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E. M. BASSLER.

PNEUMATIC CONVEYER.

APPLICATION FILED AUG. 4, 1905. RENEWED SEPT. 28, 1906.

Fig. 1.

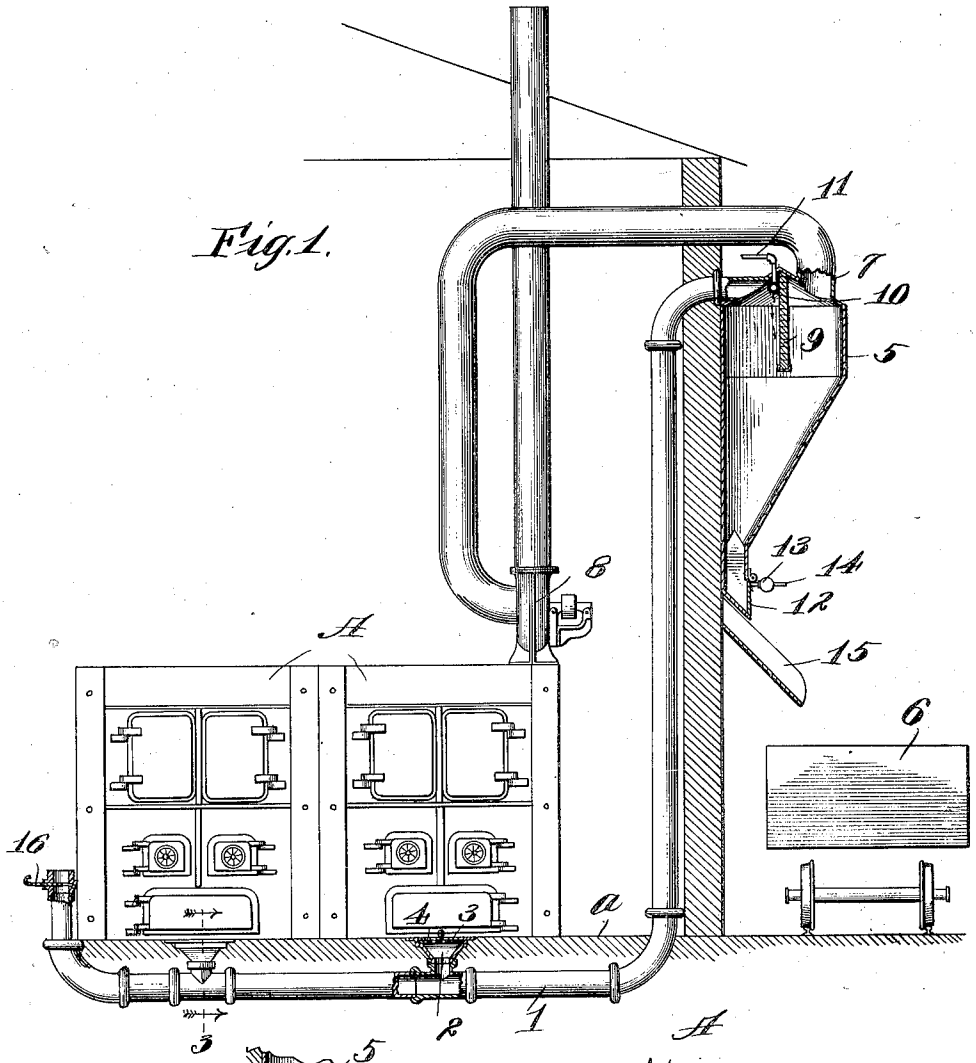


Fig. 2.

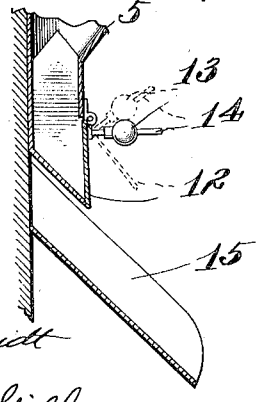
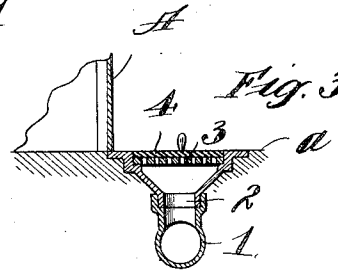


Fig. 3.



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UNITED STATES PATENT OFFICE.

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PNEUMATIC CONVEYER.

No. 851,054. Specification of Letters Patent. Patented April 23, 1907.

Application filed August 4, 1905. Renewed September 28, 1906. Serial No. 336,597.

To all whom it may concern:

Be it known that I, EDWIN M. BASSLER, a citizen of the United States, and a resident of Chicago, Cook county, Illinois, have invented certain new and useful Improvements in Pneumatic Conveyers, of which the following is a specification.

This invention relates to conveyers, and relates particularly to pneumatic conveyers.

The primary object of the invention is to provide a conveyer particularly designed and adapted for removing ashes and clinkers from furnaces and for other similar purposes.

To this end a conveyer of my invention consists of the various features, combinations of features, and details of construction hereinafter described and claimed.

In the accompanying drawings, in which a conveyer of my invention is fully illustrated, Figure 1 is a view, partly in section, of a conveyer of my invention shown as applied for removing ashes and clinkers from a battery of boilers shown in front elevation. Fig. 2 is an enlarged sectional view of the discharge-spout of the hopper, and Fig. 3 is an enlarged sectional view on the line 3 3 of Fig. 1.

For purposes of concrete illustration I have in the drawings shown a conveyer of my invention applied for removing ashes and clinkers from a battery of boilers, (shown at A.) Extending transversely in front of the boilers A beneath the floor-line (indicated by *a*) is a conduit or pipe 1, in which the ashes and clinkers raked from the boiler-furnaces are adapted to be delivered through suitable holes or openings 2 in said conduit. Gratings 3 are preferably secured in said openings 2 for the purpose of determining the maximum sizes of the pieces of material delivered into the conduit 1. Said gratings 3 are preferably made removable to provide for clearing the openings 2 in case they become clogged, and said openings are adapted to be entirely closed by means of removable covers 4. Also for convenience in delivering material thereto the upper ends of the openings 2 are made flared or hopper-shaped.

In the drawings I have shown two openings 2, one in front of the ash-pit door of each furnace. The number and location of said openings is, however, merely a matter of choice and convenience and may be varied as desired to meet requirements.

The conduit 1 may be made of any desired material, as vitrified tiling or galvanized sheet-iron, and may be of any desired size, a desirable size for ordinary purposes being from six to eight inches in diameter.

The conduit 1 discharges into the upper end of a receptacle 5, secured in fixed position at a desired point of delivery. As shown, said receptacle 5 is secured to the outside of the wall of the boiler-house in such position that the contents thereof may be discharged directly into a car, (indicated at 6.)

The portion of the receptacle 5 into which the conduit 1 discharges is much larger than said conduit, a desirable size being the equivalent of a diameter five or six times greater than that of said conduit. For purposes of convenient reference this portion of said receptacle will hereinafter be referred to as the "expansion-chamber" thereof. The receptacle 5 is also provided with a discharge-opening 7, said discharge-opening being preferably larger than the conduit 1, a desirable size therefor being about twice the diameter of said conduit.

A conveyer of my invention also comprises means to create a current of air of high velocity through the conduit 1 into the receptacle 5, as shown, and a fan or blower 8 applied to the discharge-opening 7 of said receptacle With this construction it is obvious that in operation the fan or blower 8 will tend to produce a vacuum in the receptacle 5, which will in turn create a current of air through the conduit 1 into said receptacle. Obviously, also, the blast or current of air entering the partial vacuum in the expansion-chamber of the receptacle 5 will at once expand and become rarefied, thus greatly reducing the power thereof as a vehicle and permitting practically all solid material carried thereby to fall by gravity.

As shown, both the conduit 1 and the air-discharge opening communicate with the top of the expansion-chamber of the receptacle 5, and to further completely interrupt and destroy the blast from the conduit 1 and to arrest the further movement of solid material carried by said blast under the influence thereof and also to prevent the air passing directly from the conduit 1 to the discharge-

opening 7 a baffle 9 is formed across the expansion-chamber of said receptacle between said conduit and discharge-opening in such position that the blast from said conduit will strike said baffle, preferably substantially at right angles. Said baffle 9 may be made of sheet-iron, masonry, or other suitable material.

My improved conveyer also comprises means for wetting the material delivered into the receptacle 5 from the conduit 1. This is preferably accomplished by introducing jets or streams of water into the blast from said conduit; but my invention contemplates any suitable means for this purpose. As shown, a water-pipe 10 extends across the top of the baffle 9 on the side thereof against which the blast from the conduit 1 is directed. Said water-pipe is connected with a suitable source of supply of water under pressure (not shown) by means of a pipe 11 and is provided with a series of openings adapted to discharge jets or streams of water downwardly along the face of said baffle 9 and across the blast from the conduit 1.

The portion of the receptacle 5 below the expansion-chamber thereof forms what may be termed a "trap," into which the solid material delivered into said receptacle falls and whence it may be removed through a suitable discharge-opening therein. Said discharge-opening is maintained normally closed by means of a gate 12, hinged to the upper edge of said discharge-opening so as to swing upwardly and outwardly, and which is held closed by means of a weight 13, carried on a rod 14, secured to said gate. In the preferable construction shown the weight 13 is adjustable lengthwise of the rod 14 and is adapted to be secured thereto in desired position by means of a set-screw or other means, thus providing for regulating the force applied to said gate to close the same.

When the contents of the receptacle 5 are discharged, they are delivered into the car 6 by means of a suitable spout or chute 15, secured in fixed position beneath the discharge-opening of said receptacle.

To provide for regulating the velocity of the current through the conduit 1, said conduit is provided with a vent which, as shown, consists of an open-ended extension of said conduit and which is controlled by means of a manually-operated valve or gate 16.

With a conveyer of the construction described it is obvious that in operation the fan or blower 8 will tend to create a vacuum in the expansion-chamber of the receptacle 5, which will in turn produce a current of air of high velocity through the conduit 1, which will carry with it material delivered into said conduit and will discharge the same into the receptacle 5, the maximum size of the pieces delivered to said conduit being determined by the size of the openings in the gratings 3 secured in the admission-openings 2, said maximum sizes being such that the current of air in said conduit will readily carry the same off. If at any time the velocity of the current of air through the conduit 1 is greater than desired, it can easily be regulated by closing the gate or valve 16 controlling the vent-opening of said conduit, and vice versa.

The blast from the conduit 1, together with the material carried thereby, will be projected against the face of the baffle 9 and its movement arrested, while the expansion of the air in the expansion-chamber of the receptacle will so reduce the velocity of said blast that the material delivered into said trap thereby will be free to fall by gravity into the trap at the lower end of the receptacle, the jets or streams of water from the pipe 10 operating to wash down with it all fine particles, such as ashes, only the air practically free from all solid matter passing out through the discharge-pipe 7. The water from said pipe 10 will also operate to extinguish any live coals or clinkers which may be discharged into said receptacle 5, the same being delivered into the conduit 1 in the same condition in which they are removed from the furnace without being previously wet, as obviously said conveyer will operate most effectively on thoroughly-dry material.

The contents of the receptacle 5 may be dumped at any time by opening the gate 12, and said contents will be dumped automatically whenever the weight thereof is sufficient to overcome the force tending to hold the gate 12 closed and will close again automatically as soon as said receptacle is emptied.

In the application of my conveyer shown in the drawings, in which the conduit 1 is located in front and outside of the boilers A, the ashes and clinkers are designed to be raked from the ash-pits of the furnaces in the usual manner and then delivered by hand into the conduit 1, the fan or blower 8 being operated only at intervals, as necessary to remove the ashes and clinkers raked from the furnaces. Obviously, however, the particular disposition of the conduit is immaterial and is a matter of judgment and may be varied in different applications to meet different requirements or conditions. Also the question of operating said conveyer continuously or at intervals will depend upon the duty required of said conveyer. Thus while as applied to a furnace it will ordinarily only be operated at intervals only in a planing-mill or the like it will in most cases be operated continuously.

I claim as my invention—

1. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle being provided with an air-discharge opening, means

to create a current of air through said conduit and means to wet the material delivered into said receptacle from said conduit.

2. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle being provided with an air-discharge opening, means to create a current of air through said conduit and means for applying jets or streams of water to the material delivered into said receptacle from said conduit.

3. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, provided with an air-discharge opening, means to create a current of air through said conduit and means for introducing water into the blast from said conduit.

4. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle comprising an expansion-chamber and being provided with an air-discharge opening, means to create a current of air through said conduit, means in said expansion-chamber to interrupt the blast from said conduit, and means to discharge water across said blast substantially at the point at which it is interrupted.

5. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle comprising an expansion-chamber and being provided with an air-discharge opening, means to create a current of air through said conduit, a baffle in said expansion-chamber against which the blast from said conduit is directed and means to discharge water along the face of said baffle and across the blast from said conduit.

6. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle comprising an expansion-chamber and being provided with an air-discharge opening, means to create a current of air through said conduit, a baffle in said expansion-chamber between said conduit and said air-discharge opening against which the blast from said conduit is directed and means to discharge water along the face of said baffle and across the blast from said conduit.

7. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle comprising an expansion-chamber and being provided with an air-discharge opening, means to create a current of air through said conduit, means within said expansion-chamber to interrupt the blast from said conduit, said conduit being provided with a vent-opening and a gate which controls said vent-opening for regulating the current of air through said conduit.

8. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle comprising an expansion-chamber and being provided with an air-discharge opening, a fan or blower applied to said discharge-opening, a baffle within said expansion-chamber located between said conduit and air-discharge opening against which the blast from said conduit is directed and means to discharge water along the face of said baffle and across the blast from said conduit.

9. In a conveyer, the combination of a conduit provided with an admission opening or openings, a receptacle into which said conduit discharges, said receptacle comprising an expansion-chamber and being provided with an air-discharge opening, a fan or blower applied to said discharge-opening, a baffle in said expansion-chamber located between said conduit and said discharge-opening, said conduit being provided with a vent-opening and a gate for controlling said vent-opening whereby the current of air through said conduit may be regulated.

In testimony that I claim the foregoing as my invention I affix my signature, in presence of two subscribing witnesses, this 1st day of August, 1905.

EDWIN M. BASSLER.

Witnesses:
W. A. SHARP,
B. A. RAYMOND.