

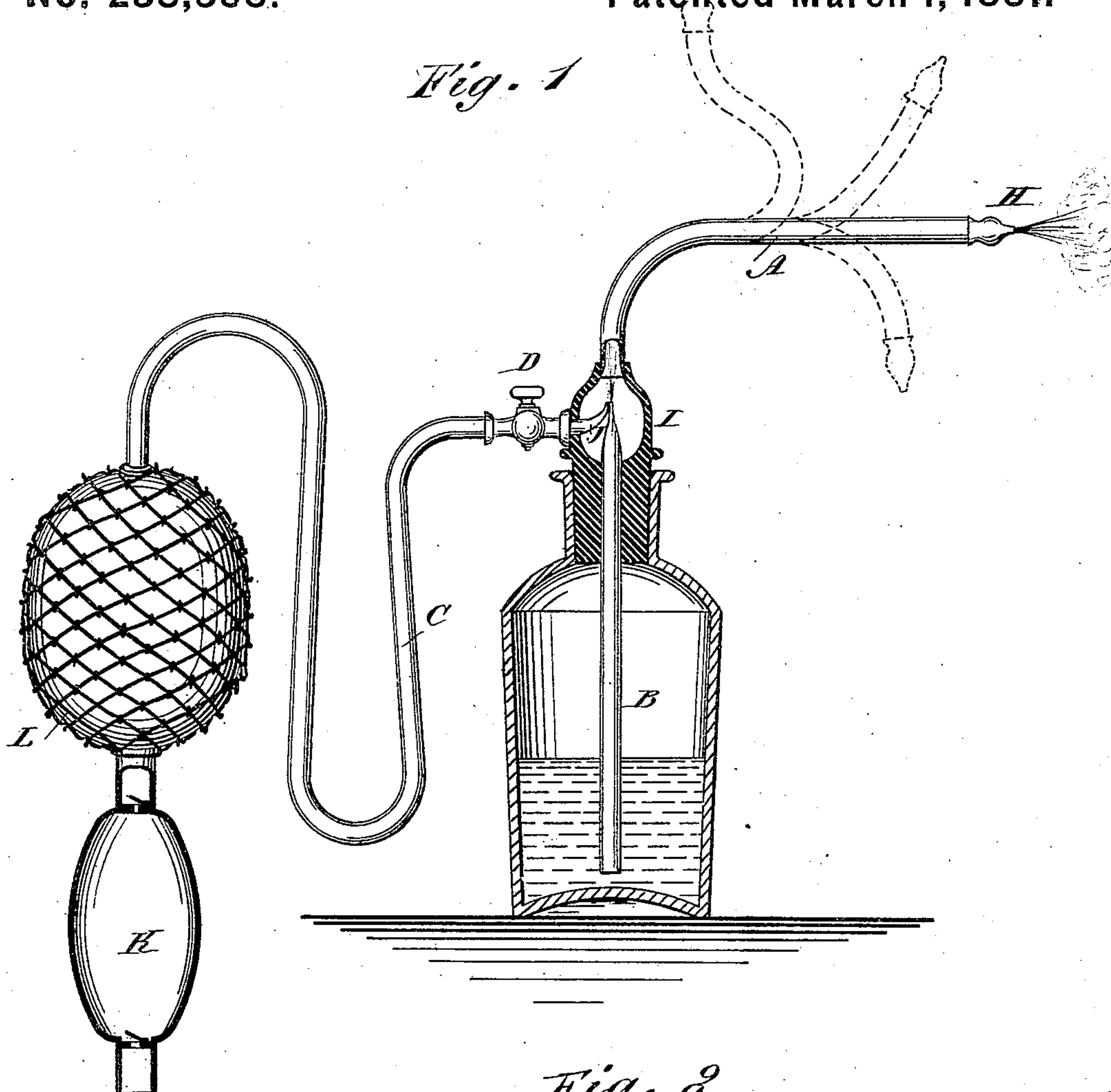
(No Model.)

I. HEINE.  
Flexible Atomizing Tube.

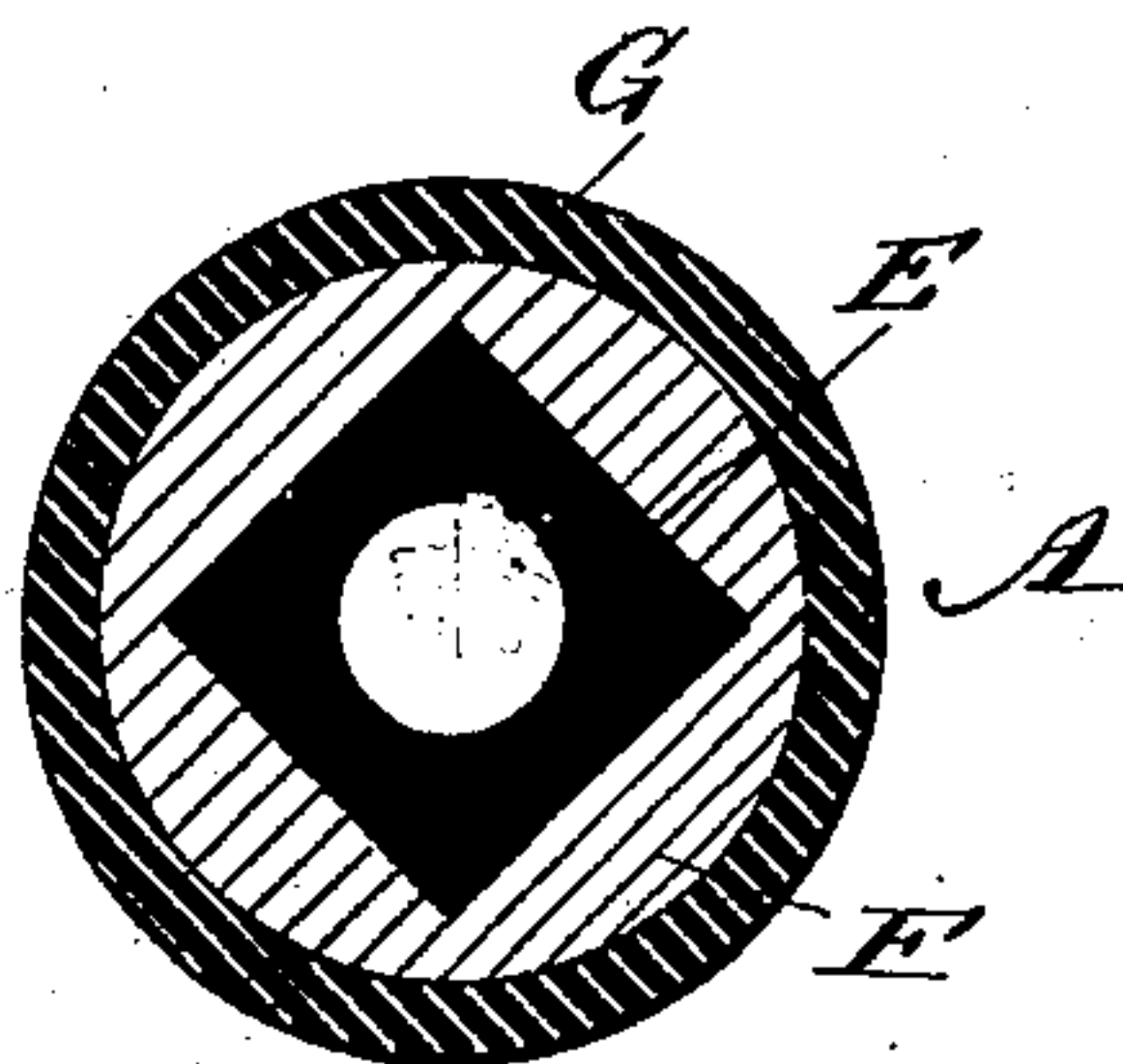
No. 238,388.

Patented March 1, 1881.

*Fig. 1*



*Fig. 2*



WITNESSES:

*C. Neveu*  
*A. Sedgwick*

INVENTOR:

*I. Heine*  
BY *Wm. H. Co.*  
ATTORNEYS.

# UNITED STATES PATENT OFFICE.

ISAAC HEINE, OF LEIPSIC, SAXONY, GERMANY.

## FLEXIBLE ATOMIZING-TUBE.

SPECIFICATION forming part of Letters Patent No. 238,388, dated March 1, 1881.

Application filed December 29, 1880. (No model.) Patented in Germany August 10, 1879.

*To all whom it may concern:*

Be it known that I, ISAAC HEINE, of Leipzig, Germany, have invented a new and Improved Flexible Atomizing-Tube, of which the following is a specification.

The object of my invention is to provide an atomizing-tube that can be bent into any desired shape, which it will retain.

The invention consists in constructing an atomizing-tube of such materials as may allow it to be flexible, to remain in any desired position, and at the same time prevent the vapor from coming in contact with the metallic constituent of the tube.

In the accompanying drawings, Figure 1 is a cross-sectional elevation of an atomizer provided with my improved flexible atomizing-tube, showing some of the shapes into which this tube can be bent. Fig. 2 is a cross-sectional elevation of the improved flexible atomizing-tube.

The flexible atomizing-tube A consists of a tube, E, of undercured hard rubber contained within a tube, F, of tin alloy, which has an outer coating, G, of vulcanized soft rubber. The tin-alloy tube E can be bent in any desired shape and will retain this shape. As the tin-alloy tube is covered with rubber on the inner and outer sides the liquid to be atomized cannot come in contact with this tube. The outer end of the atomizing-tube A is provided with a nozzle, H, and the inner end is fastened in a hollow stopper, I, in which the upper end of the suction-tube B and the end of the nozzle J of the air-tube C meet to form the spray; but the suction-tube B may be flexible and may extend up to the nozzle H, the spray being formed at the nozzle in this case, whereas it is formed in the stopper and forced through the tube A in the device shown. The quantity of spray formed

can be regulated very conveniently by means of the stop-cock D of the air-tube C.

The air is compressed in the compressor-bulb K, and passes into the reservoir-bulb L, connected with the air-tube C, the advantage of this arrangement being the following: If the cock D is closed a quantity of compressed air can be accumulated in the bulb L, and if the cock is suddenly opened a large quantity of spray will be formed immediately.

The great advantage of the within-described flexible atomizing-tube is that it can be bent into any desired shape, which it retains, thus enabling the patient to place the nozzle against certain organs of the body that are to be acted upon by the spray of the liquid—for instance, the palate, the throat, larynx, the saliva-glands, the nose, &c.

A person is thus enabled to apply the medicine with great convenience and in a more perfect manner than it could be done with the devices in use heretofore.

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

1. In an atomizer, a tube constructed of soft metal lined with rubber, substantially as described, whereby the tube may be bent and retained in any position without allowing the metal and vapor to be brought in contact.

2. In an atomizer, a tube, A, consisting of a hard-rubber tube, E, contained within a tube, F, of tin alloy, and an outer coating, G, of vulcanized soft rubber, as and for the purposes specified.

ISAAC HEINE.

Witnesses:

E. W. FIRGOD,  
FLORESTANO ANGELI.