

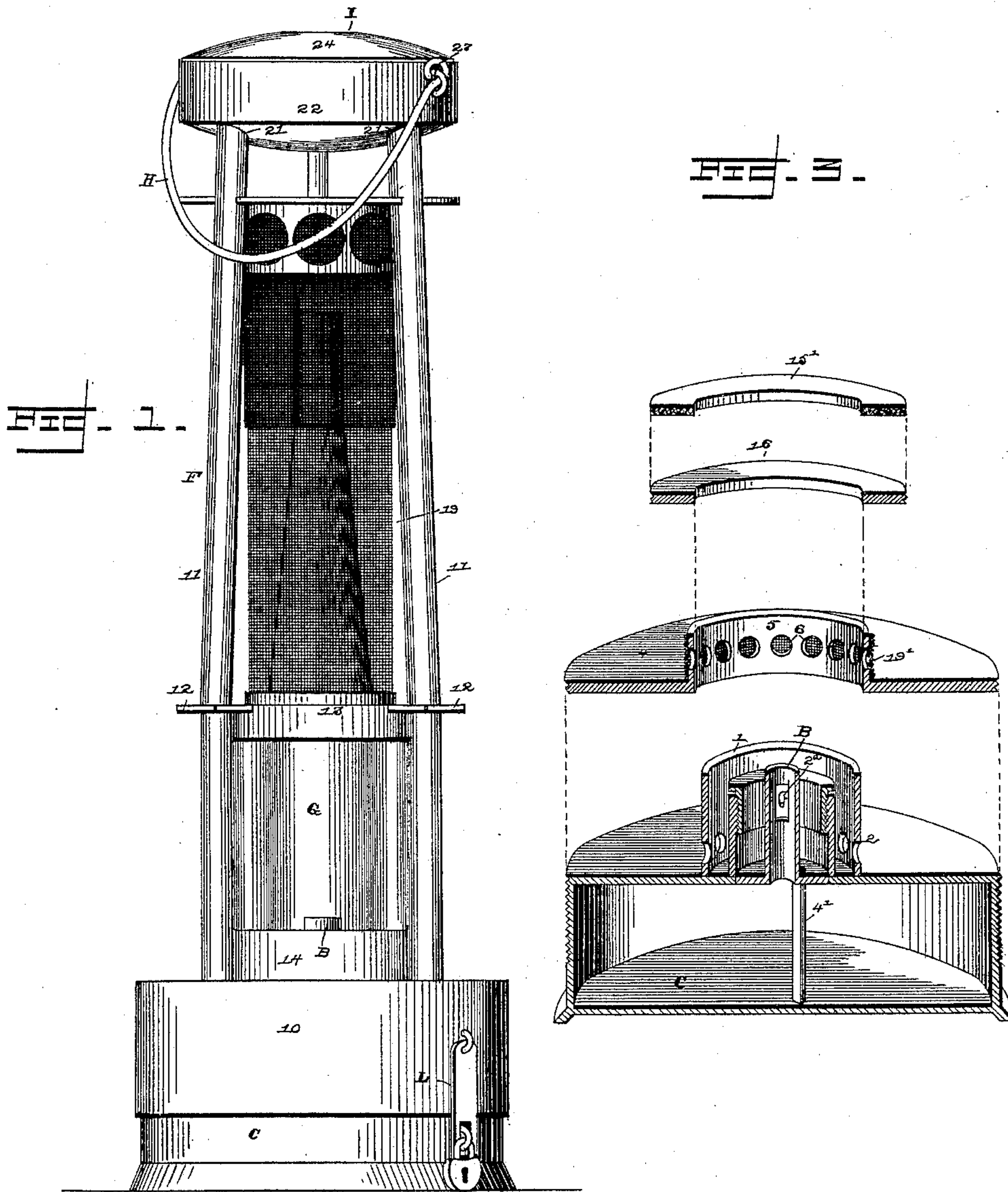
(No Model.)

2 Sheets—Sheet 1.

A. L. NELSON, J. KNAPPER & I. TAYLOR.  
SAFETY MINER'S LAMP.

No. 474,182.

Patented May 3, 1892.



Witnesses

E. S. Duwall Jr.  
W. J. Collamer.

Inventors

Andrew L. Nelson,  
Joseph Knapper and  
Isaac Taylor.

C. A. Snow & Co.

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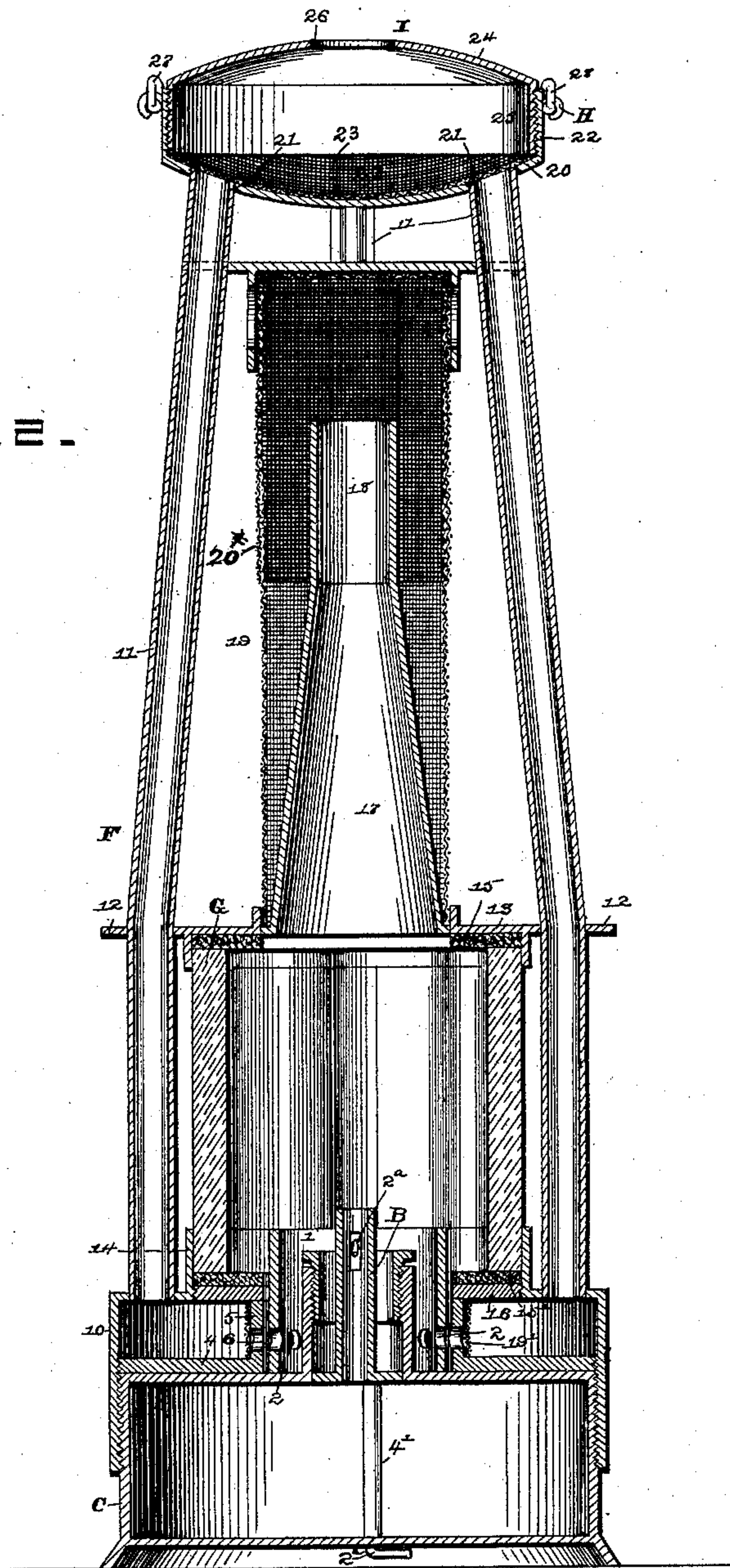
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FIG. 2.



Witnesses

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By their Attorneys,

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# UNITED STATES PATENT OFFICE.

ANDREW L. NELSON, JOSEPH KNAPPER, AND ISAAC TAYLOR, OF DUNBAR,  
PENNSYLVANIA.

## SAFETY MINER'S LAMP.

SPECIFICATION forming part of Letters Patent No. 474,182, dated May 3, 1892.

Application filed June 22, 1891. Serial No. 397,051. (No model.)

*To all whom it may concern:*

Be it known that we, ANDREW L. NELSON, JOSEPH KNAPPER, and ISAAC TAYLOR, citizens of the United States, residing at Dunbar, in the county of Fayette and State of Pennsylvania, have invented a new and useful Safety Miner's Lamp, of which the following is a specification.

This invention relates to lamps employed in mines for detecting the presence of gases or fire-damp; and the object of the same is to produce an improved lamp of this character which will test the condition of the air at the top of galleries, which will not explode if the air be heavily charged with gas, and which cannot be tampered with by unauthorized persons.

To this end the invention consists in a gas-alarm lamp of the construction hereinafter more fully described and claimed, whereby the above and other advantageous results are attained, and as illustrated on the two sheets of drawings, wherein—

Figure 1 is a side elevation of this lamp. Fig. 2 is a central longitudinal vertical section through two of the vertical tubes. Fig. 3 is a perspective sectional detail of the lamp-body, comprising the oil-cup, the extinguisher, and the burner, the parts being slightly separated.

Referring to the said drawings, the letter C designates the oil-cup, B the burner, G the globe, F the frame of the lamp, I the inlet-chamber, and H the carrying handle or bail, these parts being of the specific construction described below.

The oil-cup C is cylindrical, and the burner B rises from the center of the top thereof, being of any approved construction which will serve in a lamp of this character. Around the burner is a short upright tube 1, rising from the top of the oil-cup and having openings 2 near its base, through which air is supplied to support combustion. The wick is preferably controlled by a wick-raising device 2<sup>a</sup>, extending through a vertical pipe 4' in the body of the oil-cup, as shown, and by this means the wick can be manipulated from outside of the lamp.

4 is a disk resting upon the body of the oil-cup and having an opening at its center of a size to fit around the upright tube 1, and around this opening rises a small flange 5, having openings 6, adapted to register with those in said upright 2.

The frame F of this lamp comprises a cylindrical base 10, having threads on its inner face and into which the oil-cup C, with the disk 4, is adapted to be screwed, as seen in Fig. 2. At the upper end of this frame is the inlet-chamber I described below, and about four tubes 11 connect this chamber with the base passing intermediately through ears 12 on a collar 13. The base has a large opening in the center of its top surrounded by an upright flange 14, which is internally screw-threaded, and the globe G is adapted to be passed upwardly through the flange and bear against a packing-ring 15 beneath the collar 13.

16 is a closing-ring adapted to be screwed into the upright flange 14 around the upright tube 1, and on this ring rests a packing-ring 15', which bears against the lower end of the globe G and holds the same tightly in place.

It is to be understood that in assembling the parts the globe and the closing-ring are put in first, and afterward the oil-cup, with its disk, is inserted.

Rising from the collar 13 is a cone 17, with a tubular extension 18 leading nearly to the bottom of the inlet-chamber I, and surrounding these members is a gauze cylinder 19, as shown. A gauze strip 19' surrounds the flange 5, rising from the disk 4, and covers the openings 6 therein. The inlet-chamber is composed of a base 20, having openings 21, into which the tubes 11 are screwed, and having upright sides 22, which are internally screw-threaded for some distance from their upper ends.

23 is a gauze sheet standing across this chamber, as shown.

24 is a closing-cap having depending sides 25, which screw into the sides 22 of the chamber and having a central inlet-opening 26. The handle H is connected to eyes 27 on the sides 22 of the base of this chamber.

With the above construction of parts the



uses and advantages of this lamp are as follows: The air entering through the opening 26 passes into the chamber I, through the gauze 23, down the tubes 11, and into the base 10 above the disk 4. The height of the flange 5 forms an annular chamber between the disk 4 and the top of the base, and the air passing into this chamber leads next through the gauze strip 19' and through the registering-holes 6 and 2 to the burner B. The products of combustion rising from the burner pass upwardly through the cone 17 and extension 18, out of the upper end of the latter, thereby heating the inlet-chamber, and downwardly out through the meshes of the gauze cylinder 19. It will thus be seen that this improved lamp takes its air for combustion from the uppermost point, and hence if the lamp be used in mines it may be raised to the top of galleries to ascertain the presence of gas or fire-damp therein. The result of the same would be to increase the flame, because the gas as it is supplied thereto facilitates combustion; but by the well-known principle that a blaze will not pass through a gauze the flame will be next extinguished. Although I have not illustrated it, a hose could be led to the opening 26 in the inlet-chamber and air could be conveyed thereto from a remote point, and by this means the air at the top of a high gallery could be tested without raising the lamp thereto.

As before stated, a blaze will not pass through a gauze; but to absolutely prevent such passage of the blaze the upper part of the gauze covering is made double, as at 20<sup>x</sup>, (clearly shown in Fig. 2,) the mesh of said double covering being thereby necessarily arranged out of alignment and making it still more difficult for escape of flame.

The letter L designates a lock of any approved construction, by means of which the oil-cup is locked in the base 10 of the frame, whereby unauthorized persons are prevented from tampering with the device, and if this lock be unlocked while the lamp is burning and the operator seeks to withdraw the oil-cup from the frame the first movement necessary in unscrewing it will cause the upright tube 1 to turn within the flange 5, so that the holes 2 and 6 will be thrown out of register, and by this means the flame will be extinguished without damage.

To disconnect the parts of this lantern the oil-cup is wholly unscrewed, after which the disk 4 may be also removed, as will be clear. The packing 15 and 15' prevents leakage of air into the blaze around the ends of the globe, and the screw-threads are so closely fitted as to also prevent leakage between parts. The escaping products of combustion heat the inlet-chamber, as above stated, and the air-supply is thereby prepared for burning, as well understood in this art.

What is claimed as new is—

1. In a lamp, the combination of an upper inlet-chamber having an opening in the top thereof, tubes leading downward from and connected to the bottom of said chamber, a closed cylindrical base comprising a top, to which said tubes are connected and open there-through, a disk screwed into said base and having a central opening, a flange rising from said disk around its opening and itself having openings, a gauze strip outside of said flange over the openings therein, an oil-cup screwed into said base and having a burner, an upright tube on said oil-cup around the said burner thereof and having openings near its lower end adapted to register with those in the flange, a globe fitted over said burner in an air-tight manner, a cone above said globe, and a gauze covering over said cone, substantially as described.

2. In a lamp, the combination, with an inlet-chamber having an opening in its top, tubes leading downwardly from said chamber, a base into which said tubes open, and an oil-cup supported by said base and carrying a burner, of a globe mounted on said base, a collar at the upper end of said globe, ears thereon embracing said tubes, a cone rising from said collar and having an upward extension opening beneath said inlet-chamber, and a gauze cylinder surrounding said cone and extension, substantially as described.

3. In a lamp, the combination, with an oil-cup and burner, a base embracing the same and having an annular opening, a gauze strip between said opening and burner, and tubes extending upwardly from said opening, of a globe and chimney surrounding the burner, an inlet-chamber above the chimney and with which said tube communicates, a gauze disk across the chamber, the latter having an opening in its upper end, and a bail or handle secured to the side walls of the chamber, substantially as described.

4. In a lamp, the combination of a closed cylindrical base having internal screw-threads, a disk screwed therein and having a central opening, a flange rising from said disk around its opening and itself having openings, an oil-cup screwed in said base, a burner at the center of the top thereof, an upright tube on said cup around the burner having holes adapted to register with those in the flange, a globe over said burner, an upper extension over said globe, an upper inlet air-chamber, and tubes connecting said air-inlet chamber with the base, substantially as described.

5. In a lamp, the combination, with a base having internal screw-threads, a disk therein having a central opening, and a flange rising from said disk around its opening and itself having openings, of an oil-cup screwed into the base, a lock between said cup and base, a burner at the center of the top of the cup, and an upright tube on said cup around the



burner having holes adapted to register with those in the flange, substantially as hereinbefore set forth.

5 6. In a lamp, the combination of a base with a burner and a globe around said burner, a cone mounted over and extending upward from said globe, and a gauze covering surrounding said cone and having the upper part thereof of double thickness, substantially as described.

In testimony that we claim the foregoing as our own we have hereto affixed our signatures in presence of two witnesses.

ANDREW L. NELSON.  
JOSEPH KNAPPER.  
ISAAC TAYLOR.

Witnesses:

W. A. BARNES,  
CHAS. MULLIGAN.