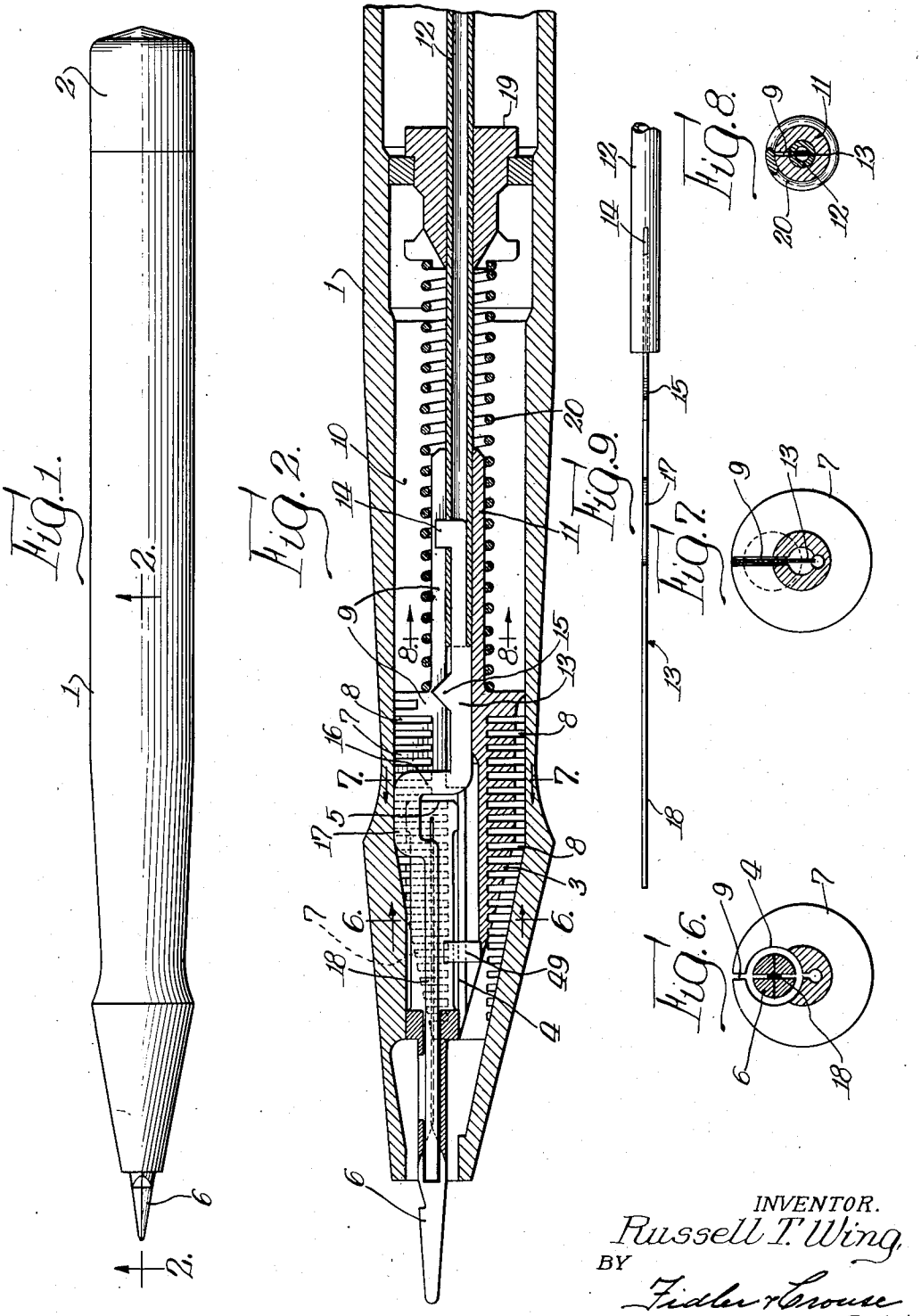
Jan. 8, 1952 R. T. WING 2,581,740

FOUNTAIN PEN

Filed March 27, 1946 4 Sheets-Sheet 1



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FOUNTAIN PEN

Filed March 27, 1946 4 Sheets-Sheet 2

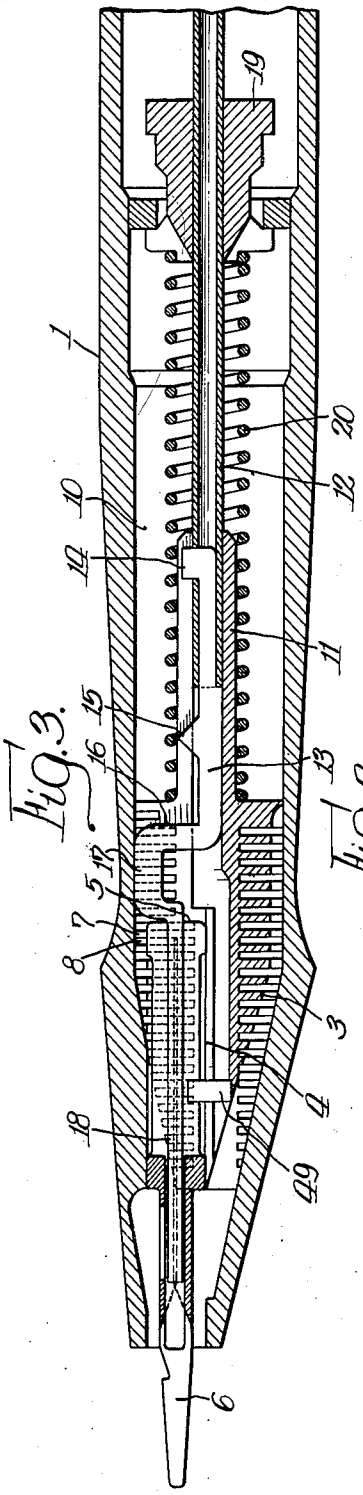

Fig. 3.

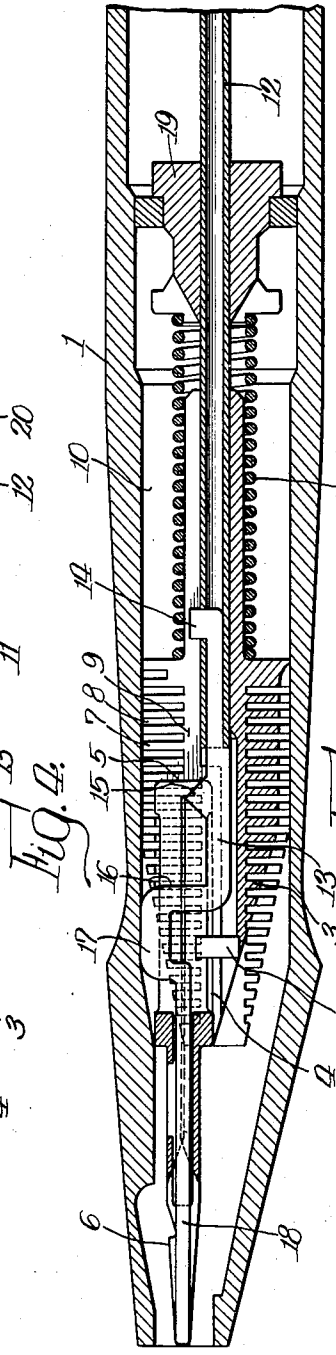

Fig. 4.

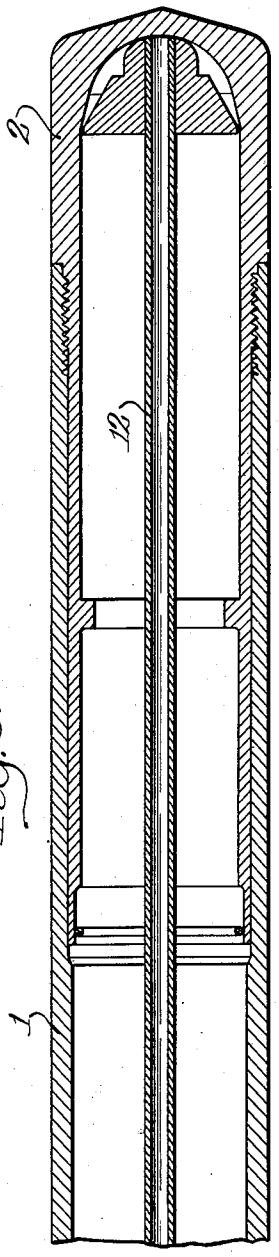

Fig. 5.

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FOUNTAIN PEN

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Fig. 10.

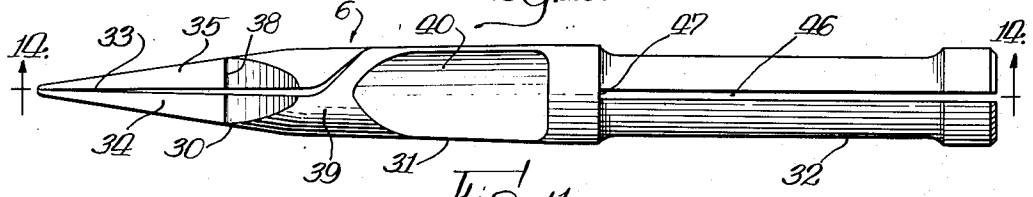


Fig. 11.

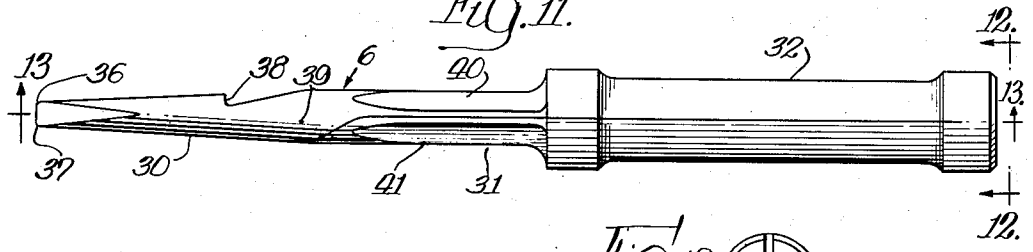


Fig. 12.

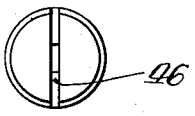


Fig. 13.

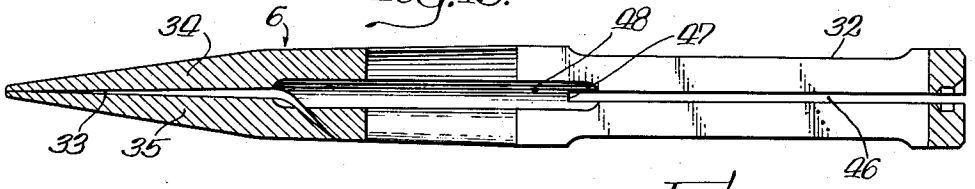


Fig. 14.

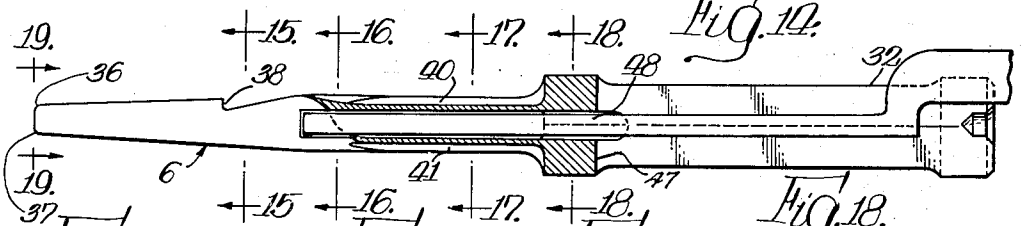


Fig. 15.

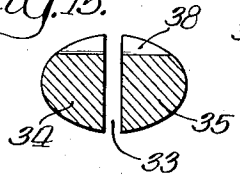


Fig. 16.

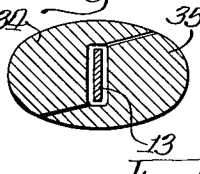


Fig. 17.

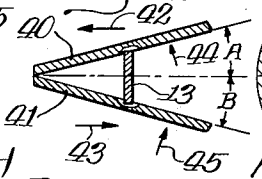


Fig. 18.

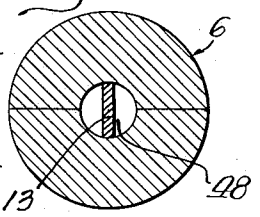


Fig. 17a.

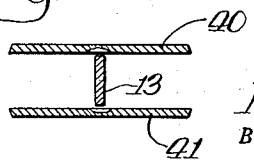
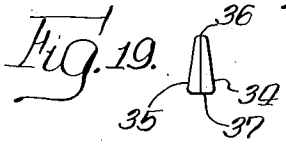


Fig. 19.



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FOUNTAIN PEN

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Fig. 20.

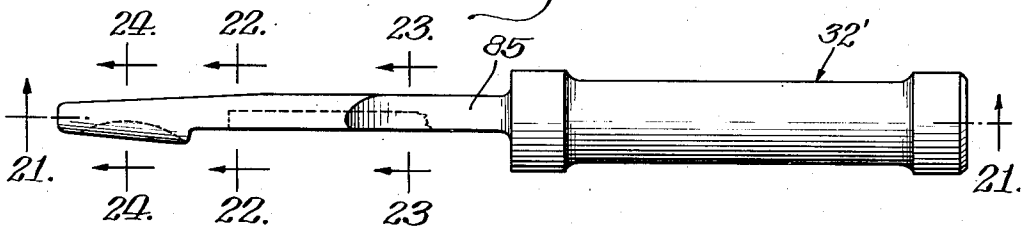


Fig. 21.

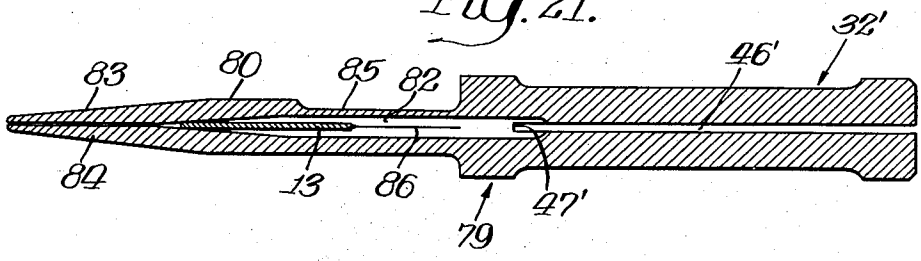


Fig. 22.

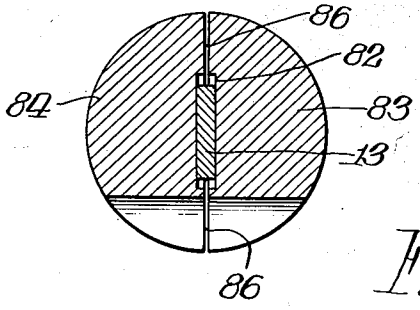


Fig. 23.

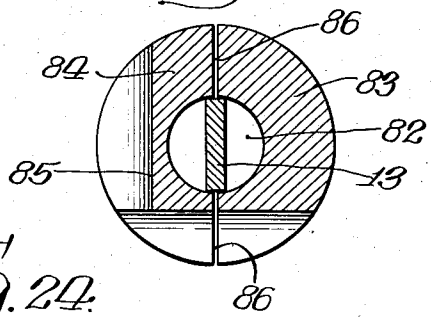
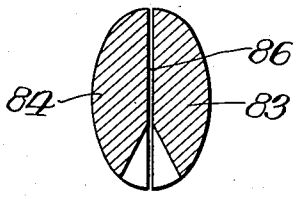


Fig. 24.



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Patented Jan. 8, 1952

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UNITED STATES PATENT OFFICE

2,581,740

FOUNTAIN PEN

Russell T. Wing, Excelsior, Minn.

Application March 27, 1946, Serial No. 657,509

4 Claims. (Cl. 120—42)

1

This invention relates to fountain pens and has to do more particularly with a fountain pen which will operate successfully with India ink and is, therefore, capable of being employed as a drafting pen. It further relates to a novel drafting pen nib and to a pen nib which can be used in place of the drafting nib for writing or lettering.

Reference is made to my copending application Serial No. 26,898, filed May 13, 1948, forming a division of the present application and disclosing and claiming certain subject matter disclosed in this application.

One of the primary objects of my invention is to provide means effective to obviate or offset the tendency of India ink quickly to clog the capillary feed channel which necessarily is employed in all fountain pens—thus making it possible to provide a fountain pen which will operate successfully with that kind of ink, or with any other ink.

Another object is to provide a successful fountain ruling pen.

A further object is to provide a fountain ruling pen which can easily be kept in continuous operation for relatively long periods and which also is readily adapted for quick adjustment as to line width.

Still another object is to provide a drafting or ruling pen nib which can be used successfully as a component part of my new fountain pen.

An additional object is to provide a flexible pen nib of small diameter suitable for writing and lettering and which is not disposed to chatter.

Another object is to provide a flexible fountain pen nib which is suitable for writing and lettering and which can be used in my new fountain pen in place of the drafting nib.

I have found that by providing a suitable cleaner element which is mounted in and movable lengthwise of the capillary feed channel, it is possible and practicable to clear said channel whenever it becomes obstructed by reason of the ink congealing or partially congealing therein; and by virtue of such provision I am able to produce a fountain pen which can successfully be used with India ink and the like.

In carrying out my invention I prefer to utilize a novel arrangement which brings about a movement of the cleaner element along the feed channel in response to pressure applied to the end of the pen nib—thus enabling a user to quickly and easily clear the feed channel whenever it becomes clogged.

I also prefer, in carrying out my invention, to employ a novel construction wherein the cleaner

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element is utilized for adjusting the drafting pen nib to effect any desired line width within its range.

Other and further objects of my invention will be apparent as the detailed description progresses.

Referring to the drawings:

Figure 1 is an elevational view of a fountain pen in accordance with my invention;

Fig. 2 is an enlarged, longitudinal, sectional view taken along line 2—2 of Fig. 1;

Fig. 3 is identical with Fig. 2 except that the nib adjusting and cleaner tongue is shown in its most retracted position;

Fig. 4 is a view similar to Figs 2 and 3 except that in this instance the pen nib and overflow governor are shown in their retracted positions;

Fig. 5 is an enlarged, longitudinal, sectional view of that portion of the pen of Fig. 1 which is to the rear of that shown in Figs. 2–4, inclusive;

Fig. 6 is a transverse sectional view taken along line 6—6 of Fig. 2;

Fig. 7 is a transverse sectional view taken along line 7—7 of Fig. 2;

Fig. 8 is a transverse sectional view taken along line 8—8 of Fig. 2;

Fig. 9 is an edgewise detail view of the nib adjusting and cleaner tongue;

Fig. 10 is an elevational view of a writing and lettering pen nib intended for use in the fountain pen of Figs. 1–9;

Fig. 11 is a right projection or sidewise elevational view of the same pen nib;

Fig. 12 is a rear endwise view of the same nib, taken at 12—12 of Fig. 11;

Fig. 13 is a longitudinal sectional view taken along line 13—13 of Fig. 11;

Fig. 14 is a longitudinal, sectional view taken along line 14—14 of Fig. 10 but with the forward portion of the cleaner tongue of Fig. 2 also shown;

Fig. 15 is a transverse section taken along line 15—15 of Fig. 14;

Fig. 16 is a transverse section taken along line 16—16 of Fig. 14;

Fig. 17 is a transverse section taken along line 17—17 of Fig. 14;

Fig. 17a is a transverse section taken at 17—17 of Fig. 14, but illustrating a modification wherein the leaf springs of the resilient portion of the nib are disposed in parallel in the horizontal plane;

Fig. 18 is a transverse section taken along line 18—18 of Fig. 14;

Fig. 19 is an endwise view taken at 19—19 of Fig. 14;

Fig. 20 is an elevational view of a drafting nib intended for use in the fountain pen of Figs. 1–5;

Fig. 21 is a view taken along line 21—21 of Fig. 20;

Fig. 22 is a greatly enlarged transverse sectional view taken along line 22—22 of Fig. 20;

Fig. 23 is a greatly enlarged transverse sectional view taken along line 23—23 of Fig. 20; and

Fig. 24 is a greatly enlarged transverse sectional view taken along line 24—24 of Fig. 20.

The pen structure of Figs. 1 to 9, inclusive, comprises an elongate barrel 1, into the rear end of which is screwed a cup-like piston 2 (see Fig. 5). Mounted in the forward end of the barrel 1 and normally assuming the position in which it is shown in Figs. 2 and 3 is an overflow governor and feed element 3 having a lengthwise bore 4 extending from the front end thereof to the point 5 and proportioned to receive snugly the shank of a pen nib 6, which is shown in detail in Figs. 10–19, inclusive.

The governor 3 has a considerable number of radial fins 7 spaced apart to form intervening narrow capillary cells 8 which constitute, jointly, an auxiliary reservoir for the reception and storage of ink which may be forced out of the main reservoir in excess of what is required for writing—said cells being operative, when filled, to feed out the stored ink to the nib. Extending from end to end of the governor on the upper side thereof, as viewed in Fig. 2 is a narrow radial slot 9. This can be seen in the sectional views, Figs. 6 and 7. Slot 9 functions as a capillary conduit through which ink from the reservoir 10 is conveyed to nib 6 and also to the capillary cells 8. Governor 3 has a rearwardly extending shank 11 which is bored axially to receive a breather tube or fill stem 12, the front end of which is slidably telescoped in said bore. Projecting forwardly from tube 12 and anchored thereto is a sheet metal tongue 13, shown edgewise in Fig. 9. Tongue 13 is secured to tube 12 by means of a laterally extending lug 14 which projects through an opening in the wall of said tube. This lug also serves to break up any obstruction due to congealed ink or foreign matter in that part of slot 9 which extends along the shank 11. Another lug 15 projecting laterally from tongue 13 also functions to break up obstructions in slot 9. Tongue 13 has a laterally extending portion 16 which is designed to enter a slot 46 (see Fig. 10) in the shank of the pen nib and is effective to break up obstructions therein when the pen nib is moved rearwardly as hereinafter described. Tongue 13 also has a portion 17 which lies in slot 9 above the shank of the pen nib and serves to break up obstructions in slot 9 near the open edge thereof. Tongue 13 further includes a long, narrow portion 18 which lies within the pin nib and extends lengthwise thereof. This portion serves both to break up obstructions inside the pen nib and also to effect line width adjustments of the nib when the nib is of the type shown in Figs. 20 to 24—which is a drafting or ruling nib.

Breather tube or fill stem 12 extends all the way to the rear of the pen, (see Fig. 5), and normally abuts the inside of the end wall of piston 2. A valve 19 is fixedly mounted on tube 12 and forms an abutment for helical spring 20 which, in turn, presses forwardly against governor 3.

The valve 19 forms a part of the subject matter

of my co-pending application, Serial No. 655,077 filed March 18, 1946, which has matured into Patent No. 2,509,465, dated May 30, 1950. It has no essential significance so far as the present invention is concerned, although it is used in conjunction therewith.

As previously stated, the fountain pens of the present invention are designed primarily for use with India ink which has a distinct tendency to congeal rather quickly and, for that reason, is indisposed to continue to flow freely and continuously in a channel of capillary dimensions. To meet that situation, the pen of Figs. 1 to 9 is so designed that by pressing inwardly on the nib, the latter is caused to recede, together with governor 3, as clearly illustrated in Fig. 4. During this operation cleaner tongue 13 remains stationary while the governor and nib move relatively thereto. The rearward movement of the governor is opposed by spring 20 which operates to return the governor and nib to normal position as soon as the retractive pressure on the nib is removed. The backward and forward movement of the governor and nib relatively to the stationary cleaner tongue serves to stir up the partially congealed ink in the capillary feed channels of both the governor and the nib and this causes the ink again to flow. In using the pen the operator from time to time, as required, presses the end of the nib against some convenient firm surface.

The nib 6 is depicted in detail in Figs. 10 to 19 and will now be described. But before entering upon such description, it should be explained that this is a writing or lettering nib and not a drafting nib, and that the primary underlying object is to provide a pen of very small dimensions laterally, which will write without chattering and which will spread at the point (if shading is desired) and which is rugged enough to withstand being pressed into the barrel without suffering impairment, and is adapted to accommodate the cleaner tongue.

For purposes of description, nib 6 may conveniently be considered as comprising three major parts, namely: a front portion 30, a resilient intermediate portion 31 and a rigid shank portion 32. Fig. 10 is a view looking downwardly on the nib, as it is held when writing; and it will be seen from inspection of this view and of the sectional view, Fig. 15, that the front portion 30 has a vertical slit 33 which divides said front portion symmetrically and constitutes an ink feed channel. The two nib sections or blades 34 and 35 which result from slitting the front portion are of solid cross-section, as shown in Fig. 15. Said blades are preferably formed at their ends as shown in Fig. 19, from which it will be seen that there is a narrow contact surface or writing point at 36 and a relatively broad contact surface at 37. The blades are so formed in order to provide a fine writing point at 36 and a broad writing point at 37. However, it is not essential that this feature be retained. That is to say, the end of the nib could, if desired, be so formed as to provide two identical writing points.

The notch 38 is provided merely to facilitate obtainment of a firm hold on the nib for withdrawing it from the governor.

In use it is generally desirable that the blades 34 and 35 spread apart in response to writing pressure just as an ordinary nib spreads when writing. But if the present nib, being very small laterally (the shank is about one-sixteenth inch maximum diameter), were constructed in the

manner of an ordinary pen nib, it would chatter very badly and would for that reason be quite unsatisfactory. To meet that situation, I have provided a resilient intermediate portion 31 which is so consrtucted that it permits the nib to flex and the blades to spread, and yet is so rigid laterally at the place where rigidity is needed that chattering is avoided. Putting the matter another way, I obtain the effect of a non-chattering broad mid-portion within small dimensional limits. To achieve that end, I twist the nib ninety degrees at the point 39, and I form the two blades at the intermediate portion 31 into flat springs, or the equivalent, as best illustrated in Fig. 17. The two leaf springs 40 and 41 are, respectively, continuations of blades 34 and 35; and said springs are so disposed as to the planes in which they lie, flatwise (see Fig. 17), that they have components of flexure laterally in opposite directions. In other words, when writing pressure is applied to the end of the nib, spring 40 has a component of flexure in the direction indicated by arrow 42, while spring 41 has a component of flexure in the direction of arrow 43; but the principal components of flexure are in the directions indicated by the arrows 44 and 45—which is to say, nearly vertical. Thus, springs 40 and 41 will yield to writing pressure and produce a desirable degree of spreading of the nib at the writing point, yet each of said springs is so wide in the horizontal plane that chattering is avoided, while at the same time the springs are confined within a very constricted area cross-sectionally. This results from the fact that the springs are positioned one above the other—which is made possible by the ninety degree twist at 39.

The flatwise planes of springs 40 and 41 as viewed in Fig. 17 are disposed at angles A and B to the horizontal plane—which angles may be, for example, fifteen degrees each, depending upon the extent to which it is desired that the blades spread apart in response to writing pressure. Angles A and B may be anything from zero, as shown in Fig. 17*a*, to say forty-five degrees. If said angles are of zero magnitude, the blades will not spread in response to writing pressure. On the other hand, if said angles are too large, there may be a tendency for the pen to chatter. Moreover, by making said angles larger, the widthwise dimension of the springs is incidentally decreased, if the over-all diameter of the nib is to be kept within a specified limit, and that, of course, would tend to detract from the non-chattering characteristic of the nib. Generally speaking, angles A and B of fifteen degrees each, or somewhat less, are satisfactory when it is desired to produce a nib which will spread; but there is nothing particularly critical about that angular value. If it is desired merely to realize flexibility without any spreading at the point of the nib, the springs 40 and 41 may be disposed one above the other in parallel horizontal planes as depicted in Fig. 17*a*.

The cross-sectional view of Fig. 16 is taken at a point where blades 34 and 35 are undergoing twist. From that point rearwardly the blades gradually change in cross-sectional configuration until they assume the rectangular form of springs 40 and 41.

The shank 32 of the nib has a lengthwise slot 46 (Fig. 10) for accommodation of the cleaner tongue 13—see Fig. 4. And said slot extends forwardly to the point 47 where it connects with an axial bore 48 which is of sufficient size, cross-sectionally, at all points to clear the cleaner tongue. In each of the cross-sectional views of

Figs. 16, 17, 17*a* and 18 cleaner tongue 13 is shown.

It is to be noted that when using the nib of Figs. 10 to 19, tongue 13 does not function to spread the blades of the nib except as an incident to clearing obstructions. It performs its nib adjusting function only when using a drafting nib such as that of Figs. 20 to 24, inclusive.

Nib 6 is prevented from rotating by means of a pin 49 which is secured in the governor and is flattened to enter slot 46.

Movement of tongue 13 to effect adjustment of a drafting nib is accomplished by partially unscrewing piston 2—see Fig. 5. Tube 12 is thus caused to recede under the pressure exerted by spring 20, and this effects a corresponding retraction of tongue 13.

In referring to the "vertical plane" as respects the pen nib of Figs. 10–19, I mean the plane along which Fig. 14 is taken; and in referring to the "horizontal plane" I mean the plane along which Fig. 13 is taken.

The drafting nib 79 illustrated in Figs. 20 to 24 may be substituted for the lettering nib 6 of Figs. 10 to 19. The nib 79 includes a forward portion 80 and a shank portion 32' substantially identical with the shank 32 of nib 6. The various reference numerals applied to the shank 32' correspond to those applied to the shank 32 but with prime indications.

The forward portion of nib 79 is divided lengthwise by nib slits 86 to form a pair of complementary tines or blades 83 and 84 similar to those of a conventional ruling pen. Blade 83 is milled to a reduced thickness at 85 to render said blade resilient laterally, so that the two blades can easily be spread apart at the front end for varying the width of line produced by the nib. Bore 82 is tapered at its forward end as shown in Fig. 21, and the tongue 13 engages the two sides of bore 82 in the manner of a wedge. Bore 82 is of rectangular configuration at section 22, as shown in Fig. 22, being thus conformed to the rectangular cross-section of the tongue.

Tongue 13 serves also as a means for breaking up any obstruction in the ink feed channel between the blades, and it does so by passing between the blades in response to a retractive movement of the nib effected by pressing the nib inwardly of the barrel, as described in connection with the nib 6.

I claim:

1. A fountain pen comprising an elongate barrel, a feed element mounted in the front end of said barrel and movable lengthwise thereof to a limited extent, a spring normally holding said feed element in its forwardmost position, a pen nib mounted in and carried by said feed element and normally projecting from the front end of said barrel, a cap in threaded engagement with the rear end of said barrel, an elongate member telescopically connected at its front end with said feed element and extending rearwardly through said barrel and engaging said cap at its rear end, said spring continuously urging said elongate member rearwardly, and a tongue-like member anchored to the forward end of said elongate member and extending forwardly therefrom, said nib having an axial passageway through which the forward portion of said tongue-like member passes, said nib and feed element being retractable against the opposition of said spring in response to pressure applied to the front end of the nib.

2. A fountain pen comprising an elongate bar-

rel, a feed element mounted in the front end of said barrel and movable lengthwise thereof to a limited extent, a spring normally holding said feed element in its forwardmost position, a pen nib projecting from the front end of said barrel and seated in a bore in said feed element extending lengthwise from the front end thereof, said feed element having a radial slit extending lengthwise from end to end thereof and communicating with said nib, said slit constituting an ink feed channel for conveying ink to said nib, a tongue-like member disposed in said slit and movable lengthwise thereof, the forward end of said tongue-like member extending lengthwise through said nib to a point near the front end thereof, a breather tube telescopically connected to the rear end of said feed element and extending rearwardly therefrom through said barrel, a piston threaded to the rear end of said barrel and acting as an abutment for the rear end of said tube, said tongue-like member being anchored to said tube and movable therewith, said spring continuously urging said tube rearwardly.

3. A pen comprising a barrel having an ink reservoir, an overflow ink governor slidably mounted in said barrel, a pen nib carried by said governor and having an ink feed channel connected in ink feeding relation to said reservoir and governor, a spring urging said governor and nib forward, a cleaner element having at least a portion extending in said feed channel, and means restraining said cleaner element against movement upon rearward movement of said governor and nib effected by application of pressure upon said nib, whereby said cleaner element is effective to clear said channel of obstructions.

4. A pen comprising a barrel having an ink reservoir, an overflow ink governor slidably mounted in said barrel, a pen nib carried by said governor and having an ink feed channel connected in ink feeding relation to said reservoir channel, a spring urging said governor and nib forwardly, a cleaner element having portions in the ink feed channels in said governor and nib, and means restraining said cleaner element against movement upon rearward movement of said governor and nib effected by application of pressure upon said nib, whereby said cleaner element is effective to clear said ink feed channels of obstructions.

RUSSELL T. WING.

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