

Aug. 13, 1929.

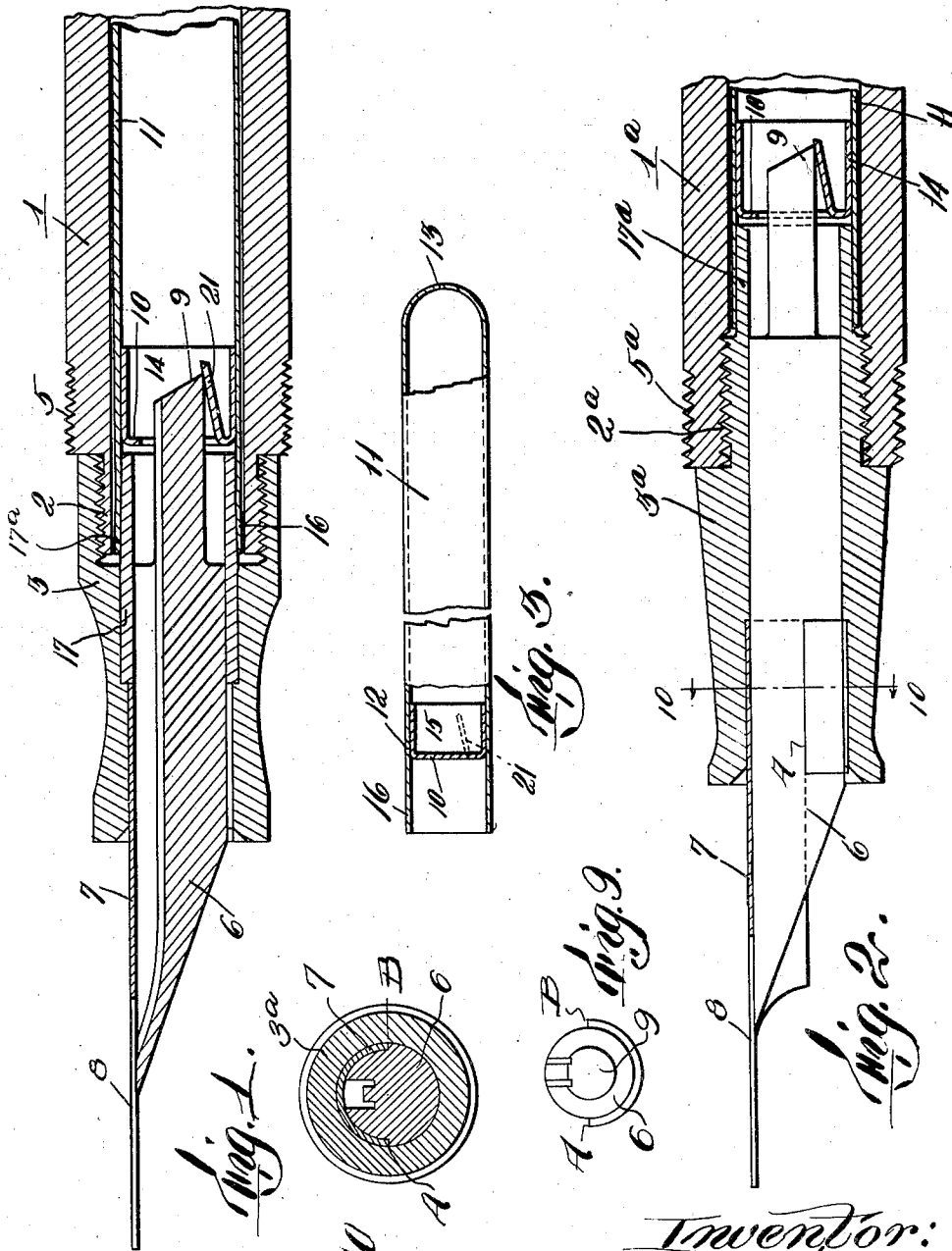
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1,724,106

CARTRIDGE PEN

Original Filed Sept. 27, 1921

2 Sheets-Sheet 1



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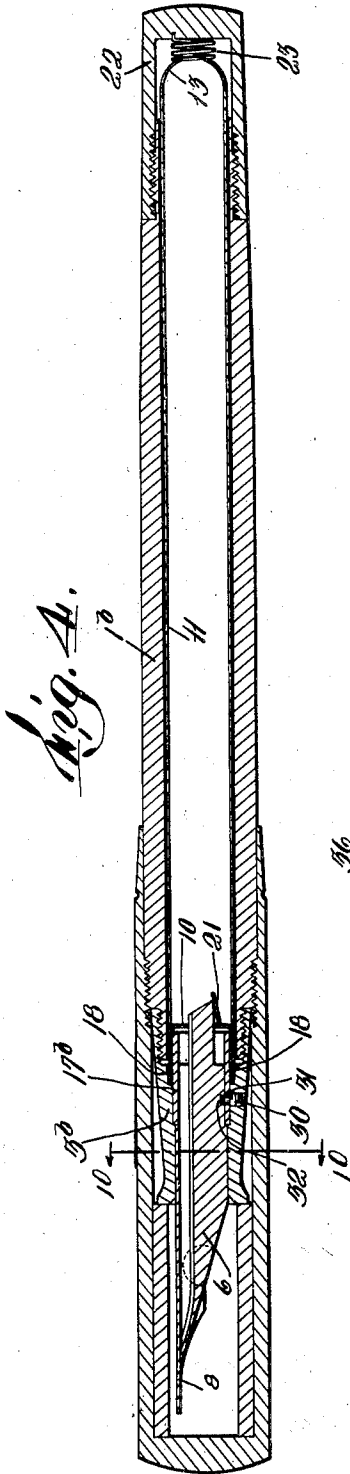


Fig. 4.

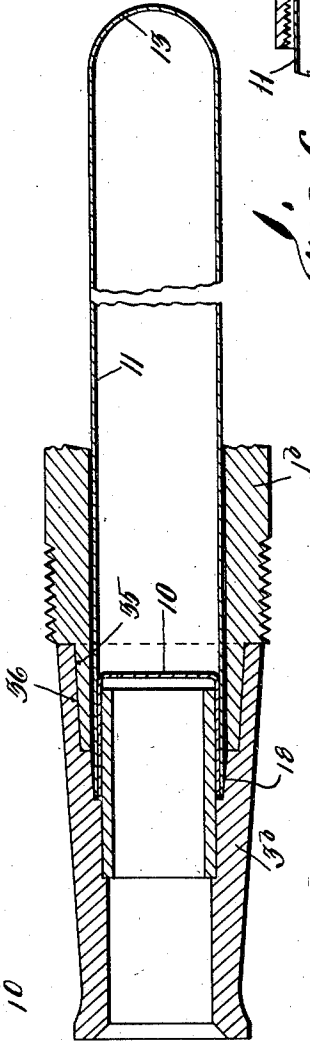


Fig. 5.

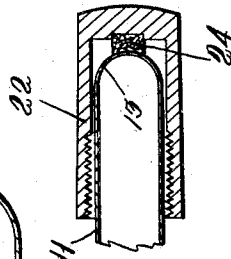


Fig. 6.

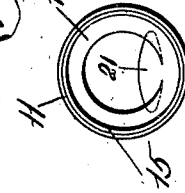


Fig. 7.

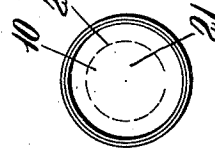


Fig. 8.

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UNITED STATES PATENT OFFICE.

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CARTRIDGE PEN.

Application filed September 27, 1921, Serial No. 503,567. Renewed March 8, 1929.

This invention relates to fountain pens of that type which employs a cartridge for holding the ink insertable in the barrel of the pen and then punctured to permit the ink to feed to the pen point.

One feature of this invention relates to an improved construction of cartridge having a protected puncturing end, this end being so constructed as to afford a large free opening for the flow of ink.

A further feature of this invention relates to the construction of the barrel for receiving the cartridge by which the end of the cartridge is effectually sealed thereto before the cartridge is punctured, thus preventing the ink from flowing about the cartridge within the barrel and in time preventing the ready removal and insertion of the cartridges and smearing the outside thereof.

Still another feature of this invention relates to the construction of the cap by which the cartridge is moved against the puncturing point to permit ink to flow to the pen.

Further this invention provides an improved pen mounting by which it is effectually prevented from displacement relative to its supporting lead, and means by which both may be removed for cleaning or other purposes and then returned to exactly the proper position.

Further objects and advantageous details and combinations of parts will appear from a more complete description of an embodiment of this invention disclosed in the accompanying drawings in which

Figure 1 is a longitudinal cross section through the forward end of the pen showing the cartridge in position.

Figure 2 is a similar view showing a slightly modified construction.

Figure 3 is an elevation partly broken away of a cartridge.

Figure 4 is a longitudinal section through the complete pen showing another modification.

Figure 5 is a fragmentary section through the forward portion of the pen illustrating a further modification.

Figure 6 is a detail section of one form of the barrel cap.

Figures 7 and 8 are end views of the cartridge looking at the puncturing end before and after puncturing, respectively.

Figure 9 is an end view of the lead illustrated in Figure 4.

Fig. 10 is a cross sectional view on line 10—10 of Fig. 2 in the direction of the arrow.

Referring to Figure 1 at 1 is indicated the pen barrel having a forwardly extending portion 2 of smaller diameter threaded on its outer face. This extension 2 receives the threaded inner end of a barrel end 3. The barrel is also threaded at 5 for receiving the usual screw cap for enclosing the pen point.

Positioned within the barrel cap 3 is a lead 6 between which and the barrel cap 3 is left a space for the reception of the shank 7 of a pen point 8. The lead has suitable passageways therein to direct the ink from within the barrel to the pen point. The rear end of the lead terminates in a puncturing point 9 against which may be forced the end 10 of an ink cartridge 11. This ink cartridge, shown in detail in Figure 3, comprises a tubular receptacle 12 having a closed rear end 13, the forward end 10 being formed by means of a cap 14 having a marginal side wall 15 insertable into and attachable to the inner face of the tube 12. As shown in Figures 1 and 2 the side wall 15 projects inwardly of the wall 10 and is positioned sufficiently within the tube 12 to provide a sealing flange 16 extending outwardly thereof. This flange passes outside of a seal 17 formed as a tubular member made fast at its outer end in the barrel end 3 and at its inner end spaced from the interior walls of the barrel to form an annular recess to receive the flange portion 16.

It is designed that the cartridge be inserted from the rear end of the pen and then pushed toward the pen point as by screwing a rear cap on the pen, the flange 16 being sealed against the tubular member 17 before the point punctures the wall 10. When in final seated position the point 9 projects inwardly of the cartridge, the ink passages in the lead conducting ink from the cartridge to the pen point. If desired the outer face of the seal 17 may be formed tapered as at 17^a to spread the flange 16 outwardly and press it tightly against the inner wall of the barrel.

In Figure 2 a slightly modified construction is shown in which the barrel 1^a is externally threaded on the barrel end 3^a,

threads 5^a being formed thereon for the reception of the usual pen point enclosing cap. In this case the seal shown at 17^a is formed integral with the barrel end 3^a. Otherwise
 5 this construction is similar to that disclosed in Figure 1.

In Figure 4 is shown a preferred construction of pen in which the barrel 1^b is formed at its forward end similar to the barrel 1
 10 (Figure 1), the barrel end 3^b being threaded thereon. A sealing tube 17^b is fixed to the inner portion of the end 3^b and forms an annular space with the inside of the barrel 1^b. In order that the end of the cartridge may
 15 be sealed closely the barrel end 3^b has formed therein about the seal 17^b an annular recess 18 having its outer wall tapered inwardly to narrow the width of the recess toward the pen point. The flange 16 of the
 20 cartridge as it is pushed into this recess is therefore pinched between the inner and outer walls thereof so that it is tightly sealed by the time the cartridge takes its final position. In this case also the position
 25 of the cartridge cap is reversed from that shown in Figures 1, 2, and 3 so that the flange portion 15 extends outwardly of the wall 10 and reinforces the flange 16 to which it is made fast. This construction materially
 30 stiffens the flange 16 and acts to protect this end of the cartridge from injury.

In order that a clear break may be made through the cartridge end it is preferable to score the end in a nearly closed path as
 35 shown at 20 in Figures 7 and 8. The puncturing point bearing on the end 10 thus breaks the end wall along the scored line forming a flap 21 which is bent inward as the point enters the cartridge. By this
 40 means it is insured that the opening through the cartridge end produced by the puncturing point is free and open so that there is no danger of clogging by ragged portions of the cartridge wall, as might otherwise occur.

In order to force the cartridge against the puncturing point a cap 22 is threaded on the open rear end of the barrel and bears against
 45 the rear end of the cartridge. If desired a spring 23 may be interposed between the rear end of the cap 22 and the rear end of the cartridge to hold the cartridge firmly in longitudinal position and prevent it from
 50 being dislodged from tight sealing engagement at its punctured end with the pen barrel. In Figure 4 a coil spring has been shown for this purpose and in Figure 6 is shown a modified construction in which a
 55 pad of felt or other springy material 24 is substituted for the spring 23.

60 It is also desirable that the pen point should be fixed relative to the lead and to the barrel so that it may not be dislodged from proper position by shocks or jars such as might occur from allowing the pen to

drop. For this purpose the lead may be 65 constructed as shown best in Figure 9, having a portion of reduced diameter between the points *a* and *b* leaving shoulders at these points between which the shank of the pen may be fitted. The shoulders *a* and *b* prevent the pen from being twisted or misaligned relative to the lead, the pen being held in this recessed portion by means of
 70 the barrel end which engages its outer face.

It is sometimes desirable to remove the 75 pen for the purpose of cleaning or for the insertion of a new pen point, or for other purposes, and it is desirable that when re-assembled the lead and the pen should be properly adjusted relative to the barrel to function in the best possible manner. For this purpose this invention provides a means
 80 by which the lead and pen may be fixed in the proper position which also insures that they are returned to the correct position. This means, as shown, comprises a set screw
 85 30 passing through the side wall of the barrel end 3^b, the inner end of the set screw terminating in a boss or projection 31 fitting within a mating socket 32 in the lead. When the socket is properly positioned to receive the set screw the pen and lead are in
 90 proper position relative to the pen barrel.

While as shown in Figures 1, 2, and 4 the barrel end may be unscrewed from the barrel it is sometimes undesirable to permit such
 95 action since if a cartridge is in position when this is done the detachment of the barrel permits a long unsupported length of cartridge to extend from its sealing connection with the barrel end. This permits the sealing connection therewith to be readily broken so that a leak may be started, which when the barrel is later screwed into position, may allow the ink to find its way between the
 100 barrel and the outer wall of the cartridge. This would result in the outer wall being smeared with the ink so that the fingers or clothing of the operator might be soiled with ink on removing the cartridge and the barrel
 105 might be gummed, preventing free removal and insertion of the cartridges. For the purpose of preventing such action the construction shown in Figure 5 may be used in which while the barrel and end are formed
 110 separately no threaded connection is provided therebetween. This connection is shown as comprising mating smooth tapered surfaces 35 and 36 on the barrel and end, respectively, which may be cemented together. This construction permits the tapered sealing socket for the cartridge end to be machined readily in the barrel end before
 115 it is assembled with the barrel to form a substantially integral structure therewith. 125

Having thus described certain embodiments of this invention it should be evident that many modifications and changes might

be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

5 1. A pen comprising a barrel for receiving an ink cartridge having a puncturable portion and a flange surrounding said portion, a sealing member for engagement with said flange, a pen point, a feed for said point
10 having a point to puncture said cartridge, and means for forcing said cartridge into sealing engagement with said sealing member and then into puncturing relation to said puncturing point.

15 2. A pen having a barrel for receiving an ink cartridge having a depressed puncturable portion and a sealing flange, a pen point, a feed for said pen point having a cartridge puncturing member, and means whereby
20 puncturing of said cartridge may not be effected prior to the sealing of said cartridge within said barrel.

3. A pen having a barrel for receiving an ink cartridge, said cartridge having a depressed puncturable portion and a sealing
25 flange, a pen point, means for sealing one end of said cartridge within said barrel, and means acting when sealing has been effected to allow ink to flow to said pen point.

30 4. A pen comprising a barrel for receiving an ink cartridge having a puncturable end and a flange projecting beyond said end, a barrel end, a sealing member carried by said barrel end and adapted to project with-
35 in said flange, a tapered portion engaging the outside of said flange for forcing it into sealing engagement with said sealing member on axial movement of said cartridge theretoward, a pen point, a feed for sup-
40 porting said point, a cartridge puncturing element carried by said feed for puncturing said puncturable end, and means for moving said cartridge axially to first seal said flange and then to puncture the end of the car-
45 tridge.

5. A pen comprising a barrel for receiving an ink cartridge having a puncturable end and a flange projecting beyond said end, a
50 barrel end, a sealing member carried by said barrel end and adapted to project within said flange, a tapered portion on said barrel end engaging the outside of said flange for forcing it into sealing engagement with said
55 sealing member on axial movement of said cartridge theretoward, a pen point, a feed for supporting said point, a cartridge puncturing element carried by said feed for puncturing said puncturable end, and means for
60 moving said cartridge axially to first seal said flange and then to puncture the end of the cartridge.

6. A pen comprising a barrel portion having a chamber for an ink cartridge tapered down at one end, an ink cartridge having a flanged portion insertable within said tapered portion, and a sealing member engag-
65 ing the inside of said flange and into sealing engagement with which said flange is pressed by said tapered portion.

7. A pen comprising a barrel having a cylindrical bore, an end section for said barrel mating the bore of said barrel and inwardly tapered, a sealing member carried by said end section and spaced from the wall of said bore to form an annular chamber of
75 decreasing thickness within said end section, and an ink cartridge having a portion insertable in said bore and held firmly by wedging engagement in said portion of decreasing thickness.

8. In a fountain pen, the combination with a barrel having a sealed removable cartridge container insertable therein, of means for sealing and separate means for puncturing the cartridge on its insertion in the barrel, the upper edge of the container being held between liquid tight sealing members.

9. In a fountain pen, the combination with a barrel, of a sealed ink cartridge insertable therein, an ink feed and pen fitted in the barrel, a puncturing and sealing member fixed in the barrel and operable to first seal the cartridge to the ink feed and then puncture the cartridge to permit the ink flow into the feed.

10. In a fountain pen, the combination with a barrel having a pen holding portion, of sealing means therein, an ink feed carrying a pen point and a puncturing element, a removable sealed cartridge insertable in the barrel and adapted to be sealed to the feed when inserted prior to being punctured.

11. In a fountain pen, the combination with a barrel having a pen holding portion, of sealing means therein, an ink feed carrying a pen point and a puncturing element, a removable ink containing cartridge having a depressed sealing cap functioning on insertion to the barrel to permit the sealing of the cartridge prior to the puncturing thereof.

12. In a fountain pen, the combination with a barrel, of a feed unit mounted in one end thereof, a puncturing point in said barrel, a sealed ink container adapted to be inserted into the barrel and engage said puncturing point, and means whereby the ink container is brought into initial sealing engagement with the feed unit before the container has been completely punctured.

In testimony whereof I have affixed my signature.

ROBERT T. POLLOCK.