

PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in or relating to Self-Filling Fountain Pens

We, MABIE TODD & COMPANY LIMITED, a Company organized under the laws of Great Britain and Northern Ireland, and EDWARD STEPHEN SEARS (British Nationality), both of 41, Park Street, Mayfair, London, W.1, do hereby declare the nature of this invention to be as follows:—

This invention relates to fountain pens of self-filling type; and of the rotary knob or back actuating type in particular.

The object of our invention, primarily, is to eliminate unnecessary strain on the movement, thereby prolonging the workable life of the pen; to eliminate costly parts, and to facilitate fitting and detachment of the movement with the minimum of skill and cost; and to readily adapt the pen to various methods of filling which is achieved with the minimum of strain on the various working parts in all types and methods used.

According to our invention:—

The pen body is suitably bored (to hold the reservoir, or sac) for almost its entire length, or the required distance to the end remote from the nib; a secondary smaller bore is a continuation of the main bore and forms a shoulder: said secondary bore may be squared, hexagon, recessed longitudinally, or of any other suitable form to receive a correspondingly shaped control sleeve. Said body is threaded externally at both ends, the thread at the end adjacent to the nib being for the reception of the usual cover cap. The threaded end remote from the nib is to receive a rotary knob; this latter thread being of suitable length to allow said rotary knob to be unscrewed but not detached.

Said cover cap may be of conventional type, and the nib section and feed may also be of known pattern. Said rotary knob is bored, threaded internally, and adapted to correspond with the external thread on the end of the body remote from the nib; and the secondary bore is

adapted to receive an adjusting sleeve preferably as a frictional fit. Externally, the rotary knob follows the contour of the body which contour—preferably a taper—retains the cover cap when the pen is in use.

Positioned in the main bore of the body remote from the nib is an actuating disc preferably of non-corrosive metal with a reasonably hard surface as a provision against wear. Said disc is cone or saucer shaped with the apex of the cone in contact with one end of said control sleeve. It—the disc—may be formed with an extension which is suitably threaded; or—which is preferable—drilled through and held in fixed relation to the control sleeve by a disc screw, a recess being formed in the bore to receive the head of said screw.

The diameter of the disc is governed by the diameter of the main bore of the body in which it should move forward and backward without friction, but with a little tolerance between sizes of the bore and the diameter of the disc as possible.

Said disc screw is preferably of metal of suitable size and length and threaded, such thread being of considerably faster pitch than the external thread on the body remote from the nib.

The head of the screw should correspond with the recess in the disc, the face of the disc screw conforming to the contour and flushed with the inside face of the disc, namely, cone, or saucer shape.

The control sleeve is of suitable length and its exterior may be squared, hexagon or of any formation which will prevent turning—corresponding with tolerance—in the interior of the secondary bore in the body. The sleeve is bored through and threaded internally, the size of the thread corresponding to the fast pitch thread on the disc screw. Said adjusting sleeve is of suitable diameter, bored and screwed internally, the thread also corresponding to the fast pitch thread in the control

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sleeve and on the disc screw. Said adjusting sleeve is adapted to fit frictionally in the rotary knob and, after adjustment of the movement, may be pinned laterally, 5 or a fixative used.

A spring, which is but one of the various means of deflating the sac, is, preferably, of spring strip of the required width and tension, and is attached to a 10 presser plate in any approved manner: one end of the spring abuts against a shoulder formed by the insertion of the nib section in the barrel, whilst its opposite end may be "turned" to present a 15 suitably smooth non-resistant surface to the actuating disc, or its end may be "balled" by the attachment of any suitable metal. The turned, or balled, or smooth end of the spring is positioned at 20 the extreme edge of the coned or saucered surface of the actuating disc in alignment with the main axis and in contact with the inside wall of the body.

Said pressure plate is of common pattern of the required length, with two ribs 25 longitudinally and adapted at or about its centre for the attachment of the spring.

In a modification, said spring may be substituted by two short back plates connected by a swivel attachment to the 30 presser plate at a suitable distance from each end.

In a further modification, one of the short back-plates, namely, the one adjacent to the actuating disc may have a 35 short spring in fixed relation to the presser plate.

The action of the movement is as follows:—

40 On unscrewing the knob, the fast pitch thread moves the actuating disc towards the nib point and causes the turned or balled end of the spring to travel towards its centre: in this position the sac is 45 partly deflated at the rear end. Continued unscrewing of the knob carries the disc progressively forward, and endwise pressure develops on the balled end of the spring which bows slightly at this end 50 and completes the deflation of the sac at the rear end. Continued unscrewing of the knob to its limit exerts further pres-

sure at the end of the spring abutting the shoulder of the section said spring bending and completing the are necessary for 55 the complete deflation of the sac.

On the return movement, that is on returning the knob to its normal position, the movement of the presser plate and spring is reversed, as the end of the 60 presser plate and spring adjacent to the section rises first and subsequently the balled end of the spring is released and moves back to its original position of inflation. The medium for returning the balled end 65 of the spring to position of deflation is the sac; this has been found sufficient for the purpose, although a spring of suitable form may be incorporated, if desired, to assist in the return movement. Thus 70 there is obtained a natural movement of filling, that is, assuming that the end of the presser plate remote from the nib is "X" and the end adjacent to the nib is "Y", the movement during the filling 75 operation is X—Y, Y—X.

In a modification the fast pitch thread is dispensed with and a press stud or button is substituted in known manner.

In a further modification, the movement may be shortened and confined to 80 the back end of the body and used in conjunction with the aforementioned stud or button and an air tube and filled pump fashion. 85

It may be found desirable to add an enlarged bore at the end of body remote from the nib, make the diameter of the actuating disc correspondingly larger, 90 and insert a screwed plug at this end. This construction makes for still greater ease of assembly and enables the movement to be assembled as a separate unit for insertion in the body. Further, the 95 shoulder formed by the enlarged bore functions as a stop to limit the outward movement of the knob.

Other modifications within the scope may occur.

Dated this 29th day of July, 1946.

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Chartered Patent Agent.

COMPLETE SPECIFICATION

Improvements in or relating to Self-Filling Fountain Pens

100 We, MABIE TODD & COMPANY LIMITED, a Company organized under the laws of Great Britain and Northern Ireland, and EDWARD STEPHEN SEARS (British Nationality), both of 41, Park Street, 105 Mayfair, London, W.1, 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 relates to fountain pens 110 of sac self-filling kind operated for filling by a knob situated at the end of the barrel remote from the nib.

The object of our invention, primarily, is to eliminate unnecessary stresses or strains on the sac-controlling means or movement, thereby prolonging the workable life of the pen; to eliminate costly parts; to facilitate fitting and detachment of the movement with the minimum of skill and cost.

A fountain pen of the type referred to, according to the present invention, is broadly characterised in that it includes a disc of cone or saucer-like configuration adapted to bear against presser-bar actuating means, and said disc being so operably associated with the knob of the pen that, on actuation of the latter, the disc will be projected toward the nib end of the pen to deflate the sac, or retracted to permit expansion thereof, as the case may be.

The accompanying sheet of explanatory drawings illustrate, by way of examples only and not of limitation, two modes of carrying our invention into effect.

In said drawings:—

Fig. 1 is a longitudinal half-section of a pen in normal condition for writing;

Fig. 2 is a fragmentary section showing the positions of the parts in the initial stage of sac deflation; and

Fig. 3 is a similar view in which the sac is shown completely deflated;

Figs. 4 and 5 illustrate modified presser-bar actuation means;

Fig. 6 is a longitudinal section similar to Fig. 1, but provided with means for returning the presser bar to normal position, i.e. after compression of the sac; and Fig. 7 is a fragmentary view in which the sac is fully collapsed; Fig. 8 is a detached view of the presser-bar-returning unit shown in Figs. 6 and 7.

1 denotes the pen body or barrel which is suitably bored for the reception of sac 2 throughout almost its entire length, or the required distance toward the end remote from nib 3 where it is enlarged to provide an annular shoulder 4. 5 designates a rotary knob in continuous engagement with an externally screw-threaded plug 6—which, in effect, constitutes an extension of barrel 1—of reduced diameter and provided with an enlargement or shoulder 6^a entered and suitably secured within the end of the barrel. The screw-threading of said plug 6 is of suitable length to allow said rotary knob 5 to be unscrewed but not detached. Said barrel 1 is threaded externally at its end adjacent to nib 3 for the reception of the usual cover cap 7 which may be of conventional type, and the nib section 8 and feed 9 may also be of known pattern. Externally, knob 5 follows the contour of barrel 1, which—pre-

ferably tapering—contour retains cover cap 7 when the pen is in use.

Said knob 5 is bored to receive an internally screw-threaded sleeve or bush (hereinafter, for convenience of reference, designated “adjusting sleeve”) 10.

Positioned in the enlarged portion of the main bore of barrel 1 remote from nib 3 is a sac-actuating disc 11, preferably of non-corrosive metal with a reasonably hard surface as a provision against wear. Said disc 11 is cone or saucer shaped with the apex of the cone secured to one end of an internally screw-threaded sleeve or bush (hereinafter, for convenience of reference designated “control sleeve”) 12. It—disc 11—is also secured to the head 13^a of a screw-threaded rod 13 of fast pitch which extends through control sleeve 12—engaging with the correspondingly fast-pitch threaded bore thereof—and enters and engages in the similarly fast pitch screw-threaded bore of adjusting sleeve 10.

The diameter of disc 11 is governed by the bore size of barrel 1, in which it should move forward and backward without friction, but with as small tolerance as is practicable between the diameters of bore and disc respectively.

The screwed rod 13 is preferably of metal of suitable size and length, its thread being of considerably faster pitch than that of the external thread of plug 6. The head 13^a of said rod should correspond with the recess in disc 11, its face conforming to the contour of and being flush with the inside face of the disc.

Control sleeve 12 is of suitable length and its exterior may be square, hexagon, or of any other formation which will prevent its turning in the bore—of corresponding configuration—of plug 6. Adjusting sleeve 10 is fitted frictionally in the rotary knob 5 and, after initial adjustment of the movement, may be positively secured by pin 14 or a fixative.

A spring 15, which is but one of various means of deflating sac 2, is of the required width and tension and is attached to a presser bar 16 in any approved manner. One end of said spring abuts against the shoulder 17 formed by the insertion of the nib section 8 in body 1, whilst its opposite end may be turned as at 15^a to present a suitably smooth non-resistant surface to the actuating disc; or its end may be “balled” by the attachment of any suitable metal. Normally, the smooth end of the spring is positioned at the extreme edge of the coned or saucer surface of the actuating disc 11 which is in alignment with the main axis of and in contact with the inside wall of the body bore. Said presser-bar 16 is of common

pattern of the required length, with two ribs longitudinally: it is attached at or about its middle to spring 15.

In the modification illustrated in Figs. 4 and 5, there are substituted for said spring 15, two short back plates 18 connected by pivotal or swivel attachments 19 to presser-bar 16 at a suitable distance from each end. In these views, Fig. 4 shows plates 18 in normal position, and Fig. 5 in the positions assumed when sac 2 is deflated. Said back plates, in operation, function similarly as spring 15, and in some cases, one of same, namely the plate adjacent actuating disc 11, may be substituted by a short spring in fixed relation to the presser-bar 16, and which spring aids in the returning of presser-bar 16 to normal position.

The action of the movement more especially illustrated in Figs. 1 to 3 is as follows:—

On unscrewing knob 5, the fast pitch thread of adjusting sleeve 10, through its screw engagement with disc-carrying rod 13, and non-rotary projection of the latter consequential on its attachment to sleeve 12, projects disc 11 toward the nib end of the barrel and causes the turned or balled end 15^a of spring 15 to travel toward its centre: in this position (Fig. 2) sac 2 is partly deflated by the presser-bar at its rear end. Continued unscrewing of knob 5 causes disc 11 to be carried progressively forward, and the endwise pressure develops on the end 15^a of the spring 15 which bows slightly at this end and completes the rear end deflation of the sac. Continuation of the unscrewing of the knob causes further pressure on the end of spring 15 until said spring completes the arc necessary for full deflation (Fig. 3) of the sac. On re-screwing knob 5 to its normal position, the movement of presser-bar 16 and spring 15 is reversed, the end of the presser-bar and spring adjacent nib section 8 rising first; then the end 15^a of spring 15 is released and moves back to its original position in relation to disc 11.

The medium for returning spring 15 to position for re-actuation is the sac itself: this has been found sufficient for the purpose, although a spring of suitable form may be introduced, if desired, to assist in the sac's return movement. Thus, there is attained a natural movement of filling; that is, assuming the end of the presser-bar 16 remote from the nib is "X" and the end adjacent to the nib is "Y", the movement during the filling operation is X towards Y and X away from Y.

By utilising said plug 6 in the pen, the assembly of the parts is simplified, as it enables the movement to be assembled

as a separate unit for insertion in the barrel; further, stop shoulder 4, formed by the enlarged body bore, limits the inward movement of disc 11 and thus the outward movement of knob 5 which, in consequence, cannot become detached from plug 6. Alternatively, however, we may, in substitution for the plug, provide the barrel remote from the nib with a secondary smaller bore which is an integral and shouldered continuation of the main bore, and said secondary bore of the barrel may be square, hexagon, recessed longitudinally, or of any other suitable form to receive slidably a correspondingly shaped non-revoluble control sleeve 12. In this case, the pen body itself will be externally screw-threaded at the end remote from the nib to receive knob 5.

Referring now to the pen of Figs. 6 to 8, inclusive, spring 15 is provided with an extension 15^b configured as shown and contacting with the opposite wall of barrel 1, and the heel 15^c whereof engages disc 11 for operation as hereinbefore described. In this arrangement, however, on deflation of the sac, spring extension 15^b is deflected inwardly, so that on reversal of the action i.e. retraction of disc 11—it raises presser-bar 16 clear of the sac, thus permitting the latter to expand without having to assist the return of the presser-bar to normal position.

In a modified pen construction under our invention, said "fast pitch" screw-threaded rod 13 is dispensed with and a press stud or button substituted therefor.

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:—

1. A self-filling fountain pen of the type referred to, which includes a disc of cone or saucer-like configuration adapted to bear against presser-bar actuating means, and said disc being so operably associated with the knob of the pen that, on actuation of the latter, the disc will be projected toward the nib end of the pen to deflate the sac, or retracted to permit expansion thereof, as the case may be.

2. A self-filling fountain pen as claimed in claim 1, which includes a barrel provided at its knob end with an externally screw-threaded knob-engaging portion in the bore of which is slidably but non-revolubly located an internally screw-threaded control sleeve whereto said disc is attached; a knob in which is affixed an internally screw-threaded adjusting sleeve; and a "fast pitch" screw-threaded rod to an end whereof is also attached said disc; and said rod engaging

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with said adjusting sleeve for the purpose specified.

3. A self-filling fountain pen as claimed in claim 2, in which a plug 5 secured to the knob-end of the body provides for screw engagement of the knob and receives said control sleeve.

4. A self-filling fountain pen as claimed 10 in any one of the preceding claims, in which sac-actuating means include a spring attached to a presser-bar, and one end of which spring engages a stop at the nib end of the pen body and the other end 15 engages with said disc.

5. A self-filling fountain pen as claimed 20 in any one of the preceding claims 1 to 3 inclusive, in which the sac-actuating means comprises two back plates swivelled or pivoted to a presser-bar.

6. A self-filling fountain pen as claimed 25 in claim 4, in which the end of the spring or plate adapted to engage the disc is turned or "balled" for the purpose specified.

7. A self-filling fountain pen as claimed

in claim 5, wherein one plate comprises a short leaf spring for the purpose specified.

8. A self-filling fountain pen as claimed 30 in any one of the preceding claims 1 to 4 inclusive, in which a presser-bar actuating spring is provided with an extension for assisting return of the bar to its initial position.

9. A self-filling fountain pen as claimed 35 in claim 1, in which the means for actuating said disc includes a press stud or button.

tially as hereinbefore described and illustrated in Figs. 1 to 3, inclusive, of the 40 accompanying drawings.

11. A self-filling fountain pen substantially as hereinbefore described and illustrated in Figs. 6 to 8 inclusive of the 45 accompanying drawings.

Dated this 21st day of June, 1947.

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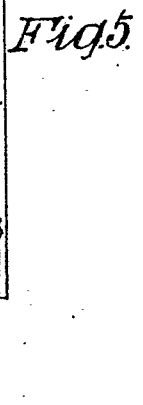
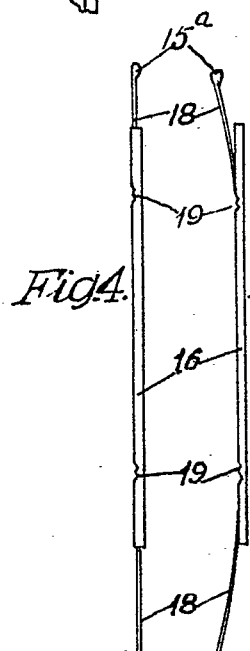
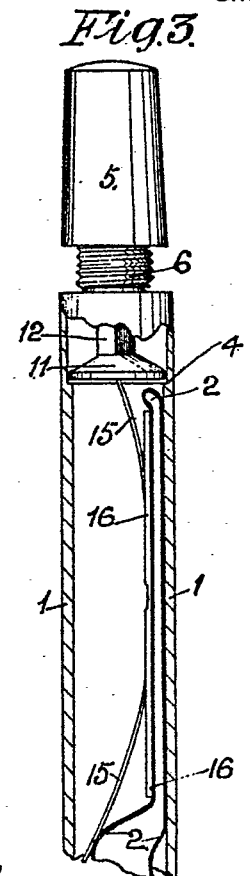
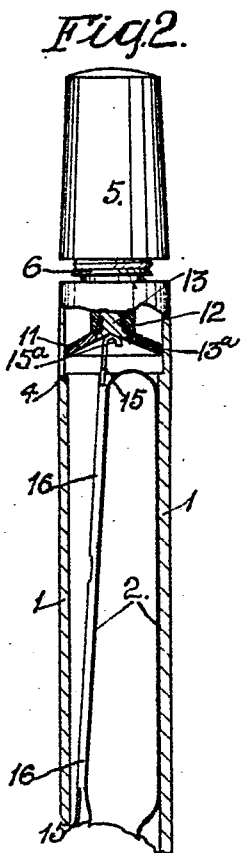
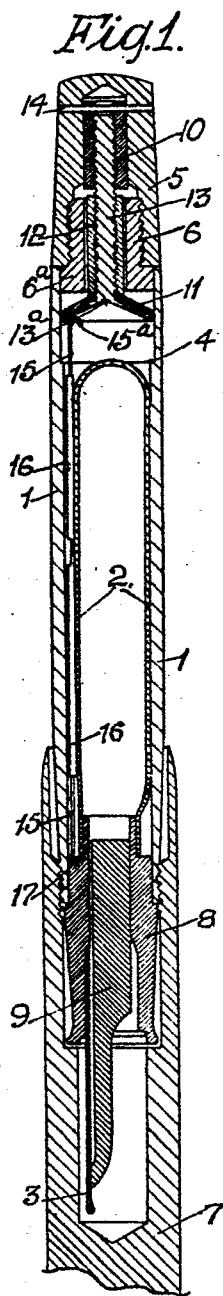


Fig. 3.

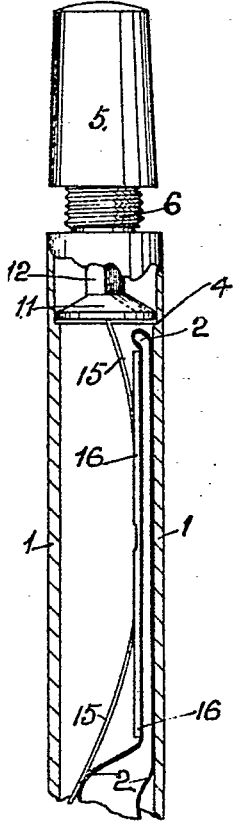


Fig. 6.

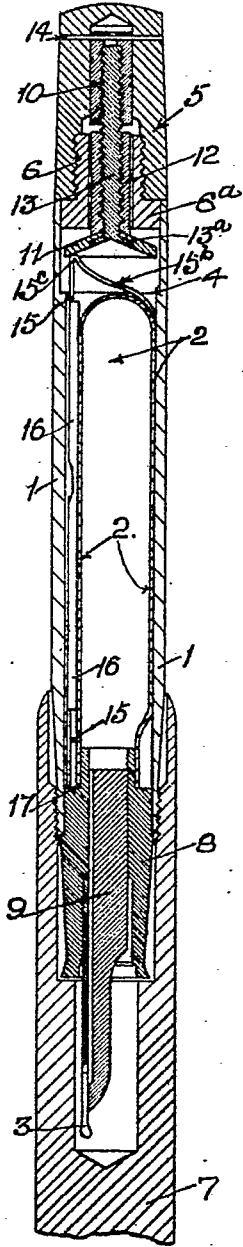


Fig. 7.

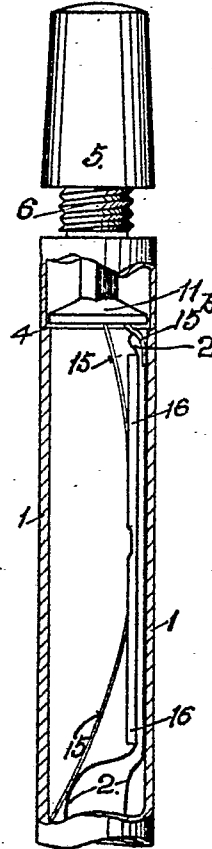


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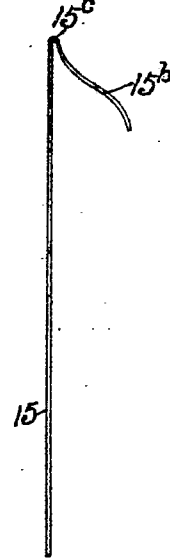
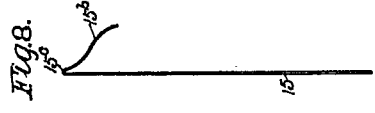
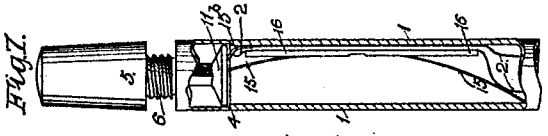
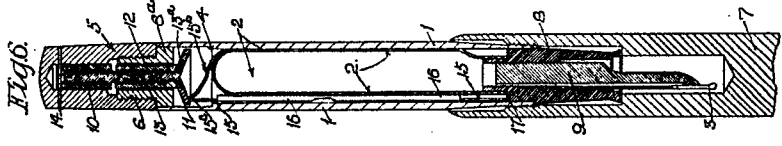
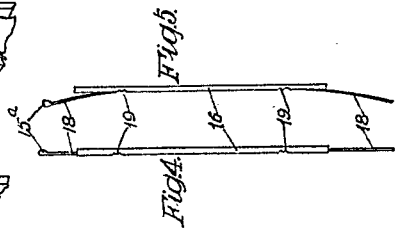
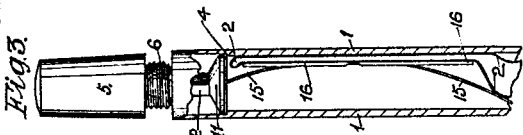
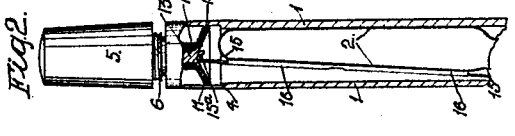
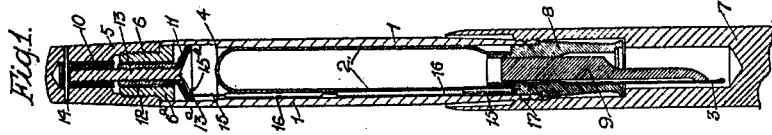


Fig. 5.





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