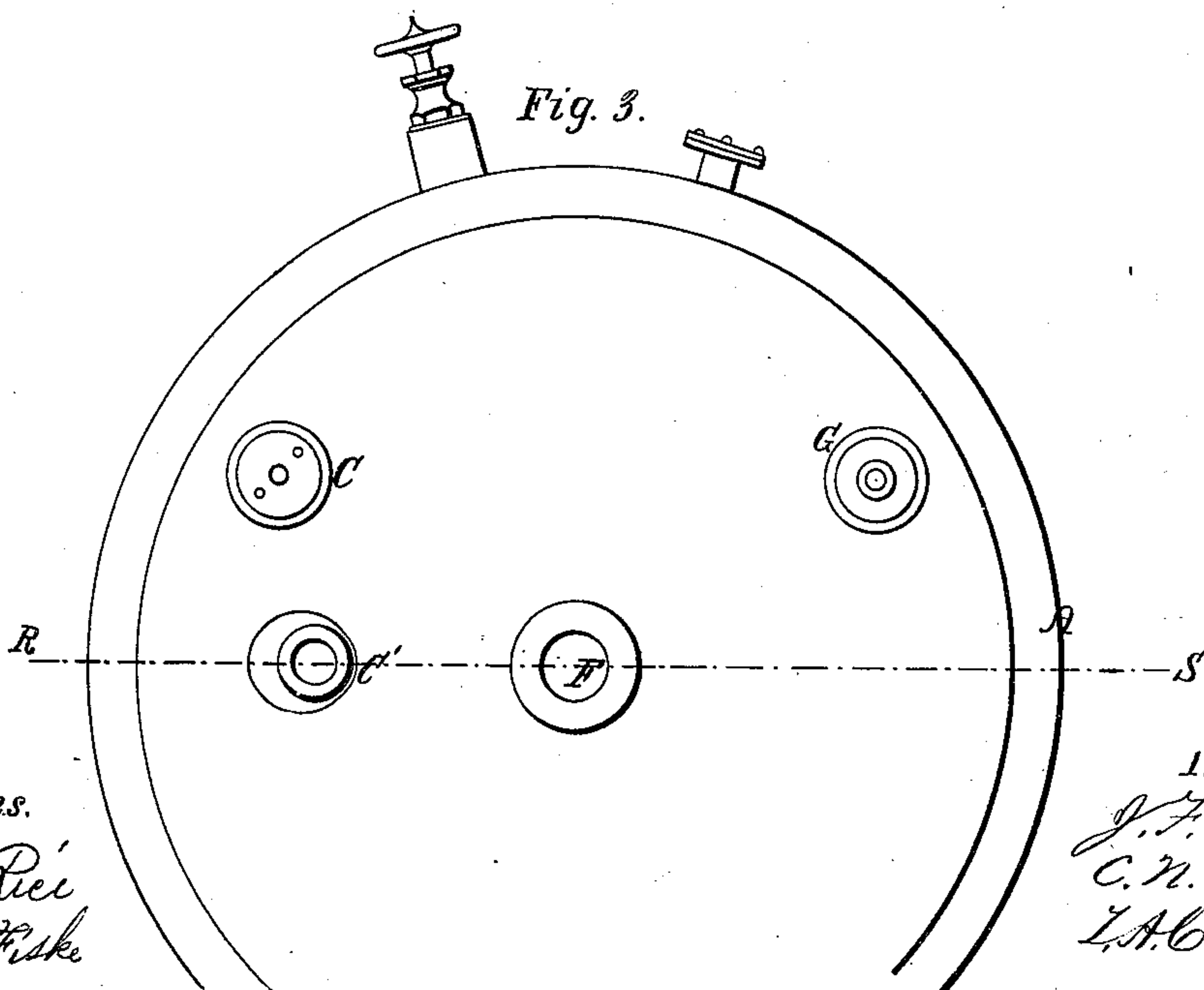
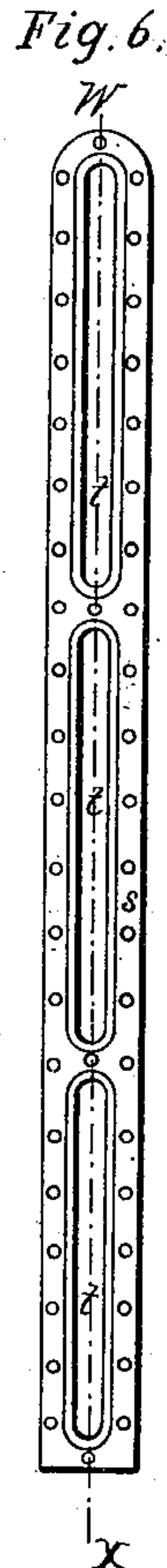
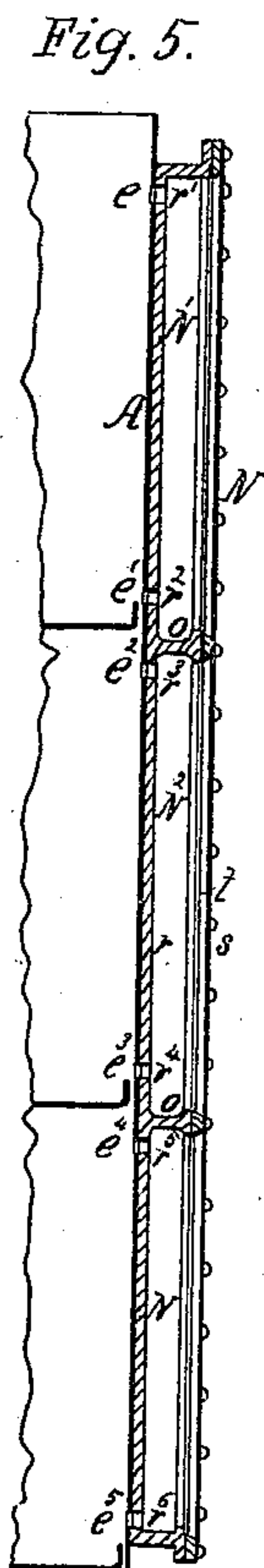
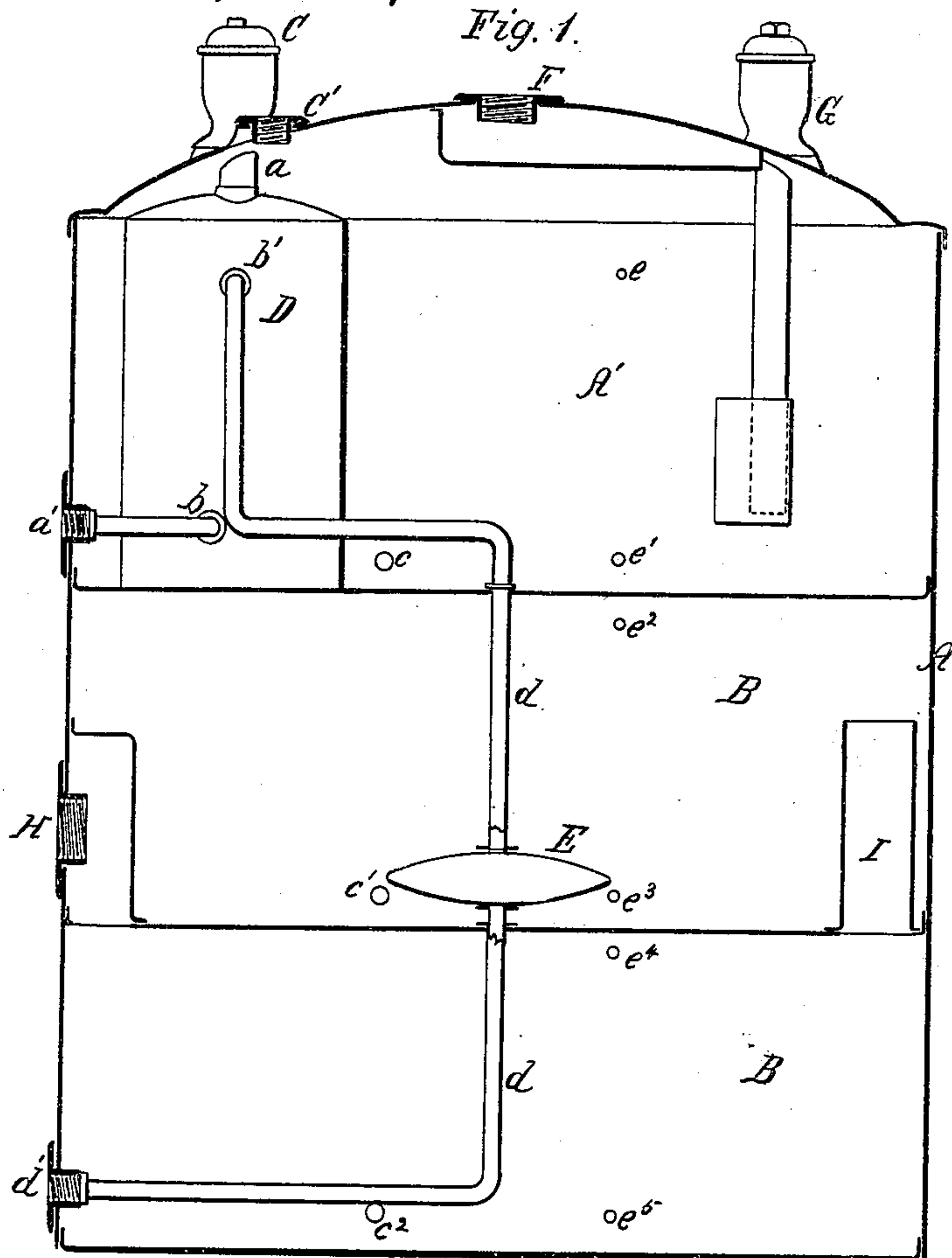


Sheet 1, 2 Sheets
Barker & Gilbert.

Carburetor.

No 93,207.

Patented Aug. 3, 1869.



Witnesses.

J. E. Rice
H. C. Fiske

Inventor.

J. F. Barker,
C. N. Gilbert,
L. A. Curtis, Atty.

Sheet 2, 2 Sheets.
Barker & Gilbert.

Carburetor.

No 93,267.

Patented Aug. 3, 1869.

Fig. 2.

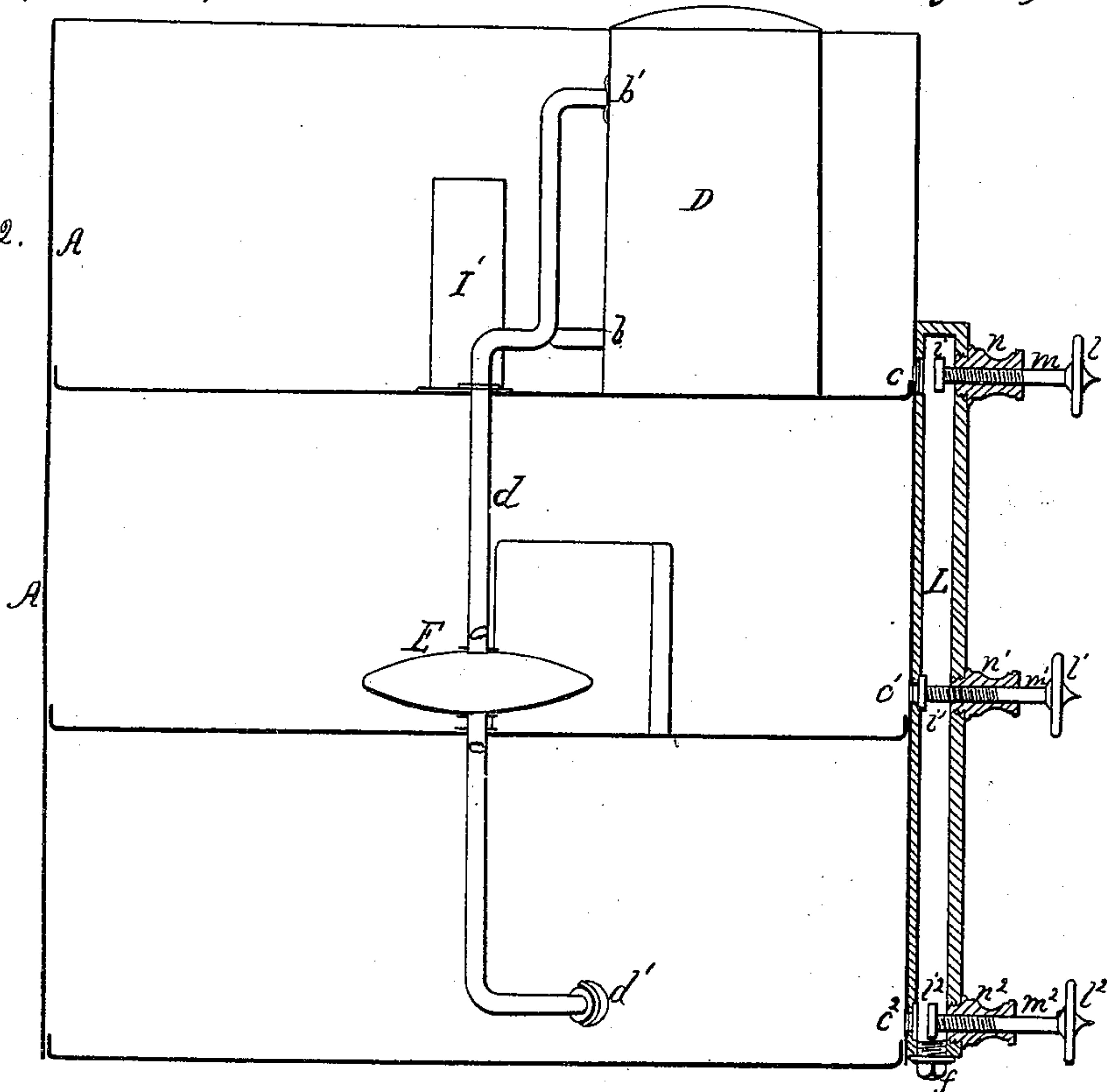
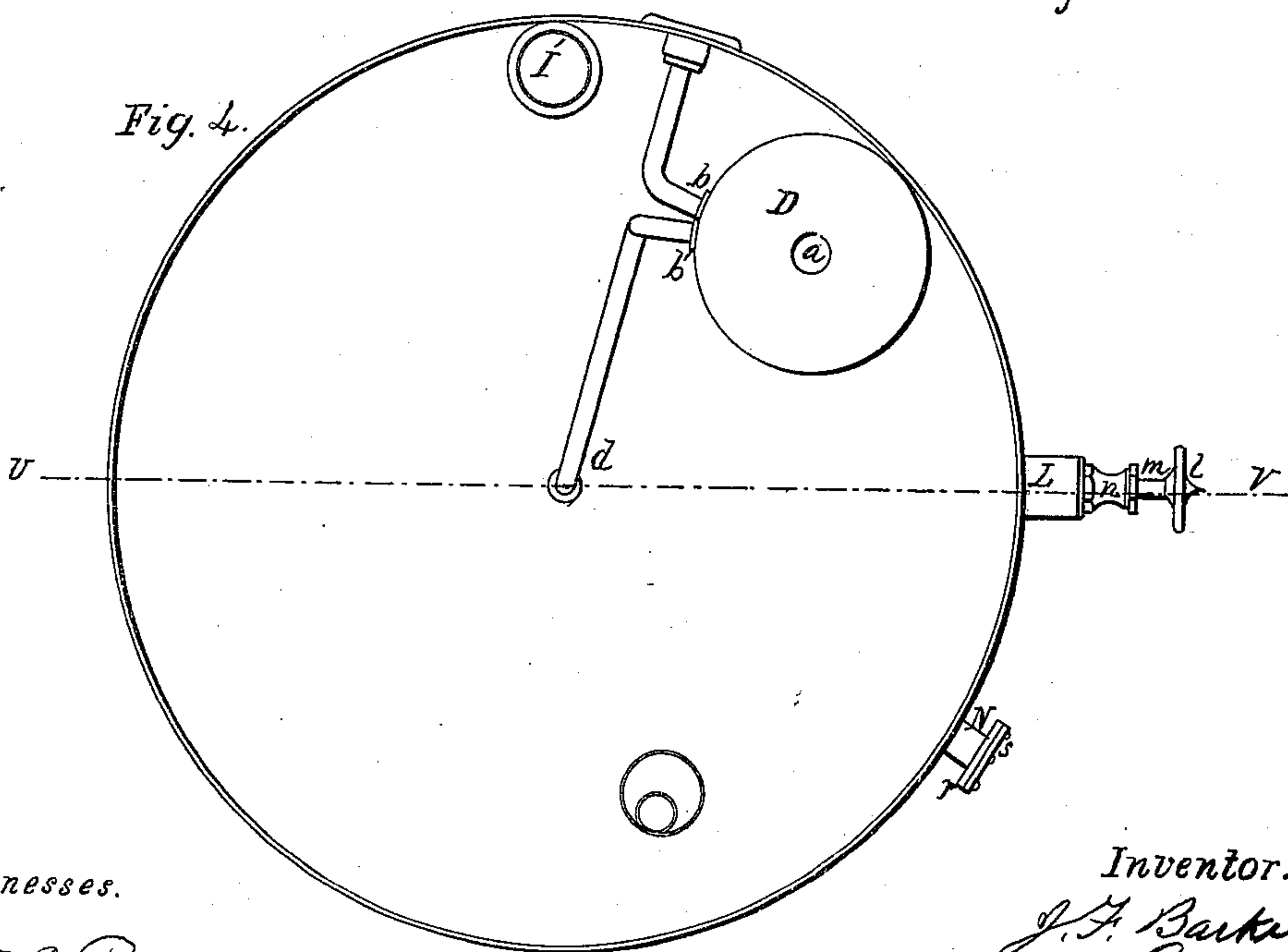


Fig. 4.



Witnesses.

J. C. Rice
H. C. Fiske

Inventor.

J. F. Barker.
C. N. Gilbert.
By L. A. Curtis, Attorney.

UNITED STATES PATENT OFFICE.

J. F. BARKER, OF SPRINGFIELD, MASSACHUSETTS, AND C. N. GILBERT, OF NEW YORK, N. Y.

IMPROVED APPARATUS FOR CARBURETING AIR.

Specification forming part of Letters Patent No. 93,267, dated August 3, 1869.

To all whom it may concern:

Be it known that we, J. F. BARKER, of Springfield, in the county of Hampden and State of Massachusetts, and C. N. GILBERT, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Carbureting Air; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1 is a vertical section of a carbureter, through line R S of Fig. 3. Fig. 2 is a vertical section of a carbureter, with the top removed, through line U V of Fig. 4. Fig. 3 is a partial plan view of a carbureter. Fig. 4 is a plan view of the upper chamber, the top being removed. Fig. 5 is a vertical section of the gage through line W X of Fig. 6; and Fig. 6 is a front elevation of the gage.

Our invention relates to that part of the apparatus used for carbureting air or gas, called the carbureter or generator; and it consists in the introduction of a tank or reservoir into said carbureter, through which reservoir the circulating fluid shall pass which heats the carbon-oil contained in the generator or carbureter, said reservoir providing the necessary space or room for the expansion of the circulating fluid, and causing it to circulate more freely and equally; and it also consists in providing a tube, secured to the outside of said carbureter, the interior part of said tube communicating with the interior of each chamber in the carbureter, through suitable apertures made in the side of the carbureter, near the bottom of each chamber, and also in said tube, said apertures being opened and closed by means of proper valves attached to said tube, for the purpose of drawing the contents of said carbureter from any upper chamber into any lower one; and it also consists in providing the said carbureter with a gage, which, being made all in one piece, longitudinally, is attached to the outside of said carbureter, to indicate the height of the fluid in each chamber of the carbureter.

In Letters Patent of the United States No. 66,777, granted to us July 16, 1867, a process was therein described for heating the fluid con-

tained in the carbureter by means of a heated fluid circulating in pipes placed within the carbureter, but in practice we have found that the expansion of the circulating fluid from the heat necessitates more space or room than merely that furnished by the pipes alone, which were arranged in the carbureter, as shown and described in said Letters Patent.

It has been found upon trial that, after repeatedly filling the different chambers of a carbureter with hydrocarbon oil and then vaporizing the same as far as possible, a residue remained which was too heavy to be readily converted into vapor or illuminating-gas sufficient to give much light at the burners, and, as it accumulated in the chambers, (as it could not be used in all the chambers with any advantage,) it had of course to be removed and thrown away.

To save this heavier and more worthless oil, and to use it more thoroughly in the extraction of all its illuminating qualities, we have provided a tube with valves and apertures therein, so that by opening any two of them direct communication is made from one chamber to another through said openings and the pipe, so that if any thick or heavy residue should remain in an upper chamber, such residue may be drawn from said upper chamber into the lower one, making room in said upper chamber to put in lighter and more easily evaporated oil.

That others skilled in the art may be able to make and use our invention, we will proceed to describe its construction and the mode of its operation.

In the drawings, A represents the carbureter, having the chambers A' B B', the general form and character of which is now well known. *d* is the pipe for conducting the heated circulating fluid, and having the radiator E in one or more of the chambers. In the upper chamber we place a cylindrical-shaped vessel or reservoir, D, which is made tight, and opening outward only through the valve C, through which the circulating fluid is placed in the said reservoir.

The circulating pipe or conduit *d* enters or communicates with the interior of said reservoir through the orifice at *b*, and also at *b'*, one being at the lower and the other at the

upper part of said reservoir. This reservoir might be placed in any one of the chambers within the carbureter, but we prefer to place it in the upper one.

To the outside of the carbureter A we attach a hollow box or tube, L, having the orifices c , c^1 , and c^2 therein, corresponding with similar orifices made in the side of the carbureter, said orifices being made in the lower part of each chamber in the carbureter. In this tube L are set the sockets n n^1 n^2 , having a threaded hole made in each, through which holes, and fitted therein, operate the threaded spindles m m^1 m^2 , having the disks i i^1 i^2 upon one end, and the hand-wheels l l^1 l^2 upon the other ends, by means of which they are operated. The disks i i^1 i^2 are properly fitted to their seats at said orifices, so that when the threaded spindles m m^1 m^2 are turned in tightly, with the disks against their seats, the said orifices c c^1 c^2 shall be securely closed, so that nothing can pass through said orifices into the tube L.

The lower end of the tube L may be made open, with a screw-thread made therein, into which may be fitted the nut f , for the purpose of drawing off any residue which may remain in the lower chamber, and which cannot be used at all.

The gage N consists of a hollow box or tube, having the transverse partitions o o therein, with the vertical apertures t in the front part, to the front of which box or tube N is secured the plate s , having corresponding elongated vertical apertures therein, a plate or plates of glass, with suitable packing, if necessary, being placed between the front of the tube or box N and the outer plate s . The partitions o o divide the said tube into any number of compartments, according to the number of chambers in the carbureter, and also according to the number of partitions o o in the tube. The holes r^1 r^2 , &c., are made in the back side of the tube, corresponding with the holes e e^1 , &c., made in the side of the carbureter, at the upper and lower part of each chamber.

The general form and construction of the carbureter alone is the same, or is similar to that described in Letters Patent granted to us, as hereinbefore mentioned.

Having thus described the construction of our improvements, we will now proceed to describe the operation of the same.

The circulating fluid having been filled into the reservoir D through the valve C, said valve is closed, and heat being applied to the coil placed outside and away from the carbureter, (the pipe d passing out through the aperture a' , and connected to the lower part of said coil, the upper part of said coil being connected, by a pipe, with the aperture d' and pipe d), the said fluid, as it becomes heated in the said coil, rises therein and enters the pipe d in the carbureter at the orifice d' , passes up through the radiator E, and enters the reservoir D at the upper aperture b' . Ample space for the expansion of the fluid is found within

this reservoir, and the fluid accumulating within said reservoir, its own weight assists in forcing it out through the lower aperture b and aperture a' into the lower part of the coil, when it again becomes heated and rises as before.

This constant circulation causes the hydrocarbon oil in the carbureter to become heated to a general uniform temperature, and to give off more vapor than it would do if it remained at a lower degree of temperature; and if the lower chamber or chambers in the carbureter contain a heavier and less volatile oil than the upper chambers, said heavier fluid becomes heated most, as it is nearer the point or coil where the circulating fluid is heated, and is caused to give off a greater amount of vapor than it would otherwise do, and, as the air in passing through the carbureter passes through the lower chambers first, the maximum amount of said vapor from said heavier fluid is absorbed by the air, so that, as the air passes up into the upper chambers, a less amount of vapor from the more volatile oil will be required to be absorbed to attain the required illuminating-power at the burners.

If the oil in any of the upper chambers should, after remaining therein sufficiently long to become heavy, and give off too little vapor to give to the gas a sufficiently strong illuminating-power, it may be taken from the upper chamber and placed in the lower one, by simply opening the orifice c by turning out the spindle m , and if the lower orifice c^2 be opened at the same time by turning out the spindle m^2 , the oil will run from said upper chamber down the tube L and into the lower chamber, and, if the valves be then closed, fresh hydrocarbon oil may be placed in the upper chamber, and the heavier oil in the lower chamber may then be made to give off a greater amount of vapor by heating it to any desired degree by means of the pipe d , and the air, as it passes in contact with the heavier oil in the lower chamber, will absorb its maximum amount in said lower chamber, and will absorb or require so much less when it reaches the upper chambers.

The great advantage of this arrangement will readily be appreciated when we consider that gasoline, for instance, when placed in a carbureter for the purpose of manufacturing illuminating-gas therefrom has a specific gravity of about 80° or 85°, and when it has been reduced by evaporation to about 68° specific gravity, it will no longer give off sufficient vapor without the aid of a greater degree of heat to produce a proper light at the burners; and, consequently, hitherto it has been found necessary to draw off such oil as is reduced to a specific gravity of about 68° and consider it worthless for the purpose of manufacturing illuminating-gas.

By our arrangement we are able to change it from an upper to a lower chamber without exposing it outside the generator, and, as it is then nearer the heating-coil, it is made to

give off more vapor than before, and the air, in passing in contact with it, absorbing such vapor, we are thus enabled to use up more completely and wholly that which has heretofore run to waste.

As a means of indicating the amount of oil in each chamber, the common gage has been employed, having only one compartment, with two holes therein, communicating with the chamber, one at the upper part and one at the lower part of the chamber and gage. When these are used singly they occupy too much space, and cannot well be used one directly above another, and when there are many chambers in a large generator too much of the outer surface of the generator has to be given up for the attachment of these single gages.

By our arrangement we are enabled to manufacture a series of these gages in one, or in one piece, so that each single compartment is directly one above another, and the series, or the whole gage as we term it, does not occupy more space than is necessary; and we find that we can manufacture the series of gages in one piece more cheaply than we can make the same number of our compartment gages separately; and our improvement in this respect consists only in combining two or more compartments in one gage.

If it should be found desirable to remove entirely all the contents from all the chambers in the generator, it may easily be done by drawing or turning out the spindles *m m*,¹ &c., and turning out the threaded plug *f* at the bottom of the tube *L*, or, either contents of either one chamber may be removed by opening its valve only, and turning out the threaded plug *f* at the bottom of the tube *L*.

It is, of course, immaterial what the par-

ticular form of the tube may be, whether prismatic or cylindrical, or what may be the particular kind of valve used, as many different kinds might be used which would produce the same result.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A carbureter having the reservoir *D* placed therein, and used in connection with the pipes for the circulating heating-fluid, all constructed and operating substantially as herein described and set forth.

2. The arrangement of a tube, *L*, with a carbureter, wherein the apertures opening from the lower part of each chamber of the carbureter into said tube are opened and closed by valves, said tube with its valves operating to draw the contents of any upper chamber into any lower one, or to draw said contents of any one or of all of said chambers entirely away from the carbureter, substantially as herein described and specified.

3. A gage, composed of two or more compartments, and having one or more partitions, *o*, therein, the same being made in one piece, with a corresponding front plate, *s*, also made in one piece, the whole constituting a series of gages, and all constructed and operating substantially as and for the purposes herein described and set forth.

J. F. BARKER.
C. N. GILBERT.

Witnesses:

T. A. CURTIS,
E. J. SOMMER,
W. STANLEY,
WM. T. B. STORMS.