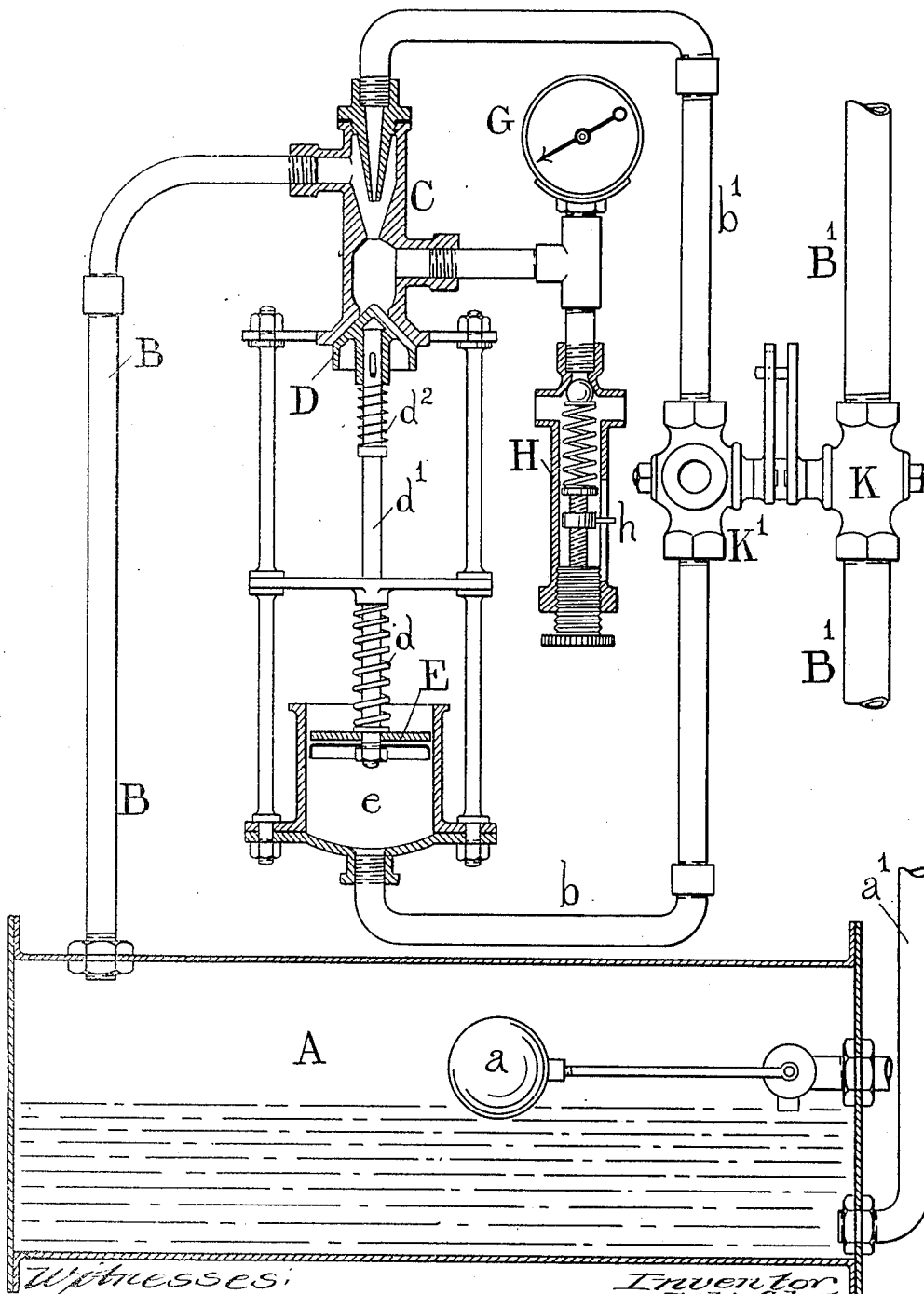


E. SLATER.  
 APPARATUS FOR SPRAYING AND ATOMIZING LIQUIDS.  
 APPLICATION FILED JUNE 22, 1918.

1,292,898.

Patented Jan. 28, 1919.



Witnesses:

*E. Slater*

Inventor  
*E. Slater*  
 by *Wm. L. Norris*  
 Attorney.

# UNITED STATES PATENT OFFICE.

ELI SLATER, OF KINDERS, GREENFIELD, ENGLAND.

## APPARATUS FOR SPRAYING AND ATOMIZING LIQUIDS.

1,292,898.

Specification of Letters Patent.

Patented Jan. 28, 1919.

Application filed June 22, 1918. Serial No. 241,419.

*To all whom it may concern:*

Be it known that I, ELI SLATER, a British subject, residing at Kinders, Greenfield, county of York, England, have invented certain new and useful Improvements in Apparatus for Spraying and Atomizing Liquids, of which the following is a specification.

This invention relates to apparatus for spraying or atomizing liquids more particularly for humidifying the atmosphere in cotton and other factories, in which a spray is produced by air and liquid under pressure through nozzles angularly disposed with relation to one another either adjustable or otherwise.

The object of the invention is to obviate the necessity of a spring controlled or loaded valve in the liquid nozzle or the passage thereto.

It consists in the particular construction and disposition of the apparatus by which the liquid is forced up to the spraying nozzle comprising an ejector connected to the liquid container whereby on reduction of the air pressure to the nozzle the pressure in the liquid container is rapidly reduced to stop the flow of liquid to the spraying nozzle.

It will be fully described with reference to the accompanying drawings:—

The figure shows diagrammatically sectional elevation of the liquid containing vessel and the air controlling apparatus connected therewith.

The spraying nozzle (not shown) to which the air and liquid are conveyed is of well known construction, the air nozzle set at an inclination to the liquid nozzle and preferably adjustable.

The liquid container A is of any ordinary construction with an inlet float valve *a* an outlet *a'* for supplying the nozzles and a pipe B for the admission of compressed air.

The air under pressure from the air compressor flows through the pipe B' to the spraying nozzles and the pipe B' is connected with the pipe B by connecting pipes *b b'* by which the pressure upon the liquid in the container is maintained at the desired degree.

In the pipe B or at its junction with the connecting pipe *b* an ejector C is fitted in such a position as will exhaust the air from the vessel A. The end of the ejector pipe is open to the atmosphere and is fitted with

a valve D by which it may be closed. The valve D is mounted upon and controlled by a piston or diaphragm E of rubber or metal fitted into a cylinder or casing *e* to which the pipe *b* is also connected to admit air under pressure to the underside of the piston or diaphragm E. The diaphragm or piston is forced outward to close the valve D by the compressed air against the pressure of a spring *d* which latter opens the valve when the air pressure is reduced. A pressure at the back of the diaphragm or piston E is maintained equal to that in the air supply pipe B'. The valve D is loaded or controlled by a spring *d* to close when the air pressure against the diaphragm or piston E exceeds a predetermined degree, (that is the pressure in air pipe B') thereby arresting the action of the ejector and allowing the air under pressure to flow past the ejector C through the pipe B into liquor container A above the level of the liquid therein.

The valve D is mounted loosely upon its spindle *d'* with a pin or otherwise to retain it in position and held in normal position by a spring *d*<sup>2</sup> lighter than the spring *d*. The valve D thus acts also as a safety valve to determine the maximum pressure in the liquid container, and should the air pressure become too great it will be forced back against the spring *d*<sup>2</sup> allowing the excess pressure to escape.

A pressure gage G and a regulating valve H are connected to the ejector pipe. The regulating valve can be opened or closed to allow for the escape of more or less air to regulate the pressure on the liquid in the container A and consequently the quantity of liquid forced up therefrom to the spraying nozzles according to the degree of humidity required. The regulating valve is operated by a fine screw thread and also carries a coarse pitch thread to move a pointer *h* to indicate on a calibrated scale the amount of liquid being passed to and through the spraying nozzle.

A stop valve K is fitted on the compressed air pipe B' and a three way valve K' is fitted to the air pipe *b'* one port of which opens to the atmosphere to relieve the pressure in the case or cylinder *e* on the piston or diaphragm, the two valves being so connected that the valve K' will open the cylinder *e* to the atmosphere as the valve K on the pipe B' is closed.

In operation when the air pressure is shut off from the sprayers and the pressure in the pipe B' is below normal the ejector valve D is open (being opened by the spring *d*) and the air in the liquid container A above the liquid is at atmospheric pressure. On the pressure of air rising in the air pipe B' air is forced through the ejector C tending to exhaust or further reduce the pressure in the liquid container A until the maximum pressure is reached in the pipe B'. This prevents any liquid being forced up to the liquid nozzle before the air issuing from the air nozzle has risen to its maximum pressure and prevents any overflow from the nozzle on starting the apparatus. This pressure acting on the piston or diaphragm E closes the valve D and the air backs up through the ejector into the pipe B and raises the pressure in the liquid container A to the desired degree. On shutting off the compressed air the pressure in the cylinder *e* falls and the valve D is opened by the spring *d* (or by a weight) bringing the ejector C into play during the time that the air in the pipe B' is not fully exhausted. The opening of the valve D relieves the pressure in the liquid container A and the ejector tends to exhaust the air therefrom, immediately relieving the pressure and stopping the flow of liquid, also allowing the liquid in the pipes to drain back. This draws away the liquid from the liquid nozzle and prevents any overflow from the nozzle on the stopping of the apparatus. The pressure of air in the liquid container can be adjusted while the ejector valve is closed by opening and closing the regulator valve H,

thereby controlling the amount of water forced up to the nozzle.

What I claim as my invention and desire to protect by Letters Patent is:—

1. In apparatus for forcing liquid to spraying nozzles an ejector connected with the liquid container and the compressed air container and a valve to close the ejector when the air pressure is normal and open the ejector when the air pressure is below normal, substantially as described.

2. In apparatus for forcing liquid to spraying nozzles the combination with a liquid container and air pipes for compressed air of an ejector through which the air under pressure passes to the container and a valve controlled by the pressure in the air pipes to open and close the ejector whereby, on the reduction of air pressure to the spraying nozzles the pressure in the liquid container is rapidly reduced to stop the flow of liquid to the nozzles, substantially as described.

3. In apparatus for forcing liquid to spraying nozzles, the combination with an ejector and valve for rapidly reducing the pressure in the liquid container when the air pressure falls or is cut off, of a regulating valve by opening and closing which the normal pressure in the liquid container may be varied, substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ELI SLATER.

Witnesses:

J. OWDEN O'BRIEN,  
GEO. H. O'BRIEN.