

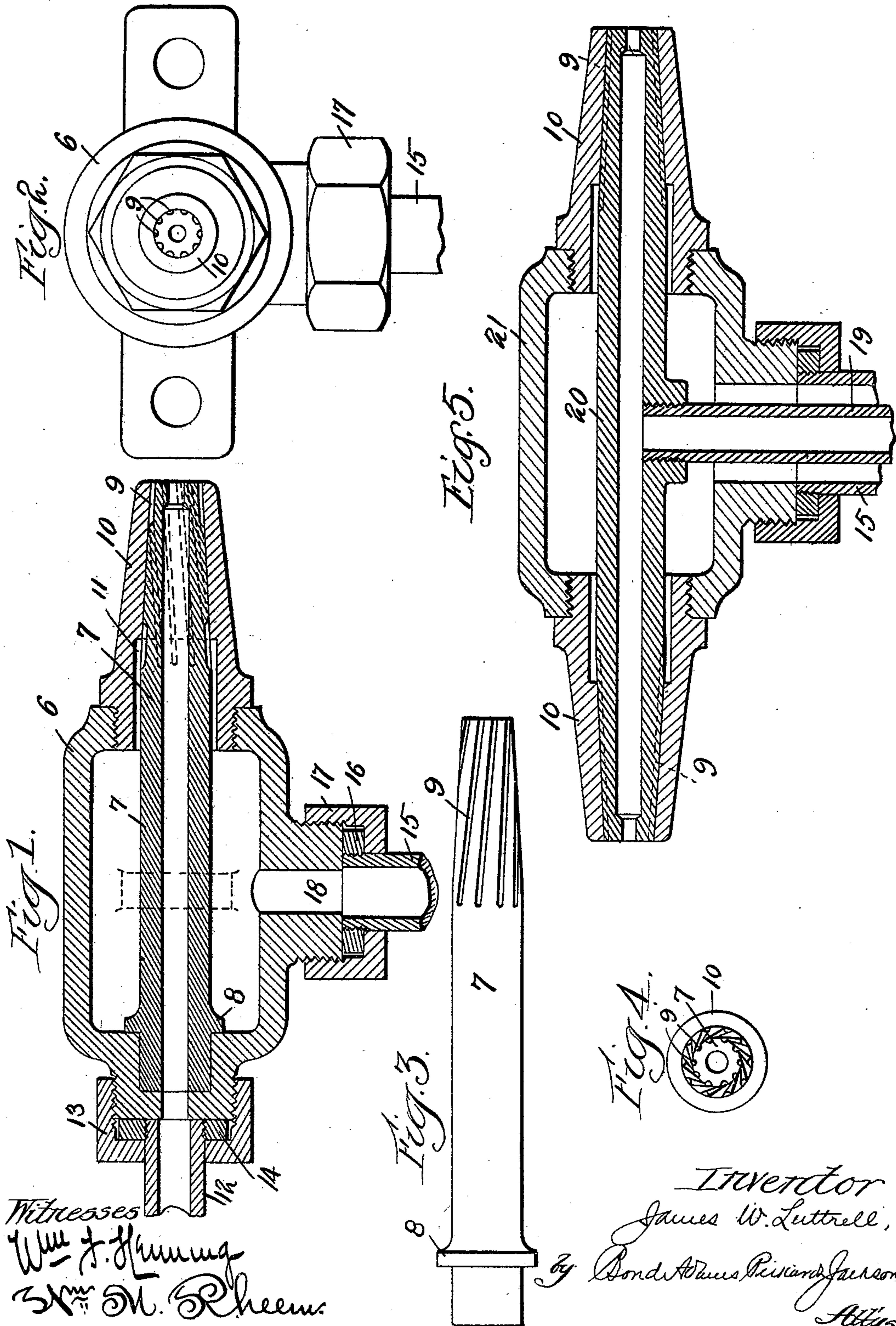
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Patented Apr. 4, 1899.

J. W. LUTTRELL.
SPRAYING NOZZLE.

(Application filed Sept. 17, 1897.)

(No Model.)



UNITED STATES PATENT OFFICE.

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SPRAYING-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 622,245, dated April 4, 1899.

Application filed September 17, 1897. Serial No. 652,018. (No model.)

To all whom it may concern:

Be it known that I, JAMES W. LUTTRELL, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Spraying-Nozzles, of which the following is a specification.

My invention relates to spraying-nozzles, and has for its object to provide a nozzle which will be so constructed as to discharge liquid in an atomized state.

My improved nozzle is particularly designed for use in supplying crude oil to furnaces; but it may be used for any other purpose to which it is adapted. For the purposes of the present description, however, I shall consider it as being used for feeding oil, as above stated.

In the drawings, Figure 1 is a longitudinal vertical section. Fig. 2 is a front view. Fig. 3 is a side view of the oil-tube. Fig. 4 is an end view thereof. Fig. 5 is a view showing a modified form of nozzle arranged to discharge in two directions to adapt it for uses such as the removing of locomotive-tires, &c.

Referring to the drawings, 6 indicates a cylinder or shell which forms the body of the nozzle.

7 indicates the oil-tube, which extends through the shell 6, being seated at one end in a suitable recess formed in the end of the body 6, as shown in Fig. 1. The tube 7 is provided with a shoulder 8, which bears against the end of the shell. As shown in Figs. 3 and 4, the discharge end of the tube 7 is tapered and is externally provided with a series of rifle-grooves 9, terminating at the end of the tube.

10 indicates a sleeve which has a conical interior surface and is adapted to receive the tapered end of the tube 7. The sleeve 10 is screw-threaded at its inner end, being screwed into the end of the body 6 opposite that at which the inner end of the oil-tube 7 is seated. As shown in Fig. 1, the outer portion of the sleeve 10 fits snugly upon the tube 7, but the inner portion thereof is recessed, as shown at 11 in Fig. 1, forming a space, which communicates with the interior of the body 6, and, as shown in Fig. 1, the inner ends of the grooves 9 in the tube 7 extend to said space 11. The tube 7 and sleeve 10 are so adjusted with re-

lation to each other that by screwing the sleeve 10 tightly in place it will force the tube 7 tightly into its seat and bind it there, the sleeve 10 thereby being made to lock the tube 7 in position.

12 indicates an oil-tube which communicates with the tube 7, being secured to the body 6 by a screw-cap 13, said tube 12 being provided with a nut 14, as shown in Fig. 1. By this arrangement the tube 12 may be drawn up tightly into contact with the body 6 by means of the cap 13.

15 indicates an air-pipe which is provided with a nut 16 and is secured to the body 6 by a cap 17 in a manner similar to that described for the tube 12. The air-pipe 15 communicates with an inlet-passage 18, which communicates with the interior of the body 6 and is preferably arranged at right angles to the oil-tube 7.

By the construction above described the various parts may be readily assembled or disconnected and may be cheaply constructed.

The operation of my improved nozzle is as follows: Air entering the body 6 through the air-pipe 15 passes through the air-space 11, and thence is discharged through the rifle-grooves 9. Owing to the conical form of the tube 7 the air is discharged in the form of a cone, at the same time having imparted to it a rotary motion by reason of the rifled form of the grooves 9. The suction produced by the discharge of the air, as above described, assists in the discharge of the oil, which enters through the tube 12 and passes through the tube 7, and as the oil passes out of the tube 7 it is carried forward forcibly by the currents of air and, becoming mingled with them, the particles of the oil are thoroughly broken up and atomized. The meeting of the currents of air with the more or less intermingled oil a short distance from the nozzle, at the apex of the cone formed by the moving currents, causes a more violent agitation and a more perfect intermixture of the oil and air, so that as the intermixed oil and air pass beyond such apex the oil is in a perfectly-atomized condition.

In Fig. 5 I have shown a modified form of apparatus designed for use where it is desired to discharge the atomized oil in two di-

rections. The construction shown in Fig. 5 is substantially the same as that shown in Fig. 1; except that instead of introducing the oil at one end of the body 6 it is introduced through a pipe 19, arranged within the air-tube 15. As shown in Fig. 5, the oil-pipe 19 communicates at its inner end with an oil-tube 20, having nozzles at both ends, and as the body 21 of the device shown in Fig. 5 is arranged to discharge air at both ends the atomized oil may be discharged in two directions. Instead of arranging the nozzles to discharge in opposite directions, as shown in Fig. 5, they may be arranged to discharge in other directions, as this will depend largely upon the use to which they are to be put.

I have described my invention in detail, but do not wish to be limited to the specific form shown, as various modifications may be made without departing from my invention.

That which I claim as my invention, and desire to secure by Letters Patent, is—

1. In a spraying-nozzle, the combination with a body or shell, of a sleeve secured to said shell, and a tube separate from said shell and sleeve, located within said shell, and having one end extending into said sleeve and held in place thereby, passages being formed between said tube and sleeve.

2. In a spraying-nozzle, the combination with a body or shell, of a sleeve adapted to be secured to said shell, a tube within said shell, one end of the tube extending into the sleeve and the other end adapted to fit into a seat, and means for adjusting the sleeve whereby the tube may be held to its seat, passages being formed between the sleeve and the portion of the tube extending thereinto.

3. In a spraying-nozzle, the combination with the body or shell, of an inner tube seated in said shell, and a sleeve adapted to be secured to said shell and surrounding said tube for holding the latter in place, passages being provided between said tube and sleeve, substantially as described.

4. In a spraying-nozzle, the combination with the body or shell, of an inner tube having one end seated in said shell and its other end provided with a tapering outer surface and a sleeve secured to said shell, surround-

ing said tube and provided with a tapering inner surface conforming to the tapering outer surface of said tube, passages being provided between said tube and sleeve, substantially as described.

5. In a spraying-nozzle, the combination with the body or shell, of an inner tube seated in said shell and having the outer surface of its discharge end tapering, and a sleeve fitting upon said tube for securing the same in place on said shell, passages being provided between said tube and sleeve, substantially as described.

6. In a spraying-nozzle, the combination with the body or shell, of an inner tube seated at one end in said shell, provided adjacent thereto with a shoulder which abuts against said shell, and having its other end provided with a tapering outer surface, and a sleeve secured to said shell, surrounding said tube and provided with a tapering inner surface conforming to the tapering outer surface of said tube, passages being provided between said tube and sleeve, substantially as described.

7. In a spraying-nozzle, the combination with a shell 6, of a tube 7 seated in one end of said shell, the exterior surface of the discharge end of said tube being conical in form, and a tube 10 adapted to fit upon said tube 7, passages being provided between said tubes, and said tube 10 being adjustably secured in one end of said shell, substantially as described.

8. In a spraying-nozzle, the combination with a shell 6, of a tube 7 seated in one end of said shell, the exterior surface of the discharge end of said tube being conical in form, a tube 10 adapted to fit upon said tube 7, passages being provided between said tubes, and said tube 10 being adjustably secured in one end of said shell, an air-supply tube 15 communicating with said shell, and a chamber 11 between the tubes 7 and 10, substantially as described.

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Witnesses:

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