E. L. FISK.

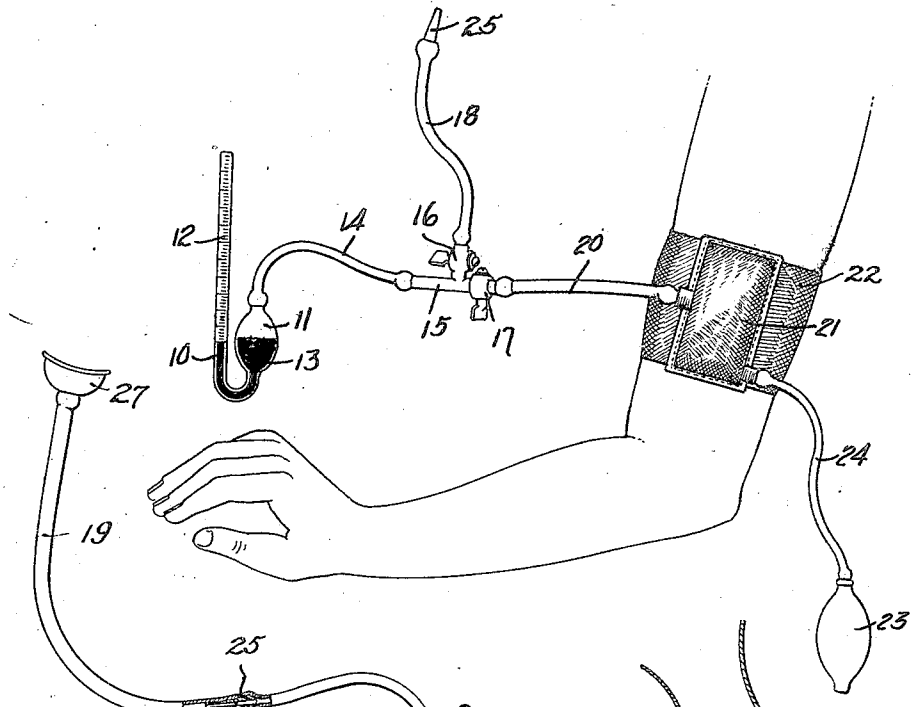
COMBINATION BLOOD PRESSURE AND RESPIRATION INSTRUMENT.

APPLICATION FILED OCT. 29, 1921.

1,433,679.

Patented Oct. 31, 1922.

Fig. 1.



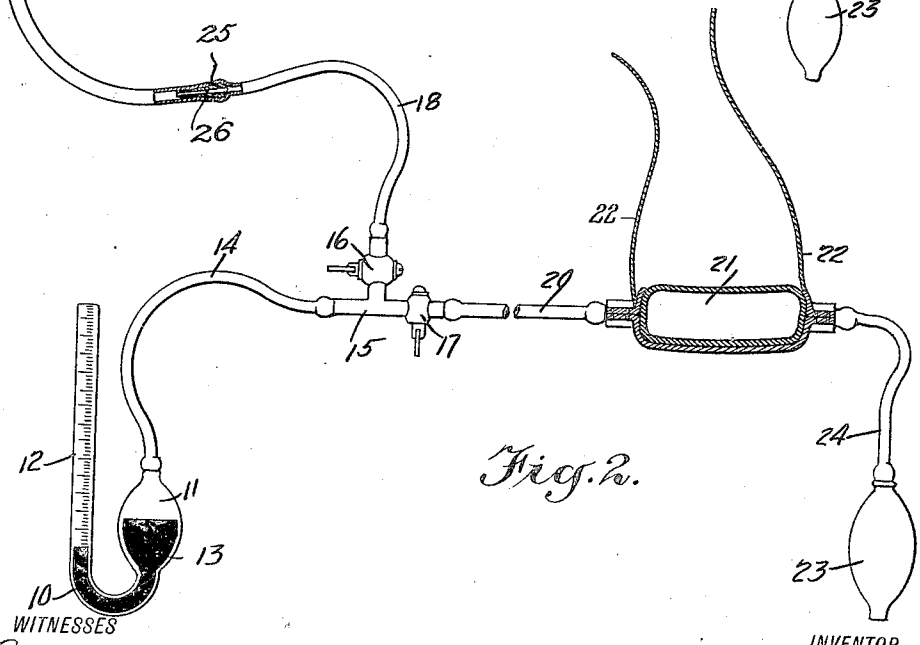


Fig. 2.

WITNESSES

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UNITED STATES PATENT OFFICE.

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COMBINATION BLOOD-PRESSURE AND RESPIRATION INSTRUMENT.

Application filed October 29, 1921. Serial No. 511,300.

To all whom it may concern:

Be it known that I, EUGENE L. FISK, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, in the county and State of New York, have invented a new and Improved Combination Blood-Pressure and Respiration Instrument, of which the following is a full, clear, and exact description.

This invention has relation to measuring instruments and refers more particularly to sphygmomanometers and spirometers for determining blood pressure and respiration.

At the present time these instruments are used separately for determining blood pressure and the breathing capacity of the lungs.

The invention therefore contemplates as one of its principal objects an instrument which combines with a sphygmomanometer a spirometer whereby the same gage may be employed for measuring the blood pressure and respiration.

As a further object the invention aims to produce an instrument of the character described which by a simple valve arrangement permits of its use in the several capacities intended whereby immediately following or preceding the blood pressure test the respiration test may be instituted without detaching the sphygmomanometer circuit and cuff to bring the mouth piece of the spirometer into use.

As a still further object the invention contemplates the provision of an instrument of the character described which eliminates the expense incident to the procurement of two instruments, the amount of storage space therefor, and the necessity of carrying a multiplicity of instruments for the several purposes intended.

With the above recited and other objects in view, the invention resides in the novel construction set forth in the following specification, particularly pointed out in the appended claims and illustrated in the accompanying drawings, it being understood that the right is reserved to embodiments other than those actually illustrated herein to the full extent indicated by the general meaning of the terms in which the claims are expressed and by variations in the phraseology of the same.

In the drawings—

Figure 1 is a perspective view illustrating the instrument in its applied position.

Fig. 2 is a side elevation thereof with parts in section.

Referring by characters of reference 10 designates a U-shaped transparent tube to the shorter arm of which a bulb 11 is secured so as to communicate therewith. The opposite or longer arm is provided with a graduated scale 12. In practice the tube and bulb contain a predetermined quantity of mercury, oil, glycerine, or other liquid substance 13 which is designed to be forced under pressure from the bulb into the scaled arm to produce a readable column for gaging the pressure required to lift the same. Preferably a flexible tube 14 communicates with and is connected with the free open end of the bulb 11, the same attached to and communicating at its opposite end with a T-shaped tubular union 15. The union is provided with valves 16 and 17 in two of its branches, the former being connected by a tube 18 to a removable mouth piece section 19, and the latter by a tube 20 to a pressure bag 21 adapted to be secured by suitable encircling bands 22 to the arm. A pressure bulb 23 or other pressure device for inflating the pressure bag 21 is connected thereby by a tube 24. The inner end of the removable mouth piece section 19 is designed to fit over a connector 25 attached to the free end of the tube 18. The connector 25 is provided with a tapered bore 26 of gradually increasing diameter from its inlet to its outlet end, whereby the patient when blowing in the mouth piece 27 will exert a uniform pressure against the mercury in the bulb 11 of the U-shaped tube 10.

In practice when it is desired to use the instrument in the capacity of a sphygmomanometer, the valve 16 is closed and the valve 17 is open. The operator by successively squeezing the bulb 23 inflates the pressure bag 21 thereby forcing the air through the tube 20, the valve 17, union 15 and the tube 14 into the bulb 11, thus forcing the fluid 13 from the bulb and into a column of the longer gage arm 12 of the U-tube until the pressure bag has exerted a sufficient force to cut off the blood pressure. When the device is to be employed in the capacity of a spirometer for testing the expiratory force, or as a means for testing the respiration fatigue, the valve 17 is cut off and the valve 16 open. The patient

then blows through the mouth piece 27, the expiratory force traveling through the section 19, the connector 25, tube 18, the valve 16, the union 15, and the tube 14 into the bulb 11. It will thus be seen that by a simple and inexpensive attachment a sphygmomanometer and a spirometer are combined in a single instrument which may be selectively brought into operation by the manipulation of a simple valve means.

I claim:

1. The combination with a sphygmomanometer including an inflatable pressure bag and a gage tube having operative connection therebetween, of means interposed in said connection for blowing into the gage tube, and means for selectively cutting off communication between the blowing means and the gage tube or the inflatable pressure bag and the gage tube, as and for the purpose specified.

2. The combination with a sphygmomanometer including a gage tube, an inflatable pressure member and a connection therebetween, of means for introducing an expiratory force into the connection, and means for selectively establishing communication between the latter means and the connection and the pressure creating means and the gage tube.

3. A combination blood pressure and respiration instrument comprising a gage tube, an inflatable pressure means, a respiration receiving means, and a valve connection between said means and the gage tube, as and for the purpose specified.

4. The combination with a sphygmomanometer including a gage tube, an inflatable pressure member adapted to be secured to the arm and a connection therebetween, of a T-shaped union interposed in said connection, a mouth piece connected to one of the arms of said union, a valve in said arm and a valve in the arm with which the inflatable pressure bag is connected whereby the gage may be employed as a spirometer when the first valve is open and the second valve is closed, and as a sphygmomanometer when the first valve is closed and the second valve is open.

5. An instrument comprising in combination a gage tube, a pressure bag having communication therewith, a blowing tube having communication with said gage, and independently operable means for cutting off communication between said pressure bag and the gage or between said blowing tube and the gage, as and for the purpose specified.

EUGENE LYMAN FISK.