

(No Model.)

J. P. HOYT.  
FOUNTAIN PEN.

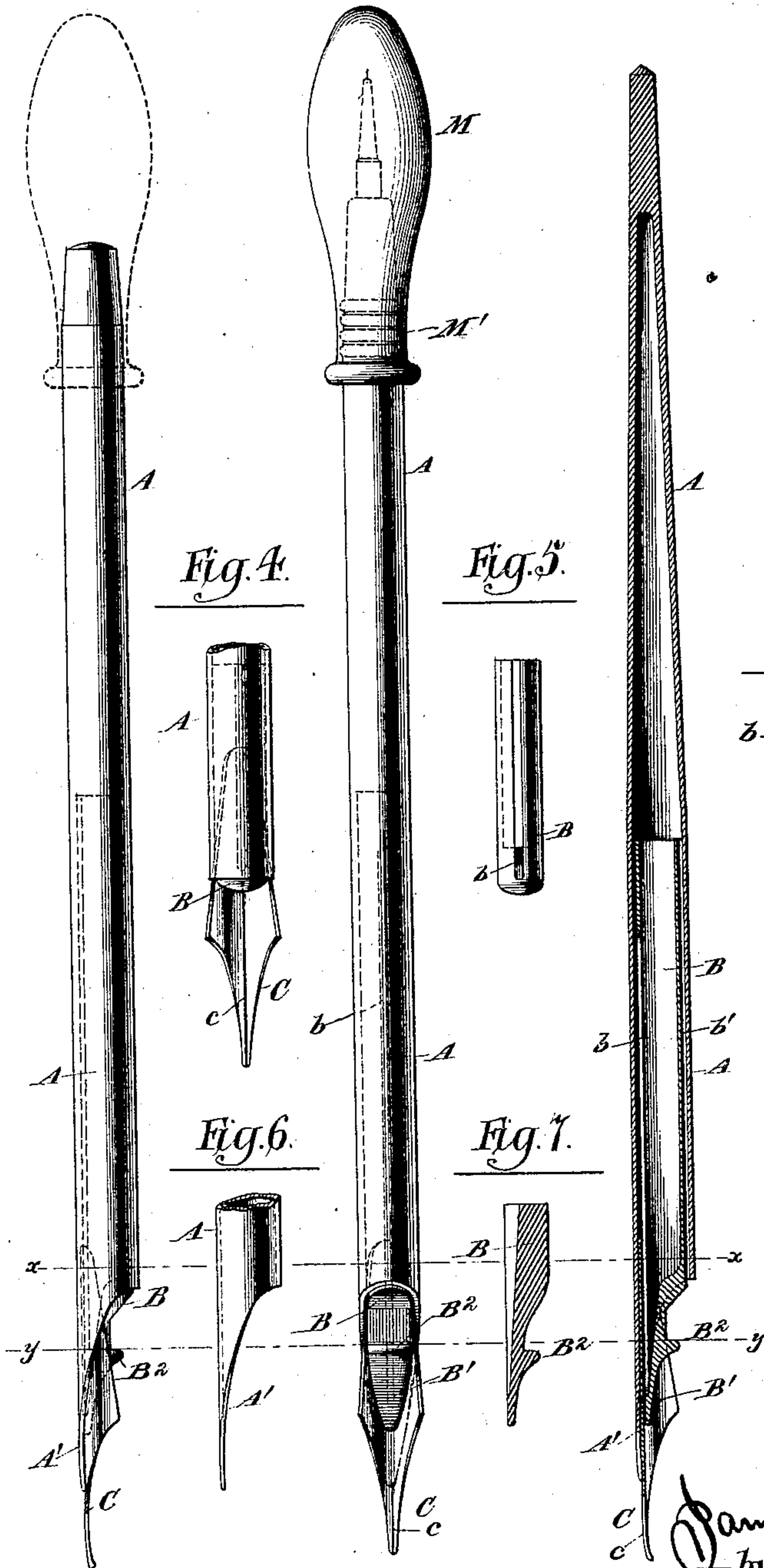
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Fig. 2.

Fig. 1.

Fig. 3.



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# UNITED STATES PATENT OFFICE.

JAMES P. HOYT, OF NEWTOWN, CONNECTICUT.

## FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 296,963, dated April 15, 1884.

Application filed February 23, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES P. HOYT, of Newtown, in the county of Fairfield, in the State of Connecticut, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

I have devised a construction in which the portion which serves as the case for inclosing the ink may itself serve as the pen, having its lower end properly split and pointed. It may also serve as a holder for a detachable pen of gold or other material. I provide for supplying the pen with ink by drawing it up by the expansion of a bulb, of soft vulcanized rubber or analogous material, at the upper end. I employ a removable case fitting within the lower end of the main case, which inner case is slotted or split along the side that delivers the ink, and enables me to continue to use down to the last drop. This inner case, which I call a "feeder," extends beyond the lower end of the main case under ordinary conditions, and is provided with a projection by which it can be engaged by the nail of the thumb or finger to facilitate its removal. This inner case can be thrust inward beyond its normal working position, and when thus adjusted and the construction is inverted the pen can be replenished with ink by supplying it to the cavity thus provided, and allowing it to descend slowly into the body. This latter mode of filling can be adopted with the rubber bulb in position, or the rubber bulb may be omitted, and this mode of filling depended upon alone.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a rear or under view, showing the pen complete. Fig. 2 is an edge view, the top alone being modified, as will appear further on. Fig. 3 is a central vertical section, the upper portion alone being modified. Figs. 4 and 5 represent a modification of the lower end. Fig. 6 is an edge view of the preferable form of lower end—that shown in Figs. 1, 2, and 3; but in this view only the outer casing is shown. Fig. 7 shows a modification of the lower end of the inner case or

feeder. Fig. 8 is a cross-section on the line  $x$  in Figs. 1, 2, and 3. Fig. 9 is a cross-section on the line  $y$  in Figs. 1, 2, and 3.

Similar letters of reference indicate corresponding parts in all the figures where they occur.

Referring to the lower portions only of Figs. 1, 2, and 3, and to Fig. 6, A is the exterior or main hollow casing of hard vulcanized rubber, celluloid, or other suitable material. It is open at its lower end and beveled, having a split point, A', resembling the once-familiar quill pen. The pen-point thus produced, if made of hard rubber, will be capable of serving a useful purpose for a long time. I propose to use the pen sometimes in this manner with or without the addition of the feeder, now to be described.

B is what I term the "feeder," a hollow cylindrical case, open at the upper end and closed at the lower end, but with the lower end peculiarly formed. The diameter of this tube is sufficiently less than the interior of the outer or main case, A, to allow it to be easily slid within the other and adjusted up and down at will. It is held in any desired position by friction. The inner tube or feeder, B, is partially divided by a long slot or slit,  $b$ , extending up and down nearly the whole length. This affords an exit for the ink. When the point A' is to serve directly as a writing-point, care should be taken to adjust the feeder B high enough to have its point B' considerably above the point of the outer case, A. The lower end of B is not beveled to correspond exactly with the lower end of A. On the contrary, it is provided with a distinct projection, B<sup>2</sup>, which is conveniently arranged to be engaged by the thumb-nail or finger-nail to draw it downward when desired.

C is a pen, of gold or any other suitable metal, which may be of exactly the ordinary construction adapted for use in an ordinary pen-holder; but I prefer, when the pens are made especially for this pen-holder, that the upper edge of the pen shall be thinner than usual. The pen C is applied in the holder by inserting its upper edge between the point A' of the outer case and the point B' of the inner case and thrusting it gently upward to the



proper extent. The effect is to spring inward the point B' of the inner case or feeder, thus making room for the pen C.

In the use of the device, the ink contained in the structure flows downward between the casings A and B, finding a ready exit from the interior of B to the space between the two, through the slot or slit *b*, and keeps the under face of the pen C effectively wetted. It is important to this result that the pen C be thrust up sufficiently far to allow the upper end of its split *c* to be presented to the slit or groove on the exterior of B. The ink flows down through the groove or slit *b*, and thus gets into the split of the pen C and flows with certainty to the point C', where it is transferred to the paper in the ordinary manner in the act of writing.

Figs 1, 2, and 3 show three different constructions of the upper ends. Either of these may be used. Fig. 3 shows the simplest, and may be first described. It is a tapering form, hollow nearly up to the upper end. Fig. 1 shows a form which is cylindrical, and is provided at the upper end with what is generally known as the "stylographic-pen point." By reversing the position of the pen this (the upper) end can become the writing end; but I do not claim to have invented anything of interest in that portion of the construction. Fig. 2 shows the case A continued cylindrically nearly to the upper end and then terminated with a frustum of a cone. Suppose the upper ends of all these forms to be closed. They will all correspond in action to that in Fig. 3. To fill such a pen, the handle should be reversed in position, and the ink may then be introduced at the pen end by means of an ordinary filler or medicine-dropper until the hollow interior of the structure is nearly or quite filled. To promote the introduction of the ink, the inner case or feeder, B, can be thrust a little farther inward than usual. The ink supplied in the cavity thus presented flows down slowly around on one side of the feeder B, the air escaping on the other side. My experiments indicate that the pen may be successfully filled in this manner without serious consumption of time. If it be desired to fill it more rapidly, withdraw the feeder B altogether and supply the ink until the inner casing, A, is two-thirds full; then introduce B again gently and thrust it home to the correct position.

In what I esteem the most complete form of the invention, I take up the ink from a suitable inkstand, bottle, or other reservoir through the aid of a partial vacuum produced in the casing A by a bulb of india-rubber. Referring to Fig. 1, M is such bulb of india-rubber, having a neck, M', fitting air-tight upon the upper end of the case A. This bulb is of sufficient length to allow the stylographic device to stand idle within it, as indicated in dotted lines. The opening through the stylographic-pen portion is sufficient to allow the motion of

the air inward and outward through it. When the bulb M is compressed by the thumb and finger, it forces its contents down through the aperture in the stylographic point into the interior of the casing A, forcing out a quantity of air at the lower end of the structure. Now the entire lower end being immersed in ink, the bulb M is liberated and expands by its elastic force, thus rarefying the air in its interior, and consequently in the interior of the connected casing A. This draws up the ink until the casing A is nearly or quite filled. Ordinarily one single collapsing of the bulb M will suffice to fill the casing A and also the bulb M. In the use of the pen thus conditioned, the ink flows down to the point and the air enters in bubbles and accumulates in the bulb M and in the upper portion of the case A in the same manner as when the casing A is employed alone. Dotted lines in Fig. 2 indicate the arrangement when a corresponding bulb is placed on the form shown in this figure. It is in such case necessary to provide, by a cock, valve, or removable plug or permanently-open slot or small aperture, for a tolerably free movement of the air between the bulb M and the interior of the case A.

My pen has advantages in point of simplicity, economy, and, I believe, durability, over any before known to me. There are but the two casings A and B, simple pieces of hard rubber, celluloid, metal, or other suitable material, accurately matched together, without requiring any elaborately-fitted screws or other devices. My experiments indicate that the working is highly satisfactory. The capacity for long working is extraordinary. The whole interior of the case serving as ink-chamber, without making the case of extraordinary diameter or length, a quantity of ink may be stored sufficient for writing hundreds of pages of long paper.

A feature to which I attach much importance is the production of fine longitudinal grooves *a'*—so fine that they might be described as mere scratches—on the inner face of the point A'. When this point A' is used to serve directly as the writing-point, these grooves serve an important function in aiding to hold the ink and to lead it downward. When an additional pen, C, is inserted, these grooves aid in forming a series of capillary tubes or channels through which the ink flows to supply the pen.

It will be understood that the success of the device depends on the aperture at the bottom, which I have described as extending quite around between the inner and the outer casings and allowing the air to enter and the ink to escape, but only allowing this at the slow rate required to supply the ink for writing. I find wax—ordinary bleached or unbleached beeswax—applied on one or both surfaces at the back or under side of the structure, gives a quality which is highly desirable in allowing the air to enter and by its property of repel-



ling water forbidding the ink to escape. In what I esteem the preferable construction, I make a small groove, *b'*, on the exterior of the back or under side of *B*, and fill such groove with wax, allowing the wax to smear or spread in a thin coating over the adjacent surfaces. I find that the writing under these conditions is more uniformly supplied with ink, with less danger of the ink coming down too fast.

Modifications may be made in the forms and proportions within wide limits without departing from the principle or sacrificing the advantages of the invention. Parts of the invention may be used without the whole. I can dispense with the bulb *M* and its close-fitting neck *M'*. I have deemed some of these worthy of representation.

Figs. 4 and 5 represent a modification of the lower end. Fig. 4 is a back or under view of the pen complete, and Fig. 5 is a front view of the interior case or feeder detached. This differs from the form shown in Figs. 1, 2, 3, and 6, in the fact that the casing *A* terminates abruptly or without the point *A'*. The inner case or feeder, *B*, also terminates abruptly or without the point *B'*. It is important that the feeder *B* shall extend down so as to supply ink to the split *c* in the pen *C*. Instead of making the split as long as shown in Fig. 4, I can use a pen having a split of more moderate length, and allow the feeder, *B*, with the blunt end, precisely as shown in Fig. 5, to extend down sufficiently beyond the lower end of the outer case, *A*, to supply ink to the shorter split. This modification of the device may be applied with either of the upper ends shown, and will work successfully, except that the outer case cannot be used directly for writing, by reason of the absence of the pen-point *A'*.

Fig. 7 shows a nearly solid plug, which may serve in lieu of the inner tube or feeder, *B*. It is provided with a point similar to *B'*, and a projection similar to *B<sup>2</sup>*.

When any difficulty is experienced as to the flow of the ink, the ink coming too fast or too slow, a little change in the adjustment of the inner case or feeder, *B*, thrusting it in a little or pulling it out, as experience may determine, will correct the evil.

It will be understood that to adapt the device to be carried in the pocket, a cap (not shown) may be provided to fit upon the lower end of the exterior case, *A*, with an interior sufficiently capacious to accommodate not only the integral point *A'*, but also the additional pen *C*. When such cap is to be employed, the exterior of the case *A* is formed with a shoulder to receive and form a seat for the cap.

I can use the device shown in Fig. 7 at-

tached to, or rather formed in one piece with, the device shown in Fig. 5.

I claim as my improvements in fountain-pens—

1. The hollow casing *A*, having the upper end tightly closed and the lower end nearly closed, to form a holding-seat for a separate pen, as *C*, with a point, *A'*, properly formed to constitute a writing-point integral with the body of the case *A*, whereby the said casing may be used as a pen, or as a holder for a separate pen, or both simultaneously, as herein specified.

2. The casing *A*, adapted to perform the double functions of a pen-handle and ink-reservoir, in combination with a suitable writing-point at the lower end, with an elastic bulb, *M*, at the upper end, and with a separate pen, as *C*, all arranged for joint operation, as herein specified.

3. The inner case or feeder, *B*, having the split *b*, in combination with the outer casing, *A*, having a tightly-closed upper end, arranged for joint operation, as herein specified.

4. The inner case or feeder, *B*, having a point, *B'*, and a projection, *B<sup>2</sup>*, the outer case, *A*, having a point, *A'*, and means for tightly closing the upper end, combined and arranged for joint operation, as herein specified.

5. In a fountain-pen, the outer case, *A*, and inner case or feeder, *B*, combined as shown to present a thin annular aperture between them, in combination with a coating of wax or analogous water-repelling material applied on one of the surfaces, substantially as herein specified.

6. A fountain-pen case in two parts—one within the other—the inner part, *B*, having a projection, *B<sup>2</sup>*, and being removable and adjustable by sliding within the other, substantially as herein specified.

7. In a fountain-pen, the elastic bulb *M*, in combination with the outer case, *A*, and adjustable inner case or feeder, *B*, the device being arranged to allow the slow escape of the ink, as herein specified.

8. A fountain-pen having two concentric casings, *A* and *B*, one of which is equipped with a pen-point, *A'*, integral therewith, arranged as shown, so as to serve at will, either as a pen itself or as a holder to receive a separate pen, *C*, and to supply ink properly under either condition, as herein specified.

In testimony whereof I have hereunto set my hand at New York city, New York, this 19th day of February, 1884, in the presence of two subscribing witnesses.

JAMES P. HOYT.

Witnesses:

W. C. DEY,

CHARLES R. SEARLE.