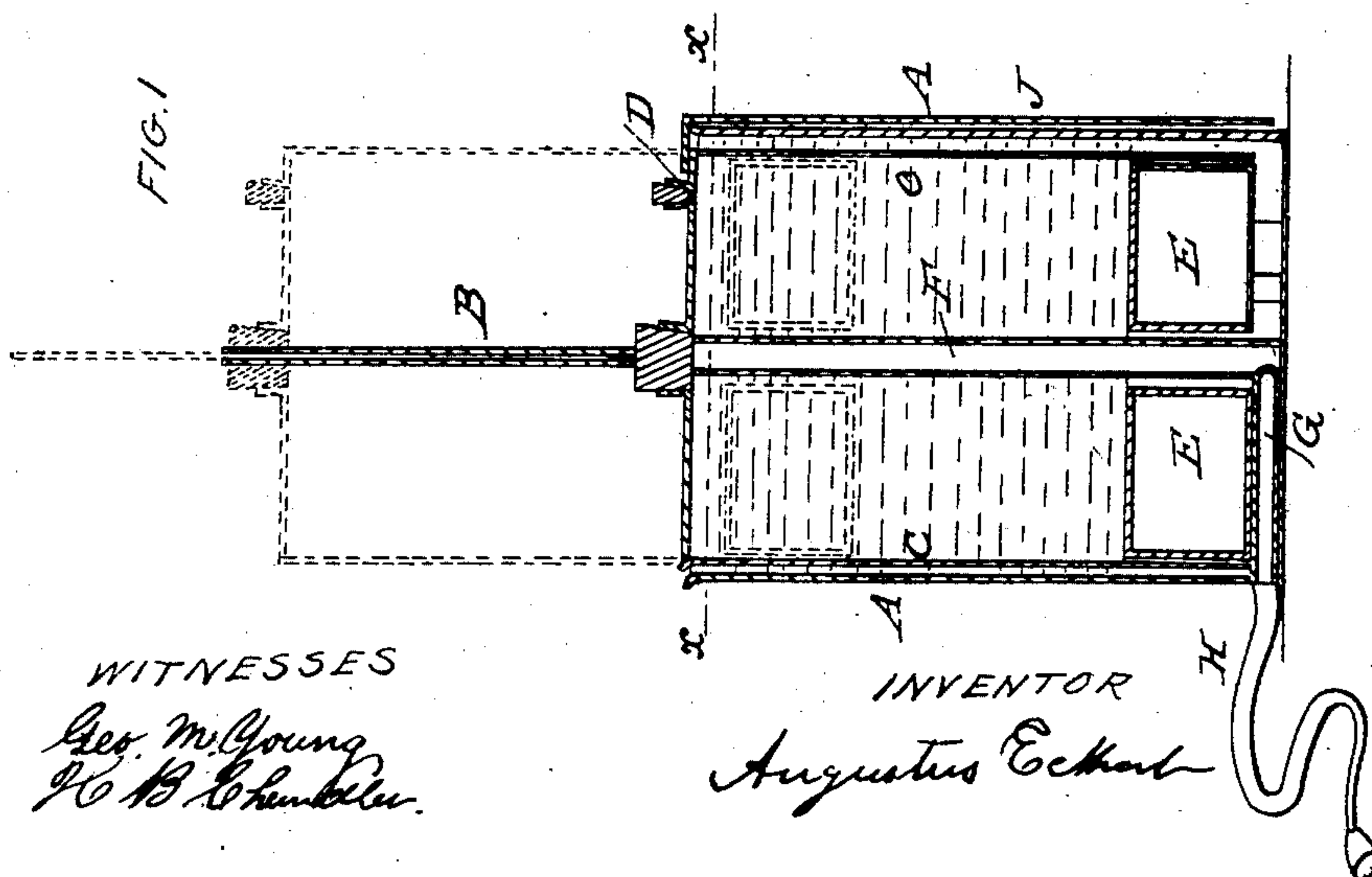
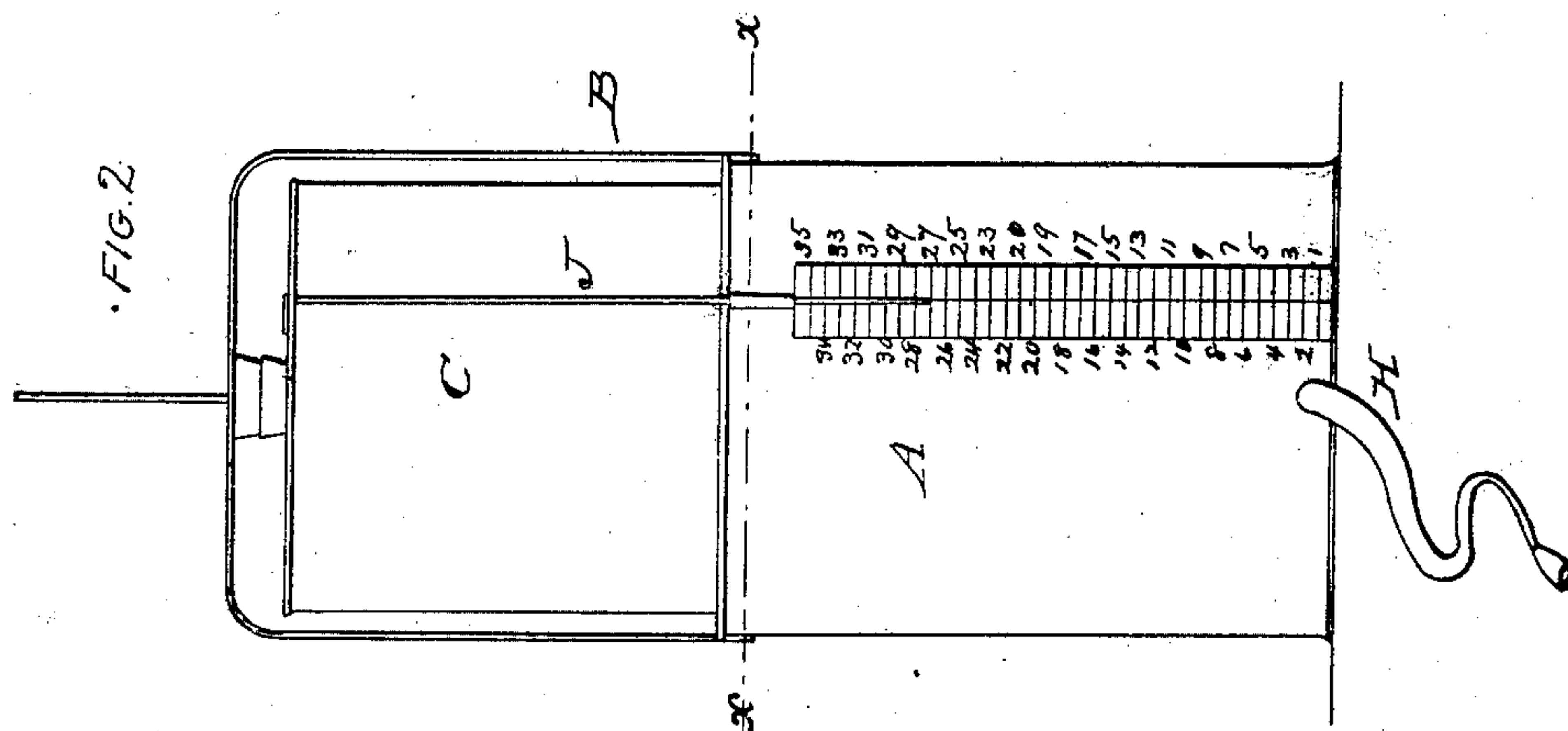


A. ECKERT.
Pulmonometer.

No. 26,754.

Patented Jan'y 10, 1860.



UNITED STATES PATENT OFFICE.

AUGUSTUS ECKERT, OF DAYTON, OHIO.

PULMONOMETER.

Specification of Letters Patent No. 26,754, dated January 10, 1860.

To all whom it may concern:

Be it known that I, AUGUSTUS ECKERT, M. D., of Dayton, in the county of Montgomery and State of Ohio, have invented a new and useful Improvement in Pulmonometers; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1, is a vertical transverse section taken through the pulmonometer exhibiting the arrangement of the chambers and cylinders. Fig. 2, is a front elevation of the same showing the inside cylinder in an elevated position when filled with air from the lungs.

Similar letters indicate corresponding parts in both figures.

My invention and improvement in lung gages consists in furnishing the bottom of the inner or measuring cylinder with a close compartment which surrounds the same for the purpose of steadying said cylinder in its motion and causing it to remain stationary at any point to which it has been blown up, so as to indicate with accuracy the vital capacity of the lungs as hereinafter described.

To enable others skilled in the art to understand my invention I will proceed to describe its construction and operation.

The lung gage or pulmonometer commonly used consists simply of a cylinder or reservoir for containing water with a smaller cylinder placed in it and inverted, the air is blown into the inner cylinder through a pipe which extends above the water level and the index is placed in various positions for indicating the amount of air. In these gages the inner cylinder is kept in a vertical position merely, by guides proceeding up from the sides of the exterior cylinder, but the slightest inclination of the gage will cause it to register wrong and in order to obviate this objection and to cause the inner cylinder and consequently the index hand to remain stationary after it is blown up to a certain point I have constructed the apparatus as follows.

A, represents the outer cylinder which may be made of any capacity found necessary. On each side of this cylinder and di-

rectly opposite each other are two rods B, B, which are connected together at their tops forming guides for keeping the inner cylinder C, in a vertical position as it is elevated by the air from the lungs. This inner cylinder C, is somewhat smaller than the outer cylinder A, and is open at the bottom and closed at its top with the exception of a small opening D, for the escape of air when it is depressed, this opening is to be kept closed by a suitable stopper when the apparatus is prepared for testing the capacity of the lungs, another opening is also made in the center of the top of this cylinder C, which is to be opened and a pipe attached over it when the apparatus is to be used as an inhaler, but the invention is not specially intended for this purpose and therefore it is not necessary to describe.

The bottom of the smaller cylinder C, is furnished with a cylindrical airtight chamber or buoy E, the object of which is, to give to this cylinder a floating capacity, or in other words to cause the cylinder to float upon the water which is contained in the outer cylinder, so that said cylinder will remain stationary after it is blown up. The buoy E, permits the water to pass up in the cylinder and attain its equilibrium.

F is a pipe extending up in the center from the bottom of the cylinder A, above the water level x, x , the bottom of which has a branch pipe G, communicating with a flexible tube H, furnished with a mouth piece.

The scale is represented on the exterior surface of the outer cylinder in Fig. 2, with an indicator rod J, attached to the top of cylinder C, for registering the capacity of the lungs, or the height to which this cylinder is blown.

In testing the strength of the lungs, or their capacity for air the cylinder C, is supposed to be resting on the bottom of the cylinder A, with the stopper inserted in the opening D, so that no air will escape therefrom, the index hand being at cipher, The mouth is now placed to the tube H, and by expiring all the air from the lungs, the cylinder, C, will be elevated and it will remain, in this position after the mouth is taken away from the tube, without the use of weights, commonly used for this purpose, and the amount of air expired may be

read off from the scale, then by removing the stopper D, the cylinder may be depressed ready for another test. The drawings exhibit this cylinder in its two extreme positions.

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

The application of the buoy E, to the bottom of the floating cylinder C, for the purposes and substantially as set forth.

AUGUSTUS ECKERT.

Witnesses:

GEO. M. YOUNG,
H. B. CHANDLER.