

(Model.)

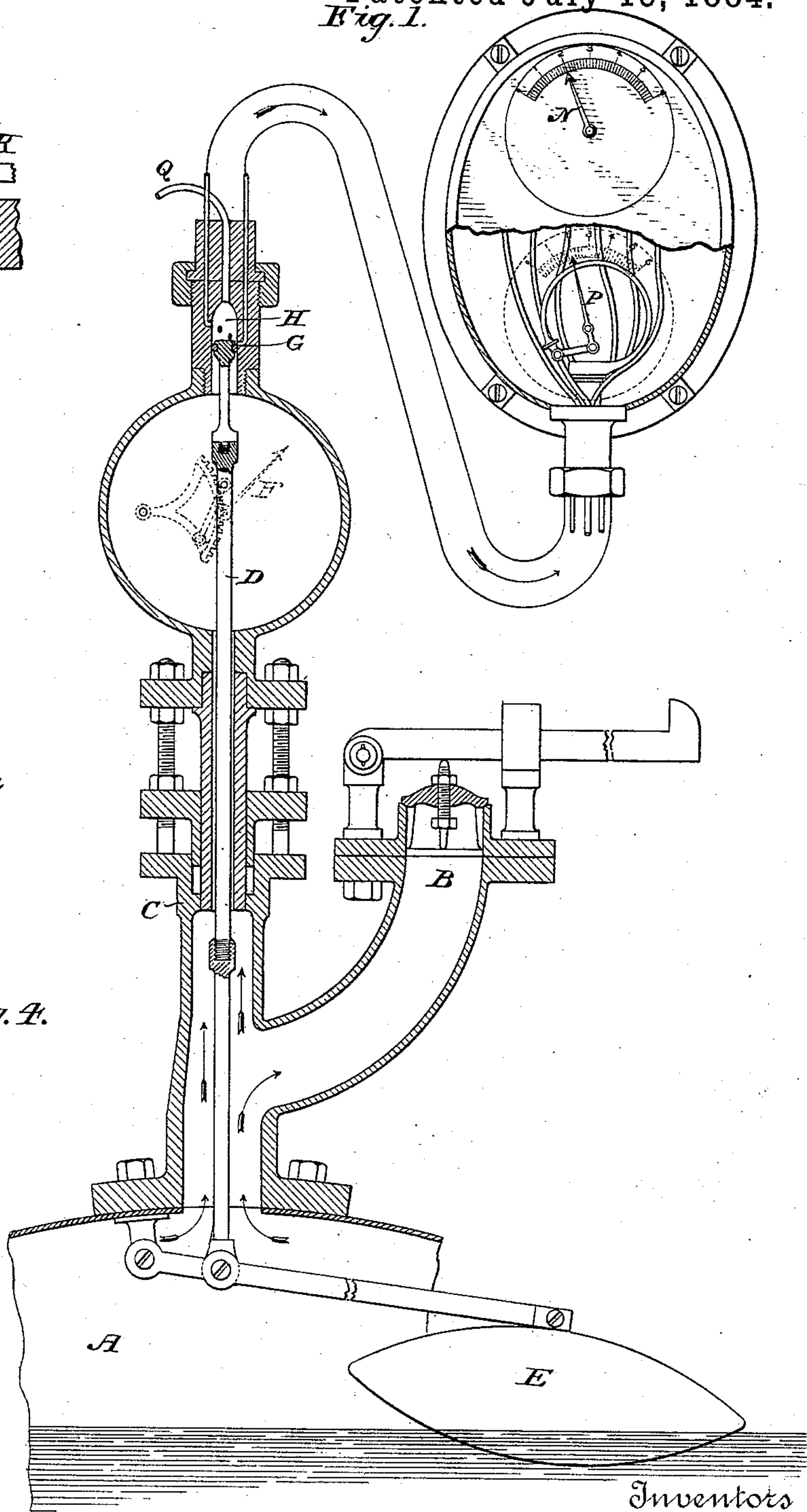
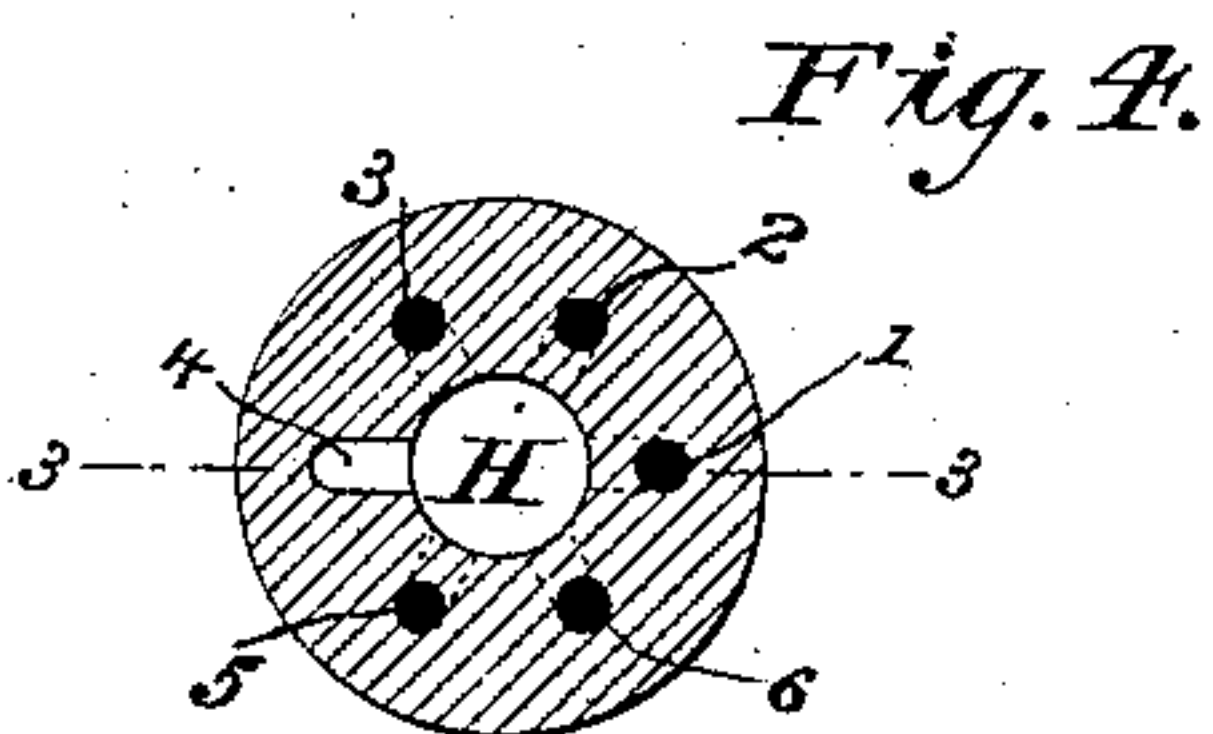
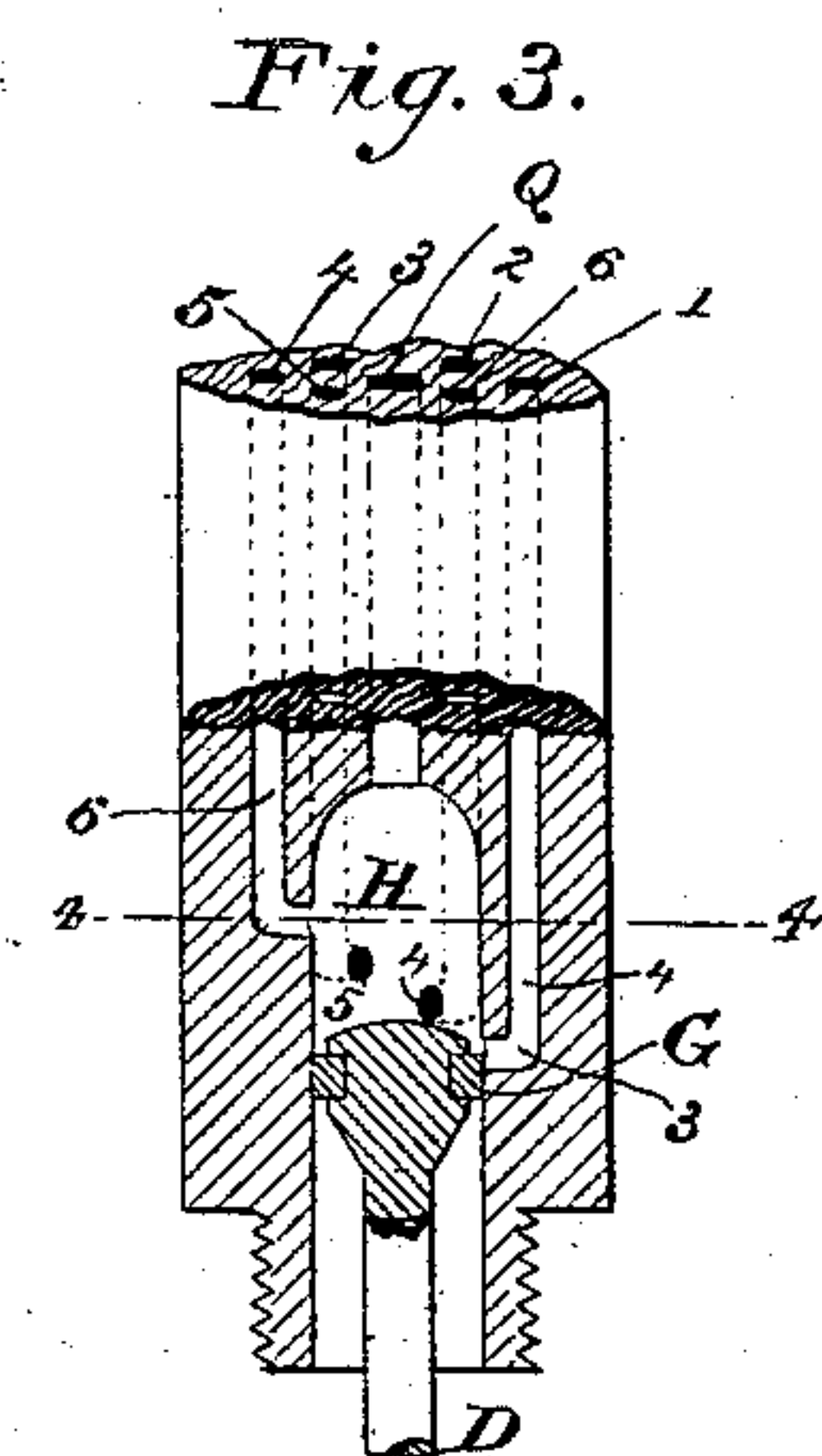
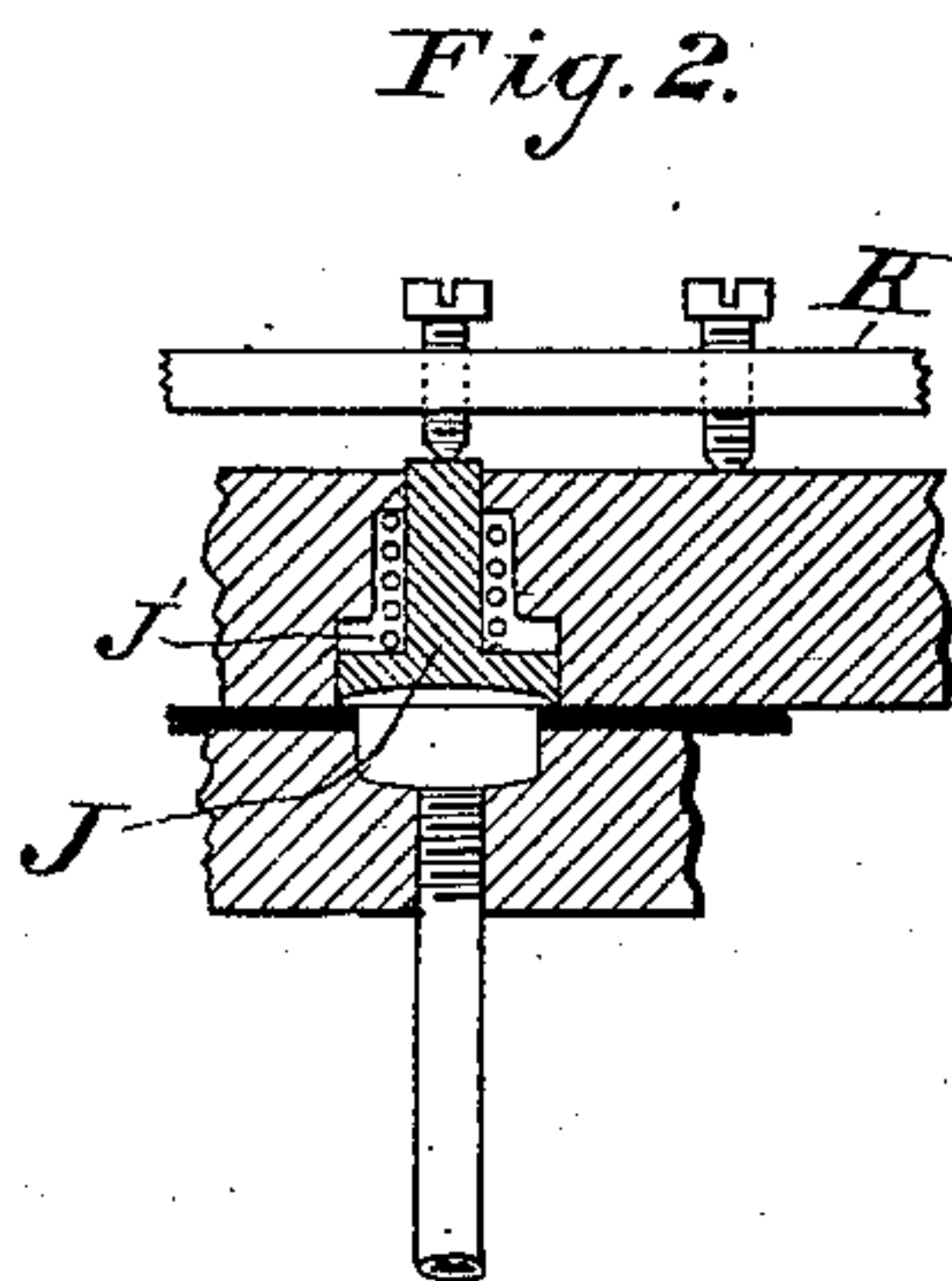
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J. B. LEFÈVRE & P. RENAUX.

AUTOMATIC WATER GAGE FOR ALL KINDS OF GENERATORS.

No. 302,008.

Patented July 15, 1884.  
*Fig. 1.*



Witnesses

Wm. A. Skinkle  
H. W. Elmore

By their Attorney

Frankland Jannet

Inventors  
J. B. Lefevre.  
P. Renaux.

(Model.)

2 Sheets—Sheet 2.

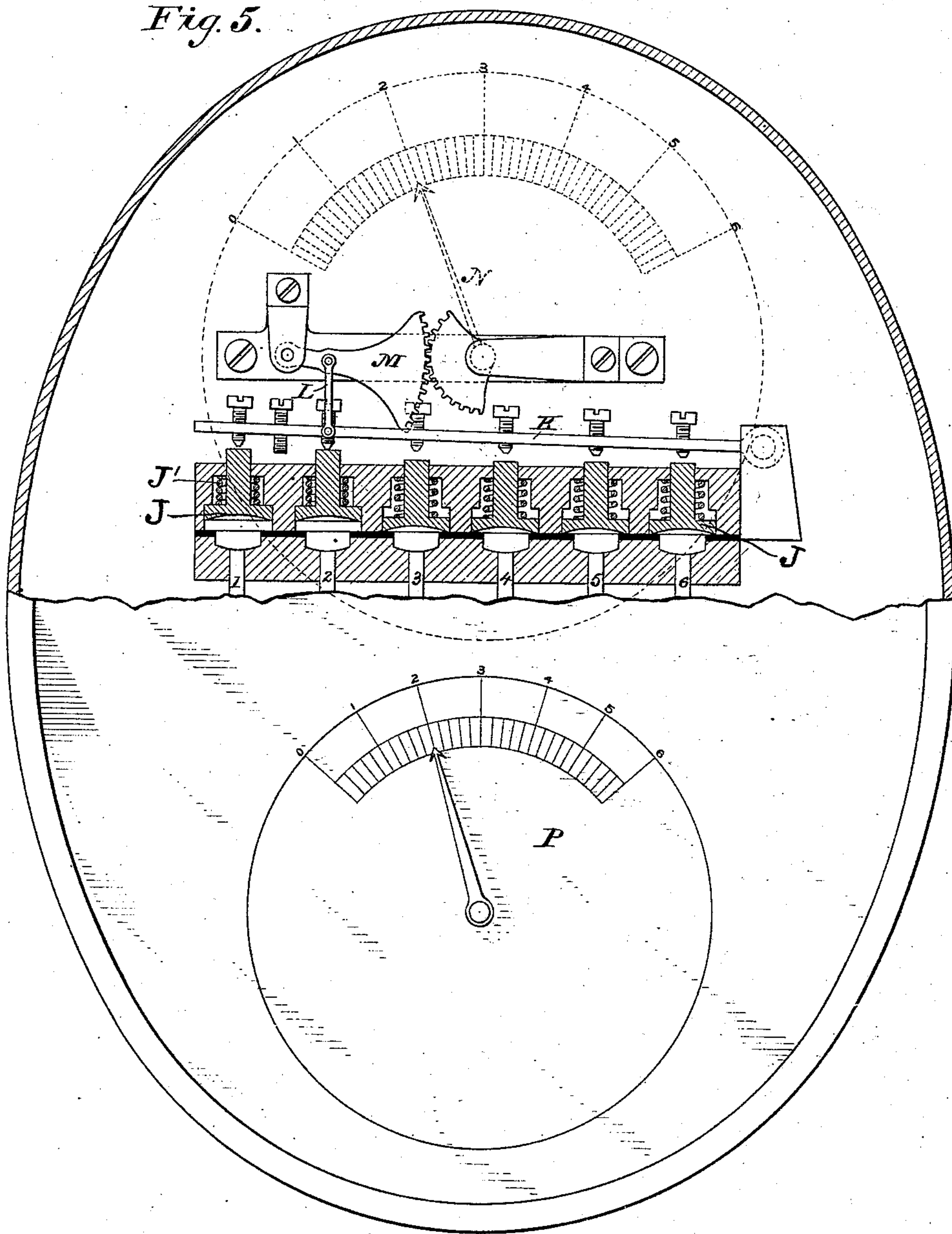
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*Fig. 5.*



Witnesses

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# UNITED STATES PATENT OFFICE.

JEAN BAPTISTE LEFÈVRE AND PROSPER RENAUX, OF PARIS, FRANCE.

AUTOMATIC WATER-GAGE FOR ALL KINDS OF GENERATORS.

SPECIFICATION forming part of Letters Patent No. 302,008, dated July 15, 1884.

Application filed August 3, 1883. (Model.) Patented in France June 9, 1882, No. 149,458; in England July 12, 1882, No. 3,312, and in Belgium July 17, 1882, No. 58,502.

*To all whom it may concern:*

Be it known that we, JEAN BAPTISTE LEFÈVRE and PROSPER RENAUX, citizens of the French Republic, residing at Paris, in the Department of the Seine and Republic of France, have invented certain new and useful Improvements in Automatic Water-Gages for All Kinds of Generators, (for which we have obtained a patent in France, No. 149,458, bearing date June 9, 1882; a patent in Belgium, No. 58,502, dated July 17, 1882, and provisional protection in Great Britain, No. 3,312, dated July 12, 1882,) of which the following is a specification.

Our invention relates to automatic water-level indicators for steam-boilers; and it consists in so organizing and arranging the same that when constructed according to our method they may be placed at any distance from and in any desired position with respect to the boiler.

In the drawings, Figure 1 is a vertical section of our device. Fig. 2 is an enlarged section of one of the pistons in the indicator. Figs. 3 and 4 are vertical and horizontal sections, respectively, of the chamber H, as hereinafter described; and Fig. 5 is an enlarged detail view of the superintendent's indicator.

A represents an ordinary boiler, upon which is mounted the safety-valve B. Connected with this, or at any other suitable opening in the boiler, is an upright tube, C, in which works a piston-rod, D, actuated by a float, E. Said float is connected by lever or other suitable means to the piston-rod, and is adapted to raise and lower the same proportionally as the water-level in the boiler rises and falls.

At a suitable point on the piston-rod D is attached the attendant's indicator F, which may be of any well-known construction. The upper end of said rod carries a piston, G, which works vertically in the chamber H. This chamber is pierced from bottom to top with a number of holes. We have, for convenience, only shown six, though any number may be used, the said openings being arranged spirally around the interior of the chamber H. From the spiral line of holes, tubes 1 2 3 4 5 6 are carried in a cluster to any place—as, for

instance, the office of the superintendent—where it may be desirable to have an indicator at all times showing the condition of the boiler. At this point and within the indicator the tubes diverge, and being arranged in a line, over the mouth of each one is placed a small piston, J, normally held down by a suitable spring, J'. These pistons are usually arranged in a single line, and resting upon the upper ends of these pistons are suitable set-screws, which support the arm K.

At a suitable point on the arm K is pivoted a pitman-rod, L, which is in turn pivoted to a rack, M, operating the indicator-index N by means of suitable gear-wheels.

The tubes 1 2 3 4 5 6 are so arranged that the one communicating with the lowest hole in chamber H shall be farthest removed from the pivoted end of the arm K, the next one place nearer, and so on. By this construction it will be seen that when pressure is admitted to the tube 1, the arm K will be raised a certain distance. When the next piston rises, the arm will be still further elevated and lifted from contact with piston No. 1, and so on throughout the series.

It is to be understood that around the rod D, within the tube C, there is sufficient space for the steam to pass up into the chamber H. Within this chamber works the before-mentioned piston G, which is a disk provided with suitable packing around its edge. It will thus be seen that when the piston G rises and exposes a hole steam-pressure is conveyed through the pipe connected therewith to the office-indicator. From the top of the chamber H an exhaust-pipe, Q, conveys away the waste steam issuing from any pipes that may be cut off by the descent of the piston G, thus removing pressure in such pipes and freeing them of their contents. A suitable pipe may also be carried with the cluster to the office-indicator for registering the steam-pressure upon a proper dial, as at P.

We claim—

1. A water-level indicator consisting, essentially, of a chamber having a series of openings therein, steam-pipes leading from said openings to an indicating device, and means



for controlling the flow of steam from the said chamber through the series of pipes by the rise and fall of the water in the boiler, substantially as set forth.

5 2. In a water-level indicator, the chamber H, pierced with a number of holes, and pipes leading from such holes to an indicator such as described, in combination with the piston G, and suitable means for raising and  
10 lowering said piston proportionally as the water-level in the boiler rises and falls.

3. In a water-level indicator, the pistons J, pipes 1 2 3 4 5 6, and suitable mechanism for admitting pressure to such pipes, in combination with the bar K, resting upon and oper-  
15 ated by said pistons and connected with a suitable indicator.

4. In a water-level indicator, the pistons J, pipes 1 2 3 4 5 6, and suitable mechanism  
20 for admitting pressure to such pipes, in com-

bination with the bar K, resting upon and operated by said pistons, pitman-rod L, rack M, and index N.

5. The chamber H, having a number of holes arranged around its sides, and the piston G, 25 adapted to move vertically within said chamber, in combination with an exhaust-pipe located above the highest side opening for conveying away waste steam.

6. In a water-level indicator, pistons ar- 30 ranged beneath a rod pivoted at one end, in combination with means for raising said pistons singly, commencing with the one adjacent to the free end of said rod.

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Witnesses:

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