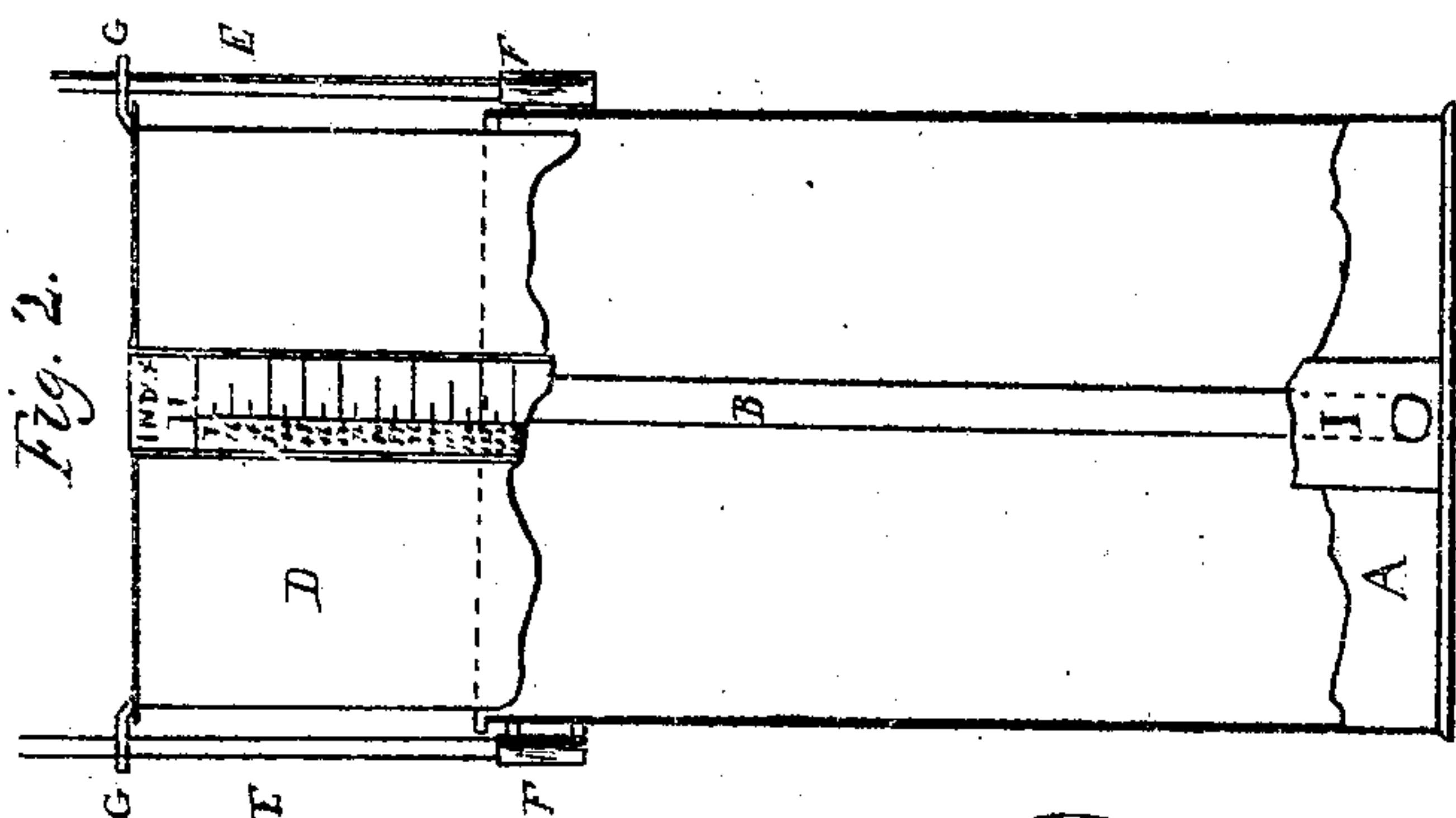
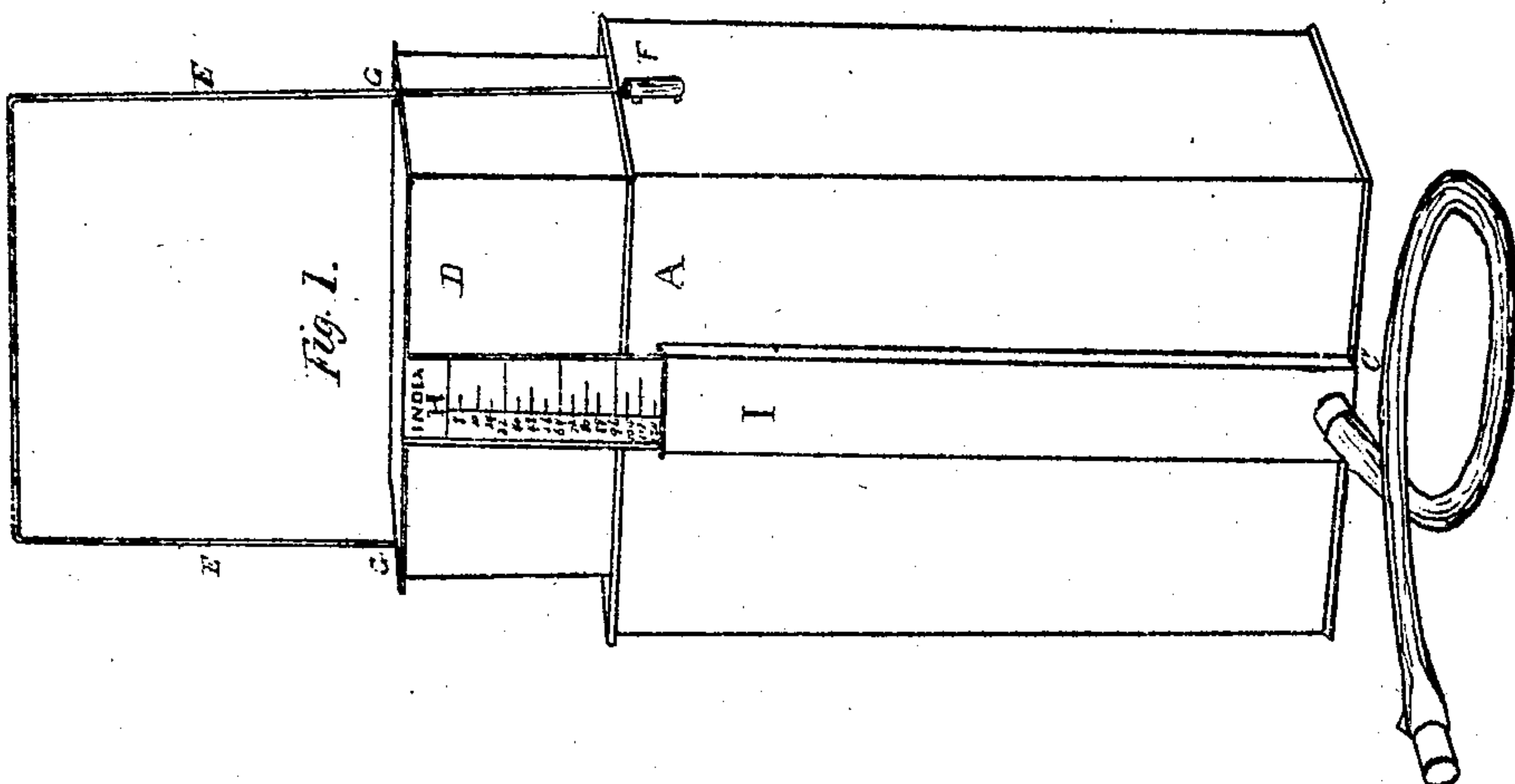
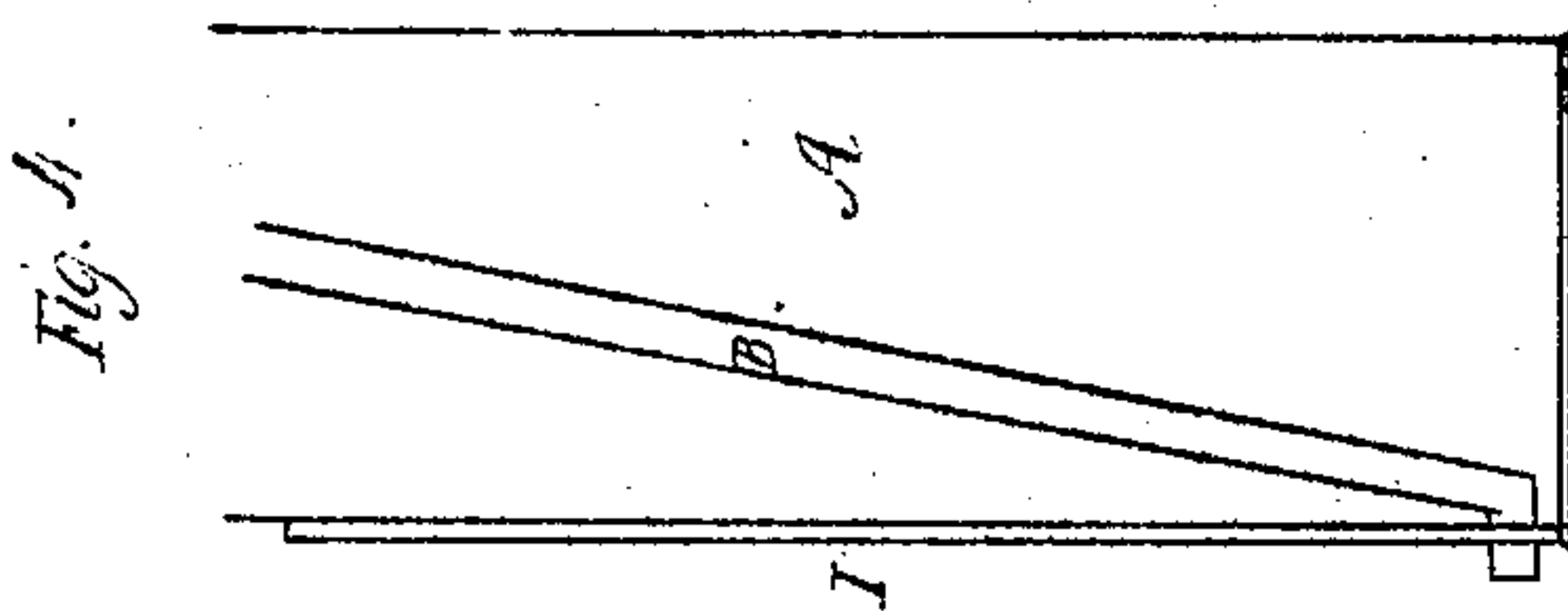


G. W. Brown.

Spirometer.

N^o 73229

Patented Jan. 14, 1868.



Witnesses:

Inventor

M. C. Pumphrey
Clerk of the Court

G. W. Brown

United States Patent Office.

GEORGE W. BROWN, OF ROCKFORD, ILLINOIS.

Letters Patent No. 73,229, dated January 14, 1868.

IMPROVEMENT IN SPIROMETERS.

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

TO WHOM IT MAY CONCERN:

Be it known that I, GEORGE W. BROWN, of Rockford, in the county of Winnebago, and State of Illinois, have invented a new and improved Spirometer, for measuring the breathing capacity of the human lungs in cubic inches, with a view to their intelligent medical treatment, if diseased.

My invention consists of a reservoir, A, made of tin plate, eight and one-half inches long, four and one-half inches wide, and thirteen and one-half inches high, with a water-tight bottom, the reservoir open only at the top. A tube, B, three-eighths of an inch in diameter, is passed through the middle of the front side, at the bottom of the reservoir; thence passing to the inner centre at the bottom, is bent at a right angle, and rises to the surface, level with the top. This tube projects three-fourths of an inch outside of the instrument, to receive an elastic tubing, one yard in length, marked C, through which the breath is expelled into the instrument. A drum, D, measuring four by eight inches in the inside, and thirteen inches high, is also made of tin plate, closed at the top, open at the bottom, and made air-tight. This is inserted in the reservoir, open end down. Guides, E E, are fixed at each end, and at the top and middle of the end of the reservoir, one-eighth of an inch in diameter, and rising above the top of the reservoir twelve inches, attached by being slipped into open sockets, F F, the size of the guides, and closed at the bottom, to prevent the guides dropping through out of place. They are connected at the top by a cross-bar, X, to sustain the upper ends of the guides and keep them equidistant from each other. I usually make the guides and cross-bar X of continuous wire, bent at the corners at right angles, as shown in the diagram. Eyes, G G, are soldered to the top of the drum, projecting half an inch at each end from the drum, and perforated with a hole, one-eighth of an inch in diameter, through which the guides are slipped, when the drum is in place, into the sockets F F; their object, to keep the drum perpendicular to the plane of the reservoir, when in use, and prevent it from careening. An index, H, to indicate the amount of air in cubic inches which the lungs can expel, is attached to the top and front side of the drum, and midway of the same, and is made of a strip of tin plate, one and one-quarter inch wide, and thirteen inches long, soldered to the top of the drum, at the middle of the front side. Projecting forward half an inch from the edge of the drum, it is bent down at right angles with the top, and parallel with the sides, so that when the drum is in place it drops down in front of the reservoir, to near the bottom of the instrument. On this I paste a printed paper index, divided into inches, half, quarter, and one-eighth inches. Each quarter of an inch on the scale indicates eight inches in the drum. The smaller numbers are at the top, increasing eight inches for each quarter of an inch marked on the scale, until it reaches the bottom. The edges of the tin plate on which the printed paper slip is pasted are bent forward, to prevent the wear of the lines and figures against the shield, to be next described. A shield, I, to cover the index, protecting it from injury, and shielding the numbers not indicated by the breath-measure from sight, extends from within one inch of the top of the reservoir to the bottom of the same, wide enough, and projecting forward from the drum far enough, to admit the free passage of the index without friction. I make this of tin, two and one-half inches wide, and twelve inches long, with half an inch on each edge bent backwards at right angles, and soldered to the reservoir, leaving a cavity extending from within one inch of the top to the bottom of the instrument, and, on the front side, one and one-half inch wide and half an inch deep. When the drum and index are in place and at rest, the zero of the index is level with the top edge of the shield.

When in use, the reservoir is filled with water to within two inches of the top of the same. The drum is inserted in the water, the open end down. The guides are passed through the eyes on the drum, and thence pressed tightly into the sockets. The lungs are inflated to their full capacity. The end of the elastic tube C, in which a three-eighth glass tube is inserted, is placed between the lips, and the breath is gradually pressed through the tubes B and C, above the top of the water in the reservoir, into the vacuum in the top of the air-tight drum. The drum, which had before settled into place, rises, carrying with it the index, and on a level with the top of the shield is read, in figures, the number of cubic inches of air expelled from the lungs, and indicating their extreme breathing capacity.

I am aware that spirometers, and the general principles of the reservoir and drum described herein, have long been in use. I therefore disclaim the invention of such appliances, apart from my specific improvements; but

I claim herein as new and of my invention, and desire to secure by Letters Patent—

1. The arrangement of spirometers and index H, and shield I, in the manner specified, and for the purpose as described herein.
2. The metal tube B, which rises through the water in the reservoir A.
3. The arrangement of the guides E E and eyes F F with spirometer, for the use and in the manner herein described and set forth.

G. W. BROWN.

Witnesses:

W. W. WOOD.

H. M. WEBB.