(No Model.)

F. W. BAKER.

SPIROMETER.

No. 531,247. Patented Dec. 18, 1894.

Fig. 1.

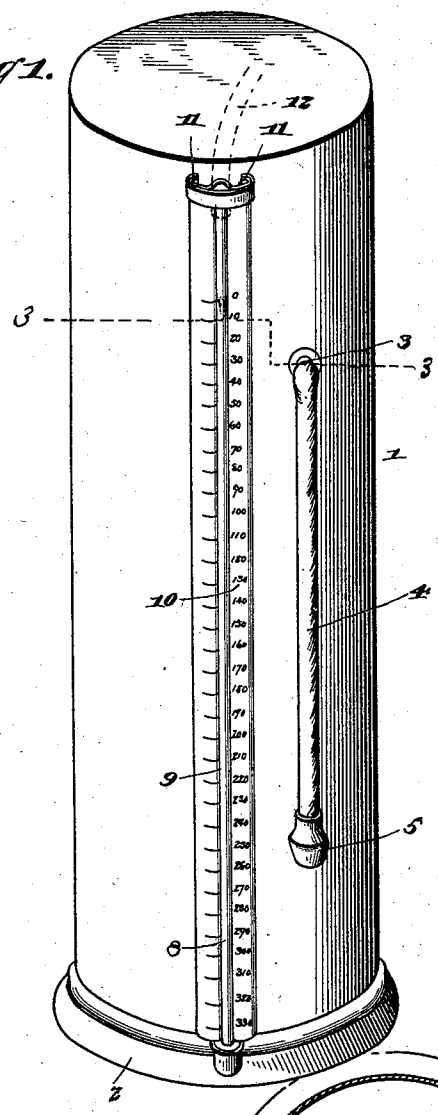
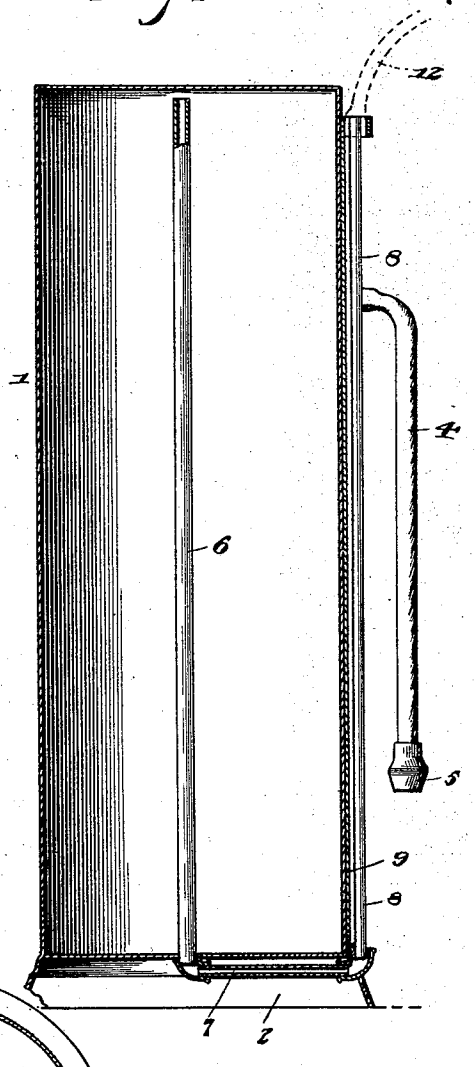


Fig. 2.



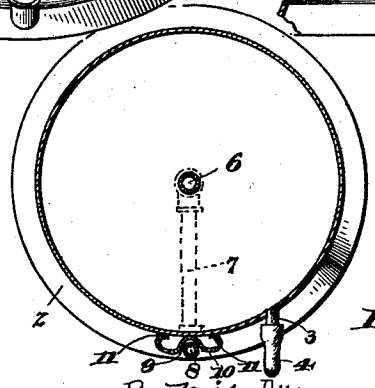


Fig. 3.

Inventor
Frank W. Baker,

Witnesses
B. S. Ober.
S. P. Holland 2d.

By his Attorneys.
C. A. Snow & Co.

UNITED STATES PATENT OFFICE.

FRANK W. BAKER, OF KOKOMO, INDIANA.

SPIROMETER.

SPECIFICATION forming part of Letters Patent No. 531,247, dated December 18, 1894.

Application filed July 31, 1894. Serial No. 519,087. (No model.)

To all whom it may concern:

Be it known that I, FRANK W. BAKER, a citizen of the United States, residing at Kokomo, in the county of Howard and State of Indiana, have invented a new and useful Spirometer, of which the following is a specification.

This invention relates to spirometers; and it has for its object to provide a new and useful apparatus of this character that is based entirely, in its operation, on inhalation in contradistinction to the exhalation operation of similar apparatus or instruments.

To this end therefore the main and primary object of the present invention is to provide a particular construction of spirometer that will accurately measure the amount of pure air breathed into the lungs, and in this use will provide means for insuring dilation and development of the air cells of the lungs, thereby increasing the breathing capacity and power of the lungs.

With these and other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings:—Figure 1 is a perspective view of a spirometer constructed in accordance with this invention. Fig. 2 is a central vertical sectional view thereof. Fig. 3 is a detail sectional view on the line 3—3 of Fig. 1.

Referring to the accompanying drawings, 1 designates an air cylinder or receiver that is adapted to be always filled with pure air, and said air cylinder or receiver is constructed in any suitable size according to the capacity desired therefor. The air cylinder or receiver 1, is perfectly air tight and is adapted to rest in an upright position on a suitable base 2, formed at the lower end thereof, and at a suitable point intermediate of its ends and preferably near the upper end thereof the said cylinder is provided with an air opening 3, to which is connected one end of the flexible air tube 4, that is provided at its other free end with the mouth-piece 5, which is adapted to be placed in the mouth of a person to provide for inhaling the pure air from within the cylinder or receiver, and when the mouth piece 5, is not in the mouth of a person, the tube 4, supplies the interior of the cylinder or receiver with pure air.

Arranged inside of the air cylinder or receiver 1, is an upright liquid tube 6. The upright liquid tube 6, extends from the top to the bottom of the said cylinder and is open at its upper end to communicate with the interior of the said cylinder, and at the lower end the said tube has connected thereto one end of the branch tube 7, that extends outside of the cylinder or receiver and is connected to the lower end of the exterior gage glass or tube 8, that is of a smaller diameter than the tube 6, with which it communicates. The exterior gage glass or tube 8, is seated in the longitudinal tube groove 9, formed centrally in and longitudinally of the register or scale plate 10, that is secured on the outside of the cylinder or receiver and extends from the upper to the lower end thereof. The said register plate 10, is provided on one side of the groove therein with a series of graduated marks, and on the opposite side of the groove with graduation numbers opposite said marks to provide a scale for determining the number of cubic inches of air that have been inhaled by a person from within the air cylinder or receiver.

The register or scale plate 10, is preferably curved in shape and is provided with flanged edges 11, to secure the same to the cylinder or receiver, and the upper end of the gage glass or tube 8, that is fitted in the groove of said plate is open and may have attached thereto a short flexible siphon tubes 12, that, together with the tube 4, provides convenient means for siphoning the proper amount of liquid into the tubes 8 and 6.

In the normal condition of the apparatus, the liquid, which may be water, occupies nearly the entire height of the gage glass or tube up to the zero mark on the register or scale plate, and the relative sizes of the tubes 8 and 6, are proportioned so that when the fluid in the tube 8, has lowered to the lower end of said tube, the fluid will have risen in the tube 6, about one and a half inches. To use the apparatus, the mouth-piece 5, is placed in the mouth of a person and the air is then inhaled into the lungs from the cylinder or receiver 1. As the air is drawn from

the cylinder or receiver, the pressure of air exerted on the column of liquid in the tube 8, will lower the liquid in such tube and cause the same to rise up within the tube 6, and the point where the level of the liquid remains stationary in the tube 8, will by means of the graduations on the register or scale plate, indicate the precise number of cubic inches of air inhaled into the lungs.

From the above it will be understood that the herein-described apparatus provides only for the inhalation of air into the lungs, and therefore by its constant use will materially assist in the development of the lungs.

Changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a spirometer, the combination of an air tight cylinder, a flexible air tube connected with said cylinder at an intermediate point and provided with a mouth-piece, an upright liquid tube arranged within the cylinder, and having its open upper end terminating short of the top of the cylinder, a register or scale plate secured on the outside of said cylinder, and a separate gage glass or tube secured on said register or scale plate and connected at its lower end with the lower end of said liquid tube, substantially as set forth.

2. In a spirometer, the combination of an air cylinder or receiver, a flexible air tube connected with said cylinder or receiver and provided with a mouth-piece, an open liquid tube arranged vertically inside of the cylinder or receiver and extending from the bottom thereof to a point short of its top, a register or scale plate secured to the outside of the cylinder or receiver and provided with a longitudinal tube groove, and a gage glass or tube arranged in said tube groove and connected at its lower end with said liquid tube, said gage glass or tube being open at its upper end and of a smaller diameter than the liquid tube, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

FRANK W. BAKER.

Witnesses:
W. S. MAPLE,
E. E. RUSSELL.