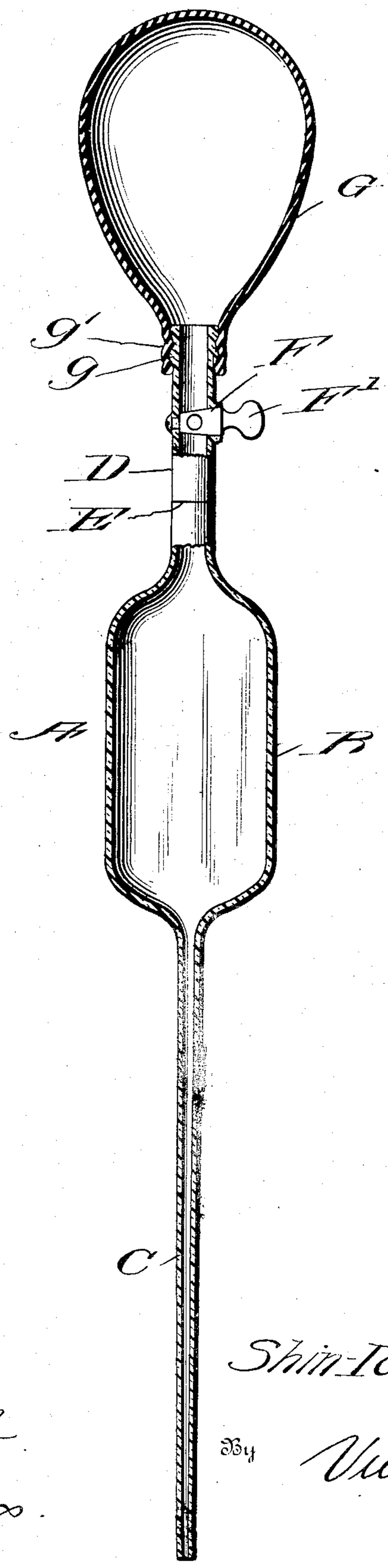
No. 813,256. PATENTED FEB. 20, 1906.

SHIN-ICHI TAKAKI.

PIPETTE.

APPLICATION FILED APR. 15, 1905.



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PIPETTE.

No. 813,256. Specification of Letters Patent. Patented Feb. 20, 1906.

Application filed April 15, 1905. Serial No. 255,783.

To all whom it may concern:

Be it known that I, SHIN-ICHI TAKAKI, a subject of the Emperor of Japan, residing at New York, in the county of New York and State of New York, have invented new and useful Improvements in Pipettes, of which the following is a specification.

This invention relates to measuring vessels of the pipette type, the object of the invention being to provide a pipette which obviates the objections to ordinary devices and may be used with absolute safety and without detriment to the health of the operator even when the vessel is employed for obtaining specimens of poisonous and noxious liquids.

The invention consists of the novel features of construction and combination of parts hereinafter fully described and claimed.

The figure of the annexed drawing shows in vertical longitudinal section, a part of the neck appearing in elevation, a pipette constructed in accordance with my invention.

A in the drawing denotes a pipette or measuring vessel comprising a bulb or chamber B, an inlet and discharge tube C communicating with one end of said chamber, and a neck D communicating with the other end thereof, these parts being preferably made of glass or some other suitable equivalent material as an integral structure. The neck D is of a desired greater diameter than the tube C and bears at a proper point above the bulb B the ordinary gage-mark E. In accordance with my invention the neck D is properly shaped above the mark E to form seat openings and recesses for a conical regulating valve or cock F, which is provided at its outer end with a finger-piece F′ for manipulating it. This valve or cock is preferably made of the same material as the vessel and may be removably mounted in place in any approved manner. The upper or outer end of the neck D is externally threaded or corrugated, as shown at *g*, to receive the contracted end or nipple *g′* of a suction and force bulb G, which is employed to produce a vacuum for the inflow of the liquid to be measured and tested and to produce pressure to expel the same.

In the ordinary form of pipette the neck D is open at its upper end, so that the operator can apply his mouth to the same, and thus exhaust the air from the tube to produce a vacuum and fill the tube with liquid, the liquid being retained and its discharge controlled by the application of the thumb or finger of the operator to the open end of the neck. This form of pipette is open to many objections and inconveniences, among them being that the health or safety of the operator is endangered when the vessel is employed for the purpose of measuring or testing acids and other poisonous and noxious liquids. The operation of regulating the discharge of liquid through the manipulation of the finger or thumb of the hand further does not always give the best of results, as the control of the liquid is dependent upon the skill of the operator. I avoid these objections by the provision of the valve F and bulb G and the proper adaptation of the neck D to receive the same, these parts permitting the inflow and exhaust of the liquid to be properly controlled without in any way endangering the person or life of the operator.

In using the device the bulb G is grasped in one hand and the finger-piece F′ of the cock F between the thumb and forefinger of the other hand, and while the device is so held the cock F is open and the bulb G compressed to expel the air from the vessel. The top of the tube C is then dipped into the liquid to be measured or tested, and the pressure on the bulb G is gradually diminished, so as to allow the solution to rise up into the vessel to a point slightly above the gage-mark E, when the stop-cock F is closed and the tube C removed from the liquid. After the liquid has been drawn into the vessel by this mode of operation accuracy of measurement may be obtained by bringing the bottom of the meniscus to a level with the mark by gentle pressure on the bulb G and gradually opening the stop-cock. In this way the liquid may be readily and conveniently drawn into the tube and gaged without danger to the operator from acids and dangerous and offensive liquids, and by proper manipulation of the bulb and cock the action of the device may be controlled to a highly sensitive degree. The liquid may be discharged by opening the valve F and compressing the bulb G, as will be readily understood.

From the foregoing description, taken in connection with the accompanying drawing, the construction and mode of operation of the invention will be understood without a further extended description.

Changes in the form, proportions, and minor details of construction may be made within the scope of the invention without de-

parting from the spirit or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed as new is—

A pipette comprising a bulb or chamber having constricted openings at its upper and lower ends, an elongated restricted inlet and discharge tube communicating with the lower end of the chamber, a relatively shorter neck of greater diameter communicating with the upper end of the chamber and provided at its lower end with a gage-mark, intermediately with seats and at its upper end with exterior retaining means, a rotary valve mounted in said seats, and a compressible bulb having a nipple fitted upon the upper end of the neck and held by the said retaining means, substantially as described.

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

SHIN-ICHI TAKAKI.

Witnesses:

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