

J. T. Rich.  
 Generating & Applying Gases.  
 N<sup>o</sup> 74001 Patented Feb. 4, 1868.

Fig. 1.

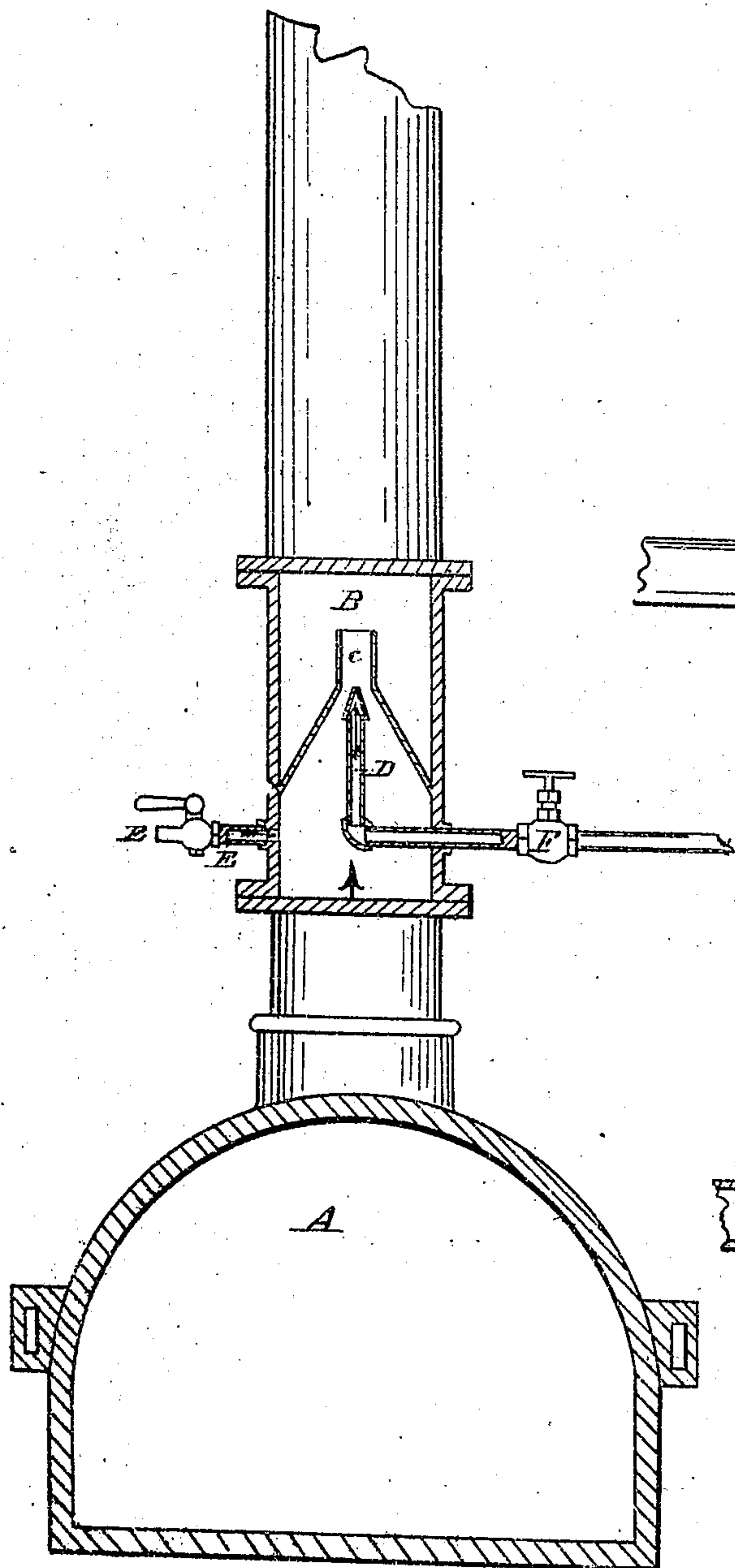


Fig. 2.

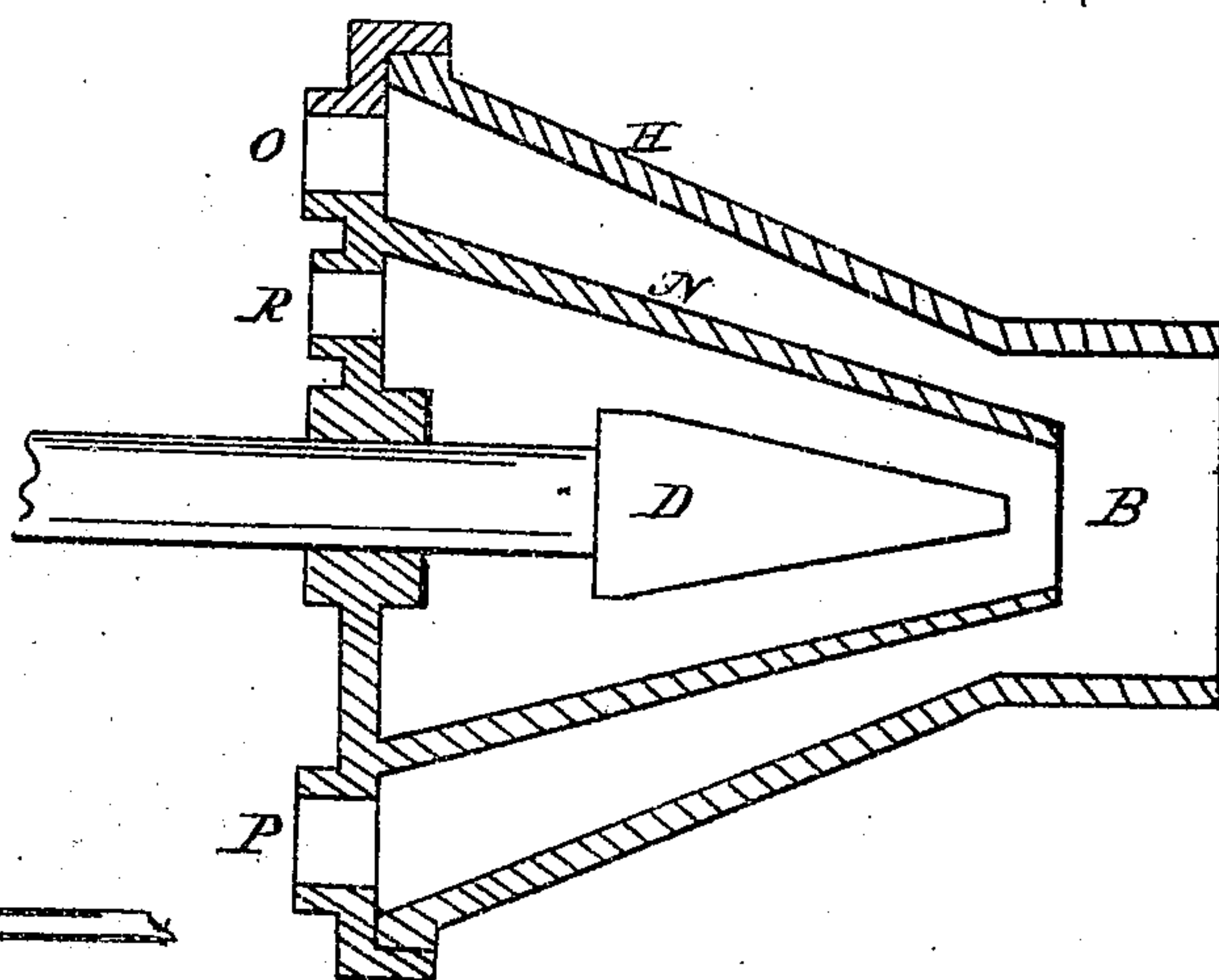
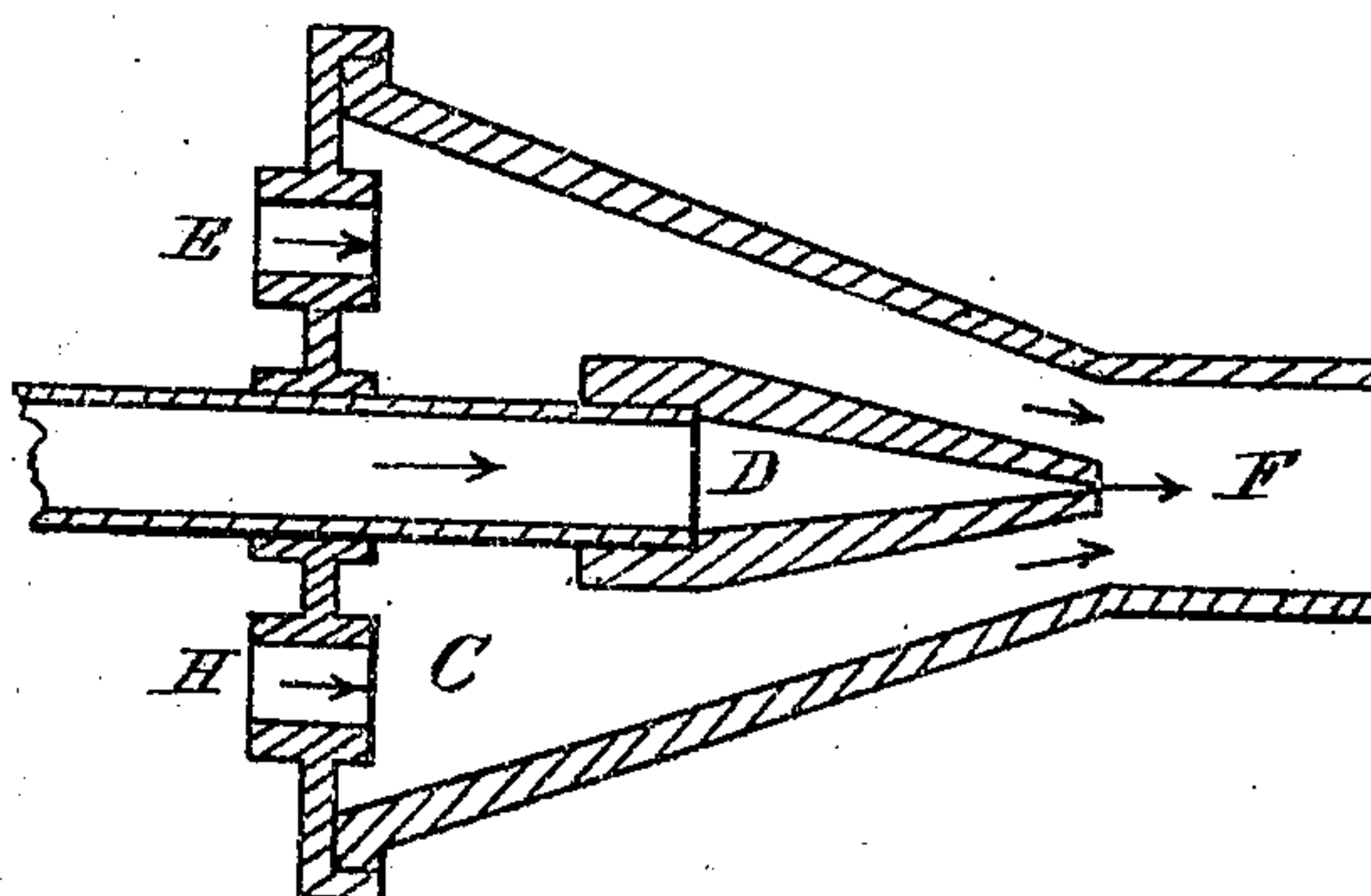


Fig. 3.



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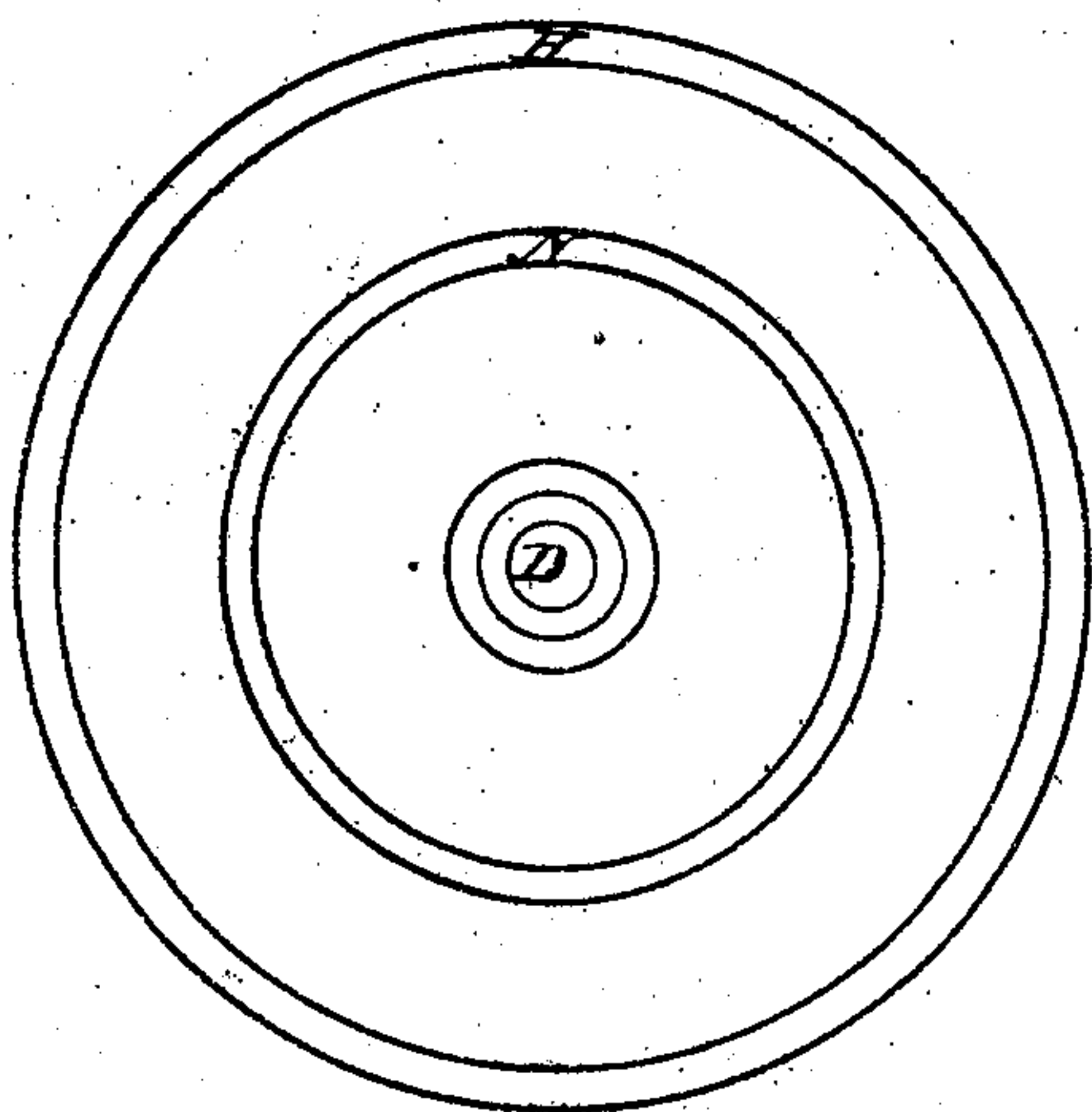


Fig. 3.

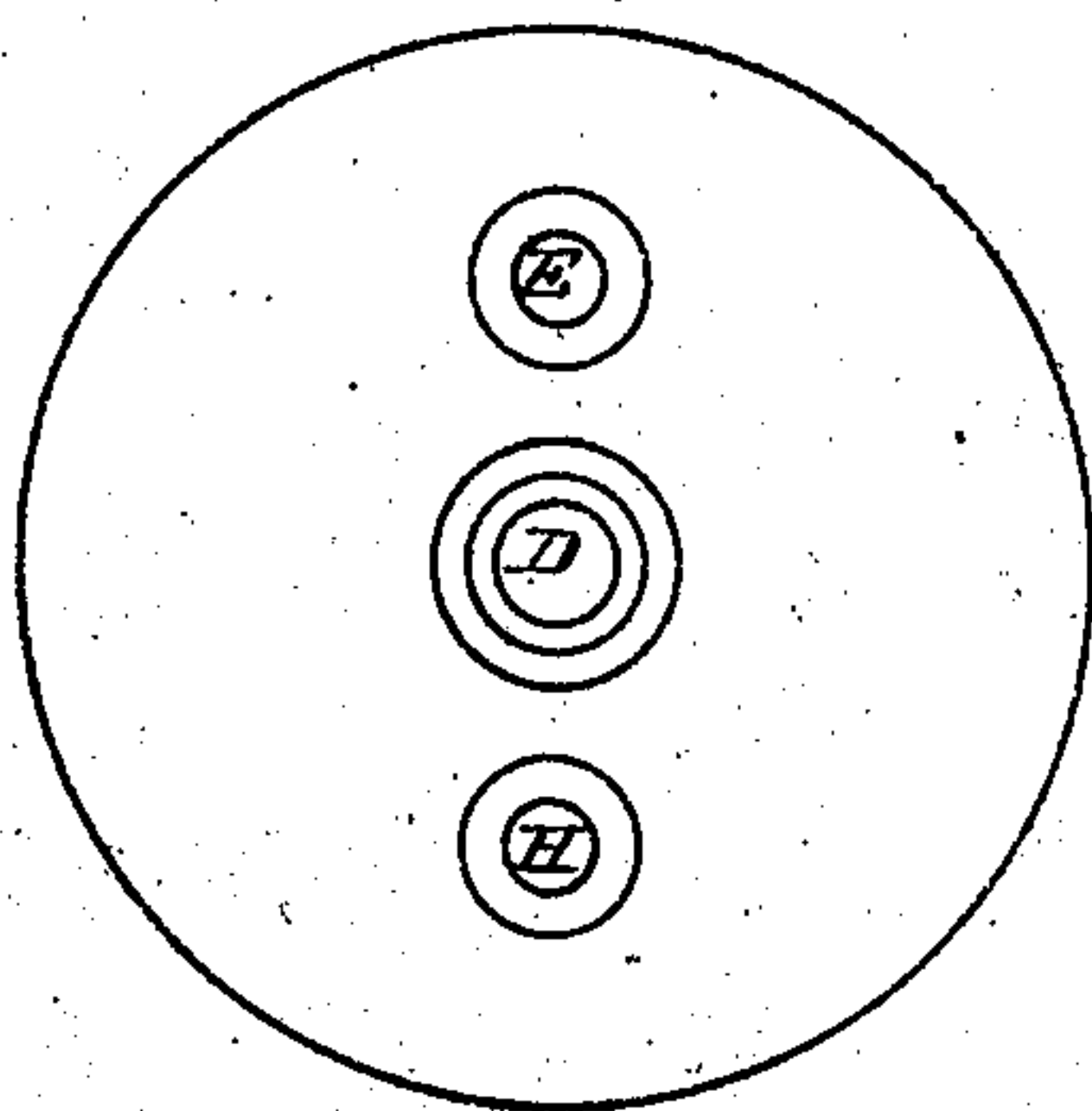


Fig. 5

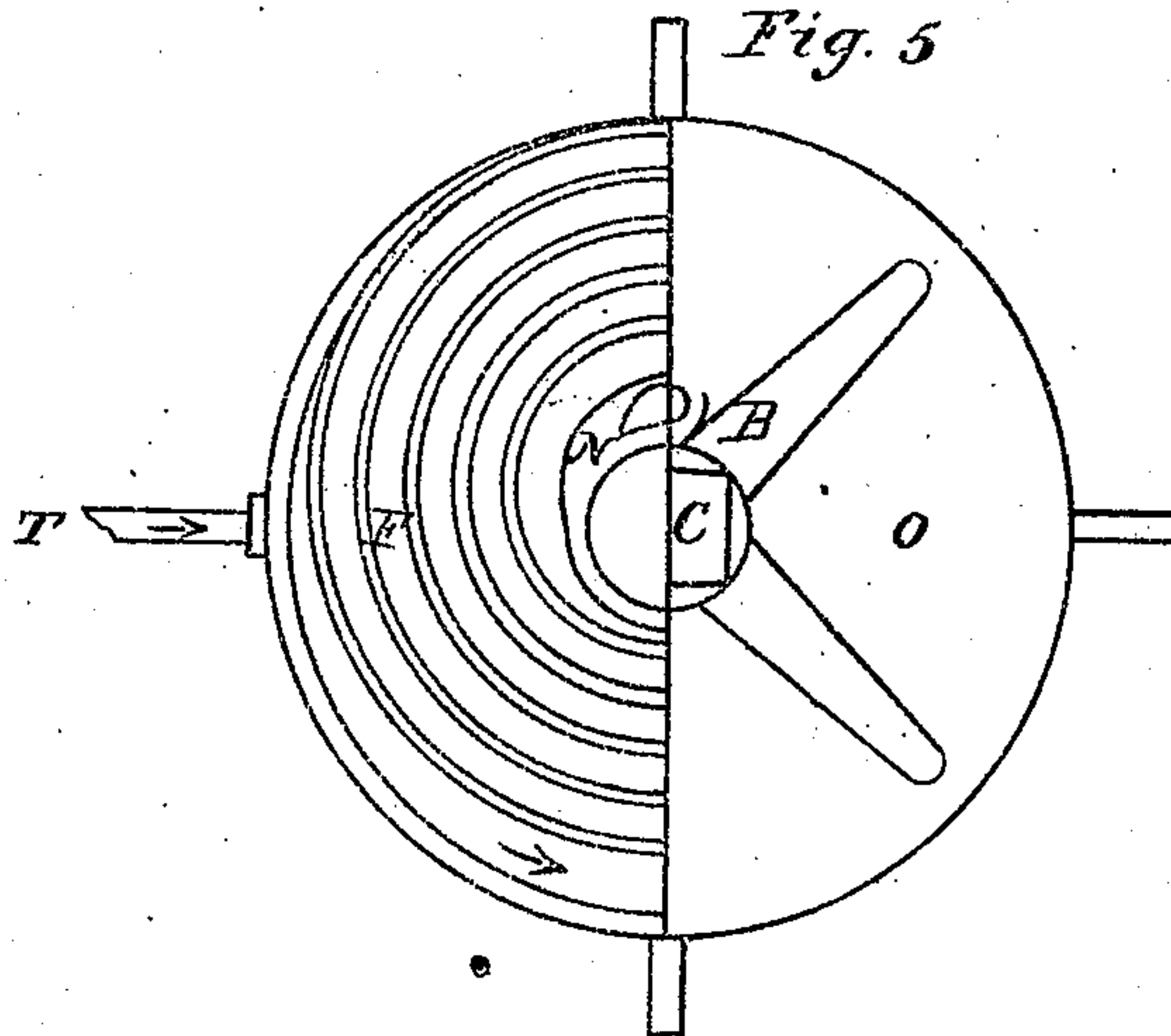
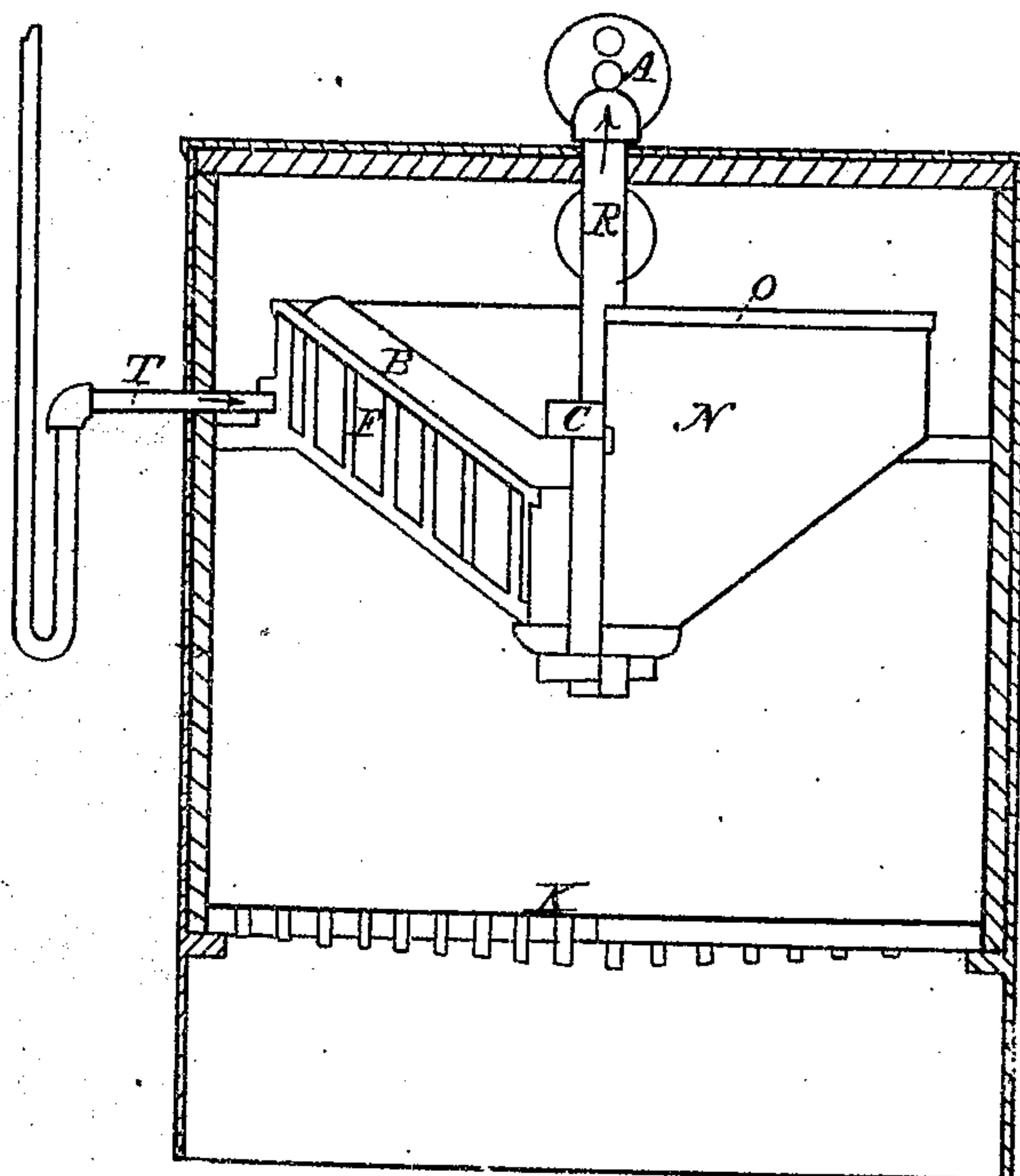


Fig. 4



Inventor

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# United States Patent Office.

JOHN T. RICH, OF PHILADELPHIA, PENNSYLVANIA.

*Letters Patent No. 74,001, dated February 4, 1868; antedated January 23, 1868.*

## IMPROVED PROCESS OF GENERATING GASES, AND IN THE APPLICATION OF THE SAME.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, JOHN T. RICH, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in the Process for Generating Gases for Heating and Illuminating Purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is an elevation, partly in section, of an apparatus for generating gases when destructive distillation is employed.

Figure 2 is a section of the steam-jet, showing a double cone.

Figure 3 is a section of the steam-jet, showing a single cone.

Figure 2' is a plan of the steam-jet shown in section, fig. 2.

Figure 3' is a plan of the steam-jet shown in fig. 3.

Figure 4 is an elevation, partly in section, of an apparatus in which the vapors of hydrocarbon are employed.

Figure 5 is a plan, partly in section, of the same.

The letters are employed in the several figures in the indication of parts which are identical.

The objects of this invention are, first, the generation of gases for admixture with hydrocarbon gases; second, the generation of oxygen gas for admixture with hydrocarbon gases; third, the application of the gases thus generated and mingled to purposes of illumination, heating, desulphurization of ores, &c.

The following description will enable one skilled in the art to construct the apparatus and apply my process.

A is a retort for destructive distillation. A steam-pipe, D, closed by the steam-cock F, is carried into the stand-pipe, and bent so as to discharge a jet of steam in the direction to which the stand-pipe leads. This pipe terminates with a conical nozzle, through which a jet of steam is blown into the stand-pipe, entering the same at the base of the tubular termination of the funnel-formed case C. This conical case is made single or double, or with more concentric cones, according to circumstances. E is a pipe, closed by a stop-cock, leading in the stand-pipe below the conical case C, and is intended for the introduction of atmospheric air into the stand-pipe as required.

In the apparatus for using the vapors of hydrocarbons, K is the furnace, where the fire acts upon the bottom of the retort N. This retort is intended to be filled with fluid hydrocarbon, introduced through the pipe T. The fluids entering through this pipe are caused to flow towards the centre of the retort through the spaces formed by the volute partition F, and, being thus exposed to the action of the heat, they are evaporated. The vapor rises through the pipe R, which terminates in a cone, as already shown. A steam-pipe, constructed as described, terminates in said cone, as does also an atmospheric-pipe, similar to the one already described.

The operation of the apparatus, whether destructive distillation or vaporization of fluids is employed, is as follows: By the action of particles of steam mingled with globules of water, commonly called wet steam, upon the nozzle of the pipe D, and upon the sides of the funnel-formed case C, electricity is generated, the amount of which may be increased, according to well-known principles, by making the nozzle of the pipe D of hard wood, and also by causing the jet of steam to impinge upon a brush of points or by using a nozzle of ground glass. This jet of steam, passing through the apex of the conical case C, carries with it the gas or vapors from the retort, and the electricity generated by the jet of steam acts upon the atmospheric air admitted through the pipe E, setting free a portion of the oxygen, the nitrogen, uniting with part of the oxygen, forming nitric acid. After the gases or vapors passing from the retort are thus mingled with the oxygen, they are carried through water, which takes up the steam which has not been decomposed, and the nitric acid thus forming a permanent gas not subject to condensation.

The use of a retort may be dispensed with, and oxygen gas be generated alone, which may be employed for chemical distillation, for the desulphurization of ores, and other suitable purposes.

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

1. The process of generating and procuring the partial decomposition of atmospheric air by the action of wet steam in contact with metallic or other hard substances, for the purpose set forth.

2. The process, substantially as described, of saturating atmospheric air, and the subsequent application

of the same to the purposes of chemical distillation, or mixed with carbon or hydrocarbon vapors to heating or illuminating purposes.

3. The process of generating and preserving oxygen gas by the action upon a current of atmospheric air of electricity evolved by a jet of wet steam, and the subsequent separation of the steam and nitric acid from the oxygen thus set free, substantially as set forth.

4. The mode of manufacturing illuminating and heating-gases by mingling hydrocarbon gases or vapor with oxygen gases, generated substantially in the manner set forth.

5. The mode of manufacturing mingled oxygen gases for use in the desulphurization of ores, &c., substantially as set forth.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN T. RICH.

Witnesses:

WM. H. WIGHTMAN,

JOHN A. HURLEY.