(No Model.)

A. L. ROUSSE.

LACTOMETER.

No. 404,985. Patented June 11, 1889.

fig 1

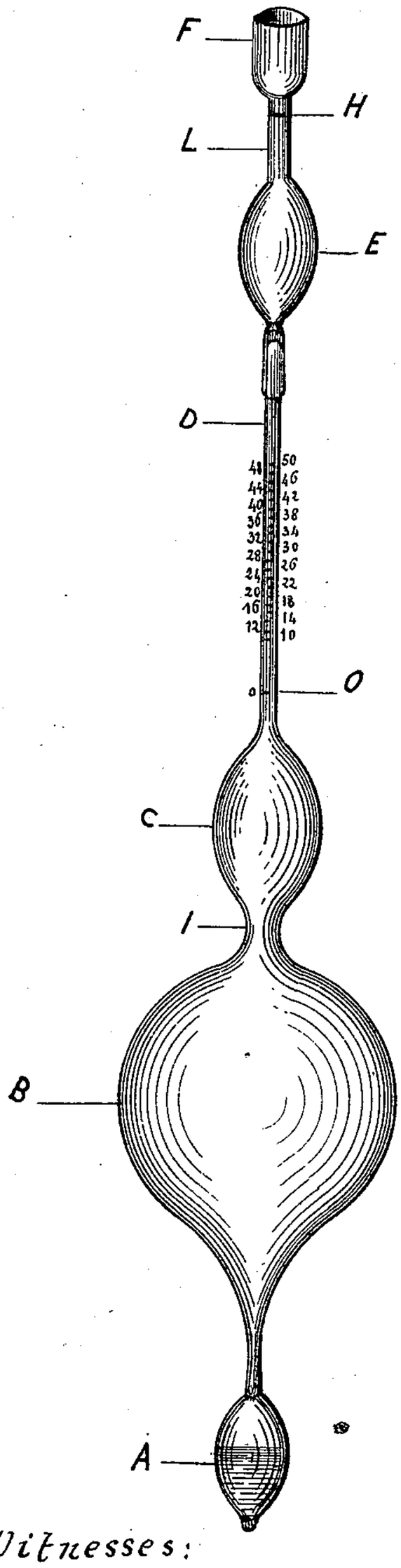
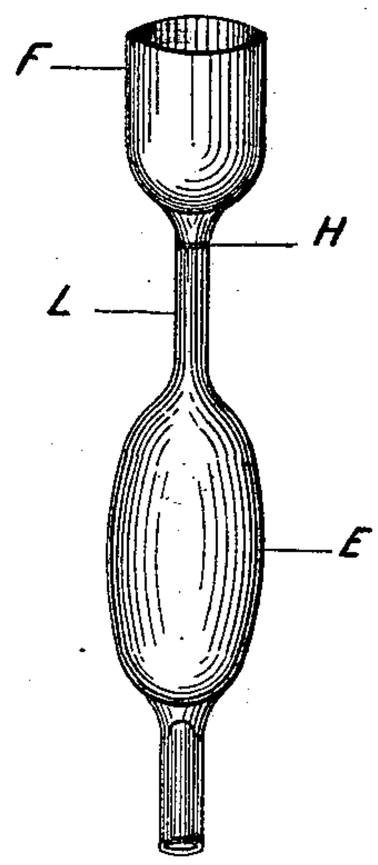


fig 2



Witnesses:
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by Ferdinand Bofshardt
his Attorney in fact.

UNITED STATES PATENT OFFICE.

AUGUSTE LÉON ROUSSE, OF FONTENAY-LE-COMTE, FRANCE.

LACTOMETER.

SPECIFICATION forming part of Letters Patent No. 404,985, dated June 11, 1889.

Application filed November 1, 1887. Serial No. 254,026. (No model.) Patented in France April 8, 1887, No. 182,916; in Luxemburg October 11, 1887, No. 904; in Belgium October 12, 1887, No. 79,177; in Germany October 13, 1887, No. 42,964; in Italy October 13, 1887, XXI, 22, 425; in England October 20, 1887, No. 14,268; in Austria-Hungary October 20, 1887, No. 41,924 and No. 6,426, and in Spain October 20, 1887, No. 11,872.

To all whom it may concern:

Be it known that I, AUGUSTE LÉON ROUSSE, doctor of medicine, a citizen of the French Republic, residing at Fontenay-le-Comte, in the Republic of France, have invented new and useful Improvements in Instruments for Ascertaining the Density of Milk, (for which I have obtained a patent in France, No. 182,916, dated April 8, 1887; in Belgium by Letters Patent No. 79,177, dated October 12, 1887; in England by Letters Patent No. 14,268, dated October 20, 1887; in Luxemburg by Letters Patent No. 904, dated October 11, 1887; in Germany by Letters Patent No. 42,964, dated October 13, 1887; in Austria-Hungary by Letters Patent Nos. 41,924 and 6,426, of October 20, 1887; in Italy by Letters Patent No. XXI, 22,425, of October 13, 1887, and in Spain by Letters Patent No. 11,872, dated October 20, 1887,) of which the following is a specification.

My invention relates to improvements in instruments for ascertaining the density of milk, called "galacto-densimeters," and has for its object to produce an instrument by means of which the density of human milk can be ascertained, and which can be also used for other milks or liquids of a density superior to 1010 and inferior to 1050 at 15° centigrade. I attain this object by the instrument illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of the instrument complete, and Fig. 2 an enlarged side elevation of the upper part of the same.

Similar letters refer to similar parts throughout the several views.

This instrument is made of glass, and consists of a graduated tube D of small diameter, the lower end of which is extended to form three successive globular parts, A, B, and C, with thin necks between the same, respectively. The upper end of this graduated tube is provided with a cup-shaped tube F, having a contracted portion to form a neck L, being closed at the bottom and open at the top. The lowest of these globular parts A, which is the smallest and serves for ballast, and the middle one B, which is the largest, are so proportioned as to cause the instrument to sink in distilled water at 15° to the neck, which connects the upper C and middle B globular parts together. The upper globular part C is so proportioned as to cause the instrument to sink in the water aforementioned to the lower end of the graduated tube D when the cup-shaped tube F aforementioned is charged with the weight of five grams. The use of the graduated tube D is such that by adding twenty centigrams to the five grams already contained in the cup-shaped tube F the instrument will sink about fifty-five millimeters from the lower end of the graduated tube. The cup-shaped tube F is of such a size that when charged with five cubic centimeters of distilled water at 15° the latter will reach the point H of the contracted portion or neck L of the same. This cup-shaped tube F is destined to receive five cubic centimeters of milk to be tested, which is sufficient in quantity to render the instrument serviceable.

The graduation of the tube D is performed in the following manner: After the cup-shaped tube F has been charged with the weight of five grams the instrument is put in distilled water at 15°. It will then sink to near the lower end of the tube D to be graduated at point to be marked 0. In adding another twenty centigrams to the five grams already contained in the cup-shaped tube F, the instrument will sink deeper to a point to be marked 40. By reducing the weight contained in the cup-shaped tube F ten centigrams, the instrument will rise to a point to be marked 20. The space between 20 and 40 I divide in ten equal parts. Five similar divisions are made above 40 and below 20. The scale comprises, therefore, twenty numbers, each of which corresponds to a known weight. Each number on the scale corresponds with five grams and one half as many centigrams as there are units in the number—*e. g.*, 36 corresponds to five grams and eighteen centigrams.

Each degree of the scale indicates, therefore, the weight of five cubic centimeters of milk, and in making the number 10 precede this number the weight of a liter of milk—that is

to say, its density—is obtained. It is necessary that the level of the five cubic centimeters of liquid contained therein be as small as possible, so as to minimize the concaving of the same and thus avoid errors. The tests being all made at a temperature of 15°, it has been found necessary, in order to suit all ordinary temperatures, to form a rectifying-table in conformity with the temperature of the surrounding air. This table comprises the tests or weights obtained between six degrees and twenty-five degrees based on the following rule: Add to or subtract from the weight as indicated by the instrument double the number of degrees of temperature, which will be respectively below or above fifteen degrees. Thus if it operates at a temperature below 15°—say 12°—it will be necessary to add six to the weight marked. If, on the contrary, the temperature is above 15°—say 20°—it will be necessary to subtract ten from the weights marked by the instrument.

To use the instrument, a receptacle of the capacity of about one liter is required, nearly filled with distilled water. The instrument charged with five cubic centimeters of the milk to be tested, the milk weighing five grams and fifty centigrams, is put into this water, in which a thermometer is suspended, when it will sink to number 50. When the instrument remains quiet, the temperature is read on the thermometer as well as on the instrument. This number will indicate the density of the milk at the temperature in which it has operated.

In order to obtain an exact test or weight, it is necessary that the milk of the small glass has the temperature of the distilled water in the receptacle aforesaid, for which purpose the cup-shaped tube F, charged with the five centimeters of milk, is dipped into the said water for about two minutes before the operation commences.

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

An instrument for ascertaining the density of human or other milk, consisting of a graduated tube D, the lower end of which is extended to form three successive globular parts A B C, and thin necks between them, respectively, and the upper end being formed or provided with a cup-shaped tube F, which is contracted in or about the middle to form a small neck L, which cup-shaped tube F serves to hold the milk to be tested, substantially as described.

In testimony that I claim the foregoing I have hereunto set my hand this 1st day of October, 1887.

AUGUSTE LÉON ROUSSE.

Witnesses:
E. RANTEIE,
G. ANTHONIS, Sr.