

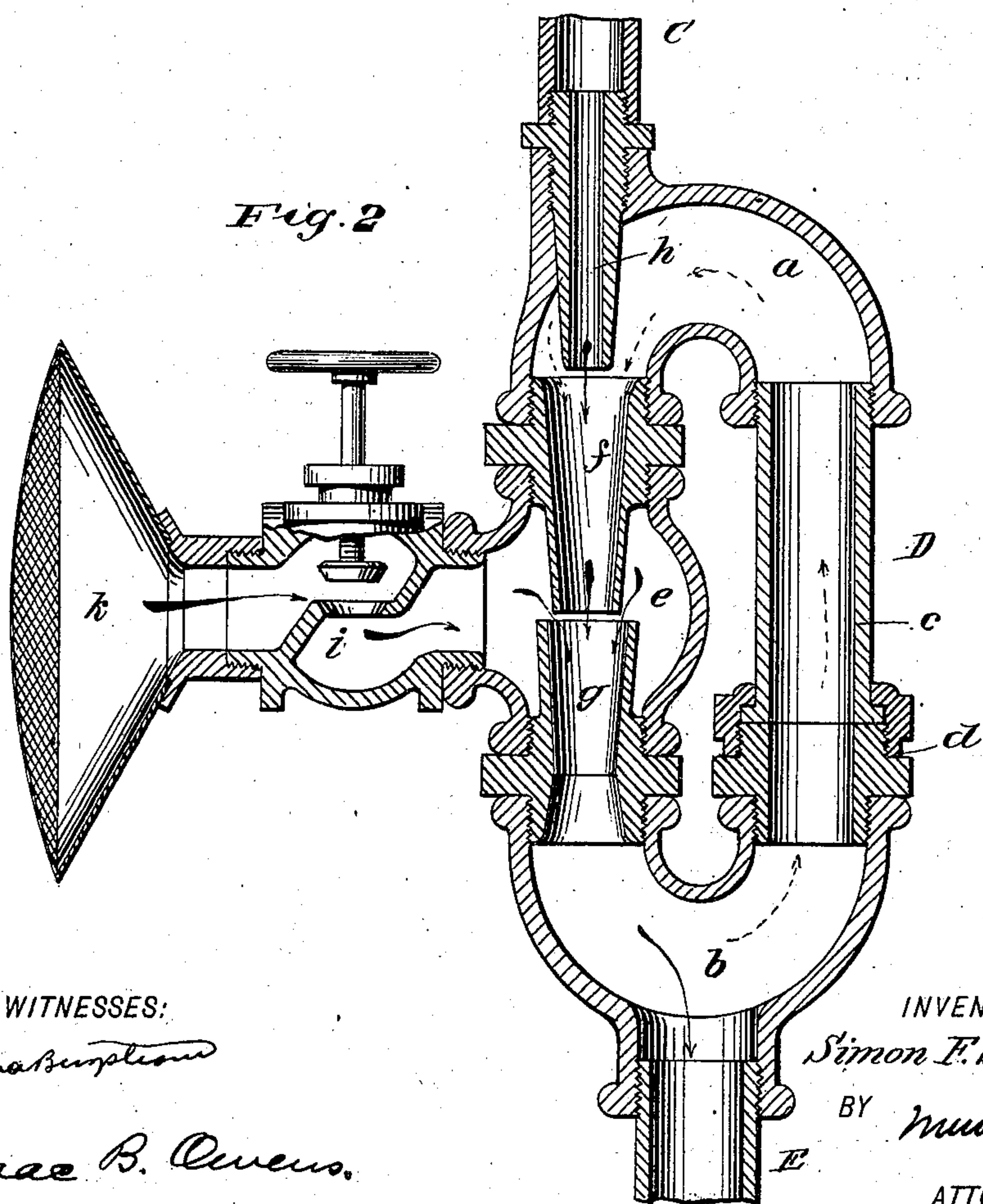
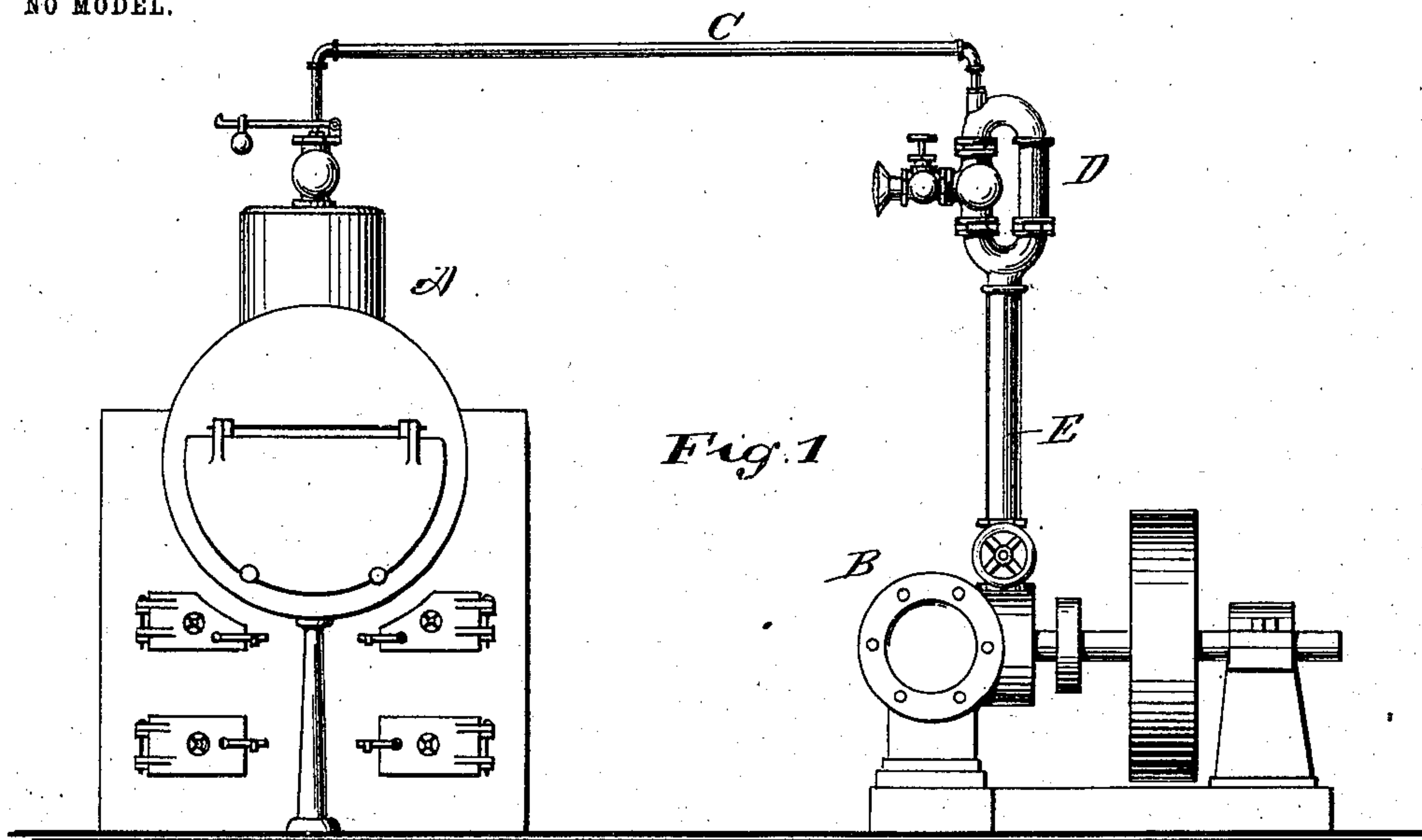
No. 726,770.

PATENTED APR. 28, 1903.

S. F. SIPLE.  
INJECTOR.

APPLICATION FILED OCT. 6, 1902.

NO MODEL.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

SIMON F. SIPLE, OF PETERSBURG, INDIANA.

## INJECTOR.

SPECIFICATION forming part of Letters Patent No. 726,770, dated April 28, 1903.

Application filed October 6, 1902. Serial No. 126,169. (No model.)

*To all whom it may concern:*

Be it known that I, SIMON F. SIPLE, a citizen of the United States, and a resident of Petersburg, in the county of Pike and State of Indiana, have invented a new and Improved Injector, of which the following is a full, clear, and exact description.

This invention relates to an injector adapted, essentially, for injecting air or other analogous gas into steam for the purpose of increasing the volume of the steam. The invention also resides in a novel combination of an injector with a source of steam and a motor driven therefrom.

This specification is a specific description of one form of the invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in both the figures.

Figure 1 is an elevational view of the invention applied, and Fig. 2 is a sectional view of the injector.

As shown in Fig. 1, A indicates a source of steam, and B indicates a motor. From the boiler A a steam-pipe C passes, which leads into the injector D, and from the injector a pipe E passes to the motor or engine. By means of the injector D atmospheric air is forced into the steam, thereby increasing the volume and absorbing the moisture thereof, this mixture of air and steam being led to the engine through the pipe E for the economical operation of the former.

The injector which I have especially constructed to carry out the purpose expressed above is shown in Fig. 2, and comprises two opposite semicircular or curved tubes *a* and *b*, connected at one end by a pipe *c*, which is screwed into the tube *a* and joined to the tube *b* by a union *d* of any suitable form. A bulb *e* connects the other ends of the tubes—the tube *a* by a nozzle *f*, and the tube *b* by a nozzle *g*. The nozzle *f* is tapered, its large end communicating with the tube *a*, and its small end opening into the bulb *e* directly opposite the large end of the nozzle *g*, which nozzle is also tapered from the bulb *e* toward the tube *b*. *h* indicates a nozzle forming a continuation of the pipe *c* and passing through

the tube *a*, said nozzle *h* discharging into the large end of the nozzle *f* and lying, therefore, directly opposite said nozzle. The pipe E leads from the middle portion of the tube *b*, as shown. The bulb *e* has a valve *i* of any desired form connected with its intermediate portion at a point opposite the meeting ends of the nozzles *f* and *g*, and this valve *i* communicates with the atmosphere through the medium of a strainer *k*, which prevents particles of solid matter from entering the valve.

The steam passing from the pipe *c* is discharged from the nozzle *h* into the nozzle *f* and passes through this nozzle and the nozzle *g* into the tube *b*. The valve *i* being open, atmospheric air is drawn into the bulb *e* and surrounds the meeting ends of the nozzles *f* and *g*, the suction of the steam drawing said air into the nozzle *g* and forming a mixture of the air and steam, which passes through this nozzle into the tube *b*. The swirling movement of this mixture of air and steam occasioned by the form of the tube *b* causes a portion of the air and steam to turn through the tube *b* and pass up through the pipe *c* into the tube *a* and back through the nozzles *f* and *g*. This current is kept up continuously, and it acts to reinforce the steam passing from the nozzle *h*. A steady volume of steam and air is passed off continuously from the tube *b* into and through the pipe E. By this means the mixture of air and steam is effected. The valve *i* is utilized to control the volume of air admitted.

In connection with the injector it will be observed that the nozzles *h* and *f* constitute steam-nozzles and that these are spaced to enable the circling current of air and steam to reënter the nozzle *f*, the nozzle *f* discharging into the nozzle *g* and the suction drawing the air into the nozzle *g*, thereby rendering the latter a mixing-nozzle.

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

1. The combination with a source of steam, and a motor to be driven therefrom, of an injector serving to inject a volume of atmospheric air or like gas into the steam prior to its admission into the motor, the said injector having a passage through which a portion of



the mixed steam and air passes continuously to the steam-inlet to reinforce the steam, as set forth.

2. The combination with a source of steam, 5 and a motor to be driven therefrom, of an injector into which extends the steam-supply pipe, the injector having an outlet-pipe leading to the motor, the said injector comprising a bulb having an air-inlet orifice, a steam- 10 nozzle opening into the bulb and into which the steam-supply pipe discharges, and a mixing-nozzle in line with the steam-nozzle, the steam-nozzle discharging into the mixing-nozzle and drawing the air into said mixing- 15 nozzle, the said injector having a passage leading from the discharge end of the mixing-nozzle to the receiving end of the steam-nozzle, as set forth.

3. An injector comprising opposite curved 20 tubes, a connecting-pipe between the tubes at one end thereof, a bulb located between the other ends of the tubes and having an air-inlet orifice, and steam and mixing nozzles located in the bulb and communicating 25 respectively with the curved tubes.

4. An injector comprising opposite semi-circular tubes, a connecting-pipe between the tubes at one end thereof, a bulb located between the other ends of the tubes, steam and 30 mixing nozzles located in the bulb and communicating respectively with the semicircular tubes, and a valve commanding an air-inlet opening into the bulb.

5. An injector comprising opposite curved 35 tubes, a connecting-pipe between the tubes

at one end thereof, a bulb located between the other ends of the tubes, steam and mixing nozzles located in the bulb and communicating respectively with the tubes, and a steam-supply nozzle entering into the tube 40 having the said steam-nozzle, and lying opposite the same to discharge thereinto, the two steam-nozzles being spaced from each other for the purpose specified.

6. An injector comprising a bulb commu- 45 nicating with the atmosphere, a steam-nozzle, a mixing-nozzle, said nozzles meeting in the bulb, the injector having a passage leading from the discharge end of the mixing-nozzle to the receiving end of the steam-nozzle, and 50 provided with inlet and outlet orifices.

7. An injector having a mixing-nozzle, and provided with a continually-open passage leading from the discharge end of the mixing-nozzle to the receiving end thereof, for the 55 purpose set forth.

8. An injector having a steam and mixing nozzle located in line with each other, the injector being formed with a continually-open passage leading from the discharge end of 60 the mixing-nozzle to the receiving end of the steam-nozzle, for the purpose set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIMON F. SIPLE.

Witnesses:

S. M. DEAN,  
JAS. RYAN.