No. 663,590. Patented Dec. 11, 1900.

B. J. SOPER.

FOUNTAIN PEN.

(Application filed Mar. 13, 1899.)

(No Model.) 2 Sheets—Sheet 1.

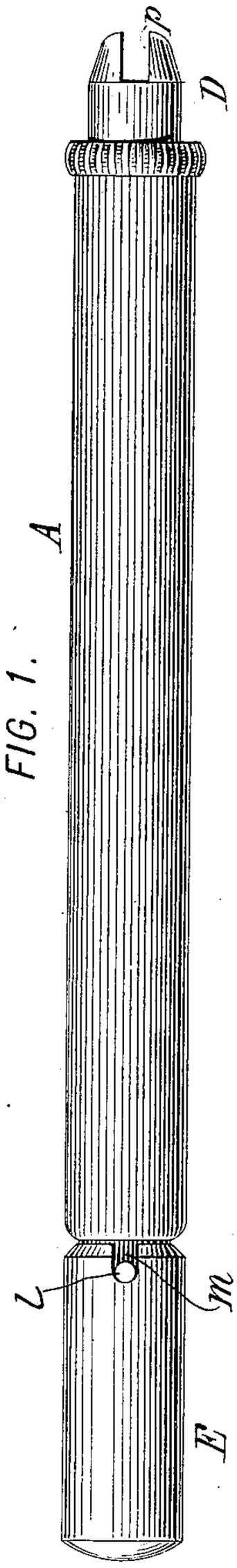

FIG. 1.

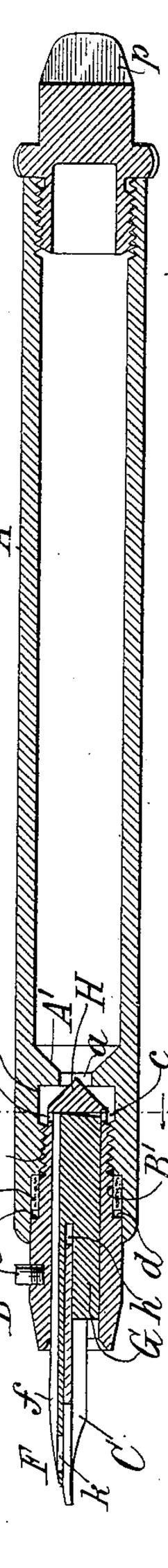

FIG. 2.

FIG. 3.

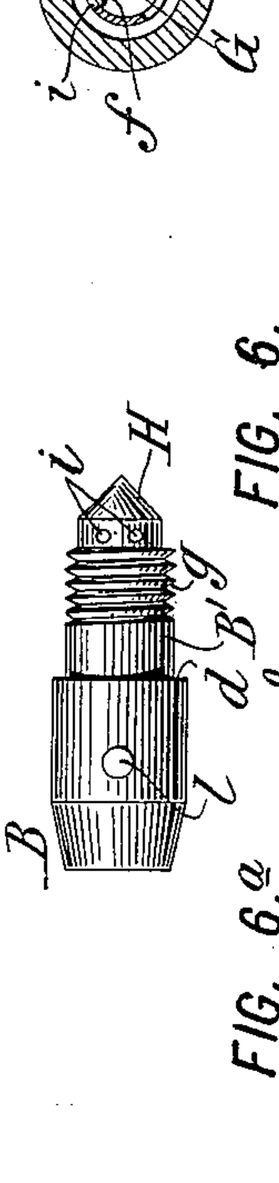

FIG. 4.

FIG. 5.

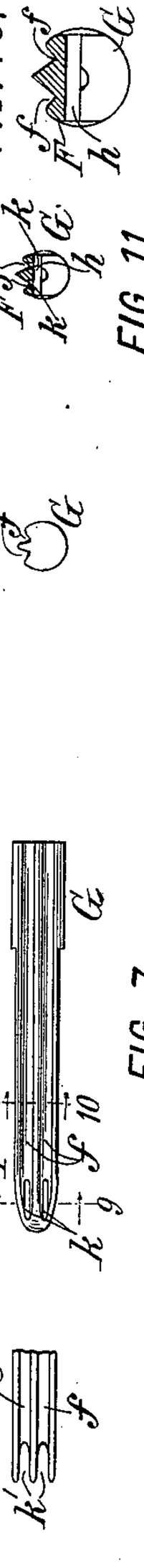

FIG. 10.

FIG. 8.

FIG. 9.

FIG. 11.

FIG. 6.

FIG. 7.

FIG. 6a.

WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

FIG. 12.

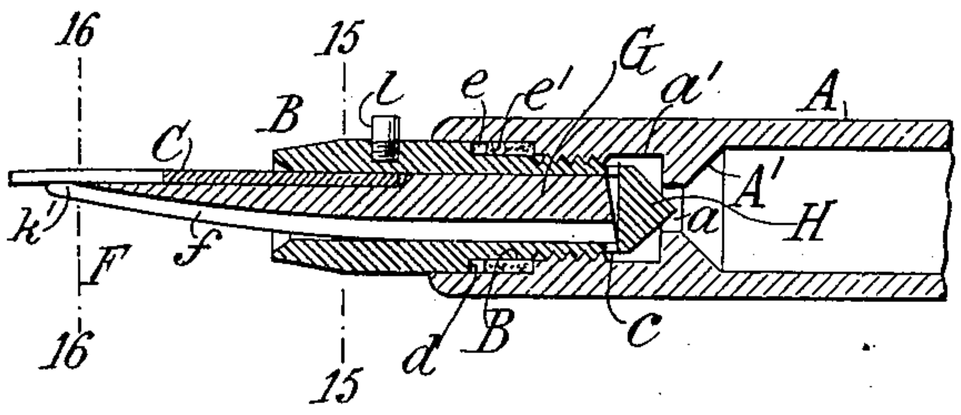

FIG. 15.

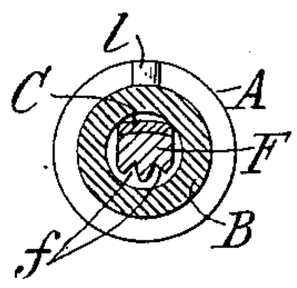

FIG 13.

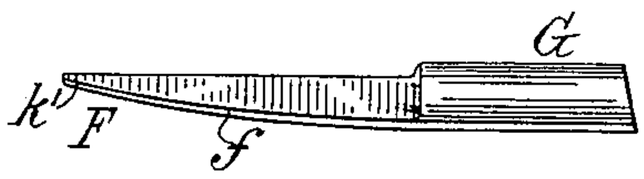

FIG. 16.

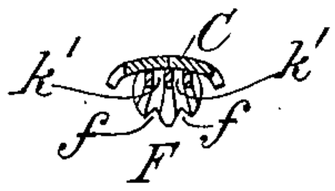

FIG. 14.

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UNITED STATES PATENT OFFICE.

BENJAMIN J. SOPER, OF HOBOKEN, NEW JERSEY.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 663,590, dated December 11, 1900.

Application filed March 13, 1899. Serial No. 708,813. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN J. SOPER, a citizen of the United States, residing at Hoboken, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a specification.

This invention relates to fountain-pens, its object being to produce such a pen which will have certain features of improvement over those now in use.

Referring to the accompanying drawings, illustrating the preferred form of my invention, Figure 1 is an elevation. Fig. 2 is a longitudinal section. Fig. 3 is an elevation of the nozzle detached. Fig. 4 is a vertical section on line 4 4, Fig. 2. Fig. 5 is an elevation of a modification of the top plug detached. Fig. 6 is a top view of the feeding-bar. Fig. 6ª is a similar view of a modification. Fig. 7 is a side view of the feeding-bar. Fig. 8 is an end view of Fig. 6 looking to the left. Fig. 9 is a transverse section looking to the right from line 9 9 in Fig. 6. Fig. 10 is an enlarged transverse section looking from the line 10 10, Fig. 6. Fig. 11 is a top view of the pen proper. Fig. 12 is a sectional view showing a modified form of feed-bar. Fig. 13 is an elevation of said modified feed-bar. Fig. 14 is a plan thereof. Fig. 15 is a section on line 15 15, Fig. 12; and Fig. 16 is a section on the line 16 16, Fig. 12.

In the drawings, A designates the reservoir-holder; B, the nozzle; C, the pen proper; D, the top plug, and E the cap.

Referring to Figs. 1 to 11, the reservoir-holder A is of the usual cylindrical form and together with the other parts (excepting the pen) is preferably made of hard rubber. Said reservoir is provided near one end with a perforated partition A′, formed, preferably, as an internal annular shoulder having an opening *a* through it. The margin of this opening forms a seat *a*′, being preferably abruptly angular at its seating edge. The holder A beyond the partition A′ is internally screw-threaded at *b*, said screw-threaded portion being interrupted a short distance from the partition A′, so as to leave a space *c*, preferably of greater diameter than said screw-threaded portion. Below the screw-thread *b* is formed a plain space *e*, preferably of greater diameter than said screw-threaded portion, and in this space is fitted a cork packing-ring *e*′, which surrounds the nozzle B and serves to prevent leakage around said nozzle.

The nozzle B is hollow for nearly its entire length, is preferably formed with a portion or neck B′ of reduced diameter, as shown, and is screw-threaded at *g* to engage the screw-threaded portion *b* of the holder, by means of which the nozzle is secured and adjusted in said holder. The neck or reduced cylindrical portion B′ is adapted to fit within the packing-ring *e*′ of the holder A and terminates in a shoulder *d*, which bears against the ring *e*′ when the nozzle is screwed into the holder to its fullest extent. The inner end of the nozzle is formed with a stopper H, which is designed to fit against the seat *a*′ of the holder when the nozzle is screwed therein, and thereby close the outlet *a*. The seat *a*′ is preferably a sharp corner, against which the tapering face of the stopper H can make an absolutely-tight joint. Thus by screwing in the nozzle when the pen has been used and it is desired to replace the same in the pocket the flow of ink from the reservoir to the pen may be entirely cut off. There is thus no liability of any leakage occurring during the periods of non-use, and the consequent soiling of the hands or clothes is prevented. I prefer to form these parts as shown; but they may be of any suitable construction, so that an outlet or outlets from the reservoir to the pen are provided, and the nozzle is provided with means for closing said outlet or outlets, so that the passage of ink to the feed-bar may be cut off. When the nozzle is adjusted in the holder for use, as shown in Fig. 2, the space *c* of the holder is left free and in communication with the reservoir through the outlet *a*. The nozzle is formed with suitable openings, as holes or slots *i i*, near its upper end, said openings communicating with the interior of the nozzle and forming passages for the ink. These openings are preferably peripheral and perpendicular to the axis of the pen, the wall of the stopper H constituting an imperforate wall or shield between them and the reservoir, so that flow to them must be around the wall.

The feed-bar F and plug G are preferably

formed in one piece and are adapted to fit in the nozzle B, said plug being preferably so formed as to snugly fit the socket in the nozzle at its inner end. The feed-bar is provided with a longitudinal groove or grooves *f*, of which there may be one or more, but preferably two, said grooves being formed on the exterior surface of said bar, being open-sided and extending the full length thereof, as best shown in Figs. 6 and 8. These grooves are preferably of flaring cross-section, as shown in Figs. 8, 9, and 10, and are in communication with the holder A through openings *i i*, space *c*, and outlet *a* and constitute the feeding means of my invention. The plug G is formed with a slot *h*, Figs 2 and 7, into which the pen C fits when said plug is in position in the nozzle B, and when the parts are so assembled the feed-bar extends along the upper side of the pen, as shown in Fig. 2. At the outer end of the feed-bar F and at the bottom of the grooves *f* I preferably form openings *k*, which serve as passages for the ink to the nibs of the pen C. These openings are preferably near the slit of the pen, so that when the nibs of the pen separate in use the ink will be sucked or drawn through said openings *k*. I may, however, with good results form these openings or passages as shown at *k'*, Fig. 6ª, in which construction the lower part of the feed-bar is cut off at a point about on the line 9 9, Fig. 6. The feed-bar should be constructed of somewhat elastic material, so that it may spring with the pen, hard rubber being suitable. It will be seen that by this construction the ink is delivered to the pen at or near the point thereof instead of by feeding along the surface of the pen and that therefore the body of the pen C will not become covered with ink; also, that the ink feeds down through the bottoms of the grooves by gravity, while the air passes over the top of the descending ink to the reservoir, so that an undue outflow of ink will fill the grooves, and thus by closing them stop inflow of air, which will automatically check and regulate or govern the feed.

To facilitate the adjustment of the nozzle B, my invention provides for a non-rotative engagement between the cap E and said nozzle, and in Fig. 1 I have shown one form of means for carrying out this feature. In this construction the nozzle B is provided with a projecting pin *l*, and the cap E is formed with a slot *m* for engaging such pin. By this means the cap is used as a key to screw up and unscrew the nozzle, and by its use any danger of soiling the fingers and bending or breaking the pen and feed-bar is avoided.

The top plug D is adapted, as usual, to screw on the top end of the holder A. My invention permits of utilizing this plug for the purpose of filling the reservoir by first screwing up the nozzle B to close against the seat *a'*. If the pen is not in every-day use, requiring refilling at frequent intervals, the ink will thicken or cement between the plug and the holder, frequently resisting all efforts to unscrew it by means of its ordinary knurled flange. Hence I provide the head of said plug D with a transverse notch *p*, Figs. 1 and 2, or a hole *p'*, as shown in the modification Fig. 5, or some equivalent formation, so that a knife, key, pin, or the like may be inserted in said notch or hole and used as a lever to unscrew the plug.

In the modification shown in Figs. 12 to 16 the feed-bar is located along the under side of the pen instead of the upper side, and the grooves *f f* are formed on the under side of said feed-bar and extend the entire length thereof, as shown. The feeding operation in this construction is practically the same as in Figs. 1 to 11—that is to say, the ink reaches the grooves *f f* in the same manner and flows along said grooves out of contact with the pen until it reaches the lower ends thereof, when it is sucked or drawn by the pen to its point. In this construction the openings or passages *k'* are preferably similar to those shown in Fig. 6ª. The slot *h* is omitted, the pen being held along the upper side of the feed-bar, as shown in Figs. 12 and 15.

What I claim is—

1. In a fountain-pen, the combination with the reservoir-holder and pen, of a feed-bar extending along the pen and having an ink-passage formed as a longitudinal groove on its outer surface, said bar communicating with the reservoir-holder, and so formed as to permit the passage of ink from said groove to the pen-nibs.

2. In a fountain-pen, the combination with the reservoir-holder and pen, of a feed-bar extending along the pen, and having a longitudinal groove on its outer surface, said groove extending beyond the nozzle and communicating with the reservoir-holder and having an opening through it communicating with the tip of the pen whereby the ink is fed only to said pen at its tip.

3. In a fountain-pen, the combination with the reservoir-holder and pen, of a feed-bar extending along the pen, and having longitudinal grooves on its outer surface, said grooves communicating with the reservoir and extending to the pen-nibs, and passages from said grooves to the pen-nibs whereby the ink feeds along said grooves and passages to the nibs of the pen.

4. In a fountain-pen, a reservoir-holder, a nozzle, a plug in said nozzle, a pen held in said nozzle by said plug, said plug having a feed-bar extending along the pen, and said bar having two longitudinal grooves on its exterior surface communicating with the reservoir-holder, and two holes over the point of the pen and opening from said grooves to the pen-nibs.

5. In a fountain-pen, a reservoir-holder having an outlet and a valve-seat formed around said outlet, and being screw-threaded at one end, a nozzle adapted to screw therein, said nozzle having its inner end closed to form

a stopper H and having openings *i* for the passage of ink, and a plug in said nozzle having longitudinal exterior grooves adapted to conduct the ink flowing through said openings to the pen near its point.

6. In a fountain-pen, a holder A, having the outlet *a* and valve-seat *a'*, a nozzle B having the stopper H and openings *i* and a feed-bar F having the grooves *f* and passages *k*.

7. In a fountain-pen, a holder A, having the outlet *a* and valve-seat *a'*, a nozzle B having the stopper H and openings *i*, a feed-bar having the grooves *f* and passages *k*, and a plug G.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

BENJAMIN J. SOPER.

Witnesses:
GEORGE H. FRASER,
THOMAS F. WALLACE.