No. 711,709. Patented Oct. 21, 1902.

# N. C. STILES.

## FOUNTAIN PEN.

(Application filed July 25, 1901.)

(No Model.)

Fig. 1.

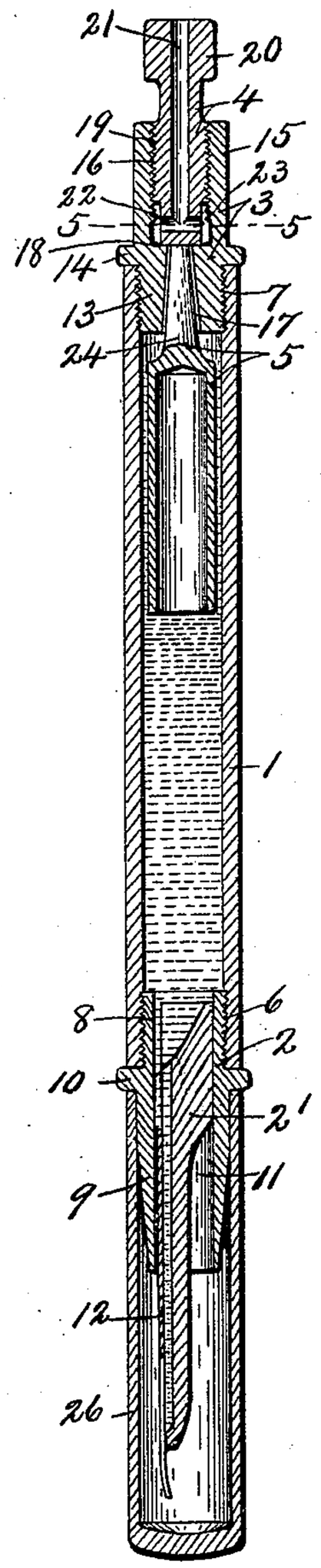



Fig. 2.

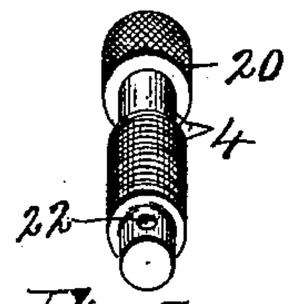



Fig. 3.

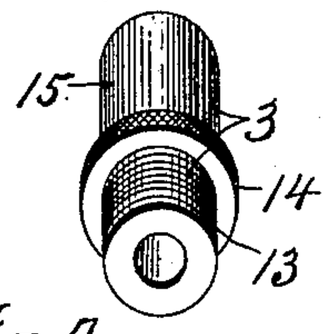



Fig. 4.

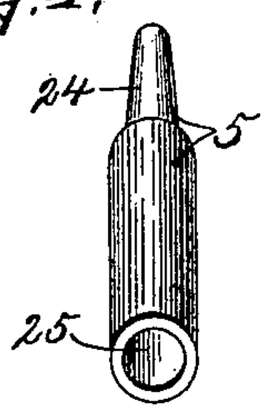



Fig. 5.

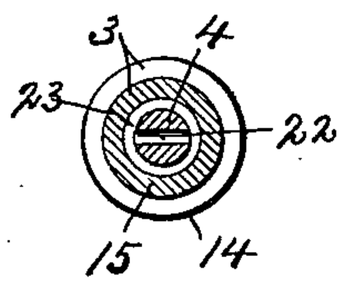



Fig. 6.

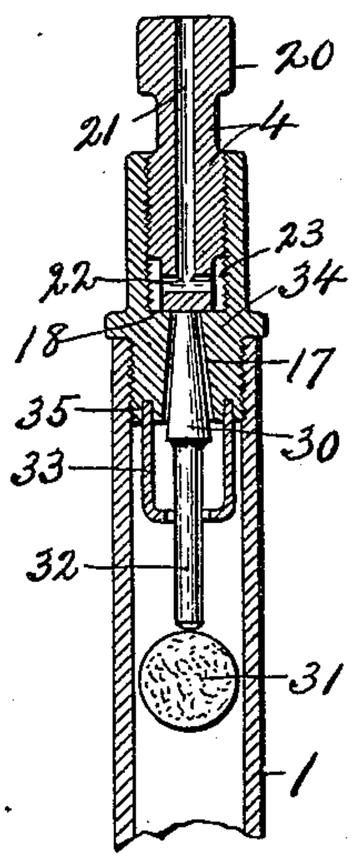
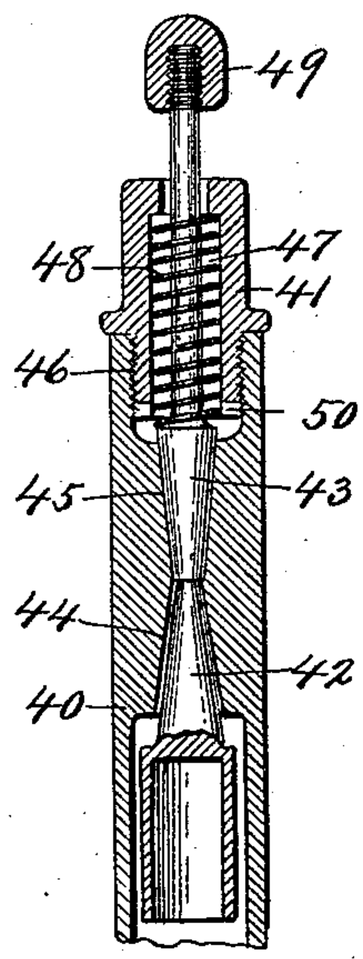



Fig. 7.

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# UNITED STATES PATENT OFFICE.

NORMAN C. STILES, OF WATERTOWN, NEW YORK.

## FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 711,709, dated October 21, 1902.

Application filed July 25, 1901. Serial No. 69,680. (No model.)

*To all whom it may concern:*

Be it known that I, NORMAN C. STILES, of Watertown, in the county of Jefferson, in the State of New York, have invented new and useful Improvements in Fountain-Pens, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in fountain-pens, having more particular reference to the means whereby the ink reservoir or chamber may be filled with ink without removing any of the parts.

The object of this invention is to produce a simple, practical, and efficient fountain-pen having a suitable ink reservoir or chamber which is adapted to be filled by suction by inserting the end in which the pen is mounted into a body of ink and then applying the mouth to the other end for producing a suction at the latter end, thereby drawing the ink into the reservoir.

A further object is to provide suitable means, such as a float-operated valve, whereby the influx of the ink into the reservoir automatically closes the suction-passage communicating with said reservoir.

A still further object is to provide a suitable plug or movable member in the suction end of the device whereby the valve may be positively forced from its seat against the action of the float and at the same time positively close the suction-passage.

To this end the invention consists in the combination, construction, and arrangement of the parts of a fountain-pen, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a vertical central section through my improved fountain-pen, showing the various elements of novelty therein. Figs. 2, 3, and 4 are isometric views, respectively, of the movable plug in the suction end of the penholder, the cap for closing the end of the ink-reservoir, and the float-valve movable in said reservoir. Fig. 5 is a transverse sectional view taken on line 5 5, Fig. 1. Figs. 6 and 7 are sectional views of the upper end of a fountain-pen, showing slightly-modified forms of my invention.

Similar reference characters indicate corresponding parts in all the views.

In Fig. 1 I have shown a cylindrical ink reservoir or holder 1, a sleeve 2, removably secured to one end of the holder and having a pen-holding and ink-feeding device 2′ detachably secured therein, a cap or sleeve 3, detachably secured to the other end of the holder, a plug 4, movable in the cap 3, and a float-operated valve 5, movable in the reservoir, said reservoir 1, the pen and cap sections 2 and 3, and the plug 4 forming a suitable inclosing case.

The ink reservoir or holder 1 may be of any desired form, size, or construction, being, preferably, of the standard cylindrical form, and provided with internally-threaded portions 6 and 7 at its opposite ends. The sleeve 2 may also be of any desired form or construction, being usually provided with a threaded nipple 8, adapted to engage the threaded portion 6 of the holder 1, and with a tapering lower end 9, said sleeve being also provided with a suitable annulus or shoulder 10, adapted to engage the lower end face of the holder 1 for limiting the inward movement of the sleeve. This sleeve is provided with a central lengthwise opening 11, in which is arranged the ink feeding and regulating device 2′, this member 2′ being held in position by frictional engagement with the inner walls of the sleeve 2, its lower end being reduced in size and extended beneath the lower end of said sleeve and is adapted to engage a suitable pen 12, which is impinged between the inner face of the sleeve 2 and the adjacent face of the member 2′. This member 2′ is provided with a lengthwise ink-passage adjacent to the pen for feeding the ink in small quantities to the tip of the pen in the usual manner, this operation being well understood by those skilled in the art, and it is believed to be unnecessary to further illustrate or describe the same. The upper cap or sleeve 3 is also provided with a threaded nipple 13, an annular flange or shoulder 14, and a hollow upward extension 15, having an internally-threaded portion 16. This cap or sleeve 3 is screwed into the upper end of the holder 1 and is provided with a tapering valve-seat 17, extending upwardly from its lower face and communicating with the interior of the extension 15, thus forming a continuous passage from the lower to the upper

face of said sleeve or cap 3, the upper end of the valve-seat 17 being of less diameter than the opening in the extension 15 for forming an additional valve-seat or shoulder 18.

The plug 4 is inserted into the socket of the extension 15, being provided with a screw-threaded portion 19, engaged with the internal threads 16, and is also formed with a suitable extension or mouthpiece 20 and a central lengthwise suction-passage 21, the lower end of which is provided with lateral branch passages 22. The lower end of the plug 4 is somewhat reduced in diameter for forming an air-chamber 23, which communicates with the branch passages 22 and serves to connect the main passage with the valve-opening 17 when the plug is adjusted away from the valve-seat 18.

The float-valve 5 is movable lengthwise in the chamber of the ink-reservoir 1, being usually provided with a tapering upper end or valve proper, 24, and having a hollow lower end 25, the tapering portion 24 being adapted to fit within the valve-seat 17 when the plug 4 is elevated from the seat 18, and the hollow portion 25 forming a suitable air-chamber open at its lower end, whereby the valve 5 is automatically seated when the reservoir is filled with ink.

The lower extension 9 of the sleeve 2 and the upper extension 15 of the sleeve 3 are arranged to receive a suitable cap 26, shown in Fig. 1 as secured to the extension 9, this cap being of the usual construction and is adapted to be removed from the sleeve 9 and placed upon the extension 15 when desired to use the pen.

In the operation of my invention when it is desired to fill the reservoir with ink the cap 26 is removed from the extension 9 and the plug 4 is unscrewed or elevated from its valve-seat 18 a sufficient distance to establish communication between the central passage 21 and the valve-opening 17, the holder 1 being held in an upright position and the valve being normally at the base of the holder or unseated from its valve-seat 17. The lower end of the reservoir upon which the pen is mounted is then inserted into a body of ink, and the upper end, or rather the portion 20 of the plug 4, is inserted in the mouth of the operator, who then sucks or draws the air from the interior of the holder 1 through the apertures 21, 22, 23, and 17, thereby causing the ink to flow upwardly into the reservoir, which seals the open end of the float 25, forming an air-chamber therein and causing the same to rise with the liquid or ink until the tapering end 24 closes the aperture 17, this taper end being of such length that when it is seated in its valve-seat its upper end extends slightly above the seat 18. Before withdrawing the lower end of the reservoir from the ink the plug 4 is screwed inwardly until its lower end engages the valve-seat 18 and closes the communication between the passage 21 and the passage 17. It is apparent, however, that owing to the slight taper of the valve 5 and its seat in the passage 17 said valve will automatically seat itself and remain seated by friction or capillary force even when the ink recedes therefrom or the pen is inverted. This operation causes the ink to be retained in the reservoir for use when desired, and at the same time the plug 4 may, if necessary, be operated to force the valve 24 from its seat, so that as the ink is used or exhausted from the reservoir the float-valve will readily descend by gravity to its initial position at the lower end of the reservoir, the operation just described being repeated as often as the ink in the reservoir is exhausted.

In Fig. 6 I have shown a slightly-modified form of my invention, in which I employ a valve 30, being provided with a depending stem 32, which is guided in a suitable nipple 33, secured to the lower end of the cap or sleeve 34. This cap 34 is substantially identical with the cap 3, except that its lower face is provided with an annular groove 35, in which is frictionally secured the upper end of the nipple 33, the opening in the lower wall of said nipple which receives the stem 32 being of slightly-greater diameter than said sleeve for permitting a passage of air during the operation of drawing the ink into the reservoir. The upper portion of the device just described is substantially the same as that seen in Fig. 1, having the plug 4, valve-seat 17, and lengthwise and branch passages 21 and 22. The operation of this device is substantially the same as that described for the operation of the device seen in Fig. 1, except that the float 31, which may be of cork or any other suitable material, is independent from the valve 30 or its stem 32.

In Fig. 7 I have shown a still further modified form of my invention, consisting of an ink reservoir or holder 40, a sleeve or cap 41, and oppositely-arranged lower and upper valves 42 and 43, the lower valve 42 being substantially the same as that seen in Fig. 1, except that the air-chamber at its lower end is somewhat shorter. The upper end of the reservoir 40 is provided with valve-seats 44 and 45 and a threaded socket 46, the valve-seat 44 receiving the valve 42 and the valve-seat 45 being arranged to receive the valve 43. The cap or sleeve 41 is formed with a lengthwise socket 47, in which is arranged a coil-spring 48, one end of which bears against the upper wall of the socket, and the lower end is adapted to engage the upper end of the valve 43 for normally seating said valve 43 in the seat 45. This valve 43 is provided with an upwardly-extending stem within the coil-spring 48 and projecting above the cap or sleeve 41, being provided with a removable mouthpiece 49. The lower end of the cap or sleeve 41 is provided with transverse grooves 50, which serve to prevent the closing of the communication between the socket 47 and valve-seats 44 and 45. The opening in the upper end of the sleeve 41 through which the

stem in the valve 43 passes is of slightly-greater diameter than said stem and communicates with the socket 47. In the operation of this device when it is desired to fill the reservoir with ink the upper end of the cap or sleeve and portion 49 are inserted into the mouth, the operator engaging the member 49 with the teeth and drawing the valve 43 from its seat against the action of the spring 48 and at the same time sucks or draws the air from the reservoir, causing the ink to elevate the float-valve 42 and to thereby close the passage 44. When the valve 42 is thus seated, its upper end extends slightly into the valve-chamber 45, and as soon as the reservoir is filled the operator releases the valve 43, and spring 48 forces said valve into its seat, and thereby releases the valve 42 from the seat 44 in order that the said valve 42 may readily descend by gravity as the ink is exhausted from the reservoir.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that the essential feature of my invention consists in drawing the ink into the reservoir by suction produced by the operator and also in providing a suitable float-valve actuated by the influx of the ink into the reservoir for automatically closing the suction-passage when the reservoir is sufficiently filled.

I have shown several means for carrying out the object of my invention; but it will be evident that other means may be employed without departing from the spirit of this invention. Therefore I do not limit myself to the precise construction and arrangement of the devices shown and described.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A fountain-pen comprising an inclosing case having an ink-reservoir and an air-passage leading from the reservoir to the exterior of the case and serving as a suction-passage for the purpose described, and a valve actuated by the influx of ink to close said passage, and a movable member for unseating the valve.

2. A fountain-pen comprising an inclosing case having an ink-reservoir and an air-passage leading from the reservoir to the exterior of the case and serving as a suction-passage for the purpose described, a valve actuated by the influx of ink to close said passage, and movable means for unseating the valve and closing said passage.

3. A fountain-pen comprising an inclosing case having an ink-reservoir and an air-passage leading from the reservoir to the exterior of the case and serving as a suction-passage for the purpose described, a float-actuated valve for closing said passage, and means for unseating the valve and simultaneously closing the passage.

4. In a fountain-pen, the combination with a reservoir having a pen-holding section at one end and an air-passage at its other end leading from the reservoir for the purpose described, a float-actuated valve automatically closing the passage by the influx of ink, and an adjustable member for opening and closing the passage and for unseating said valve.

5. A fountain-pen comprising an ink-reservoir, a pen-holding section and ink-feed in one end of the reservoir, a sleeve in the other end of the reservoir and provided with a valve-opening, a float-operated valve actuated by the influx of ink to close the opening, a plug movable in said sleeve and having a passage leading from the valve-opening to the exterior of the plug, said plug being arranged to open and close the valve-opening independently of the valve and to unseat said valve.

In witness whereof I have hereunto set my hand this 15th day of July, 1901.

NORMAN C. STILES.

Witnesses:
H. E. CHASE,
MILDRED M. NOTT.