

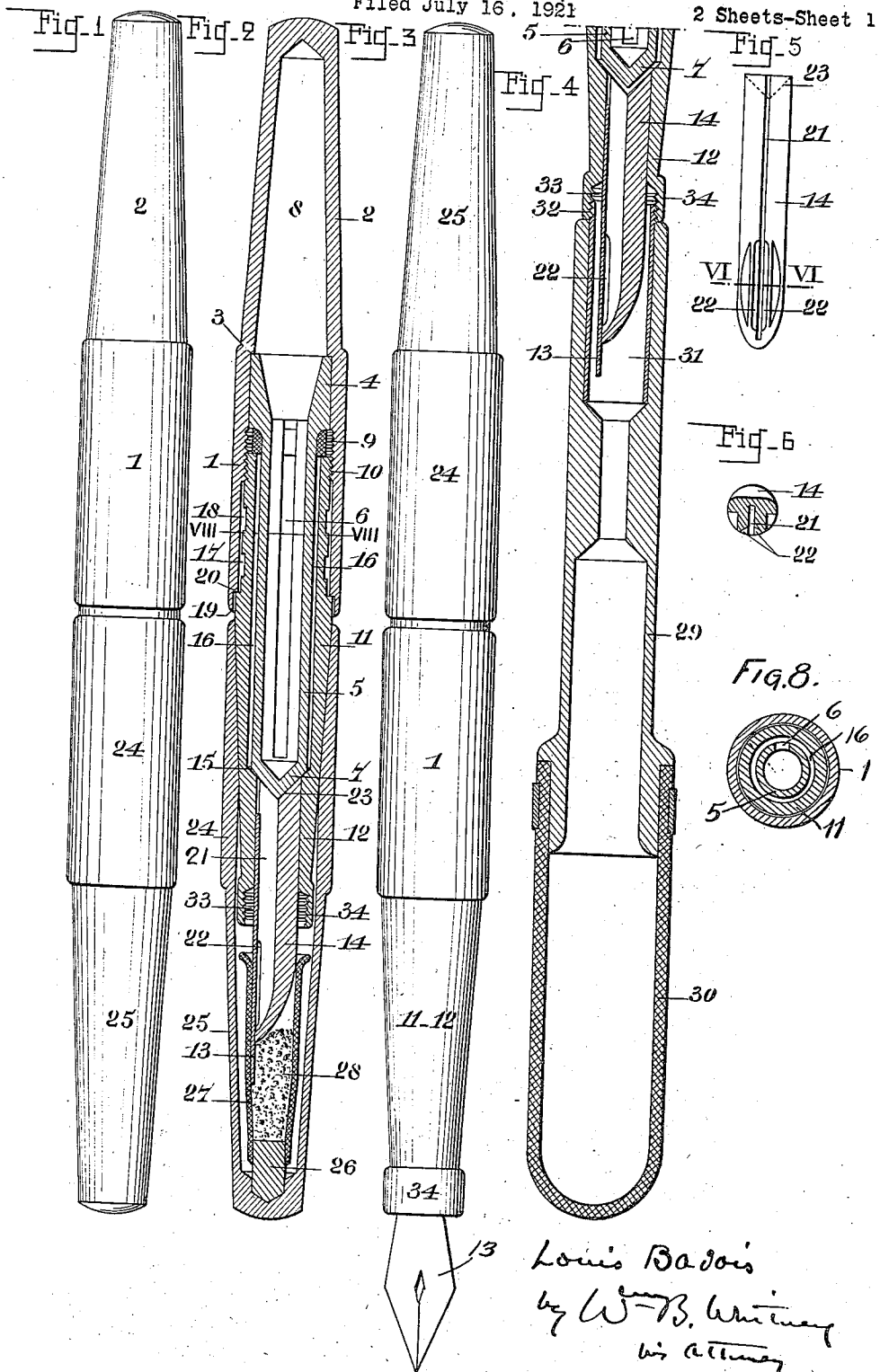
June 5, 1923.

L. BADOIS  
FOUNTAIN PEN

1,457,765

Filed July 16, 1921

2 Sheets-Sheet 1



Louis Badois  
by W. B. Whitney  
his attorney

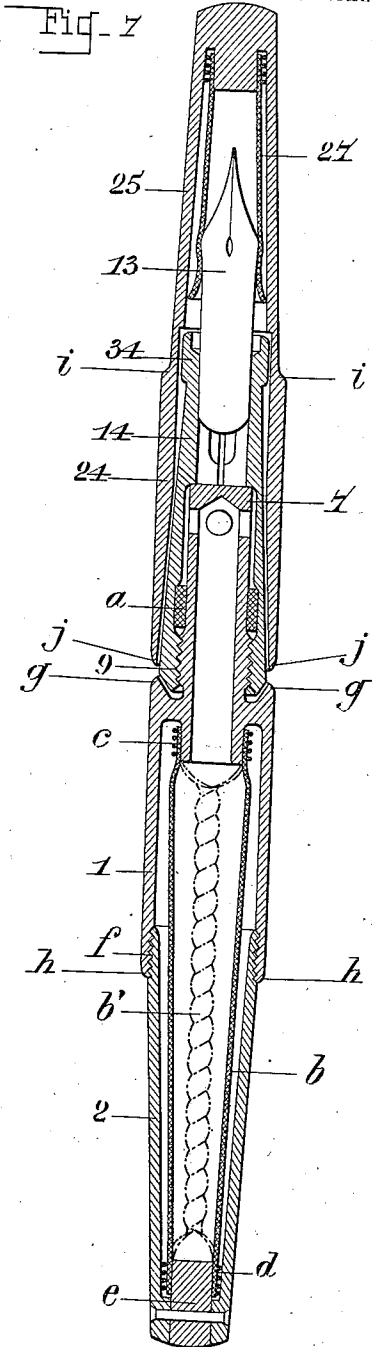
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2 Sheets-Sheet 2



Louis Badois  
by *W. B. Whitman*  
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# UNITED STATES PATENT OFFICE.

LOUIS BADOIS, OF PARIS, FRANCE.

FOUNTAIN PEN.

Application filed July 16, 1921. Serial No. 485,211.

*To all whom it may concern:*

Be it known that I, LOUIS BADOIS, a citizen of the Republic of France, residing at Paris, 212 Boulevard Péreire, Department of the Seine, France, have invented certain new and useful Improvements in and Relating to Fountain Pens, of which the following is a specification, reference being had to the accompanying drawings.

The present invention relates to fountain pens and its object is to provide a fountain pen capable of being used with any kind of ink (fixed black ink, copying ink, etc.), of being carried in any position, of being instantaneously opened and closed, of being always ready for use, having a perfectly regular feed of the nib, and capable of being instantaneously filled and cleaned without any risk of staining.

It should be also pointed out that particular attention has been given in the construction of the fountain pen to this, that it shall have an elegant shape, a large capacity and that it shall be easily held in hand.

The improvements according to the present invention include also the combination of the hollow plug-spindle of the fountain pen with a reservoir constructed in such a manner as to allow by its own means an automatic filling of the fountain pen and its emptying of ink with a view to cleaning it.

This improved combination allows of obtaining a very important industrial result: it permits indeed of having in the same apparatus: a perfectly tight-joint closing of the ink reservoir, and an automatic filling of the fountain pen without any filler or special arrangement suitable for the filling operation being necessary.

In the accompanying drawings which illustrate the mode of construction of a fountain pen according to the present invention:

Fig. 1 is a view in elevation of the fountain pen when closed.

Fig. 2 is a longitudinal section corresponding to Fig. 1.

Fig. 3 is a view in elevation of the fountain pen when open with the cap placed upon the rear end of the pen holder.

Fig. 4 is a section showing the fountain pen combined with its filling and cleaning device.

Fig. 5 is an elevation of the feed regulat-

ing device with which the fountain pen is provided, and

Fig. 6 is a section of the same device along the line VI—VI of Fig. 5.

Fig. 7 is a longitudinal section of the mode of construction including the combination of the hollow plug-spindle with a reservoir allowing by its own means an automatic filling of the fountain pen.

Fig. 8 is a section on the line VIII—VIII of Fig. 2.

The improved fountain pen may comprise the following elements:

A hollow member for holding ink and having a special shape as shown in Fig. 1 and 2 of the drawing, that is a projecting portion 1 the outside surface of which is cylindrical and a portion 2 the outside surface of which is conical. The said member is provided with an inside shoulder 3 which supports the base 4 of a hollow spindle 5 integral with the said member 1—2. The said spindle is provided along one of its generating lines with a longitudinal slot 6 which stops a little before the conical head 7 of the said spindle, and which allows the ink contained in the reservoir 8 formed by the member 1—2, to pass outside the hollow spindle. Obviously, any kind of orifice suitably arranged, placing in communication the inside with the outside of the spindle, could be used for the same purpose.

The inner surface of the portion 1 is provided with a screwthread 9 which engages with the screwthreaded end 10 of a member 11, the other end 12 of which carries the nib 13 and the feeding device 14. The member 11 is provided with a conical seat 15 on which the head 7 of the spindle can be applied. From the said seat up to its screwthreaded end 10 the member 11 has an inside diameter slightly greater than the outside diameter of the body 5 of the spindle, in such a manner as to form at 16 an annular space having a small or capillary thickness. The said capillary space is constantly filled with ink owing to the existence of the slot 6 above mentioned; the said ink passes into the feed-regulating device 14 when the head 7 of the spindle is slightly removed from its seat and its flow can in fact be adjusted by the said movement and is completely stopped when the head of the spindle rests on its seat. The relative mo-

tion of the spindle relatively to its seat is obtained by means of the screwthreads 9 and 10, by rotating the two members 1—2 and 11 relatively to each other.

5 The mode of closing by means of a spindle above described, combined with the ink distributor 16 consisting of a capillary annular cylindrical surface allows on one hand the fountain pen to be carried in all positions  
10 without any leakage being possible, and on the other hand, in view of the phenomena of capillarity, it allows of regulating the feed and more particularly of reducing the size of the drop of ink when the fountain pen is  
15 almost emptied.

A tight-joint fit should be provided between the two parts 1, 11 which are screwed on each other; this result may be obtained by one of the following means, used either  
20 separately or combined.

The said parts may be provided with a screwthread, notches being provided at intervals or, as shown in Fig. 2, the surfaces which are opposite to each other may be  
25 smooth and notches such as 17, 18 provided in one of the surfaces, in the portion 11 for instance. This is a new and effective way of obtaining a tight jointing.

The feed regulating device 14 above mentioned forms an important part of the fountain pen according to the present invention. It has been studied and constructed in such a manner as to combine its capillary action with that of a cylindrical regulator 16 in  
35 order that the ink shall be retained in the best manner possible, whilst ensuring the presence of a large quantity of ink in the capillary conduits; moreover, reserve recesses ensure a certain elasticity in the flow of the ink. The said recesses could in fact  
40 be suppressed.

As shown in detail in Figs. 5 and 6 of the drawing the feed regulating device is provided with a narrow channel 21 allowing the  
45 ink to be brought to the end of the nib and a channel 22 of small depth arranged at a right angle relatively to the former, the said channel having for its object to allow the air to penetrate when the ink contained in the  
50 feed regulating device has been almost exhausted whilst maintaining the ink by capillarity when the latter for any reason fills the feed regulating device entirely.

The back end 23 of the feed regulating device has the shape of a cone fitting exactly the spindle in such a manner as to leave a space of uniform thickness between the feed regulating device and the spindle.

The device according to the present invention comprises also an automatic starting device the principle of which has been suggested by that movement which consists in wiping the end of the nib on a piece of cloth when the nib does not write.

65 The device in question allows precisely

automatically to rub the end of the nib when the cap which covers it, is removed. It may be completed with advantage, although it is not necessary, with a device allowing to hold a certain quantity of ink in contact with the  
70 nib, when the fountain pen is closed without the said ink making any stains when the part of "cap" 24 is operated.

The starting device above mentioned is illustrated in section in Fig. 2 of the accompanying drawings and may be constructed in the following manner, or in any other similar manner:

A projecting member 26 is provided inside the cap 24 and on the bottom of the conical  
30 part 25 of the latter, which projecting part acts as a support to a rubber tube 27 which, when the fountain pen is closed, surrounds very exactly, owing to its elasticity, the nib 13. The said tube produces the starting by  
85 its friction on the nib when the cap is removed from over pen section and the fountain pen is opened. Moreover, it prevents the ink from being evaporated when in contact with the air, thus avoiding condensation  
90 of the evaporated water on that part of the fountain pen which is in contact with the fingers.

The said rubber tube may be combined with advantage with a spongy and supple  
95 mass 28 made of rubber for instance, arranged on the bottom of the tube and bearing on the support 26 of the latter and placed in contact with the end of the nib 13 when the fountain pen is closed by the putting  
100 in place of the cap. The said mass receives thus automatically when the fountain pen is closed a certain quantity of ink which impregnates the nib when the fountain pen is opened, thus ensuring a perfect  
105 starting of the nib.

The cap 24 is provided on its inner part with a conical section which is adapted to receive the conical outer surface on the member 11 (the fountain pen is then closed) or  
110 a conical part 2 on the member 1 (the fountain pen is then opened). The cone is chosen in such a manner that the said member shall be fitted in and removed easily without any great effort.

115 As to the general arrangement of the fountain pen according to the present invention, it should be pointed out.

When the fountain pen is closed, it has a perfectly symmetrical shape as shown in  
120 Fig. 1. When the fountain pen is opened and the cap 24, 25 has been fitted on to the reservoir 1, 2, its shape is still perfectly symmetrical as shown in Fig. 3. This result is obtained owing to the projections with which  
125 the cylindrical parts 1 and 24 of the reservoir and of the cap are provided.

Lastly the device according to the present invention comprises a filling and washing device which is adapted in a tight-joint man- 130

ner on to the end of the opened fountain pen. The said device is constructed in the following manner (Fig. 4).

It comprises a hollow cylindrical part 29 provided at one end with a rubber bulb 30 and at its other end with a metallic cylinder 31 the end of which goes beyond that of the member 29 and is provided with an outside screwthread 32.

When the said screwthread engages with a corresponding screwthread 33 provided inside the end 34 of the member 11, a tight-joint fit of the filling and washing device on the fountain pen is effected. It should be pointed out here that as the filling device is filled with ink like an ordinary drop-counter it has its end stained with ink, but as it does not come into contact with those parts of the fountain pen which are in contact with the fingers, there are no risks of stains.

When it is desired to fill the fountain pen (the latter being placed at the lower part relatively to the drop-counter filled with ink and screwed) the rubber bulb 30 is pressed 5 or 6 times and the ink from the drop-counter passes into the fountain pen, the air from the fountain pen passes into the drop counter and the filling is effected.

When the fountain pen has been filled, it is no longer necessary to wipe it as is done with all existing systems.

If it is desired to clean the fountain pen it is proceeded in the same manner as for the filling, but the fountain pen is placed above the empty drop-counter; if the rubber bulb is acted upon, the ink from the fountain pen passes into the drop-counter; when the fountain pen has been emptied the drop-counter is filled with water which is passed into the fountain pen, then it is removed with the filling and cleaning device; the said operation washes the fountain pen perfectly and in a rapid and clean manner.

The modification of the mode of establishment of the improved fountain-pen shown in the Figure 7, permits to obtain the very important following industrial result.

It permits of having in the same and one apparatus; a perfectly tight-joint closing of the ink reservoir, and an automatic filling of the fountain pen without any filler or special arrangement suitable for the filling operation being necessary.

The fountain pen comprises always a cap 24, 25, a starter 27, a feed regulating device 14 of the nib 13 and a plug-spindle 35, acting together with a member carrying the nib and the feed regulating device, a tight-joint fit always existing, at *a* for instance, between the said two elements.

According to the present modification, the hollow spindle 35 instead of communicating with the reservoir which is not filled by its own means, is combined for instance with a reservoir made of a resilient substance such

as rubber, which may be twisted on itself when one of its ends is rotated leaving the other end fixed and which may afterwards be untwisted and retake for itself its normal original position.

The said resilient tube *b* is fitted at one end at *c* on the back of a hollow spindle 35 and at its other end at *d* upon a member *e* integral with the part 2 of the fountain pen, which part may rotate here relatively to the part 1 integral with the spindle 35, by reason of a suitable screw-thread provided at *f*, between the said two parts.

Under these conditions of construction, it is seen that by rotating the two parts, 1 and 2 relatively to each other, it is possible to bring the resilient tube in the twisted position shown at *b'*, at which position the whole of the ink, which it contained in its untwisted position *b*, is expelled.

It is obvious that by rotating the members 1 and 2 relatively to each other in the opposite direction to the previous one, the reservoir *b* will be filled with liquid (water or ink according to the operation to be effected) on the condition, of course, that the end 34 of the fountain pen shall have been immersed into the said liquid.

It is thus seen that the improved arrangement according to the present modification allows of ensuring an automatic filling and cleaning of the fountain-pen with the advantage of entirely separating from the nib the reservoir filled with ink, this double result being obtained by the combination of the reservoir *b* which is filled by its own means and of the hollow-spindle 7.

It should be pointed out here that the filling (about three revolutions of the screwthread *f*) and the actuation of the plug-spindle 7 (about half a revolution of the screw-thread 9) are obtained by acting upon parts which can easily be perceived, by reason of the projections provided at *g* and *h* upon the middle cylinder part 1 of the body of the fountain pen, the parts to be operated having a large bearing surface for the fingers thereby allowing of obtaining a particularly easy and certain operation.

Moreover, it should be pointed out that the special arrangement of the said parts and that of the conical and cylindrical parts of the cap 24, 25 allow of obtaining a very interesting industrial result, that is of constructing a fountain pen which shall be well in the hand without any undue clenching of the fingers. The means allowing of obtaining these results are the projections provided at *g* and *h* upon the cylindrical part 1 of the one part, and the projections provided at *i* and *j* on the cylindrical parts 24 of the cap on the other side.

What I claim is:

1. An improved fountain pen in which the ink from the reservoir only flows through

capillary passages in order to reach the nib, comprising a hollow spindle the displacement of which regulates by capillarity and stops the flow of ink, said spindle co-acting with a feed regulator characterized by the fact that all its passages are capillary, allowing alternatively the outflow of ink and the entrance of air under the desired conditions for a good feed regulation, said feed regulating device being itself provided with means for ensuring the starting of the ink in the nib by the removal of the cap.

2. In an improved fountain pen according to claim 1, a hollow spindle (5) fixed to the ink reservoir (2) having longitudinal slots (6) for the passage of the ink which flows slowly into the narrow annular space (16) which acts as a regulator by capillarity during the descent of the ink and the entrance of the air, the extremity (15) of the said spindle being in the form of a cone for fitting accurately on the conical seating (23) of the feed regulator and forming an intermediate capillary passage between the two capillary passages (16) and (21) the displacement of this spindle with reference to its seating to allow the regulation or the shutting off the flow of ink by reason of the variations of the capillary actions in the space provided.

3. In an improved fountain pen as claimed in claims 1 and 2, means for ensuring a tight joint fit between the internal surface of the ink reservoir and the external surface of the member provided with the feed regulating device and the nib, the said means consisting in providing one of the two parts, which are in contact with each other with circular grooves arranged at intervals, the

surfaces of the said member and reservoir opposite to each other being screwthreaded on a length which is sufficient for ensuring displacement of the spindle.

4. In an improved fountain pen as claimed in claims 1 and 2 a feed regulating device (14) the back end (23) of which is constructed in such a manner as to fit into the conical head of the spindle, and forming with it a narrow space thus avoiding any interruption in the continuity of the capillary action, the said feed regulating device comprising a capillary channel (21) through which the ink is brought to the end of the nib and a channel (22) forming a kind of cup rounded at the bottom the edges of which are pressed against the nib, and allowing the air to enter when the ink remaining in the feed regulating device is nearly exhausted.

5. In an improved fountain pen as claimed in claim 1, an ink starting device consisting of a rubber tube pressing against the nib by its elasticity when the pen is closed and adapted to contain a soft spongy substance, the said tube preventing the evaporation of the ink remaining on the nib, automatically drawing to the end of the nib the ink which remains in the eye of the nib, and exercising a suction which draws a small amount of ink from the reservoir into the feed regulating device at the moment the pen is opened.

In testimony thereof I have signed my name to this specification in presence of two witnesses.

LOUIS BADOIS.

Witnesses:

JULES FAYOLLET,  
ANDRÉ BORDILLON.