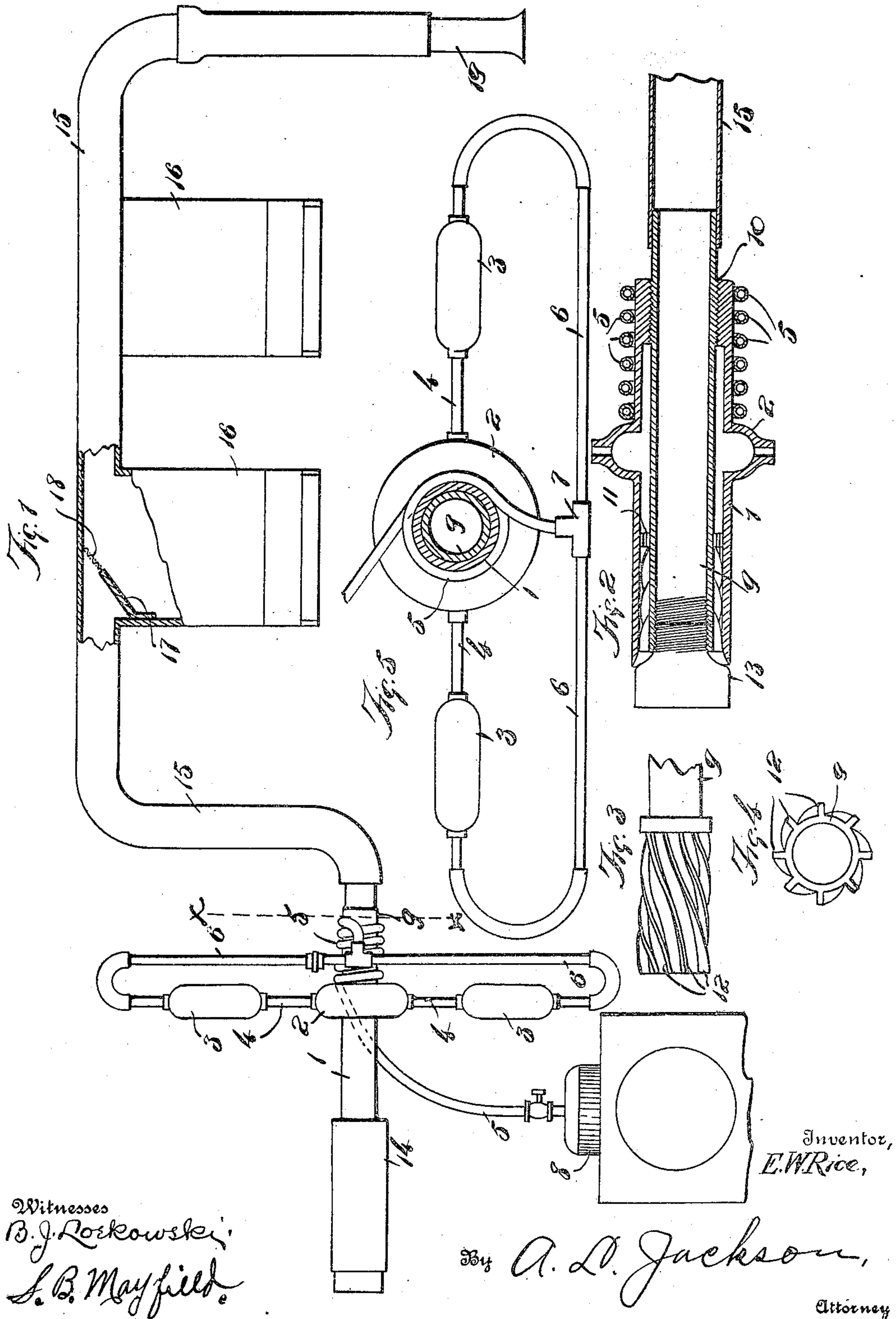


E. W. RICE.  
PNEUMATIC JET FOR CONVEYERS.  
APPLICATION FILED NOV. 19, 1908.

934,628.

Patented Sept. 21, 1909.



Witnesses  
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# UNITED STATES PATENT OFFICE.

EARLEY W. RICE, OF WAXAHACHIE, TEXAS.

PNEUMATIC JET FOR CONVEYERS.

934,628.

Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed November 19, 1908. Serial No. 463,389.

*To all whom it may concern:*

Be it known that I, EARLEY W. RICE, a citizen of the United States, residing at Waxahachie, in the county of Ellis and State of Texas, have invented certain new and useful Improvements in Pneumatic Jets for Conveyers, of which the following is a specification.

My invention relates to a power creating means and more particularly to means for creating suction by means of steam jets; and the object is to provide power for use in elevating and distributing seed cotton, conveying cotton seed from gins, elevating coal, and for use in a similar manner to convey and deliver various other commodities.

Other objects and advantages will be fully explained in the following description and the invention will be more particularly pointed out in the claims.

Reference is had to the accompanying drawings which form a part of this application and specification.

Figure 1 is a diagrammatic view, partly in section, of the improvement, as applied to a cotton elevator and distributor. Fig. 2 is a longitudinal section of the jet creating devices. Fig. 3 is a detail view, illustrating the spiral grooves on the end of the tube. Fig. 4 is an end view of the same. Fig. 5 is a vertical section, taken along the line *x x* of Fig. 1.

Similar characters of reference are used to indicate the same parts throughout the several views.

The invention is illustrated in connection with a cotton elevator and distributor, but it must be understood that this elevator is merely to illustrate one application of the invention and that the invention is applicable to elevators and conveyers of various designs for different purposes.

A main cylinder 1 which is provided with a condensing chamber 2 or an enlargement 2 for condensing purposes. Storage chambers 3 are connected to the chamber 2 by pipes 4. The storage chambers 3 are connected to the steam coil pipe 5 by pipes 6 and a T-pipe 7 and the steam coil 5 is connected to a boiler 8. The tube 9 is screwed into the cylinder 1 with a steam-tight joint 10 which joint is for the purpose of preventing back pressure, as hereinafter explained. A ring 11 serves to hold the tube 9 in operative position within the cylinder 1. This ring 11 has perforations for the passage of

steam between the cylinder 1 and the tube 9. The tube 9 is provided with spiral grooves 12 which run substantially one quarter around the tube 9 near its end. These grooves cause the steam to form or assume a movement somewhat in the form of a vortex. The intent is to cause the steam to pass out of the tube 9 with the greatest possible force. The tube 9 is provided with a flared nozzle 13 to regulate the passage of the steam and also to prevent the possibility of back pressure within the tube 9. By reason of the form of the tube the steam is forced away from the center. The flared nozzle also provides a surface to meet the flared end of the cylinder 1 so that the opening for the passage of the steam may be increased or decreased at will by simply screwing the nozzle 13 farther out or farther in the tube 9. The nozzle 13 and the end of the cylinder 1 constitute the exhaust and the end of the cylinder 1 and the nozzle 13 may be inclosed in a pipe 14 of thin sheet metal. In Fig. 1 is shown how seed cotton which may be moving through the conveyer 15 will be separated from the air which is sucked through the conveyer by the steam jet. The mass of cotton and air will fall into the feeders 16, being deflected down within the feeder box by a board 17 and the screen 18 will allow the air to pass on in the conveyer pipe, 15, which is connected with the tube 9. The conveyer pipe 15 is provided with the usual adjustable section 19 to be adjusted to a wagon or other device containing material to be conveyed or delivered.

The pipe 19 is properly adjusted before commencing operation. Steam from the boiler is turned through the coil of pipe where it is partly condensed. The steam passes to the storage chambers where it forms a basis for feeding steam to the condensing chamber about the main cylinder. The steam will have much more force, coming from the storage chambers than if coming direct from the boiler. The steam is partly condensed in the storage chambers and when so condensed it will carry a greater volume of air than the dry steam. The steam is also partly condensed in said coil of pipe. From the storage chambers, the steam passes to the condensing chamber 2. This chamber 2 provides a basis for the expansion of the steam which passes on about the periphery of the tube 9 and through the perforations in the ring 11 where it is further re-inforced by



condensation before being discharged at the end of the tube 9 through the nozzle. In this manner the steam has acquired great force which creates suction through the tube 5 9 and through the conveyer sufficient for doing the work required. The amount of force thus created may be regulated by adjusting the nozzle 13.

Having fully described my invention, what I claim as new and desire to secure by Letters Patent, is,—

1. A pneumatic exhaust device comprising a tube from which air is to be exhausted, an exhaust nozzle in operative relation with said tube, means for forcing a steam jet through said nozzle, and means for partially condensing the steam before it issues from such nozzle, whereby its air carrying power is increased.

2. A pneumatic jet comprising a tube, an inclosing cylinder screwed on said tube at one end forming a steam-tight joint and forming at the other end an exhaust, and a steam pipe including a coil having connections with said cylinder intermediate the ends thereof and diametrically opposite each other.

3. A pneumatic exhaust device comprising a tube from which air is to be exhausted, an exhaust nozzle in operative relation with said tube, means for forcing a steam jet through said nozzle, and a condensing chamber associated with said parts, through which chamber the steam passes on its way to the nozzle, whereby the steam is partially condensed, and its air-carrying power increased.

4. A pneumatic jet comprising a tube, an inclosing cylinder screwed on said tube at one end to form a steam-tight joint and forming an exhaust at the other end, a condensing chamber formed in said cylinder intermediate the ends thereof, steam pipe connections with said chamber, and storage chambers connected with said pipes.

5. A pneumatic jet comprising a tube, an inclosing cylinder screwed on said tube at one end to form a steam-tight joint and forming an exhaust at the other end and having an annular condensing chamber formed inter-

mediate the ends thereof, steam pipe connections with said chamber at diametrically opposite points thereof, storage chambers connected with said steam pipes, and steam pipes connected with said storage chambers for supplying steam thereto.

6. A pneumatic jet comprising a tube, an inclosing cylinder screwed on said tube at one end and forming an exhaust at the other end and having an annular condensing chamber formed intermediate its ends, steam pipes connected to said chamber at diametrically opposite points, storage chambers on opposite sides of said condensing chamber and having communication therewith, and a steam supply pipe coiled about said cylinder and connected with said storage chambers.

7. A pneumatic jet comprising a tube and an inclosing cylinder screwed on said tube at one end and forming at the other end with said tube an exhaust, said tube being co-extensive with said cylinder from the joint therewith and terminating with exterior spiral grooves within said cylinder.

8. A pneumatic jet comprising a tube, an inclosing cylinder screwed on said tube at one end to form a steam-tight joint and forming at the other end with said tube an exhaust and having an annular condensing chamber formed intermediate its ends, and a perforated ring holding said tube and said cylinder in operative relation.

9. A pneumatic jet comprising a tube, an inclosing cylinder screwed on said tube at one end to form a steam-tight joint and forming with said tube an exhaust at the other end and having a condensing chamber formed intermediate its ends, a steam pipe connection with said chamber, and a nozzle adjustable on said tube to regulate the passage of steam.

In testimony whereof, I set my hand in the presence of two witnesses, this 13th day of November, 1908.

EARLEY W. RICE.

Witnesses:

A. L. JACKSON,  
J. C. SMITH.