

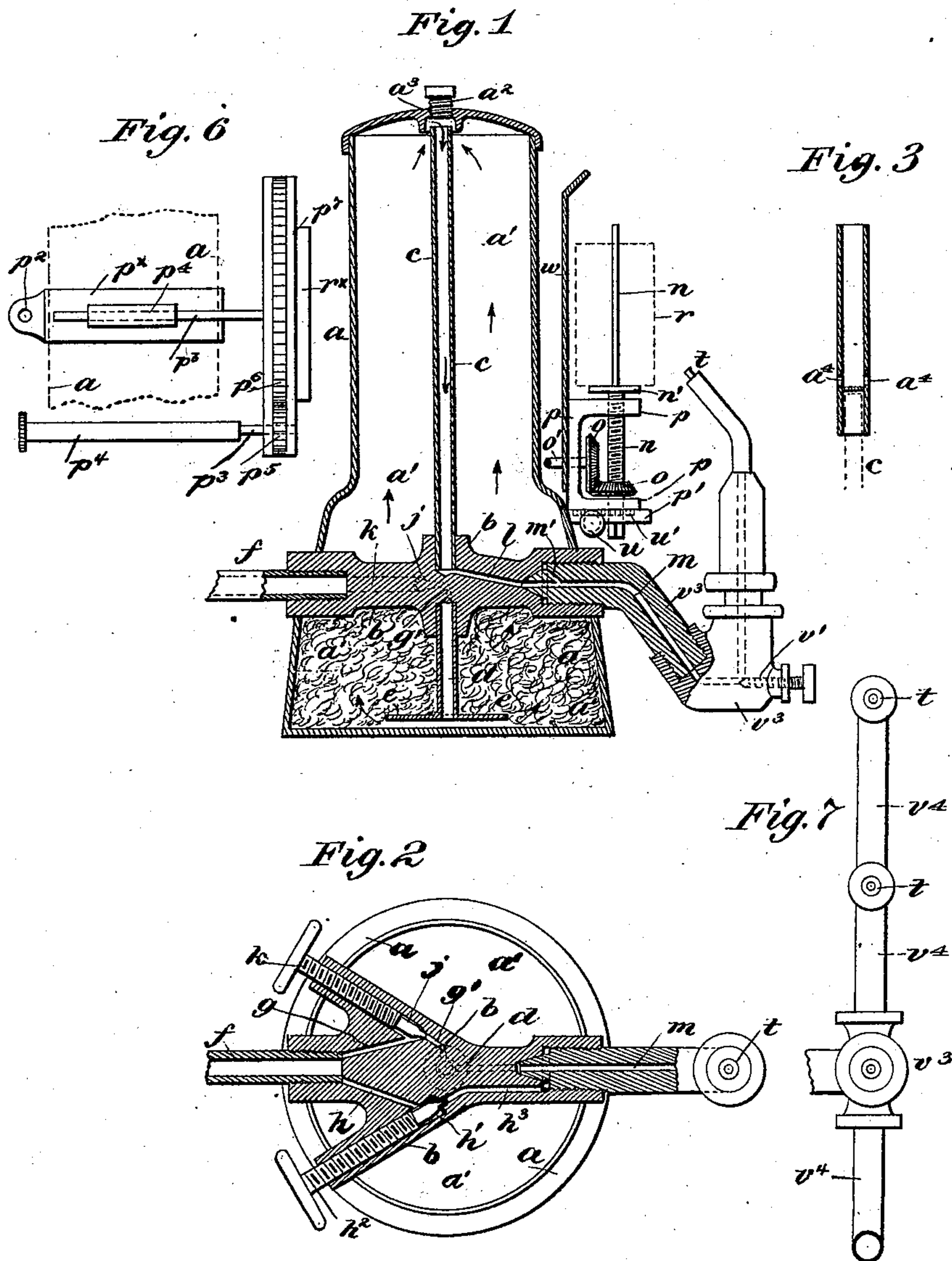
(No Model.)

2 Sheets—Sheet 1.

W. LAWSON.
LIME LIGHT APPARATUS.

No. 517,870.

Patented Apr. 10, 1894.



Witnessed
J. F. Wilson
Engineer.

Inventor
William Lawson.

Wm. H. Finckel.
his atty.

(No Model.)

2 Sheets—Sheet 2.

W. LAWSON.
LIME LIGHT APPARATUS.

No. 517,870.

Patented Apr. 10, 1894.

Fig. 8

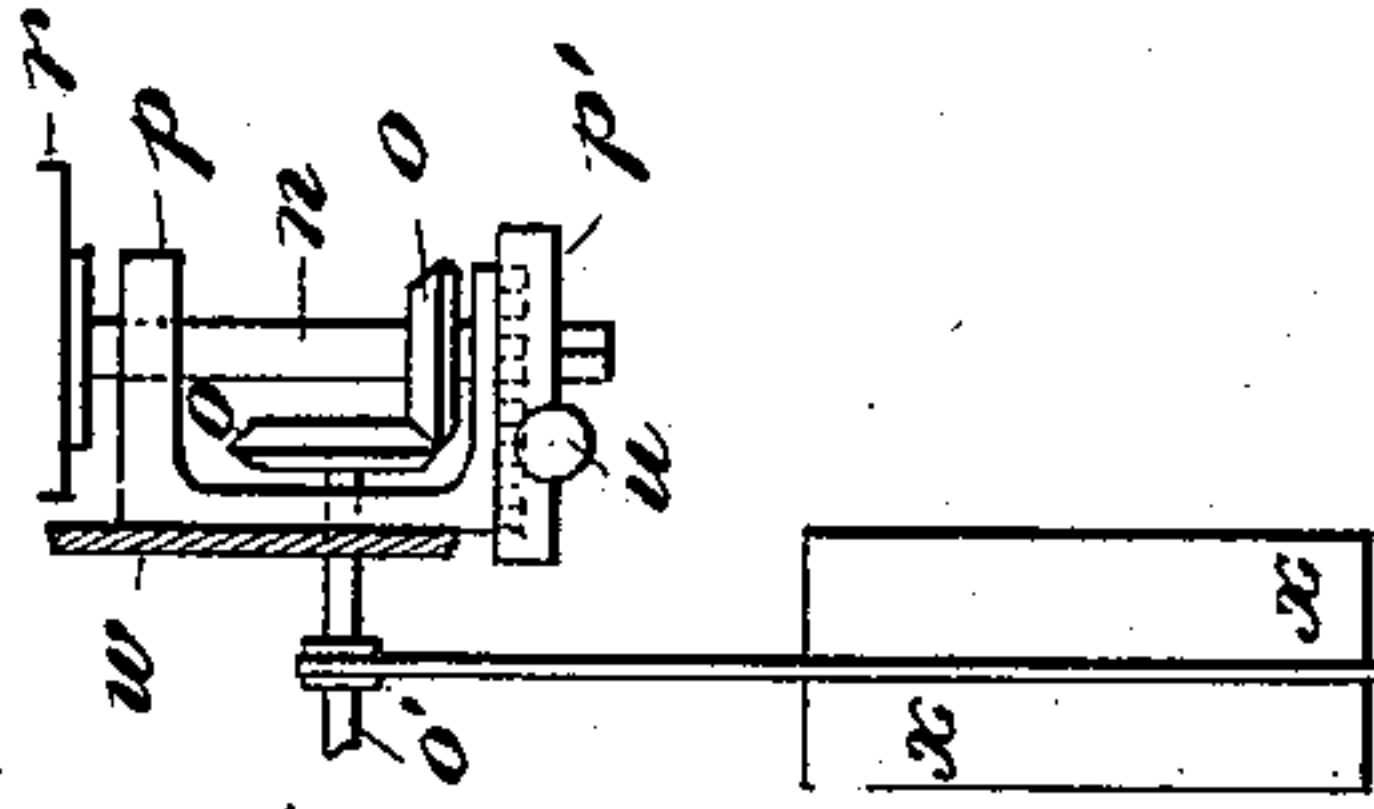


Fig. 4

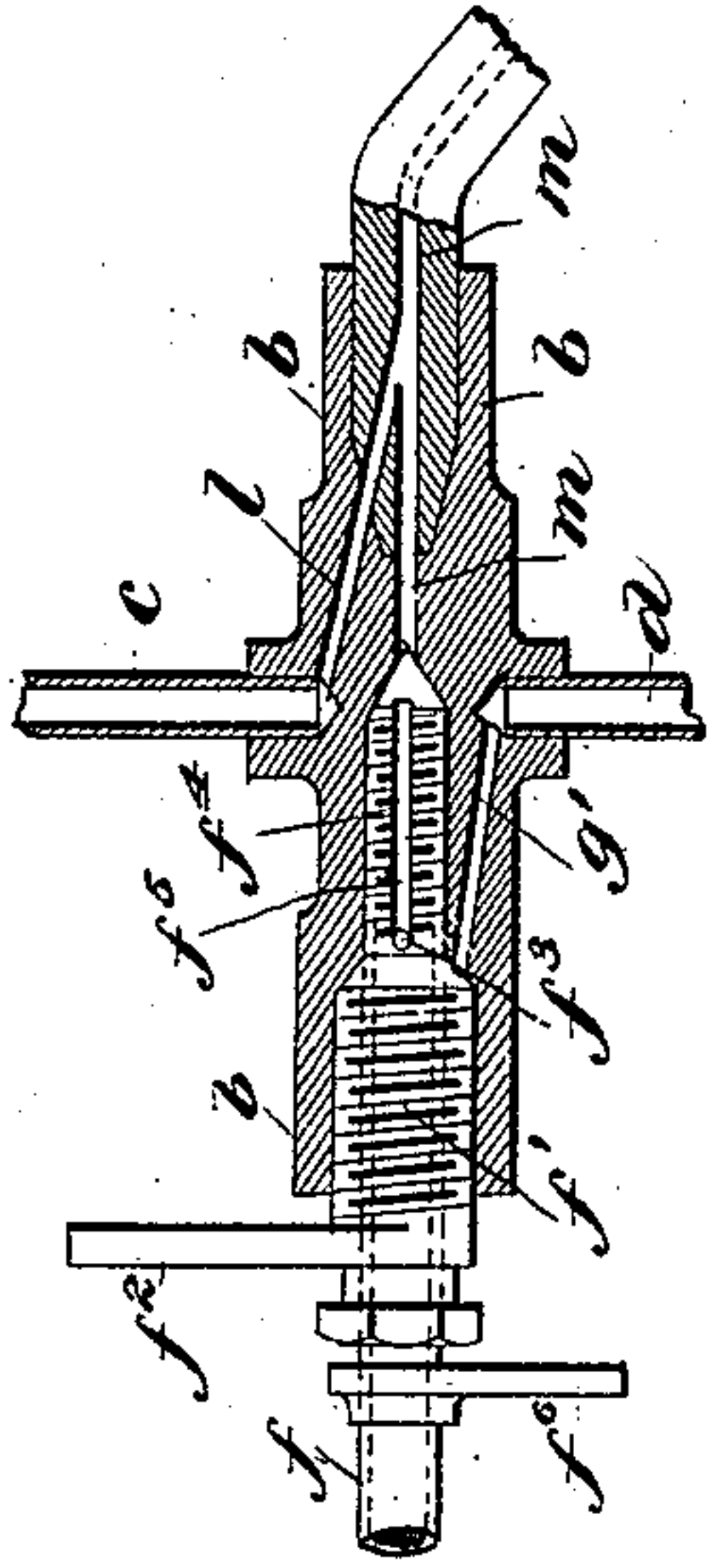
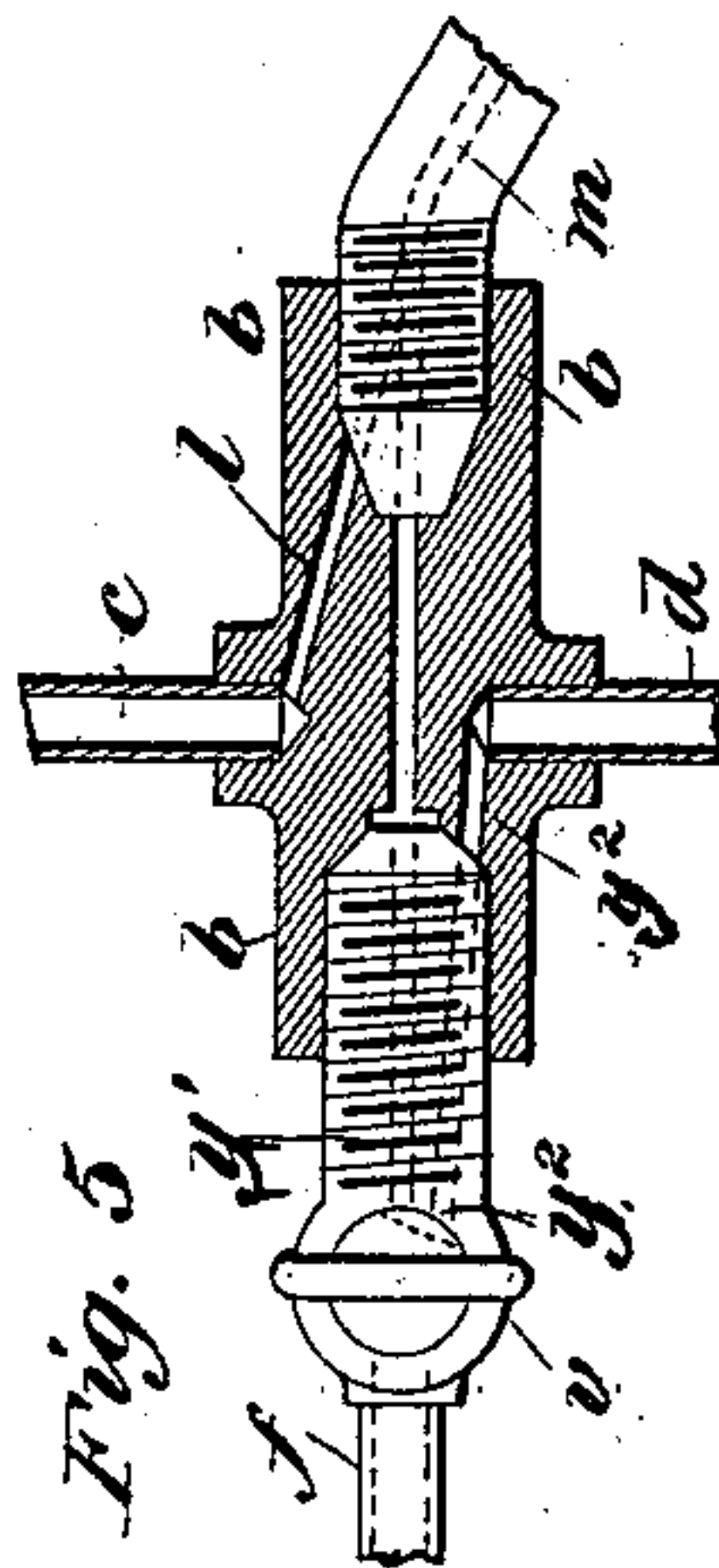


Fig. 5



Witnesses:

J. P. Colman
Ed. Finckel

Inventor

William Lawson.

By W. H. Finckel.
his atty.

UNITED STATES PATENT OFFICE.

WILLIAM LAWSON, OF NEWTON-LE-WILLOWS, ASSIGNOR TO JOSEPH RILEY,
OF BRADFORD, ENGLAND.

LIME-LIGHT APPARATUS.

SPECIFICATION forming part of Letters Patent No. 517,870, dated April 10, 1894.

Application filed June 19, 1893. Serial No. 478,135. (No model.) Patented in England November 15, 1892, No. 20,628.

To all whom it may concern:

Be it known that I, WILLIAM LAWSON, a subject of the Queen of Great Britain, residing at Newton-le-Willows, Lancashire, England, have invented a certain new and useful Improvement in Lime-Light Apparatus, (patented in Great Britain, No. 20,628, November 15, 1892,) of which the following is a full, clear, and exact description.

My invention relates to an apparatus for the production of lime light for use either in single optical lanterns, side by side, bi-unial, and triple lanterns, or for internal or external illumination.

The object of this invention is to obviate the danger of explosion during the use of the light, either by unskillful handling or from other causes. I attain this object by the means hereinafter described and as illustrated in the accompanying two sheets of drawings, in which—

Figure 1. is a sectional elevation and Fig. 2, a sectional plan of a lamp constructed according to this invention. Fig. 3. is a pipe for charging the same. Figs. 4 and 5 are modifications of Fig. 2. Fig. 6 is a form of carrier for a lime disk. Fig. 7 is a plan view of a modification of burner tubes and jets, and Fig. 8 is an elevation of a clock-work mechanism for actuating the lime.

In this invention I construct a case either such as *a*, or a case of other preferred form; I place transversely within and preferably near the bottom of said case, a metallic tube and valve carrier *b*. I connect the tube *c* to the upper portion and the tube *d* to the lower portion of said carrier. I attach a diaphragm *e* to the lower end of the tube *d*, said diaphragm being affixed within a short distance of the bottom of the case *a*. I pack the space *a'* within the case *a* with saturating material that is composed of woolen or other absorbent substance charged with light petroleum, ether, or other like fluid through which to pass oxygen gas, said oxygen gas thereby becoming saturated and producing an inflammable vapor as in the manner ordinarily obtained. I place at one side of aforesaid valve carrier *b* a screwed valve or connection *f* by which gas is conveyed from the oxygen cylinder to the passages *g* and *h*. In order to permit the

gas to enter the passage *g* for the purpose of passing through the saturating material, the valve *j* is opened by unscrewing the plug *k* which regulates the supply, when the gas enters the passage *g'*, is conveyed down the tube *d*, passing out at the bottom around the diaphragm *e* and by these means is distributed through the hereinbefore described saturating material which is packed in such a manner as to permit the gas to circulate equally through all parts of said material without collecting in any quantity at any one place. The gas then passes upward through said material when the saturated gas enters the tube *c* and descends into the passage *l* from whence it is conveyed through the passage *m* to the jet *t*.

In order to afford a supply of pure oxygen that may be required to mix with and modify the effect of the saturation in the production of the inflammable gas previous to emission from the jet *t*, the valve *h'* Fig. 2 is opened by unscrewing the plug *h²* when pure oxygen will enter the passage *h³*, is conveyed along the passage *m'* Fig. 1. formed in the elbow *v³*, where it mixes with the saturated gas prior to emission from the jet *t*. The quantity of pure oxygen thus supplied is regulated by the screwed plug *h²*. When it is required to saturate the oxygen through compression I close the passage *m* more or less by means of the valve *v'*. The lime employed may be either cylindrical as shown in Fig. 1 or of a disk form. When a cylindrical form of lime is employed I attach a bracket *p* in a convenient position on the case *a* and insert within said bracket a screwed spindle *n*, that is capable of being raised or lowered and also revolved by bevel gearing *o* or other like means. I place the lime *r* on the upper portion of the spindle *n* and resting on a collar *n'*. The aforesaid bevel or other gearing may be actuated by a rod *o'* extending to a convenient position on the opposite side of the case *a* which when turned will cause the lime *r* to revolve and at the same time to be raised or lowered by means of the screwed portion *n'* of the spindle *n*. The relative position of the lime *r*, with the jet *t*, may be regulated by the pinion *u* which gears into the rack *u'* formed on the under side of the bracket *p* by which said bracket may be

moved along the slide p' . The case a may be protected from excess of heat from the lime by the shield w which is attached to the bracket p and may be either flat or of a semi-circular form, and may be hinged at the top to retain more heat if required. When a disk of lime is employed I attach said lime to the case a in the manner shown in Fig. 6. The lime may be placed at any required height on the case by sliding the bracket p^x represented in Fig. 6 either up or down to the position required where it is secured by the set screw p^2 . The lime r^x may be caused to advance toward or recede from the jet t by means of the studs p^3 which slide within the guides p^4 ; rotary motion is given to the disk by means of the pinion p^5 which gears into the toothed wheel p^6 that is attached to the case p^7 holding the lime.

In a modification of my invention I form the tube and valve carrier b as shown in section in Fig. 4, which represents the inlet end of said carrier formed with a screwed plug f' to which a lever f^2 is attached for the purpose of opening or closing said inlet. I pass a screwed valve through the plug f' said valve f^4 having a passage f^3 formed therein through which the gas enters, passing through the passage g' into the tube d from whence it circulates through the case a as herein previously described, entering the passage l from the tube c and passing on to the jet t . Pure oxygen is admitted when required by opening the screwed valve f^4 , by means of the lever f^6 , when the gas is conducted along the groove f^5 to the passage m , being mixed with the inflammable vapor in its transit to the jet t .

In another modification shown in Fig. 5, I place a tap or cock v that may be turned so as to admit either oxygen to be passed through the saturating material, or pure oxygen to be passed to the jet, or both in certain proportions, said tap having an opening in the plug of suitable size to come opposite both the passages y' and y^2 at the same time, or one of said passages may be closed and the other remaining open according to the position in which the tap v is turned. The case a may be charged by the removal of the screwed plug a^2 when a tube such as is represented in Fig. 3 is placed in the hole a^3 thereby closing temporarily the tube c and preventing any of the fluid entering therein, said fluid passing into the case a through the holes at a^4 . When additional jets are required either horizontally or vertically, I form a boss on either or both sides of the elbow v^3 in which is the gas passage m and connect thereto pipes such as v^4 in Fig. 7 to which jets are attached in any position required.

For the purpose of revolving the lime at times when personal supervision is not convenient, I attach clockwork mechanism consisting of a spring contained in a drum x with ordinary clockwork gearing, that may

be connected either in the manner shown in Fig. 8 or in other preferred position.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is—

1. In an apparatus for producing lime light, the case, a tube and valve-carrier arranged within the case, a gas-supply and a burner for said tube and valve-carrier arranged outside the case, said tube and valve-carrier having a valved passage leading from the gas-supply and communicating with the interior of the case, a passage leading from the interior of the case and communicating with the burner, and an independent valved passage leading from the gas-supply and communicating directly with the burner, the lime, and means for supporting said lime in proper relative position to the burner, substantially as described.

2. In an apparatus for producing lime light, the case, a tube and valve-carrier arranged within the case, a gas-supply and a burner for said tube and valve-carrier arranged outside the case, said tube and valve-carrier having a valved passage leading from the gas-supply and communicating with the interior of the case, a passage leading from the interior of the case and communicating with the burner, and an independent valved-passage leading from the gas-supply and communicating directly with the burner, the lime and a support therefor, and means for automatically adjusting the lime in proper relative position to the burner, substantially as described.

3. In an apparatus for producing lime light, the case, a tube and valve-carrier arranged within the case, a gas-supply and a burner for said tube and valve-carrier arranged outside the case, said tube and valve-carrier having a valved passage leading from the gas-supply and communicating with the interior of the case, a passage leading from the interior of the case and communicating with the burner, and an independent valved passage leading from the gas-supply and communicating directly with the burner, a valve v' for regulating the supply of gas to said burner, the lime, and means for supporting said lime in proper relative position to the burner, substantially as described.

4. In an apparatus for producing lime light, the combination of the case a , the tube and valve carrier b arranged within said case and provided with a gas supply and valved gas passages, a tube d extending from one of said valved gas passages and opening into the bottom of the case and provided with a diaphragm e , and a tube c extending upwardly from such tube and valve carrier and opening into the top of the case and communicating with the burner tube through another of the said passages, substantially as described.

5. In an apparatus for producing lime light, the combination of the case a containing inflammable material, the tube and valve car-

rier *b* arranged within said case and provided with a gas supply and valved gas passages, a tube *d* extending downwardly from said tube and valve carrier and opening into the bottom of the case and communicating with the gas supply through one of said passages and also opening into the inflammable material in the case, a tube *c* extending upwardly from the tube and valve carrier and opening into the top of the case and communicating with the burner tube through another of such gas passages, the lime, and means for adjusting said lime in proper relative position to the burner tube, substantially as described.

6. In an apparatus for producing lime light, the combination of the case *a* containing inflammable material, the tube and valve carrier *b* arranged within said case and provided with a gas supply and valved gas passages, a tube *d* extending downwardly from said tube and valve carrier and opening into the bottom of the case and communicating with the gas supply through one of said passages and also opening into the inflammable material in the case, a tube *c* extending upwardly from the tube and valve carrier and opening into the top of the case and communicating with the burner tube through another of such gas passages, the lime, a support therefor ar-

ranged outside the case, and a shield interposed between the case and lime, substantially as described.

7. In an apparatus for producing lime light, the combination of the case *a* containing inflammable material, the tube and valve carrier *b* arranged within the case and provided with a gas supply and valved gas passages, a tube *d* extending downwardly from said tube and valve carrier and opening into the bottom of the case and communicating with the gas supply through one of said passages and also opening into the inflammable material in the case, a tube *c* extending upwardly from the tube and valve carrier and opening into the top of the case and communicating with the burner tube through another of such gas passages, a suitable number of jets arranged outside the case and communicating with the burner tube, the lime and means for adjusting said lime in proper relation to the jet or jets, substantially as described.

In testimony whereof I have hereunto set my hand this 2d day of June, A. D. 1893.

WILLIAM LAWSON.

Witnesses:

THOMAS PRESCOTT,
FRANK PRESCOTT.