May 21, 1946. L. J. BIRO 2,400,679

FOUNTAIN PEN

Filed May 17, 1944 2 Sheets-Sheet 1

Fig. 2

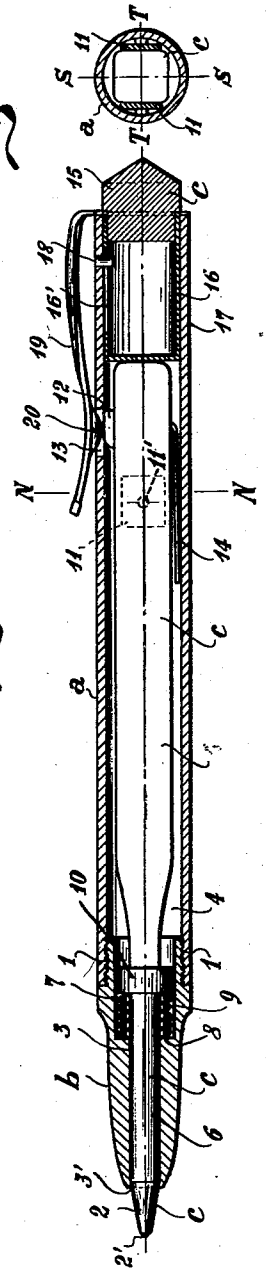
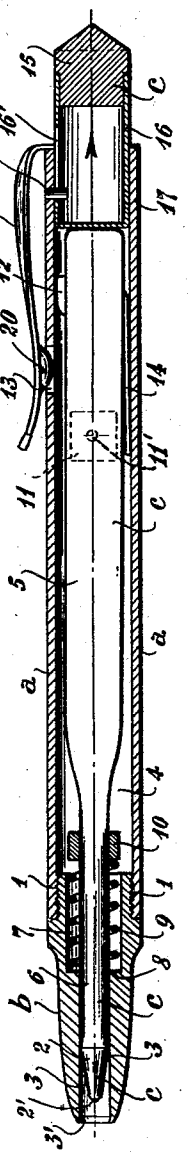


Fig. 1

Fig. 3



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FOUNTAIN PEN

Filed May 17, 1944 2 Sheets-Sheet 2

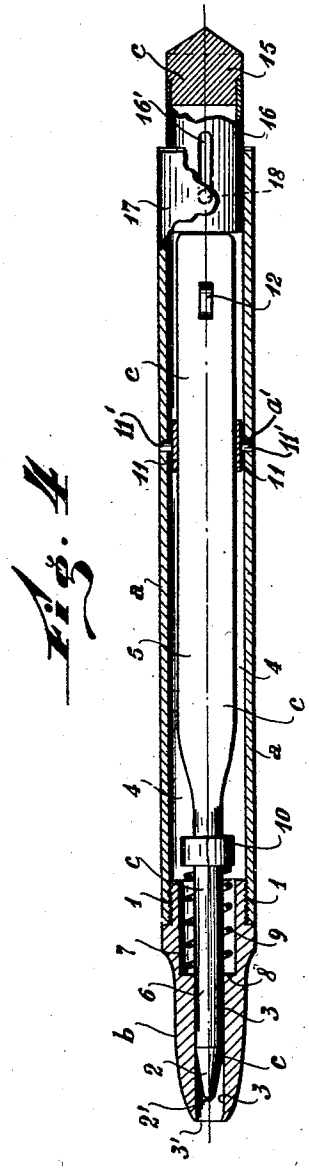

Fig. 4

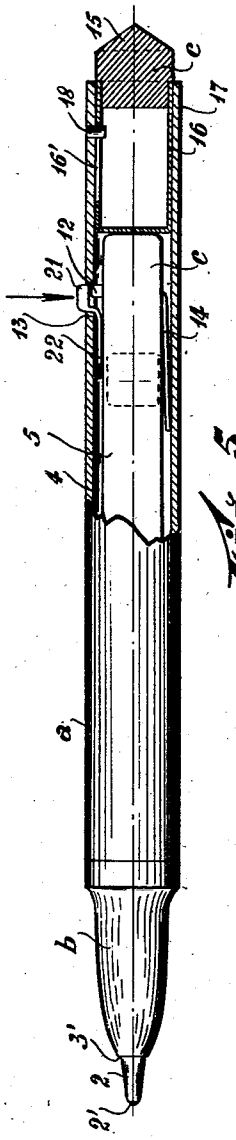

Fig. 5

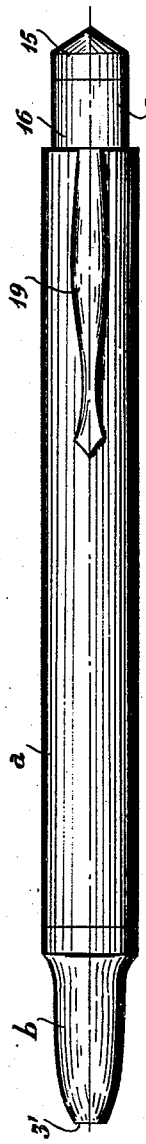

Fig. 6

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FOUNTAIN PEN

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Application May 17, 1944, Serial No. 536,011

10 Claims. (Cl. 120—49)

This invention relates to improvements in fountain-pens, and particularly to automatic fountain-pens of the rolling ball-tip type.

While in recent years considerable improvements have been made in fountain-pens, the efforts have generally been directed towards the ink-feeding means and associated parts, and little or no consideration has been given to the handling of the pen in itself. Thus, even the most modern types of fountain-pens are still provided with a detachable cap which has to be removed in order to use the pen, and replaced again over the writing end of the instrument before placing same in the pocket, so as to prevent the clothes from coming into contact with the ink.

As is known, said caps are provided with holding means, generally constituted by screw-threads, and this complicates not only the construction but also the handling of the pen, since it requires the use of both hands in order to remove or replace the cap.

The improvements of the present invention overcome these drawbacks in a very effective and simple manner, specially in the case of fountain-pens of the ball-tip type, by means of a special mounting of the device comprising the writing tip, and the ink reservoir and feeding means, in such a manner that through simple displacement and releasing operations it is possible to readily place the pen in writing position and conceal the writing tip, respectively.

For this purpose, the device comprising the tip, ink reservoir and feeding means is slidably housed within the tubular body constituting the fountain-pen barrel and when in concealed or inoperative position under spring-pressure, the device can be pushed into writing or operative position and locked in said position until the spring is released, whereupon the device will automatically return to inoperative position.

The principle of the present invention resides in the arrangement of the movable elements relative to the tubular body holding same. In effect, the movable body formed by the above-mentioned device plus the control button, is longer than the tubular body so that there will always be a portion of the slidable body projecting from either end of the tubular body.

In addition to the foregoing, the invention contemplates other objects, among which is that of rendering unnecessary the use of the cap.

A further object of the invention is to provide means whereby the writing tip may be placed in operative and concealed positions in response to simple operations which can be carried out through one of the fingers of the same hand holding the pen.

A still further object of the invention is to provide a fountain-pen of simple construction, without additional elements other than the control button, since the release of the stop is obtained by a simple means which, if desired, may be combined with the ordinary clip carried by most fountain-pens.

A still further object of the invention is to provide a fountain-pen of this type which will be economical and have a long life, notwithstanding the tip-concealing mechanism, inasmuch as the latter is simple and offers no complications.

Other objects and advantages of the invention will become apparent from the course of the following description.

In order that the invention may be more clearly understood and readily carried into practice, it has been illustrated by way of example and in a preferred embodiment in the accompanying drawings, wherein:

Fig. 1 is a longitudinal sectional view of the body of the fountain-pen, showing the arrangement of the slidable device, which in the present instance is in operative or writing position. This view is taken along the line S—S of Fig. 2.

Fig. 2 is a sectional view of the same instrument, taken along the line N—N of Fig. 1.

Fig. 3 is a longitudinal sectional view similar to that of Figure 1, but showing the pen in inoperative or concealed position.

Fig. 4 is a longitudinal sectional view taken along the line T—T of Figure 2, with the device in concealed position.

Fig. 5 is a side view of the fountain-pen in operative position and illustrating a modification of the stop releasing means.

Fig. 6 is an outside view of the fountain-pen, with the slidable device in concealed or inoperative position.

The same reference characters are used to indicate like or corresponding parts or elements throughout the different figures.

As may be seen from the drawings, *a* is the tubular body of the fountain-pen, terminating at one end in an end-piece *b* attached to the body *a* by means of the thread 1.

Said end-piece *b* tapers gradually and terminates in a substantially conical tip 2 which, however, does not form a part of the end-piece proper, but of the slidable device *c* of the ink system.

Said end-piece *b* is provided with an axial perforation 3 in alignment with the bore 4 of the tubular body *a*.

The bore 4 of said tubular body *a* houses an ink reservoir 5, from which is derived a feed channel 6 terminating in said tip 2, the end of said tip 2 being provided with a small ball 2' which replaces the ordinary writing nib. Said ball 2' is set on said tip 2 and fed with ink through the feed channel 6, so that upon being rolled in contact with the paper, it will mark the desired traces.

The reservoir 5, feeder 6 and tip 2 constitute the ink system and, together with the push-button 15, form the device *c*.

As mentioned above, said device *c* with the button 15, is capable of longitudinally sliding within the tubular body *a*, as may be clearly seen in Figs. 1 and 3.

By means of the axial perforation 3 thereof, said end-piece *b* serves as a guide for the feeder 6 when longitudinally displacing the device *c* within the tubular body *a*, and said end-piece *b* also serves as a housing for the tip 2 which, on being caused to assume the position indicated in Figs. 3, 4 and 6, will remain concealed within said perforation 3.

Said end-piece *b* is also provided with an enlarged perforation 7, forming with the perforation 3 a seat 8 for seating a spring 9. Said spring 9 acts against a ring 10 fixed to the device *c* so that due to the pressure of said spring 9, the device *c* will tend to take the concealed or inoperative position shown in Figs. 3, 4 and 6.

Apart from the guide constituted by the perforation 3 of the end-piece *b*, the device *c* is arranged between further guides indicated at 11 for the purpose of guiding the portion of the device *c* corresponding to the ink reservoir 5. The guides 11, as shown particularly in Fig. 4, are provided with pins or lugs 11', which are disposed in complementary apertures *a'* of the tubular body *a*, such as by a press-fit engagement for fixedly securing the guides 11 to the body *a*. Said guides 11 are substantially flat, as shown in Figs. 2 and 4, so that they will act as guiding elements in both directions, that is to say, that said guides 11 not only allow the longitudinal displacement of the device *c*, but also a slight lateral displacement so that the projection or tooth 12 carried by said device *c* may fit in a slot 13 which is formed by a perforation made in the wall of the tubular body *a*. Said slot 13 is so located that when said projection 12 of the device *c* fits therein, the tip 2 will project from the mouth 3' of the perforation 3.

In order to cause the projection 12 to enter the slot 13, the device *c* is urged by a spring 14 located opposite to said projection 12.

Said push-button 15 constitutes the pushing element for setting the fountain pen in the writing or operative position as defined by the fitting of said projection 12 in said slot 13. Said button 15, with a piston-like projection 16, enters the portion 17 of the body *a*, said extension 16 being guided within the body *a* which is provided with a pin 18 adapted in a slideway 16' carried by the extension 16, so that the stroke of said button 15 and extension 16 is limited by the length of said slideway 16'.

In order to complete the device 3, said extension 16 of button 15 abuts against or is connected to the ink reservoir 5, so that upon pressing said button, the entire device will be longitudinally displaced from the position shown in Figs. 3, 4 and 6, to the operative position corresponding to the fitting of the projection 12 into the slot 13, and as the device *c* is urged by the spring 14, when said projection 12 coincides with slot 13, the action of said spring 14 will lock the device in operative position, as clearly shown in Figs. 1 and 5.

As in the majority of the ordinary pocket fountain-pens, the pen of the present invention is also provided with a clip 19, and in the case of Figs. 1 and 3, the inner side of said clip 19 is provided with a projection 20 registering with the slot 13, so that normally said projection 20 will tend to enter said slot, but inasmuch as the tension of the spring 14 is greater than that offered by the clip 19, the latter cannot prevent the entry of the projection 12 into the slot 13. However, since the projection 20 of clip 19 tends to occupy the same place as the projection 12, viz., the slot 13, an increase in pressure of clip 19 will overcome the resistance of spring 14, and therefore a slight manual pressure exerted on said clip 19 will readily release the projection 12 from the slot 13, thus freeing the device *c* which will slide backwards through the action of spring 9, thereby causing the outward projection of button 15 and, consequently, the tip 2 will enter the portion 3' of the end-piece *b*, where it will remain practically shielded, with the terminal thereof, constituted by the ball 2', spaced from the side walls of said mouth 3'.

Thus, the tip 2 will not require a detachable protective cap, as this function is served by the end-piece *b*. In effect, when the instrument is in concealed position as clearly shown in Figs. 3 and 4, the ball 2' will remain housed within the instrument, and therefore the fountain-pen may be safely placed in the pocket without any danger of staining the clothes with ink, and inasmuch as the position of the device *a* will depend on the actuation of the push-button 15, it will be sufficient to press the latter in order to set the fountain-pen ready for use, as shown in Fig. 1. Upon pressing said button 15, it will cause the displacement of the device *c* by means of the button extension 16, whereby the tip 2 will project from the end-piece *b*, and the device will be locked in this position by the fitting of projection 12 into slot 13.

After the fountain-pen has been used, it will be sufficient to slightly press the clip 19 to overcome the pressure of spring 14 and cause the release of projection 12, whereupon the spring 9 will return the device *c* to the concealed or inoperative position as shown in Figs. 3, 4 and 6, where the tip 2 will remain housed within the mouth 3' of said end-piece *b*, while at the opposite end the button 15 will again project outwardly, ready for the next actuation when it is again desired to place the fountain pen in writing position.

Instead of using a projection 20 carried by the clip 19 as the means for releasing the projection 12, a separate element may be provided for this purpose, for example as illustrated in Fig. 5. In this instance, the element consists of an auxiliary button 21 arranged within the perforation constituting the slot 13. Said button 21 is supported by a resilient tongue 22 fixed to the inner wall of the tubular body. Due to the resilient action of said resilient member 22, the button 21 will tend to project outwardly, thus leaving said slot 13 free to receive the projection 12 upon the actuation of button 16. It will be apparent that upon pressing said button 21 in the direction shown by the arrow, the projection 12 will be released, whereupon the device *c* will return to its concealed or inoperative position shown in Fig. 4.

Summarizing, the improvements of the present invention comprise a fountain-pen constituted by a tubular body *a* supplemented with an end-piece *b* and housing a slidable device *c* formed by the ink reservoir 5, the feeder 6, the writing tip 2 and the push-button 15. This latter assembly, including the button 15, is longer than the overall length of the tubular body plus the end-piece, so that said slidable device *c*, urged

to inoperative position by means of the spring 9, causes the button 15 to project outwardly to the maximum extent, in which position the writing tip 2 will remain housed within said end-piece b, whereas when in operative or writing position, the slidable device c is provided with locking means constituted by a projection 12 fitting within a slot 13, there being provided releasing means constituted by a projection 20 carried by the clip 19, according to Figs. 1 and 3, or by a separate button adapted in the perforation constituting said slot 13, as in the embodiment of Fig. 5.

It is evident that in carrying the invention into practice several changes, modifications and adaptations may be made by those skilled in the art, without departing from the scope of the present invention, as clearly set forth in the appended claims.

I claim:

1. A fountain pen comprising a tubular body provided with an axially perforated forwardly tapering end portion, said end portion housing a slidable device formed by an ink reservoir, an ink feeder, a tapering writing tip and a push-button at the end opposite the said tip, a spring arranged to bias the slidable device toward its push-button end, the length of said slidable device together with said button being greater than that of said tubular body and end portion whereby when said slidable device is urged by said spring to its inoperative position, the maximum outward projection of said button is effected and the writing tip is retracted within said end portion, means for locking said slidable device in operative writing position and means for releasing said locking means, said end-piece constituting a guide for the sliding of the ink feeder and also a housing for the writing tip when in inoperative position, said tapering writing tip when in projected writing position forming a forwardly tapering continuation of the tapering end portion said end portion being also provided with a perforated abutment forming a seat for said spring.

2. A fountain pen comprising a tubular body provided with an axially perforated end portion, said body and end portion housing a slidable device formed by an ink reservoir, an ink feeder, a writing tip, and a push button at the end opposite the said tip, a spring arranged to bias the slidable device toward its push-button end, the length of said slidable device together with said button being greater than that of said tubular body and end portion, whereby when said slidable device is urged by said spring to its inoperative position, the maximum rearward projection of said button is effected and the writing tip is retracted within said end portion, means for locking said slidable device in operative writing position, means for releasing said locking means, said portion constituting a guide for the sliding of the ink feeder and also a housing for the writing tip when in inoperative position, said end portion being also provided with a perforated abutment forming a seat for said spring, said locking means comprising a projection on the ink reservoir adapted to enter a slot provided in the wall of said tubular body when said fountain-pen is in operative position, and a spring arranged to urge said slidable device laterally so as to force said projection into said slot.

3. A fountain pen comprising a tubular body provided with an axially perforated end portion, said body and end portion housing a slidable device formed by an ink reservoir, an ink feeder, a writing tip, and a push-button at the end opposite said tip, a spring arranged to bias the slidable device toward its push-button end, the length of said slidable device together with said button being greater than that of said tubular body and end portion, whereby when said slidable device is urged by said spring to its inoperative position, the maximum rearward projection of said button is effected and the writing tip is retracted within said portion, means for locking said slidable device in operative writing position, means for releasing said locking means, said end portion constituting a guide for the sliding of the ink feeder and also a housing for the writing tip when in inoperative position, said end-piece being also provided with a perforated abutment forming a seat for said spring, said locking means comprising a projection adapted to enter a slot provided in the wall of said tubular body when said fountain pen is in operative position, and a spring arranged to urge said slidable device laterally so as to force said projection into said slot, said fountain pen being provided with a clip the inner face of which is in turn provided with an extension registering with said slot, said clip having a certain amount of tension, the pressure of which is less than that of said lateral spring.

4. A fountain pen comprising a tubular body provided with an axially perforated end-piece and housing a slidable device formed by the ink reservoir, the ink feeder, the writing tip and push-button at the end opposite the said tip, a spring arranged to bias the slidable device toward its push-button end, the length of said slidable device together with said button being greater than that of said tubular body and end-piece, so that said slidable device, urged by said spring to its inoperative position, causes the maximum outward projection of said button when said writing tip is housed within said end-piece, means for locking said slidable device in operative position, means for releasing said locking means, said end-piece constituting a guide for the sliding of the ink feeder and also as a housing for the writing tip when in inoperative position, said end-piece being also provided with a further enlarged perforation forming a seat for said spring, the ink reservoir of said slidable device being provided with a projection adapted to enter a slot provided in the wall of said tubular body when said fountain-pen is in operative position, and a spring arranged to urge said slidable device laterally so as to force said projection into engagement with said slot, said slot being constituted by a perforation in said tubular body, and an auxiliary button for releasing said projection.

5. A fountain pen comprising a tubular body provided with an axially perforated end-piece and housing a slidable device formed by the ink reservoir, the ink feeder, the writing tip and push-button at the end opposite the said tip, a spring arranged to bias the slidable device toward its push-button end, the length of said slidable device together with said button being greater than that of said tubular body and end-piece, so that said slidable device, urged by said spring to its inoperative position, causes the maximum outward projection of said button when said writing tip is housed within said end-piece, means for locking said slidable device in operative position, and means for releasing said locking means, said end-piece constituting a guide for the sliding of the ink feeder and also as a housing for the writing

tip when in inoperative position, said end-piece being also provided with a further enlarged perforation forming a seat for said spring, said push-button of the slidable device being located at the end of said tubular body opposite the said end-piece and provided with an extension guided telescopically within said body, the stroke of which is limited by a slidway, said extension being directly related with said slidable device.

6. A fountain pen comprising a tubular body provided with an axially perforated end-piece and housing a slidable device formed by the ink reservoir, the ink feeder, the writing tip and push-button at the end opposite the said tip, a spring arranged to bias the slidable device toward its push-button end, the length of said slidable device together with said button being greater than that of said tubular body and end-piece, so that said slidable device, urged by said spring to its inoperative position, causes the maximum outward projection of said button when said writing tip is housed within said end-piece, means for locking said slidable device in operative position, and means for releasing said locking means, said end-piece constituting a guide for the sliding of the ink feeder and also as a housing for the writing tip when in inoperative position, said end-piece being also provided with a further enlarged perforation forming a seat for said spring, said push-button of the slidable device being located at the end of said tubular body opposite the said end-piece and provided with an extension guided within said body in a piston-like manner, the stroke of which is limited by a slideway, said extension being directly related with said slidable device, said tubular body being provided with an additional set of internal guides, said guides being substantially flat and capable of allowing a slight lateral displacement of said device in order to enable said projection to enter said slot.

7. A fountain pen comprising a tubular housing body provided with an axial perforation at one end and housing a slidable device consisting of an ink reservoir, an ink feeder, and a writing tip, the end of said reservoir farthest removed from the writing tip being of smaller dimensions than the inside of the housing so that it is capable of limited transverse movement within the housing, a push button slidably mounted for limited axial movement within the end of the housing farthest removed from the writing tip having an inner surface abutting against said reservoir and an outer end extending beyond the housing, spring means for urging said slidable device to inoperative position, the ink reservoir of said slidable device being provided with a projection adapted to enter an opening in the wall of the housing when said slidable device is in operative position, and a spring arranged to urge the reservoir end of said slidable device laterally to force said projection into engagement with the edge of said opening.

8. A ball type pen comprising an elongated tubular casing and having a tapering end portion, said end portion being provided with an axially directed opening, an axially movable assembly in the casing constituting an ink reservoir, a push button projecting rearwardly through an axially directed opening in the rear end of the casing, and a writing tip projecting forwardly through the first-mentioned opening when the device is moved forwardly in the casing, said tip tapering forwardly to a point and being provided at the location of said point with a rotatably mounted writing ball and forming in effect a forwardly tapering continuation of the encircling tapered portion of the casing when the assembly is moved forwardly, and being retracted to a position within the tapered portion of the casing when the assembly is moved rearwardly; said casing being provided at a point spaced rearwardly from its front end with a rearwardly facing seat, a coil spring compressed between said seat and an opposed portion of the assembly for urging the assembly rearwardly in the casing, means for locking the assembly in its forwardly projected position, and means for releasing said locking means.

9. A writing instrument comprising a tubular body provided with a forwardly tapering front end portion, which tapering portion is substantially reduced in diameter at its front end and is provided with an axial opening of still smaller size through which the writing tip of the instrument is adapted to project; a device which is housed within the body and is adapted to reciprocate therein, said device including an exposed push button, an ink reservoir in front of the push button, and a ball writing tip in front of the reservoir in communication with the latter, said tip being provided with a forwardly tapering front end portion which when projected forwardly through said axial opening closes the latter and forms in effect a forward continuation of the taper of the front end portion of the body; a spring within the body for urging the device rearwardly therein; the over-all length of the device being greater than that of the body whereby when the device is moved rearwardly by the spring the maximum rearward projection of the push button is effected and the writing tip is retracted within the tapering front end portion of the body; means for locking the device in its operative writing position with the tapered writing tip projecting forwardly through and closing the tapered front end portion of the body; and means for releasing said locking means.

10. A writing instrument comprising a tubular body provided with a forwardly tapering front end portion, which tapering portion is substantially reduced in diameter at its front end and is provided with an axial opening of still smaller size through which the writing tip of the instrument is adapted to project; a device which is housed within the body and is adapted to reciprocate therein, said device including an exposed push button, an ink reservoir in front of the push button, and a ball writing tip in front of the reservoir in communication with the latter, said tip being provided with a forwardly tapering front end portion which when projected forwardly through said axial opening closes the latter and forms in effect a forward continuation of the taper of the front end portion of the body; a spring within the body for urging the device rearwardly therein; the over-all length of the device being greater than that of the body whereby when the device is moved rearwardly by the spring the maximum rearward projection of the push button is effected and the writing tip is retracted within the tapering front end portion of the body; means for locking the device in its operative writing position with the tapered writing tip projecting forwardly through and closing the tapered front end portion of the body; and means for releasing said locking means, said body being provided adjacent the rear end of the same with a forwardly extending pocket clip and said locking means being exposed through the side of the body at a point opposite the clip and being releasable by the clip upon depression of the latter.

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