April 14, 1959 B. M. CRAIG 2,881,735

RETRACTABLE WRITING INSTRUMENT

Filed Dec. 1, 1954

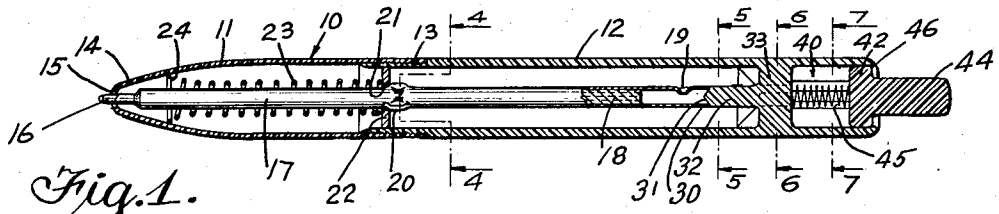


Fig. 1.

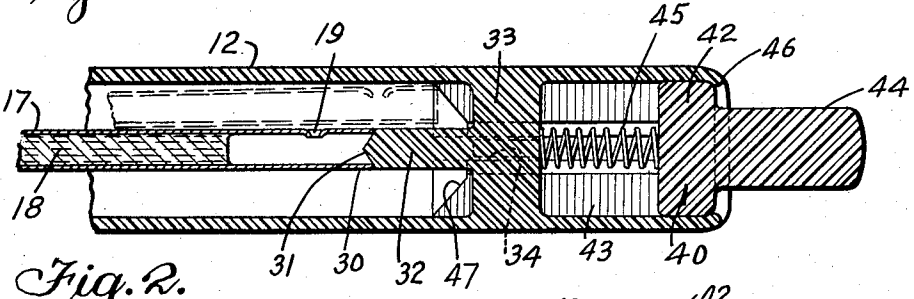


Fig. 2.

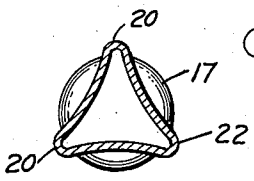


Fig. 4.

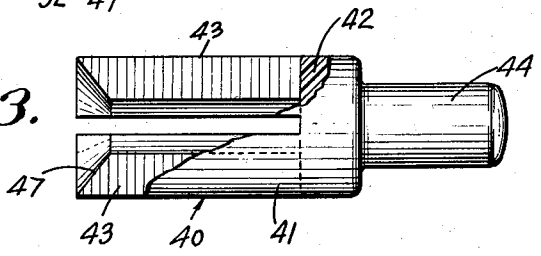
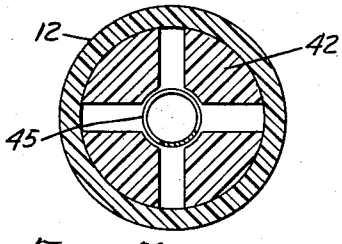
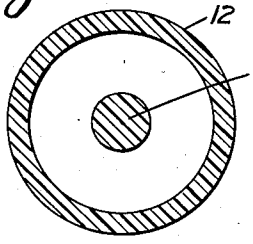


Fig. 3.

Fig. 5.





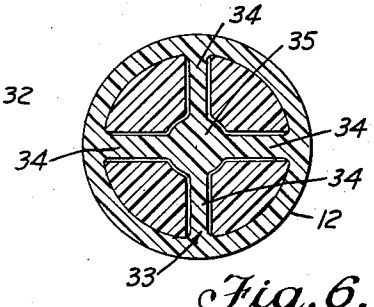


Fig. 7.

Fig. 6.

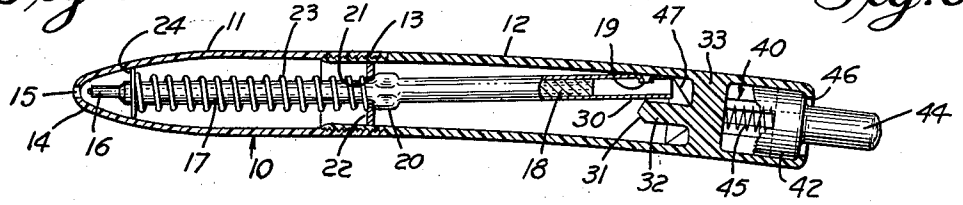


Fig. 8.

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RETRACTABLE WRITING INSTRUMENT

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Application December 1, 1954, Serial No. 472,412

6 Claims. (Cl. 120—42.03)

This invention relates to a ball point pen.

The general object of the invention is to provide an improved ball point pen.

A more specific object of the invention is to provide an improved retracting means for a writing instrument such as a ball point pen.

Another object of the invention is to provide a ball point pen including a barrel having a cartridge therein and wherein means is provided for holding the cartridge in advanced position and wherein the barrel is flexible and means is provided when the barrel is flexed to cause the wriiting point to be retracted.

A further object of the invention is to provide a ball point pen including a flexible barrel having a cartridge slidable therein with a ball writing point mounted on the cartridge and wherein a push button serves to advance the writing ball to writing position and wherein flexing of the pen barrel causes the writing point to retreat from writing position.

Another object of the invention is to provide a cartridge for a ball point pen wherein the cartridge includes novel means for engaging a retracting device in a pen barrel.

Other objects and advantages of the invention will be apparent from the following description taken in connection with the accompanying drawings, wherein:

Fig. 1 is a central sectional view showing a ball point pen embodying the features of the invention;

Fig. 2 is an enlarged fragmentary view similar to Fig. 1;

Fig. 3 is an elevation, partly in section showing the plunger member;

Fig. 4 is a section of the cartridge taken on line 4—4, Fig. 1;

Figs. 5, 6 and 7 are enlarged sectional views taken on lines 5—5, 6—6, and 7—7, Fig. 1, respectively; and

Fig. 8 is a view similar to Fig. 1 showing the parts in another position.

Referring to the drawing by reference characters a pen embodying features of the invention is indicated generally at **10**. The pen shown includes a front barrel portion **11** which is threaded to a rear barrel portion **12** as at **13**. The barrel includes a tapering front end **14** which has an aperture **15** therein through which a writing tip **16** on an ink cartridge **17** extends.

The ink cartridge includes a bleed hole **19**. The cartridge includes a plurality of crimps **20**. The crimps should be at least three in number to secure the desired effect to be later described. The forward end of the cartridge extends through a hole **21** in a washer **22**. A spring **23** surrounds the cartridge and the forward end of the spring is shown as enlarged as at **24** to engage the tapered portion **14** on the barrel. The crimps **20** engage the rear of the washer **22** thus limiting the movement of the washer **22** along the cartridge.

When the parts are in the position shown in Fig. 1 the spring **23** is urging the cartridge **17** to the right, and the point **16** is in an advanced position. The cartridge is held in this advanced position due to the engagement of the hollow rear end **30** of the cartridge with a conical

portion **31** on a stem **32** which is integral with a partition member **33** on the barrel portion **12**. The partition member **33** includes integral ribs **34**, shown as four in number, and a central portion **35** which is a continuation of the stem **32**.

The barrel portions **11** and **12** may be either or both made of flexible material such as plastic or metal. In the disclosure the portion **11** is shown as made of metal and is more rigid than is the portion **12** which is made of polyethylene and is flexible. Thus when pressure is applied in the vicinity of the portion **14** the rear portion **11** will flex and will be displaced at one side of the longitudinal axis of the pen.

Assuming that the parts are in the position shown in Fig. 1 and that the rear portion **12** is flexed as described; this will cause the front end of the cartridge **17** to be rocked with the point of contact of the crimps **20** with the wall of the hole **21** as the fulcrum and will cause the inner end **30** of the cartridge to be displaced laterally from the conical portion **31** on the stem **32**. This will free the washer **22** which has a loose fit in the portion **12** to move inwardly and the washer engaging the crimps **20** on the cartridge will move the cartridge to the broken line position shown in Figs. 1 and 2.

When the parts are in the position shown in Fig. 8, it is necessary to restore the parts to the position of Fig. 1 to make the pen operative for writing. To do this I provide a plunger device **40** which includes a generally cylindrical body **41**. This body includes a solid portion **42** from which a plurality of segmental members **43** extend forwardly. Each of the members **43** fits between a pair of the partition members **33** and slides along these members. The portion **42** includes a reduced push button member **44**. The member **44** is normally urged to the position shown in Figs. 1 and 2 by a spring **45** which engages the partition portion **35** and the plunger. The plunger is held in place by an inwardly turned lip **46** on the part **12**. The material of the portion **12** of the barrel is resilient so that the lip **46** may be stretched sufficiently to allow the plunger to be inserted after which the plunger will return to its normal position to prevent accidental removal of the plunger.

The front end of the segmental members **43** are tapered in frusto-conical form as at **47** and in its rearward movement, shown in Fig. 8, the rear end of the cartridge engages the frusto-conical portion **47** to limit rearward movement of the cartridge.

When the parts are in the position of Fig. 8 and the plunger **40** is pushed inwardly the sloping portions of **47** of the segmental members **43** on the plunger will engage the end **30** of the cartridge and will move the cartridge forward against the tension of the spring **23**. The inclination of the portion **47** will cause the free end **30** of the cartridge to be urged inwardly against the stem **32**. When the end of the stem is reached the end **30** will be free to move inwardly and it will be forced inwardly by the inclined portion **47** so that it will ride over the portion **31** on the stem **32** to the position shown in Fig. 1, whereupon when pressure is removed from the plunger **44** the parts will remain in the full line position of Fig. 1.

From the foregoing description it will be apparent that when the writing tip **16** is in advanced position a bending of the rear end of the barrel **11** will cause the writing tip to be retracted. Forward pressure on the plunger button **44** will again cause the writing tip to be advanced to writing position.

Having thus described the invention, I claim:

1. A writing instrument including a tubular elongated barrel having an open front end, apertured fulcrum forming means within the barrel, an elongated cartridge member axially disposed in the barrel and slidably extending through the apertured fulcrum means, said cartridge

member including a writing tip at one end thereof and an ink reservoir communicating with the tip, said cartridge being movable from an advanced position wherein the tip projects through the barrel opening to the retracted position wherein the tip is withdrawn into the barrel, means normally urging the cartridge to its retracted position, a partition member disposed in the rear of the barrel, said partition member including a body and spaced portions connecting the body to the barrel, said body having a front end portion coaxial with the barrel and adapted to engage the rear end of a cartridge when the cartridge is in an advanced position, a plunger slidable within the rear end of the barrel, the front end portion of the body and the barrel adjacent the front end portion of the body being of the size to provide a space which is adapted to receive the rear end of the cartridge when the cartridge is in its retracted position, means normally urging the plunger rearwardly, said plunger having forwardly extending spaced members which are slidable between the partition spaced portions, said plunger members at their front ends being internally tapered in frusto-conical form and being adapted to engage the rear end of a cartridge when the cartridge is in its retracted position, said barrel having a flexible front portion, said fulcrum means through which the cartridge projects providing a fulcrum about which the cartridge pivots when the front portion of the barrel is flexed to thus swing the cartridge from its engagement with the front end portion of the body to thereby permit the cartridge to move rearwardly.

2. A writing instrument including a tubular elongated barrel having an open front end, an apertured fulcrum forming member within the barrel, an elongated cartridge member axially disposed in the barrel and slidably extending through the fulcrum member, said cartridge member including a writing tip at one end thereof and an ink reservoir communicating with the tip, said cartridge being movable through the fulcrum member from an advanced position wherein the tip projects through the barrel opening to a retracted position wherein the tip is withdrawn into the barrel, spring means normally urging the cartridge to its retracted position, a partition member disposed in the rear of the barrel, said partition member including a body having spaced radiating ribs and a stem projecting inwardly from the body, said stem having a tapered front end portion which is coaxial with the barrel and is adapted to engage the rear end of a cartridge when the cartridge is in an advanced position, a plunger member including a body portion slidable within the rear end of the barrel, said plunger including a rear end portion operable to move the plunger forwardly, the stem and the barrel adjacent the stem being of the size to provide a space which is adapted to receive the rear end of the cartridge when the cartridge is in its retracted position, means normally urging the plunger rearwardly, said plunger having forwardly extending spaced members which are slidable between the partition ribs, said plunger members at their front ends being internally tapered in frusto-conical form and being adapted to engage the rear end of a cartridge when the cartridge is in its retracted position, said barrel having a flexible front portion, said fulcrum member through which the cartridge projects providing a fulcrum about which the cartridge pivots when the front portion of the barrel is flexed to thus swing the cartridge from its engagement with the forward end of the stem to thereby permit the cartridge to move rearwardly.

3. A writing instrument including a tubular elongated barrel having an open front end, an apertured washer arranged within the barrel intermediate the length of the barrel, an elongated cartridge member axially disposed in the barrel and slidably extending through the washer, said cartridge member including a writing tip at one end thereof and an ink reservoir communicating with the tip, said cartridge being movable through the washer from an advanced position wherein the tip projects through the barrel opening to a retracted position wherein the tip is withdrawn into the barrel, a spring surrounding the cartridge and normally urging the cartridge to its retracted position, a partition member disposed in the rear of the barrel, said partition member including a central portion and spaced radiating ribs, said partition member having a stem projecting inwardly from the central portion, said stem having a conical end portion which is coaxial with the barrel and is adapted to engage the rear end of the cartridge when the cartridge is in an advanced position, a plunger member slidable within the rear end of the barrel, said plunger having a protruding end portion operable to move the plunger forwardly, the stem and the barrel adjacent the stem being of the size to provide an annular space which receives the rear end of the cartridge when the cartridge is in its retracted position, a spring normally urging the plunger rearwardly, said plunger having forwardly extending spaced members, said plunger members being slidable between the partition ribs, said plunger members at their front ends being internally tapered in frusto-conical form and being adapted to engage the rear end of a cartridge when the cartridge is in its retracted position, said barrel having a flexible forward portion adapted to be flexed, said washer through which the cartridge projects providing a fulcrum about which the cartridge pivots when the front portion of the barrel is flexed to thus swing the cartridge from its engagement with the forward end of the stem to permit the first mentioned spring to move the cartridge rearwardly.

4. A writing instrument including a tubular elongated barrel having an open front end, an apertured fulcrum forming member within the barrel, an elongated cartridge member axially disposed in the barrel and slidably extending through the fulcrum member, said cartridge member including a writing tip at one end thereof and an ink reservoir communicating with the tip, said cartridge being movable through the fulcrum member from an advanced position wherein the tip projects through the barrel opening to a retracted position wherein the tip is withdrawn into the barrel, a spring surrounding the cartridge and normally urging the cartridge to its retracted position, a partition member disposed in the rear of the barrel, said partition member including a central portion and spaced radiating ribs, said partition member having a stem projecting inwardly from the central portion, said stem having a conical end portion which is coaxial with the barrel and is adapted to engage the rear end of a cartridge when the cartridge is in an advanced position, a plunger member including a cylindrical portion slidable within the rear end of the barrel, said plunger having a reduced rear end portion operable to move the plunger forwardly within the barrel, the stem and the barrel adjacent the stem being of the size to provide an annular space which receives the rear end of the cartridge when the cartridge is in its retracted position, a spring engaging the plunger and partition and normally urging the plunger rearwardly, said plunger having forwardly extending spaced segmental members, said plunger segmental members being slidable between the partition ribs, said segmental members at their front ends being internally tapered in frusto-conical form and being adapted to engage the rear end of a cartridge when the cartridge is in its retracted position, said barrel having a flexible forward portion adapted to be flexed, said fulcrum member through which the cartridge projects providing a fulcrum about which the cartridge pivots when the front portion of the barrel is flexed to thus swing the cartridge from its engagement with the forward end of the stem to permit the first mentioned spring to move the cartridge rearwardly.

5. A writing instrument including a tubular elongated barrel having an open front end, said barrel having a forward portion and a rearward portion, an apertured fulcrum forming member within the barrel disposed be-

tween said forward portion and said rearward portion, an elongated cartridge member axially disposed in the barrel and slidably extending through the fulcrum member, said cartridge member including a writing tip at one end thereof and an ink reservoir communicating with the tip, said cartridge being movable through the fulcrum member from an advanced position wherein the tip projects through the barrel opening to a retracted position wherein the tip is withdrawn into the barrel, spring means normally urging the cartridge to its retracted position, cartridge engaging means in the rear end of the barrel to retain the cartridge in an advanced position, a recess in said rearward portion adapted to receive the rear end of said cartridge when said cartridge is in its retracted position, one of the portions of said barrel being resilient whereby the axis of the front portion of said barrel may be inclined to the axis of rear portion of said barrel by lateral pressure exerted on said barrel and whereby the rear end of the cartridge is displaced from said cartridge engaging means permitting the spring to translate the cartridge to its retracted position.

6. A writing instrument including a tubular elongated barrel having an open front end, said barrel having a forward and a rearward portion, an elongated writing unit axially and slidably disposed in the barrel, said writing unit including a writing tip at one end thereof, said writing unit being movable between an advanced position wherein the tip projects through the barrel open front end and a retracted position wherein the tip is withdrawn into the barrel, spring means normally urging

the writing unit to its retracted position, means adjacent the rear end of the barrel engageable with a portion of the writing unit to retain the writing unit in advanced position, means substantially providing lateral engagement between the barrel and writing unit at a point intermediate the ends of the barrel, said rearward barrel portion having a recess adapted to receive the rear end of said writing unit when said writing unit is in its retracted position, at least a part of the barrel being resilient whereby the axis of the forward portion of said barrel may be inclined to the axis of the rearward portion by lateral pressure exerted on said barrel whereby said writing unit portion is displaced from said engageable means permitting said spring means to translate said writing unit to its retracted position.

References Cited in the file of this patent

UNITED STATES PATENTS

2,580,754	Frentzel	Jan. 1, 1952
2,584,569	Frentzel	Feb. 5, 1952
2,645,204	Bross	July 14, 1953
2,692,580	Kahn et al.	Oct. 26, 1954
2,734,484	O'Sullivan	Feb. 14, 1956

FOREIGN PATENTS

444,447	Italy	Jan. 21, 1949
814,568	Germany	Sept. 24, 1951
1,000,555	France	Oct. 17, 1951