

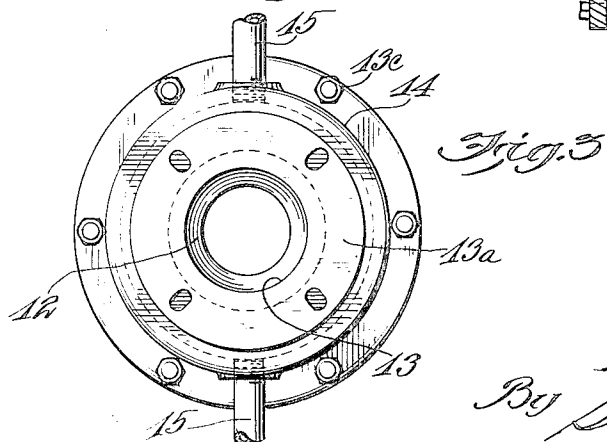
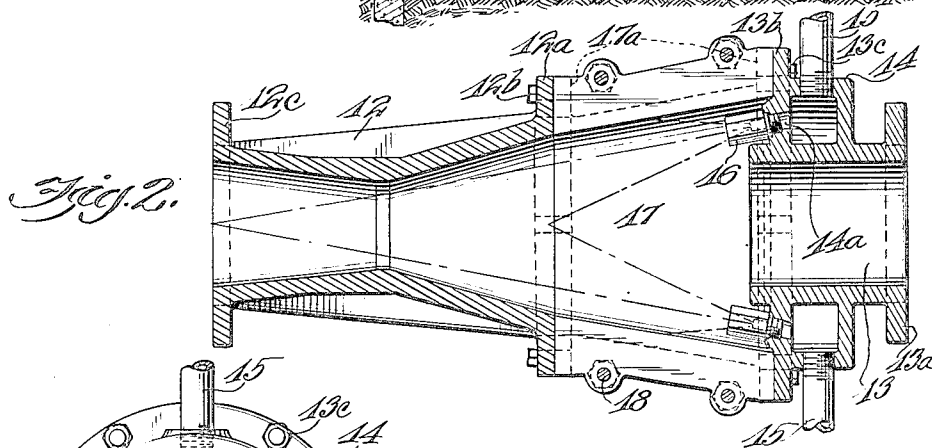
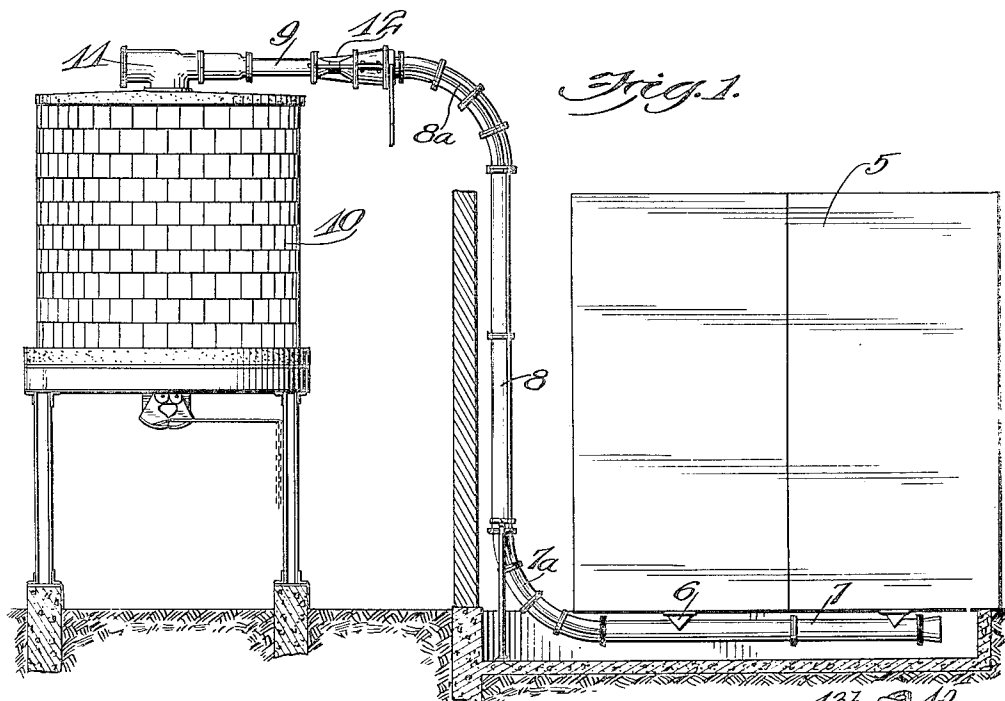
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MATERIAL CONVEYER

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UNITED STATES PATENT OFFICE

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MATERIAL CONVEYER

Application filed November 24, 1930. Serial No. 497,946.

My invention relates to material conveyers, and more particularly to that type in which a steam jet is used to create a suction for the conveyance of ashes through a conduit for deposit in an elevator tank.

One object of my invention is to interpose a vacuum producer in a conduit line at a point near an elevated tank, in order that the ashes may travel dry through the conduit and impart a minimum of wear to the walls thereof.

A further object of the invention is to design the novel material conveyers with a vacuum producer comprising an assembly of three units, viz. a steam chamber, an expansion chamber, and a Venturi tube.

A still further object of the invention is to include in such novel producer an annular steam chest from which any number of steam jets may be extended for cooperative action.

Another object of the invention is to make the Venturi tube of the novel vacuum producer easily separable from the assembly thereof, in order that it may be readily replaced in case of wear.

An additional object of the invention is to design the expansion chamber of the vacuum producer with a removable section, which permits easy access to the steam nozzles for the replacement or repair thereof.

A final but nevertheless important object of the invention is to construct the novel vacuum producer on lines of ruggedness, simplicity and economy.

With the above objects in view and any others that may suggest themselves from the specification and claims to follow, a better understanding of the invention may be had by reference to the accompanying drawing, in which—

Fig. 1 is an elevation of a typical ash conveying system of the type mentioned;

Fig. 2 is a plan section of the novel vacuum producer; and

Fig. 3 is an end view of the latter taken from the right hand side.

Referring specifically to the drawing, 5 denotes a power plant having ash outlets 6 which lead into a horizontal suction run 7 forming a part of the ash conduit. This run takes an upward curvature 7a to form a riser 8 which

in turn takes a curvature 8a to form an elevated horizontal run 9 extending over a receiving tank 10. The connection between the run 9 and the tank 10 is in the form of a baffle box 11, and in the said run is also interposed the vacuum producer 12.

As more clearly indicated in Figs. 2 and 3 the vacuum producer originates with a central nipple 13, which is suitably flanged at 13a for connection with one of the conduit sections. The nipple 13 is enlarged radially with an annular chamber 14, whose periphery is tapped in one place or in two places as shown, to receive steam pipes 15. The frontal wall of the chamber 14 is perforated at a number of places as indicated at 14a and receives screw nozzles 16 from without, these nozzles being inclined in the direction of the nipple axis whereby to eject steam jets formed in accordance with the dot-and-dash illustration in Fig. 2, the space outlined by such illustration indicating the blending of two diametrically-opposite jets to produce a single one.

The nipple 13 is also marginally flanged at its frontal end, as indicated 13b for application by bolts 13c to the flange 17a of a frusto-conical expansion chamber 17. As indicated in Fig. 2; this chamber is made in two halves which may be assembled by bolts 18, one of these halves being removable without unfastening the chamber from its flanged connections.

Frontally of the expansion chamber 17 is applied the Venturi tube 12, this tube being of conventional form and having attaching flanges 12a adapted to be secured by bolts 12b to the corresponding flanges 17a of the expansion chamber. It is thus an easy matter to remove the Venturi tube from the vacuum producer assembly.

The simple annular steam chest 14 provides in an integral appliance a steam storage receptacle from which any number of steam jets may be taken in a circle. This construction permits the steam jets and nozzle therefor to occupy a true circular position at any radial point and to be outside of the path of air and ashes entering the vacuum producer by way of the nipple 13. By providing

the expansion chamber, the air and ashes from the nipple 13 become more rarified and are therefore drawn in a more uniform state into the union of the steam jets, increasing the suction and the travel rate of the medium in the conduit. However, should the nozzles 16 corrode or become otherwise deficient, it is an easy matter to remove the lid portion of the chamber 17 for the replacement or repair of the nozzles without dismantling the assembly of the vacuum producer.

The vacuum producer 12 also has a frontal flange 12c for bolting to the conduit run in which the vacuum producer is located, and when the Venturi tube has received excessive wear, the bolts in the flanges may be readily removed and the Venturi tube quickly replaced.

It is thus seen that the novel vacuum producer is located practically at the remote end of the ash conduit, so that the ashes travel in the conduit free of moisture or steam and will not adhere to the walls of the conduit. Also, the remote location of the vacuum producer insures the continued travel of the ashes whatever the reasonable length of the conduit may be. The novel vacuum producer itself is constructed in a rugged and simple manner and has the economical advantages described whereby to make possible quick replacements, immediate attention to parts which receive wear, and to eliminate delays in servicing the equipment.

I claim:—

1. A material conveyer comprising an inlet, a pressure chamber surrounding the inlet, a plurality of removable discharge nozzles communicating with said chamber, a casing providing an expansion chamber and having a removable wall portion arranged about the nozzles, and a Venturi tube secured to said casing and extending from the expansion chamber, said removable wall portion being so arranged whereby the nozzles are accessible for replacement.

2. A material conveyer comprising an inlet, a pressure chamber surrounding the inlet, a plurality of removable discharge nozzles communicating with said chamber, a longitudinally divided casing providing an expansion chamber arranged about the nozzles, and a Venturi tube secured to one end of said casing and extending from the expansion chamber, said casing providing a removable lid portion whereby the nozzles are accessible for replacement.

3. A material conveyer comprising an inlet nozzle, a pressure chamber surrounding the nozzle and having a plurality of circumferentially arranged threaded openings therein, a plurality of threaded discharge nozzles arranged in said openings, a casing providing a frusto-conical expansion chamber surrounding said discharge and inlet nozzles, said casing being split longitudinally

to provide a removable wall whereby the nozzles are accessible for replacement and a Venturi tube removably secured to one end of said casing and extending from the expansion chamber.

4. In combination with a conveying conduit, a unitary casting forming a tubular nipple formed with a flange at one end for attachment to one end of a conduit section and an annular steam chest encircling said nipple intermediate the ends thereof, said steam chest including an inner wall portion formed with converging threaded openings in circularly spaced relation and terminating at its edges into an annular flange, an expansion chamber casing formed of a plurality of sections bolted together, said casing being secured to the annular flange of said wall aforesaid and said nipple having its inner end extending into said chamber, and nozzle elements threadedly engaged in said threaded openings in the inner wall of said steam chest and converging toward a point axially of said inlet nipple.

5. A material conveyer including a conduit, an open ended inlet nipple having its outer end secured to said conduit, an annular manifold surrounding said nipple, said manifold having an inner wall portion provided with threaded circularly spaced openings, discharge nozzles fitted in said openings, a sectional casing secured at one end to the inner wall of said manifold and providing a frusto-conical expansion chamber surrounding said discharge nozzles and into which extends the inner end of said inlet nipple, one section of said casing being removable to give access to said nozzles, and a Venturi tube secured to the other end of said casing and merging with said frusto-conical expansion chamber.

In testimony whereof I affix my signature.
HARRY H. WEISS.