

UNITED STATES PATENT OFFICE.

JOHN R. ROBINSON, OF ELMIRA, NEW YORK.

FOUNTAIN-PEN.

No. 815,218.

Specification of Letters Patent.

Patented March 13, 1906.

Application filed September 13, 1905. Serial No. 278,331.

To all whom it may concern:

Be it known that I, JOHN R. ROBINSON, a citizen of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention relates to improvements in penholders wherein a barrel for containing a writing fluid is provided at one end with a pen and with means for feeding the fluid from the barrel to the pen.

The object of my invention as herein set forth is to provide means for regulating the admission of air to the top of the barrel to conform with the adjustment of the feed at the pen-point; and, further, to provide a filling device which may be carried attached to the holder or may be detached therefrom and whereby the barrel may be charged with the writing fluid without detaching the point-section and without fear of soiling the fingers or spilling the fluid.

I attain my objects by arranging and assembling the several parts of the penholder in the manner illustrated in the accompanying drawings, in which—

Figure 1 represents a longitudinal section of a complete fountain-pen embodying my improvements upon an enlarged scale; Fig. 2, a modified form of the filler; Fig. 3, an end view of the barrel on the line *xx* in Fig. 1 with the cap K removed, and Fig. 4 a modified form of vent-chamber and cap.

Like letters of reference designate like parts in the several views.

The body of the penholder, as described in my said copending application, consists of a barrel A, made of hard rubber or other suitable material and forming a reservoir for the writing fluid. Into one end of this barrel is screwed the point-section B, which is provided with a longitudinal duct or passage-way F, adapted to receive the feed-bar C, and with a socket to receive the pen D. Within the outer end of the point-section is a revoluble sleeve E, provided with screw-threads adapted to receive corresponding screw-threads cut upon the outside of feed-bar C. To adjust the feed, the sleeve E is turned in one direction or the other, thereby moving the feed-bar C toward or away from the point of the pen. As the feed-bar is retracted it will be evident that by reason of the contraction at the inner end of the duct F the passage-way for the fluid from the barrel to the

pen will be gradually constricted. By this arrangement of the feed-bar and the gradually-constricted fluid-conduit a double adjustment for the flow of ink to the pen is attained, since it will be evident that as the end of the feed-bar is advanced nearer the point of the pen (which naturally causes the ink to flow more freely from the lips) the passage-way through the channel F will also be increased in size, thereby admitting a larger supply of ink to said channel to meet the demand at the point of the pen. As the feed-bar is moved inward or away from the point of the pen the passage-way through the channel F will be reduced in size, thereby causing a lessened delivery of the ink to the pen in conformity with the lessened demand.

In order that the ink may flow from the barrel readily and in conformity with any adjustment with the feed-bar, I provide means at the top of the barrel for admitting air above the fluid in proportion to the flow of the ink through the feed. To accomplish this adjustability in the air-vent, I construct the barrel with a diaphragm H near the upper end, through which pass a number of holes I around a central conical plug J. A screw-cap K is fitted into the end of the barrel beyond the diaphragm and is provided with a central conical bore to fit the plug. A central longitudinal hole passes from this conical bore to the top of the cap, and it will be evident that air passing through this opening will be admitted to the top of the barrel through the holes I to a greater or less degree, depending upon the position of the cap K with relation to the plug J. When the cap is screwed into close engagement with the plug, the air admission will be entirely closed off, and by turning the cap slightly a very small amount of air may be admitted, the quantity increasing with the degree of rotation imparted to the cap.

The central hole in the cap K is preferably screw-threaded, and into said hole is screwed the stem of a second cap L, having a central bore provided with a series of transverse vent-openings M. As so arranged, the amount of air admitted into the first cap K through the second cap L is regulated by the number of holes M exposed by screwing the latter cap outward, and the amount of air admitted to the barrel is in turn regulated, as above stated, by the adjustment of the first cap with respect to the plug J. By the use of these two caps, therefore, the amount of air

admitted to the barrel can be regulated to a very fine degree. If desired, however, the cap L may be dispensed with when using the pen, the vent adjustment being accomplished entirely through the cap K.

For filling the penholder with writing fluid I extend the central bore completely through the cap L and attach to said cap a rubber bulb N, as shown in Fig. 1, and to protect the parts as so arranged, especially the bulb N, I may provide a cap O, which will be retained in place upon the barrel except when adjusting the air-vent or when filling the pen. This cap is provided at P with an air-vent by which air is admitted around the bulb to the holes M in the cap L.

To fill the pen, the cap L will be screwed out sufficiently to give a vent for expelling the air contained in the bulb N. The cap K will be screwed in tight and the bulb will be compressed to expel the air therefrom, after which the cap L will be screwed in to close the vent-holes and the cap K will be screwed out to place the bulb in communication with the barrel of the holder. The pen will then be placed with the lower end of the feed-bar C in the ink, and the bulb will be allowed to expand, thereby causing the ink to be drawn into the barrel. If the bulb does not fill the barrel at one operation, by again unscrewing cap L, closing cap K, and compressing the bulb the air may be expelled from the bulb without driving the ink from the barrel, and more ink can be drawn into the barrel upon properly readjusting the caps and again expanding the bulb.

Instead of using a collapsible rubber bulb for the filler I may substitute on the cap L a cylinder, such as shown at Q in Fig. 2, provided with a piston R, adapted to be operated by means of a button S, attached to the end of the piston-rod which passes out from the end of the cylinder, the ink being drawn into the barrel of the pen by reciprocating the piston after adjusting the vents through the screw-threaded stem of the cap L and the cap K in the same manner as described in connection with the bulb-filler. With this cylinder-and-piston filler the protecting-cap O will not necessarily be required.

It will be understood that either form of filler may be detached from the penholder except when filling the reservoir, and a cap with a solid head, such as shown at L in Fig. 4, may be substituted for the filler-cap. The point-section of the holder in Fig. 1 is shown protected by a cap G, and this cap may be transferred to the other end of the holder in using the pen without the filler attachment, as in fountain-pens now in common use.

In order to provide against filling the reservoir of the penholder to overflowing, I may insert a valve at the upper end of the holder, whereby the air-passage to the filler will be shut off and the suction of the ink into the

holder stopped when the reservoir becomes full. For this purpose I provide a slightly-different construction of the holder vent-caps, as illustrated in Fig. 4, wherein a chambered cap T is shown attached to the end of the barrel A' above the diaphragm K', formed at the end thereof. This chambered cap T is provided at U with a central orifice communicating with a conical bore V, into which fits a plug X, projecting downwardly from the vent-cap W. This vent-cap is provided at the top with a central screw-threaded bore to receive the cap L, said central bore communicating through the plug X with the conical bore V by way of the air-ducts Y. Within the chambered cap T, I provide a ball-valve Z of material which will float in the writing fluid. As the ink is drawn up by the filler into the cap T through the passages I' in diaphragm H' the valve Z will be floated up into a corresponding valve-seat formed below the orifice U, so that when the reservoir becomes completely filled with ink no more ink can be drawn beyond said orifice and into the passages in the vent-cap. To prevent the ink from flowing out through the vent-caps when they are left open and the holder is turned upside down, I provide in the chamber T a second weighted ball-valve Z', which as the holder is turned over will change places with the float-valve Z and close the orifice U against the outflow of the ink when the holder is upside down.

With a vent device so arranged a very fine adjustment of the feed may be attained to conform with different requirements in writing, and the ink will flow to the last drop in the barrel. Any form of adjustment for the flow of ink to the pen in the point-section may be used in connection with my vent and filler device, and other variations in the vent-cap and valve device may be provided without departing from the spirit of my invention.

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

1. In a fountain-pen, the combination, with the barrel, of an adjustable vent comprising a perforated diaphragm adjacent the upper end of the barrel, a screw-cap having a central bore closing the end of the barrel and adapted to adjust the passage-way for air to the diaphragm, and a second cap having a screw-threaded stem inserted in the central bore of the first cap, said stem having a central bore with one or more transverse vent-openings leading thereinto.

2. In a fountain-pen, the combination, with the barrel, of an adjustable vent-cap closing the upper end of the barrel and having a central screw-threaded bore, a second cap centrally bored and having a transversely-perforated screw-threaded stem adapted to be inserted in the first cap, and a filler device attached to said second cap.

3. In a fountain-pen, the combination, with the barrel, of a filler device, a vented stem projecting from the filler device and entering the rear end of the barrel, said stem
5 being adapted to open the filler to the atmosphere when air is to be discharged therefrom, and a valve in the barrel adapted to close communication between the barrel and filler when the vent is open.

10 4. In a fountain-pen, the combination, with the barrel, of a valve-chamber at the rear end thereof having an orifice at its outer end, a float-valve in said chamber adapted to close the inner end of said orifice, a valve-cap
15 adapted to close the outer end of said orifice, a hollow vented screw in said cap, and a filler device attached to said screw.

5. In a fountain - pen, the combination with the barrel, of a valve-chamber at the rear end thereof communicating with the
20 barrel and provided with an orifice at its outer end, a float-valve and a weighted valve in said chamber adapted to close said orifice according to the position in which the pen is held, an adjustable vent-cap fitted to the
25 outer end of said chamber, and a filler device adapted to be attached to said cap.

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

JOHN R. ROBINSON.

Witnesses:

J. H. O'BRIEN,
A. S. DIVEN.