G. A. GIESELER.

NOZZLE.

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1,416,013. **Patented May 16, 1922.**

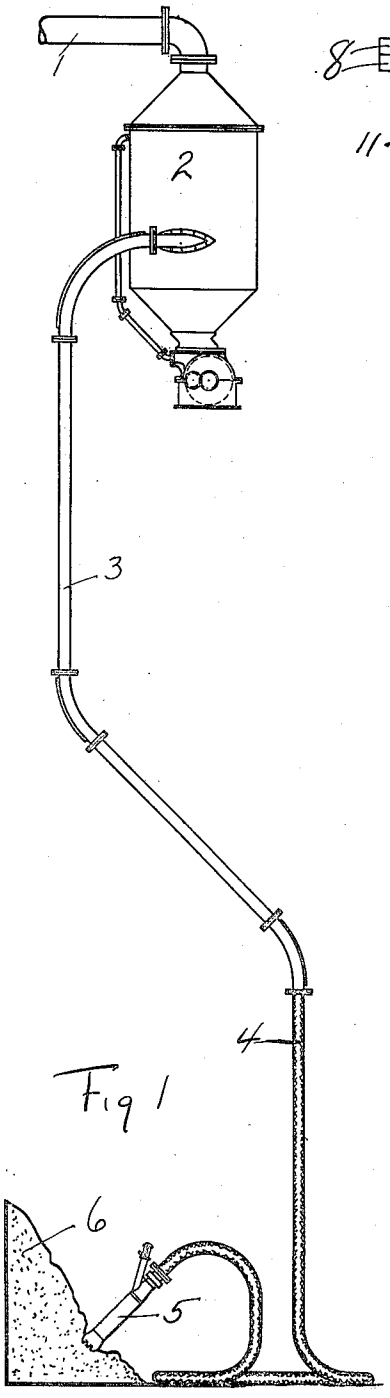


Fig 1

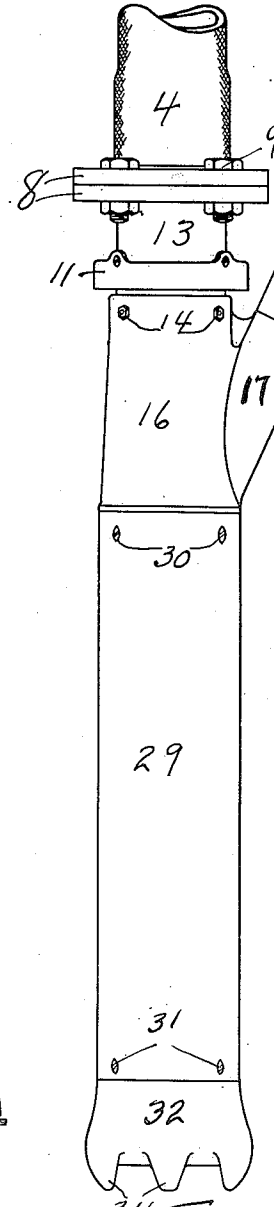


Fig 2

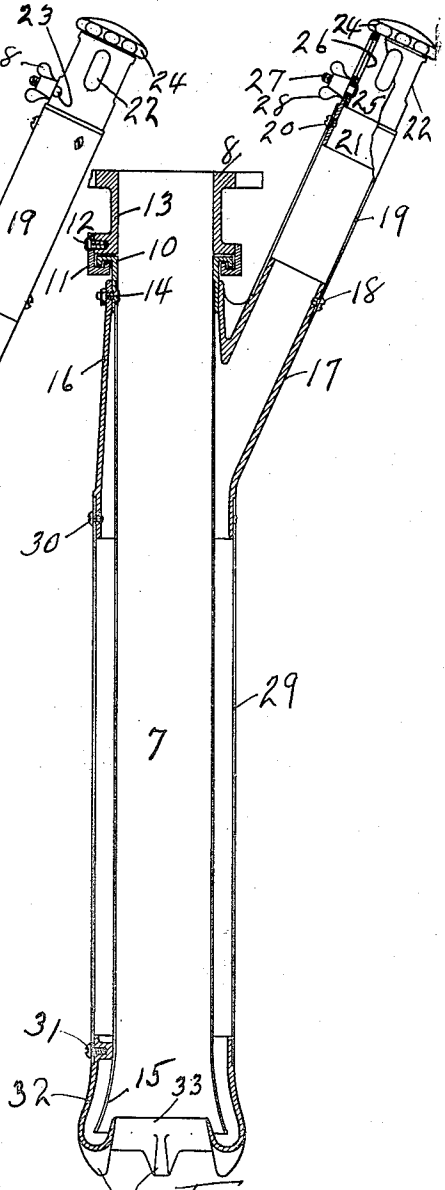


Fig 3

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NOZZLE.

1,416,013. Specification of Letters Patent. Patented May 16, 1922.

Application filed February 14, 1921. Serial No. 444,924.

To all whom it may concern:

Be it known that I, GEORGE A. GIESELER, a citizen of Germany, residing at Cleveland, Ohio, have invented certain new and useful Improvements in Nozzles, of which the following is a specification.

The invention relates particularly to nozzles such as are attached to flexible tubes and then thrust into piles of granular or dust like material when suction may be applied to the hose to draw the material therethrough.

In the accompanying drawings is shown one form the invention may take. Fig. 1 is a diagrammatic view of a conveying system in which the nozzle may be employed. Fig. 2 is a side elevation of the nozzle and Fig. 3 is a vertical longitudinal section of the nozzle.

Suction may be applied by means of a fan, pump or other suitable apparatus, not shown, to the pipe 1 leading from a settling chamber 2 into which leads the conductor 3 to which is attached a flexible hose 4 at the end of which is a nozzle 5 attacking a pile 6 of granular or powdered material. The nozzle consists of an inner tube 7 which may be attached by means of the flanges 8 and the bolts 9 to the flexible hose 4. The tube 7 carries at its upper end a flanged ring 10 engaged by a collar 11 which in turn is held by a screw 12 tapped into the coupling 13 carrying one flange 8. The tube 7 is attached to the ring 10 by means of a bolt 14. This will make an air tight connection between the central tube 7 and the flexible hose 4. The lower end of the tube 7 is belled outwardly at its lower end 15.

Surrounding the ring 10 and attached thereon by the bolts 14 is a frusto conical band 16. The smaller upper end of the band 16 forms an air tight joint with the ring 10. The band inclines outwardly and its lower end is separated a short distance from the tube 7 around which it forms an annular enclosed air passage. At one point in its circumference the band 16 is provided with an upwardly laterally inclined sleeve 17 into which is tapped a screw 18 carrying a tube 19 which forms an extension of the sleeve 17. A screw 20 holds an air valve 21 in the end of the tube 19. The air valve 21 is provided with longitudinal slots 22 and a circumferential slot 23. A knurled cap 24 carries a sleeve 25 which fits within the valve 21 and is provided with longitudinal slots 26 corresponding to the slots 22 in the valve 21. The sleeve 25 has an outwardly extending bolt 27 passing through the circumferential slot 23 in the valve 21 on which is threaded a wing nut 28. In the position shown in Fig. 3 the slots 26 register with the slots 22 and the tube 21 is in communication with the atmosphere. By means of the knurled handle 24 the sleeve 25 may be turned and the slots 22 in the air valve be adjusted, regulated or partially or wholly closed. The thumb nut 28 may be tightened on the bolt 27 in any position of the sleeve 25 and hold the valve in any adjusted position. Extending downwardly from the lower end of the band 16 is a tube 29 surrounding the tube 7. Screws 30 hold the tube 29 on the band 16. At the lower end of the tube 29 screws 31 hold a shoe 32 which extends below the lower belled end 15 of the inner tube 7. The shoe 32 is belled outwardly to correspond substantially with the belled lower end 15 of the tube 7 and at its lower end is bent inwardly and upwardly to form a mouth 33 which is smaller in diameter than the inner tube 7. The mouth 33 extends upwardly within the belled lower end 15 of the tube 7. Extending downwardly from the curved bottom of the shoe 32 are feet 34. When suction is applied through the hose 4 there is a tendency to draw up through the tube 7 whatever granular or powdered material lies below the mouth 33. Many materials must have air mixed with them in order to make them pass through the tube. This is particularly true of various chemicals and more or less impalpable powders which pack so tightly as not to allow air to pass through. The valve sleeve 25 may be set in any operation to allow a suitable quantity of air to enter the sleeve 17 and so pass into the annular air chamber formed between the inner tube 7 and the band 16, the outer tube 29 and the shoe 32. From this air chamber the air will be drawn around the curve at the lower end of the shoe into the belled end of the tube 7. Material lying about the outside of the shoe will be drawn through the mouth 33 and into and through the tube 7. The mouth 33 is slightly less in cross-section than the tube 7 so the tendency to block is reduced to a minimum. The fact that the shoe 32 is belled to correspond with the lower end 15 of the tube 7 produces an air passage way substantially uniform in cross-section from the sleeve 17 to the mouth 33. This may produce a fairly uniform air flow free from gusts. Since the shoe is turned inwardly to form the mouth

33 the entrance to the nozzle might be entirely blocked if the shoe should rest on the ground or the bottom or side of a bin or other smooth surface. In order to prevent this the feet 34 are provided which hold the shoe up so that material may pass between the feet and into the nozzle. Since the mouth 33 is well up into the tube 7 and since the shoe is curved about the lower edge of the belled end 15 it will be seen that the air passage between the bell 15 and shoe 32 is closed at its lower end. This construction tends to keep the air passage clear since substantially no material from the pile to be conveyed can get past the shoe and into the passage. There is consequently little likelihood of the nozzle becoming blocked.

I claim as my invention:

1. In a nozzle, an inner tube belled outwardly at its lower end, an outer tube attached to the upper part of the inner tube, a shoe for the outer tube at its lower end and belled outwardly to correspond to the inner tube and having an upwardly extending mouth piece extending within the belled end of the inner tube, a tube extending upwardly and laterally from the upper part of the outer tube, and an air valve on the extending tube.

2. In a nozzle, an inner tube belled outwardly at its lower end, an outer tube surrounding the inner tube and having its lower part belled outwardly to correspond to the inner tube and then turned inwardly and upwardly within the belled end of the inner tube, a band connecting the tubes, a sleeve extending upwardly and outwardly from the band, and an air valve on the sleeve.

GEO. A. GIESELER.