(No Model.)

J. P. HOYT & F. S. BARTRAM.

FOUNTAIN PEN.

No. 325,211. Patented Aug. 25, 1885.

Fig. 1.

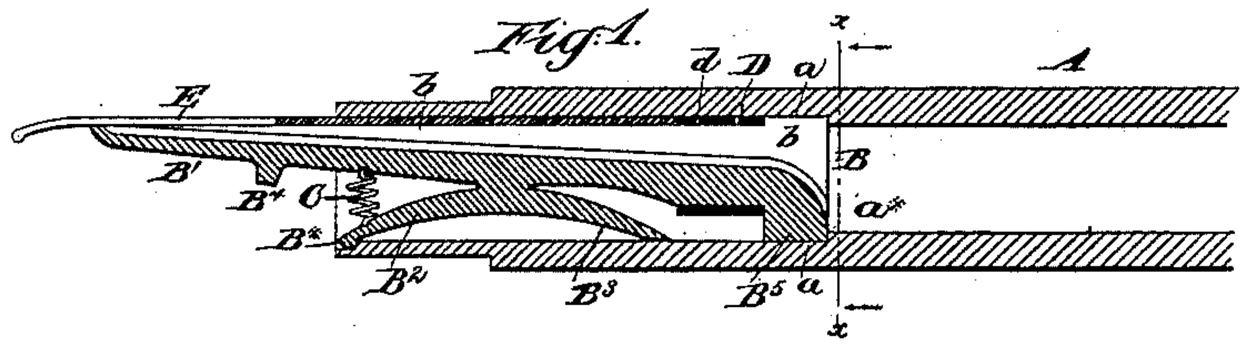


Fig. 2.

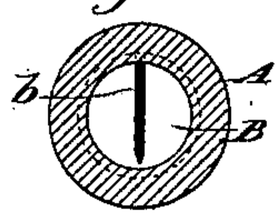


Fig. 3.

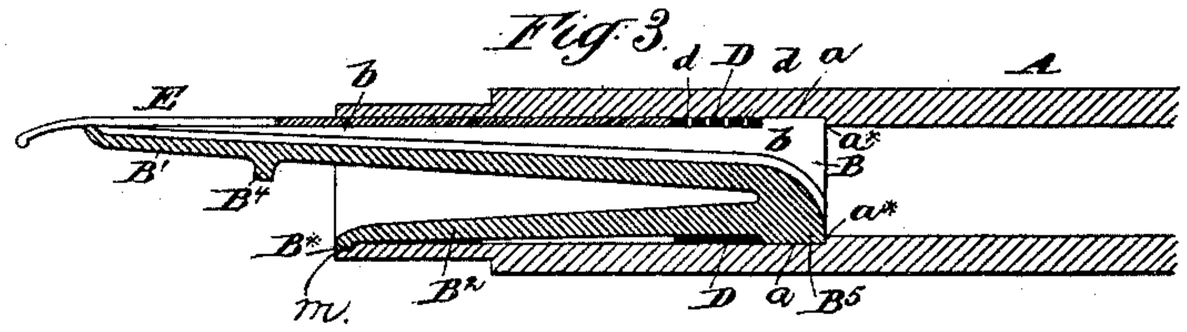


Fig. 4.

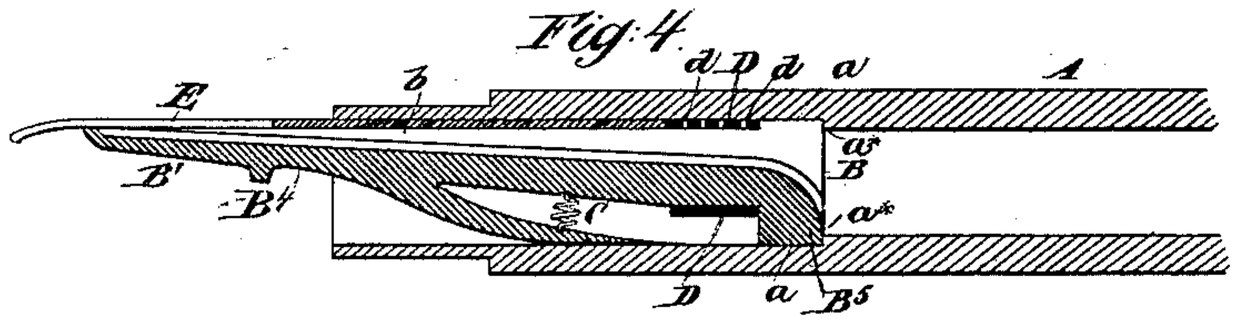
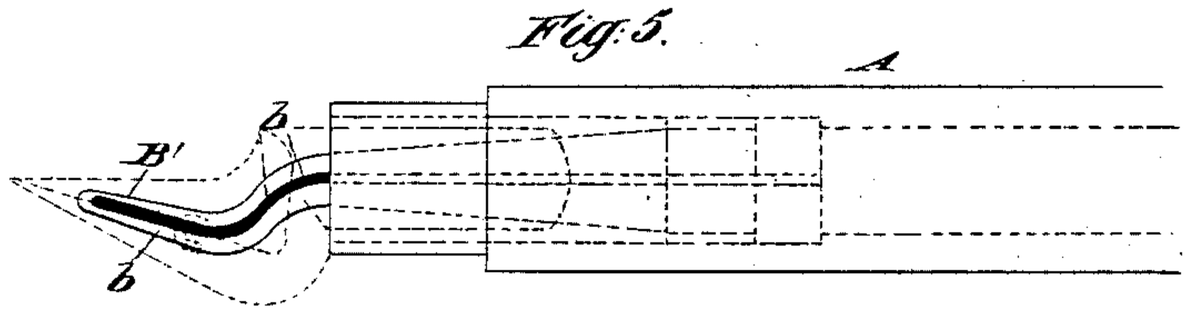


Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES P. HOYT, OF NEWTOWN, CONNECTICUT, AND FERDINAND S. BARTRAM, OF NEW YORK, N. Y.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 325,211, dated August 25, 1885.

Application filed April 14, 1885. (No model.)

To all whom it may concern:

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

Our improved pen is mainly of the construction set forth in the patent to one of us, James P. Hoyt, dated April 15, 1884, No. 296,963.

We have devised improvements in the form of the channeled plug, which, fitting with sufficient tightness in the lower end of the barrel or body, performs important functions in holding the pen and allowing the ink to flow thereto in proper quantities. We make the plug with an ink-conducting groove extending from the upper end, where it enters the reservoir, to a point near the lower end, but not extending the whole length. The upper end of this groove is deep, extending, preferably, some two-thirds across the diameter of the plug, and the depth diminishes to nothing near the other end. The bottom of the groove is of V shaped section.

It is difficult in practice to secure a just sufficiently firm pressure of the pen against that portion of the plug which is adjacent to the point. It is liable either to lie too close or to stand too far away. Some writers press with more force than others on the paper; all press the pens away from the plug to some extent when making heavy lines. We overcome this difficulty by elasticity. The plug is caused to press by a gentle spring force against the inner and under side of the pen, and to follow it by a corresponding force as the pen is pressed outward. This allows also for the substitution of pens of different thicknesses.

We provide improved means for determining the extent to which the plug may be set into the pen-case.

We provide a separate perforated band to embrace the pen and plug within the case and aid in determining the desired gradual flow of the ink to the point.

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

Figure 1 is a central longitudinal section, and Fig. 2 a transverse section on the line *x x* in Fig. 1. The remaining figures show modifications. Figs. 3 and 4 are longitudinal sections, corresponding to Fig. 1. Fig. 5 is a plan view with the pen removed.

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

Referring to Figs. 1 and 2, A is the main body, a hollow cylindrical casing of hard rubber or analogous material.

B is a plug, which we may sometimes refer to by the term "feeder." Certain portions will be designated, when necessary, by additional marks, as $B' B^2$. This plug fits into an enlargement, *a*, of the bore of the barrel A, extending up to the shoulder a^*, where this enlargement joins the main bore of the barrel. The plug must fit a little loosely in the enlargement *a*. The part which applies against the under face of the pen near the point is designated B′. The under side of the plug is formed with two elastic or yielding arms, B^2 B^3. The arm B^2 is provided with a hook, B*, which, when the plug is fully inserted, engages against the end of the body A, and serves as a stop, to determine the depth to which the plug and its attachments may be thrust into the body.

C is a spiral spring fitted in slight recesses, so as to exert its elastic force to press the arm B^2 downward and the point B′ upward.

B^4 is a ridge, step, or offset on the under face of B′, which facilitates the withdrawing of the plug, as is necessary at frequent intervals.

The upper end of the plug (marked B^5) is of greater diameter than the main body. This portion B^5 fits easily, but not tightly, in the enlargement *a*, of the barrel. Immediately below this enlarged portion is fitted a band, D, of soft rubber or other suitable material, clinging with gentle force around the body of the plug. It is perforated, as indicated by *d*. The difference in diameter between the main body of the plug and the enlargement B^5, accommodates the shank or body of the pen E. The elastic action of the parts allows the body of the pen to be of greater or less thickness without materially disturbing the action.

The arm B^3 extends in the opposite direction from the arm B^2. It contributes to the elastic action.

The parts are so proportioned that when the plug is fully inserted the hook B* rests against the end of the body or case A, and serves as a stop additional to or independent of that afforded by the shoulder *a**. The recess *m*, receiving the hook B*, aids to prevent the plug from being turned or rotated in the case.

E is the pen.

The spring action insures that the point B′ of the plug shall be capable of yielding inward to a considerable extent, and will always press outward to follow the pen with gentle force. This elastic action of the parts contributes greatly to equalize the pressure of the point B′ against the inner face of the pen under the various conditions which obtain in practice.

An important function is performed by a longitudinal groove, *b*, which extends nearly, but not quite, the whole length of the plug. It extends some two thirds across the upper end of the plug, and thence toward, but not quite to, the lower end, growing gradually shallower and stopping entirely a little short of the lower end. The bottom of this groove is of V-shaped section.

Ink may be supplied at intervals through any suitable orifice at the opposite end of the body or case A. If, for any reason, it is not convenient to introduce the ink in that manner, we can reverse the position of the parts, so as to put the pen uppermost, remove the pen E, and the plug B, and introduce the ink through the opening thus provided, then replace the parts, and, properly changing the position of the whole, commence again to write as before.

We attach importance to the reduction of the diameter of the plug to receive the thickness of the pen. This construction allows the case A to be continued of considerable thickness quite down to the end, and allows the pen and plug to be more conveniently withdrawn together and inserted together than would be otherwise practicable. This also allows the pen to be withdrawn, when desired, and again returned or another inserted without withdrawing the plug.

The elastic perforated band D performs an important function in increasing the surfaces, which are pressed gently in contact, and serves to allow the passage of ink with just sufficient freedom. The perforations allow an easy exchange of the ink from the inner face to the outer and back again. The band altogether serves, to some extent, the functions ordinarily ascribed to a sponge. We have in our experiments used soft rubber of a thickness about equal to the offset or difference in size between the body of the plug and the enlargement B^5. The back end of the pen E abuts against the lower edge of the band D.

We have in Figs. 1 and 3 shown a short groove, which receives the hook B*. We consider such preferable, but it is not essential.

The narrow channel *b*, for the ink, being deepened to or near the full diameter of the plug B at the inner end thereof, serves to draw the ink by capillary attraction from the bottom of the interior of the structure, so as to allow the last to be utilized. Its narrowness prevents the flowing of the ink too fast under any circumstances.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

We can, by providing sufficient elastic action in the two branches B^2 B^3 of the plug, allow a very gentle spring, C, to serve, or we can dispense with such separate spring entirely, always providing the arms B^2 B^3 possess of themselves a sufficient elastic action to press the point B′ gently up against the under face of the pen, and to allow the pen to be pressed inward or outward considerably without materially changing the gentle pressure of the point B′ against the pen.

The elastic action of our arms B^2 B^3 is sufficient to hold the plug in position under all ordinary conditions. It prevents the plug and pen from falling out when the end of the construction is held downward. When the structure is reversed in position, these parts are supported by the spring force against falling into the body, even if the hook B* were omitted.

The spring force of our plug not only enables the point B′ to maintain the proper gentle contact with the pen when the latter is bent back, but allows the employment of pens of different thicknesses.

Fig. 3 shows a modification in which the plug is substantially bifurcated, and the spring C is omitted. In this form the part corresponding to the arm B^2 exerts a sufficient elastic force by its own elasticity.

In the modification shown in Fig. 4 an arm, somewhat corresponding to B^2, is arranged in the reverse position, and is provided with a spring corresponding to C. A similar spring may be employed in the form shown in Fig. 3, or the spring may be omitted in the form shown in Fig. 4.

To accommodate crooked pens, we make the part B′ of our plug correspondingly crooked, and the groove *b* with a corresponding crook. This condition is shown in Fig. 5.

We claim as our invention—

1. In a fountain-pen, the plug B, having a point, B′, supporting the pen, and a spring for exerting an elastic action to maintain a gentle pressure of the point B′ against the inner or under face of the pen E under all conditions, as herein specified.

2. In a fountain-pen, the spring-plug B, having hook B*, adapted to serve as a stop, in combination with the body A, having a recess to receive said hook, and pen E, as herein specified.

3. In a fountain-pen, a solid plug, B, hav-

ing a groove, *b*, extending a portion, but not the whole, of its length, and having its bottom of V-section and deepened to nearly the entire thickness of the plug at the end receiving the ink from the body, as shown, so as to conduct the last drops of ink to the pen, substantially as herein specified.

4. In a fountain-pen, as described, the plug B, in combination with a band, D, encircling it, as shown, and with the case A and pen E, as and for the purpose set forth.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

JAMES P. HOYT.
F. S. BARTRAM.

Witnesses to the signature of F. S. Bartram:
E. BROOKES,
CHARLES R. SEARLE.

Witnesses to the signature of J. P. Hoyt:
ABIGAIL N. SKIDMORE,
HENRY T. NICHOLS.