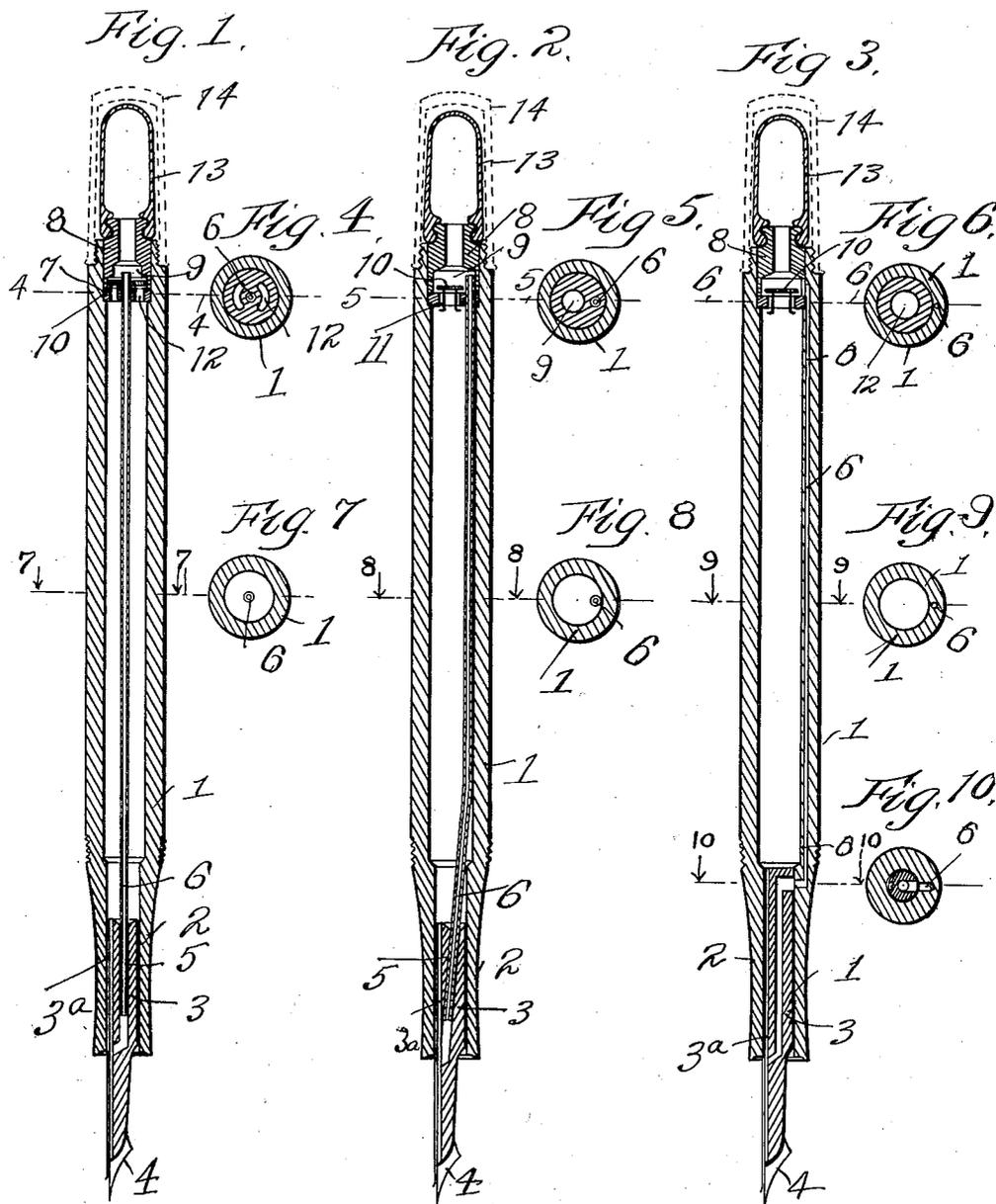


F. RIESENBERG.
 FOUNTAIN PEN.
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FELIX RIESENBERG, OF NEW YORK, N. Y.

FOUNTAIN-PEN.

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To all whom it may concern:

Be it known that I, FELIX RIESENBERG, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

My invention relates to that type of fountain pens known as self filling pens, adapted to be filled with ink without the use of separate filling devices and the chief objects of my invention are to simplify the construction of such a pen, eliminate ink joints and secure a larger ink capacity than is now possible in this type of pen. Other incidental advantages will be referred to in the following specification, or be apparent from an examination of the structure.

In said drawings, Figures 1, 2 and 3 are longitudinal sectional views illustrating three substantially equivalent forms of the invention. Figs. 4, 5 and 6 are transverse sectional views of the several forms of pen illustrated in Figs. 1, 2 and 3 on the lines 4-4, 5-5 and 6-6. Figs. 7, 8 and 9 are corresponding sectional views on the lines 7-7, 8-8 and 9-9. Fig. 10 is a section on the line 10-10 Fig. 3.

The main body or font 1 of the pen is as shown, preferably integral with the finger or neck portion 2, the use of the usual joint between these portions being avoided and thus a frequent cause of soiling the fingers eliminated. Within the mouth of the finger portion 2 is placed a feed section 3 having usual ink passage 3^a and the pen 4 is held between the feed 3 and the wall of the finger or neck portion 2. The feed 3 has a bore 5 within which is inserted loosely the end of the small tube 6, which has a bore of greatly less diameter than that of the font 1. At its other end the tube 6, in the forms of the invention shown in Figs. 1, and 2 is passed through and rigidly held by the bottom 7 of a nipple 8 containing a valve chamber 9. In the form of the invention shown in Fig. 3, the tube 6 is formed in the wall of the font itself and at the end toward the pen has its opening coincident with the upper end of the bore of the feed member 3.

Within the valve chamber 9 is arranged a check valve 10 which may, as shown in Fig. 1, be an annular ring or as shown in Figs. 2 and 3, be a disk valve with feather guides 11, enabling the valve to move verti-

cally with reference to its seat on the bottom of the nipple, but to prevent its dislocation therefrom. Through the said bottom of the nipple, one or more ports 12 are arranged, the upper ends of which afford a seat for the valve 10. The nipple 8 is centrally bored and adapted to receive a small rubber bulb 13, as shown.

When the pen is to be filled its lower end is inserted in the ink bottle with the neck 2 projecting below the surface of the ink thereof and the bulb 13 compressed, valve 10 seats itself and the air is then expelled through small tube 6 emerging beneath or near the pen point outside of the font. When the bulb is released a partial vacuum causes the ink to flow into the pen through the regular feed section, by way of the feed passage 3^a, the relatively greater skin friction in the long narrow tube 6 causing the ink to rise more freely in the font than in that tube. The bulb 13 being small, the ink only partially fills the font and the bulb must be again compressed, whereupon the check valve 10 again closes and the air is expelled through the tube 6. The bulb 13 being again allowed to expand the ink rises farther in the font and the process may be continued until the font, bulb and ultimately the small tube 6 are filled with ink, a state indicated when air ceases to escape from the lower end of the pen.

A cap 14 may be provided to screw or press on to the font over the bulb 13, and the usual cap (not shown) may also be provided to cover the pen point.

It will be noted that when filling the pen, the ink will not rise readily in the small tube because of the excessive skin friction therein and it therefore takes the line of least resistance along the pen font through the feed channel or channels in the feed member 3. As the bulb is small it must be compressed and released a number of times to fill the font. The principle here adopted makes it possible to fill the pen by the use of a small bulb which would not otherwise be possible. When the font proper is filled the bulb itself can be filled and will act as an additional reservoir for ink. It is not intended that the valve 10, shall have a tight fit with its seat and therefore when the pen is used in writing the ink in the bulb and valve chamber escapes down into the font by leaking past the valve, thus making

all the ink available for use. In order to empty the pen it is held above the ink surface and the bulb compressed and released as in filling.

- 5 It will be noted that the pen has no objectionable sections to interfere with or soil the fingers while writing; the usual joint between the neck and body of the font is eliminated, the ink capacity of the font is very nearly as large as in the plain style of fountain pen; there are no moving parts such as pistons, etc.; the one valve used is of large dimensions and simple construction not easily deranged, and not tight fitting and furthermore is so arranged that gravity assists the easy action of the valve when the pen is being filled. The valve may be made of hard or soft rubber or other suitable material. Also the rubber bulb is small and can be easily replaced when worn out, the operation is simple and self evident, it is impossible to soil the fingers with ink when filling the pen and the forcing of air and ink through the small tube has the advantage of cleaning the pen beyond the point where the ink enters the feed passage in filling.

It will be understood that the several constructions herein shown and described are by way of illustration only and that many other forms of my invention may be made within the limits expressed in the following claims without departing from my invention.

35 What I claim is:

1. A fountain pen having an ink receptacle provided with a valve chamber at its upper end opening into said receptacle and an ink passage at its lower end, a valve in said valve chamber controlling the passage from the valve chamber to said receptacle, and an air passageway leading from said valve chamber above said valve and discharging through the lower end of said receptacle.

2. In a fountain pen, the combination of an ink font terminating at its upper end in a valve chamber, and having a feed passage at its lower end, a check valve in said chamber, and an air tube terminating in said chamber at one end and at the lower end of the font at its other end, and of such relatively small cross-section that the skin friction therein will substantially prevent the rising of fluid therein.

3. A fountain pen, comprising two tubes, one of relatively much smaller cross sec-

tional area than the other communicating with each other at both ends and having in the connection at the upper end a check valve.

4. A fountain pen having an ink receptacle provided with a valve chamber at its upper end opening into said receptacle and an ink passage at its lower end, a valve in said valve chamber controlling the passage from the valve chamber to said receptacle, and an air passageway connecting said valve chamber above said valve with said ink passage independently of said receptacle.

5. In a fountain pen, the combination of an ink font having a separate air passage extending substantially from one end to the other thereof, and a connection from said font to said air passage at their upper ends, a valve closing the upper end of the font and controlling the connection between the point and the air passage, and a collapsible bulb connected to the upper end of the font.

6. In a fountain pen, the combination of an ink font having a separate air passage extending from near the lower end of the font to a point near its upper end, a nipple having a valve chamber with which said air passage and font both communicate, a valve in the said chamber controlling the connection between the point and the air passage and a collapsible bulb connecting with said nipple.

7. In a fountain pen, the combination of an ink font having a feed member and a separate air passage extending from said feed member near the lower end of the font to a point near its upper end, a nipple having a valve chamber with which said air passage and font both communicate, a downwardly closing check valve in said chamber controlling the connection between the point and the air passage, and a collapsible bulb on said nipple adapted to seat said valve and expel the air when compressed.

8. A fountain pen comprising an ink font, pumping means connected with the upper end of said font, an air tube leading from the upper end of said font and discharging through the lower end of said font, and a valve controlling communication between the upper end of said tube and said ink font.

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