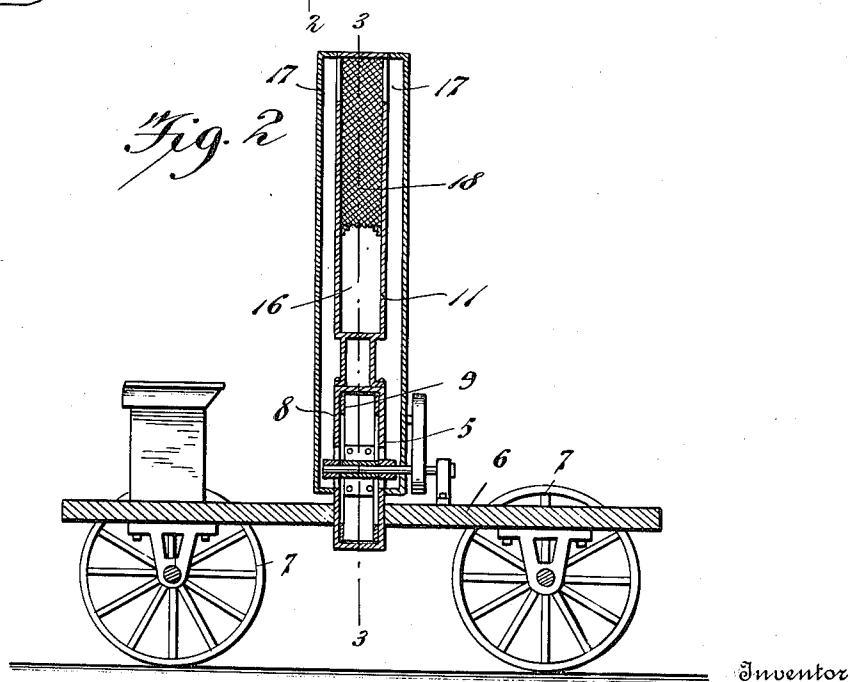
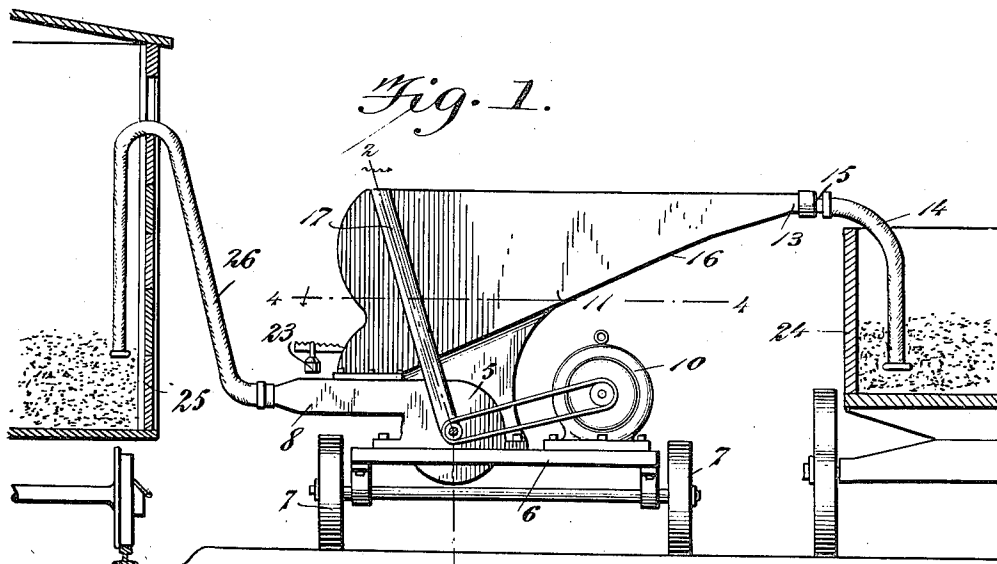


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PNEUMATIC CONVEYER.
APPLICATION FILED APR. 19, 1913.

1,173,073.

Patented Feb. 22, 1916.

2 SHEETS—SHEET 1.



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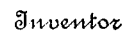
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2 SHEETS—SHEET 2.



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PNEUMATIC CONVEYER.

1,173,073.

Specification of Letters Patent.

Patented Feb. 22, 1916.

Application filed April 19, 1913. Serial No. 762,278.

To all whom it may concern:

Be it known that I, BENJAMIN L. WILLIAMS, a citizen of the United States, residing at Corning, in the county of Holt and State of Missouri, have invented new and useful Improvements in Pneumatic Conveyers, of which the following is a specification.

This invention relates to conveyers and especially to pneumatic conveyers of that class which are used for handling, elevating and transferring grain and the like.

The present invention has for its object to produce a conveyer of the class described which shall be of simple and efficient construction and in which a rotary fan or blower is employed to create a partial vacuum within a suction chamber into which the material is taken from the source of supply, said material passing from the suction chamber to the exit spout of the blower where it is subjected to the blast of the fan, thereby utilizing the blast as well as the suction created by the fan in handling the material.

A further object of the invention is to produce a simple and efficient device of the character described having an automatic valve to regulate the passage of the material from the suction chamber to the exit spout of the blower casing.

With these and other ends in view which will readily appear as the nature of the invention is better understood, the same consists in the improved construction and novel arrangement and combination of parts which will be hereinafter fully described and particularly pointed out in the claim.

In the accompanying drawings has been illustrated a simple and preferred form of the invention, it being, however, understood that no limitation is necessarily made to the precise structural details therein exhibited, but that changes, alterations and modifications within the scope of the claim may be resorted to when desired.

In the drawings, Figure 1 is a side elevation of a machine constructed in accordance with the invention, showing the same mounted for transportation on a truck frame which also supports a motor whereby the apparatus may be driven, and showing the device in position for transferring grain or other material from a wagon to a railroad car. Fig. 2 is a vertical sectional view taken

on the line 2—2 in Fig. 1. Fig. 3 is a vertical sectional view taken at right angles to Fig. 2, substantially on the line 3—3 in Fig. 2. Fig. 4 is a horizontal sectional view taken on the line 4—4 Fig. 1.

Corresponding parts in the several figures are denoted by like characters of reference.

A blower casing 5, which is suitably supported on a platform 6 having transporting wheels 7 and constituting a truck whereby the machine may be conveniently moved from place to place, is provided with the customary tangential exit spout 8, said exit spout having been shown as extending approximately horizontally from the upper part of the blower casing. The casing 5 contains the rotary fan 9 which may be driven from a suitable motor 10 supported on the truck. It is obvious, however, that the blower casing is not necessarily mounted for transportation, and that power for driving the fan may be derived from any suitable source.

Supported above the blower casing is a casing 11 which I designate as the vacuum chamber, said casing being substantially hopper-shaped and communicating at its lower end with the discharge spout 8 through a port or opening 12. The casing 11 is provided adjacent to its upper edge at one end with a spout 13 constituting an inlet, said spout being so constructed that a flexible hose may be readily connected therewith or attached thereto, as shown at 14. For convenience in manipulating the hose, the spout 13 may be connected with the casing by means of a swivel connection 15. The casing 11 has an inclined bottom member 16 leading from the intake 13 to the port 12 which constitutes the outlet of the vacuum chamber. Ducts 17 connect the vacuum chamber with the eyes of the blower casing which obviously constitute the air intake of said casing, said ducts being connected with the vacuum chamber near the upper edge of the latter and preferably at the end opposite to the intake spout 13.

Supported within the chamber or casing 11 above and in substantially parallel relation to the inclined bottom member 16 is a screen 18 that constitutes a foraminous deflector and which while separating the intake 13 from the air ducts 17 so far as the passage of grain or other material that is to be handled is concerned does not obstruct

the passage of air. It will be understood that the screen or deflector 18 is not necessarily supported in parallel relation to the bottom member 16, which latter constitutes a chute or slide over which the grain or other material is carried to the exit port 12, but that said screen or deflector is preferably mounted in an inclined position with respect to said outlet port for the purpose of deflecting the grain or other material in the direction of said port. The port 12 is normally obstructed by a valve which has been shown as comprising two hinged support-
 10 ed leaves 19, each having an arm 20 connected by a link 21 with one arm of a lever 22, the other arm of which carries an adjustable weight 23 whereby the valve is normally maintained in an obstructing position and whereby the degree of force re-
 15 quired to open the valve may be regulated.

For the purpose of illustrating the operation of this invention there has been shown in Fig. 1 a wagon 24 which may be assumed to be loaded with grain and a railroad car 25 into which the grain is to be transferred. A flexible duct 26 has been shown as being connected with the spout 8 of the blower casing, and leading from thence to the railroad car into which the grain is to be transferred.
 30 It will be observed that, being mounted on supporting wheels, the truck or platform carrying the machine and the motor may be readily driven into position for operation wherever it shall be needed. The hose con-
 35 nected with the intake of the vacuum casing being dipped into the wagon box that constitutes the source of supply, and the discharge duct 26 having been led into the car, the motor is started. The operation of the
 40 blower will quickly create a partial vacuum within the casing or chamber 11, the air being exhausted through the ducts 17 and expelled through the discharge spout of the blower casing. At the commencement of the
 45 operation the valve will be maintained in obstructing position by the weight 23 which has been adjusted so as to overcome any tendency to open, to which the valve may be subjected by the air current passing through
 50 the spout 8. The grain or other material will be forced by the external atmospheric pressure through the intake spout 13 where it is deflected against the screen 18 on to the inclined bottom member 16 over which it
 55 gravitates through the port 12 into the spout 8 where it immediately becomes subjected to the blast from the fan, being thereby forced through the exit duct 26 to the point of delivery.

60 The valve members 19 will be normally retained in obstructing position by the weight

23 which is adjustable on the arm or lever 22, but said valve members will swing open under the influence partly of the pressure of the grain or other material accumulating thereon and partly under the influence of the suction set up in the exit spout 8 by the operation of the fan. It is obviously not desirable that grain should be permitted to enter the exit spout until the fan has ac-
 70 quired a speed at which the blast caused thereby will be quite sufficient to dispose of the grain. The amount of blast required to move the grain through the exit spout obviously varies with the kind and quality of grain, the heavier grains requiring a stronger blast than the lighter ones. It is, therefore, desirable that the valve members shall remain closed until the fan acquires a prede-
 75 termined speed. By properly adjusting the weight 23 on the lever arm 22 this object may be attained, and the valve may thus be said to operate as a governor to regulate the operation of the device.

It will be seen from the foregoing that I have produced a simple and efficient mechanism whereby grain and other material may be quickly moved, elevated and transferred and in which both the suction and the blast of the blower is utilized without necessity of passing material through the fan casing and subjecting it to the more or less destructive and deleterious beating action of the fan.

Having thus described the invention, what is claimed as new, is:—

In a device of the class described, a hopper-shaped main casing having an inclined bottom and provided with intake and outlet ports adjacent to the upper and lower ends, respectively, of the inclined bottom member, an inclined foraminous deflector within the casing spaced from the bottom member and from the ports adjacent thereto, a blower casing having a tangential outlet duct extending below the main casing and communicating therewith through the port adjacent to the lower end of the bottom member, a valve to obstruct said port, said valve being operable by an air current rushing through the outlet duct of the blower casing, means for regulating the resistance of the valve, a driven fan in the blower casing, and a duct connecting an inlet of the blower casing with that part of the main casing which is above the inclined foraminous deflector.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN L. WILLIAMS.

Witnesses:

J. B. WILLIAMS,
 J. A. SCHMUTTE.