

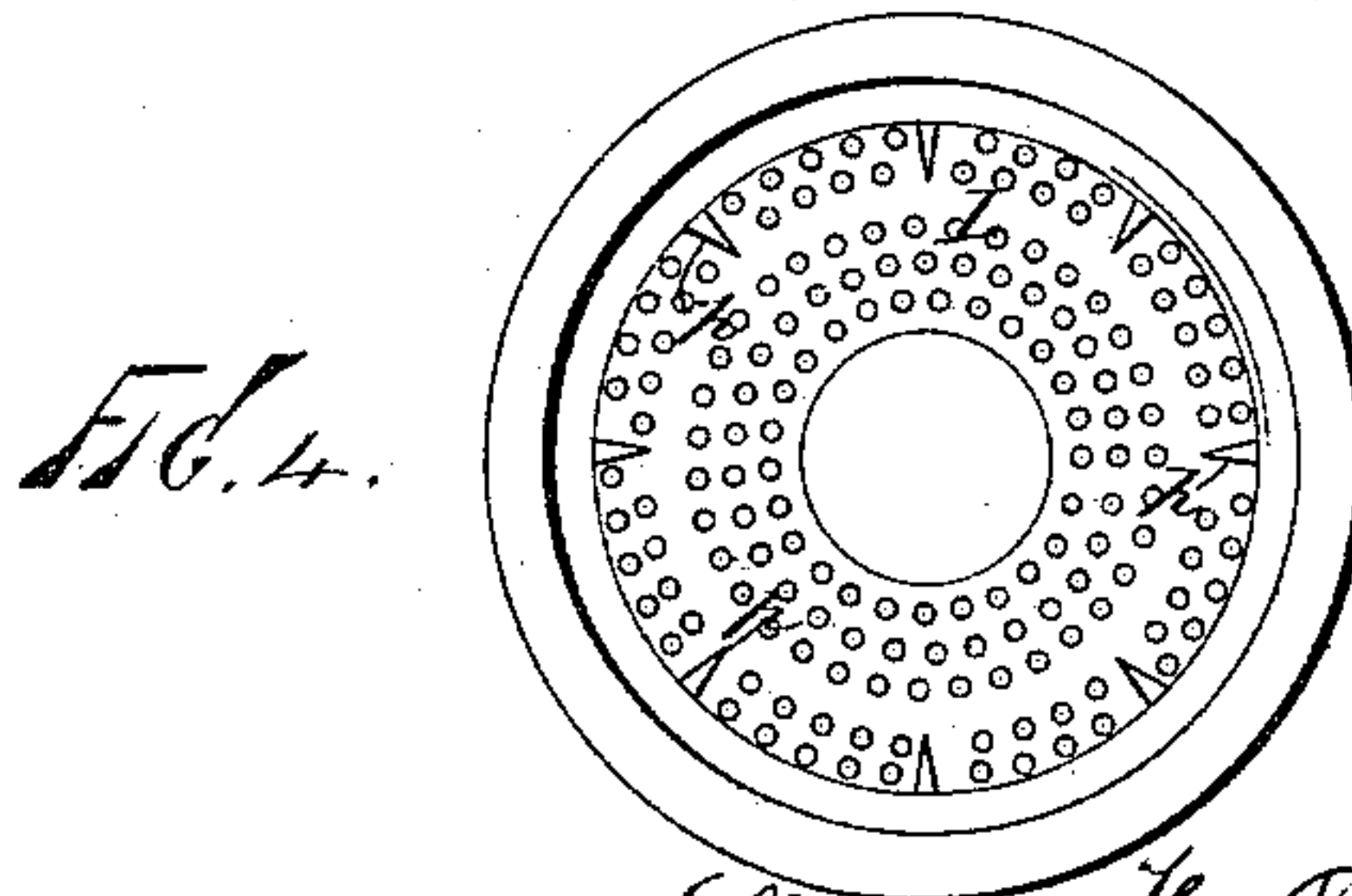
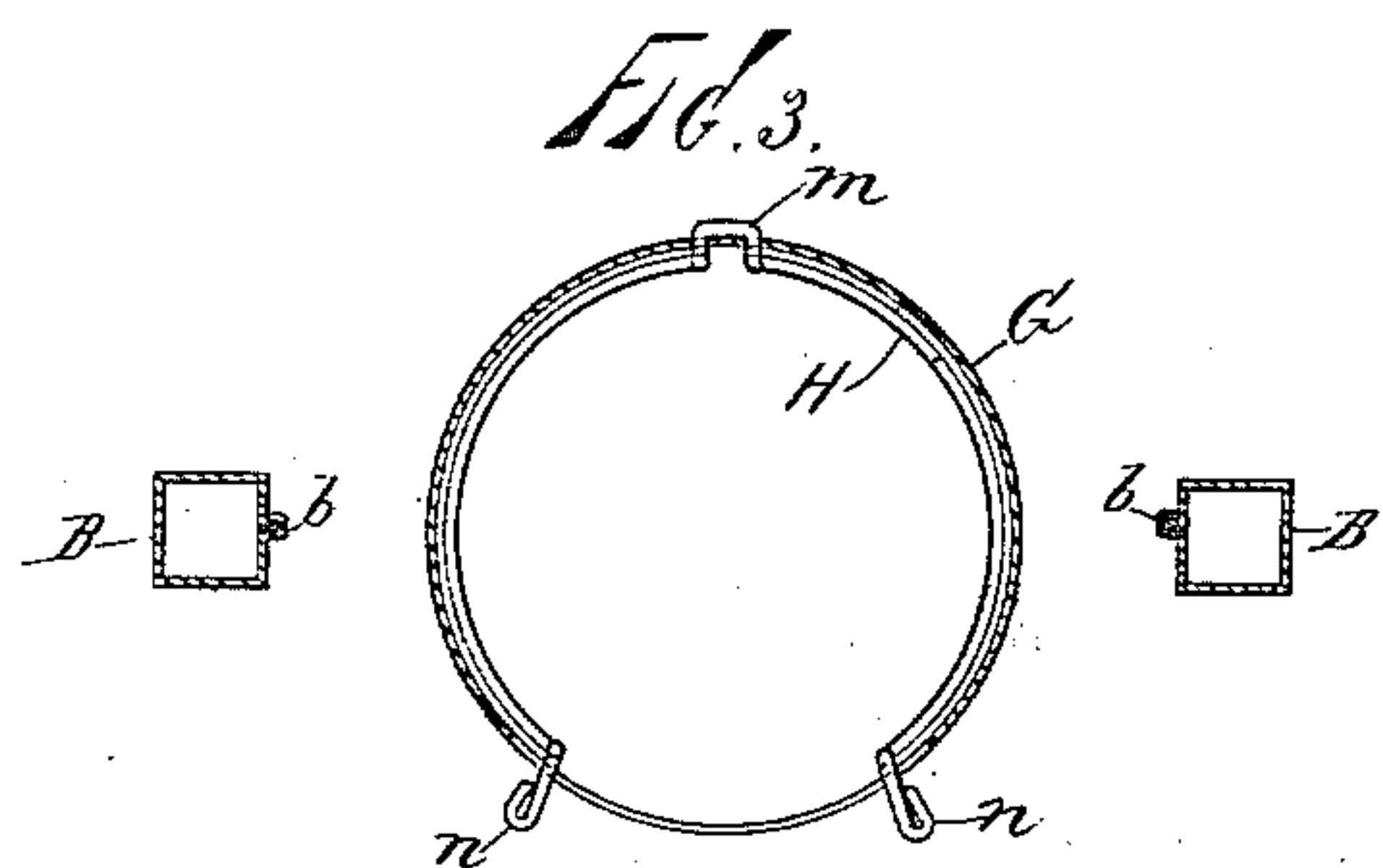
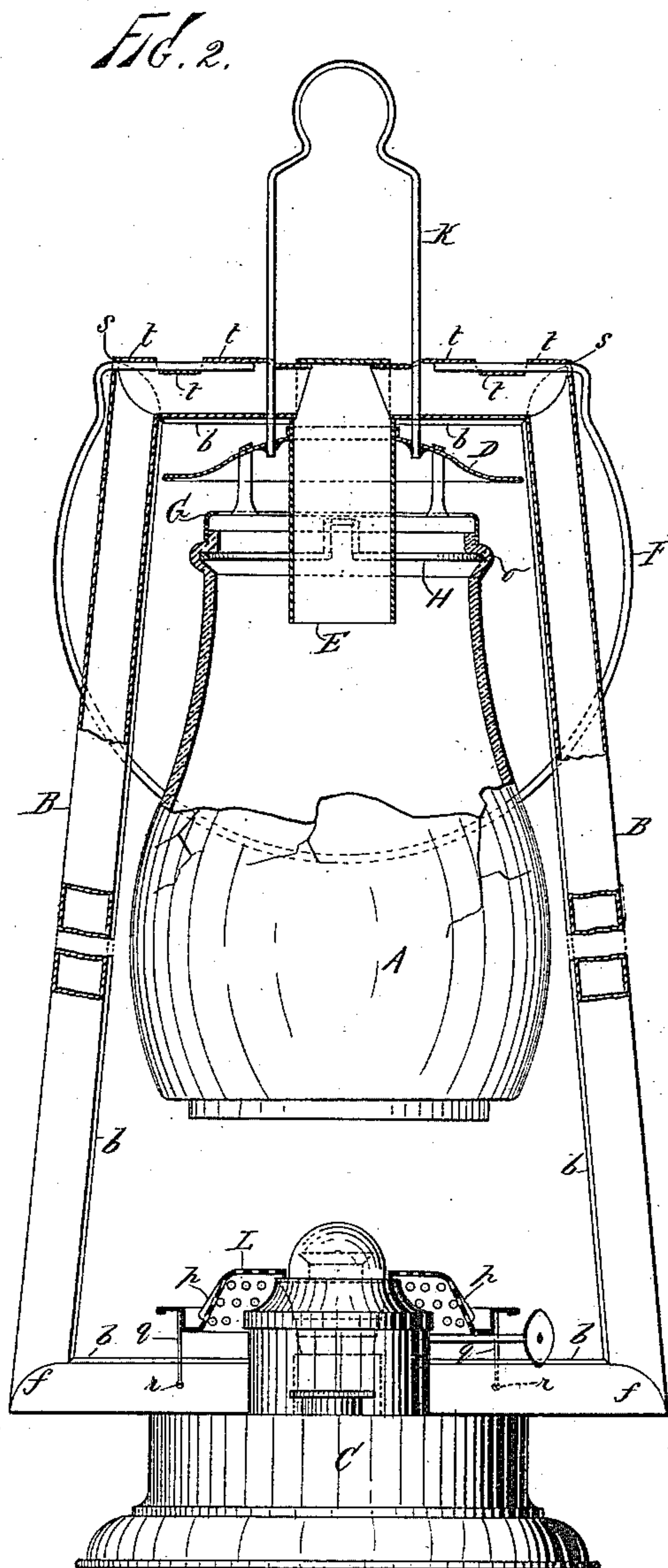
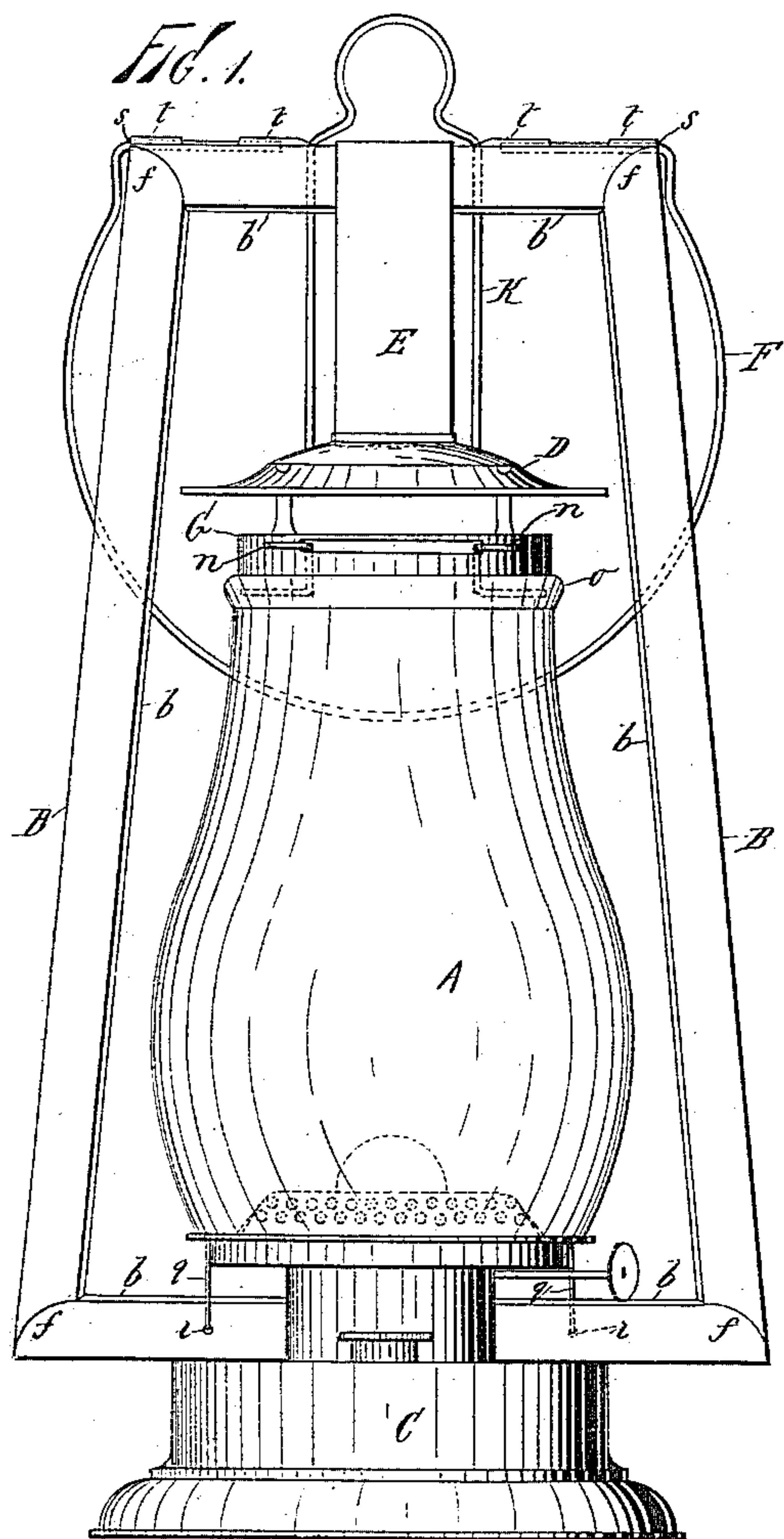
(No Model.)

2 Sheets—Sheet 1.

L. F. BETTS.  
TUBULAR LANTERN.

No. 379,304.

Patented Mar. 13, 1888.



Witnesses:  
John Buckner,  
L. H. Osgood,

Lewis F. Betts,  
Inventor:  
By North & Good,  
Attorney.

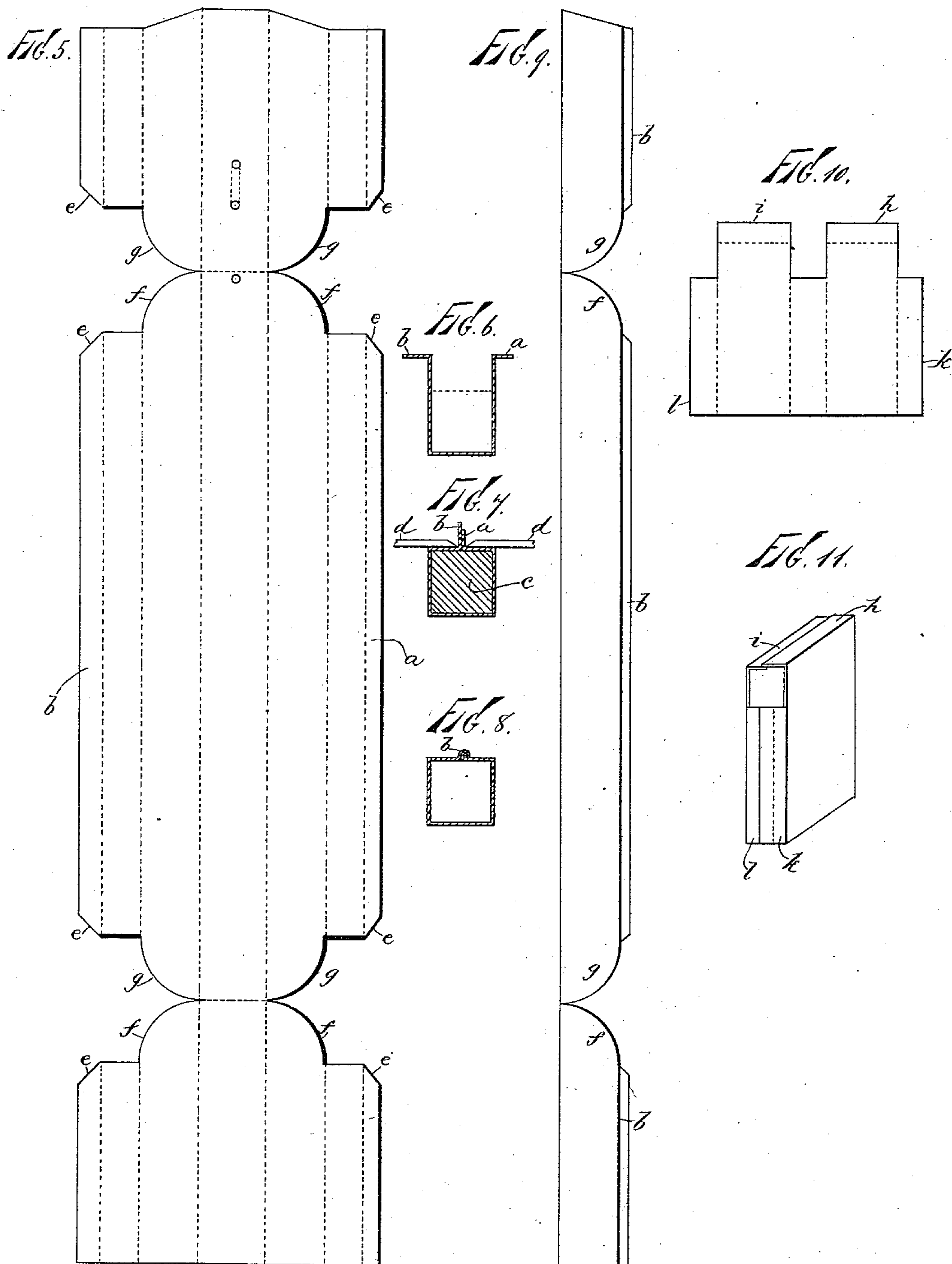
(No Model.)

2 Sheets—Sheet 2.

L. F. BETTS.  
TUBULAR LANTERN.

No. 379,304.

Patented Mar. 13, 1888.



Witnesses:  
John Buckle,  
L. H. Osgood

Lewis F. Betts,  
Inventor:  
By North Osgood,  
Attorney.



# UNITED STATES PATENT OFFICE.

LEWIS F. BETTS, OF NEW YORK, N. Y., ASSIGNOR TO ROSA M. BETTS, OF  
SAME PLACE.

## TUBULAR LANTERN.

SPECIFICATION forming part of Letters Patent No. 379,304, dated March 13, 1888.

Application filed February 12, 1887. Serial No. 227,370. (No model.)

*To all whom it may concern:*

Be it known that I, LEWIS F. BETTS, of New York city, county and State of New York, have invented certain new and useful Improvements in Tubular Lanterns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention has relation to that class of lanterns or illuminating devices wherein air for the support of combustion is conducted down to the under side of the burner-cone from a point or points in the region of the outlet for products of combustion through suitable tubes provided for the purpose, which class is now commonly known as "tubular lanterns," "tubular lamps," &c.

The principal objects of my invention are to simplify and improve the general construction of the lantern or lamp; to make the tubes each of a single piece of metal and angular in cross-section, whereby they may be easily and quickly made and securely mounted in place, requiring very little solder and being more rigid and durable than the round forms; to simplify the globe lifting and holding attachments or accessories, rendering them convenient, accurate, and durable; to provide simple and efficient means for guiding the globe to its seat, for securing the perforated bottom, burner, and cone against accidental disarrangement, and for mounting the bail in connection with the tubes, and to secure other advantages in the matter of construction and arrangement, as will appear from the following explanations. To accomplish all of this my improvements involve certain new and useful arrangements or combinations of parts and details of construction, as will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is an elevation of a tubular lantern constructed and arranged for operation in accordance with my invention and embodying my improvements, the globe being shown in its closed and locked position resting upon the perforated bottom, as when the lantern is burning. Fig. 2 is an elevation, partly in section, showing the globe elevated to give access to the burner for lighting, ex-

tinguishing, trimming, &c., a fragment being broken out of each tube, so as to show its angular form. Fig. 3 is a horizontal sectional view upon a plane passing through the upper globe-holder and tubes, showing the globe-holding spring in plan. Fig. 4 is a plan view of the perforated globe-bottom detached. Fig. 5 is a plan view showing the general form of the blank from which each tube is made in accordance with my invention; Fig. 6, a cross-section showing the sides and marginal flanges bent and ready to receive a mandrel; Fig. 7, a similar view showing the mandrel in place and the flanges pinched together, and Fig. 8 a cross-section showing the flanges turned one upon the other and locked. Fig. 9 is a side view of the tube before the branches are bent and soldered in place. Fig. 10 is a plan of the blank from which the angular central pipe may be formed, and Fig. 11 is a view in perspective of the completed central pipe detached from the other parts.

In all the figures like letters of reference, wherever they occur, indicate corresponding parts.

A is the globe or flame-protector; B B, the air-conducting tubes; C, the oil-pot; D, the dome; E, the central air-pipe through which air is delivered to the tubes, and F the bail or handle.

According to my invention I make the side tubes each of one piece of metal and square (or substantially square) in cross-section, proceeding as follows: I take flat strips of tin or other metal of proper length and width and cut or trim or stamp these, as shown in Fig. 5, to form the blanks, which are afterward to be bent along the dotted lines, suitable machinery or implements being employed for the purpose. At one stage the parts assume the form shown in Fig. 6, the two flanges *a* and *b* being of unequal widths, so that one may double over the other to form the lock. A mandrel is then inserted, as at *c*, Fig. 7, and those parts above the dotted line in Fig. 6 brought to the position shown in Fig. 7, the two flanges touching each other, and pinched firmly together by any suitable tools, as at *d d*, after which they (the flanges) are beaded or locked or bent, as shown in Fig. 8, and the mandrel withdrawn. The tube thus made is then of the form shown in



Fig. 9, the end portions ready to be bent at suitable angles with the middle or main part, so as to take the form and position indicated in Figs. 1 and 2. That the seam or joint may not interfere with the proper bending and locating of the parts, the blank, Fig. 5, is cut away, as at *e e*, which leaves the seam, when finished, with inclined ends, as in Fig. 9, which may abut against each other after the parts are bent to final position. Air for the support of combustion travels downwardly in the tubes, and, that the currents may not be interfered with, the rounded portions *f f* are made to lap over the outside of the portions *g g*. The ends of the tube, being bent to final location, require only to be soldered at the angles, which soldering may be easily and quickly done, the joints being flat.

The blank from which the central air-pipe is made is shown at Fig. 10. This being bent to the form indicated in Fig. 11, the parts *h i* and *k l* are secured by soldering and the central pipe is completed. It should be a trifle greater in cross-section than the two side tubes together, so as to insure an abundant supply of air to them.

The ends of the side pipes are secured in the top of the central air-pipe, as indicated in Fig. 2, the joints being all plain or flat, and consequently easily and quickly made and strong and durable, as will be readily seen.

The dome *D* is movable up and down upon the central air-pipe and carries with it a metallic globe-ring, *G*, to which the globe is removably connected by a spring, *H*. This spring *H* is mounted in ring *G*, as by a loop, *m*, passing through the ring and soldered upon the exterior, and has two finger-pieces, as *n n*, projecting through a slot in the opposite side of the ring. The two portions of the spring enter the neck *o* of the globe, being suitably bent for that purpose, and when they are in place connect the globe with the ring, so that it must move with it. To detach the globe the spring has only to be compressed.

It is desirable to elevate the globe at times, so as to gain access to the burner. Heretofore globe-lifters have been connected with the perforated bottom plate, requiring guides for the long wires to be connected with the side tubes and preventing the detachment or removal of the globe except when in a certain position. According to my improvement I employ a spring lift-wire, *K*, passing through the upper sections of the air-tubes and connected with the top or dome, *D*. The dome being guided upon the central air-pipe and each branch of the lift-wire at two points in the tube through which it passes, no further or extra guiding arrangement is required.

The globe is elevated or depressed by simply moving the lift-wire. When down to its final position, as in Fig. 1, the upper bent portions of the wire spring very slightly beneath the margins of the upper orifices in the air-tubes, thus holding the globe firmly to its seat and

requiring no other lock or catch for this purpose.

The perforated bottom plate for the globe is represented at *L*. This fits over the burner-cone and admits air to the exterior of the flame. To guide the bottom of the globe accurately to its final position (after being elevated) and to prevent disarrangement of the bottom plate, the central portion of this plate is considerably elevated, and upon the face of this elevated part I provide any number of plain ridges, as at *p p*.

To secure the burner and cone against accidental disarrangement, as when not held in place by the globe, and to likewise secure the bottom plate, I lock the bottom plate in place and rely upon this to hold the burner and cone. Upon the bottom plate I secure two wires or strips, as at *q q*, projecting downwardly to a point below the tops of the lower parts of the air-tubes. These parts of the air-tubes are perforated, as at *r r*, and receive the lower ends of the pieces *q q*. The pieces *q q* fall on opposite sides of the air-tubes, and the arrangement is such that by turning the plate a trifle the wires will be disengaged from the air-tubes and the top plate may be easily removed to be afterward as easily replaced and locked, as will be readily understood.

With the round-tube lanterns separate appliances have been found necessary for connecting the bail with the air-tubes. Under my construction I simply perforate the tubes, as at *s*, and indent them, as at *t t t*. The ends of the bail are then slipped in place, as best indicated in Fig. 2, and the union between the parts is all that may be desired. The perforations in no way interfere with the joints at the angles, and no soldering or separate pieces are required.

Being constructed substantially as above explained, the improved lantern is found in practice to fulfill all the purposes or objects of the invention previously stated.

I make no claim herein to any method of making the side tubes, nor yet to the side tubes considered independently of other parts, these features forming subjects of separate applications for patent filed February 17, 1888, Serial Nos. 264,391 and 264,392.

Having now fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with a tubular lantern, of the angular air-tubes, each having substantially vertical and horizontal portions, the central air-pipe joined with said tubes, and the flat-topped oil-pot, the lower horizontal portions of the tubes bearing upon the oil-pot and secured thereon, and the seams being located on the inner faces of the tubes, substantially in the manner and for the purposes set forth.

2. The combination, with a tubular lantern, of the adjustable dome, the globe-ring secured thereto, and the globe-holding spring connect-



ing the globe and ring, substantially as shown and described.

3. The combination, with a tubular lantern, of the air-tubes, the dome, the globe, and the  
5 spring lift-wire passing through the air-tubes and connected with the dome, said wire being bent and arranged to automatically lock the globe down by bearing upon the under sur-  
faces of the upper faces of the air-tubes,  
10 through which the bent portions of the spring project, substantially as shown and described.

4. The combination, with a tubular lantern, of the perforated globe-bottom, burner-cone, depending wires or strips, and the perforated  
15 air-tubes, the globe-bottom resting upon the burner-cone and the wires or strips connected with said bottom and arranged to enter the

perforations in the air-tubes for the purpose of locking the parts, substantially as shown and described.

5. In a tubular lantern, the combination, with the air-tubes provided with perforations and indentations, as shown, of the bail the ends of which enter said perforations in the tubes and rest in said indentations, substan-  
25 tially as shown and described.

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

LEWIS F. BETTS.

Witnesses:

WORTH OSGOOD,  
JOHN BUCKLER.