

July 20, 1937.

G. LARSEN ET AL

2,087,672

FOUNTAIN PEN

Filed April 6, 1935

2 Sheets-Sheet 1

Fig. 2.

Fig. 1.

Fig. 3.

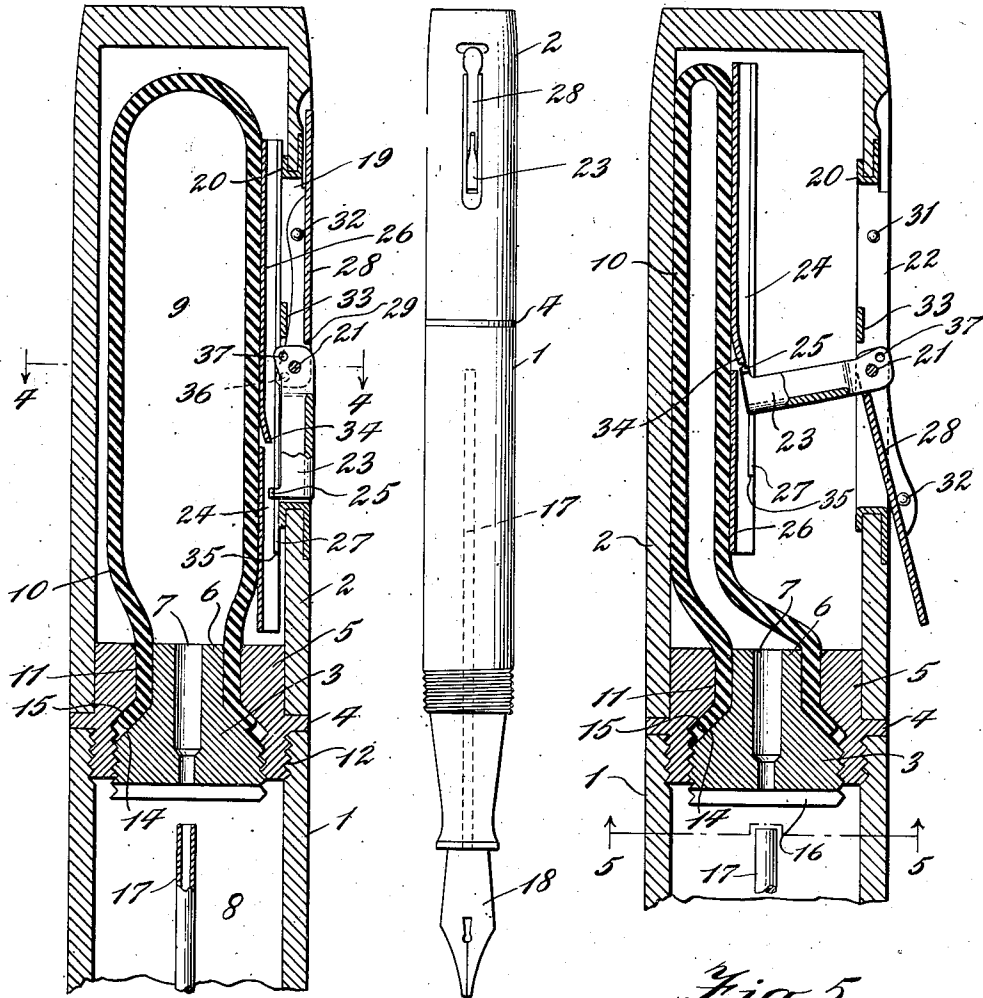


Fig. 4.

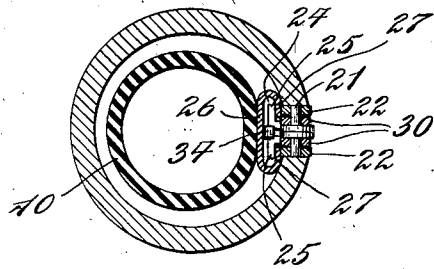
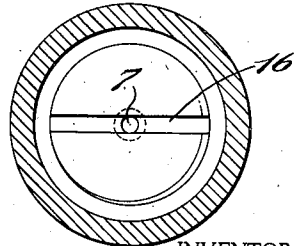


Fig. 5.



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Fig. 6.

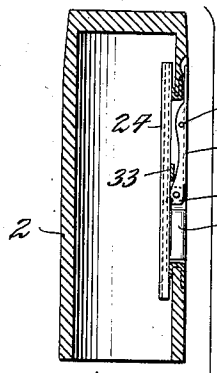
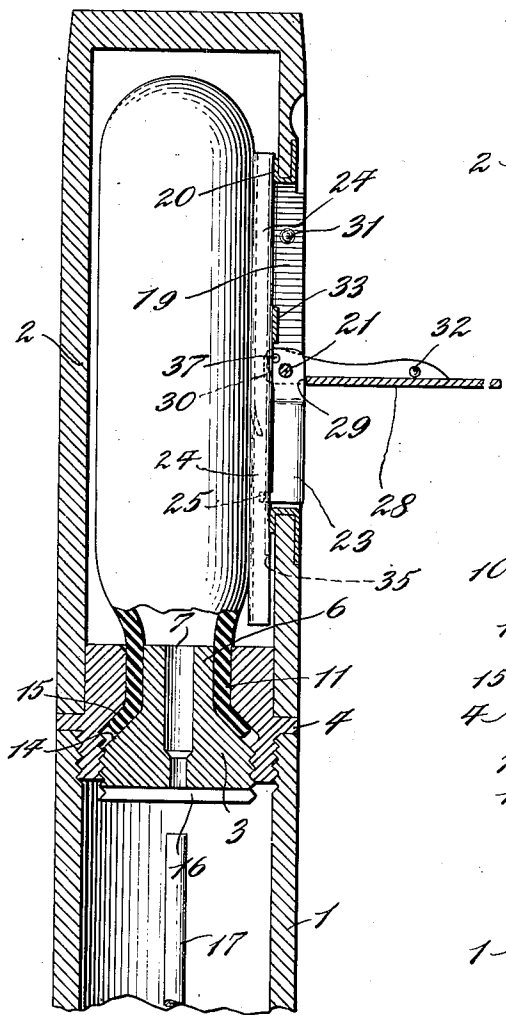


Fig. 9.

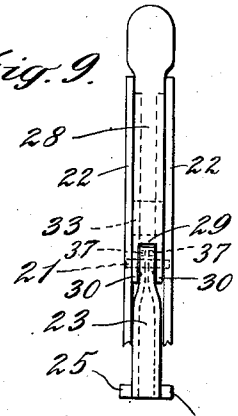


Fig. 7.

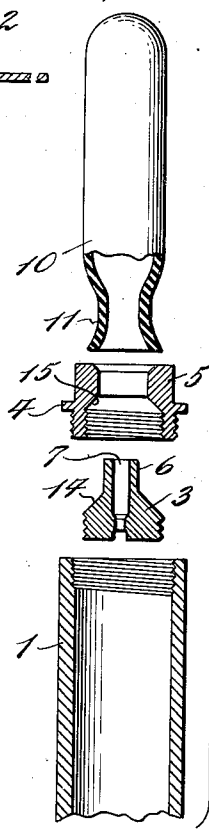


Fig. 8.

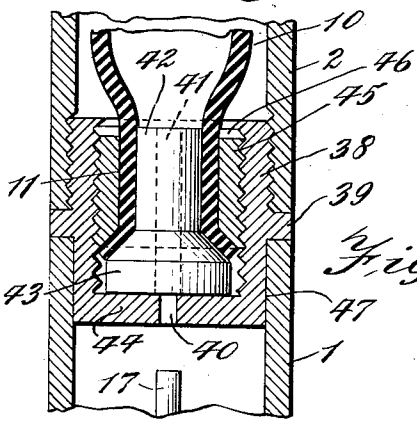
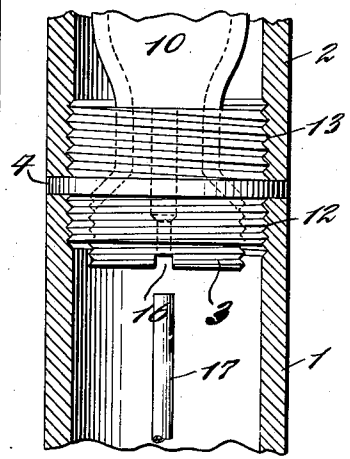


Fig. 10.

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UNITED STATES PATENT OFFICE

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FOUNTAIN PEN

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Application April 6, 1935, Serial No. 15,044

11 Claims. (Cl. 120—46)

This invention relates to a novel and improved form of fountain pen, the novel features of which will be best understood from the following description and the annexed drawings, in which we have shown a selected embodiment of the invention and in which:

Fig. 1 is a longitudinal view of a fountain pen constructed according to the invention;

Fig. 2 is a vertical section taken at right angles to Fig. 1 on a greatly enlarged scale;

Fig. 3 is a view similar to Fig. 2 but showing the parts in different positions;

Fig. 4 is a section on the line 4—4 of Fig. 2;

Fig. 5 is a section on the line 5—5 of Fig. 3;

Fig. 6 is a view similar to Figs. 2 and 3 but showing the parts in still other positions;

Fig. 7 is an exploded view of the parts appearing in Fig. 6;

Fig. 8 is a fragmentary view of some of the parts appearing in Fig. 6 and showing a slight modification;

Fig. 9 is a view of part of the structure appearing in Fig. 2 as seen from the right of that figure;

Fig. 10 is a fragmentary view on the same plane as Fig. 6 but showing a different construction of plug.

The invention relates to the type of pen shown, for example, in the patent to Taylor 802,668, although certain features claimed herein may be employed with other types of pen where found suitable.

In the illustrated embodiment, we have shown the pen as comprising a barrel having two sections 1 and 2 disposed coaxially with each other, and each detachably secured to a plug 3 which has an outwardly extending flange 4 against which the adjacent edges of the walls of the two barrel sections engage.

The plug has two parts, namely, an outer part 5 and an inner part 6 having an opening 7 therethrough. The plug thus forms a partition between an ink reservoir 8 and a pump chamber 9, and the pump in the chamber 9 is in the form of a flexible or collapsible sac 10 which has its neck 11 received between the inner and outer parts of the plug 3, with the opening 7 communicating with the reservoir 8 and with the interior of the sac.

The outer part 5 of the plug may be threaded into engagement with the wall of the barrel section 1, as indicated at 12, and may have a tight frictional fit with the wall of the barrel section 2, as shown in Figs. 2 and 6, or it may likewise have threaded engagement therewith, as indicated at 13 in Fig. 8. If the latter construction

is used, the threads at 12 and 13 should be of opposite hand so that one section may be unscrewed without disturbing the other. The flange 4 has the same diameter as the sections 1 and 2, and the contour of the edge of this flange will conform to the contour of those sections so as to form a continuation thereof.

The inner part 6 of the plug is provided with an outwardly extending peripheral shoulder 14 cooperating with a similar outwardly extending shoulder 15 on the outer part to clamp therebetween the edge portion of the neck 11 of the sac. These shoulders are preferably tapered, as shown, so that as the inner part is screwed into the outer part, the neck will be securely wedged and clamped between the two parts. The plug and sac may then be treated as a unit for removal from the barrel, and the sac may be removed from the plug for replacement when found necessary. The inner part 6 is provided with a slot 16 for engagement with a screw driver, to aid in removal and replacement of the sac.

We have shown a vent tube 17 disposed in the ink reservoir 8 and extending from a point adjacent the opening 7 to a point beneath the pen point 18. Usually, such a tube will communicate with the feed disposed beneath the pen point, as is well known in the art, and no detailed showing of that arrangement is thought necessary.

In pens of the general type shown, the reservoir 8 may be filled by collapsing and expansion of the sac 10. Sometimes this has been done by hand, the user employing his fingers to squeeze the sac and then release it. When the sac is squeezed, air is forced therefrom through the vent tube 17 and out beneath the point 18. When the pressure on the sac is released, ink will be forced into the reservoir 8. This operation may be repeated as many times as is necessary to fill the reservoir or even to cause ink to flow into the sac.

Not only has this operation been performed by hand, but various pump mechanisms have been devised for the purpose. We shall now describe a novel form of mechanism for collapsing the sac and permitting it to expand.

The barrel section 2 is provided with an elongated opening 19 in one wall thereof, in which is disposed a box 20 of sheet material and which may be constructed to accord with boxes used to support the filling levers now in common use.

Extending across the opening and supported in the side walls of the box is a pivot 21 which may

be in the form of a pin having its ends mounted in the walls 22 of the box.

Mounted at one end upon the pivot 21 is a lever 23 and having its other end slidably engaging a bar 24 contacting with the wall of the sac 10. This bar may be of the channel section best shown in Fig. 4, and the lever may conveniently be made of a single piece of sheet metal folded on itself and having oppositely extending tongues 25 at its ends disposed between the bottom 26 and the top 27 of the channel. By this construction, as the lever depresses the bar, it may move along it, and, similarly, when the lever returns to initial position, it may slide along the bar, as will be evident.

To actuate the lever 23, we provide a handle 28 mounted at one end upon the pivot 21 and having its other end extending towards one end of the opening 19, preferably the end opposite that end of the same opening which is normally occupied by the end of the lever 23.

The parts normally occupy the position shown in Fig. 2, and when it is desired to actuate the pump, the handle 28 may be moved to some such position as shown in Fig. 6, which movement is an idle one. The handle is shown as made of a single piece of sheet metal folded on itself in the same manner as the lever 23, and part of the fold is cut away to form a transverse shoulder 29, on opposite sides of which are the wings 30 through which passes the pivot 21. The handle may be freely moved from the position shown in Fig. 2 to that shown in Fig. 6 without actuating the lever. When the shoulder 29, however, engages the top of the lever as shown in Fig. 6, and the handle is rotated further on the pivot, then it will be obvious that the lever 23 will be actuated inwardly until it reaches some such position as shown in Fig. 3. During this movement, the lever will slide along the channel bar, and when the pressure on the handle is released, the lever and handle will return to the position shown in Fig. 6, by the resilience of the sac. The operation may be repeated as many times as desired, and then the handle may be returned to its normal inoperative position shown in Fig. 2, where it may be releasably held by known means, indicated as projections 31, on the box walls received in depressions 32 on the handle. A stop 33 may be used, if desired, to positively stop movement of the handle.

As the lever 23 moves from the position of Fig. 3 to that of Fig. 6, the tongues 25 slide along the channel bar, as previously noted. In order to limit sliding of the bar 24 downwardly or towards the point, we strike up a portion of the bottom 26 of the bar to form a lug or stop 34 adjacent the point 35 where the top of the channel ends, to engage the end of the lever.

In the operation of the handle and lever described above, the return of the two from the position shown in Fig. 3 to that shown in Fig. 6 is caused by the resilience of the sac alone. However, we find it desirable to provide a positive means for causing this movement, and to that end we provide the handle with a projection 36 adapted to enter a recess or depression 37 in the lever to temporarily lock the two parts together in the same manner as the projections 31 and depressions 32 cooperate. The engagement of the projection 36 and depression 37 forms a temporary positive lock between the handle 28 and lever 23, so that if the thumb nail is placed under the end of the handle when it is in the position of Fig. 3 and then the handle is lifted so as to rotate in a counterclockwise direction, such rotation will

carry with it the lever 23 until the handle and lever reach the position shown in Fig. 6. Then continued rotation of the handle on its pivot will move the handle to the position shown in Fig. 2, further rotation of the lever 23 being prevented by engagement of its tongues 25 with the top 27 of the channel.

During the several movements of the lever which will ordinarily be required for pumping ink into the reservoir, the handle and lever may be positively moved as one member, between the positions of Fig. 3 and Fig. 6, and then when the pumping is completed, the handle may be moved to the position of Fig. 2.

Referring now to Fig. 10, we have shown therein a modified form of the plug shown in Fig. 6. The plug shown in Fig. 10 comprises a cup 38 having a flange 39 received between the barrel sections 1 and 2. The cup may be threaded to one of the sections, here shown as the section 2, and it may have a close frictional contact with the other. It is of course obvious that it may be threaded to both or have frictional contact with both. In the bottom of the cup is a vent 40 communicating with a vent 41 in an insert 42 which has a head 43 resting upon the bottom 44 of the cup.

The wall of the cup forms a sleeve in contact with the adjacent walls of the sections 1 and 2, and between that sleeve and the wall of the insert is disposed an inner sleeve 45 which is threaded to the outer sleeve and which clamps the neck 11 of the sac against the insert in the same manner as this neck is clamped between the inner and outer sections of the plug 3. The inner sleeve is provided with a slot 46 for engagement with a suitable tool for turning it. By this arrangement the sleeve may be readily removed to permit replacement of the sac from the rear or top of the plug, without disturbing the ink-tight joint at 47.

While we have shown the invention as embodied in a specific form, it is to be understood that various changes in details may be made without departing from the scope of the invention, as defined by the appended claims.

We claim:

1. A fountain pen comprising a barrel having therein an ink reservoir and a pump chamber disposed in line with each other, a flexible pump sac in said chamber and communicating with said reservoir, a bar engaging one side of said sac, said chamber having a wall extending generally parallel to said side of the sac and having an elongated opening therein, a pivot extending across said opening, a lever having one end pivotally mounted on said pivot and the other end normally disposed adjacent one end of said opening, a handle having one end pivotally mounted on said pivot independently of said lever and normally extending towards the other end of said opening, means on the handle adapted to engage the lever after outward movement of the handle to a predetermined extent, to actuate said lever to press said bar against the sac, and means to detachably hold said lever and handle together after said engagement.

2. A fountain pen comprising a barrel, a plug disposed on the interior of the barrel and formed of an inner and outer part, a flexible sac having a neck received between said parts, means on said parts for securing them together and clamping said neck therebetween, said inner part having an opening therethrough communicating with said sac, and other means for securing said outer part to the barrel.

3. A fountain pen comprising a barrel, a plug

disposed on the interior of the barrel and formed of an inner and outer part, said outer part having a central hole therethrough, the wall of said hole having an outwardly extending shoulder, a flexible sac having a neck disposed within said hole in engagement with said shoulder, means on said parts for securing them together and clamping said neck therebetween, said inner part having an opening therethrough communicating with said sac, and other means for securing said outer part to the barrel.

4. A fountain pen comprising a barrel, a plug disposed on the interior of the barrel and formed of an inner and outer part, said outer part having a central hole therethrough, the wall of said hole having an outwardly extending shoulder, a flexible sac having a neck disposed within said hole in engagement with said shoulder, threads on said parts to secure them together and to clamp said neck therebetween, said inner part having an opening therethrough communicating with said sac, and means other than said threads for securing said outer part to the barrel.

5. A fountain pen comprising a barrel having two coaxial sections, a plug disposed within the barrel and detachably engaging each of said sections, said plug having an outer part with an outwardly extending flange disposed between adjacent edges of the barrel walls and having a central hole therethrough, an inner part of the plug disposed within said hole, a flexible sac having a neck disposed between said parts, and means for securing said parts together with said neck clamped therebetween, said inner part having an opening therethrough communicating with said sac.

6. A fountain pen comprising a barrel having therein an ink reservoir and a pump chamber disposed in line with each other, a flexible pump sac in said chamber and communicating with said reservoir, a bar engaging one side of said sac, said chamber having a wall extending generally parallel to said side of the sac and having an opening therein, a lever pivotally mounted within said opening and having one end thereof engaging said bar, a handle mounted on said wall and adapted to actuate said lever to press said bar against the sac, and means forming a temporary lock to hold said lever and handle together during operation of the lever.

7. A fountain pen comprising a barrel having an elongated collapsible sac therein, said barrel having a wall extending generally parallel to said sac, a bar engaging one side of said sac, said wall having an elongated opening therein with a pivot extending across it, a lever having one end pivotally mounted in said pivot and the other end normally disposed adjacent one end of said opening, a handle having one end pivotally mounted on said pivot and normally extending towards the other end of said opening, means on the handle adapted to engage the lever after movement of the handle to a predetermined extent,

to actuate said lever to press said bar against the sac, and means forming a temporary lock between the handle and the lever when said handle has been moved to said predetermined extent.

8. A fountain pen comprising a barrel having an ink reservoir and a pump chamber therein, a plug within the barrel forming a partition between said reservoir and chamber and comprising a cup with its bottom adjacent the reservoir and its top adjacent the chamber and having a wall extending lengthwise of the barrel, an insert disposed within said cup and having a head engaging the bottom thereof, a sleeve threaded within the cup wall, and a sac within the chamber and having a neck between said ring and insert and flared outwardly into engagement with said insert head, whereby the sac neck may be clamped against said head by rotation of the sleeve, said bottom and insert having aligned vents there-through.

9. A fountain pen comprising a barrel having an ink reservoir and a pump chamber therein, a plug within the barrel forming a partition between said reservoir and chamber and comprising a cup with its bottom adjacent the reservoir and its top adjacent the chamber and having a wall extending lengthwise of the barrel, a sac having a neck disposed within said cup, and means for detachably securing said neck in said cup.

10. A fountain pen comprising a barrel having an ink reservoir and a pump chamber therein, a plug within the barrel forming a partition between said reservoir and chamber and comprising a cup with its bottom adjacent the reservoir and its top adjacent the chamber and having a wall extending lengthwise of the barrel, a sac having a neck disposed within said cup, means for detachably securing said neck in said cup, said barrel being formed in sections, with one section enclosing said sac, and means for detachably securing said sac-enclosing section to said plug independently of the sac-securing means, said plug having a vent connecting said reservoir with the interior of said sac.

11. A fountain pen comprising a barrel having an ink reservoir and a pump chamber therein, a plug within the barrel forming a partition between said reservoir and chamber, said barrel being formed in sections with one section forming said chamber, a sac within said chamber and having a neck, means for detachably securing said section to said plug, a projection on said plug extending within the neck of said sac, and means engaging the outer surface of the sac neck to clamp said neck against said projection, said last-named means being operable to attach or detach the sac to or from the plug after removal of said section, said plug having a vent connecting said reservoir with the interior of said sac.

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