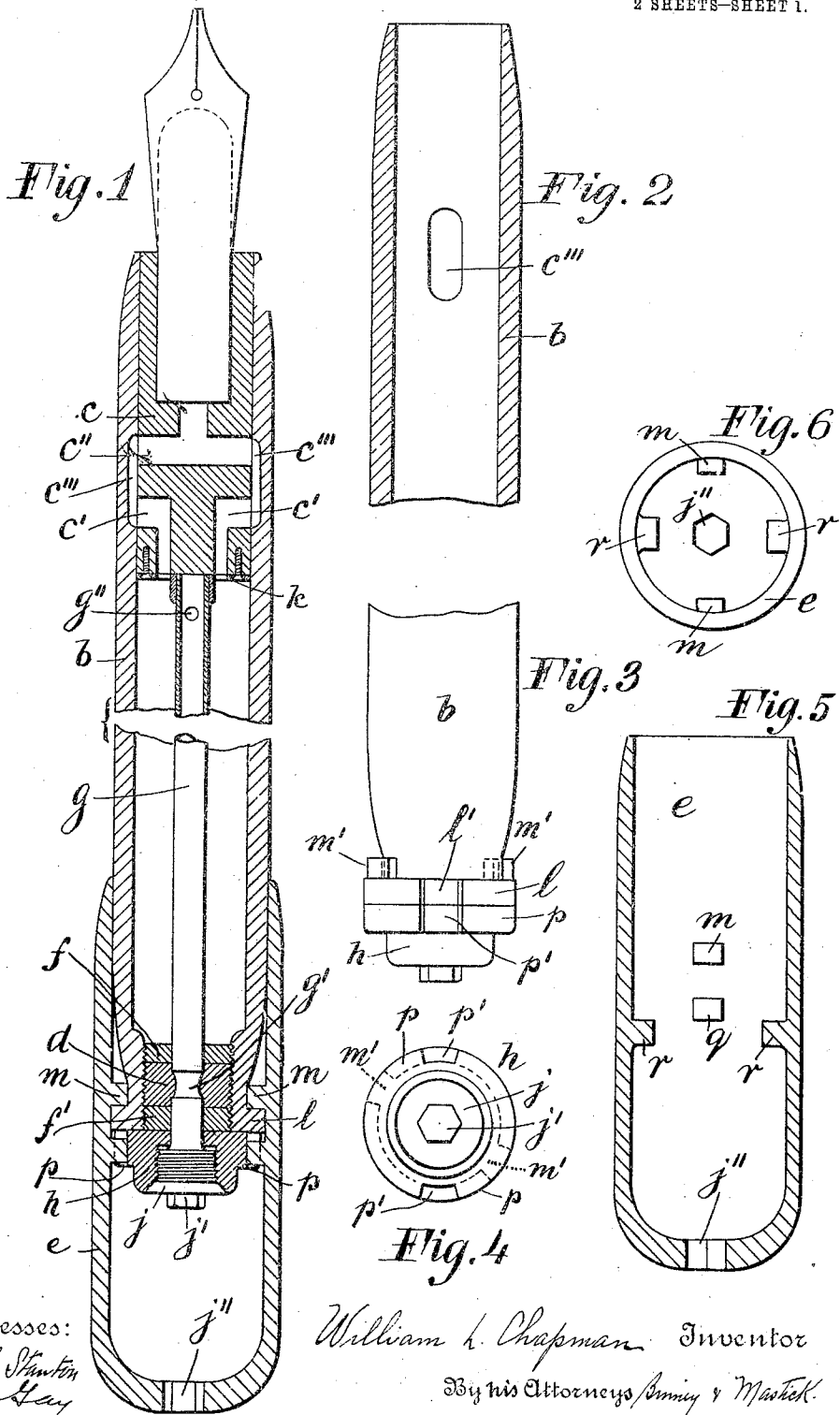


W. L. CHAPMAN.
 FOUNTAIN PEN.
 APPLICATION FILED MAR. 26, 1912.

1,080,099.

Patented Dec. 2, 1913.
 2 SHEETS—SHEET 1.



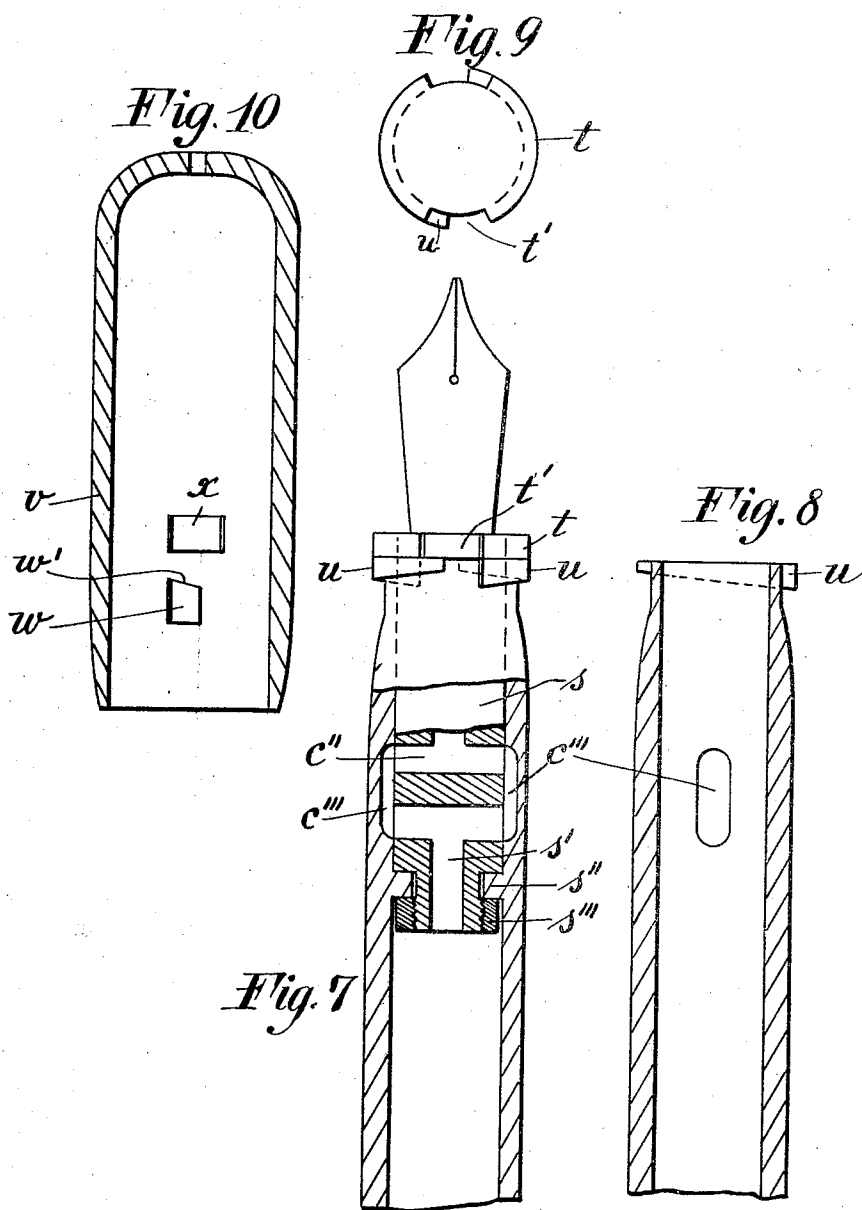
Witnesses:
 Francis A. Stanton
 E. P. LaHay

William L. Chapman Inventor
 By his Attorneys, Army & Mastick.

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 By his Attorneys *Smiley & Mackick*.

UNITED STATES PATENT OFFICE.

WILLIAM L. CHAPMAN, OF NEW YORK, N. Y.

FOUNTAIN-PEN.

1,080,099.

Specification of Letters Patent.

Patented Dec. 2, 1913.

Application filed March 26, 1912. Serial No. 686,293.

To all whom it may concern:

Be it known that I, WILLIAM L. CHAPMAN, a citizen of the United States, and resident of the borough of Brooklyn, in the city of New York, State of New York, have invented certain new and useful Improvements in Fountain-Pens, (Case D,) of which the following is a specification, accompanied by drawings.

The invention relates to fountain pens suitable for carrying in the pocket.

The invention provides an easily operated and reliable valve for opening and closing communication between the reservoir and the pen proper, so that this communication may be closed and danger of leaking obviated when the pen is not in use.

It also provides means for drawing ink into the reservoir of the pen from any convenient supply of ink without requiring filling devices separate from the pen.

Also, it provides a combined piston and rotary valve for opening and shutting the communication between the reservoir and the front of the pen and for drawing in the ink.

It also provides means by which the putting on and taking off of the cap of the pen may cause the opening and closing of the communication between the reservoir and the front of the pen, so that it shall be closed when the cap is on the front of the pen and open when the cap is on the rear end of the pen.

While I prefer to combine all these features of the invention, it is possible to use some of them without the others, as will be apparent from the following description.

Figure 1 shows in longitudinal sectional view a preferred embodiment of the invention in a fountain pen, the parts being in the writing position. Fig. 2 is a longitudinal section of the front end of the barrel of the pen at right angles to Fig. 1. Fig. 3 is a side view of the rear end of the pen without the cap, the parts being in carrying position. Fig. 4 is a rear end view of the same. Fig. 5 is a cross section of the cap at right angles to Fig. 1. Fig. 6 is a view looking into the open end of the cap. Fig. 7 shows a modification wherein the rotary valve is actuated from the front end of the pen. Fig. 8 is a partial section taken at right angles to Fig. 7. Fig. 9 is an end view of the same. Fig. 10 is a sectional view of the cooperating cap for same.

Referring first to Figs. 1 to 6 of the drawings, the barrel *b* which contains the reservoir chamber is fitted to receive the slide piston or head *c*. The barrel is closed at the rear end by a packing ring *d*, preferably of high grade cork, which is held between two screw-threaded, perforated disks or heads *f*, *f'* screwed into the rear end of the barrel *b*. Through this packing *d* runs the rod *g*, which is a tubular rod forming a piston rod, filling tube and valve stem, as will presently appear. The rod *g* has a gently reduced neck *g'* which is normally, except when the pen is being filled, within the body of the packing *d*, allowing the packing to act elastically on the reduced neck and form a spring means for holding the rod *g* against being accidentally drawn out or displaced longitudinally. The rear end of the rod *g* terminates in a head *h*, which has provision for rotating it and is also provided with a screw plug valve *j* for closing the rear end of the filling tube. This plug has preferably a conical valve surface, as shown, that seats in the head *h*, and a hexagonal nut-like portion *j'* which fits a corresponding recess *j''* in the end of the cap and permits the cap to be used as a wrench, for screwing the plug valve *j* into and out of place in the head *h*. The forward end of the tubular rod *g* is secured to the piston or head *c*, preferably by means of a flange *k*, in order that the rotation of the tubular rod *g* may turn the piston or head *c*, which constitutes a rotary valve. The head *c* is provided with ink ducts *e'*, *e''*, which register with channels or ducts *e'''* when in writing position, so as to allow the ink to flow from the reservoir through the ducts *e'* to the channels *e'''* and thence through the duct *e''* to the pen proper. The ducts *e'* may be L-shaped, as shown, leading from the reservoir to the periphery, and the duct *e''* may be T-shaped leading from the periphery of the valve to the pen proper.

The pen proper is mounted in the forward end of the head, valve or piston *c*, and receives ink from the duct *e''* in any approved manner. The channels *e'''* in the wall of the barrel *b* are of such length and position as shown that when the head or valve *c* is rotated preferably ninety degrees the channel is closed and communication shut off between the reservoir and the point of the pen. It will now be seen that the head *c* is in fact a rotary valve. In order

to cause proper actuation of the valve by the mere putting on and taking off of the cap of the pen, I provide the rear end of the barrel of the pen with an interrupted flange *l* having two openings or interruptions *l'*, and the cap *e* is provided with corresponding teeth *m* which can pass through the openings *l'* when the cap is placed on the rear end, and then by turning the cap the teeth *m* pass behind the flange *l* and come to rest against the stops *m'*. Thus, the cap is secured in place. The head *h* is provided with an interrupted flange *p*, the two interruptions or openings of which correspond and register with the openings *l'* when the rotary valve *c* is closed and the pen in carrying position with its cap on the front end. The cap *e* is also provided with another pair of internally projecting teeth *q* in line longitudinally with the teeth *m*, and which enter and lie in the openings *p'* of the rotary flange *p* when the teeth *m* pass through and behind the flange *l* of the barrel. In order to prevent the cap being thrust too far on to the rear end of the pen, stops or teeth *r* are provided, which strike against the rotary flange *p* when the teeth *q* are in place in the openings *p'*. It will now be seen that in putting the cap on the rear end of the pen the teeth *m* have to find the openings *p'* and these latter have to come into registration with the openings *l'*, if not already so, before the teeth *m'* can pass the flange *l*. Then, upon turning the cap to lock it on the pen, the teeth *m* will turn until they meet the stops *m'*, during which the teeth *q* turn the flange *p* and head *h* a quarter turn, thereby turning the rotary valve *c* and opening the ink ducts at the front of the pen, so that the pen is ready for writing. Reversely, when the cap is taken off the rear end, it will be seen that the openings *p'* are brought into line with the openings *l'* to permit the drawing off of the cap. When the cap is drawn off, it leaves the ink ducts at the front of the pen closed. It is also, of course, possible to turn the head *h* directly by the fingers, if desired.

In filling the pen, the head *c* operates as a piston. The tubular piston rod *g* is provided with side perforation *g''* near its forward end, allowing the ink to pass from the rear end of the tubular rod into the reservoir. When it is desired to fill the pen, the cap *e* is used to unscrew the plug valve *j* by means of its hexagonal end *j'*, and then the rear end of the filling tube formed by the piston rod *g* is open. The head *h* is then firmly grasped and drawn rearward, drawing out the rod *g*. The reduced neck *g'* of the rod, in cooperation with the packing *d*, allows this to occur, although it prevents such a movement accidentally. The rod *g* is drawn out as far as the piston *c*

will allow, and its open rear end at the head *h* is thrust into a body of ink in an ink well or bottle or other convenient receptacle, whereupon, by pressing down the barrel and pushing home the piston rod, which is now the filling tube *g*, the suction created in the rear of the piston draws in the ink from the tube, so that it flows out of the perforation *g''* into the reservoir. Next, the rear end of the pen should be rinsed and the screw plug *j* screwed into place, closing the filling tube. Thereupon, by putting the cap *e* in place on the rear end of the pen, the rotary valve will be opened and the pen made ready to write.

In the modifications shown in Figs. 7 to 10, inclusive, the rotary valve and head which carries the pen proper rotates but does not reciprocate longitudinally. The rotary valve or head *s*, shown partly in section, is provided with ducts as before communicating with the ducts *c''* in the wall of the pen barrel, but instead of two ducts *c'*, a single T-shaped duct *s'* is appropriate. The valve or head *s* is prevented from longitudinal movement by means of a flange *s''* in the wall of the barrel. The head is shouldered as shown to rest against the flange *s''*, and the projecting end has screwed upon it a nut *s'''* which rests against the opposite side of the flange *s''*, so that the head *s* cannot move longitudinally in either direction. The front of the head *s* is provided with a flange *t* interrupted at two points by openings *t'*. The forward end of the barrel is provided with an interrupted flange *u*, the interruptions or openings in which register on one side with the openings *t'*, as shown, when the pen is in writing position and the ink ducts of the valve are open. Preferably, instead of having the flange *u* similar to the flange *l* described above, the flange *u* has helical rear surfaces to act as cams in securing the cap tightly in place by the wedging of the flange *u* between the teeth *w* and *x* on the inside of the cap. The cap *e* is provided with opposite internal teeth *w* having an inclined surface *w'* in position to cooperate with the cam surface of the flange *u* and draw the cap tightly in place. These teeth *w* are of width to pass through the openings in the flange *u*. The cap is also provided with two opposed teeth *x* of width and position to approximately fit and occupy the openings *t'* in the flange *t* when the cap is put on; but these teeth *x* are of too great width to pass through the flange *u*, and, therefore, act as stops for the cap, preventing it passing too far on to the pen. The two parts of the flange *u* wedge between the teeth *w* and *x* when the cap is put on and turned until it wedges, which should occur in about a quarter turn.

After writing with the pen, the cap should

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be put on, as follows: Push the cap on until the teeth *w* strike the flange *t* and then turn lefthandedly until they find the openings *t'*, continuing the turning until they find the opening in the flange *u*, whereupon it will be seen that the flanges will register as shown in Fig. 7 and the teeth *w* in the openings *t'* come to rest against the flange *u*. Then the cap may be turned righthandedly and the teeth *w* will wedge beneath the flange *u*. This turning of the cap to cause the wedging will also cause the flange *t* to be turned by the teeth *w* from the position shown in Fig. 7, closing the valve ducts so that ink cannot pass from the reservoir to the front of the pen. Reversely, in taking off the cap, it is only necessary to turn it lefthandedly until the teeth *w* find the openings in the flange *u* and allow it to be pulled directly off, leaving the rotary valve in the position shown in Fig. 7. If no displacement of the valve occurs, it will be seen that when the cap is again applied, it will go on easily without much feeling around for the opening in the flange *u*.

It will be apparent from comparison of the first and second forms of the invention described that considerable modification of detail will readily suggest itself to those skilled in the art, and that some features of the invention may be used without others where all the objects are not carried out in a single pen.

I do not claim broadly the piston and filling tube in this application, as these are the subject-matter of a prior application filed by me.

What I claim is:

1. A fountain pen having a rotary valve for opening and closing the front end of the reservoir, a piston combined with said valve, and a combined valve stem, piston rod and filling tube, adapted to be drawn out at the rear end of the reservoir, the said stem having means for turning it, means for releasably holding it longitudinally and means for opening and closing the end of the filling tube.

2. A fountain pen having a rotary valve for opening and closing the front end of the reservoir, a piston combined with said valve, and a combined valve stem, piston rod and filling tube, adapted to be drawn out at the rear end of the reservoir, the

said stem and the cap of the pen being provided with cooperating means for turning the stem by movement of the cap.

3. A fountain pen having a rotary valve for opening and closing the front end of the reservoir, a piston combined with said valve, and a combined valve stem, piston rod and filling tube, adapted to be drawn out at the rear end of the reservoir, a cap having means for securing it to the pen by turning it and means for automatically turning the stem by the turning movement of the cap.

4. A fountain pen having a rotary valve for opening and closing the front end of the reservoir, a piston combined with said valve, and a combined valve stem, piston rod and filling tube, adapted to be drawn out at the rear end of the reservoir.

5. A fountain pen having a reservoir and a rotary valve which coacts with ink ducts in the reservoir wall, a combined filling tube and valve rod, valve actuating means comprising a rotary flange having one or more openings, a flange on the barrel having one or more openings, a cap having projections or teeth one of which is adapted to pass said flanges and to be turned to secure the cap and another of which engages with the rotary flange during such action to operate the valve.

6. A fountain pen having an ink duct and a valve for controlling the passage of ink at the forward end of the pen, and a cap provided with means engaging by rotation with cooperating means on the pen barrel for securing it thereto, said cap also having other means for automatically shutting and opening the valve by the motions of securing and removing the cap.

7. A fountain pen having a rotary valve provided with a rotary flange having one or more openings, and a cap provided with one or more teeth adapted to engage such openings, said pen having means for securing the cap by turning it while said teeth are engaged.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses this 20th day of March, 1912.

WM. L. CHAPMAN.

Witnesses:

HAROLD BINNEY,
AUGUSTA PSCHIERER.