

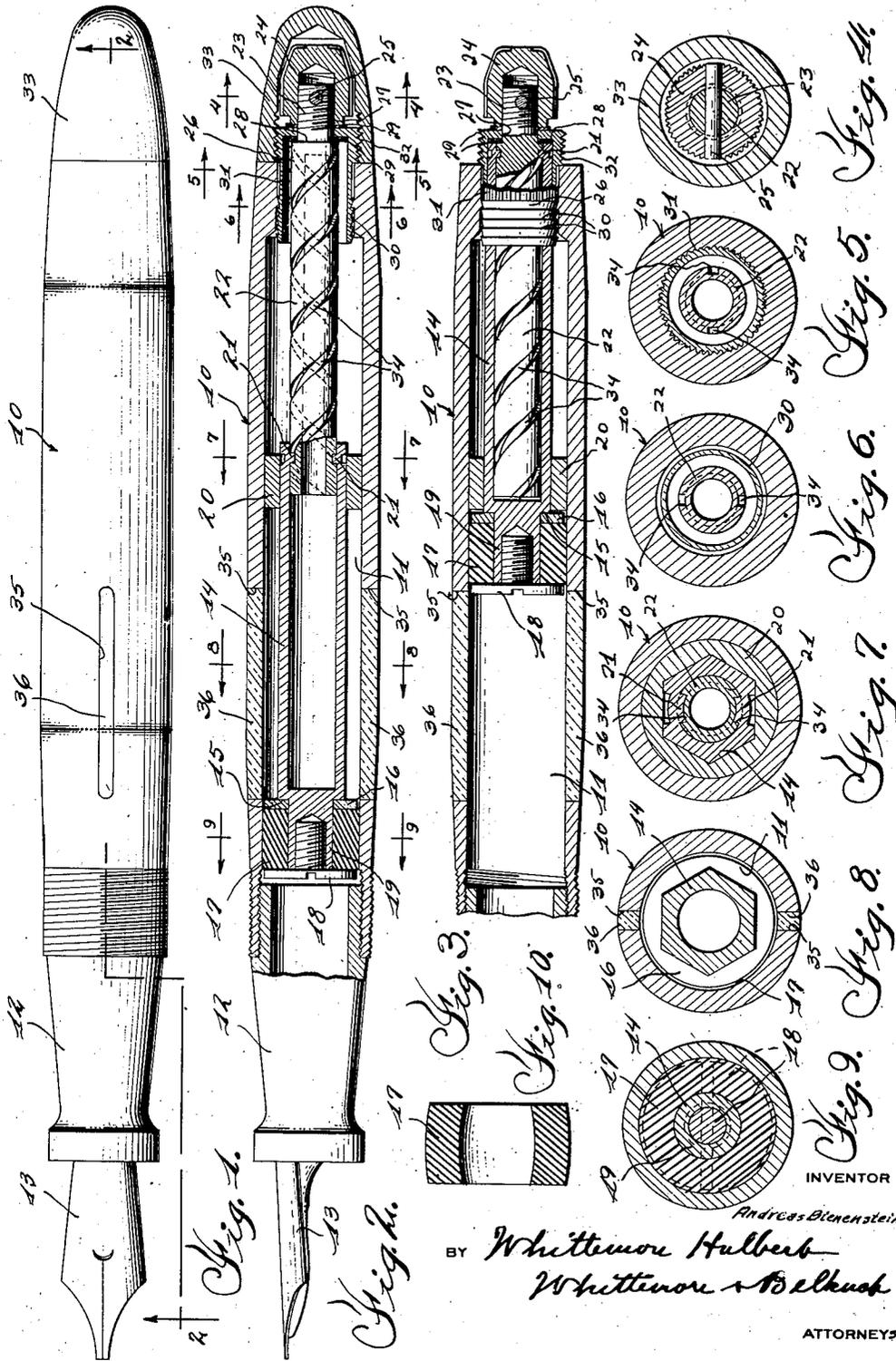
March 28, 1933.

A. BIENENSTEIN

1,902,809

PLUNGER TYPE PEN

Filed Nov. 24, 1930



INVENTOR  
*Andreas Bienenstein*

BY *Whittemore Hulbert*  
*Whittemore & Hulbert*

ATTORNEYS

# UNITED STATES PATENT OFFICE

ANDREAS BIENENSTEIN, OF TOLEDO, OHIO, ASSIGNOR TO THE CONKLIN PEN COMPANY, OF TOLEDO, OHIO, A CORPORATION OF OHIO

## PLUNGER TYPE PEN

Application filed November 24, 1930. Serial No. 497,939.

This invention relates to fountain pens and more particularly to an improved construction of sackless or plunger type fountain pens.

5 One of the important objects of my invention is to provide a plunger type fountain pen which is simple and durable and one which may be manufactured economically and assembled with facility.

10 Other objects, advantages and novel details of construction and the arrangement of parts will be made more apparent as this description proceeds, especially when considered in connection with the accompanying drawing, 15 wherein

Figure 1 is an elevational view of a fountain pen constructed in accordance with my invention, the cap being removed;

20 Figure 2 is a longitudinal sectional elevational view of the fountain pen;

Figure 3 is a fragmentary longitudinal sectional view with the piston completely retracted;

25 Figure 4 is a sectional view on the line 4—4 of Figure 2;

Figure 5 is a sectional view on the line 5—5 of Figure 2;

Figure 6 is a sectional view on the line 6—6 of Figure 2;

30 Figure 7 is a sectional view on the line 7—7 of Figure 2;

Figure 8 is a sectional view on the line 8—8 of Figure 2;

35 Figure 9 is a sectional view on the line 9—9 of Figure 2; and

Figure 10 is a detail-sectional view through an element of the piston.

Referring now particularly to the drawing wherein like reference characters indicate 40 like parts, it will be noted that the pen comprises a barrel 10, the hollow interior of which provides an ink reservoir 11. This reservoir is cylindrical in shape and a piston, yet to be referred to, is adapted to reciprocate therein. 45 There is illustrated a conventional form of nib end section 12 threaded into the end of the barrel 10, this end section being provided with the customary nib 13.

50 The reference character 14 indicates a tubular piston or plunger rod or stem shouldered

adjacent one end as at 15. The piston carried by the rod 14 consists of a washer 16, a piston body 17 and a securing element in the form of a screw 18 threaded into the reduced extension 19 of the piston rod. The body 17 55 of the piston is substantially in the form of an axially or longitudinally bowed sleeve-like member of resilient material having the shape or configuration substantially as illustrated in section in Figure 10. In assembling 60 the piston with its rod or stem 14, the metal washer 16 is first slipped over the reduced end 19 and engaged with the shoulder 15 whereupon the body portion 17 is placed upon 65 this reduced portion and the screw 18 screwed in place. The washer 16 and the head of the screw 18 form opposed end abutments for the sleeve-like body 17 which resist the tendency of the sleeve 17 to increase in length due 70 to the radial compression thereof when inserted in the cylinder or reservoir 11. By reason of this and also by reason of the fact that the body 17 is made of resilient material, the piston will fit snugly within the cylinder and seal the same to prevent the passage of 75 ink past the piston while permitting of the reciprocation of the piston within the pen barrel. The compressive end pressure on the ends of the sleeve 17 and its tendency to 80 radially expand will insure adequate compensation for wear occasioned the piston during continued use of the pen.

While the interior of the hollow piston rod 14 is cylindrical to receive the operating screw 85 member therefor, in a manner to be later referred to, the exterior of the piston rod is preferably of hexagonal shape to fit a hexagonal opening in a sleeve 20 rigidly fixed within the pen barrel 10. This permits reciprocation 90 of the piston and its rod but prevents rotation thereof as will be obvious. The piston rod is provided with opposed short thread sections in the form of projections 21, these projections being conveniently formed by radially 95 inwardly displacing the tubular piston rod at the desired points.

The reference character 22 indicates a steep pitch threaded rod operatively connected to the piston rod or stem 14 by the threads or 100

projections 21 thereof. This screw or operating member 22 is preferably of tubular form so as to reduce the weight thereof and is provided with a reduced end 23 to which a knob or head 24 is attached. This operating knob may be threaded thereon and secured thereto by means of a pin 25 as illustrated. The exterior of the knob is preferably provided with straight longitudinal knurls to provide a gripping surface.

The operating rod 22 is swivelly mounted in the pen barrel 10 by means of a ferrule member 26 formed preferably of metal and provided with an opening 27 adjacent one end thereof through which the reduced end 23 of the operating rod 22 projects or extends. The reduced end 23 on the operating member provides an annular shoulder 28 which takes the end-thrust imparted to the operating rod 22 in one direction. The end-thrust in the other direction is taken by the knob 24 and to provide suitable bearing surfaces for the parts, washers 29 are interposed between the shoulder 28 and the ferrule and between the knob and the ferrule.

This ferrule member 26 is rigidly attached to the body 10 of the pen by forcing the same in the open end of the pen barrel. This ferrule member is preferably provided with a plurality of circumferential grooves forming shoulders 30 and a plurality of longitudinally extending knurls 31. Thus when the ferrule has been forced into the body the circumferential shoulders 30 prevent withdrawal of the same and the straight knurls 31 act to prevent rotation of the ferrule. In assembling the pen after the ferrule has been forced under pressure into the body as heretofore mentioned, the body contracts and tightly grips the ferrule.

The ferrule member 26 is also provided with exterior threads 32 to threadedly receive a cap 33 to removably secure the cap to the end of the pen body. Obviously, this cap must be removed in order to rotate the operative member 22 through the knob 24 but after the pen is filled, this cap 33 is screwed down into place so that accidental rotation of the operating member 22 is prevented.

When it is desired to fill the fountain pen with ink or other writing fluid, the nib end is inserted into an ink well with the piston in its lowermost position, that is, the position illustrated in Figure 2. Thereupon the piston is retracted to its other position illustrated in Figure 3 by rotation of the operating screw member 22 by means of the knob 24. This will draw the ink into the pen barrel or reservoir 11 as will be obvious. The double threads 34 of the screw member 22 are of a high or steep pitch so that the piston may be quickly moved. During this movement the screw member 22 telescopes within the tubular plunger or piston rod 14

so that the piston and its associated parts in the retracted position of the piston occupy a minimum space. The space between the interior of the ferrule 26 and the exterior of the screw member 22 is sufficient to permit the sleeve-like rod 14 to extend thereinto so that the piston may be completely retracted to the position illustrated in Figure 3.

As is customary, the body 10 of the pen will be preferably constructed of an opaque material so that the contents of the interior thereof are obstructed or concealed from view. However, in order that the contents of the ink supply within the pen may be readily ascertained, I propose providing a pair of opposed sight openings in that portion of the pen barrel which constitutes the reservoir 11. These sight openings are in the form of a pair of longitudinally extending relatively narrow slots 35 formed in the body 10 of the pen and in which inserts 36 of transparent material are placed. These transparent inserts 36 may be secured to the material of the body of the pen in any preferred or desired manner. Thus, by holding the pen up to the light with the inserts 36 in alignment, the quantity of ink in the ink reservoir of the pen may be readily ascertained. The width of these transparent sections will preferably be so chosen that the presence of these window sections will not be readily apparent to the casual observer.

It has been found that the transparent inlays 36 may be of transparent pyroxylin.

The threads 34 may be, and are preferably, rolled in the tubular member 22. This provides a simple and economical method of producing the threads of the screw member. This screw member 22 is preferably formed of a non-corrosive bronze alloy. Moreover, the ferrule 26 as well as the knob 24 are formed preferably of aluminum alloy so as to be of a minimum weight and treated to prevent corrosion. This is likewise true of the plunger or piston rod 14.

The novel details of construction and the combination and arrangement of parts of the present invention provide an improved construction having many practical commercial advantages. The structure may be quickly and economically manufactured and moreover may be assembled with facility. The construction of the several parts is such that the weight thereof may be reduced to a minimum without sacrificing the durability thereof. Furthermore, the ink capacity of the pen is materially increased over that of pens of corresponding size employing the conventional compressible rubber sack. While an embodiment of the invention has been illustrated and described herein somewhat in detail it will be readily apparent to those skilled in this art that changes may be made in many of the non-essential details of construction and to this end reservation is made to

make such changes as may come within the purview of the accompanying claims.

What I claim as my invention is:

1. A fountain pen having in combination, a barrel portion presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a piston stem therefor, a steep pitch screw-drive for said piston including a screw member, means for swivelly mounting said screw member in said barrel portion, and a short sleeve in said barrel having an angular bore engaging a similarly shaped exterior surface on said stem. 70
2. A fountain pen having in combination, a barrel portion having an open end and presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a stem connected thereto, a steep pitch screw-drive for said piston including a screw member operatively connected to said stem, means fixed in the open end of said barrel for swivelly mounting said screw member and means for slidably mounting said stem including a member fixed within said barrel spaced from the open end thereof and provided with a longitudinally extended angular bore engaging a similarly shaped exterior surface on said stem. 80
3. A fountain pen having in combination, a barrel portion presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a piston stem therefor, a screw-drive for said piston including a screw member, a ferrule member fixed in the end of said barrel, said screw member having a shoulder engaging said ferrule on one side and an operating knob engaging said ferrule on the opposite side thereof for swivelly mounting said screw member, and a short sleeve member presenting a longitudinally extended bearing surface fixed in said barrel spaced from the end thereof and engaging said piston stem to prevent rotation of said piston. 85
4. A fountain pen having in combination, a barrel portion presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a stem connected thereto, a steep pitch screw-drive for said piston including a screw member operatively connected to said stem, means for swivelly mounting said screw member, said stem having a hexagonal exterior, and a separate mounting member therefor fixed within said barrel and having a hexagonal bore through which said stem slides. 90
5. A fountain pen having in combination, a barrel portion presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a screw-drive for said piston including a screw member, a ferrule member having ribs thereon fixed to said barrel by being forced into the end thereof where said ribs engage the adjacent surface of the barrel, and means for swivelly mounting said screw member on said ferrule. 95
6. A fountain pen having in combination, a barrel portion having an open end and presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a screw-drive for said piston including a screw member, means fixed in the open end of said barrel for swivelly mounting said screw member in said barrel with the one end thereof projecting beyond said barrel, and screw threads on said swivel mounting means for receiving a cap for enclosing the projecting end of said screw member. 100
7. In a fountain pen, a barrel portion having an open end presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a tubular stem therefor, a tubular operating member having a steep pitch thread rolled therein, a ferrule member fixed in the open end of said barrel, means for swivelly mounting said operating member on said ferrule member, and a separate sleeve member fixed within the barrel spaced from the open end thereof and provided with an irregular bore engaging a similarly shaped exterior surface on said stem for slidably and non-rotatably supporting said stem. 105
8. In a fountain pen, a barrel having an open end and presenting a tubular reservoir, a piston axially reciprocable in said reservoir, a tubular stem connected thereto, a tubular operating member having a steep pitch thread rolled therein, a ferrule member fixed in the open end of said barrel, said operating member having a shoulder engaging said ferrule on one side and an operating knob engaging said ferrule on the opposite side thereof and secured to the end of said operating member for swivelly mounting said operating member, and a short sleeve in said barrel spaced from said open end thereof and having a bore for slidably and non-rotatably supporting said stem. 110
9. A fountain pen having in combination, a barrel portion presenting a tubular reservoir, a piston reciprocable in said reservoir, a hollow piston stem therefor, a screw member operatively connected to said piston stem and telescoping therein, means for swivelly mounting said screw member at the end of said barrel and for holding said screw member against relative longitudinal movement, and a member spaced within said barrel portion a substantial distance from said swivel means and having an angular longitudinally extended bearing surface encircling and engaging a similarly shaped exterior surface on said piston stem. 115

In testimony whereof I affix my signature.

ANDREAS BIENENSTEIN. 120