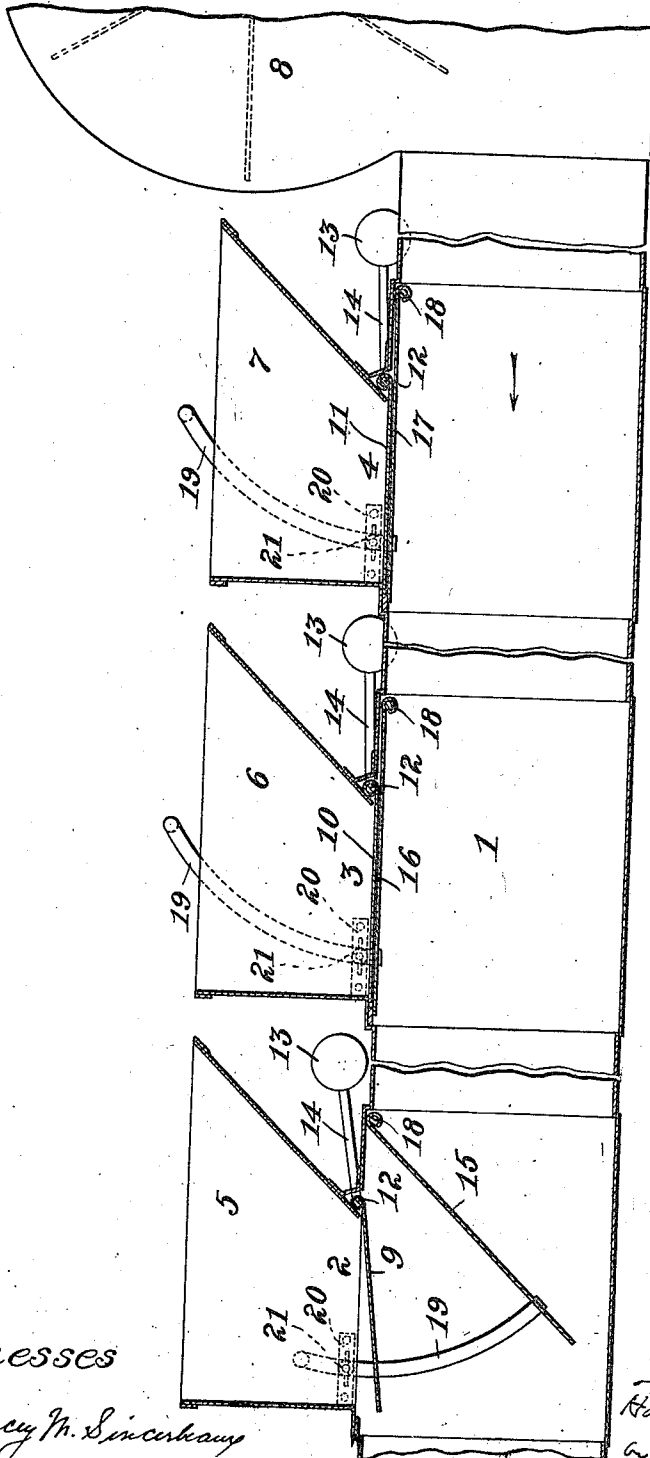


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PNEUMATIC CONVEYER APPARATUS.
APPLICATION FILED AUG. 1, 1911.

1,062,352.

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Witnesses

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1,062,352.

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To all whom it may concern:

Be it known that I, HARRY N. MIDDLETON, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Pneumatic Conveyer Apparatuses; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to a pneumatic conveyer apparatus and more particularly to a pneumatic conveyer apparatus of the type comprising a conveyer pipe provided with a series of ports through which the material may be introduced at different points into said pipe.

The object of the present invention is to produce a novel and improved pneumatic conveyer apparatus in which material may be introduced at any one of a series of different points along the conveyer pipe and conveyed through said pipe in a satisfactory and uniformly reliable manner.

With the above object in view, a feature of the invention contemplates the provision in a pneumatic conveyer apparatus comprising a conveyer pipe provided with a series of inlet ports, of a back pressure valve adjacent each of the ports, and a deflector adjacent each of the ports, certain of which have provision for adjustment to leave the conveyer pipe substantially unobstructed adjacent the ports which are not in operation.

Other features of the invention consist of certain constructions, arrangements and combinations of parts, the advantages of which will be obvious to one skilled in the art from the following description.

In the drawing illustrating the invention in the best form at present known to the inventor, the figure is a side elevation of a pneumatic conveyer apparatus embodying the invention, certain parts thereof being shown in section.

The reference numeral 1 indicates the pneumatic conveyer pipe provided with a series of inlet ports 2, 3 and 4 for the introduction of material at different points into said pipe. A series of hoppers 5, 6 and 7 are arranged respectively at each of the inlet ports to conduct the material thereto.

In the drawing, the portions of the conveyer pipe 1 between the inlet ports are broken out for convenience in illustration. A blast fan 8 is located at the extremity of the blast pipe and operates to create a blast of air in the direction of the arrow through the conveyer pipe. Adjacent each of the inlet ports is a back pressure valve which is automatically operated by the back pressure produced upon the introduction of material through the corresponding inlet port into the conveyer pipe to close the port and confine the blast and prevent the escape thereof at said port. In the drawing, the back pressure valves respectively adjacent the inlet ports 2, 3 and 4 are indicated by reference numerals 9, 10 and 11. In the construction shown, each of these valves is hinged at 12 in advance of the corresponding port and is freely movable on said hinge to open and close said port. A counterbalance weight 13 mounted upon an arm 14 arranged to move with the back pressure valve, is provided for each of said valves. A series of deflectors 15, 16 and 17 are arranged respectively in advance of each of the inlet ports and adjacent thereto. These deflectors project preferably at an angle partially across the interior of the conveyer pipe adjacent each of the inlet ports forming a constricted passage to increase the velocity of the air blast opposite the port and also forming an eddy space in front of the deflector opposite the inlet port, the blast passing beneath the edge of said deflector having an injector effect upon the air in said eddy space. In the construction illustrated, each of the deflectors is hinged at 18 in advance of the adjacent inlet port and may be adjusted so that it projects downwardly at an angle below the port any desired distance across the interior of the pipe or so that it occupies a position adjacent the wall of the pipe and parallel with the axis thereof so as to leave the conveyer pipe substantially unobstructed adjacent the inlet port when the port is not in operation. The arrangement of each of the deflectors is such that when it is swung into inoperative position adjacent the wall of the pipe, it overlies the back pressure valve and holds the same in closed position. This is of advantage since it prevents the accidental introduction of material and the consequent clogging of the conveyer pipe at the

ports which are not in operation. Each of the deflectors may be manipulated to locate the same in different positions within the conveyer pipe by means of an arc-shaped bar 19 attached at one extremity to the deflector and provided at its other extremity with a handle by which it may be operated. This bar extends upwardly along the side of the conveyer pipe into the hopper and passes between the side of the hopper and a plate 20 spaced therefrom. The said bar is clamped to hold the deflector in the desired position by means of a butterfly clamp screw 21.

In the drawing, the parts are shown in the positions in which they are located when the inlet port 2 is in operation and the inlet ports 3 and 4 are out of operation, the deflector 15 being adjusted so as to project downwardly at an angle below the inlet port 2 and the deflectors 16 and 17 being adjusted to positions adjacent the wall of the tube, leaving the conveyer pipe substantially unobstructed adjacent the ports 3 and 4. The back pressure valve 9 is freely movable to open and close the inlet port 2. The position which the said valve occupies as illustrated in the drawing, is substantially that which it takes before the material is introduced to the inlet port. When a quantity of material is introduced at the inlet port, the back pressure valve swings downwardly to permit the material to drop into the eddy space in front of the deflector and the said valve then automatically closes the inlet port and confines and prevents the escape of the air blast at said port. The injector effect of the blast passing beneath the edge of the deflector on the air in the eddy space in front of the deflector causes the air and material in front of said deflector to be drawn into the blast. When the material introduced has been acted upon by the air blast and has acquired substantially the velocity of the blast, the back pressure valve again opens, as shown in the figure.

As explained above, it is desirable when material is being introduced through one or more of the inlet ports that the conveyer pipe adjacent the ports which are not in operation shall be substantially unobstructed so as to permit the air and material to pass freely through the conveyer pipe. In the conveyer apparatus which has been devised in the present invention, when any one of the inlet ports is out of operation, the de-

flector adjacent this port may be adjusted to leave the conveyer pipe substantially unobstructed adjacent thereto. By this adjustment of the deflector, the back pressure valve is also held in position to close the port and prevent the accidental introduction of material at said port.

Having explained the nature and object of the invention and having specifically described one form of mechanism in which it may be embodied, what is claimed is:—

1. A pneumatic conveyer apparatus, having, in combination, a conveyer pipe provided with a series of inlet ports leading into said pipe, a freely movable back pressure valve for each of said ports constructed and arranged to be automatically closed by the back pressure produced upon the introduction of material through the corresponding port, a deflector projecting partially across the interior of said pipe in advance of each of the ports, certain of said deflectors having provision for adjustment to leave the pipe substantially unobstructed thereby.

2. A pneumatic conveyer apparatus having, in combination, a conveyer pipe provided with a series of inlet ports leading into said pipe, a freely movable back pressure valve for each of said ports, constructed and arranged to be automatically closed by the back pressure produced upon the introduction of material through the corresponding port, a hinged deflector projecting partially across the interior of said pipe in advance of each of said ports, certain of said deflectors having provision for swinging them against the wall of the pipe to leave it substantially unobstructed.

3. A pneumatic conveyer apparatus having, in combination, a horizontal conveyer pipe, a series of ports in the top of the pipe, hinged back pressure valves for closing the ports arranged to be automatically closed by the back pressure produced upon the introduction of material through the corresponding port, a deflector plate hinged at the top of the pipe in advance of each port, and means for retaining each deflector plate in position across the interior of the pipe, or in position overlying the corresponding back pressure valve.

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