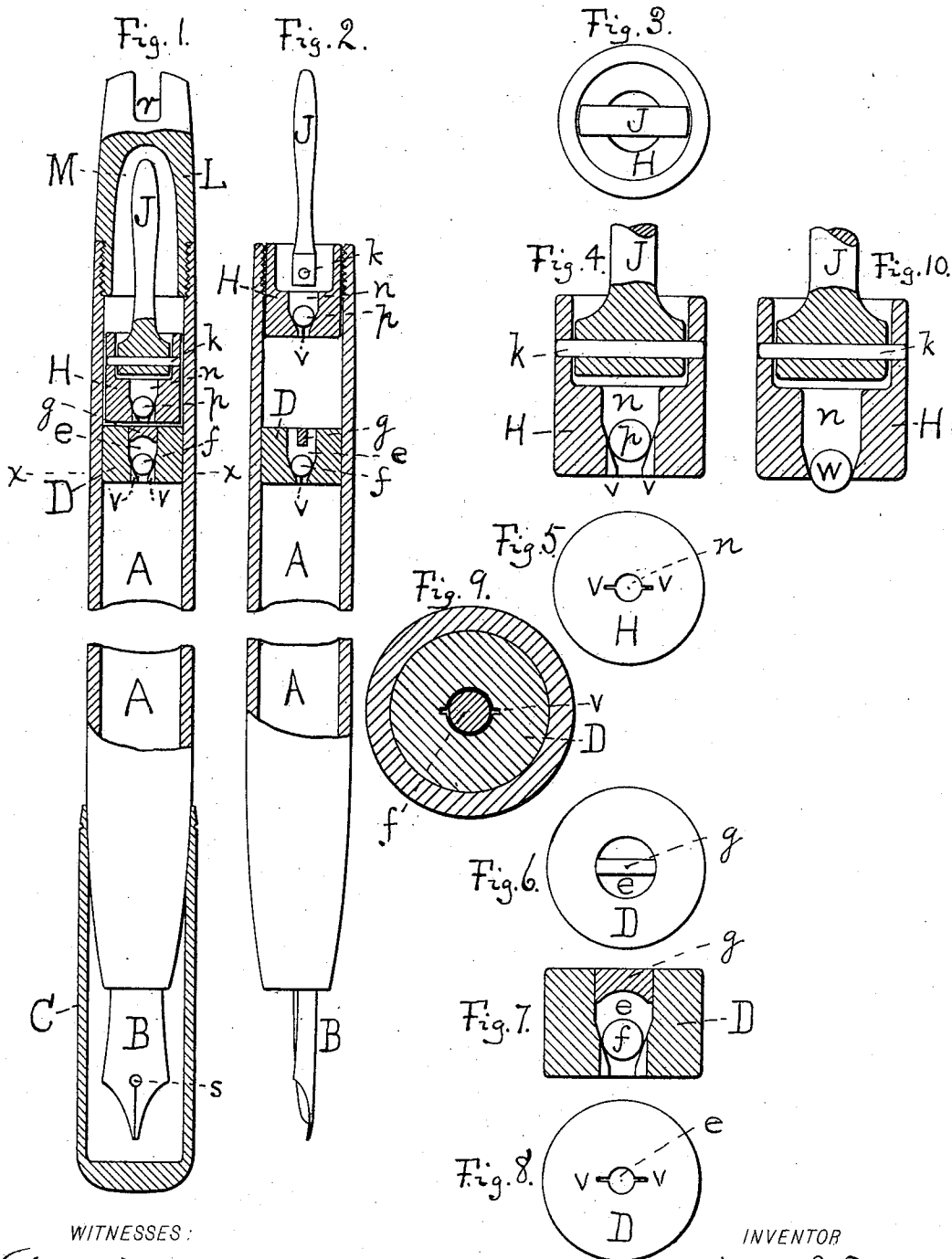


(No Model.)

W. I. FERRIS.
FOUNTAIN PEN.

No. 578,054.

Patented Mar. 2, 1897.



WITNESSES:

Arnold W. Sherman
Hubert H. Kellogg

INVENTOR

William D. Ferris

BY

William S. Clark
his ATTORNEY.

UNITED STATES PATENT OFFICE.

WILLIAM I. FERRIS, OF STAMFORD, CONNECTICUT.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 578,054, dated March 2, 1897.

Application filed December 24, 1896. Serial No. 616,901. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM I. FERRIS, a citizen of the United States, and a resident of the city of Stamford, county of Fairfield, and State of Connecticut, have invented a certain new and useful Improvement in Fountain-Pens, of which the following, taken with the accompanying drawings, is a description.

My invention relates to means for filling fountain-pens constructed to contain a reservoir of ink within the penholder, and has for its object greater convenience, efficiency, and cleanliness in the filling.

It consists, substantially, of a device permanently situated at the top of the penholder, comprising a stationary partition with valve, a piston with valve, and a short handle projecting above the end of the penholder when open, in combination with a tightly-fitting cap for that end of the holder which when on forms interiorly an extension of the reservoir and exteriorly a smooth extension of the penholder, the stationary partition and the piston both having a small permanent opening in addition to the valves to allow communication of pressure throughout the interior of the penholder.

The advantages of the use of suction applied at the top of the penholder to fill it with ink and so do away with the ordinary filler or medicine-dropper applied at the other end are that it does away with the leaky joint in the penholder where the fingers rest, just above the pen, and thus enables one to make the penholder in one piece, and that the filling device is always at hand. For this purpose various methods have been used, such as using the suction of the mouth with an automatic valve to prevent the ink rising above a certain point, or a single piston tightly fitting the smooth interior of the reservoir, having a long handle which, after the ink has been drawn in, extends beyond the top of the reservoir, or the same tightly-fitting piston with the same long handle, but detachable. My device differs from these in having a stationary partition below the piston, filling with a number of short strokes instead of one long stroke, pumping until the ink appears above the piston, and having means for returning the ink above the piston to the reservoir. The advantage of this filling device besides that of being always in the penholder ready for use is, first,

that it is always sure to draw up a solid column of ink and so utilize the full capacity of the reservoir; and, second, that it does not require the careful fitting of parts that the single-stroke piston does.

The single-stroke piston cannot be made to go to the lower end of the penholder. The pen and other parts there prevent it. Therefore no matter how deeply the penholder is immersed some air will go up above the ink. This reduces the capacity of the pen. Besides that the piston must be fitted very snugly to the interior of the holder at all points or air will leak in around the top of the piston. This means costly polishing in the manufacture. With my device it makes no difference how much air comes in either at the bottom or around the piston. It is pumped out at the succeeding strokes, and the reservoir is always completely filled. So far for the application of suction, but I have an additional feature. With the single-stroke piston no ink comes above the piston. It is essential that it should not. My device provides that it shall come above, so that one may know the pen is full, and then be returned to the reservoir automatically. It does not all run back, as in the common well-pump, but only that above the piston, so that the reservoir remains full. This will be more fully explained later on.

In the accompanying drawings, Figure 1 is a longitudinal view, mostly sectional, of the entire device. Fig. 2 is a longitudinal view on a plane at right angles to that of Fig. 1 and having the cap or upper part of the reservoir removed and the piston in the alternate position. Fig. 4 is an enlarged sectional view of the piston, with its rod and valve on the same plane as Fig. 1. Fig. 3 is a top view of the piston and rod, and Fig. 5 a bottom view of the same. Fig. 7 is an enlarged sectional view of the stationary partition on the same plane as Fig. 1. Fig. 6 is a top view of the stationary partition, and Fig. 8 a bottom view of the same. Fig. 9 is a horizontal sectional view of the stationary partition and valve on the line *xx* of Fig. 1. Fig. 10 is a variation of the piston and valve shown in Fig. 4.

A is the barrel or reservoir; B, the pen; C, the ordinary cap to cover the pen-point when not in use.

D is a stationary partition within the res-

ervoir situated about an inch below the open top thereof. Through the center of this partition is a conical hole *e*, narrowing to the bottom, in which is placed a ball *f* (ordinary shot will do) too large to drop through. Above the shot is a stop *g* to prevent its dropping out when the penholder is reversed.

H is a piston situated above the stationary partition D and adapted to move up and down in the space above the stationary partition D; but it is not at all essential that the piston should fit the interior of the reservoir tightly or even snugly. No smoothing of the parts is necessary in the manufacture. The piston H has a piston-rod or handle J attached to the piston by a pivot *k*. The upper portion L of the reservoir is removable and screws into the interior of the reservoir or otherwise tightly fits into or over it, and has a hollow M in which to receive the handle J when the pen is to be used and a slot *v* by which it can be easily turned when it sticks tight. The piston H has the same kind of valve as the stationary partition D, consisting of a conical hole *n* and a ball *p*. The bottom of the handle J is placed so close to the top of the hole *n* that the ball *p* cannot escape when the penholder is reversed. Any other sort of valve could be used in place of these holes and balls; but these are inexpensive and entirely efficient. Besides the conical holes *e* and *n*, at the lower ends thereof, there are cut small perpendicular slots *v*, which serve to prevent the valves from being perfectly tight valves and leave an open communication throughout the holder. (See Figs. 5 and 8.) This is an essential feature of the device.

The operation of the device is as follows: The reservoir being empty, the removable part of the penholder or "cap," as it may be called, is unscrewed, the lower end of the pen B immersed in the ink far enough to cover the hole *s*, and the piston H worked up and down a half a dozen times, the ink is drawn up by the air-suction until it appears above the piston H. Then the penholder is full and there is no air in it. Then appears the function of the slots *v*. A little surplus ink has come above the piston H in the pumping. It cannot be allowed to remain there, for if it were the pen would not be a practical device. If the part L were left off, the penholder could not be reversed, and if put on then the ink above the piston would run down into the space M and soil the handle J, so that it could not be used again without cleaning; but with the openings *v* there or their equivalent, if the pen is held perpendicularly for just a moment, the ink above the piston H immediately recedes through the openings *v* and drops off the point of the pen, drop by drop, into the ink-bottle. When it has reached the level of the top of the piston H, this dropping ceases, and the part L may be screwed on again and the pen is ready for use.

With the part L off, although the top of the penholder is open to the air, nevertheless, the openings *v* are so small that the ink will not run out by gravity when it has reached the level of the top of the piston H.

Any opening of proper size through the partition D and the piston H will serve the purpose of the slots *v*, but it must be of such size that the ink will slowly recede, as described, and yet not so large as to destroy the suction of the pump. Fig. 10 is a variation for this purpose. The hole *n* in the piston H is made so large that the ball *w* partly projects through. When the piston H is placed at rest against the partition D, the ball *w* is pressed up, leaving small spaces around it for the surplus ink to pass back, as described.

It is to be noted that the function of the cap L is a double one. It is more than a cap to cover the handle J or an extension of the penholder to make it all a smooth barrel on the outside. Its interior forms, really, a part of the reservoir A, for through the slots *v* all parts of the reservoir A and the interior M of the cap L are in communication. Nevertheless, when the reservoir A is full of ink and the penholder is reversed, as carried (pen up) in the pocket, no ink will make its way from the reservoir A into the hollow M. The air-pressure in the hollow M will keep the body of ink back and therefore the handle J always remains dry.

The slot *v* in the cap L is exceedingly useful. The screw-joint between the cap L and the holder must be very tight to exclude all air. The joint is quite likely to stick, but a knife-blade or other edge may be inserted in the slot *v* and a slight pressure will easily turn the cap.

I claim as my invention—

1. In a fountain-pen, the combination of a hollow penholder, a stationary partition situated near the top and containing a valve, and a piston just above it containing a second valve.

2. In a fountain-pen, the combination of a hollow penholder, a removable cap closing the upper end, a stationary partition situated near the top and containing a valve, and a piston just above it containing a second valve.

3. In a fountain-pen, the combination of a hollow penholder, a removable cap closing the upper end, a stationary partition near the top and containing a valve, and a piston just above it containing a second valve; both stationary partition and piston having small longitudinal openings to allow gravity to withdraw any surplus of ink above the piston.

In witness whereof I have signed my name, in the presence of two witnesses, this 23d day of December, 1896.

WILLIAM I. FERRIS.

Witnesses:

ARNOLD W. SHERMAN,
SALTER STORRS CLARK.