

N^o 13,133



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PROVISIONAL SPECIFICATION.

"Improvements in Fountain or Reservoir Pens"

We, GEORGE WILLIAM PERKS of Selwood, Strensham Hill, Moscley, Birmingham, Engineer and FREDERICK CHARLES THACKER, of Cornwall Street, Birmingham, Stationer. do hereby declare the nature of this invention to be as follows:—

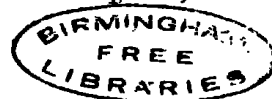
5 This invention has relation to fountain or reservoir pens, and has for its object the providing of efficient means for refilling the ink reservoir by its self contained filling apparatus without removing the nib-plug from the body of the tube.

10 The improved pen consists of a body tube or hollow stem which constitutes the reservoir for the ink and which is contracted internally at its after end and has a double stepped or shouldered neck on the outer circumference at this same end. The larger part of the neck is adapted to receive the mouth of a
15 detachable cap or sheath for enclosing a long tubular air-sack or flexible or thin-walled bag, one end of which is closed whilst the other and open end fits tightly onto the extreme tip or smaller part of the neck of the body tube, whilst located inside the said bag or air-sack and at a short distance from the mouth, is an
20 internal collar or choke which is sprung into an annular groove formed around the headed or enlarged end of a long and open-ended small-bore tube extending centrally within the inside of the body tube and having a sliding fit within the internally-contracted bore or neck at the after end thereof, and whereby connection is established between the sack and the inner tube, whilst the flexibility
25 of the portion of the walls of the air-sack between the internal collar and the mouth both admits of the said inner tube making the said sliding movement within the neck of the outer or body tube for the purpose hereinafter described, and also acts as a spring for returning the air sack and inner tube to their normal positions.

30 A small hole is formed through the walls of the small-bore tube near to the head thereof, and this hole constitutes an air-way wherethrough air may pass from the reservoir space within the interior of the body tube into the small-bore tube which serves as a duct through which air is expelled when the air-sack is compressed.

35 The nib itself (which is of a special construction) is fitted to or carried by a plug which is screwed into the open forward end of the body tube and whoses inner end has a small axial hole coinciding with the forward end of the small-bore air-duct, which normally stands a short distance away from the said hole in the plug but lies within a she-coned or domed seating or recess formed in
40 the said inner end of the plug, and serving both as a guide for centring the fore end of the air tube or duct relative to the hole in the nib plug. The forward or outer end of the plug is bored out axially to receive the circular stem or shank of a vulcanite nib-carrier by which the nib is held in position and which has an ink-channel or gutter running from the rear to near the fore end and passing underneath the said nib for conveying ink to its point, communi-

[Price 8d.]



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cation being made between the said channel and the central hole in the plug by a small vertical slot or groove formed in the back end of the carrier stem.

The forward end of the plug has a neck onto which a nib-sheath cap or protector sockets when the pen is not in use. Preferably this protector is of such diameter internally as will admit of it being fitted or placed onto the end of the air-sack sheath when the pen is in use.

To fill the reservoir of the pen with ink, both the nib cap and the air sack sheath are removed, the headed end of the small-bore tube is pushed with the finger or fingers towards the nib-end of pen in order to take the fore end of the said tube into the domed seating of the plug the air-sack is then compressed between the fingers to expel most of the air therefrom and the pen nib is dipped into ink.

The finger pressure on headed end of small-bore-tube is then removed and the fore end of same is therefore lifted from the seating in the plug, the finger pressure is then removed from the air-sack and the suction thus created draws air out of the reservoir in body tube through the small hole formed in the walls of the small bore tube, ink being drawn through the nib, the channel in the nib carrier and the central hole in the nib plug into the reservoir formed by the interior of the body tube in order to occupy the space previously occupied by the air.

One or more repetitions of this cycle of operations expels air in like manner and draws ink into the reservoir of body tube until it is filled.

On commencing to write the ink flows from the reservoir in body tube, through the central hole in the plug, the channel in the nib carrier, and to the nib.

Dated this 9th day of June, 1902.

GEORGE WILLIAM PERKS,
FREDERICK CHARLES THACKER,
By Henry Skerrett,
Agent for Applicants.

COMPLETE SPECIFICATION.

"Improvements in Fountain or Reservoir Pens"

We, GEORGE WILLIAM PERKS of Selwood, Strensham Hill, Moseley, Birmingham, Engineer and FREDERICK CHARLES THACKER, of Cornwall Street, Birmingham, Stationer, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

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 re-filling 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.

Figure 2 is a similar sectional view of the pen to that represented in Figure 1, but shows the relative positions of the parts when the ink-reservoir is being charged or re-filled with ink.

Figures 3, 4, 5 and 6 represent cross sectional views of the pen taken respectively on the dotted lines x^1 , x^2 , x^3 and x^4 Figure 2.

Figures 7, 8, 9 and 10 represent longitudinal sectional views of detail parts of the pen separately.

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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 enclosing a tubular and elastic air-sack or flexible thin-walled bag *c*, one end of which is closed whilst the other and open end fits tightly onto the extreme tip or smaller part *a*² of the stepped after end of the body tube, whilst 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 *e*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 Figure 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 air-way where-through 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 Figure 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 Figure 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 centring 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, whilst the top-side of the same is provided with an ink-channel or gutter *h*² running 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 ensured.

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 it being fitted or placed onto the reduced or necked end *b*¹ 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

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forward or towards 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 centred 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 Figure 2) so as to expel most of the air and whilst 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 e^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 underside 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 re-charging 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, whilst 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 now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

First:—In a fountain or reservoir pen; the employment of self-contained filling or charging means consisting of a sliding air-tube, connected to an elastic or compressible and expansible air-sack located on the outside of the ink-reservoir, which said tube is directed through the reservoir and communicates with the interior thereof by way of an air hole, and its forward end is adapted to be brought against a passage leading into the reservoir, or formed through the nib plug of the pen, so as to thereby 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 and also as set forth in the accompanying drawings.

Secondly:—In a fountain or reservoir pen; the employment of self-contained

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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 inwards 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, and also as set forth in the accompanying drawings.

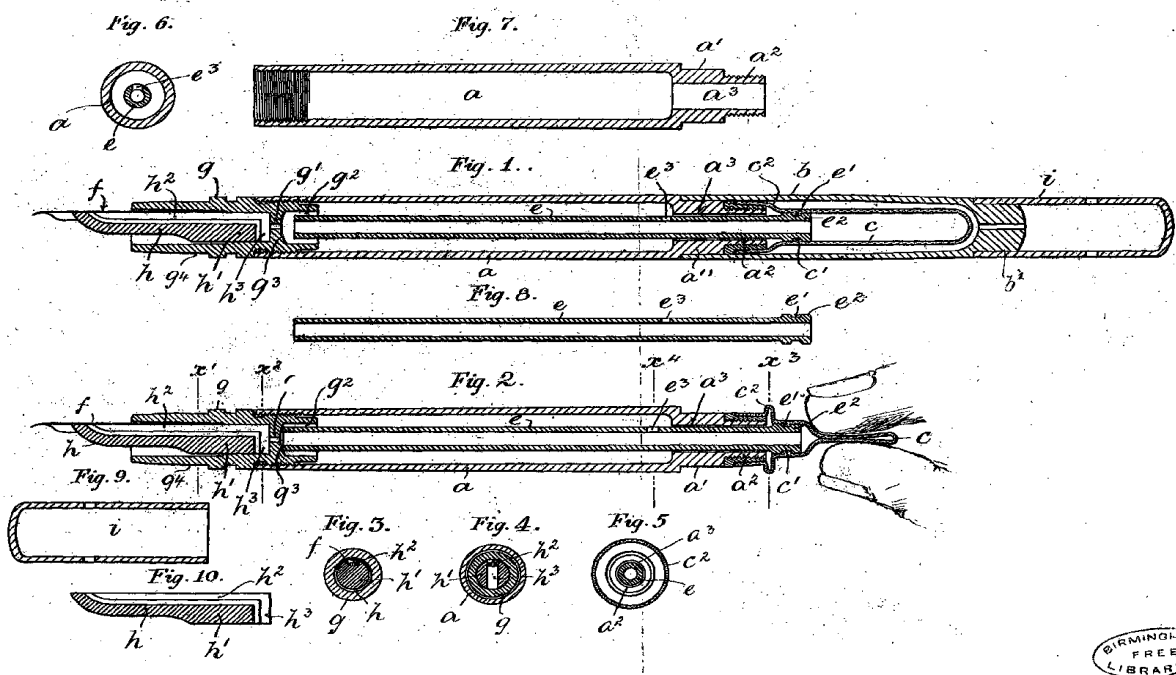
Thirdly:—In a fountain or reservoir pen; the employment in combination with a pen body having an internal ink-reservoir, of an elastic or collapsible and expansible air-sack made fast to the after end of the said body, a sliding and perforated air-tube working through a hole in the said after end and having its outer part connected to the inside of the air sack at a distance inwards 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 centring 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, and set forth in the accompanying drawings.

Fourthly:—In a fountain or reservoir pen; the employment in combination with a nib plug having a bored or hollow outer end and a piercing or axial hole leading from the said bored part into the ink reservoir, of a nib carrier, the stem of which is adapted to abut against the inner end of the boring of the plug, and is provided with an ink channel running along its top side and extending into or communicating with a vertical slot or groove formed in the abutting end of the said nib carrier, coincident with the axial hole in the plug, substantially as and for the purpose herein described and set forth.

Dated this 22nd day of November 1902

GEORGE WILLIAM PERKS,
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By Henry Skerrett,
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Agent for Applicants.



[This Drawing is a reproduction of the Original on a reduced scale.]

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Fig. 6.

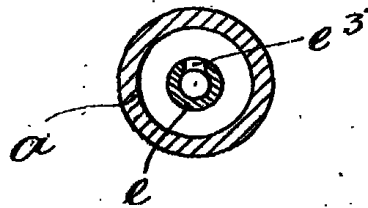


Fig. 7.

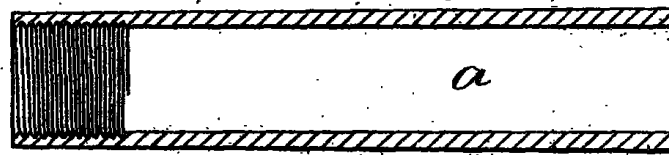


Fig. 1.

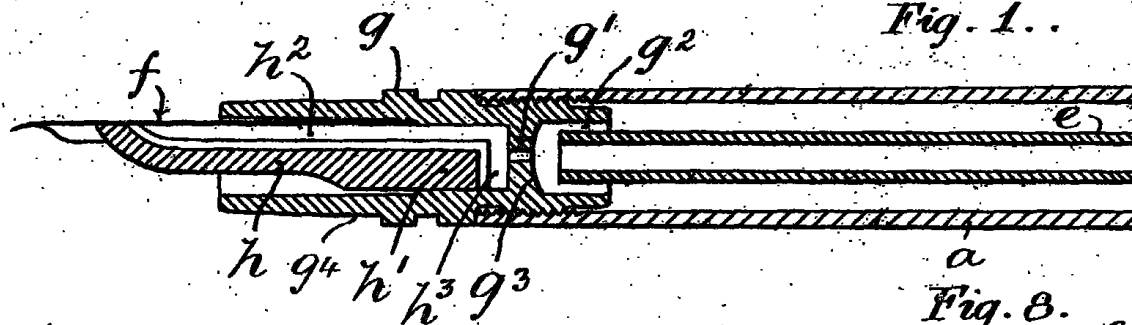


Fig. 8.

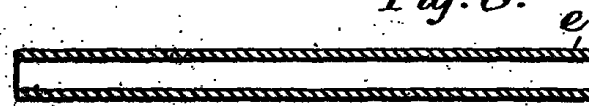


Fig. 2.

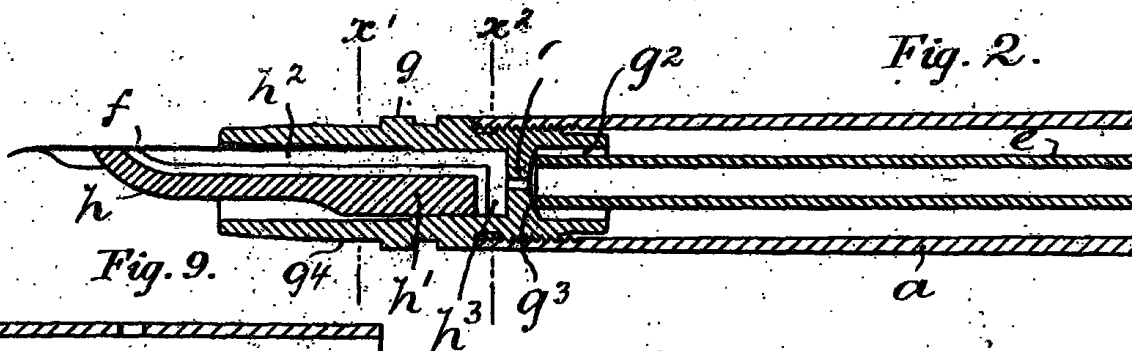


Fig. 9.

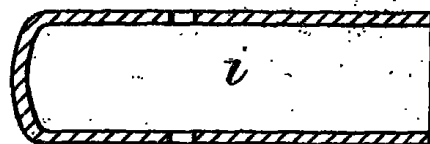


Fig. 10.

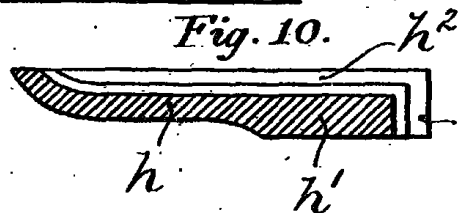


Fig. 3.

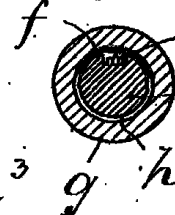


Fig. 4.



[This Drawing is a reproduction of the Original on a reduced scale.]

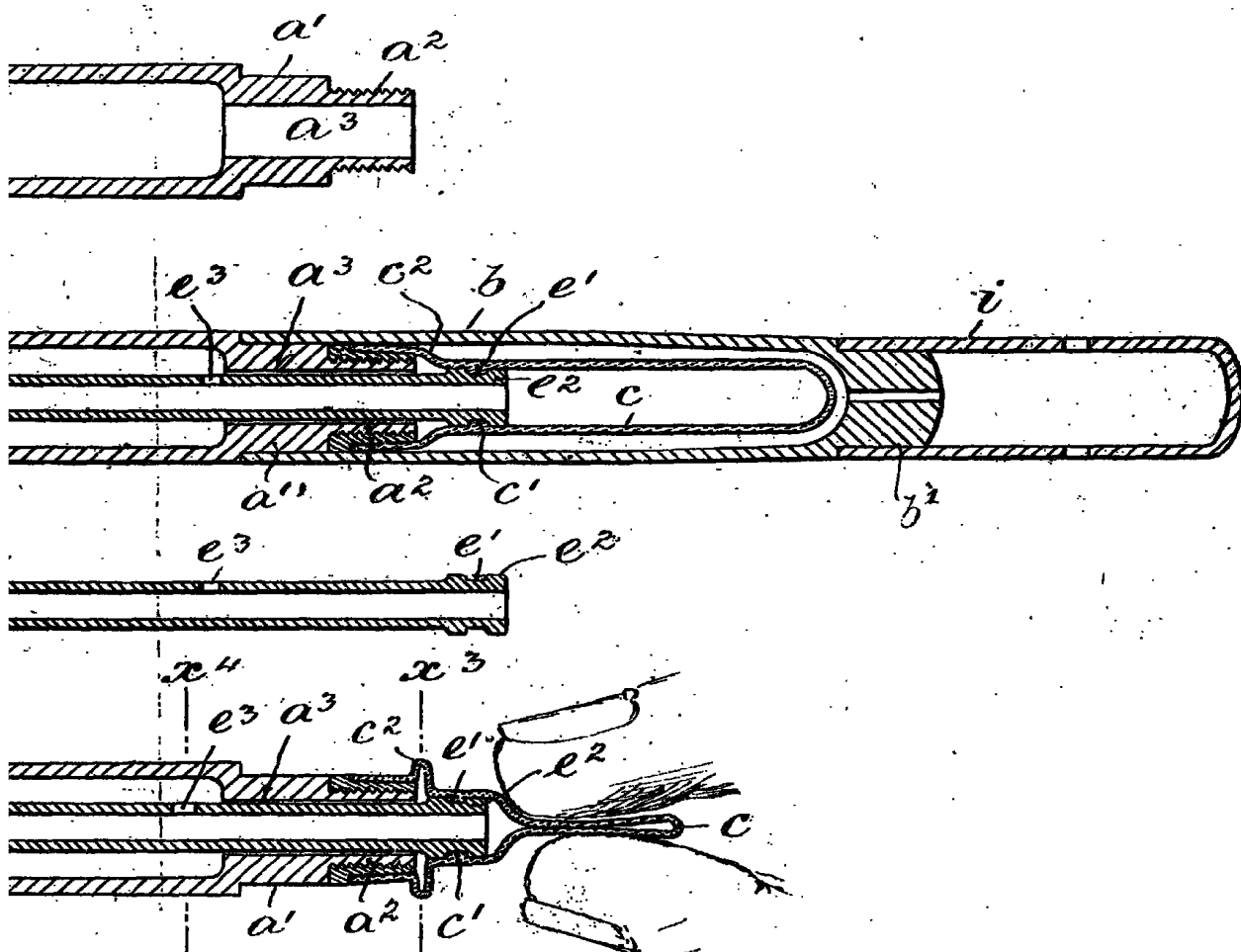


Fig. 5

