector against the lower hopper forming surfaces of the hopper higher up above the lower outlet opening.

2. Apparatus as claimed in claim 1, and in which the deflector is in the form of a cone which has its apex at a level below the lower level of the conduit outlet, and its base below the apex.

3. Apparatus as claimed in claim 1, and in which the pressure medium conduit is arranged in a straight line and extends upwardly externally of the container axially of the lower outlet for the hopper; and in which the conduit is enclosed inside the container in an outer conduit which likewise extends in a straight line axially of the lower hopper outlet to at least the top of the container, and is of a cross-sectional area that is but a minor portion of the cross-sectional area of the cross-sectional area of the hopper, but is of larger cross-sectional area than the pressure

medium conduit, and forms an air chamber therearound, and in which the deflector is in the form of a cone having its apex below the pressure medium conduit and its base below the apex, and of a cross-sectional area less than that of the outer conduit.

References Cited in the file of this patent

UNITED STATES PATENTS

1,029,273	Butler	June 11, 1912
1,390,974	Von Porat	Sept. 13, 1921
1,678,225	Kincade	July 24, 1928
1,819,756	Reed	Aug. 18, 1931
1,971,852	Goebels	Aug. 28, 1934
2,272,442	Tamminga	Feb. 10, 1942
2,534,253	Fash	Dec. 19, 1950
2,652,175	Davis	Sept. 15, 1953