May 15, 1945. A. O. DAHLBERG 2,375,770

FOUNTAIN PEN

Filed Nov. 19, 1943 3 Sheets-Sheet 1

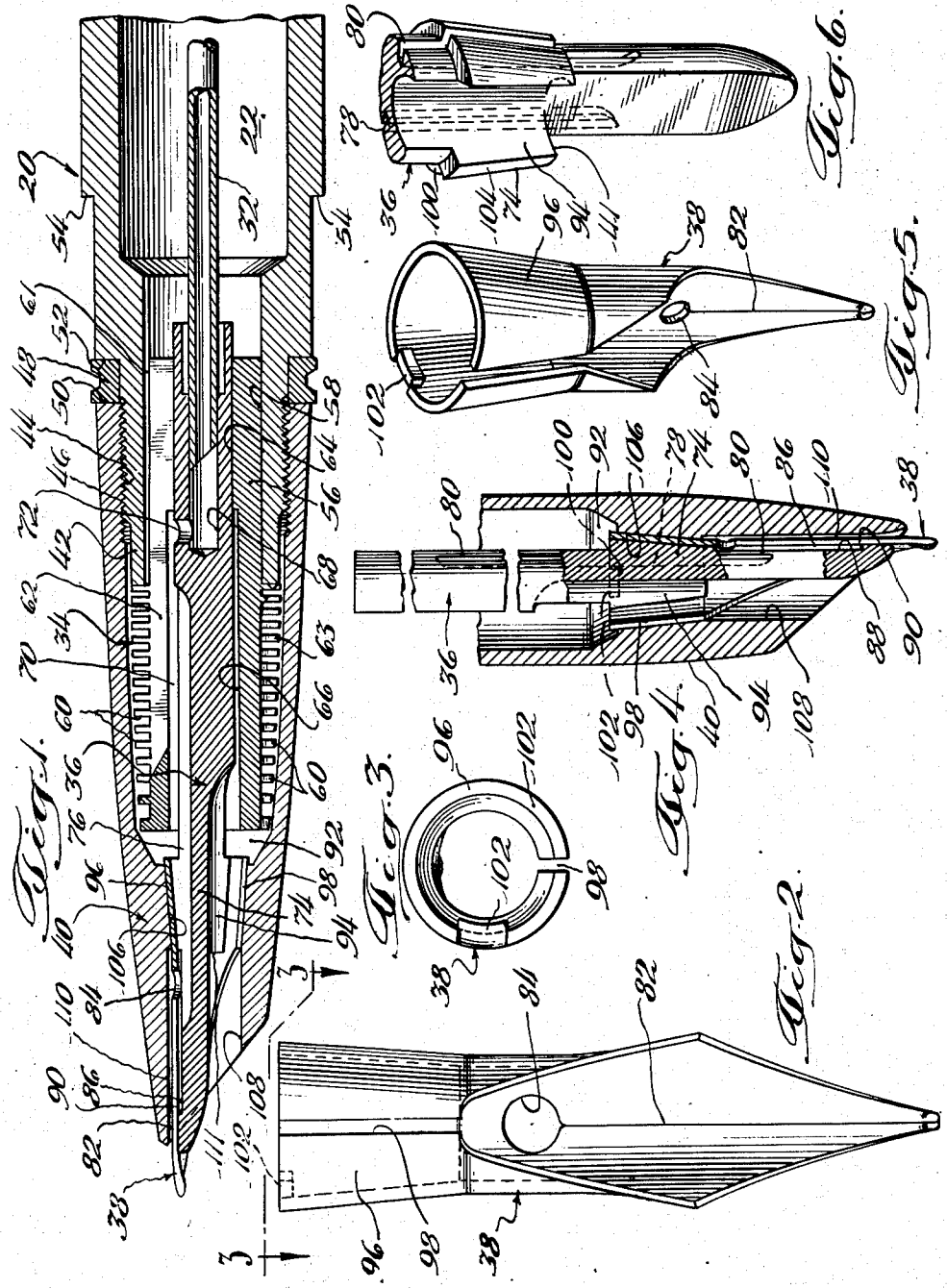

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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FOUNTAIN PEN

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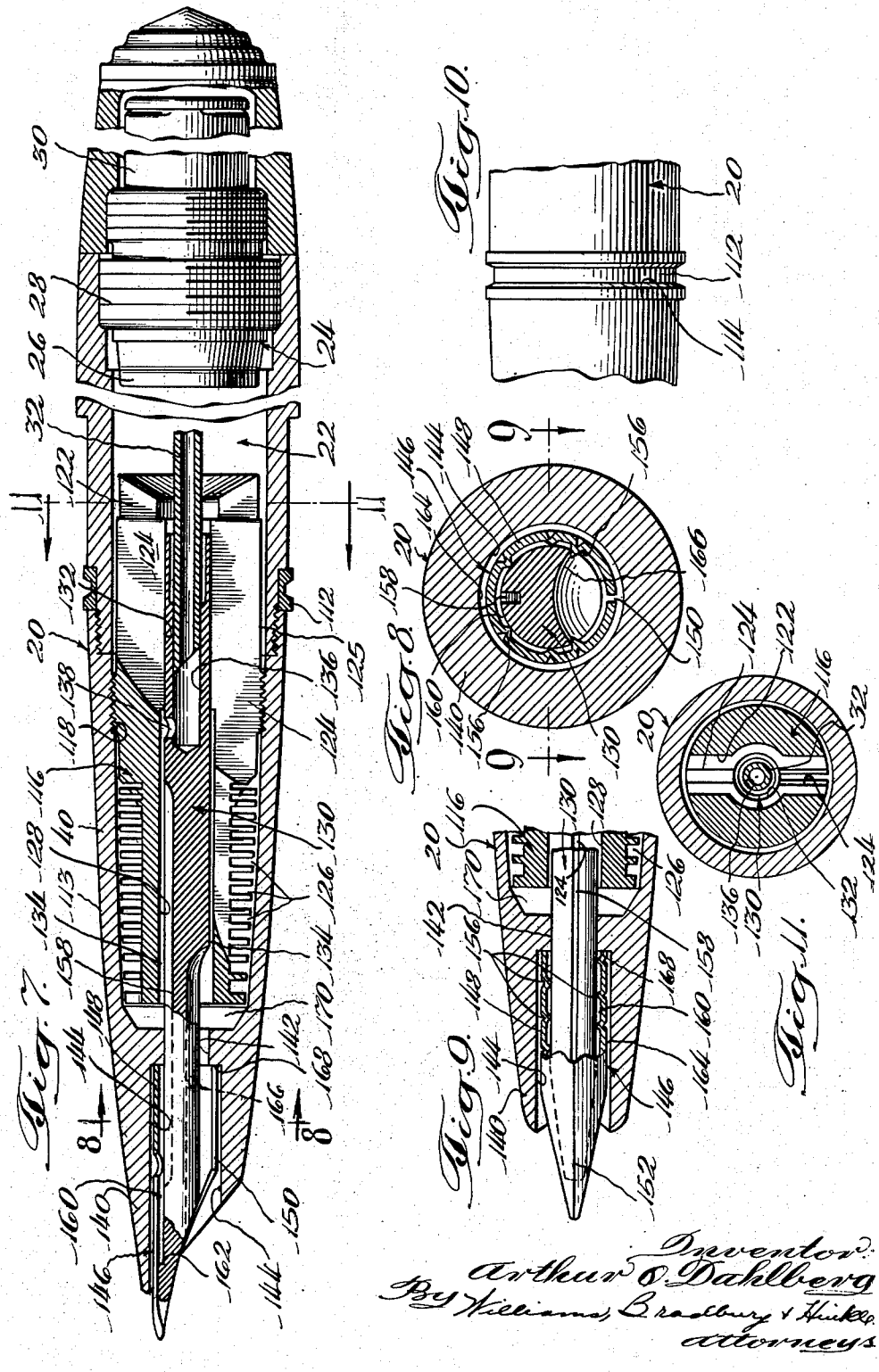

Fig. 7.

Fig. 10.

Fig. 8.

Fig. 9.

Fig. 11.

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FOUNTAIN PEN

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Fig. 12.

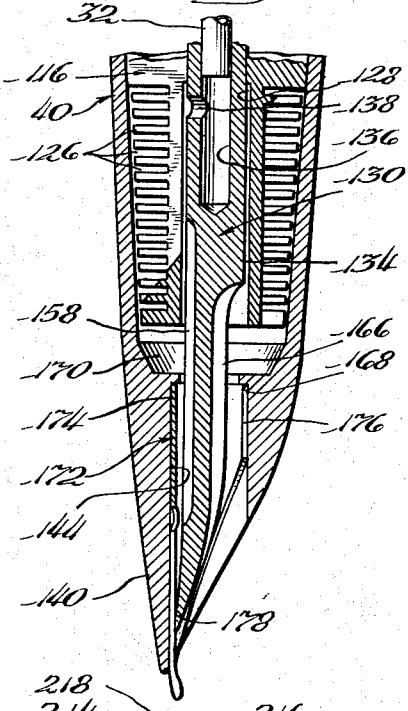


Fig. 13.

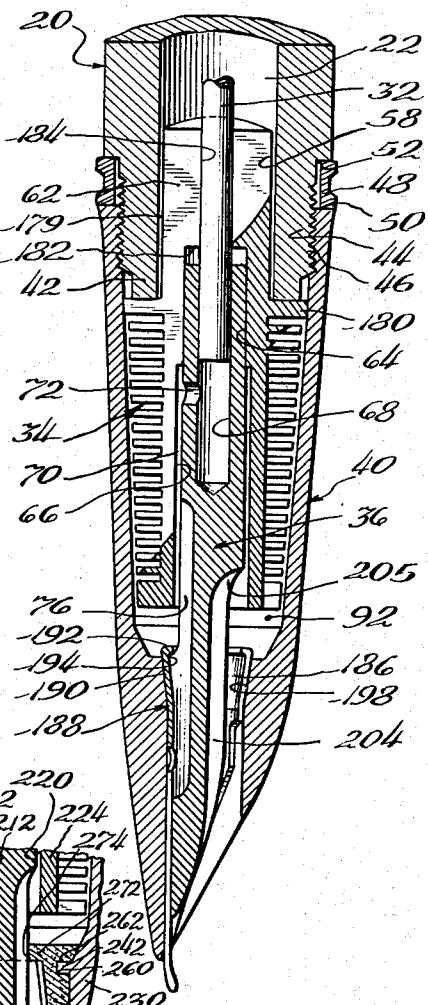


Fig. 14.

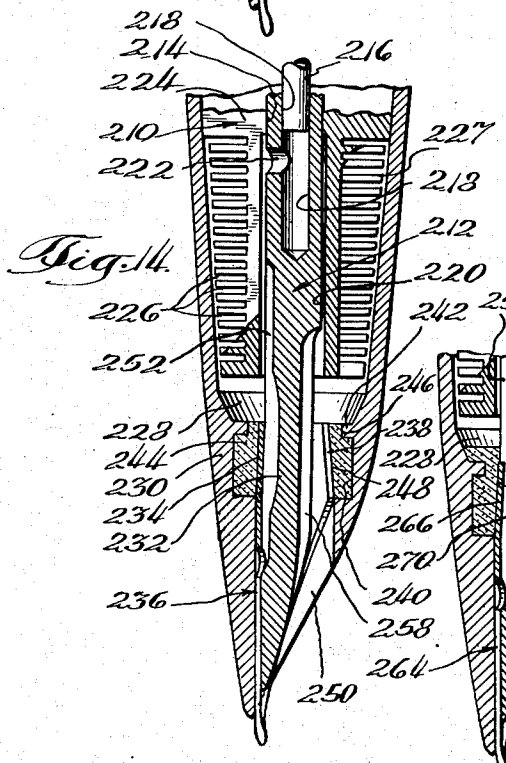
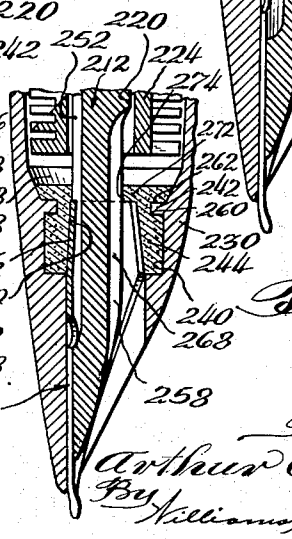


Fig. 15.



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Patented May 15, 1945 2,375,770

UNITED STATES PATENT OFFICE

2,375,770

FOUNTAIN PEN

Arthur O. Dahlberg, Scarsdale, N. Y.

Application November 19, 1943, Serial No. 510,902

31 Claims. (Cl. 120—52)

My invention relates generally to fountain pens and more particularly to an improved pen point and means for mounting the pen point in ink receiving communication with the ink reservoir. The present invention represents an improvement over my prior patented invention disclosed and claimed in Letters Patent No. 2,016.106, issued October 1, 1935.

One of the most expensive elements in a fountain pen is the pen point or nib, which necessarily has a relatively high content of gold in proportion to any other metals which may be used. The well known anti-corrosive characteristic of gold makes it an almost indispensable element in the manufacture of pen points for fountain pens. Any practical construction by which the amount of gold required is reduced is extremely desirable, provided the writing characteristics or usefulness of the pen are not impaired.

The assembly of the nib and the feed bar is an operation which at present usually requires a high degree of skill, and any method of assembling these parts which could be practiced by a less skilled workman would also reduce the cost of manufacture. My invention contemplates the formation of a nib having a shape complementary to the shape of the feed bar, which would automatically correctly position the nib on the feed bar when these parts are assembled.

It has become a custom among fountain pen manufacturers to guarantee their product for life or forever. To make a pen stand up under constant use for a long period of time, the manufacturers have made the pen point harder and stiffer, which makes writing with such a point less pleasant and more wearying. I have overcome this objection to guaranteed fountain pens by mounting the nib in such manner that the shock of writing is absorbed, yet without in any way restricting the flow of ink from the ink reservoir to the writing point. Furthermore, I have been able appreciably to reduce the cost of the nib by materially reducing its size and without impairing its utility in fountain pen constructions employing a capillary ink collector which is separate from the feed bar.

A patent issued in the name of Marlin S. Baker on December 3, 1940, No. 2,223,541, relates to a fountain pen which is marketed by The Parker Pen Company of Janesville, Wisconsin, under the trade name of "Parker 51." In the fountain pen of this construction, the nib has a shank of considerable length which is mounted within an ink collector to form capillary ink passages which, through other capillary passages, are in communication with the ink reservoir. My present invention is also an improvement over the "Parker 51" construction in that the shank of the pen nib may be relatively short and is mounted independently of the ink collector. This reduces the cost of manufacture of such pens without destroying any of the advantages gained by the type of construction illustrated in the Baker patent.

It is therefore an object of the present invention to obtain all of the advantages in fountain pen construction set out above, and to impart to the improved fountain pen the desired writing characteristics, while reducing the manufacturing costs.

Other objects and advantages will become apparent from the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a longitudinal cross sectional view of the lower half of a fountain pen embodying my invention;

Fig. 2 is a greatly enlarged plan view of the underside of the pen point mounted in the pen illustrated in Fig. 1;

Fig. 3 is a top plan view of the pen point and may be considered as taken on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged cross sectional view of the lower end of the pen of Fig. 1, taken on the same plane but looking in the opposite direction and showing another form of positioning the ink ducts in the feed bar;

Fig. 5 is a perspective view of the pen point;

Fig. 6 is a perspective view of the lower end of the feed bar illustrated in Fig. 4;

Fig. 7 is a longitudinal cross sectional view of a second embodiment of my invention, and illustrates the filling mechanism;

Fig. 8 is an enlarged cross sectional view taken on the line 8—8 of Fig. 7;

Fig. 9 is a cross sectional view of the lower end of the pen taken on the plane of the line 9—9 of Fig. 8;

Fig. 10 is a fragmentary side view of that portion of the barrel carrying the cap retaining ring;

Fig. 11 is a cross sectional view taken on the line 11—11 of Fig. 7;

Fig. 12 is a cross sectional view of the lower end of a fountain pen, illustrating another form of the pen point;

Fig. 13 is a cross sectional view of the lower end of a fountain pen similar to the pen of Fig. 1, but illustrating a modified construction;

Fig. 14 illustrates the shock absorber mounting of my invention and is a cross sectional view of the lower end of a pen; and

Fig. 15 is a view similar to Fig. 14, but showing a modified construction of the shock absorber mounting.

For a better and more complete understanding of the principles on which the ink collector operates, reference may be had to the aforementioned Baker patent and to Patent No. 2,187,528, issued January 16, 1940, to Russell T. Wing.

The fountain pen of my invention comprises a barrel section 20 forming an ink reservoir 22, which is adapted to be filled by a filling mechanism 24 (Fig. 7) of the character described in my prior Patent No. 1,904,358, issued April 18, 1933. This mechanism includes a flexible diaphragm 26 detachably secured at 28 to the upper end of the barrel and is actuated by a spring biased reciprocable plunger 30. A breather tube 32 completes the filling mechanism. Downward movement of the plunger 30 expands the diaphragm 26 and expels air from the reservoir, and upward movement sucks ink into the reservoir. The operation of reciprocating the plunger 30 may be repeated as often as is necessary to fill the reservoir 22, and is taught by my prior patent. The specific type of filling mechanism forms no part of my present invention, and any other suitable type may be used with equal facility.

Referring to Fig. 1, the ink feeding mechanism comprises an ink collector 34, a feed bar 36, a nib 38, and an outer shell 40. The barrel 20 is provided at its lower end with an extension 42 having a reduced outer diameter and threads at 44. (In this specification, and in the appended claims, the words "lower" and "upper" used in describing the various elements are to be considered with respect to a pen held in writing position—nearly vertical.) The shell 40 has internal threads at 46 and is adapted to be threaded onto the extension 42. A cap retaining ring 48 is held between end 50 of the shell 40 and a shoulder 52 formed on the barrel 20. A second shoulder 54 on the barrel restricts the inward movement of the cap which may be of the same type as that shown in the Baker patent.

The ink collector 34 is also of the type shown in the Baker patent, and functions according to the principles described therein and also in the Wing patent to prevent flooding of the pen under varying conditions of use. It is formed with an extension 56 which has a slip fit in a bore 58 in the extension 42 of the barrel 20. The ink collector 34 is provided with a plurality of circumferential fins 60, the spaces between which become progressively wider toward the lower end of the collector so that when ink is taken from these spaces they empty from the lower end of the collector toward the top. The extension 56 has a flattened portion 61 to create a primary capillary channel in communication with the reservoir 22. A capillary ink slot 62 is cut for approximately the full length of the ink collector 34 and is in communication with the channel formed by the flat portion 61 and also with the reservoir 22. It also provides a path for ink flow between the spaces formed between the fins 60. A slot 63, wider than the ink slot 62, is formed preferably on the opposite side of the collector, and provides a path for ink flow between the spaces formed between the fins 60. The collector is bored at 64 to receive the upper end of the feed bar in a sliding fit. A second and slightly larger bore 66 concentric with the bore 64 and surrounding the feed bar 36 is formed in the ink collector 34 and with the feed bar forms a channel 70, the function of which will become more fully apparent hereinafter.

The feed bar 36 receives the lower end of the breather tube 32 with a force fit in bore 68, the latter communicating with the air return channel 70 formed by the bore 66 and the surface of the feed bar 36 through a port 72.

On the feed bar 36, adjacent its lower end, is a frusto-conical portion 74. The feed bar 36 may be provided with a single capillary ink duct 76, as shown in Fig. 1, or two or more of them 78—80 (Figs. 4 and 6) which cut through the frusto-conical portion 74. At the lower end of the feed bar the ducts 76, or 78—80, communicate with the usual slit 82 formed in the nib 38, the slit 82 terminating in an opening 84, and receiving ink, in part by way of a capillary space 86. The capillary space 86 may be formed by a flat portion 88 on the end of the feed bar and beneath the nib, and may be closed at its lower end by a shoulder 90 on the feed bar, although the clearance between the nib and feed bar may provide an adequate ink conveying duct.

Ink is fed from the reservoir 22 to the writing tip by way of the capillary duct 62 in the ink collector, the spaces between the fins 60, channel 70, ducts 76 (or 78—80), and 86 in the feed bar, and slit 82 in the nib. The ink in the reservoir is replaced by air from an air space 92 which bubbles its way through the ink collector 34 and air duct 63 often forcing from the spaces between the fins 60 any ink which may have collected there. The air space 92 communicates with the atmosphere through a slot 94 in the underside of the feed bar 36 through the frusto-conical portion 74.

The nib 38, most clearly shown in Figs. 2, 3, and 5, has a shank 96 of frusto-conical shape, flaring outwardly toward the top through approximately one-third of its length. A longitudinal slot 98 is formed by the edges of the shank portion 96. At one side of the slot 98, one of the edges has a flange 102 bent inwardly toward the center of the shank. This flange 102 engages in a complemental recess 100 in the feed bar to assure exact angular alignment of the feed bar and nib. The flange 102, by its engagement in the recess 100 at the upper end of the frusto-conical portion 74, also determines the position of the nib longitudinally with respect to the feed bar. The pen nib is thus prevented from either angular or longitudinal displacement with respect to the feed bar and may be readily removed by flexing the nib to disengage the flange 102 from the recess 100. The nib 38 may be formed by stamping out the desired shape from a sheet and then rolling the blank thus formed in order to obtain the desired taper.

The shell 40 is provided with a frusto-conical seat 106 into which the shank 96 of the nib 38 is wedged. The seat 106 communicates with a bore 108 at the lower end of the shell which is formed with a portion overlying the nib, but spaced from it to provide a space permitting flexure of the nib. Some ink retained in the capillary space 110 aids in maintaining the nib in condition for instant writing action.

The fountain pen of my invention may be assembled rapidly and without requiring the services of a skilled craftsman. The ink collector 34 is slipped into the bore 58 at the lower end of the barrel 20. The breather tube 32 is positioned in the bore 68 and the frusto-conical shank 96 of the nib 38 is snapped in place with the flange 102 fitting in the recess 100. The feed bar and its associated parts are dropped into the shell 40 so that the shank 96 is securely wedged into its seat 106. The shell 40 is then screwed onto the barrel 20 with the ring 48 held in place, the feed bar sliding in the bore 64. The pen is easily disassembled for repairs or to change the pen points. After the shell has been removed, the nib may be changed by applying a drift pin or the like against a shoulder 111 on the underside

of the feed bar and gently tapping it to unseat the feed bar and nib from the seat 106. If it is necessary to clean out the ink reservoir 22, the ink collector 34 may be removed with ease. It is thus apparent that the feed bar 36, breather tube 32, and nib 38 constitute one assembly, while the ink collector 34 may either be separate or may constitute a part of the barrel assembly.

In the embodiment of my invention illustrated in Figs. 7 to 11, the barrel 20 may be of unitary construction throughout its entire length, or may be of the two-part construction illustrated. The barrel has an ink reservoir 22 and a filling mechanism 24 as previously described. The cap retainer 112 may, if required, be a split ring which may be opened up and slipped over the barrel 20. The pen is provided with an ink collector 116 which has the same function as the collector 34, but is threaded at 118 so as to be held in place in the shell 40. The collector 116 may be slotted at 122 to receive a screw driver or similar tool for positioning the collector 116 in the shell.

A relatively narrow ink duct 124 is cut approximately the entire length of the collector 116, and a relatively wide air duct is cut across the fins 60. Because the collector 116 is of slightly less diameter than the interior of the barrel 20, there is provided a capillary space 125 between the collector and the shell which may be used as a primary ink conductor for the capillary duct 124. The collector 116 has a plurality of circumferential capillary ducts 126 which become progressively wider toward the lower end of the collector, and it is provided with an internal bore 128. A feed bar 130 is inserted into the collector in bore 132 with which it may have a press fit. Bores 128 and 132 are concentric and the surface of the feed bar 130 with the surface of the bore 128 forms a capillary channel 134 which is in communication with the bore 136 in the upper end of the feed bar through the port 138; the breather tube 32 is pressed into the bore 136.

A bore 142 is formed in the lower end 140 of the shell 40 to receive the feed bar 130 in an ink sealing relationship. A second and larger bore 144 concentric with the bore 142, provides a space into which a nib 146 may be inserted. The nib 146 has a straight shank portion 148 and a slot 150 in the lower side thereof. The shank portion 148 is studded with indentations 156 which grip the end of the feed bar when the nib is positioned thereon. If preferred, the shank portion may be provided with a plurality of longitudinal ridges instead of indentations 156. The shank portion 148 has a normal diameter slightly less than the diameter of the end of the feed bar and when the shank is placed on the feed bar, it must be opened slightly. The nib, therefore, grips the feed bar sufficiently to prevent its being removed or displaced unintentionally.

A capillary duct 158 extends throughout the greater length of the feed bar 130 and communicates with the ink reservoir 22 through the capillary channel 134, capillary duct 124, and capillary space 125. The indentations 156 space the nib slightly away from the feed bar 130 to form a capillary space 160 under the nib which may be closed by the shoulder 162 at the end of the feed bar and which is in ink receiving communication with the duct 158. The capillary space 160 maintains the nib wet while the pen is not in use to facilitate instant writing when needed, and also provides an effective block to prevent leakage at this point. Air is restored to an air space 170 from the atmosphere through the air duct 166 which is cut in the underside of the feed bar from the lower end thereof to a point adjacent the lower end of the ink collector 116. From the air space 170 air bubbles through the collector when the pen is in use to replace the ink.

The nib 146 may be very readily changed in this embodiment of the invention, since it is unnecessary to remove any part other than the nib. As seen most clearly in Fig. 8, the indentations 156 (or ridges, if preferred) may be placed on the shank 148 in such a manner that the nib 146 may assume only one correct angular position relative to the feed bar without slipping off. If two series of indentations 156 (or two ridges) engage the feed bar at the edges of the channel 166, the shank 148 will tightly grip the feed bar and the nib is also accurately located. If it is desired, the lower end of the feed bar may, in addition, be provided with very shallow grooves to receive the indentations 156 and thus accurately position the nib. The nib 146 may be inserted to the point at which the end of shank abuts against the shoulder 168 forming a wall between the bore 144 and the air space 170.

The construction shown in Fig. 12 is similar to that shown in Figs. 7 and 9, except that nib 172 is provided with a straight, smooth shank portion 174 which is slotted at 176 on the underside thereof. The exterior surface of the shank frictionally engages the interior surface of the bore 144. The feed bar 130 is shaped so that its lowermost tip 178 rests against the underside of the nib adjacent the writing point. The shell 40 may be relieved sufficiently adjacent the tip of the nib to permit some flexure thereof.

The shank 174, when unconfined, has an outside diameter which is slightly greater than the inside diameter of the bore 144, and the nib is inserted between the surface of the bore 144 and the feed bar 130 by compressing it slightly while pushing it back against the shoulder 168. When the nib has been properly positioned longitudinally and angularly with respect to the bore, it may be released and the outer surface of the nib 172 frictionally engages the interior surface of the bore 144 and is thus held securely in position. The nib of this embodiment of my invention is readily removed for repairs or changing, and its manufacturing cost is low. It is to be understood, of course, that either of the nibs 146 and 172 may be mounted in a detachable shell portion similar to the shell 40, but the feed bar must be mounted relative to the ink collector 116 or 34, and not relative to a detachably mounted lower shell portion unless it is secured therein.

In the modification illustrated in Fig. 13, the ink collector 34 is spaced from the interior wall of the ink reservoir 22 slightly to provide a capillary space 179 which is in communication with the ink reservoir 22 and the capillary duct 62. To prevent the ink from leaking from the reservoir 22 directly into the air space 92 below the ink collector 34, the latter is provided with a flange 180 which has a slip fit in the shell 40 and is engaged by the lower end of the extension 42. The feed bar is a slip fit in the bore 64 of the ink collector 34 and the extent of the inward movement thereof may be limited by the shoulder 182. The breather tube 32 extends into the reservoir 22 through bore 184 in the collector 34 and is pressed into the bore 68 in the feed bar 36 in the manner described in connection with

Fig. 1. The longitudinal capillary duct 62 which is in communication with the capillary channel 70 and the ink reservoir 22, feeds ink to the capillary channel 70 surrounding the feed bar 36 and to the duct 76 cut in the upper surface of the feed bar.

Adjacent the lower end of the feed bar, a frusto-conical portion 186 is formed similar to the portion 74. The nib 188 has a frusto-conical shank portion 190 flaring outwardly toward the upper end thereof, and has a circumferential inwardly directed flange 192 which engages a shoulder 194 forming the upper end of the conical portion 186. The shell 40 is formed in a manner similar to Fig. 1, with a frusto-conical seat 198 into which the shank 190 and frusto-conical portion 186 of the feed bar are wedged. If desired, interengaging means on the feed bar and nib may be provided to determine their angular relationship.

Ink is fed to the writing tip from the duct 76, which is in ink receiving communication with the capillary channel 70, capillary duct 62, and capillary space 179. Air is supplied to the air space 92 from the atmosphere through a duct 204 formed in the underside of the feed bar 34.

In assembling the pen, the nib 188 is mounted on the lower end of the feed bar 36 and the breather tube 32 is pressed into the bore 68. The feed bar assembly is then wedged into the conical seat 198 in the lower end of the shell 40. The ink collector 34 is slipped over the end of the breather tube 32 and feed bar 36 so that its flange 180 slides within and engages the wall of the shell 40. The shell is then screwed on to the portion 42 of the barrel 20 and the feed bar 36 slides within the bore 64. The extension 42 of the barrel 20 forces the collector 34 into the shell 40 so that the flange 180 slides on the interior wall of the shell 40, sealing the air space 92 from the ink reservoir 22 and positioning the ink collector at the proper place within the shell 40. This assembly operation also tightly wedges the shank 190 of the nib 188 in the seat 198 from which it may be removed by placing a drift pin or the like against the shoulder 205 at the end of the air duct 204.

In Figs. 14 and 15, I have illustrated the "shock absorber" method of mounting the nib and feed bar in the lower end of the pen. As was pointed out in the introductory remarks to this specification, in the manufacture of fountain pens which are guaranteed for life or forever, it is customary to use a pen point which is stiffer and harder than those used in a conventional pen, to preclude their breaking, becoming damaged, or wearing out during the life of the guarantee. The guaranteed pens have a very harsh "feel" which tires the writer more rapidly than an ordinary fountain pen. To give the guaranteed pens the smooth writing characteristics desired in fountain pens, I mount the feed bar and nib in a "shock absorber" which in the embodiment shown takes the form of a sleeve of elastic and resilient material. I have found that the most desirable material for this use is elastic Vinylite because that material resists the corrosive action of ink and retains its elasticity even though it may be held in a deformed position for long periods of time. Furthermore, this material does not adhere to metal nor to the synthetic or plastic material from which the barrel may be made, which makes the removal of the nib relatively easy and does not necessitate the use of a new sleeve each time the nib is removed or changed. It is apparent that any other material which has the same characteristics may be used with equal facility, and it is not my intention to limit myself to the use of elastic Vinylite.

In the embodiment of Fig. 14, my novel fountain pen has an ink collector 210 which is mounted in the lower end of the ink reservoir in the same manner as the collectors 34 or 116. A feed bar 212 is slidably mounted in a bore 214 in the collector 210 and carries a breather tube 216 secured in a bore 218. A second bore 220 surrounds the feed bar and communicates with the breather tube 216 through a port 222 and with the ink reservoir through a capillary slot 224 cut longitudinally of the collector 210 and to one side thereof. The annular capillary spaces 226, which become progressively wider toward the lower end of the collector 210, communicate with the ink reservoir through the slot 220 and with an air space 228 formed within a shell 230, which may be similar to the shell 40.

The feed bar is formed with a tapered portion 232 to receive shank portion 234 of a nib 236. The shank 234 is complementally tapered to engage the tapered portion 232 and is slit at 238 to permit the narrow portion of the shank to be sprung over the wider portions of the feed bar.

An undercut bore 240 is provided in the lower end of the shell 230 adjacent the air space 228, there being a shoulder 242 extending around the inner end thereof. A sleeve 244 of ink resistant, resilient material, such as elastic Vinylite, is inserted into the bore 240 where it is retained by the shoulder 242 which fits into an annular groove 246 on the sleeve. The sleeve 244 is formed with a centrally located tapered opening 248 to grip the shank 234 of the nib, frictionally holding it in its seat.

The shell 230 is formed with an opening 250 to receive the nib 236 and the lower end of the feed bar 212.

The feed bar 212 has a capillary ink duct 252 communicating with the capillary slot 224 in the ink collector. An air duct 258 in the underside of the feed bar places the air space 228 in communication with the atmosphere.

In assembling the pen of Fig. 14, the nib is mounted on the assembly of the feed bar and breather tube 216; the resilient sleeve is inserted into the bore 240, and then the feed bar and nib are inserted into the opening 250, the tapered portion of the nib seating in the complemental bore of the sleeve 244. The ink collector 210 may then be inserted in the shell by sliding it over the breather tube 216 and feed bar 212, and the shell then secured to the barrel. Because the Vinylite sleeve does not lose its elasticity, the nib is firmly held in place but has imparted to it a slightly resilient feel during writing. The elasticity of the Vinlylite sleeve also renders the removal of the feed bar and nib very simple and permits repairs to be made readily.

It will be noted that the nib, in Fig. 14 as well as in other embodiments of the invention, terminates at the entrance to the air pocket. This construction is highly advantageous since it avoids the trouble of air-lock in the air passageway 258. The nib and feed bar may therefore be of lesser diameter than usually considered feasible, since even in the smaller diameters the passageway 258 can be made of adequate size to provide a reliable unobstructed path for flow of air to the air pocket 228. The saving in the amount of gold required for the smaller size nib is substantial.

In the embodiment shown in Fig. 15, the bore 240 in the shell 230 is provided with an annular shoulder 242, and the resilient sleeve 244 is formed with an annular recess 260 which receives the shoulder 242. An annular flange or lip 262 engages the upper side of the shoulder 242 to secure the sleeve 244 in place. A nib 264 having a tapering shank 266 engages a tapered portion 268 on the feed bar 212. I have found the most desirable taper to be approximately 1½°. The tapered shank 266 and tapered portion 268 of the feed bar are mounted in a tapered opening 270 in the sleeve 244 and are held therein, the feed bar by an internal flange 272 on the sleeve 244 and the tapered shank of the nib by the inner surface 270 of the sleeve 242. The feed bar 212 is formed with the ink duct 252 communicating with the nib 264. An air duct 268 is provided on the underside of the feed bar. The assembly of this construction is similar to the construction illustrated in Fig. 14. In view of the improved writing qualities, the saving in gold necessary for the nib, and in view of the ready replaceability of the nib, the constructions of Figs. 14 and 15 represent preferred forms of the invention.

It is not essential that the nib have the tapered shank portion in the constructions shown in Figs. 14 and 15. Instead, the shank may be cylindrical, since the frictional grip of the elastic sleeve 244 will be adequate to hold the nib in its correct position.

The "shock absorber" mounting has been illustrated in connection with a pen having a shell portion which encloses the ink collector and feed bar. Other settings for this mounting may be used. For instance, the mounting may be incorporated in a more conventional fountain pen having a detachable nib holder or section, or in a pen having a unitary barrel construction.

It will be apparent to those skilled in the art that numerous modifications and changes may be made other than those which have been described and illustrated herein. For example, I have shown several forms of constructing and mounting the pen nib relative to the feed bar and the shell, and several methods of mounting the ink collector in the barrel. It is readily understood that many combinations of these forms may be made by those skilled in the art without departing from the essential ideas which I have set forth herein. I have found a nib with a very short shank portion to effect a considerable saving in material. By mounting such nib at the end of the feed bar and having the opposite end of the feed bar projecting into the ink collector, traversing the intermediate air pocket, excellent feed of ink to the nib is obtained.

It will be observed that, in the various embodiments of the invention disclosed herein, the nib may be aligned with the shell, as contrasted with prior constructions in which the nib was carried by and rotatable with the ink collector. Thus in my improved constructions the nib may readily be removed and replaced without disturbing the position of the collector.

The embodiment of the invention shown in Fig. 12 is disclosed and claimed in my copending divisional application, Serial No. 575,043, filed January 29, 1945.

While I have shown and described particular embodiments of my invention, it will be apparent that numerous variations and modifications thereof may be made without departing from the underlying principles of the invention. I therefore desire, by the following claims, to include within the scope of my invention all such variations and modifications by which substantially the results of my invention may be obtained through the use of substantially the same or equivalent means.

I claim:

1. In a fountain pen, the combination of a barrel having an ink reservoir therein, an ink collector having one end positioned at the lower end of said ink reservoir, a feed bar having a sliding fit in said collector, a nib mounted at the lower end of said feed bar and spaced from said collector to provide an air space, and means placing said nib in ink receiving communication with said collector and said ink reservoir.

2. In a fountain pen, the combination of a barrel having an ink reservoir therein, a hollow ink collector having one end positioned at the lower end of said ink reservoir, a capillary ink duct in said collector extending substantially the full length thereof, a feed bar fitted in said collector and forming therewith a capillary ink conducting means, a nib mounted at the lower end of said feed bar and spaced from said collector to provide therebetween an air space of substantial volume, and means placing said nib in ink receiving communication with said capillary ink conducting means.

3. In a fountain pen, the combination of a barrel having an ink reservoir therein, and an ink feeding mechanism in communication with said ink reservoir comprising, a member having a central opening therein, a capillary duct extending almost the full length of said hollow member and in communication with the central opening, a feed control element having one end thereof having a sliding fit in said hollow member and the other end thereof protruding therefrom, the surface area of said feed control element forming with the wall of said opening a capillary space, a nib mounted at the lower end of said feed control element and spaced from said member to provide an air space therebetween, and means placing said nib in ink receiving communication with said capillary space.

4. In a fountain pen, the combination of a barrel having an ink reservoir therein, an ink feeding mechanism in ink receiving communication with said ink reservoir comprising an ink collector, a capillary duct in said ink collector extending almost the full length thereof, an internal bore in said collector in communication with said duct, a feed bar having one end in said bore and forming therewith a capillary space, said feed bar being readily separable from said collector, a nib mounted at the lower end of said feed bar and spaced from said ink collector, and a capillary duct in said feed bar connecting said capillary space and said nib.

5. In a fountain pen, the combination of a barrel having an ink reservoir therein, a shell portion, a nib having its shank portion enclosed within said shell portion, and an ink feeding mechanism enclosed within said barrel and said shell portion comprising, a hollow member having a central opening therein and positioned with one end thereof in the lower end of said ink reservoir, a capillary duct in said hollow member extending approximately the length thereof and in communication with said opening, a feed bar projecting freely into said opening and forming therewith a capillary space, said feed bar having a capillary groove therein and having its lower terminus adjacent said nib, said nib being spaced from said hollow member to provide

an air space, a passageway connecting said air space with the atmosphere, and means placing said nib in ink receiving communication with said capillary space.

6. In a fountain pen, the combination of a barrel having an ink reservoir therein, a shell portion detachably mounted on the lower end of said barrel, a nib receiving space formed in the lower end of said shell portion, a nib positioned in said space, and an ink feeding mechanism enclosed within said barrel and said shell portion comprising, an ink collector positioned with one end thereof in said ink reservoir and having a central opening therein, a capillary duct extending lengthwise of said collector and in communication with said opening, a feed bar extending freely into said opening and forming therewith a capillary passageway, said feed bar having its lower terminus adjacent the tip of said nib and providing a capillary passageway forming the sole means for conducting ink from said collector to said nib.

7. In a fountain pen having an ink reservoir, a hollow ink collector positioned with one end in the lower end of said reservoir, a nib, and means mounting said nib spaced a substantial distance longitudinally from said collector and in ink receiving communication therewith comprising, a feed bar having one end thereof within said collector, means mounting said nib at the opposite end of said feed bar with the writing tip protruding beyond the end of said feed bar, and a capillary duct in said feed bar to conduct ink from said collector to said nib.

8. In a fountain pen having an ink reservoir, a hollow ink collector positioned at the lower end of said reservoir, a nib, a feed bar mounted with one end projecting freely into said ink collector and the other end adjacent said nib, means for feeding ink from said reservoir to said nib, and means for positioning said nib on said feed bar comprising, a conical shank portion on said nib, a conical portion on said feed bar adapted to be engaged by said shank portion, and means preventing longitudinal displacement of said nib relative to said feed bar.

9. In a fountain pen having an ink reservoir, a hollow ink collector positioned at the lower end of said reservoir, a nib, a feed bar mounted with one end projecting freely into said ink collector and the other end adjacent said nib, means for feeding ink from said collector to said nib, and means for positioning said nib on said feed bar with the nib spaced a substantial distance from said collector comprising, a conical shank portion on said nib, a conical portion on said feed bar adapted to be engaged by said shank portion, and means preventing longitudinal and angular displacement of said nib relative to said feed bar.

10. In a fountain pen having an ink reservoir, an ink collector, a feed bar, a nib spaced apart from said collector, and means mounting said nib on the lower end of said feed bar comprising, a conical shank portion formed on said nib, a complemental conical portion on said feed bar receiving and engaging said conical shank, a recess in said conical portion of said feed bar, and means formed on said nib and projecting into said recess to prevent angular displacement of said nib relative to said feed bar.

11. In a fountain pen having an ink reservoir, an ink collector communicating with said reservoir, a feed bar, a nib spaced apart from said collector, and means mounting said nib on the lower end of said feed bar comprising, a conical shank portion formed on said nib, a complemental conical portion on said feed bar receiving and engaging said conical shank, a shell surrounding said collector and having wedging engagement with said feed bar and nib, and means for preventing rotation of said nib with respect to said feed bar and shell assembly.

12. In a fountain pen having an ink reservoir, an ink collector, a feed bar, a nib spaced apart from said collector, and means mounting said nib on the lower end of said feed bar comprising, a conical shank portion formed on said nib, a complemental conical portion on said feed bar having a shoulder at one end thereof and receiving and engaging said shank, and means formed on said nib to engage said shoulder to prevent longitudinal displacement of said nib relative to said feed bar.

13. In a fountain pen having an ink reservoir, an ink collector, a feed bar, a nib spaced apart from said collector, and means mounting said nib on said feed bar comprising, a conical shank portion formed on said nib, a complemental conical portion on said feed bar having a shoulder at one end and receiving said shank, a recess in said conical portion of said feed bar, and means formed on said shank to engage in said recess to prevent angular displacement of said nib relative to said feed bar and to prevent longitudinal displacement of said nib relative to said feed bar.

14. In a fountain pen, in combination, a barrel forming an ink reservoir, an ink collector communicating with said reservoir, a feed bar, a nib spaced apart from said collector and mounted at the lower end of said feed bar, a shell detachably mounted on the lower end of said barrel and enclosing said ink collector, said feed bar and said nib, and means mounting said nib comprising, a tapered seat in the lower end of said shell, a tapered portion on said feed bar, and a tapered shank on said nib secured between said tapered seat and said tapered portion on said feed bar.

15. In a fountain pen, in combination, a barrel forming an ink reservoir, an ink collector, a feed bar, a nib spaced apart from said collector and mounted at the lower end of said feed bar, a shell detachably mounted on the lower end of said barrel and enclosing said ink collector, said feed bar and said nib, means mounting said nib comprising, a tapered seat in the lower end of said shell, a complementally tapered portion on said feed bar, and a tapered shank on said nib clamped between said tapered seat and said tapered portion on said feed bar, and means preventing longitudinal and angular displacement of said feed bar relative to said nib.

16. As a new article of manufacture, a fountain pen nib having a shank portion, said shank portion being tapered and provided with a slot throughout its length on the underside thereof, and an inwardly directed arcuate flange integral with said shank portion.

17. In a fountain pen, the combination of a barrel having an ink reservoir therein and an air space in a shell cup located below said ink reservoir, a hollow ink collector disposed in said shell cup with one end in said ink reservoir and the opposite end in said air space, a feed bar with the upper end thereof projecting freely into said ink collector and the lower end protruding from the lower end of said shell, a nib receiving space formed in the lower end of said shell, a nib longitudinally spaced from said collector and detachably secured in said space, and a capillary channel formed between said ink collector and said

feed bar to place the lower end of said feed bar and said nib in ink receiving communication with said ink reservoir.

18. In a fountain pen, in combination, a barrel with a shell having a nib receiving seat at its lower end, a complementally formed nib positioned in said seat, a feed bar securing said nib against said seat, an ink collector mounted in said barrel and freely receiving the upper end of said feed bar, said ink collector dividing said barrel into two chambers, the upper of said chambers comprising the ink reservoir, and duct means formed in said ink collector and in said feed bar to conduct ink from said reservoir to said nib.

19. In a fountain pen having a nib, a finger grip portion hollow at its upper end overlying said nib, and means mounting said nib in said finger grip portion, comprising, a bore in the lower end of said grip portion, a wall separating said bore from the upper end of said grip portion, an opening in said wall connecting said bore and the hollow upper end of said grip portion, and a feed bar extending through said opening, said nib frictionally engaging said feed bar and abutting said wall.

20. In a fountain pen having a feed bar, a nib mounted at the lower end of said feed bar, a shank portion on said nib having a longitudinal slot extending the length thereof on the underside of said nib, a plurality of inwardly projecting indentations on said shank portion engaging said feed bar to space said nib from said feed bar to form a capillary area between said nib and said feed bar.

21. As a new article of manufacture, a nib having a shank portion, a longitudinal slot in the underside of said shank portion, and a plurality of inwardly projecting indentations in said shank portion.

22. In a fountain pen, in combination, a barrel having an ink reservoir therein, an ink collector having one end thereof at the lower end of said ink reservoir, a shell portion enclosing said ink collector and mounted on said barrel, and a flange on said collector abutting the lower end of said barrel and slidably engaging the inner wall of said shell portion to position said collector within said shell portion when said shell portion is mounted on said barrel.

23. In a fountain pen, in combination, an ink reservoir, an ink collector having one end thereof in said reservoir, a feed bar, a nib mounted at the lower end of said feed bar, a shell portion enclosing said ink collector and said feed bar and overlying said nib, and a mounting for said nib carried by said shell portion including a sleeve of ink resistant resilient material gripping the shank portion of said nib.

24. In a fountain pen having a shell, a feed bar contained therein, a nib mounted at the lower end of said feed bar with the writing tip thereof protruding from said shell, and means for mounting said nib including a sleeve of ink resistant resilient material gripping the shank portion of said nib and secured in said shell portion.

25. In a fountain pen, a feed bar, a nib mounted at the lower end of said feed bar, an element surrounding said feed bar, and means mounting said nib in said element including a sleeve of ink resistant, resilient and elastic material gripping the shank portion of said nib and secured in said element.

26. In a fountain pen, a feed bar, a nib mounted at the lower end of said feed bar, an element surrounding said feed bar, and means mounting said nib in said element including a sleeve of elastic Vinylite gripping the shank portion of said nib and secured in said element.

27. In a fountain pen, a shell, a feed bar enclosed therein, a nib mounted at the lower end of said feed bar with the writing tip thereof protruding from said shell, and means mounting said nib comprising, a tapered shank portion on said nib, a complementally tapered portion on said feed bar receiving said tapered shank, a bore in said shell adjacent the lower end thereof, a sleeve of ink resistant resilient and elastic material surrounding and gripping said tapered shank portion of said nib, and means retaining said sleeve in said bore.

28. In a fountain pen, a shell portion, a feed bar enclosed within said shell portion, a nib mounted at the lower end of said feed bar with its writing tip protruding from said shell portion, and means mounting said nib comprising a tapered shank portion on said nib, a complementally tapered portion on said feed bar receiving said tapered shank, a bore in said shell portion adjacent the lower end thereof, a shoulder on the inner periphery of said bore, a sleeve of ink resistant resilient material in said bore, said sleeve having a tapered opening therethrough to receive and grip said tapered shank, and means formed in said sleeve to engage said shoulder.

29. In a fountain pen, a shell portion, a feed bar enclosed within said shell portion, a nib mounted at the lower end of said feed bar with its writing tip protruding from said shell portion, and means mounting said nib comprising, a sleeve of ink resistant resilient material in said shell surrounding and gripping said shank portion of said nib, means formed on said sleeve also to engage said feed bar, and means retaining said sleeve in said bore.

30. In a fountain pen, a shell, a feed bar enclosed therein, a nib mounted at the lower end of said feed bar, and means mounting said nib comprising a shank portion on said nib, a portion on said feed bar receiving said shank, a bore in said shell adjacent the lower end thereof, a shoulder on the inner periphery of said bore, a sleeve of ink resistant resilient material positioned in said bore and having an opening therethrough to receive and grip said shank and an annular groove in said sleeve to receive said shoulder retaining said sleeve in said bore.

31. In a fountain pen, a shell, a feed bar enclosed therein, a nib mounted at the lower end of said feed bar, and means mounting said nib comprising a tapered shank portion on said nib, a complementally tapered portion on said feed bar receiving said tapered shank, a bore in said shell adjacent the lower end thereof, a shoulder on the inner periphery of said bore, a sleeve of ink resistant resilient material positioned in said bore and having an opening therethrough to receive and grip said tapered shank, and an annular groove in said sleeve to receive said shoulder retaining said sleeve in said bore.

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