M. I. COHEN.

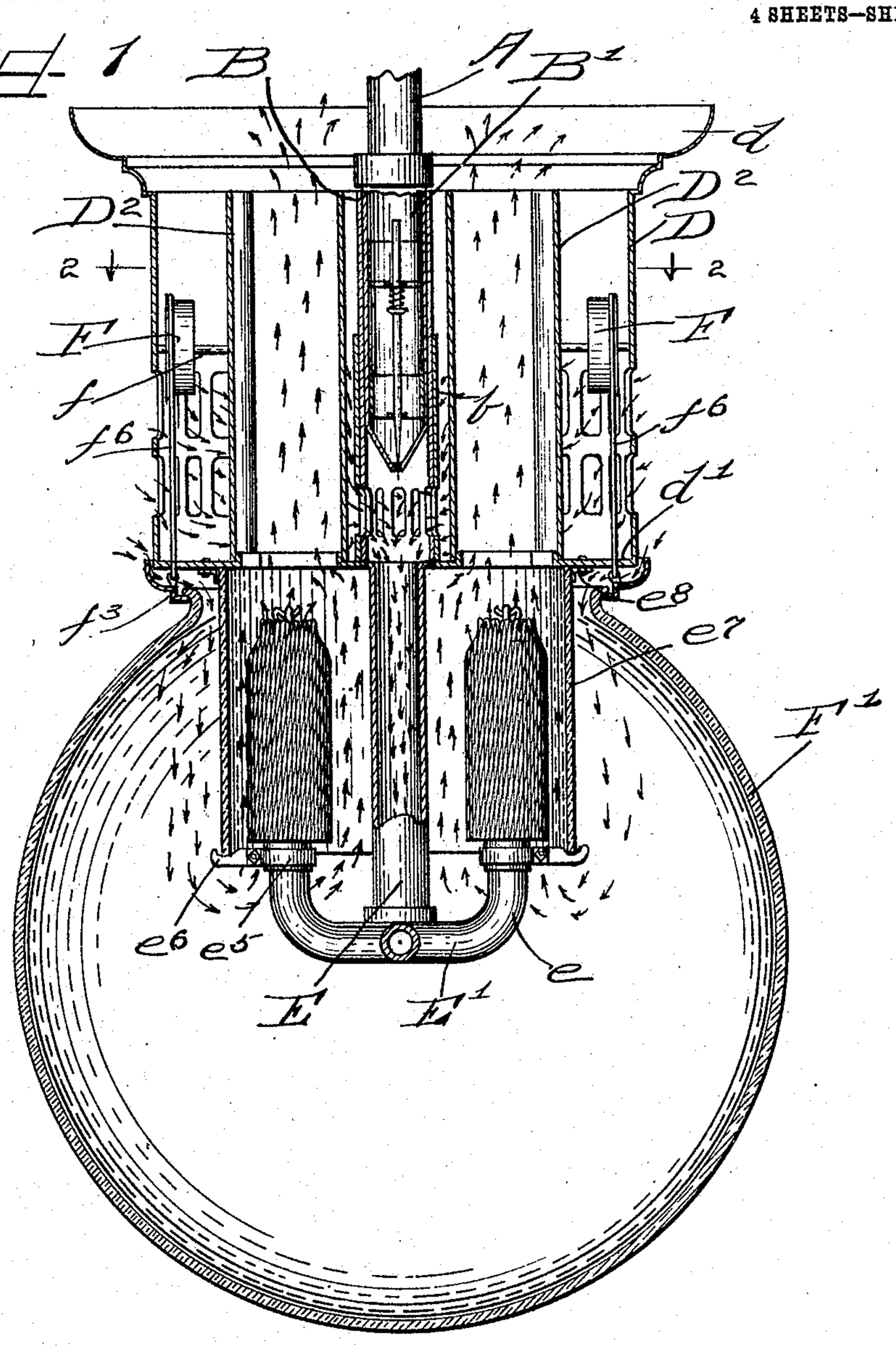
LAMP.

APPLICATION FILED MAY 25, 1908.

924,600. Patented June 8, 1909.

4 SHEETS—SHEET 1.

Fig. 1



Witnesses

J. H. Angell.

J. E. Hannah

Inventor

Morris I. Cohen.

by Charles O. Keep

Atty.

M. I. COHEN.

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4 SHEETS—SHEET 2.

Fig 2

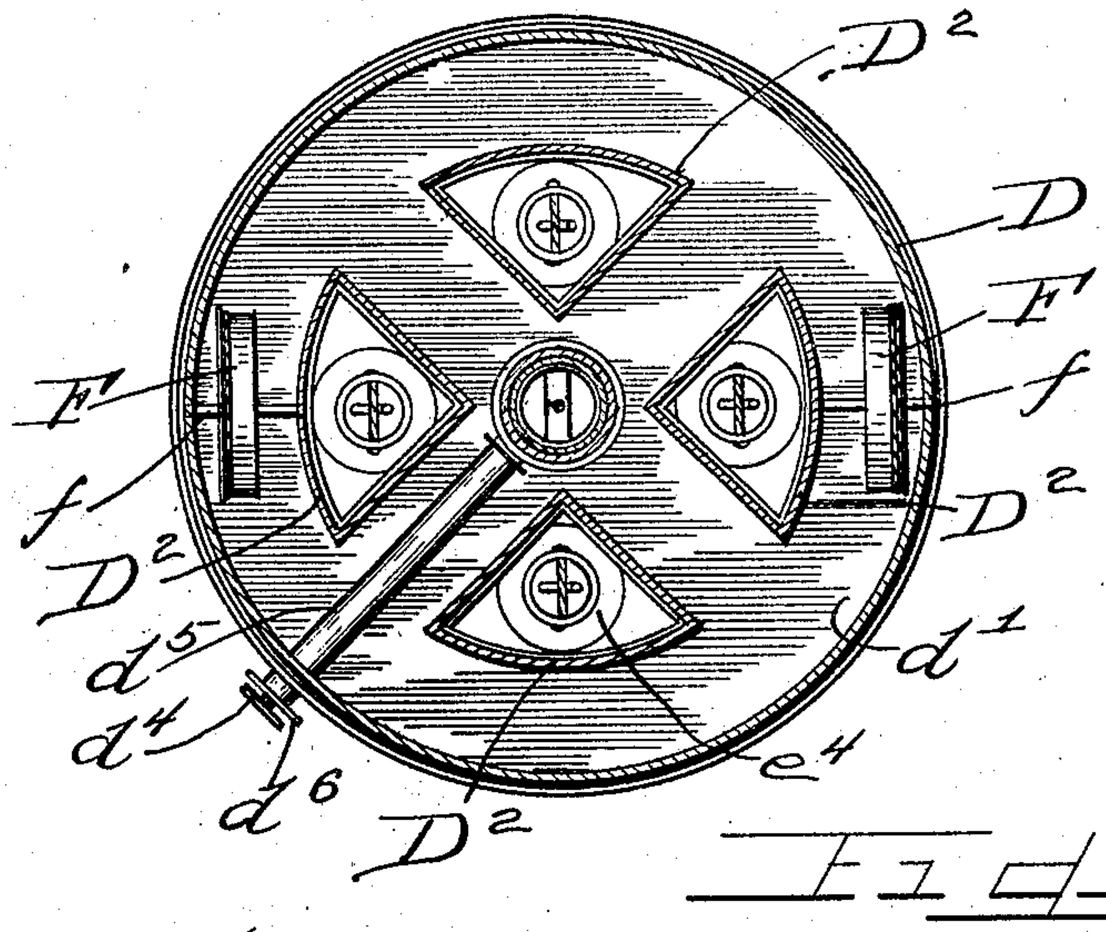


Fig 3

Fig 4

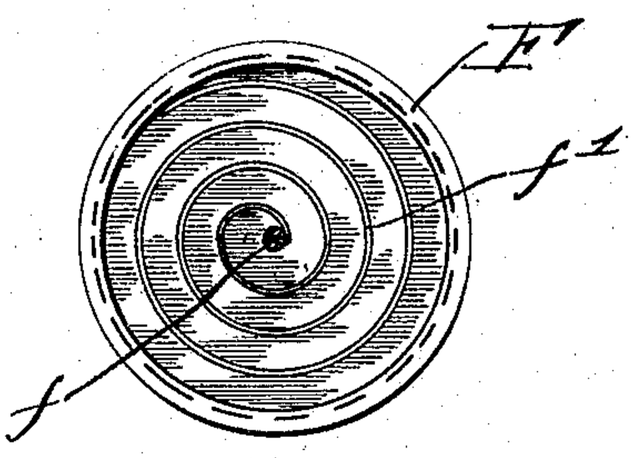


Fig 5

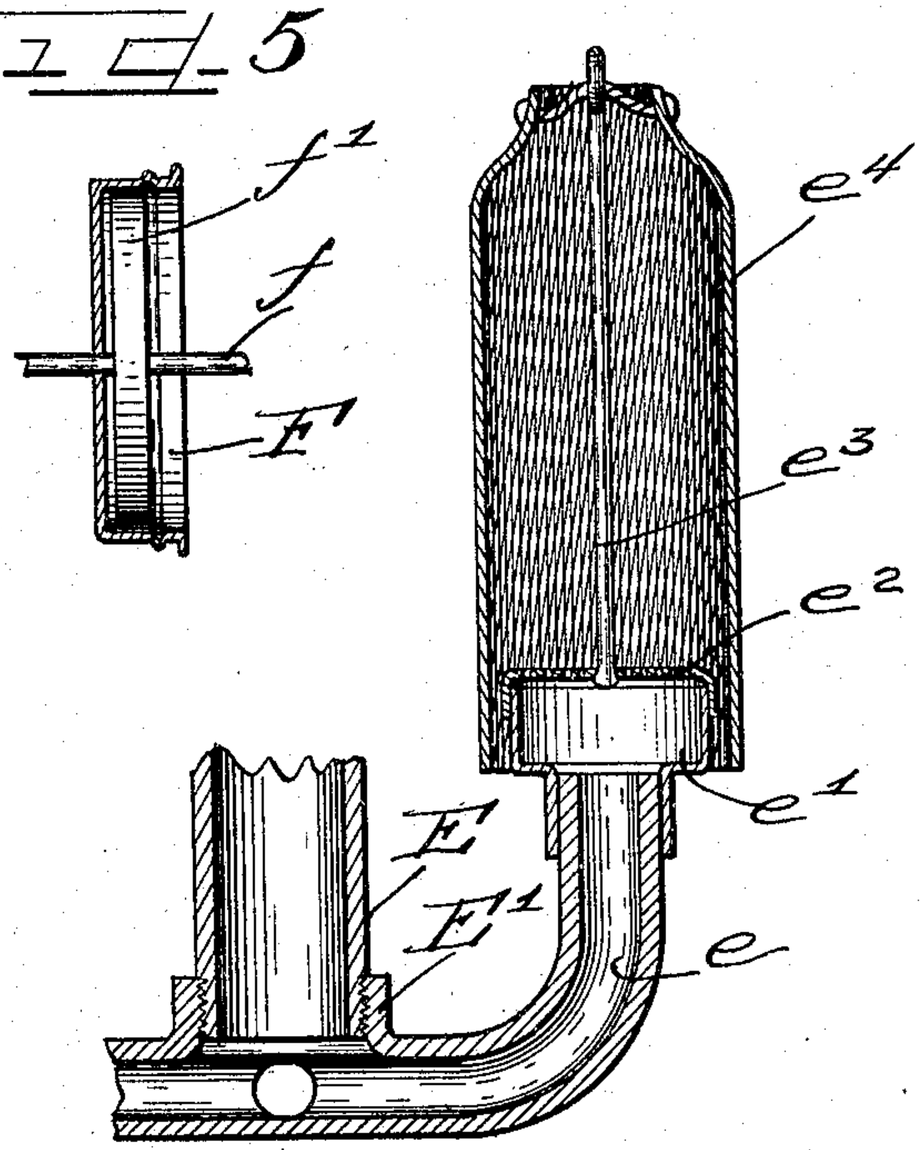
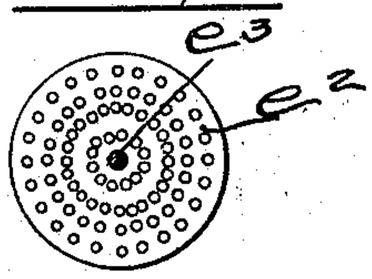


Fig 6



Witnesses

J. H. Angell.

D. C. Hannah

Inventor

Morris I. Cohen.

by Charles Goepel Atty.

M. I. COHEN.

LAMP.

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4 SHEETS—SHEET 3.

Fig. 7

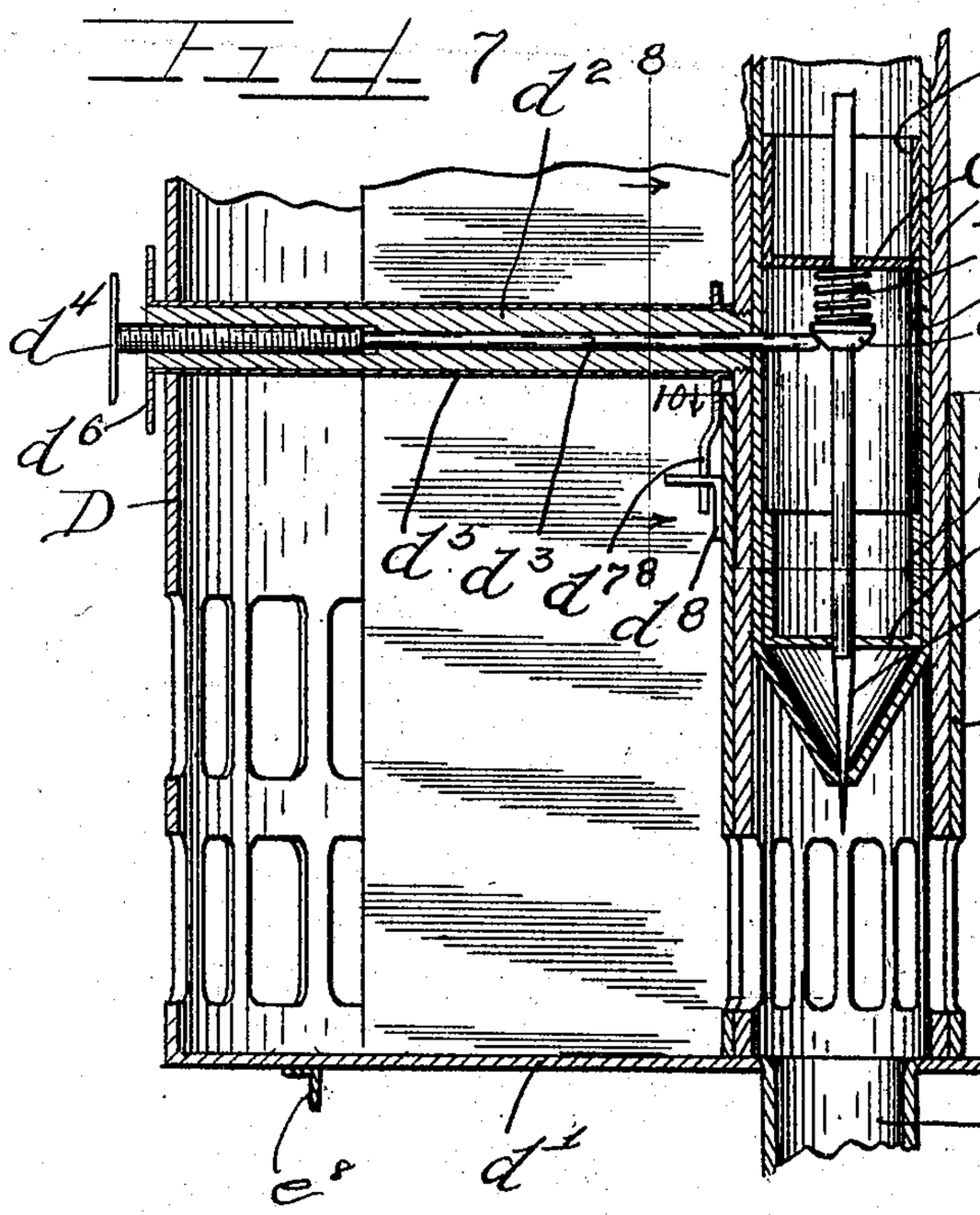


Fig. 8

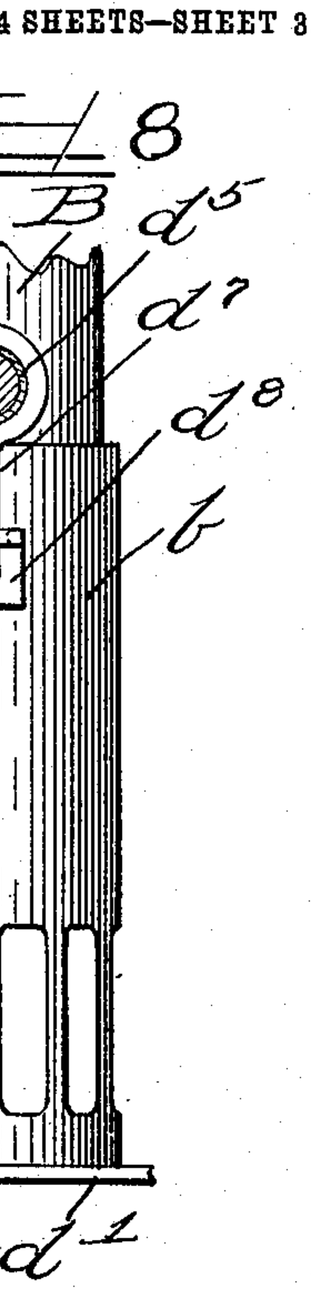


Fig. 9

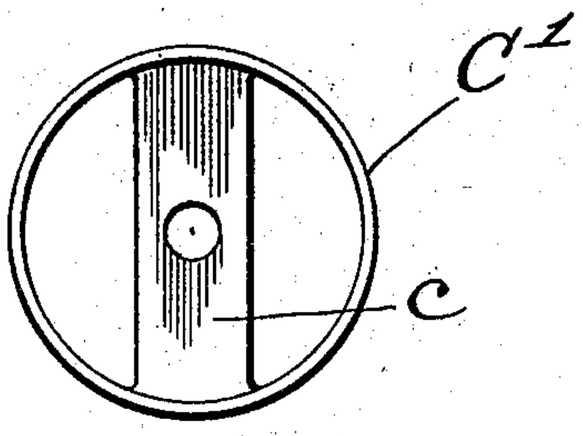
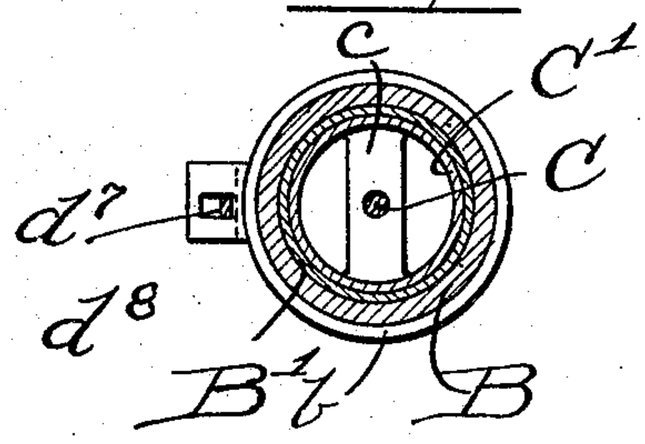


Fig. 10



Witnesses

J. H. Angell.

L. E. Hannah

Inventor

Morris I. Cohen.

by Charles Sies Atty.

M. I. COHEN.

LAMP.

APPLICATION FILED MAY 25, 1908.

924,600. **Patented June 8, 1909.**

4 SHEETS—SHEET 4.

Fig 11

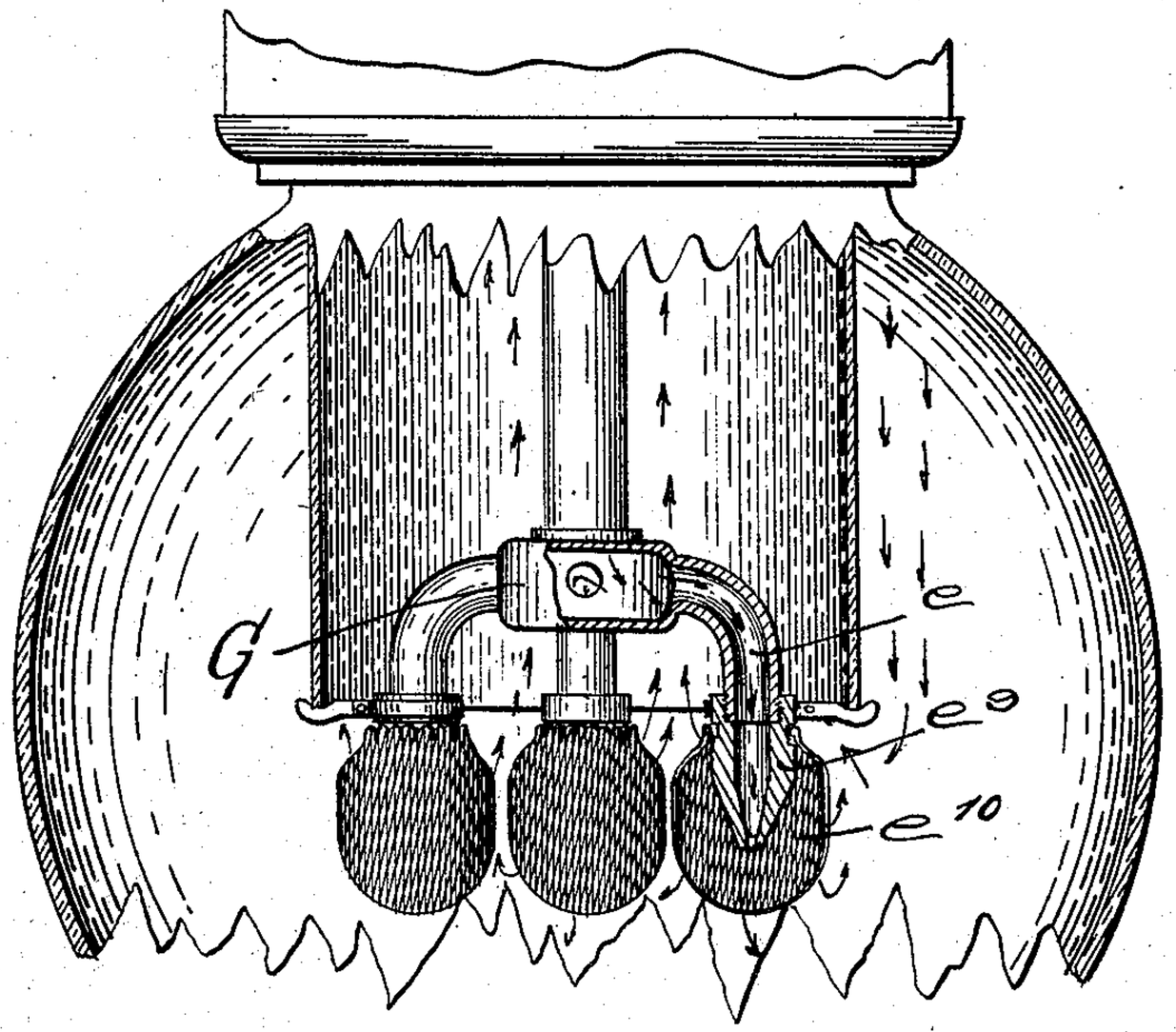


Fig 13

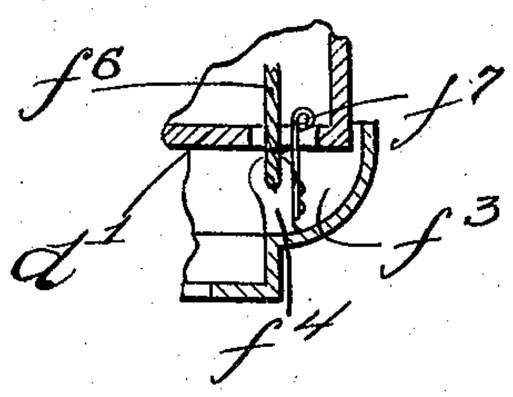


Fig 12

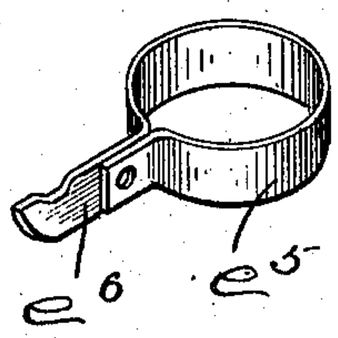
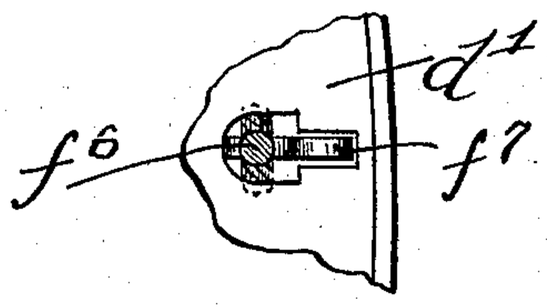


Fig 14



Witnesses

J. N. Angell.

W. E. Hannah

Inventor

Morris I. Cohen.

by Charles W. Hill Atty.

UNITED STATES PATENT OFFICE.

MORRIS I. COHEN, OF CHICAGO, ILLINOIS.

LAMP.

No. 924,600. Specification of Letters Patent. Patented June 8, 1909.

Application filed May 25, 1908. Serial No. 434,980.

To all whom it may concern:

Be it known that I, MORRIS I. COHEN, a citizen of the United States, and a resident of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Lamps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in lamps of that class adapted for any of the various hydro-carbon fluids in the form of a vapor.

Heretofore of the numerous lamps in more or less extensive use in which a vapor or gas is burned, considerable difficulty has been experienced in so adjusting and regulating the supply of the burning fluid as to enable a constant and regular flame to be maintained without variation or flickering, owing to the slight and constantly occurring variations in pressure of the fluid delivered to the burner and also to insure such satisfactory regulation as to prevent carbonization on the mantle when used.

The object of this invention is to provide a lamp of the class described adapted for use either with an inverted or an upright burner, and in which a gas chamber or reservoir is provided exposed to the heat of the burner or burners, and whereby uniformity of pressure is maintained at the burners even though variation may occur in pressure within the main supply pipe.

It is also an object of the invention to afford in a lamp of the class described adjusting means whereby the supply of the hydro-carbon vapor or gas may be adjusted accurately and satisfactorily to the air supply necessary to support perfect combustion.

It is a further object of the invention to afford a construction by the use of which a supply of air is provided both within the mantle and mixed with the gas or vapor to be burned, and also without the mantle, both supplies being more or less heated before coming in contact with the mantle.

It is a further object of the invention to provide a lamp of the class described having both an inner and an outer globe, the outer globe affording at the bottom an entirely closed construction and necessitating the inflow of the air to support combustion at a point above the lamp.

The invention embraces many novel features and consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

In the drawings: Figure 1 is a central vertical section of a lamp embodying my invention and provided with a plurality of burners and in which the burners are directed upwardly. Fig. 2 is a section taken on line 2—2 of Fig. 1. Fig. 3 is a longitudinal, fragmentary, vertical section of one of the burners, its mantle and supply pipe. Fig. 4 is a face view of the spools or spring rollers or drums on which the outer globe is supported. Fig. 5 is a transverse section of the same. Fig. 6 is a top plan view of one of the perforated screens or diaphragms at the top of the burner. Fig. 7 is an enlarged sectional detail of the graduating and adjusting means for regulating the fuel supply. Fig. 8 is a section on line 8—8 of Fig. 7, with parts omitted. Fig. 9 is a top plan view of the upper guide sleeve and bar. Fig. 10 is a section on line 10—10 of Fig. 7. Fig. 11 is a fragmentary, vertical section of a lamp embodying my invention and having the burners turned downwardly, but otherwise constructed as before. Fig. 12 is an enlarged perspective view of one of the supports for the inner globe. Fig. 13 is an enlarged fragmentary detail of a part of the support for the outer globe. Fig. 14 is a fragmentary detail of a part of the support for the outer globe showing the same in plan.

As shown in the drawings: A, indicates the supply or system pipe for coal gas or other hydro-carbon fluid with which it is desired to connect the lamp embodying my invention. Threaded on said pipe is the main supply pipe B, of the lamp, which extends downwardly for a suitable length and is provided with longitudinal peripherally arranged slots or apertures near its lower end, which fit in a sleeve *b*, having corresponding apertures and alternate webs, which, when said sleeve is rotated or partly rotated, serve to partly close the apertures through the pipe B, and in consequence, serves to regulate the air inlet thereinto. Rigidly secured in the pipe B, as shown in Fig. 7, is a pipe B′, which is open at the upper end and at its lower end tapers downwardly to a central, small circular aperture, as shown in Fig. 7,

adapted to be closed or partly closed by the needle C, thereby affording a needle valve for the regulation of the gas inlet for the lamp, and as shown, said needle C, is slidably secured in an aperture extending through a transverse bar c, in a lower sleeve or thimble C′, and at its upper end passes through a similar bar c', in an upper thimble C^2. As shown, the stem of the lamp thus formed is surrounded at a suitable distance by a casing D, having ornamental open tops d, as shown in Fig. 1, and having an ornamental or otherwise perforated lower portion adapted to afford ready inlet for the air about its entire periphery. Extending through said outer shell or casing D, and threaded into the main stem or pipe B, is a relatively heavy tube d^2, which projects through said shell and is internally threaded for a part of its length and through which extends the adjusting rod d^3, the inner end of which extends beneath a downwardly tapered or conical collar c^4, on the needle and between which and the bar c', is secured a pushing spring c^5, tending to hold the needle downwardly. Said adjusting rod or stem d^3, is provided on its outer end with a small hand wheel d^4, whereby the same may be threaded inwardly or outwardly. In threading the stem inwardly the needle is obviously lifted to increase the flow of gas through the needle valve and when threaded outwardly the needle is permitted to descend under the action of its spring c^5, to close or partly close the needle valve.

A sleeve d^5 is rotatably engaged on the tubular rod d^2, and is provided also with the hand wheel d^6, whereby the sleeve may be rotated. As shown, an arm d^7 is provided on said sleeve at its inner end and engages in a suitable apertured bracket d^8, on the air regulating sleeve or tube b, to partly rotate the same on the main stem or supply pipe by rotation of said hand wheel d^6. As shown, said shell D, is provided with a closed bottom d', through which the supply pipe E, for the burners extends in axial alinement with the main stem B, before described, and, as shown in Figs. 1 and 2, tubes D^2 are provided, one above each of the burners and in the present instance four in number, and, as shown, open at the top and affording vent flues to permit ready escape of the heated gases of combustion from the lamp and between the same affording passages to permit to some extent, the heating of the air inflowing to the supply pipe. On the lower end of said supply pipe E, as shown in Figs. 1 and 3, is threaded a hollow fitting E′, having as many tubular upturned arms e, as there are burners, the number, of course, corresponding with the number of vent tubes in the casing. Each of said upturned arms e, as shown is provided at its top with an enlargement e', affording a chamber and which, as shown, is covered at its top with a perforated or other screen e^2, which serves to spray the gas into the mantle. As shown, a simple cap piece is used for this purpose having a downturned flange adapted to fit over the walls of the chamber e', and of a size to fit loosely within the mantle. A rod e^3 is provided centrally on said screen and affords the support for the mantle e^4.

Supported near the upper end of each of the upturned branches e, of the burner, are supporting clamps e^5, which are provided with an outwardly directed finger e^6, adapted to extend beneath and afford the support for the inner globe e^7, which, as shown is open at the bottom and fits at its upper end against the bottom D′ of the casing, and within a ring e^8 secured on said bottom, serving to hold the upper end of said globe in place. Journaled in said casing on diametrically opposite sides thereof are drums or spring rollers F, as shown two in number, and each comprising a pressed metal shell rotatably secured on the axial shaft f, and provided with a spring f'', one end of which is engaged to the shaft, and the other to the drum, said spring being set at a tension to readily support the weight of the outer globe F′, which, as shown, is globular in form, and open at the top and is engaged in the usual or any suitable manner at its top in a globe ring f^3, which, as shown, is provided with upwardly directed apertured lugs or eyes f^4, which register with apertures in the bottom d', of the upper casing, as shown in Figs. 1, 13 and 14, and to which are engaged cables f^6, trained about said drums F and the lower ends of which are engaged in said eyes. As shown, a spring detent f^7, is provided on each of the eyes f^4, and which, is adapted to extend through a slot in the bottom d', of the casing, and engages above the bottom d', by a slight rotation of the supporting ring and outer globe to assist in supporting the weight of the globe.

While I have described the burners as directed upwardly, this is not essential inasmuch as the branches e, may be turned downwardly and provided with tubes e^9, as shown in Fig. 11, adapted to support mantles e, as is usual for inverted burners, in this event, however, to afford a requisite pressure chamber in the supply pipe, I have connected a globular casing G, in the supply pipe and from which said branches extend. In other respects the lamp is constructed as before described.

The operation is as follows: To afford access to the burner, the outer globe is simply pulled downwardly, unwinding the cables on the drums F, and lowering the globe sufficiently to permit of free access to the burner. Of course, the inner globe may be quickly removed by releasing such globe from the spring clips e^5, engaged on the arm e, to the respective burner. The combustion is as fol-

lows: The air is drawn inwardly through the lower end of the casing, passing through the passages between the vent pipes D^2, flows into the supporting stem B, of the lamp, which may be fully open, as shown in Fig. 1, or partly closed, the degree of opening being regulated at any time by means of the hand wheel d^6, whereby the damper or regulating sleeve *b*, is rotated to regulate the openings into the supply pipe. At the same point the supply of the gas with reference to the supply of the air is quickly adjusted by rotating the hand wheel d^4, and elevating or lowering the needle to regulate the degree of opening of the needle valve. Owing to the size of the stem below the needle valve, and the length thereof, a large body of gas mixed with air in the requisite proportion is at all times within the supply pipe and branches, and owing to the rate of supply being perfectly regulable, such supply within the enlarged supply pipe serves at all times to maintain a steady flame or light independent of those slight variations in pressure constantly occurring in any gas system, but which in this instance all occur beyond the needle valve. In consequence, notwithstanding such fluctuations and variations, the supply of gas below the needle valve is always sufficient to maintain a steady and uniform combustion. This is, of course, materially assisted by the air supply from below the burner. For this purpose, a constant inflow of air takes place at the top of the outer globe and owing to the constant exhausting of the air from said globe to the outflow of the heated products of combustion through the vent pipe, the cooler air is drawn downwardly from the top of the globe and then upwardly to the burner, (as shown by arrows in Fig. 1), and, inasmuch as the entire lower end of the inner globe is open, the burners are thus constantly supplied on the outer side with fresh and slightly warmed air supporting an intense combustion at the mantle, and thus, owing to a perfect supply of air both within and without the mantle, insuring the perfect combustion and precluding carbonization.

The construction shown in Fig. 11 is identical with the exception that the burners are turned downwardly and to compensate for the longer supply tube and to afford a requisite quantity of the combustible mixture an enlargement in the supply pipe, indicated by G′, and affording a globular gas chamber, is provided. This maintains uniform delivery to the burners, and entirely precludes flickering and carbonization.

Of course, I am aware that many changes in the construction may be made without departing from the principles of my invention, and I have shown but one of several constructions possible embodying the same principles. I therefore do not purpose limiting this application for patent otherwise than necessitated by the prior art.

I claim as my invention:

1. A lamp of the class described embracing a plurality of burners, a regulable supply pipe connected therewith and with a source of supply for the illuminating fluid, means for admitting air into the supply pipe, flues for the burners in vertical alinement therewith and around which the air flows to the supply pipe, a valve in the supply pipe and said pipe below the valve affording a chamber of sufficient capacity to afford a reserve fuel supply.

2. A lamp of the class described embracing a plurality of burners, an independent flue for each burner, a supply pipe positioned between the flues, a valve in the supply pipe for controlling the delivery of gas therethrough, and a valve for admitting air into the supply pipe, said air passing around and between the flues to said admission valve.

3. A lamp of the class described embracing a plurality of burners, an independent flue for each burner, a supply pipe positioned between the flues, a valve in the supply pipe for controlling the delivery of gas therethrough, a valve for admitting air into the supply pipe, said air passing around and between the flues to said admission valve, a casing surrounding the flues and rotatable adjusting stems projecting through one side of the casing adapted one for adjusting the gas regulating valve and the other the air admission valve.

4. A lamp of the class described embracing a plurality of burners, an independent flue for each burner, a casing around the flues having a closed bottom and apertures in the sides to admit air into the casing, a supply pipe for the burners, a gas regulating valve in the supply pipe, an air regulating valve for the supply pipe, a reserve chamber for holding the combustible mixture prior to delivery to the burners, and means supplying air around the outside of the burners.

5. In a lamp a plurality of burners, a mantle secured to each, a spray head for each burner, a clamp secured to each burner, an inner globe supported by the clamps, a casing, spring controlled drums therein, a cable secured to each drum, an outer globe and a supporting ring therefor to which the cable is attached.

6. A lamp embracing an inner and an outer globe, the former open at its bottom, the latter open at its top only, a supply pipe extending into the globes, a plurality of burners supported on the lower end of the supply pipe, a vent pipe above each burner, a regulating valve for the hydro-carbon fluid, a regulating valve for admitting air to mix therewith, concentrically arranged means for actuating the same, said supply pipes below

the valves being of a size and capacity to contain a reserve supply sufficient to prevent flickering.

7. A lamp embracing an inner and an outer globe, the former open at its bottom, the latter open at its top only, a supply pipe extending into the globes, a plurality of burners supported on the lower end of the supply pipe, an exhaust pipe above each burner, a regulating valve for the hydro-carbon fluid, a regulating valve for the air supply, said valves concentrically arranged, means for actuating the same also concentrically arranged and a reserve chamber for the combustible mixture.

8. A lamp embracing an inner and an outer globe, the former open at its bottom, means for yieldingly supporting the outer globe to admit air between the globes, a supply pipe extending into the globes, a plurality of burners supported on the lower end of the supply pipe, a casing above the globes apertured to admit air thereinto and means in the casing for supporting the means for yieldingly supporting the outer globe.

9. A lamp embracing an inner and an outer globe, the former open at its bottom, a supply pipe extending into the globes, a plurality of burners supported on the lower end of the supply pipe, a casing above the burners, means journaled therein for supporting the outer globe, a vent pipe opening from each burner and spring clamps for detachably supporting the inner globe.

10. A lamp embracing an inner and an outer globe, means for supporting the globes to admit air therebetween, a plurality of burners in the globes, a vent pipe above each burner, a supply pipe provided with slots at the lower end, a regulating valve in the pipe above the slots for the hydro-carbon fluid, a pipe concentric with the supply pipe and having slots adapted to register with the slots in the supply pipe, concentric stems, one for adjusting each valve and a chamber for holding combustible gas communicating with the burners.

11. In a device of the class described a casing, a globe below the same, burners in the globe, a pipe for supplying fuel thereto, a reciprocating valve for controlling the delivery of illuminating gas through the supply pipe, a rotatable valve for controlling the supply of air delivered into the supply pipe and independent concentric rotatable means for operating said reciprocating and rotatable valves, and both operated from the same place.

12. In a device of the class described a casing, a globe below the same, burners in the globe, a pipe for supplying fuel thereto, a reciprocating valve for controlling the delivery of illuminating gas through the supply pipe, a rotatable valve for controlling the supply of air delivered into the supply pipe and independent rotatable means actuated from the same point, one for adjusting the reciprocating valve and the other for adjusting the rotatable valve.

13. In a device of the class described a casing having a closed bottom, an outer globe, means supporting the outer globe to admit air into the top of the globe, an inner globe open at the bottom to admit air therethrough, burners in the inner globe, flues extending through the casing, one for each burner, a supply pipe for the burners positioned centrally between the flues and extending parallel therewith and means for admitting air into the supply pipe in the casing between the flues causing the air to be heated by the flues.

14. In a device of the class described a casing having a closed bottom, a supply pipe opening through the bottom, flues surrounding the supply pipe also opening through the bottom, burners connected with the supply pipe, drums in the casing, cables trained therearound, a globe supporting ring supported by the cables, means for automatically rotating the drums in one direction and a globe supported by the globe ring.

15. In a device of the class described a casing, a supply pipe extending therethrough, burners connected with the supply pipe, an inner globe open at the bottom, means secured to the burners adapted to support the inner globe and hold the same against the bottom of the casing, an outer globe, means for supporting the same adapting the globe to be adjusted from the casing without detaching the same and part of the supporting means adapted to automatically return the outer globe to normal.

16. In a device of the class described a casing, a supply pipe, burners connected with the supply pipe, a globe surrounding the burners, a ring supporting the globe, means yieldingly supporting the ring to admit air between the same and bottom of the casing into the globe and spring members coacting with the aforesaid ring supporting means for aiding in supporting the ring.

17. In a device of the class described a casing apertured to admit air thereinto and having a closed bottom, a supply pipe extending through the casing and apertured in the casing to admit the air from the casing into the supply pipe, a sleeve concentric with the supply pipe having apertures to register with the apertures in said supply pipe, means for rotating the sleeve to vary the degree of opening of the apertures in the supply pipe, a pipe in the supply pipe having a closed end except for a small aperture, a needle valve for controlling the degree of opening of said aperture and means for adjusting said needle valve.

18. In a device of the class described a cas-

ing apertured to admit air into the same, a supply pipe therein, a valve in the pipe for controlling the feed of fuel through the pipe, a valve for admitting air from the casing into the supply pipe below the valve in the pipe, adjusting rods for actuating the valves and each provided with an operating wheel, burners communicating with the supply pipe, and a globe inclosing the burners.

19. In a device of the class described a casing, apertured to admit air into the same, a supply pipe therein, a valve in the pipe for controlling the feed of fuel through the pipe, a valve for admitting air from the casing into the supply pipe below the valve in the pipe, adjusting rods for actuating the valves and each provided with an operating wheel, burners communicating with the supply pipe, a globe inclosing the burners, spraying heads for the burners, mantles inclosing the spraying heads, a supporting ring for the globe and means rotatable in the casing for supporting the ring.

In testimony whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

MORRIS I. COHEN.

Witnesses:
K. E. HANNAH,
LAWRENCE REIBSTEIN.