April 26, 1949. H. J. FAHRINGER ET AL 2,468,258

WRITING INSTRUMENT

Filed Dec. 19, 1947

3 Sheets-Sheet 1

Fig. 1.

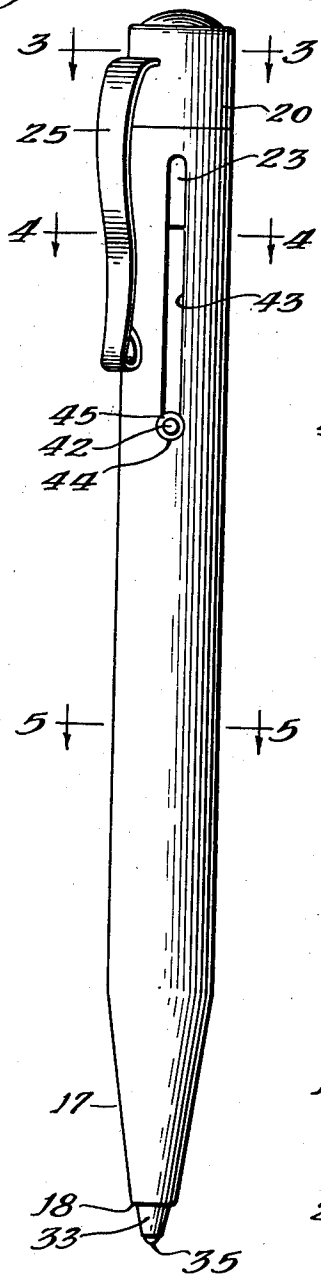


Fig. 2.

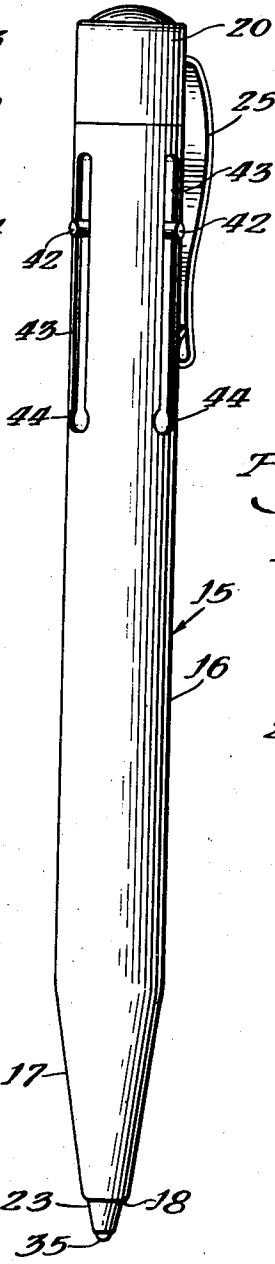


Fig. 3.

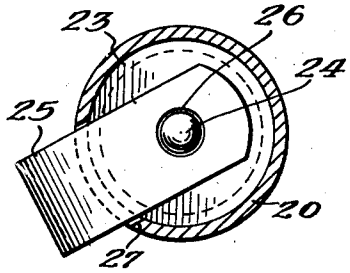


Fig. 4.

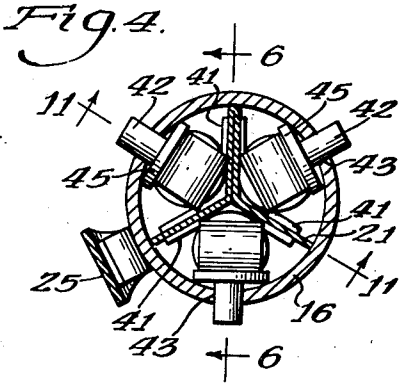
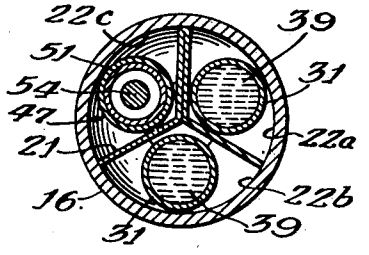


Fig. 5.



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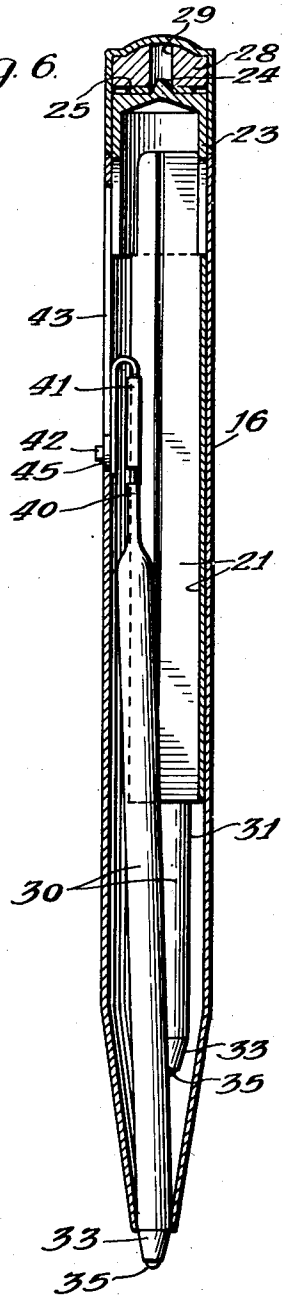
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WRITING INSTRUMENT

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Fig. 6.



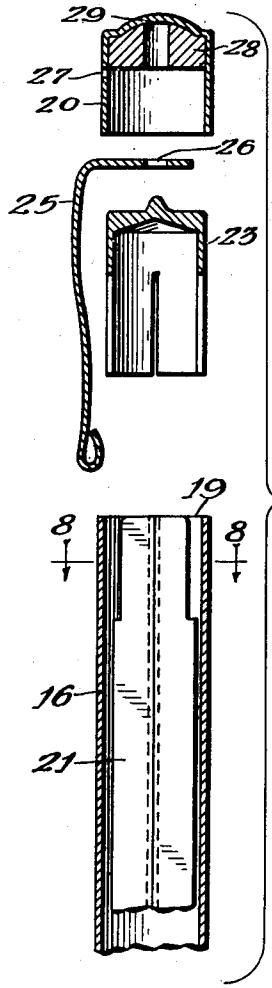


Fig. 7.

Fig. 8.



Fig. 9.

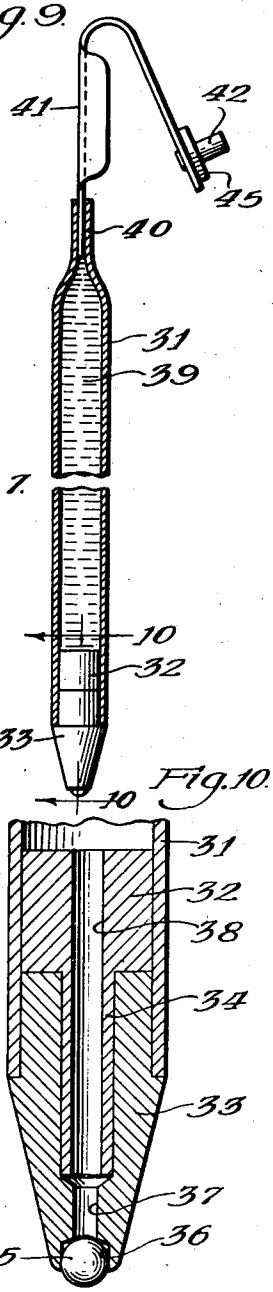


Fig. 10.

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WRITING INSTRUMENT

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Fig. 11.

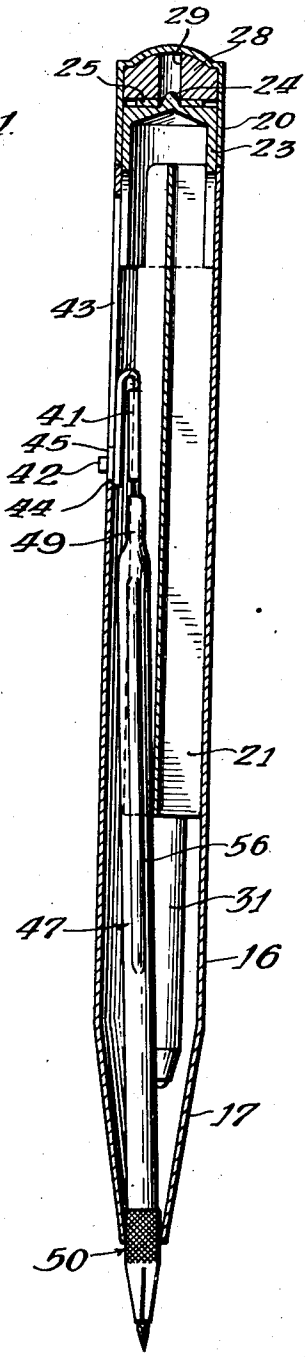


Fig. 12.

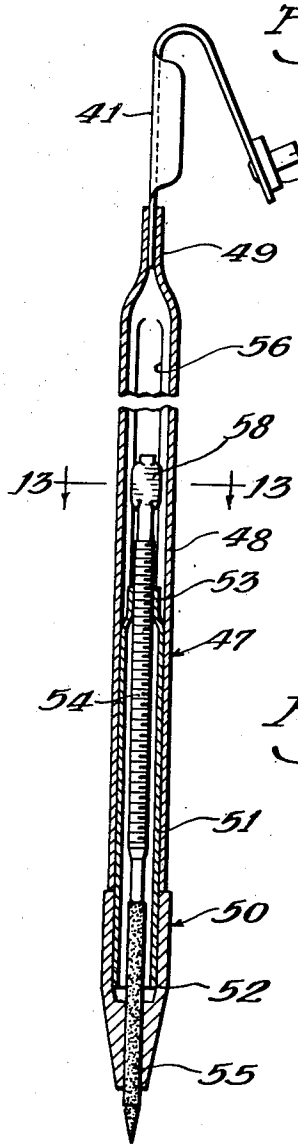




Fig. 13.

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UNITED STATES PATENT OFFICE

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WRITING INSTRUMENT

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Application December 19, 1947, Serial No. 792,754

3 Claims. (Cl. 120—42.12)

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The present invention relates to writing instruments of the type known as ball point pens. In this type of an instrument a small ball is mounted at the tapered end or point of the pen and during operation of the pen, this ball is rolled across the paper. Ink from a reservoir in the pen is deposited onto the ball and is transferred by the ball onto the paper.

The present invention is particularly concerned with a retractable point type of pen wherein the ball during use of the pen projects beyond the tapered end of the pen barrel, but when not in use the ball is pulled back within the barrel so as to be protected thereby. The ball is mounted in the end of a cartridge and this cartridge is moved manually in a direction lengthwise of the barrel. Means are provided for locking the cartridge when the ball point is in its writing position projecting through the tapered end of the pen barrel.

The present invention is intended to provide a relatively simple writing instrument of a type wherein the ink contained in the barrel is fed by gravity onto the ball. When the supply of ink in the cartridge has become depleted it is intended that the cartridge may be quickly and simply removed from the pen barrel and replaced with a freshly loaded cartridge.

The invention further contemplates a writing instrument of this sort wherein a plurality of cartridges can be employed in a single pen barrel, each cartridge containing a different color ink. For example, one cartridge can contain blue ink, another green ink, and a third can contain red ink. The three cartridges can be selectively advanced to writing position in the pen barrel so that the operator can select one of the three colors at a time.

It is further contemplated that one of the cartridges may contain pencil lead instead of ink so that a writing instrument embodying the present invention may contain two or more cartridges, one of which will contain ink that is fed onto the ball socketed in one end of said cartridge and another cartridge may contain lead that feeds through the writing end of the cartridge. In this embodiment of the invention the operator can selectively advance into writing position either the ink filled cartridge (in which case the instrument serves as a ball point pen) or the lead filled cartridge (in which case the present writing instrument serves as a pencil).

The foregoing constitute some of the principal objects of the present invention, others of which will become apparent from the following description and the drawings, in which

Fig. 1 is a top plan view of a writing instrument embodying the present invention illustrating one of the three cartridges disposed in writing position;

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Fig. 2 is a bottom plan view of the pen shown in Fig. 1 and illustrating the remaining two cartridges in their withdrawn or retracted position;

Fig. 3 is a transverse sectional view taken through the cap of the writing instrument, the view being taken on the line 3—3 of Fig. 1;

Fig. 4 is a transverse sectional view taken through the upper end of the writing instrument, the view being taken on the line 4—4 of Fig. 1;

Fig. 5 is a transverse sectional view taken through the writing instrument, the view being taken on the line 5—5 of Fig. 1;

Fig. 6 is a longitudinal sectional view taken through the pen illustrated in Fig. 1, the view being taken on the line 6—6 of Fig. 1, a portion of the pen being illustrated in elevation;

Fig. 7 is a fragmentary exploded sectional view corresponding to Fig. 6;

Fig. 8 is a transverse sectional view taken through a portion of the casing illustrated in Fig. 7, the view being taken on the line 8—8 of Fig. 7;

Fig. 9 is an enlarged longitudinal sectional view through one of the cartridges illustrated in Fig. 6, a portion of the view being shown in elevation;

Fig. 10 is an enlarged, fragmentary, longitudinal sectional view through the cartridge, the portion shown being that portion of Fig. 9 bounded by the arrows 10—10, the ball being illustrated in elevation;

Fig. 11 is a longitudinal, sectional view taken through a pen illustrating a second embodiment of the invention wherein a pencil cartridge is used in combination with one or more pen cartridges;

Fig. 12 is an enlarged sectional view through the pencil cartridge illustrated in Fig. 11, a portion of the view being shown in elevation; and

Fig. 13 is a transverse sectional view taken through the pencil cartridge, the view being taken on the line 13—13 of Fig. 12.

For purposes of illustration certain specific embodiments will be described herein, though it is recognized that many modifications may be made without departing from the intended scope of the invention.

Referring to the drawings the writing instrument is illustrated at 15 and comprises generally a hollow cylindrical barrel 16, hereinafter referred to as a pen barrel that is tapered at one end as at 17 and is open at both ends as at 18 and 19 (see Figs. 2 and 7). A cap 20 (Figs. 1, 2, 6 and 7) closes the one end 19 of the barrel 16.

A partition member 21 is adapted to divide the inside of the pen barrel 16 into three substantially trough-shaped chambers indicated at 22*a*, 22*b* and 22*c* in Fig. 5. This partition member 21 as shown in Fig. 6 occupies only a portion of the length of the pen barrel 16 and is held in the barrel by friction. A crown insert 23 is removably

held in the pen barrel 16 at the open end 19 thereof and over the end of the partition member 21. The crown insert 23 is provided with an upstanding lug 24 on its upper face so as to receive a pocket clip 25 that is apertured at 26 to fit over the lug 24. The cap 20 slides over the projecting portion of the crown insert 23 and is slotted at 27 to receive the pocket clip 25 that passes therethrough. A clip spacer 28 rests against the upper inner face of the cap 20 and is provided with a passage 29 along the central axis thereof so as to receive the lug 24 that projects through the aperture 26 in the pocket clip 25 and into the passage 29.

As shown in Figs. 5 and 6 the barrel 16 is adapted to house one or more cartridges generally indicated at 30. In the embodiment illustrated in the drawings there are three such cartridges housed within the barrel 16, one cartridge 30 residing in each of the chambers 22*a*, 22*b* and 22*c* (see Fig. 5). Also in the embodiment of the invention illustrated in the drawings each of the cartridges 30 comprises an ink unit case 31 that is open at one end to receive a nozzle 32 and a point member 33. The nozzle 32 is provided with a shank 34 over which the point member 33 is mounted. A ball 35 is rotatably mounted in a socket 36 in the free end of the point member 33. An ink passage 37 extends from the socket 36 longitudinally throughout the remainder of the point member 33. The nozzle 32 is provided with a longitudinal passage 38 that extends throughout the length of the nozzle and provides communication between the interior of the ink unit case 31 and the passage 37. The ink unit case 31 is filled with a supply of ink indicated at 39 in Fig. 9. The upper end of the ink unit case 31 is crimped as at 40 to hold one end of an operating spring 41. This operating spring 41 is bent over and is provided at its opposite end with an operating button 42. When assembled these parts comprise a cartridge as referred to herein. Directly adjacent the ink case 31, the spring 41 has a pair of oppositely extending integral ears 41*a* which are angularly disposed with respect to the plane of the body of the spring 41 and project laterally therefrom in such fashion that they engage the partition wall on each side of the case 31 and cooperate with said partition wall to guide the ink unit case in its movements in the cylinder. Thus guided, the cartridge is centrally located in the trough and the insertion of the unit into the barrel is greatly facilitated. This construction permits the button 42 to be guided into the barrel 16 while it is maintained in alignment with the slot 43, whereupon, on assembly or replacement of a cartridge, the button 42 readily enters the slot 43 with a minimum amount of manipulation.

As best shown in Figs. 1 and 2 the barrel 16 is provided with a plurality of longitudinal slots 43, each of which has a locking portion 44 at the lower end thereof. The operating button 42 on the operating spring 41 is adapted to project through the slot 43 and is slidable lengthwise therein. Each operating button 42 is provided with an enlarged locking shoulder 45 that enters the locking portion 44 (see Fig. 1) at the bottom of the corresponding slot 43 so as to lock the cartridge in the position where the point 33 projects through the lower open end 18 of the barrel 16.

In the first embodiment of the invention there are three cartridges 30 contained within the pen barrel 16. One of these cartridges may contain

a blue ink, another a green ink, and the third red ink. The user of the pen may then select which color he wishes to use at a particular time by merely manipulating the operating button 42 so as to slide the selected cartridge 30 into the operative position illustrated in Fig. 1 where the point 33 projects through the opening 18 at the tapered end of the pen barrel. Another color may be selected by first applying pressure against the operating button 42 so as to retract the locking shoulder 45 from the enlarged portion 44 and then moving the operating button 42 upwardly in the slot 43 to its uppermost position. This clears the way for another one of the cartridges 30 to be advanced to operating position. When the pen is not in use all of the cartridges can be raised to their uppermost position so that none of the point members 33 project through the open end 18 of the pen barrel 16.

When the ink in any of the cartridges has been used up, such depleted cartridge can be replaced by simply first removing the pen cap 20 from the barrel and then pushing the operating button 42 to the uppermost position in its slot 43. In this condition the upper end of the operating spring 41 projects through the upper open end of the pen barrel 16 so that the operating spring 41 may be grasped for removal of the cartridge. The operating spring is squeezed so as to retract the operating button 42 from its slot 43 and then the cartridge may be simply withdrawn from the upper end of the pen barrel 16 and a new one inserted in its place.

A band of color is provided on the point member 33 corresponding to the color of the ink contained in the cartridge so that when the point member 33 projects through the opening 18 of the pen barrel 16 the color band will be exposed so as to indicate the color of the ink in that cartridge.

Referring now to Figs. 11 to 13 inclusive a second embodiment of the invention is shown wherein the writing instrument serves both as a pencil and as a pen.

In this form of the invention a pencil cartridge generally indicated at 47 is disposed in the cylindrical barrel 16 in place of one of the pen cartridges described in connection with the first embodiment of the invention. This pencil cartridge 47 comprises a casing 48 that is crimped at the top as at 49 to hold one of the operating springs 41 previously described in connection with the pen cartridge 30 illustrated in Fig. 9. This casing 48 is open at the bottom to receive an adjustable lead assembly generally indicated at 50. This assembly 50 comprises an inner sleeve 51 that can be inserted within the cartridge casing 48 and a point portion 52 that telescopes over the lower end of the sleeve 51. The upper end of the sleeve 51 is provided with a reduced or neck portion 53 that is threaded to receive a threaded lead advancing member 54. This advancing member 54 upon rotation in the sleeve 51 can be advanced or retracted toward or away from the point end 52 of the cartridge. Pencil lead 55 is held in the point end 52 of the lead assembly and is adapted to be backed by the advancing member 54.

As best shown in Figs. 12 and 13 the walls of the casing 48 throughout substantially the upper half of the casing are crimped as at 56 so as to provide a plurality of grooves or slots 57 that are disposed ninety degrees apart and extend in a longitudinal direction with respect to the casing 48. A follower member 58 is provided at the

upper end of the lead advancing member 54 and this follower member is adapted to extend between two of the diametrically opposite grooves 57 so as to be held against rotation by these grooves. The point portion 52 is fixed with respect to the sleeve 51 so that by rotating the point portion 52 the sleeve 51 is caused to rotate about the fixed advancing member 54. Thus the sleeve 51 is caused to ride up and down on the advancing member 54 so as to advance or permit retraction of the lead 55 in the point portion 52. The lead assembly 50 can be withdrawn from the casing 48 by merely pulling the assembly out from the bottom opening in the casing.

The pencil cartridge 47 is held in place in the barrel 16 in the manner previously described with respect to the pen cartridge 30 in connection with Fig. 6. The pencil can be advanced and retracted by manipulation of the operating button 42 as previously described and the withdrawal of the pencil cartridge from the barrel 16 is effected through the top of the barrel in the same manner as previously described with respect to the first embodiment of the invention.

Thus there is provided in connection with this second embodiment of the invention a combination pencil and pen wherein a pencil cartridge and one or two pen cartridges can all be housed within one barrel 16. All of these cartridges are advanced through a common opening in the barrel.

This application constitutes a continuation in part of the applicants' copending application, Serial No. 723,770, filed January 23, 1947 for Writing instruments. This case has become abandoned.

We claim:

1. In a multicolor writing instrument, a barrel having a plurality of longitudinally extending slots spaced about the circumference thereof, a partition member within the barrel dividing same into a plurality of longitudinal trough-shaped chambers, each slot opening into a chamber, at least one of said chambers having a cartridge

containing a writing medium and a writing point, said cartridge being slidable in said chamber, said cartridge having a resilient stem secured in one end thereof and an arm integral with said stem, said arm being bent upon itself so as to extend toward the writing end of the cartridge and being resiliently urged outwardly, with an operating button on said arm extending through the adjacent slot in the barrel to provide means for controlling the movements of said cartridge in said barrel, and guide means integral with and extending laterally from said stem, said guide means being slidable in said chamber and conforming in shape to, and cooperating with, the trough-shaped partition wall for guiding said cartridge in said chamber and to keep said button aligned in said slot.

2. A device according to claim 1, in which said guide means comprises ears extending laterally from each side of said stem, said ears being angularly disposed with respect to said stem, and arranged to lie against the walls of the trough-shaped partition.

3. A device according to claim 1 in which said stem comprises a leaf spring and said guide means comprises resilient ears integral therewith and extending laterally from each side of said stem, said ears being disposed on said stem directly adjacent said cartridge and resiliently adjusting themselves to the walls of the trough-shaped partition.

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