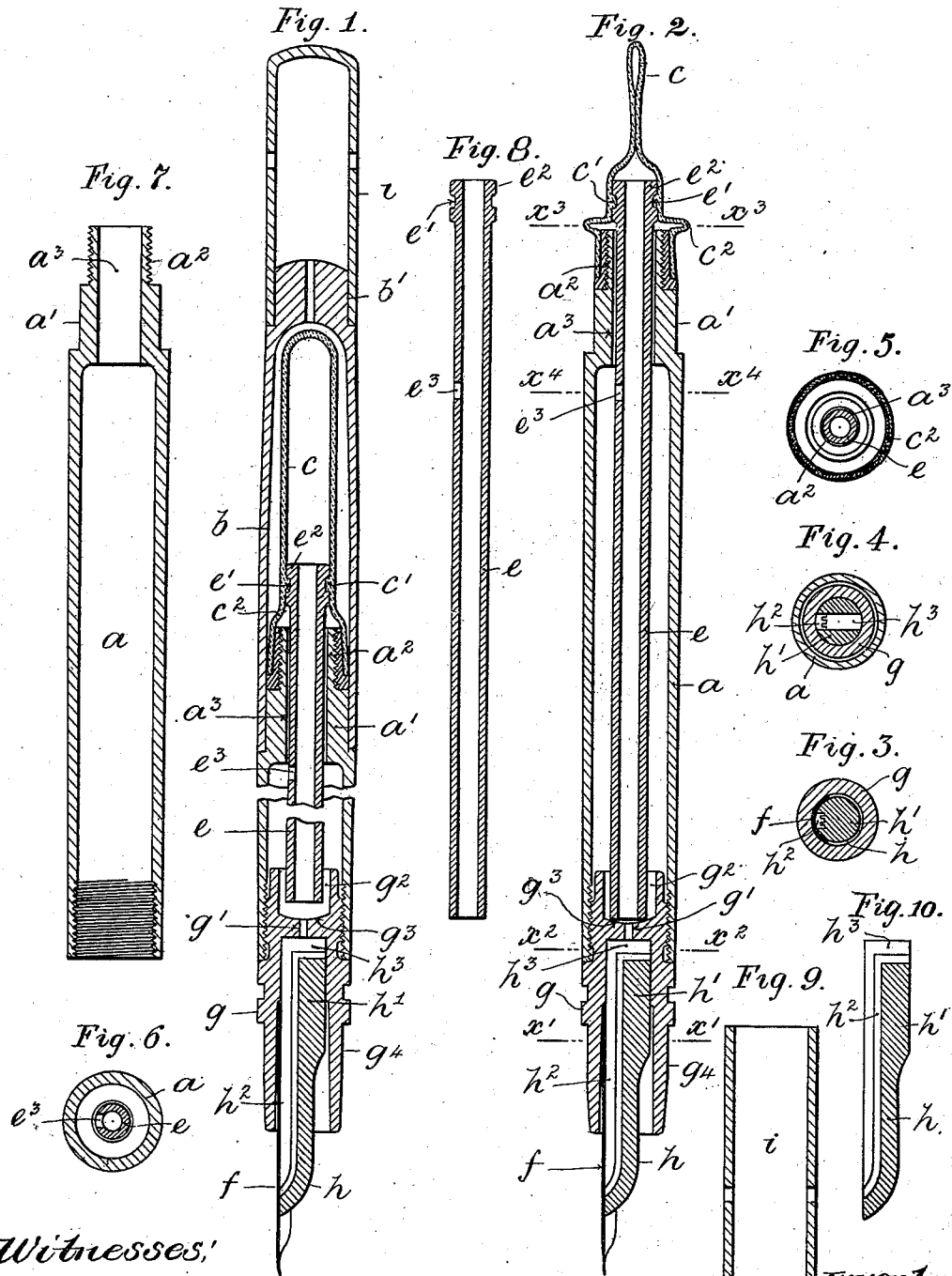


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FOUNTAIN PEN.

APPLICATION FILED DEC. 6, 1902.

NO MODEL.



Witnesses:

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# UNITED STATES PATENT OFFICE.

GEORGE W. PERKS AND FREDERICK CHARLES THACKER, OF  
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## FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 723,726, dated March 24, 1903.

Application filed December 6, 1902. Serial No. 134,146. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE WILLIAM PERKS, engineer, of Selwood, Strensham Hill, Moseley, Birmingham, and FREDERICK CHARLES THACKER, stationer, of Cornwall street, Birmingham, England, subjects of the King of Great Britain, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention has relation to fountain or reservoir pens, and has for its object to provide such pens with efficient and self-contained means for filling or charging the ink-reservoir without it being necessary to first remove or detach the nib-plug or nib-holder from the body of the pen.

Figure 1 of the accompanying drawings represents a complete longitudinal vertical section of a reservoir or fountain pen provided with refilling means constructed and arranged in accordance with our invention, the said view showing the several parts in the positions they assume when the pen is in use. Fig. 2 is a similar sectional view of the pen to that represented in Fig. 1, but shows the relative positions of the parts when the ink-reservoir is being charged or refilled with ink. Figs. 3, 4, 5, and 6 represent cross-sectional views of the pen, taken, respectively, on the dotted line  $x^1$ ,  $x^2$ ,  $x^3$ , and  $x^4$ , Fig. 2. Figs. 7, 8, 9, and 10 represent longitudinal sectional views of detail parts of the pen separately.

The same letters of reference indicate corresponding parts in the several figures of the drawings.

The improved pen consists of a body-tube or hollow stem  $a$ , the interior of which serves as a reservoir for ink and which has a double stepped or shouldered neck on the outer circumference at the after end. The larger part  $a^1$  of this neck is adapted to receive the mouth end of a detachable cap or sheath  $b$  for normally inclosing a tubular and elastic air-sack or flexible thin-walled bag  $c$ , one end of which is closed, while the other and open end fits tightly onto the extreme tip or smaller part  $a^2$  of the stepped after end of the reservoir, while located inside the said bag or air-sack and at a short distance from the mouth is an internal collar or choke  $c^1$ , which is sprung into an annular groove  $e^1$ , formed around the

headed or enlarged end  $e^2$  of a long and open-ended small-bore air-tube  $e$ , extending centrally within the inside of the ink-reservoir and having a sliding fit within an axial hole  $a^3$ , which is bored through the stepped after end of the said reservoir. A clearance or space is left between the extreme end of the reservoir and the headed end of the air-tube, and the flexibility of the portion of the air-sack marked  $c^2$  coming between the internal collar and the mouth admits of the said part being collapsed or gusseted under end pressure, and so allows the said inner tube to make a limited longitudinal sliding movement to and fro within the hollow neck of the reservoir for the purpose hereinafter described and also provides for a spring reaction which returns the air-sack and the air-tube connected with it to their normal positions, as shown in Fig. 1, after a forward movement has been given to the air-tube. A small hole  $e^3$  is formed through the walls of the said tube near to the head end, but within the ink-reservoir, and this hole constitutes an airway wherethrough air may pass from the reservoir-space within the interior of the body-tube into the small bore, which serves as a duct through which air is expelled when the air-sack is compressed when the parts are in the positions shown in Fig. 2.

The nib  $f$  is fitted to or carried by a plug  $g$ , which has an internal shoulder against which the inner end of the nib abuts and is screwed into the open forward end of the body-tube, the screwed-in shank of the said plug having a small axial hole  $g^1$  coinciding with the bore of the air-tube, whose forward end normally stands a short distance away from the said hole in the plug, as shown in Fig. 1, but lies within a counterbored seating or recess  $g^2$ , formed in the inner end of the plug, and having a she coned or domed part  $g^3$ , which serves as a guide for centering the fore end of the air-tube relative to the hole  $g^1$  in the nib-plug  $g$ . The forward or outer end of the plug is bored out axially to receive the circular stem or shank  $h^1$  of a vulcanite nib-carrier  $h$ , by which the nib is held in position, and whose inner end abuts against the perforated end of the plug, while the top side of the same is provided with an ink channel or gutter  $h^2$ , run-

ning from the rear to near the fore end and passing underneath the said nib for conveying ink to its point, communication being made between the said channel and the central hole in the plug by a small vertical slot or upright groove  $h^3$ , formed in the back end of the carrier-stem, so that there is always communication between the ink-channel in the carrier and the passage through the nib-plug whatever may be the relative positions of the carrier within the plug. By arranging for the nib-carrier to abut against the end of the bored-out hole in the plug the said carrier is made to always assume a definite position relative to the nib and a steady or regular flow of ink to the nib is insured.

The forward end of the plug has a neck  $g^4$ , onto which a nib-sheath cap or protector  $i$  sockets when the pen is not in use. Preferably this protector is of such diameter internally as will admit of its being fitted or placed onto the reduced or necked end  $b'$  of the air-sack sheath  $b$ , when the pen is in use.

To fill the reservoir of the pen with ink, both the nib-cap  $i$  and the air-sack sheath  $b$  are removed, and then the headed after end of the air-tube is pushed forward or toward the nib of the pen by the thumb and finger, so as to take the forward end fully home within the internal seating or recess of the nib-plug, and by its abutment against the coned part of this plug the said forward end of the air-tube is centered or brought coincident with the axial filling-hole in the said plug, whereby a continuous and direct air-passage is established between the air-sack and the outside of the pen by way of the air-tube, the hole through the nib-plug, and the ink-passages in the nib-carrier. The air-sack is then compressed between the finger and thumb, as shown in Fig. 2, so as to expel most of the air, and while the parts are held in these positions the nib end of the pen is dipped into an ink-pot or other vessel containing ink. The finger-pressure against the headed end of the air-tube is now relieved, and by the spring reaction of the part  $c^2$  of the flexible walls of the air-sack the forward end of the said tube is taken away from the hole in the recessed inner end of the nib-plug and at the same time the finger-pressure is removed from the air-sack, which thereupon expands or resumes its normal form, and the suction thereby created draws air from the reservoir-space into the air-sack by way of the small hole  $e^3$  in the air-tube, and to fill up the partial vacuum thus created in the reservoir ink is forced up the channel in the nib-carrier and through the axial hole in the nib-plug into the said reservoir and is made to occupy the space previously filled by exhausted air, and at each repetition of this cycle of operations (involving a movement of the sliding air-tube up to and away from the hole in the nib-plug) air is expelled from the air-sack by way of the air-tube and the passages in nib-plug and carrier and is replaced by more air

exhausted from the reservoir at each expansion of the air-sack, and thus a further supply of ink is drawn into the said reservoir until the same has been sufficiently charged, whereupon the nib end of the pen is lifted out of the ink vessel, the air-sack sheath is replaced, and the pen is ready for use.

On commencing to write ink flows from the reservoir through the central hole in the plug and the channel in the nib-carrier to the under side of the nib, which is kept continuously supplied with ink until the charge in the reservoir has been used up.

The self-contained filling or recharging means herein described is simple, effective, and rapid in its action and does not increase the weight or bulk of the pen or impair its utility as a writing instrument. Further, as the whole of the parts are practically unbreakable the improved filling device is not liable to become deranged by use, while by making the device as a self-contained and fixed or non-detachable part of the pen it is prevented from being lost, as frequently occurs in the case of loose or separate filling devices.

It is obvious that a light auxiliary spring may be interposed between the head of the air-tube and the necked end of the ink-reservoir to assist in drawing back the air-tube when finger-pressure on the air-sack is relieved.

Having fully described our invention, what we desire to claim and secure by Letters Patent is—

1. In a fountain or reservoir pen; a self-contained filling or charging means consisting of a sliding air-tube, an elastic or compressible and expansible air-sack located on the outside of the ink-reservoir and connected therewith, which tube is directed through the reservoir and communicates with the interior thereof through the medium of an air-hole, and its forward end being adapted to be brought against a passage leading into the reservoir, or formed through the nib-plug of the pen, thus to establish a temporary but direct communication between the air-sack and the outside air, the said parts being arranged and operated substantially in the manner and for the purposes herein described.

2. In a fountain or reservoir pen; a self-contained filling or charging means consisting of a sliding air-tube directed through the ink-reservoir, communicating with the interior of the said reservoir by way of an air-hole, and connected at its external end to an elastic or compressible and expansible air-sack which is also attached to the body of the pen, the said connection between the tube and the sack being made at a distance inward of the mouth of the latter, thereby leaving a portion of the walls of the said sack free to be collapsed or gusseted under end pressure to allow for the forward movement of the air-tube and to provide for the return of the said tube to its normal position when end pressure is

relieved, the several parts being arranged and operated substantially in the manner and for the purposes herein described.

3. In a fountain or reservoir pen; the combination with a pen-body having an internal ink-reservoir, of an elastic or collapsible and expansible air-sack made fast to the after end of the said body, a sliding and perforated air-tube working through a hole in the said after end and having its outer part connected to the inside of the air-sack at a distance inward of the mouth of the latter, and a nib-plug attached to the forward end of the said body and having a hole or passage leading to the outside of the reservoir and a seating or recess for centering the forward end of the air-tube relative to the said passage; the several parts being arranged, combined and adapted to operate substantially as and for the purposes herein described.

4. In a fountain or reservoir pen; the combination with an ink-reservoir and an air-tube arranged therein, of a nib-plug having a bored or hollow outer end, an axial hole leading from the said bored part into the ink-reservoir, and a nib-carrier, the stem of which is adapted to abut against the inner wall of the bore of the plug, and is provided with an ink-channel running along its top side and extending into or communicating with said axial hole of the nib-plug, coincident with the bore of the air-tube, substantially as and for the purpose herein described and set forth.

5. A fountain-pen comprising an ink-res-

ervoir, an air-tube slidably mounted therein and communicating therewith, a nib-plug for communication with the external air, and means for actuating the air-tube first to cause it to establish a passage-way between it and the nib-plug and then to cause it to draw ink into the reservoir.

6. A fountain-pen comprising an ink-reservoir, an air-tube slidably mounted therein and communicating therewith, a nib-plug having communication with the external air, and means for projecting the air-tube into engagement with the nib-plug to establish a passage-way between it and the nib-plug, and then to retract it to cause it to draw ink into the reservoir.

7. A fountain-pen comprising an ink-reservoir, an air-tube slidably mounted therein and communicating therewith, a nib-plug having communication with the external air, and an elastic air-bulb connected with the ink-reservoir and the air-tube and operating upon compression to establish a passage-way between the air-tube and the nib-tube and upon release to draw ink into the reservoir.

In testimony whereof we have hereunto set our hands in presence of two subscribing witnesses.

GEORGE W. PERKS.  
FREDERICK CHARLES THACKER.

Witnesses:

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