

Patented Dec. 27, 1910.

979,427.

Fig. 1.

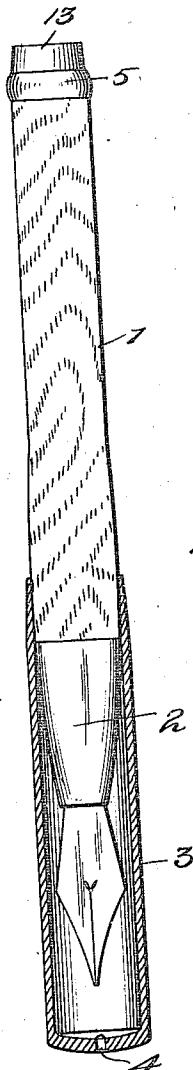


Fig. 4.

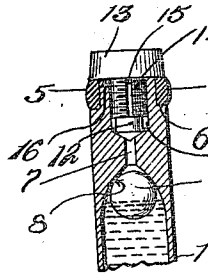


Fig. 2.

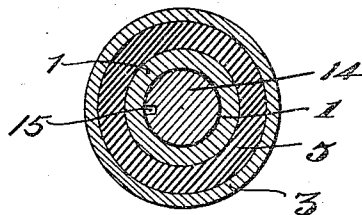
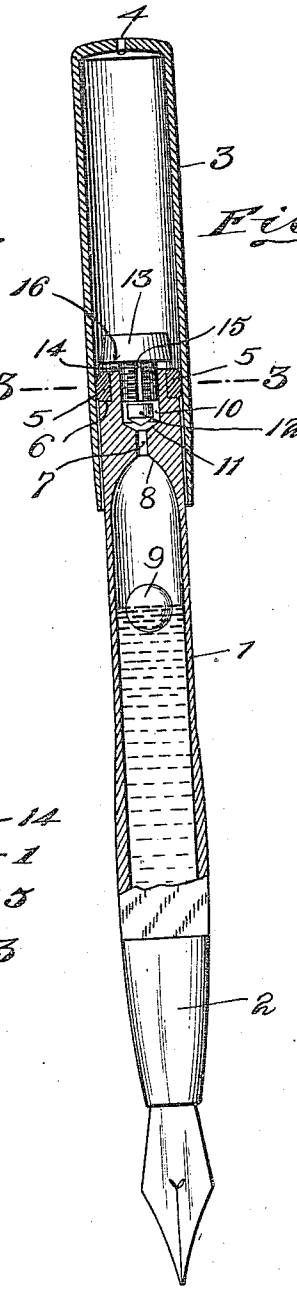


Fig. 3.

Witnesses:
Samuel H. Big
Adolph G. Dineen

Inventor
George Heber Carter
 By his Attorneys
Dunn & Smith

UNITED STATES PATENT OFFICE.

GEORGE HEBER CARTER, OF NEW YORK, N. Y.

FOUNTAIN-PEN.

979,427.

Specification of Letters Patent. Patented Dec. 27, 1910.

Application filed October 22, 1909. Serial No. 523,963.

To all whom it may concern:

Be it known that I, GEORGE HEBER CARTER, a subject of the King of England, residing at Richmond Hill, in the city of New York, borough and county of Queens, and State of New York, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a full, clear, and exact specification.

My invention relates to fountain pens and particularly to that class of such pens as contain within themselves the means whereby they may be refilled and which are called "self-filling fountain pens." The type of such pens to which my invention relates is that wherein the cap of the pen acting as an exterior piston, draws the ink into the barrel through the nozzle.

The object of my invention is to produce a simple and economical construction of such device and one that shall be simple in operation and have no passages which will be likely to clog up, and consequently will not get out of order and will not need frequent cleaning.

Other and important objects which I accomplish are, to prevent the discharge of any small amount of ink which may be in the barrel, through the nozzle, when the cap is set to position to act as a piston and fill the barrel; also to prevent the further drawing in of ink when the barrel is filled; also to prevent any leakage of ink when the suction of the piston is released; and to effect these and other objects and advantages which will appear more fully hereafter, my invention consists, among other things, in the employment of a cap acting as an exterior pump piston and which I prefer to perforate, together with a barrel having a bore to permit such pump action to take place, combined with oppositely-acting valves which automatically check the inflow of ink when the barrel is filled and the outflow when the suction is released. Such valves as are illustrated are a float valve for preventing further feeding when the barrel is filled, with means for securely sealing the bore when the barrel is filled, a check valve for preventing back flow when the barrel is filled and the suction is released, and a barrel of varying diameter.

One embodiment of my invention is illustrated in the accompanying drawing wherein—

Figure 1 is an elevation of my improved fountain pen closed, the cap being shown in section. Fig. 2 is a longitudinal section (the nozzle being in full lines) through the pen, the parts being in the position they will assume in filling, and the pen being partially filled. Fig. 3 is a cross-section through the perforated stem of the set valve, barrel packing ring, and cap; and Fig. 4 is a detail of the rear end of the barrel, filled with ink, with the float valve in sealing position and the set valve sealing the end of the barrel.

The barrel 1 of the pen is provided with a nozzle 2, equipped with any suitable variety of feed bar. The cap 3, which is perforated at 4, for purposes hereinafter more fully explained, fits snugly upon the nozzle end of the barrel. The barrel is reduced in diameter at its rear end for a distance of something like two-thirds of its length, and upon this reduced part the cap 3 slides when acting as a piston. A ring packing of soft rubber or equivalent material is seated and securely held, as by cement, etc., in a groove or channel 6, formed peripherally upon the barrel, and fits snugly to the inner wall of the cap, while permitting the latter to slide thereon.

The barrel has a bore 7, formed in its rear end, and the inner wall of the barrel adjacent such bore is tapered as at 8, to form a seat for the float ball valve 9. The bore 7 opens into an enlarged bore 10, and between such bores 7 and 10, a tapered seat 11 is formed in the side walls for the check valve 12, which has a correspondingly-shaped tapered face. The outer end of the bore 10 is screw-threaded and receives the threaded stem 14 of a headed set valve 13. Such stem is formed with an external, longitudinal air duct 15, extending from the base of the valve head to the inner end of the stem and which, when the head is raised, permits free passage of air from the interior of the barrel to the interior of the cap.

The valve head is intended to be manually operated and may be round or of other convenient shape externally. It should

have its face 16 formed into a good fit with the rear end of the barrel, as in connection with the check valve 12 it forms the means for sealing the rear end of the barrel when the latter is full of ink. To aid this the stem 14 may be of such length as that the check valve will be crowded to its seat by such stem when the set valve is seated.

The operation of my device is as follows: We will assume that the barrel has previously been used and that the ink has become substantially exhausted. A slight film of ink will still remain, sufficient to produce bubbles and soil the fingers if forced out. To refill the barrel or reservoir, the headed set valve should be unscrewed sufficiently to open the air duct 15. The cap should then be placed upon the rear of the barrel and pushed in as far as it will go. During this pushing in of the cap the perforation 4, in its end should remain open to permit the air to pass out. The check valve 12 will be seated by the air pressure and will prevent any passage of air into the barrel and consequently any discharge of ink or bubbles through the nozzle. The cap being in its inner position, the nozzle is inserted in the supply of ink and the finger placed over the perforation in the end of the cap, closing same, and the cap then withdrawn. This will cause the cap to act as an external piston and will lift the check valve 12, and permit air to pass freely from the barrel into the cap through bores 7 and 8 and air duct 15, and will pump or lift ink into the barrel through the nozzle. The inflow of ink will continue until the barrel is nearly full, when the float valve 9 will automatically find its seat 8 and will close bore 7 and prevent the further drawing in of ink. The finger will then be removed from the perforation 4, whereupon the check valve 12 will immediately and automatically fall to its seat 11, and will prevent the passage of any ink through the nozzle. The cap may then be removed and the headed set valve screwed to its seat, effectually sealing the end of the barrel.

From the foregoing it will be seen that the ink cannot pass into the bore 7, and that consequently the air duct and bores are not liable to become clogged. Should there be any occasion, however, for cleaning the barrel, nozzle, or other parts, the set valve and check valve may be removed and the parts thoroughly washed by using the cap as above described.

The various parts above described, with the exception of the float valve and the ring packing, will preferably be made of hard rubber, though I do not limit myself to such material, as other suitable material may be used. The float valve will preferably be made of some material which will float

readily in ink, such as cork, wood, etc., and the ring washer I prefer to make of soft rubber, cork, or some suitable friction material.

If the cap is retained in position, some of the enumerated parts may be dispensed with and a practical pen remain, as, for instance, the perforation in the cap may be omitted, and the check valve and set valve and the float valve and its seat and the bore retained.

I claim:

1. A fountain pen comprising a perforated, removable cap, a barrel provided with a bore at its rear end, means for causing a tight fit between the cap and the rear end of the barrel, a loose check-valve and a seat therefor at the outer end of said bore, and means for holding the same to its seat after the barrel is filled which means are withdrawn from operative position while the barrel is being filled.

2. A fountain pen comprising a perforated, removable cap, a barrel provided with a bore at its rear end, means for causing a tight fit between the cap and the rear end of the barrel, a float-valve and a seat therefor at the inner end of said bore, a check-valve and a seat therefor at the outer end of said bore, and means for holding same to its seat after the barrel is filled which means are withdrawn from operative position while the barrel is being filled, substantially as described.

3. A fountain pen comprising a removable perforated cap, a barrel provided with a bore at its rear end, a peripheral packing on the rear end of said barrel, a loose, removable check-valve and a seat therefor in said bore, and means for holding same to its seat when the barrel is filled.

4. A fountain pen comprising a removable perforated cap, a barrel provided with a bore at its rear end, a peripheral packing on the rear end of said barrel, a float-valve and a seat therefor at the inner end of said bore, a loose check valve and a seat therefor in said bore, said valve automatically opening to permit the filling of said barrel by suction at the rear end, and automatically closing the bore when the suction ceases, and means for holding same to its seat when the barrel is filled.

5. A fountain pen comprising a removable perforated cap, a barrel provided with a bore at its rear end having a reduced inner portion and an enlarged, threaded outer portion, a peripheral packing on the rear end of said barrel adapted to fit said cap, a float-valve and a seat therefor in said bore, a loose check-valve and a seat therefor at the outer end of said bore, a set-valve and a seat therefor at the end of said barrel, and a threaded, perforated stem therefor

adapted to seat said check-valve when the set valve is closed.

6. A fountain pen provided with a barrel having a rear end reduced in diameter, a removable, perforated cap therefor adapted to fit the nozzle end of said barrel, and a packing on the rear end of the barrel adapted to fit closely within the cap, whereby said cap performs the double function of protecting the pen point and of acting as a piston to fill the barrel.

7. A fountain pen comprising a barrel having a bore at the rear end, a float-valve and a seat therefor in said bore, a loose check-valve and a seat therefor in said bore, a set-valve adapted to seal said bore when closed, and to open same when raised, com-

bined with means for filling said pen operated from the rear end.

8. A fountain pen comprising a barrel, a peripheral packing thereon and a removable perforated cap fitting snugly upon said packing and adapted, when removed, to fit upon the nozzle of the pen, whereby said cap performs the double function of protecting the pen point and of acting as a piston to fill the barrel.

In witness whereof I have hereunto set my hand in the presence of two subscribing witnesses.

GEORGE HEBER CARTER.

Witnesses:

ADOLPH F. DUISE,
BERNARD BLASCOW.