Feb. 27, 1934. W. FRIEDMAN 1,949,201

FOUNTAIN PEN

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Fig. 1

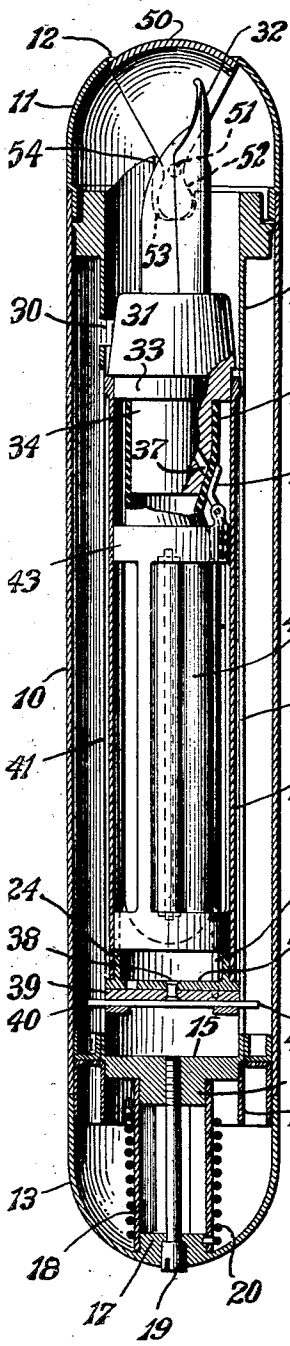


Fig. 2

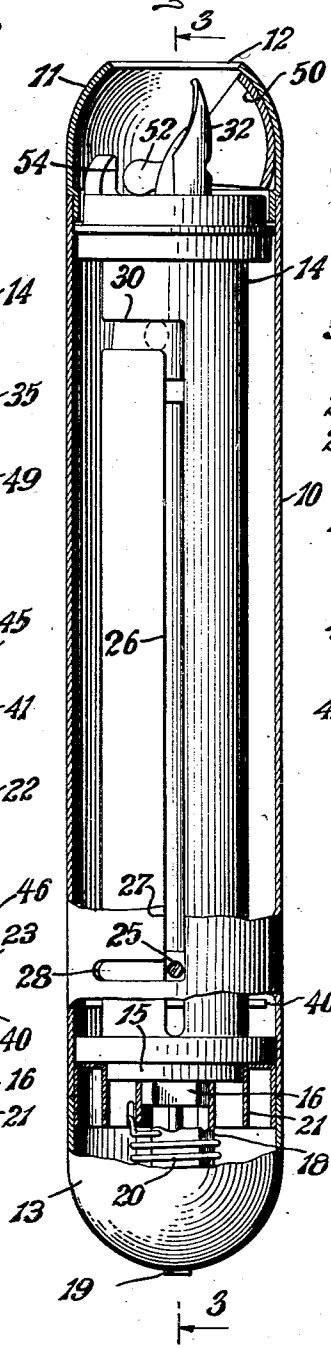
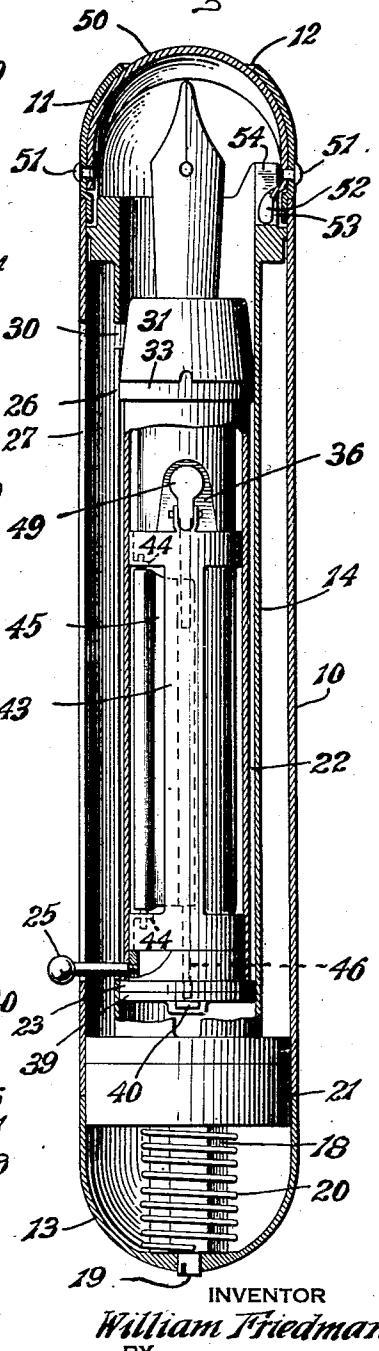


Fig. 3



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Fig. 8

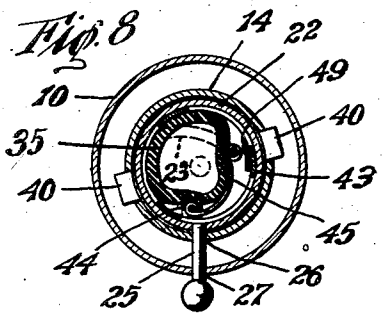


Fig. 4

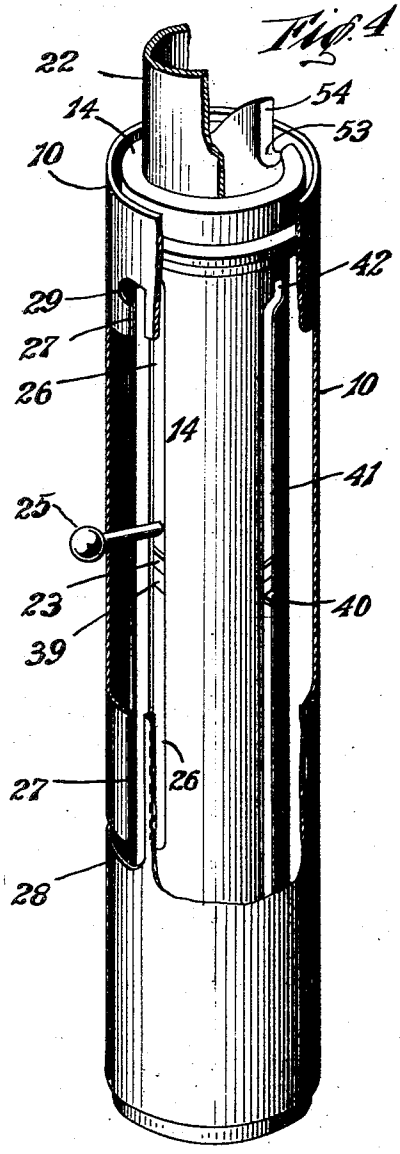


Fig. 5

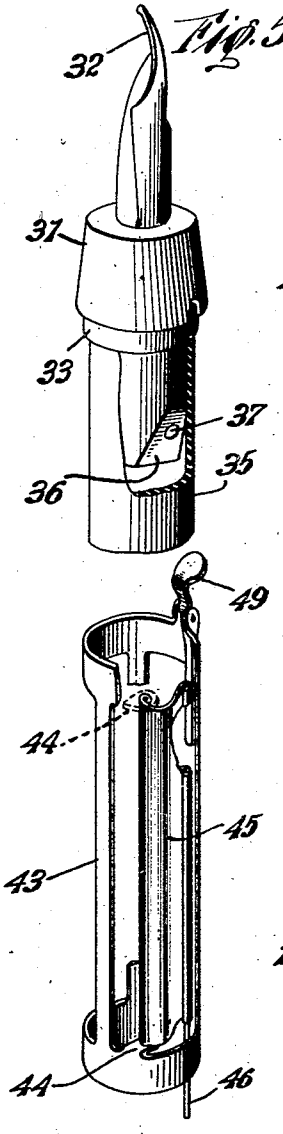


Fig. 6

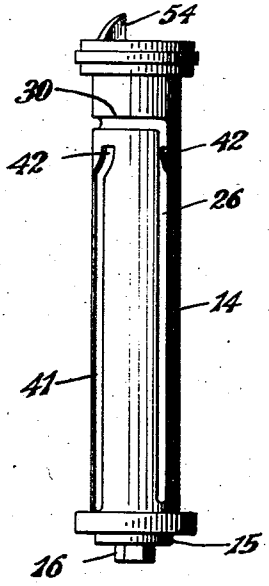
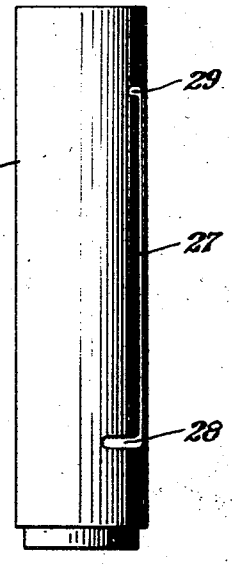


Fig. 7



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UNITED STATES PATENT OFFICE

1,949,201

FOUNTAIN PEN

William Friedman, New York, N. Y.

Application September 8, 1932. Serial No. 632,178

12 Claims. (Cl. 120—49)

This invention relates to fountain pens or the like and has for its objects to provide a fountain pen in which the nib may be retracted into a casing and the casing closed; to close the casing by a continued manipulation of the pen retracting device; to obtain this manipulation by convenient and readily operated means; to provide novel and appropriate filling means; to avoid twisting the ink sac; to provide means for stopping the flow of ink to the nib when the pen is retracted into the casing; to make the pen leak proof; to automatically start the flow of ink to the nib as the pen is projected; to enable the pen including its casing to be slender, light, and properly balanced so as to be satisfactory in use; to secure a durable and fool proof construction; to secure simplicity of construction and operation; and to obtain other advantages and results as may be brought out in the following description.

Referring to the accompanying drawings in which like numerals of reference indicate the same parts throughout the several views;

Figure 1 is a longitudinal sectional view of a pen embodying my invention;

Figure 2 is a similar longitudinal sectional view of the casing showing interior parts in elevation;

Figure 3 is a longitudinal sectional view on line 3—3 of Fig. 2;

Figure 4 is a perspective view of a part of the casing and portions of the interior structure visible through a broken away portion of the casing;

Figure 5 is a perspective view of the interior assembly in separated condition to show the several parts comprising the same;

Figure 6 is a side elevation of the operating sleeve; and

Figure 7 is a side elevation of the body portion of the casing.

Figure 8 is a cross section of the pen just above the finger operating pin.

In the specific embodiment of the invention illustrated in said drawings the fountain pen comprises an interior assembly, which for convenience I am referring to herein as the pen, this assembly having a casing thereover such that the pen may be projected in part out of one end of the casing when desired to use the pen, and retracted when the pen is out of use and to be carried around. The casing referred to provides a tubular body portion 10 at one end of which is provided a fixed cap 11 having a substantially semi-spherical shape with an opening 12 therein through which the pen may be projected and retracted. This cap may be secured to the body 10 in any suitable manner, for instance by friction, threaded engagement, spot welding, and the like. At the other end of the sleeve-like body portion 10 is a permanently closed cap 13 which, under certain conditions, may be rotated to apply a squeezing pressure to the ink sac hereinafter referred to and in a manner subsequently described.

Rotatably mounted within body portion 10 of the casing is a sleeve 14, said sleeve being longitudinally fast so as not to move back and forth upon projecting or retracting the pen. The end of this sleeve toward the closed and rotatable cap 13 is preferably provided with a closed cross head 15 with a central angular projection 16 projecting therefrom toward the cap and said cap has a similar angular projection 17 projecting toward the cross head. These angular projections receive a correspondingly shaped sleeve 18 thereover and the parts are bound together by a screw 19 extending longitudinally through the sleeve and projections centrally thereof. The rotatable cap 13 and sleeve 14 are fixed with respect to each other by the means just described so that rotation of the said cap will obtain a corresponding rotation of the sleeve. It is desired to have this sleeve normally assume a definite position with respect to the casing, returning to that position when released by the operator. For this purpose a spring 20 is made fast at one end to the sleeve by attachment to the collar 18. The other end of the spring is fast with respect to the body portion 10 of the casing by attachment to an inside ferrule 21 in turn made fast by spot welding or otherwise to the said body portion. A part of this ferrule 21 projects into the cap as a bearing for the same to prevent lateral displacement of the cap with respect to the body portion.

Within sleeve 14 is positioned a tubular pen body portion 22, the end of which toward the rotatable cap 13 is substantially closed by a head 23 fixed with respect thereto. As here shown this head has an annular flange 24 projecting into the pen body portion 22 and secured in suitable manner, as by spot welding. Radially projecting from this end of the pen body portion is a finger piece or pin 25, the outer end of which projects through casing 10 for manipulation by the operator. This pin is here shown as screw threaded into flange 24. A longitudinal slot 26 is provided in sleeve 14 and a longitudinal slot 27 is provided in casing 10 for the said pin 25 to ride in and thus enable the pen body to be projected and retracted by manipulation of the pin. At the end of slot 27 in the casing body toward the cap 13 is a lateral slot 28. When the pin is at this end of the slot, for convenience termed the lower end, spring 20 actuates the pen body to rotate the same with the pin 25 then riding in the lateral slot 28 until it reaches the end of said slot which acts as a stop against further rotation. It is to be noted that the corresponding lower end of slot 26 in the pen body does not have a lateral slot, which necessitates a rotation of both said sleeve 14 and pen body 22 simultane-

ously while pin 25 is riding in lateral slot 28 of the casing.

By sliding pin 25 to the opposite, or as here shown, to the upper end of longitudinal slot 27 of the casing, the pen body is projected the full extent permitted. At this upper end of slot 27 is a lateral notch 29 extending in the same direction as lateral slot 28, but nowhere near as deep. Spring 20 will act to enter pin 25 into this notch 29 and thus retain the pen extended notwithstanding pressure that may be exerted while writing. Juxtaposed to notch 29 is a lateral slot 30 in sleeve 14, said slot communicating with longitudinal slot 26. This lateral slot 30 is of considerable length and extends in the same direction as notch 29. By virtue of this slot 30, sleeve 14 may be rotated, if desired, with respect to body 10 of the casing. This rotation is for purposes of filling the pen, as will hereinafter appear, and it is to be observed that this relative rotation between the pen body and the sleeve is permitted only at the completely extended position of the pen body. It therefor is not possible to inadvertently eject ink when the pen is retracted.

Carried by the forward end of the pen body portion is the nib holder 31 carrying nib 32. As here shown this nib holder has a rim 33 frictionally fitting within said pen body and has an extension 34 of less diameter projecting into said body portion. This extension 34 receives the ink sac 35 which frictionally grips the extension, said sac extending substantially to the closed end of the pen body portion. I have shown an inner part of this extension beveled as at 36, this beveled portion having hole 37 therein forming the only outlet for the ink from the sac to the nib. This hole can be closed by pressing the sac against the said beveled portion, and thus prevent outflow of the ink when so desired. I provide a means for automatically pressing the sac over this hole 37 as the pen is retracted, as will hereinafter appear.

Rotatably carried, as by a central rivet or hinge pin 38, flatwise against the closed end 23 of the pen body portion, is a disc 39 of substantially the same diameter as said head 23 so as to fit within sleeve 14 and slide and rotate as permitted with respect thereto. Fingers 40, 40 project diametrically from this disc, and ride within longitudinal slots 41, 41 in sleeve 14. The upper ends of slots 41 are offset as at 42 to obtain a slight rotation of disc 39 with respect to said sleeve as the pen body approaches the extended position. Rotation of disc 39 with respect to said sleeve 14 obtains pressure upon ink sac by means described below, and releases that pressure when rotation is in the opposite direction. The rotation obtained in projecting the pen is in the right direction to squeeze the sac and thereby obtain an initial flow of ink sufficient to fill passage 37 to the nib. As the pen is retracted, release of the pressure on the sac permits the sac to expand and draw the ink contained in passage 37 back into the sac so as not to leave any ink therein which might spill while the pen is out of use.

Within the pen body 22 and positioned between said body and the ink sac is a frame 43. This frame maintains a fixed relationship to the pen body and provides a pair of inwardly directed lugs 44 which form bearings to receive pintels at the opposite ends of a pressure gate 45 longitudinally positioned with respect to the said frame and pen body. This gate is eccentrically disposed so as to be at one side of the ink sac. Swinging the gate inwardly will press the sac whereas swinging the gate outwardly will release the sac and permit ink to be sucked thereinto. The edge of the gate which thus swings in and out is shown curled to support a longitudinal rod 46 which projects from the lower end of the gate, downwardly through the head 23 for the pen body into the rotatable disc 39. Each of these parts provide slots 47 and 48 respectively transverse to rod 46 and transverse to each other. Slot 47 in the end wall or head 23 is curved with its center of curvature in alignment with the axis of pivoting of the pressure gate 45. Slot 48 in the disc is preferably radial thereby permitting the squeezing edge of the gate to approach the center of the pen body when rotating the disc in one direction and permitting the gate to swing back when rotating the disc in the opposite direction. Rotation of the disc is effected either by virtue of offset slots 42 or by virtue of pin 25 riding in transverse slot 30 of sleeve 14. This latter rotation is obtained when the pen is fully extended and cap 13 is rotated with respect to body 10 of the casing.

For purposes of closing ink passage 37, frame 43 is shown as pivotally supporting a pressure lever 49 the outer end of which is opposed to said opening and the inner end of which lies between the pressure gate 45 and frame 43. As lever 49 is a first class lever, outward pressure by the gate thereon when the gate is fully open to release the ink sac obtains an inward pressure on the upper end of said lever, this inward pressure forcing the ink sac against bevel 36 to close the passage 37. It will therefor be noted that while fingers 40 of the disc 39 ride in the longitudinal portion of slot 41, at which time the gate is fully opened, the pressure lever 49 is holding the sac against passage 37 to close off any ink supply. However, when the pen body is fully extended fingers 40 ride into the offset part of slot 41, namely into slot 42 offset from longitudinal slot 41 thereby slightly rotating the disc and swinging the gate inwardly a corresponding amount which in turn releases pressure of lever 49 against the ink sac and opens passage 37. It is to be understood that while the drawings show the offset 42 rather abrupt for purposes of clearly showing the offset, it is within the scope of the invention to make this offset as gradual as may be found desirable.

A cover 50 is provided for opening 12 of the casing whereby the opening may be closed when the pen is retracted entirely within the casing. This cover 50 is shown as pivoted by rivets 51, 51, or otherwise to fixed cap 11, said cover being within the cap and rotatable into a position at the side of the cap for uncovering opening 12 as clearly shown in Fig. 2. An extension 52 beyond one of the rivets 51 comprises an operating means adapted to ride on the upper end of sleeve 14 during rotation thereof after the cover is once opened. The said end of the sleeve provides a socket 53 and an adjacent abutment 54 whereby a return rotation of the sleeve causes the abutment to engage extension 52 and swing it into socket 53, thereby swinging the cover into closing position. The edge of the socket 53 opposite from abutment 54 will swing the extension to open the cover when the sleeve is rotated in that direction. Operation of the sleeve for opening and closing the cover is obtained by movement of finger piece or pin 25 in the lower transverse slot 28 of the casing.

It will be observed that the structure which I have described above affords a retractable pen

with an automatic closure; a pen by which an initial flow of ink may be obtained; a pen wherein ink in the feed duct or passage will be drawn back into the sac when the pen is not in use; a pen wherein the ink is prevented from entering the feed duct when the pen is not in use; and an extensible pen wherein the filling device can be operated only when the pen is fully extended.

Obviously detail changes and modifications may be made in the construction and use of my improved fountain pen without departing from the spirit or scope of the invention, and I do not wish to be understood as limiting myself to the exact construction shown or described except as set forth in the following claims when construed in the light of the prior art.

Having thus described the invention, I claim:—

1. A fountain pen comprising a pen body, a casing adapted to receive said pen body, means for retracting said body into the casing, a cover to overlie the pen body when retracted and close the casing, and means for operating said cover by the retracting means while the pen body is longitudinally at rest.

2. A fountain pen comprising a pen body, having an end opening, a casing adapted to receive said pen body therein through said opening, and means for successively retracting said pen body to its most retracted position and thereafter closing said opening.

3. A fountain pen comprising a pen body, a casing having an end opening adapted to receive said pen body therein through said opening, a cover for said opening, and means for successively retracting said pen body into the casing entirely within the opening to the most retracted position of said pen body and thereafter operating said cover to closed position.

4. A fountain pen comprising a pen body, a sleeve holder receiving said pen body, a casing supporting said sleeve, said casing having a longitudinal slot with a transverse slot and a notch at the opposite end of the receiving slot and a pin projecting from the pen body through said slot whereby the pen body may be longitudinally slid and rotated when the pin reaches either end of the longitudinal slot, said sleeve also having a longitudinal slot through which said pin passes thereby permitting longitudinal movement of the pen body within the sleeve and obtaining a rotation of the sleeve when rotating the pen body by said pin.

5. A fountain pen comprising a pen body, a sleeve holder receiving said pen body, a casing supporting said sleeve, said casing having a longitudinal slot with a transverse slot and a notch at opposite ends of the receiving slot and a pin projecting from the pen body through said slot whereby the pen body may be longitudinally slid and rotated when the pin reaches either end of the longitudinal slot, said sleeve also having a longitudinal slot through which said pin passes thereby permitting longitudinal movement of the end body within the sleeve and obtaining a rotation of the sleeve when rotating the pen body by said pin, and a closure for the end opening of the casing operated by relative rotation between the sleeve and casing.

6. A fountain pen comprising in combination with a casing and a pen body providing a nib holder having an ink duct, an ink sac carried by said nib holder, and a frame in the pen body around said sac, said frame having means for closing said ink duct and stopping flow of the ink therethrough.

7. A fountain pen comprising in combination with a casing and a pen body providing a nib holder having an ink duct, an ink sac carried by said nib holder, a frame in the pen body around said sac, and means on said frame for pressing the sac against the end of the duct in the sac for stopping the flow of ink therein.

8. A fountain pen comprising in combination with a casing and a pen body providing a nib holder having an ink duct, an ink sac carried by said nib holder, and a frame in the pen body around said sac, said frame having means for closing said ink duct and stopping flow of the ink therethrough, and means also carried by said frame for creating a slight pressure upon the ink sac simultaneous with the opening of the ink duct.

9. A fountain pen comprising in combination with a casing and a pen body providing a nib holder having an ink duct, an ink sac carried by said nib holder, a frame in the pen body around said sac, and means on said frame for pressing the sac against the end of the duct in the sac for stopping the flow of ink therein, and means for creating a suction within the sac simultaneous with the stopping of the flow of ink to the said duct.

10. A fountain pen comprising in combination with a casing and a pen body providing a sleeve upon said body, said sleeve having slots therein, a casing having a slot, a pin projecting from the pen body through one of the slots in the sleeve and said slot in the casing whereby the rotation of the body and sleeve may be simultaneously effected by said pin, and other means than said pin for rotating the pen body with respect to said sleeve.

11. A fountain pen comprising in combination with a casing and a pen body providing a sleeve upon said body, said sleeve having slots therein, a casing having a slot, a pin projecting from the pen body through one of the slots in the sleeve and said slot in the casing whereby the rotation of the body and sleeve may be simultaneously effected by said pin, and other means than said pin for rotating the pen body with respect to said sleeve, a disk within said sleeve having a finger projecting into another of said slots of said sleeve said disk being rotatable with respect to the sleeve and held against rotation with respect to the sleeve while the pen body is rotated with respect to the sleeve by said separate means.

12. A fountain pen comprising in combination with a casing and a pen body providing a sleeve upon said body, said sleeve having slots therein, a compressible ink sac within said body and sleeve, a casing having a slot, a pin projecting from the pen body through one of the slots in the sleeve and said slot in the casing whereby the rotation of the body and sleeve may be simultaneously effected by said pin, and other means than said pin for rotating the pen body with respect to said sleeve, a disk within said sleeve having a finger projecting into another of said slots of said sleeve said disk being rotatable with respect to the sleeve and held against rotation with respect to the sleeve while the pen body is rotated with respect to the sleeve by said separate means and sac-compressing mechanism engaged by said disk so as to be operated by the relative rotation between the disk and the sleeve.

WILLIAM FRIEDMAN.