This invention relates to retractable point writing instruments and particularly to improved constructions for effecting extension and retraction of the writing points of ballpoint writing instruments of the novel type disclosed in my copending application Serial No. 732,255, filed May 1, 1958, and which issued on April 14, 1959, as United States Patent No. 2,881,736.

Conventional writing instruments of the ballpoint type generally include, in addition to the usual carrying clip, a button member extending from one end of the barrel that is manually displaceable to effect extension of a retracted writing point from the other end thereof together with associated means, of varying character, to effect retraction of the point usually by action of a biasing spring, in response to a manipulative act of the user. In such type construction, the hazard is always present that the user will forget to retract the writing point after use and will insert the pen, with the writing point extended, into a pocket, handbag or other receptacle. Disposition of the pen in a pocket or other receptacle with the writing point in its extended position is extremely likely to result in soiling due to a capillary flow of ink from the point to any surface that it may engage as well as in possible clogging of the point by contact with foreign matter, such as dirt, lint etc.

This invention may be briefly described as an improved construction for effecting the extension and retraction of the writing points of ballpoint writing instruments by rotative manipulation of a rocking clip assembly of the type generally disclosed in my above identified patent and in a narrower sense an improved construction for a writing point assembly displacing member and the actuating means associated therewith.

Among the advantages attendant the present invention is the provision of a structure having a minimal number of component elements and being of a character that permits appreciable economies in component expense and assembly costs.

The object of this invention is the provision of an improved mechanism for effecting the extension and retraction of a writing point in a retractable point writing instrument.

Another object of this invention is the provision of an improved construction for the writing point assembly displacing member and associated actuating means therefor in rocking clip types of ballpoint writing instruments.

Other objects and advantages of this invention will be pointed out in the following disclosure and drawings which illustrate, by way of example, the principles of this invention, together with the presently preferred embodiments thereof incorporating those principles.

Referring to the drawings:

FIGURE 1 is a side elevational view of a presently preferred embodiment of a ballpoint writing instrument incorporating the invention and illustrating the disposition of the carrying clip member when the writing point is disposed in retracted position;

FIGURE 2 is a side elevational view, partly in section, of the writing instrument illustrated in FIGURE 1;

FIGURE 3 is a side elevational view, partly in section, of the writing instrument illustrated in FIGURES 2 and 3 but showing the disposition of the component parts thereof when the writing point is in an advanced writing position;

FIGURE 4 is a sectional view taken on the line 4—4 of FIGURE 2;

FIGURE 5 is a sectional view taken on the line 5—5 of FIGURE 3; and

FIGURE 6 is a front elevation of one of the component elements of the writing instruments illustrated in FIGURES 1 to 3.

FIGURES 1 through 6 illustrate the constructional details of a ballpoint type writing instrument incorporating the principles of this invention and which constitutes the presently preferred embodiment thereof as particularly adapted for simple and inexpensive commercial manufacture. As illustrated in the above identified drawings, there is provided a lower barrel portion A having a plurality of bores 2, 4 and 6 therewithin of successively decreasing diameter. Longitudinally disposed within the lower barrel portion is a displaceable writing point assembly 8 such as a ballpoint cartridge member having a ball writing tip 10 at the dependent end thereof. The writing point assembly 8 is normally biased in retracted position relative to the lower barrel portion A by a biasing member or spring 12 disposed intermediate the lugs 14 extending from the surface of the cartridge member and the shoulder 16 formed by the junction of the bores 2 and 4.

The outer surface of the lower barrel portion A adjacent the upper end thereof is provided with a recess 18 having an angularly or slantingly disposed lower defining edge 20 adapted to receive and contain, as by a press fit, a decorative sleeve member 22. The recess 18 and the sleeve 22 are sized and shaped so that, when assembled, the outer surface of the sleeve 22 is disposed flush with the outer surface of the lower barrel portion A thereby providing an attractive decorative effect and an unbroken continuity of surface. The portion of the lower barrel member A disposed above the aforementioned recess 18 is made of reduced external diameter and is externally threaded as at 24 to receive a threaded sleeve-like coupling member 26 having an axially disposed bore 28 sized to slidably contain and thereby position the upper end of the cartridge member 8 axially of the writing instrument.

Adapted to be secured to the lower barrel portion A as by threaded engagement with the coupling member 26 is an upper barrel portion B. Should it be desired, of course, a press fit engagement may be employed in substitution of the illustrated threaded arrangement. The upper barrel portion B is provided with aligned and spaced apart upper and lower apertures 30 and 32, respectively. Disposed within the upper aperture 30 and pivotally mounted on the lower defining edge thereof intermediate its extremities is a rocking clip assembly generally designated 34. The rocking clip assembly includes an externally disposed dependent clip arm member 36 having an inwardly directed bevel 38 at the dependent end thereof positioned so as to be displaceable into and be received by the lower aperture 32. The upper portion of the clip arm member 36 includes a generally U-shaped clamping or connecting section 40 disposed substantially perpendicular to the long dimension of clip member 36.

The U-shaped section 40 is sized to be contained within the upper aperture 30 and to extend inwardly into the interior of the upper barrel portion 28. The end portions of the section 40 are provided with suitable prongs or lugs 42. The rocking clip assembly also includes an internally disposed dependent springlike actuating member 44 sized so that the dependent end thereof is disposed in overlying relationship with the lower aperture 32 and in abutting operative engagement with the bevel 38 on the dependent end of the clip member 36. The upper end of the actuating member 44 is suitably shaped, as by extending flanges 45 sized to extend to contained between the lugs 42 as to permit securement thereof to the U-shaped clamping section 40 of the clip member 36 by deform-
tion of the lug members 42 theretabout. As shown in the drawings, the actuating member 44 may be sized to provide an extending upper end 46 adapted to be internally disposed beyond the upper defining edge of the upper aperture 30. This extending portion 46 in conjunction with an extending bead 48 on the upper portion of the U-shaped clamping section 40 serves to prevent removal or an undesirable degree of displacement of the rocking clip assembly from or into said upper aperture 30. The downstream end of the spring-leaf actuating member 44 is provided with a generally U-shaped inwardly directed projection 50. Both arms of the U-shaped inwardly directed projection 50 are terminally shaped to provide an inclined cam surface 52 and a dependent locking or retaining offset 54 disposed therebeneath.

Mounted on the upper end of the cartridge member 8 and longitudinally displaceable in conjunction therewith is a writing point displacing sleeve element generally designated 56 and shown in enlarged size in FIGURE 6. The writing point displacing sleeve is generally semi-cylindrical in shape and includes a horizontally disposed extending top or cover member 58 adapted to rest upon and be supported by the upper end of the cartridge member 8. Dependent from the cover member 58 is a vertically disposed body portion recessed as at 60 and provided with an aperture 62 on the rear surface thereof. The sleeve element terminates in a horizontally disposed bottom or base member 64 shaped to provide a pair of horizontally disposed transversely extending shoulders 66 disposed on either side of a generally semi-circular bore 68 sized to partially encircle the cartridge element 8. The sleeve member 56 is preferably formed of suitable plastic and is sized so that the horizontally disposed shoulders 66 on the base member 64 thereof are positioned adjacent the lower aperture 32 in the upper barrel portion B and in operative engagement with the inclined cam surfaces 52 on the arms of the inwardly directed U-shaped projection 50 on the dependent end of the actuating member 44. Such positioning as well as the desired positioning of the sleeve member 56 relative to the cartridge 8 is materially aided by the provision of an extending bead 65 on the barrel engaging surface of the base member 64, sized to ride against the inner surface of the upper barrel portion B.

The upper end of the upper barrel portion B may be closed by a suitable decorative cap piece 70 shaped to cooperate with the sleeve 22 to provide a pleasing and attractive external configuration for the assembled writing instrument.

When the writing point 19 is disposed in its retracted position, the component elements forming the preferred embodiment are positioned as illustrated in FIGURE 2. As there shown, the dependent end of the actuating member 44 is disposed in overlying or covering relationship with the lower aperture 32 and with the inclined cam surfaces 52 being disposed in abutting relationship with the shoulders 66 on the base member 64 of displacing sleeve element 56 which is in its retracted or upper position. Such disposition of the actuating member 44 results in disposition of the beaded dependent end 38 of the clip member 36 in its exposed position relative to the aperture 32 and the surface of the upper barrel portion 28.

With the parts so positioned, a manually effected inward displacement of the dependent bead 38 on the clip member 36 toward its concealed position results in an introduced said bead 38 into the lower aperture 32 and in joint inward displacement of the dependent end of the actuating member 44 inwardly toward the center or longitudinal axis of the upper barrel portion 28. Because of the pivotal mounting of the rocking clip assembly, as described earlier, and also as described in more detail in my above identified United States Patent, such inward displacement of the bead effects a rotational displacement of the clip 36 and as a consequence thereof the upper portion of the clip 36 disposed above the pivotal mounting, i.e. the clamping section 40, is conjointly advanced to its exposed or extended position wherein it is positioned relatively remote from the surface of the upper aperture 30. The inward displacement of the lower end of the actuating member 44 as described above effects, because of the operative engagement of the inclined cam surfaces 52 with the horizontally disposed shoulders 66 on the base 64 of the sleeve member 56, a concurrent inwardly disposed actuating member 44 and said sleeve member 56. The downward displacement of the sleeve member 56 effects a concomitant downward displacement of the ballpoint cartridge 8 against the resistance of the biasing spring 12 toward its extended position. Such downward displacement of the ballpoint cartridge 8 and displacing sleeve element 56 in response to inward displacement of the bead 38 will continue until the retaining or locking offsets 54 disposed beneath the inclined cam surfaces 52 engage the upper surface of the base member 64 of the sleeve 56 and compressive engagement therebetween is maintained by the action of the biasing spring 12. At this time the parts will be positioned as illustrated in FIGURE 3 wherein the bead 38 will be disposed within the aperture 32 and the body portion of the clip 36 disposed beneath the pivotal mounting thereof will be disposed closely adjacent the surface of the upper barrel portion 28, precluding its utilization for carrying purposes while the writing point 19 is in its advanced or extended position.

Retraction of the writing point assembly 8 from its advanced or extended position, as illustrated in FIGURE 3, is readily effected by a manual inward displacement of the exposed portion of the rocking clip assembly disposed above the pivotal mounting thereof, i.e. the exposed portion of the clamping section 40. Such inward displacement, as by manual pressure applied to the exposed surface of the clamping section 40, will result in a rotative displacement of the rocking clip assembly 34 about its pivotal mounting and in disengagement of the locking offsets 54 from the upper surface of the shoulders 66. Such disengagement permits the biasing spring 12 to upwardly displace the writing point assembly 8 and the writing point assembly displacing sleeve 56 mounted thereon. The upward displacement of the displacing sleeve 56 effects, by engagement of the inclined cam surfaces 52 with the shoulders 66, a concurrent upward displacement of the dependent end of the actuating member 44 from the position illustrated in FIGURE 3 to that illustrated in FIGURE 2. The outward displacement of the dependent end of the actuating member 44 in conjunction with the above described manual displacement of the clamping section 40 results in a displacement of the bead end 38 of the clip 36 from the concealed position as illustrated in FIGURE 3 to its exposed position as illustrated in FIGURE 2 wherein it is available for carrying purposes.

The above described mounting of the rocking clip assembly 34 together with the springlike character of the actuating member 44 additionally permits manual rotative displacement of the beaded dependent end 38 of the clip member 36 in a direction away from the surface of the upper barrel portion 28 to facilitate utilization of the carrying clip 36 when the point 19 is in its retracted position. With the component parts positioned as illustrated in FIGURES 1 or 2, an inwardly directed manual pressure applied to that portion of the rocking clip assembly 34 disposed above the pivotal mounting thereof results in a further rotative displacement of said clip member 36 against the biasing action of the springlike actuating member 44 in such manner as to cause the bead 38 to be displaced away from the surface of the upper barrel portion 28, as illustrated by the dotted lines on FIGURE 1. Such permitted additional displacement of the beaded dependent end 38 of carrying clip member 36 contributes to the ease of utilization thereof for carrying purposes.
Having thus described my invention, I claim:

1. A writing instrument comprising a barrel having an open forward end and an aperture disposed rearwardly of said open forward end, a writing point assembly longitudinally movable within said barrel between an advanced position extending through said open forward end and a retracted position, a biasing spring in said barrel urging said writing point assembly toward said retracted position, and an actuating mechanism for moving said writing point assembly between said advanced and retracted positions; said mechanism including a sleeve element within said barrel suspended from the upper end of said writing point assembly for longitudinal movement therewith, said sleeve element having a horizontally disposed base member adjacent said lower aperture, said base member defining a pair of lineal shoulders spaced apart by a semi-circular bore coaxially aligned with and partially encircling said writing point assembly, said shoulders extending transversely from generally diametrically opposed sides of said point assembly, a clip assembly carried on said barrel rearward of said aperture, said clip assembly having a clip arm disposed externally of said barrel and an actuating member disposed internally of said barrel, said actuating member and said clip arm depending toward said open end and terminating adjacent said aperture, an inwardly directed bead disposed on the dependent end of said clip arm for movement through said aperture between exposed and concealed positions upon transverse movement of the dependent end of said clip arm between outward and inward positions relative to said barrel, the dependent end of said actuating member overlying said aperture and displaceably engaging said bead for transverse movement therewith, and a generally U-shaped projection formed on said actuating member internally of said barrel adjacent said aperture, said projection defining a pair of parallel arms spaced to receive said writing point assembly and aligned with said shoulders, said arms extending inwardly toward said sleeve element to a position beyond said shoulders, each of said arms terminally providing a camming surface inclined toward said open forward end and a transverse locking offset contiguous with the lower end of said camming surface, the upper end of said camming surfaces extending rearwardly of said shoulders and transversely therebeyond to limit the rearward movement of said writing point assembly and said sleeve in said retracted position, said arms moving transversely in said barrel toward said shoulders in response to engagement between said bead and said actuating member upon displacement of the dependent end of said clip arm between said inward and outward positions, a respective one of said camming surfaces and said locking offsets successively engaging each of said transverse shoulders and moving said point assembly to and releasably holding said point assembly in said advanced position upon inward displacement of said bead into said aperture and conjoint inward movement of said actuating member, said locking offsets disengaging said shoulders and said point assembly retracting within said barrel upon outward displacement of said bead from said concealed to said exposed positions.

2. A writing instrument comprising a barrel having an open forward end, said barrel including upper and lower aligned spaced apertures disposed rearwardly of said open forward end, an elongated generally cylindrical writing point assembly longitudinally movable within said barrel between an advanced position extending through said open forward end and a retracted position, a biasing spring in said barrel normally urging said writing point assembly toward said retracted position, and a manually operable actuating mechanism for moving said writing point assembly between said advanced and retracted positions; said mechanism including a sleeve element within said barrel suspended from the upper end of said writing point assembly for longitudinal movement therewith, said sleeve element having a longitudinally extending semi-cylindrical body portion terminating in a horizontally disposed base member adjacent said lower aperture, said base member defining a pair of lineal shoulders spaced apart by a semi-circular bore coaxially aligned with and partially encircling said writing point assembly, said shoulders extending transversely from generally diametrically opposed sides of said point assembly, a clip assembly mounted within said upper aperture, said clip assembly having a clip arm disposed externally of said barrel and an actuating member disposed internally of said barrel, said actuating member and said clip arm depending from said upper aperture toward said open end and terminating adjacent said lower aperture, an inwardly directed bead formed on the dependent end of said clip arm and positioned for movement through said lower aperture between exposed and concealed positions upon transverse movement of the dependent end of said clip arm between outward and inward positions, relative to said barrel, the dependent end of said actuating member overlying said lower aperture and displaceably engaging said bead for transverse movement therewith, and a generally U-shaped projection formed on said actuating member internally of said barrel adjacent said lower aperture, said projection defining a pair of parallel arms spaced to receive said writing point assembly and aligned with said shoulders, said arms extending inwardly toward said sleeve element to a position beyond said shoulders, each of said arms terminally forming a camming surface inclined toward said open forward end and a transverse locking offset contiguous with the lower end of said camming surface, the upper end of said camming surfaces extending to a position rearwardly of said shoulders and transversely therebeyond to provide a wedging engagement between said surfaces and said shoulders limiting the rearward movement of said writing point assembly and said sleeve in said retracted position, said arms moving transversely in said barrel toward said shoulders in response to engagement between said bead and said actuating member upon displacement of the dependent end of said clip arm between said inward and outward positions, a respective one of said camming surfaces and said locking offsets successively engaging each of said transverse shoulders and moving said point assembly to and releasably holding said point assembly in said advanced position upon inward displacement of said bead into said barrel aperture and conjoint inward movement of said actuating member, said locking offsets disengaging said shoulders and said point assembly retracting within said barrel upon outward displacement of said bead from said concealed to said exposed positions.

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