

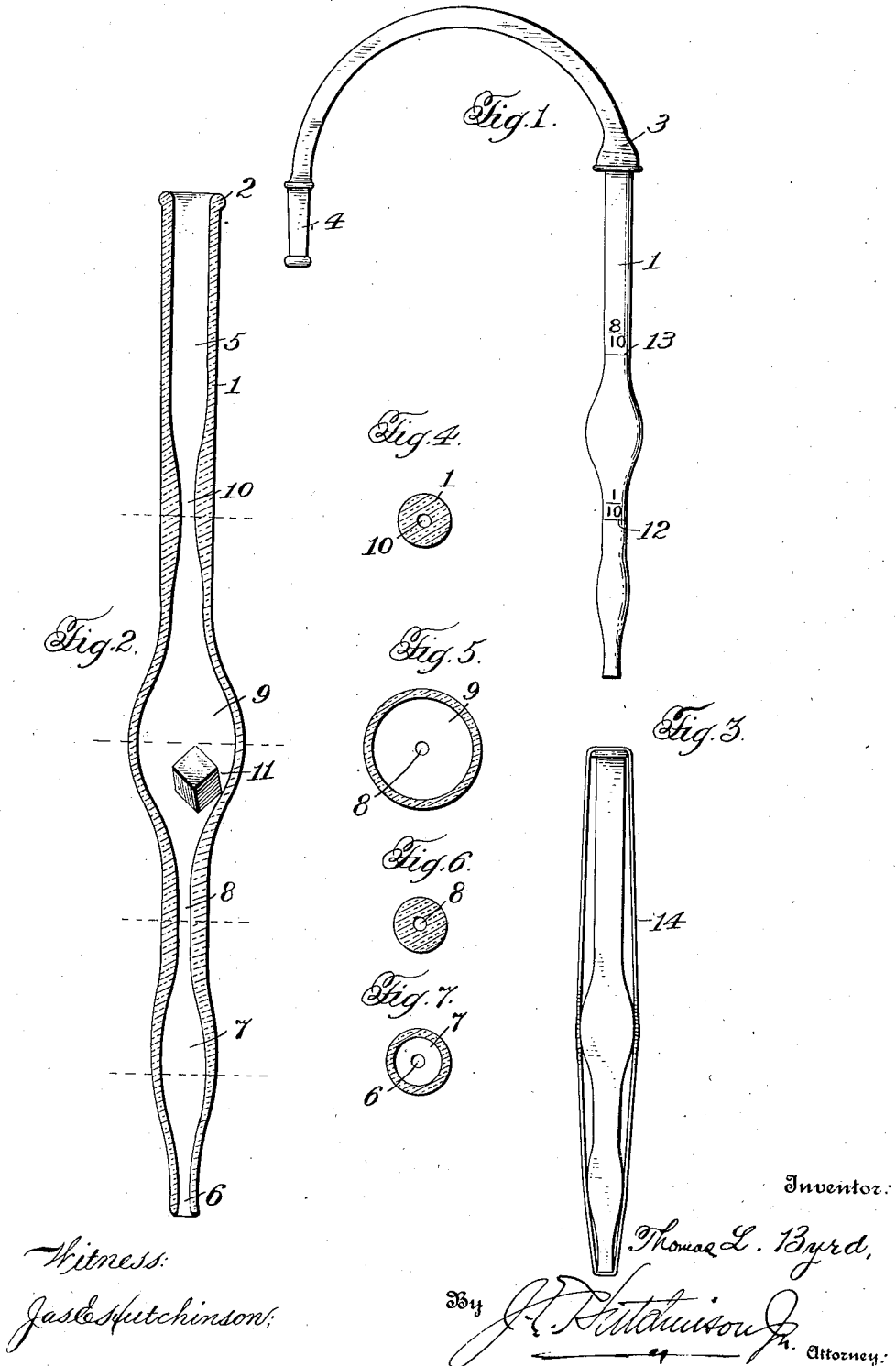
July 28, 1925.

1,547,562

T. L. BYRD

PIPETTE

Filed July 21, 1924



UNITED STATES PATENT OFFICE.

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PIPETTE.

Application filed July 21, 1924. Serial No. 727,243.

To all whom it may concern:

Be it known that I, THOMAS LUTHER BYRD, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Pipettes, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to pipettes and the principal object of the invention is to provide a device of this character, which may be conveniently used for obtaining and diluting small quantities of blood to be subsequently used for sugar tests of diabetic patients.

It has been found in actual practice that the ordinary pipette, commonly used for obtaining blood for counting tests of the red and white corpuscles, is entirely unsuited to the work of obtaining blood for sugar tests.

In a pipette constructed for obtaining blood for counting the white cells, its usual capacity is about .250 cc., whereas the red blood cell counting pipettes total capacity is approximately .425 cc. or a fraction over $\frac{1}{2}$ cc. The adherence of blood to a capillary tube, which would hold sufficient for the process for which the present device has been conceived, would make a tube so long as to be totally impracticable, also the cleaning of a tube of this character, after each use, would be extremely tedious and costly.

It is, therefore, one of the objects of this invention to provide a device which overcomes the difficulties heretofore encountered and in which the blood can be conveniently retained and accurately diluted in an instrument which may be held at its ends between the thumb and forefinger.

In the process of obtaining blood from a patient, the operator very often has to pause in the process to express more blood from the bleeding point, when only a small part of the required amount of blood necessary has been originally obtained and it is, therefore, another object of this invention to provide a pipette having a substantially fusiform blood containing chamber, which will contain the required amount of blood and yet prevent the same from running out of the pipette and thus being lost.

Still another object of the invention is the provision of a pipette of relatively small

dimensions longitudinally so that an elastic band may be stretched over the pipette lengthwise and close both ends thereof effectively, thus permitting proper agitation of the diluted fluid without the possibility of losing any.

Further objects of the invention will appear as the following specific description is read in connection with the accompanying drawing, which forms part of this application and in which:

Figure 1 is an elevation, showing the complete pipette with the suction tube attached thereto;

Fig. 2 is an enlarged longitudinal sectional view with the suction tube removed;

Fig. 3 is an elevation of the pipette with the suction tube removed and the end-closing band sprung thereover;

Figs. 4, 5, 6 and 7 are sections taken at various points throughout the length of the pipette, their position being indicated by the dotted lines in Fig. 2.

The pipette, as shown in Fig. 1, comprises an elongated tube of glass, fused quartz, or similar transparent material, generally indicated at 1. The upper end of the pipette is provided with a flange 2, over which one end of a flexible and resilient tube 3 is adapted to be removably secured.

The opposite end of the tube 3 is similarly secured over a mouthpiece 4, which is utilized by the operator to produce a suction in the tube and pipette, so as to draw the blood from the bleeding point into the pipette in a well-known manner.

As shown in Fig. 2, the bore 5 of the pipette is variously diametered. The lower portion or inlet end of the pipette is provided with a filiform passage 6 leading into a substantially fusiform chamber 7 of somewhat larger diameter than the bore 6. The upper end of this chamber merges gradually into a second filiform passage 8, which in turn merges into a diluting chamber 9 of relatively large capacity compared with the chamber 7 and also fusiform in shape. This upper chamber also merges at its upper end into an attenuated passage 10 and, as shown, contains a glass or fused quartz cube 11, which is utilized to facilitate the agitation and proper commingling of the blood with the diluting fluid. Intermediate the chambers 7 and 9, the outer surface of the

pipette is provided with a graduation mark 12, and above the chamber 9 there is provided a second graduation 13. The lower graduation indicates that the bore up to this point contains $\frac{1}{10}$ cc. of blood, while the upper graduation indicates that the bore to that point will contain $\frac{1}{10}$ cc. of blood and diluting fluid.

- In the operation of the device, the physician punctures the skin of the patient at any suitable point and applies the end 6 to the blood exuding therefrom. He then places his mouth over the mouthpiece 4 and draws until a sufficient quantity of blood has been obtained to fill the bore of the pipette to the graduation 12. After this is done, end 6 is inserted in a suitable diluted fluid, such as distilled water or the like, and a sufficient quantity drawn into the tube to fill the bore up to the graduation 13. The tube 3 is then removed and a band, similar to that indicated at 14, is placed over the ends of the tube and the same grasped between the middle finger and thumb and shaken thoroughly so that the cube 11 will effectively agitate and cause a thorough intermingling of the two fluids. This fluid may then be expelled from the pipette and placed in a test tube for making the usual tests for diabetes.

What I claim is:

1. A pipette having spaced chambers, one of which is substantially fusiform.
2. A pipette having spaced chambers, one of which is fusiform and a filiform passage connecting said chambers.
3. A pipette having a variously diametered bore, including spaced chambers.
4. A pipette having a variously diametered bore, including spaced connected chambers, one of which is substantially fusiform.
5. A pipette having a variously diametered bore, including spaced connected chambers, one of which is substantially fusiform and an agitating element in the other of said chambers.
6. A pipette constructed of transparent material and having a variously diametered bore intersected by spaced chambers, one of which is fusiform and a filiform entrance passage into said chamber.
7. A pipette constructed of transparent material and having a variously diametered bore intersected by spaced chambers, one of which is fusiform and a filiform passage connecting said chambers.
8. A pipette comprising a transparent body having a variously diametered bore intersected by enlarged spaced chambers, a filiform inlet into said bore and a filiform outlet from one of said chambers.
9. A pipette comprising a transparent body having a variously diametered bore intersected by enlarged spaced chambers, a filiform inlet into said bore and a filiform outlet from both of said chambers.
10. A pipette comprising a transparent body having a variously diametered bore including spaced chambers and graduations on opposite sides of one of said chambers.
11. A pipette comprising a transparent body having a variously diametered bore including spaced chambers and filiform passages on opposite sides of said chambers and graduations on said tube arranged adjacent said filiform passages.
12. A pipette comprising a transparent body having a longitudinal bore and removable means for closing the ends of said bore.
13. A pipette comprising a transparent body having a longitudinal bore and a flexible band for closing the ends of said bore.
14. A pipette comprising a transparent body having a central bore including spaced chambers, one of which is fusiform and a loosely mounted agitating element in the other of said chambers.
15. A pipette comprising a transparent body having a central bore including spaced chambers, one of which is fusiform and a loosely mounted cubical agitating element in the other of said chambers.
16. A pipette comprising a transparent body having a central bore including spaced fusiform chambers, and a loosely mounted agitating element in one of said chambers.
17. A pipette of transparent material, having two spaced fusiform chambers connected by a scaled neck with filiform bore, the opposite ends of said chambers terminating in tubular extensions of filiform bore, the upper of which is scaled and expands into a tube of indefinite contents constructed to receive a rubber tube, the lower having a capillary tube and tapering to a dull point.
18. A pipette of transparent material, having a variously diametered bore including two fusiform chambers connected by a scaled tubular neck of minute bore, one of which chambers is one-tenth ($\frac{1}{10}$) cc. capacity and terminates in a tapering tube of minute bore, and the other chamber being seven-tenths ($\frac{7}{10}$) cc. capacity, tapering into a scaled tube of minute bore which expands into a tube of indefinite capacity.
19. A pipette consisting of transparent material and having a variously diametered bore that expands into fusiform chambers of specific capacity, the inlet to one of said chambers being of capillary bore, the connecting neck of said chambers also being of minute bore and scaled, and the outlet of the other chamber being contracted into a tapering scaled tube of minute bore, that finally expands into a tube of indefinite capacity.
20. A pipette of transparent material, its lower end consisting of a cylindrical tube of minute capillary bore expanding into a fusi-

form distention of one-tenth ($\frac{1}{10}$) cc. capacity, converging into a scaled neck of tubular form with minute bore, which connects with and expands into another fusiform chamber of seven-tenths ($\frac{7}{10}$) cc. capacity, terminating in a scaled tube of minute bore which expands into a tube of indefinite capacity whose end is constructed to receive and retain a rubber tube which terminates with a mouthpiece. 10

In testimony whereof I affix my signature in the presence of two witnesses.

THOMAS LUTHER BYRD.

Witnesses:

CHARLES M. SCANLAN,
CARL KEMPF.