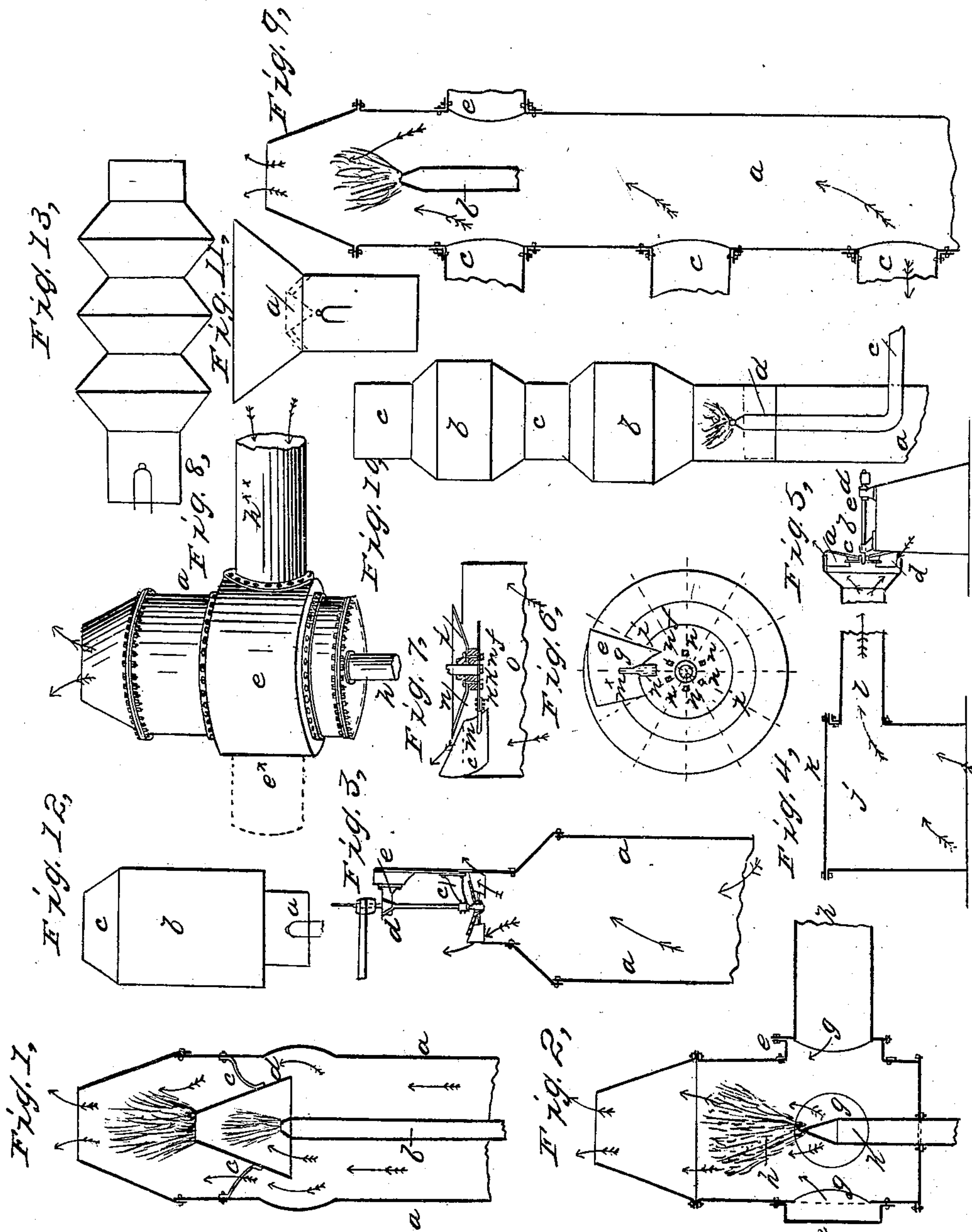


R. W. SIEVIER.

Apparatus for Exhausting Atmospheric Air or Gases.

No. 29,226.

Patented July 17, 1860.



Witnesses:
J. B. Lundy
J. F. Lundy

Inventor:
Wm. Sievier
 Signed & Attested in face
 of Robert W. Sievier

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Fig. 17,

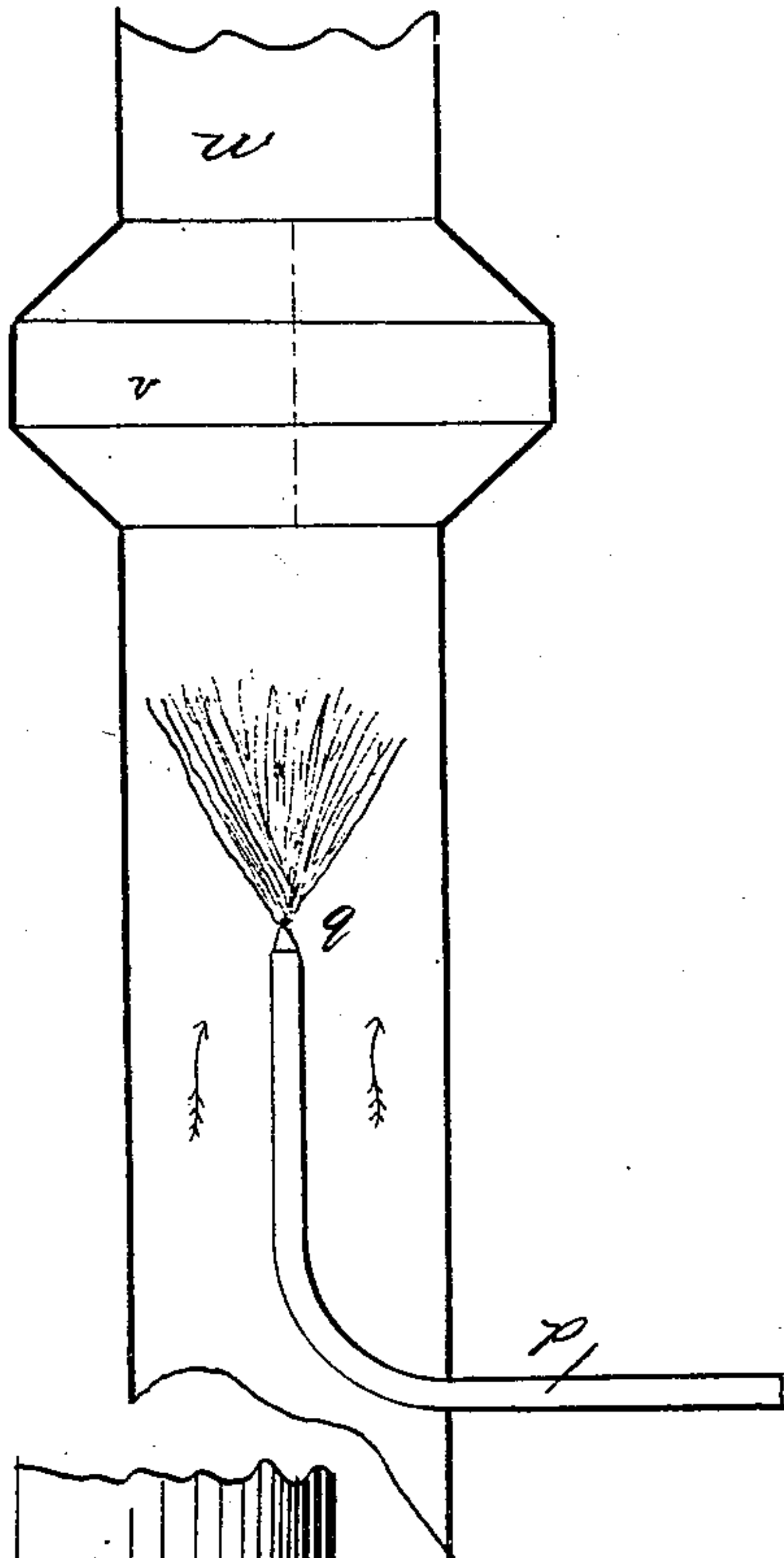


Fig. 16,

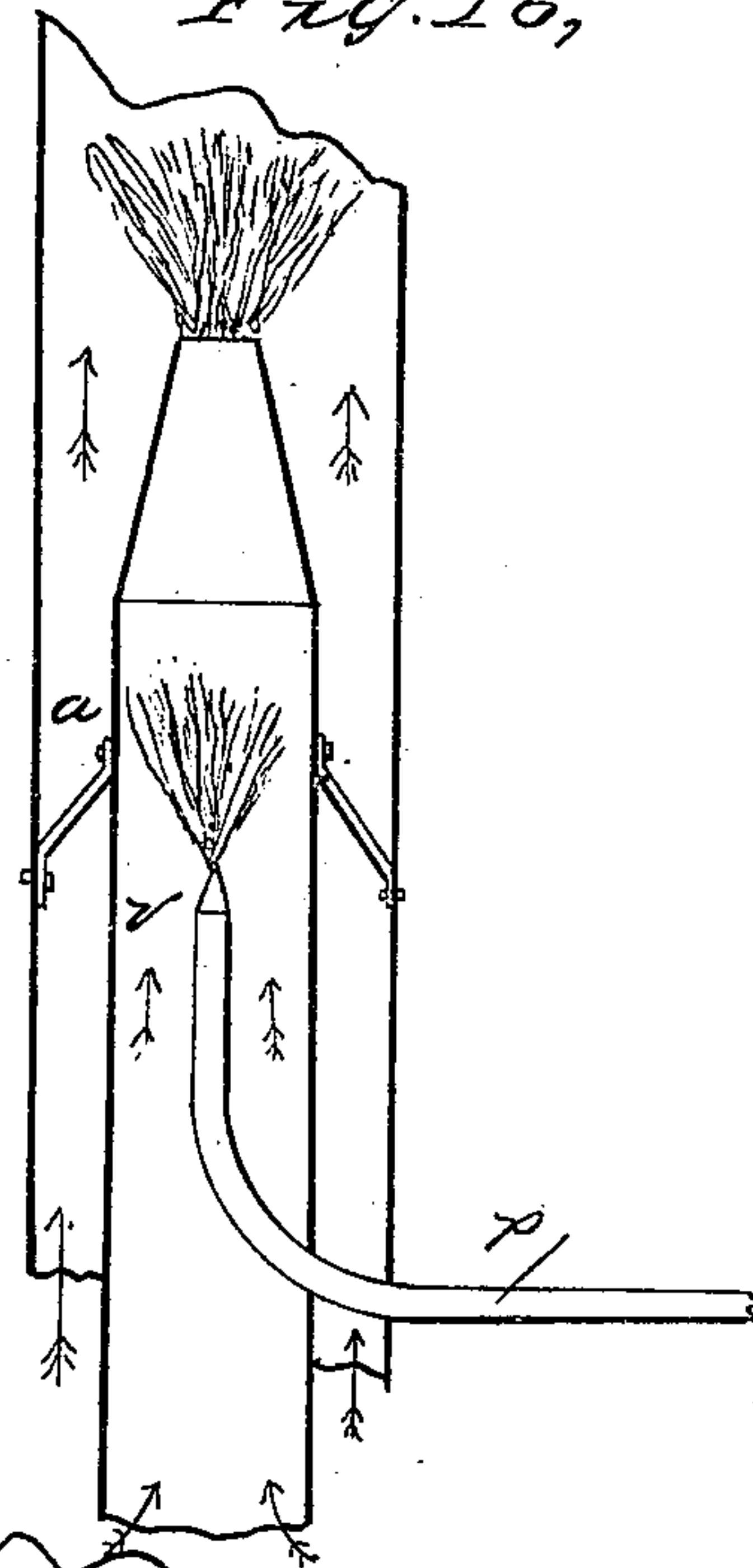


Fig. 15,

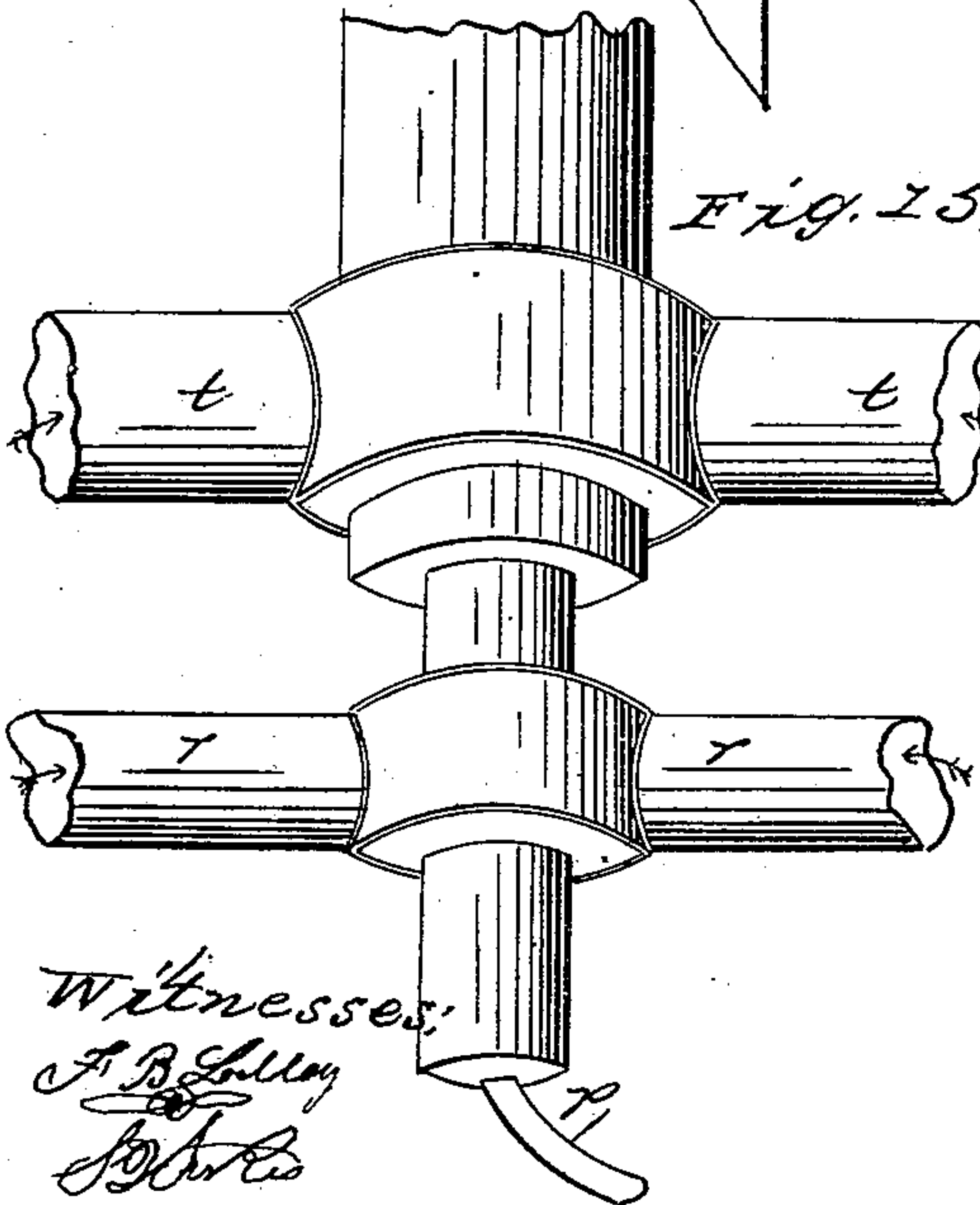
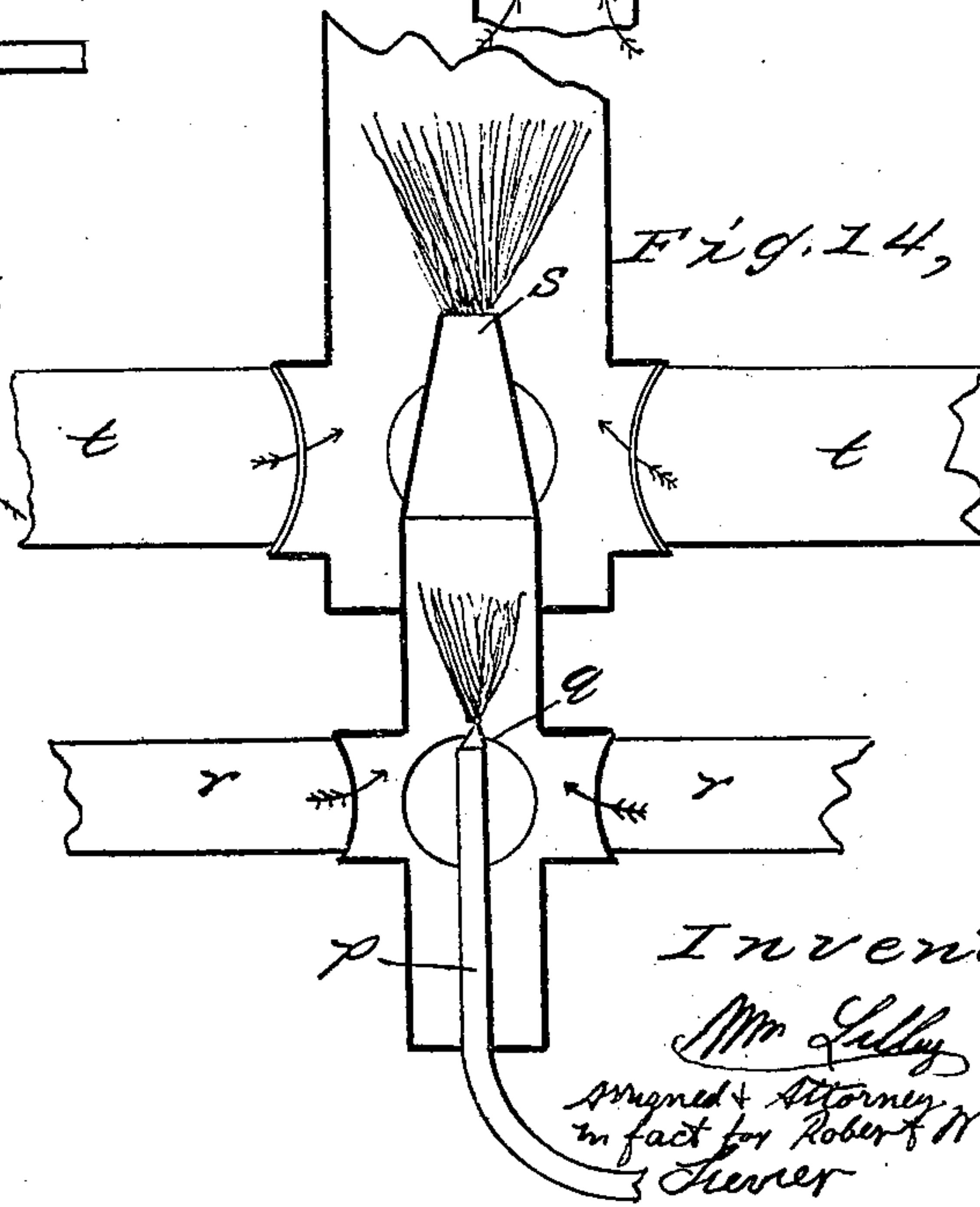


Fig. 14,



Witnesses:
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Sievier

UNITED STATES PATENT OFFICE.

ROBERT WILLIAM SIEVIER, OF UPPER HALLOWAY, ENGLAND, ASSIGNOR TO
WILLIAM LILLEY.

APPARATUS FOR EXHAUSTING ATMOSPHERIC AIR OR GASES.

Specification of Letters Patent No. 29,226, dated July 17, 1860.

To all whom it may concern:

Be it known that I, ROBERT WILLIAM SIEVIER, of Upper Halloway, in the county of Middlesex, England, and Fellow of the
5 Royal Society, and now sojourning in the city of Hamburg, Germany, have invented certain improvements in the method of exhausting atmospheric air and gases from
10 any place where such atmospheric air and gases may require to be removed for the purposes of health or creating a draft for any purpose; and I do hereby declare that the following is a full and exact description
15 thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My improvement consists in removing atmospheric air or gases from any situation they may be inconvenient or where it is
20 necessary to remove them for a useful purpose and for supplying the place with fresh air or any other gases. For instance suppose the foul air of mines requires removal
25 I do not act upon them by forcing pure air into the mine but by the removal of the obnoxious gases and the pure air supplies its place. Should I desire to create what is
30 called a draft in chimneys and for which high chimneys are built, I am enabled by a simple contrivance to exhaust the gases and convey them to a point desirable and at
35 the same time to do away with the expense incurred in building high chimneys; in steamboats by causing a powerful draft very inferior coals may be used, and steam also
40 may be more rapidly generated; buildings can be easily ventilated and sewers of large towns may be prevented from being obnoxious; holds of ships can be ventilated and
45 the difficulty and excessive heat encountered by stokers of steamers at once removed.

In the accompanying sheet of diagrams will be seen the mode I adopt for carrying out the above.

45 Figure 1, represents the upper part of a chimney. Suppose it is for manufacturing when a high chimney is required, I do not require a chimney of more than a few feet high. *a, a, a, a*, represents a plate iron
50 shell which is placed at the upper part of the chimney, (care must be taken to make the whole of the flue and chimney air tight). *b* is a tube carrying a jet of steam, this jet of steam plays into a conical shaped piece
55 of sheet iron, *d*, attached to the sides *a, a*,

a, a, by the brackets *c, c*. This jet of steam causes the gases to be drawn with great velocity up the chimney in the direction of the arrows. Fig. 2, is a somewhat similar mode with this difference; it has not the conical
60 shaped piece, *d*, but has around it a casing at *e, e*, four holes, three of which are seen *g, g, g*, which communicate with the chimney, the jet of steam *h*, which comes through the steam pipe *h^x* impinges against the
65 conical sides and causes the air to rush in at the pipe *h^{xx}* which communicates with the flue (better seen at Fig. 8, Fig. 2, being only a sectional view) the underneath part *i*, is closed up by a plate. These instruments
70 Figs. 1 and 2, can be used for the removal of air or gases in any situation. In Figs. 3 and 4 will be seen two other modes for accomplishing the same results. It is very
75 similar to that attached to my patent for the smelting of iron and other ores.

Fig. 4, represents the upper part of a ventilating shaft for a mine or the end of the shaft or chimney of a furnace. It is closed at the top at *k*, and its exit is at *l*.
80 There is attached to the end of this pipe *l*, the exhauster.

In Fig. 5, *a, a*, are the leaves of the fan; *b*, the shaft; *c, c*, the bearings, and *d*, the driving pulley which is moved
85 by a strap by any motion power. This fan or exhauster is seen better on a larger scale, Fig. 6, being a front view and one leaf *e*, only shown there being twelve in number, one being placed on each of the dotted lines.
90 This leaf is attached to an iron plate *f*, (the letters of reference to Figs. 6 and 7 are the same to prevent confusion). The piece of iron *g*, is reunited to the plate *f*, and the leaf is bent to curve so as to lap
95 over the plate *f*, and when riveted to the piece *g*, touches the back plate *i, i*, which is dished and forms a shape as seen in Fig. 7. The leaf is riveted by the rivets *m^x* to this
100 dished shape piece to keep it steady. *k, k*, is the shaft which turns this fan or exhauster, this shaft passes through the cast iron boss *m*, and the bolts *n, n*, attach it firmly to the disk *f*. By giving a rapid
105 rotary motion to this exhauster a very sharp draft is produced through the pipe *o*, in the direction of the arrows, and the gases are removed. Fig. 3, represents the same fan acting vertically on the upper part of a
110 shaft (but I prefer its being the reverse

way as in Fig. 5), *a, a*, being the sides; *b*, the fan or exhauster; *c, c*, the bearings; *d*, a cone turned on the shaft to prevent its lowering. There is no support represented
 5 in the plate holding the bearings as that is easily conceived and may be built in any convenient way. The exhauster differs from that patented in my former patent alluded to by having a dished shape back plate *i*,
 10 which allows the gases more easily to escape and increases the power of the ventilator or exhauster.

Fig. 8, is a view of Fig. 2 shown in perspective that its outer form may be seen, *h^x* the steam pipe and *h^{xx}* the pipe to the chimney; *e*, the outer casing which surrounds the casing *a*.

Fig. 9, represents a chimney or tube *a*. It will be seen that the jet of air or steam *b*,
 20 must be placed higher up the tube, and by this arrangement a number of chimneys or ventilating inlets may be placed leading into it as seen at *c, c, c, c*, and by such means a jet of air or steam will exhaust more air
 25 or gases than if only one feeding pipe was introduced. In Fig. 8, the dotted part *e^x* shows another inlet tube placed opposite the one *h^{xx}*. Another benefit will be derived from having an arrangement similar to Fig.
 30 9, viz., suppose the gases to be exhausted are very much heated or poisonous they may be cooled or diluted by the admission of air by opening the lower tubes, of course these tubes must have a slide valve to each, to
 35 shut off or open communications as may be desired.

In Fig. 10, *a*, represents the chimney on board the boat; *b, b*, two pieces shaped as seen; *c*, the exit pipe of the chimney, which
 40 is a very little larger than the chimney pipe *a*. The cap, *d*, is made to slide up and down the pipe, *e*, that its height may be adjusted. By blowing into the pipe, *e*, a very great draft is given.

45 Fig. 11, is a mere shelved opening at the top of the chimney, having a cone fixed as seen at, *a*, the jet plays a small distance from it. Fig. 12 is another cut for the top of the chimney; *a*, represents the chimney,
 50 *b* the cut, *c* the opening which should be a

little larger than the chimney. Fig. 13 is a form which is placed at the top of the chimney to effect the same object.

Fig. 14, Sheet 2, is a sectional view of Fig. 15, and is for different ventilating purposes. 55 The exhaust is quadrupled, thus enabling you to ventilate four separate places (the different decks of a man of war for example) at one and the same time and with the same jet of steam or air. In this figure *p*,
 60 is the pipe through which the jet of steam passes, and as it passes out at the nozzle, *q*, it creates an exhaust in the two lower openings *r, r*, taking up the air and passing into the conical shaped end, *s*, thus increasing 65 the strength of the exhaust in the upper openings *t, t*. Fig. 16, is another method, but more particularly adapted to large chimneys, but still acting on the same principle; *u* is the chimney; *v*, a tube inserted 70 in it, which should extend down as near the furnace as the heat will admit of. This tube is one half the diameter of the chimney in which it is placed.

Fig. 17 is a simple cap to be placed on the 75 top of the chimney. It is similar to Figs. 11, 12 and 13 in Sheet 1, with this difference, that the upper part *w* must be two and a half times the height of the space marked with the red line, and the nozzle, *q*, must be 80 below the chamber *x*, say three fourths the diameter of the chamber.

What I claim and desire to secure by Letters Patent is—

The application to ships, mines, build- 85 ings, &c., of a jet of steam or air in a shaft or flue, in connection with the fan and director, when the said devices are constructed and arranged as specified in the manner and for the purpose set forth. 90

In testimony whereof I the said ROBERT WILLIAM SIEVIER hereto subscribe my name in the presence of witnesses whose names are hereto subscribed on the seventh day of May A. D. 1859.

R. W. SIEVIER. [L. s.]

In presence of—

JOHN B. MILLER,
 JAMES R. McDONALD.