

(No Model.)

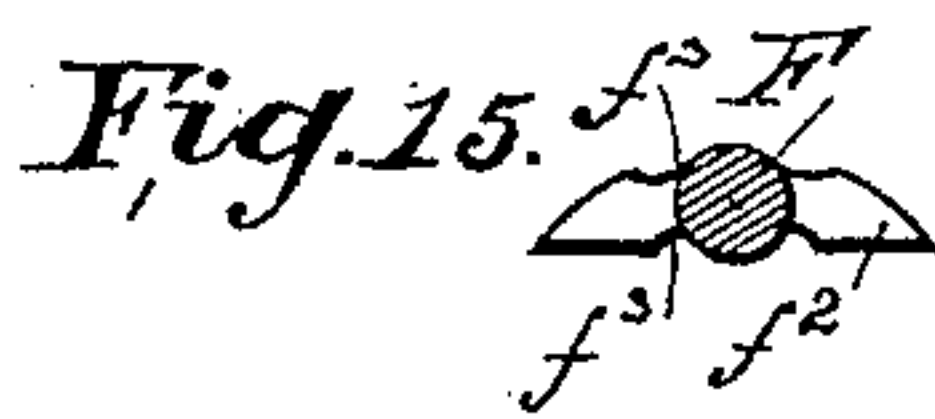
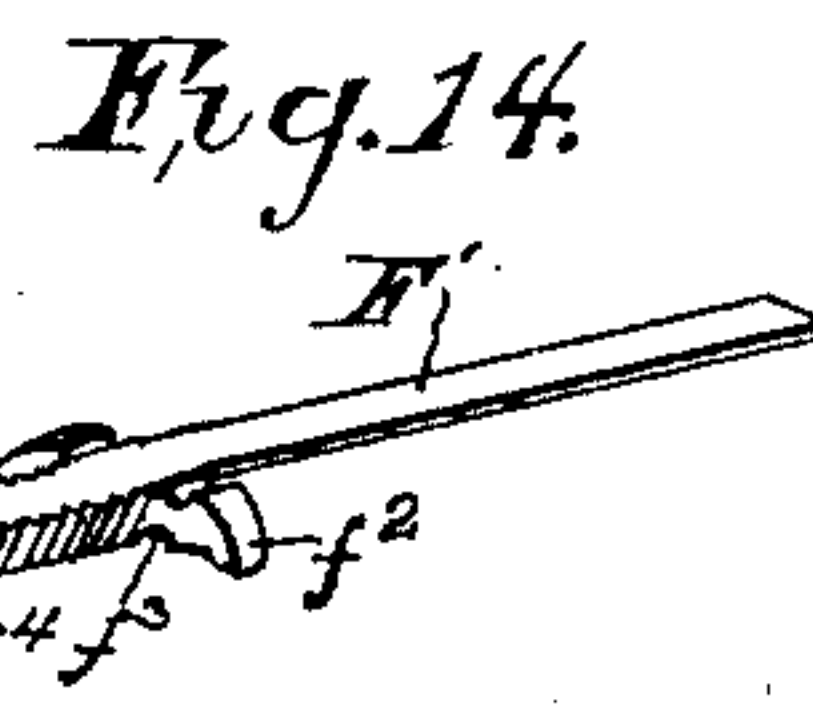
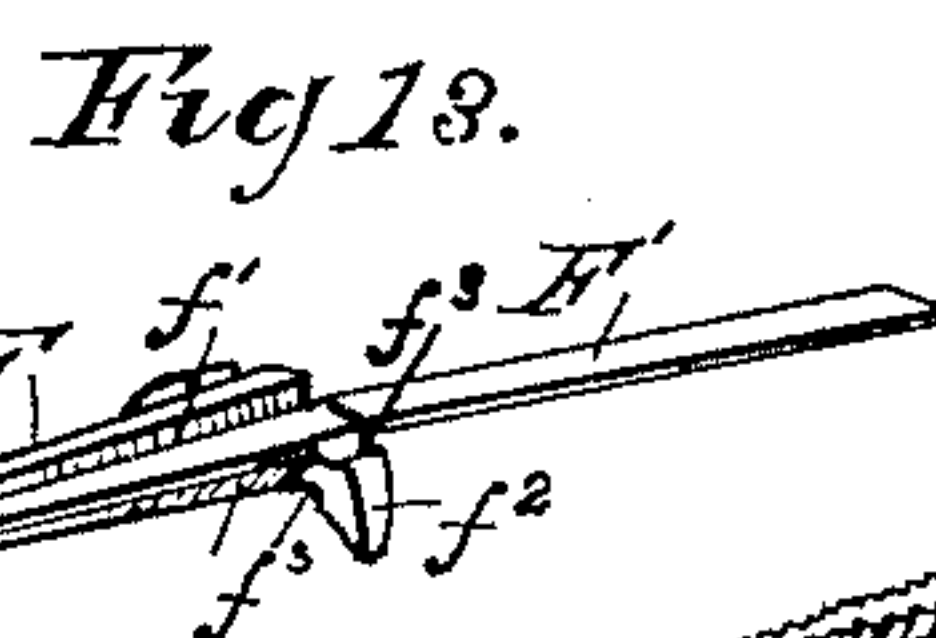
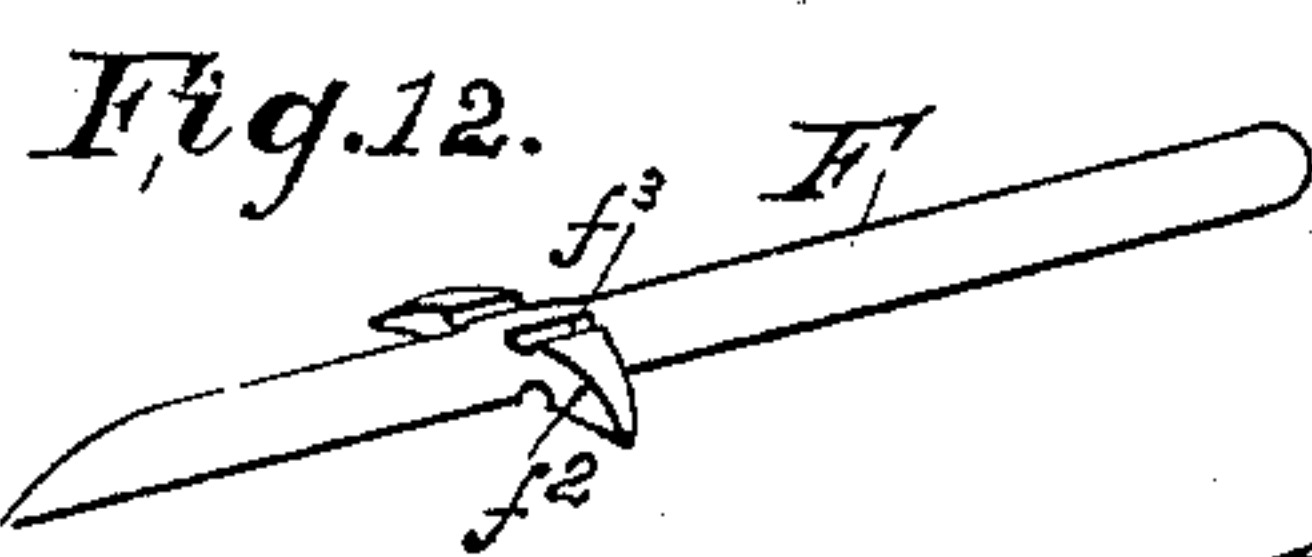
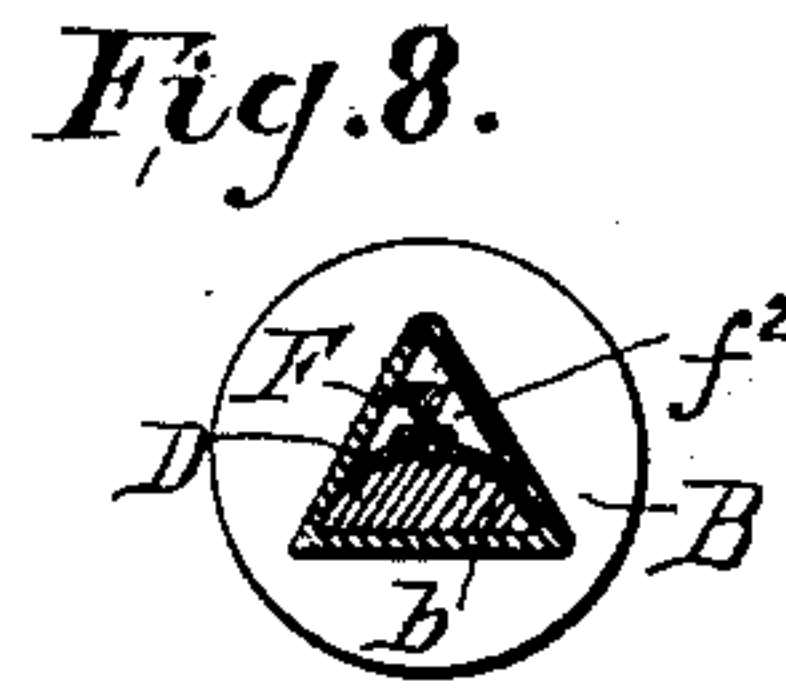
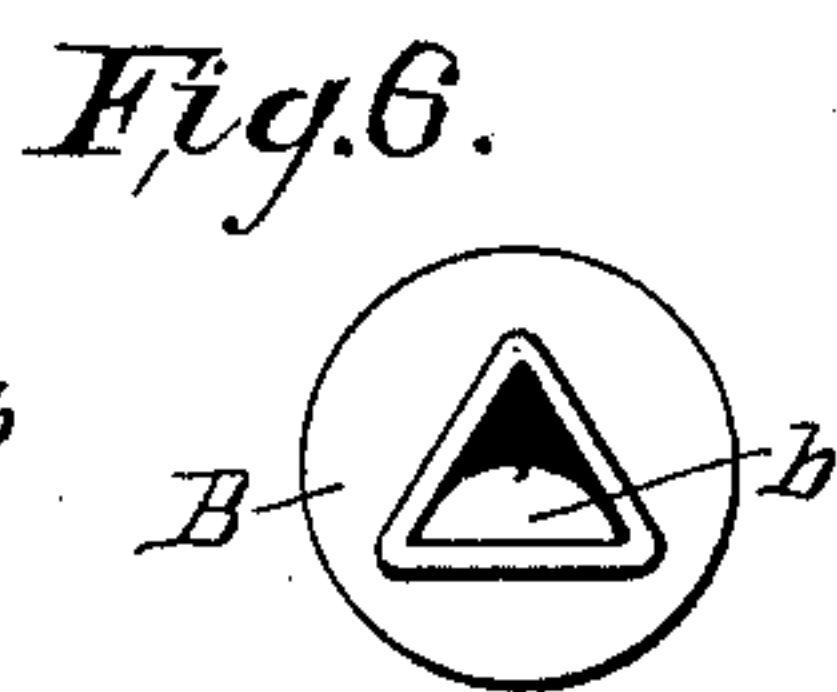
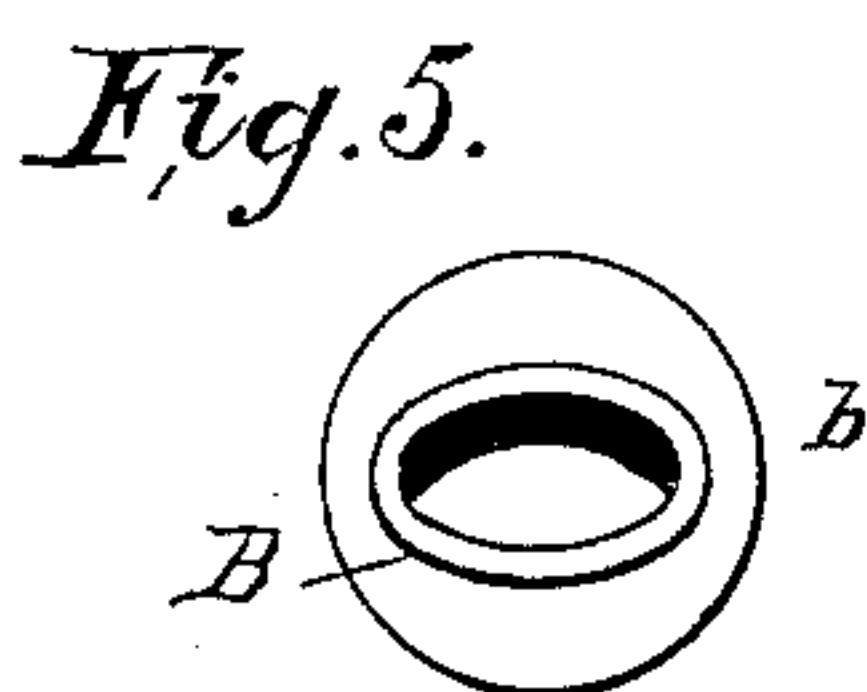
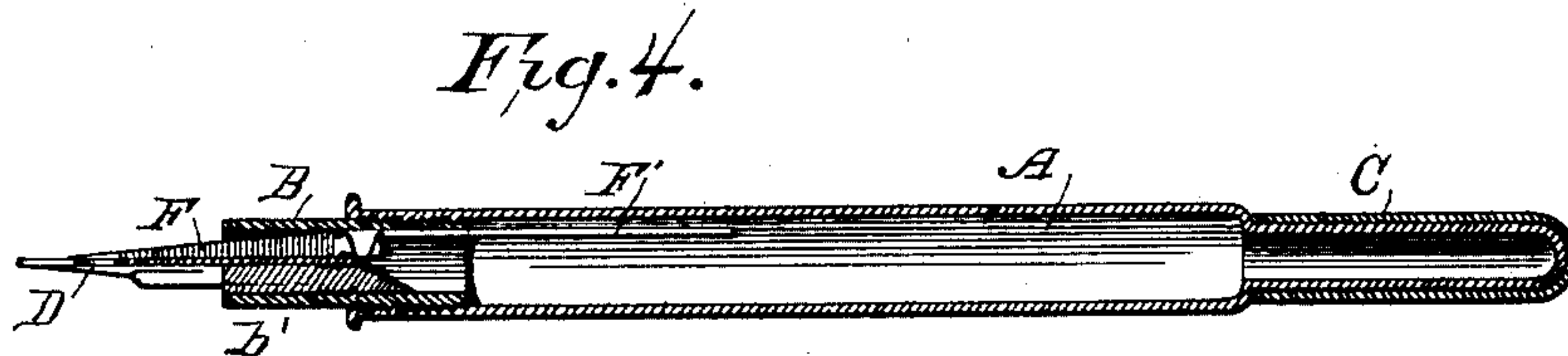
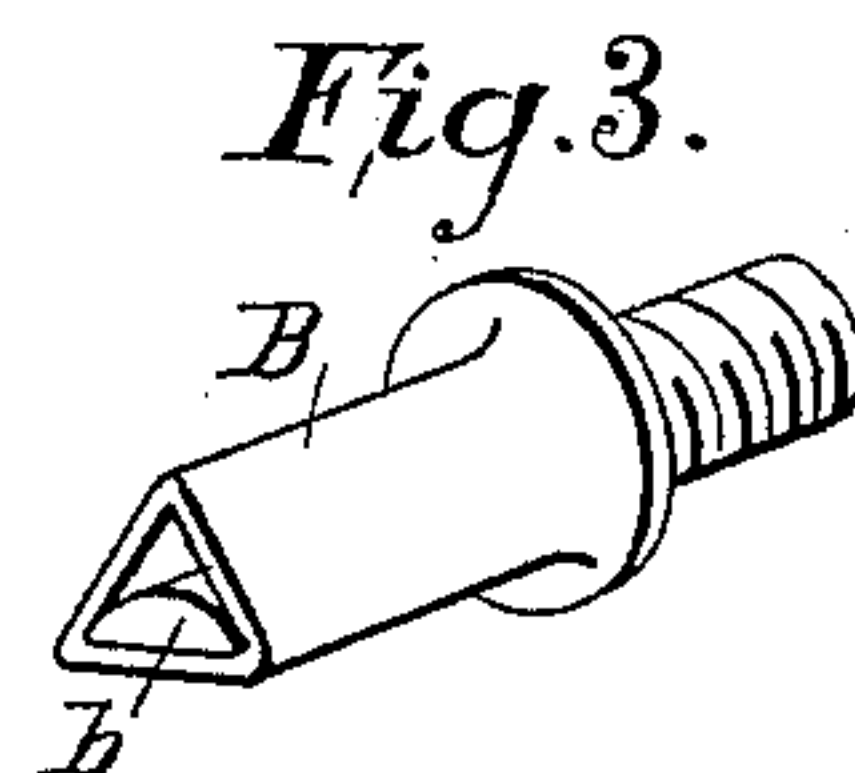
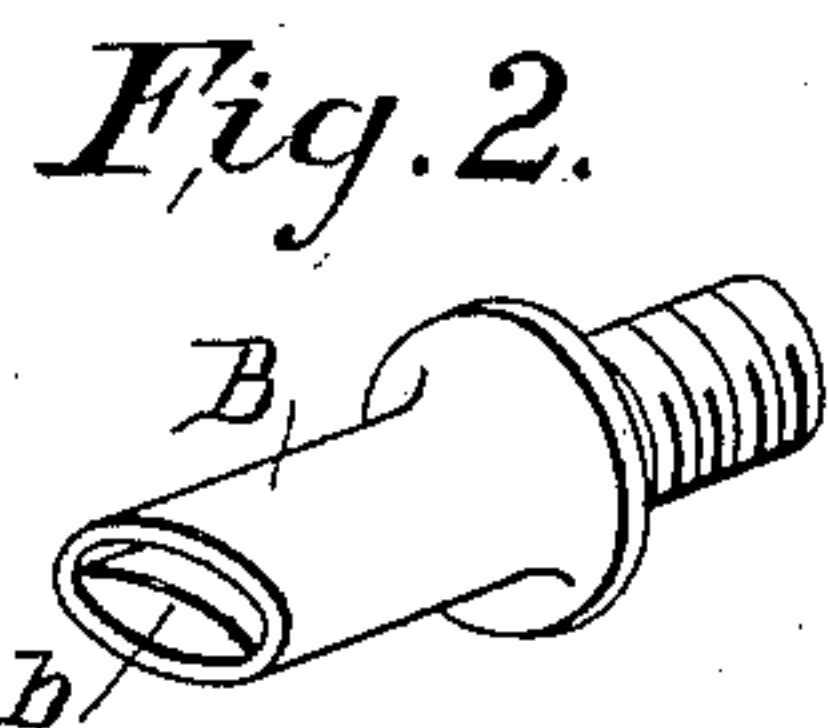
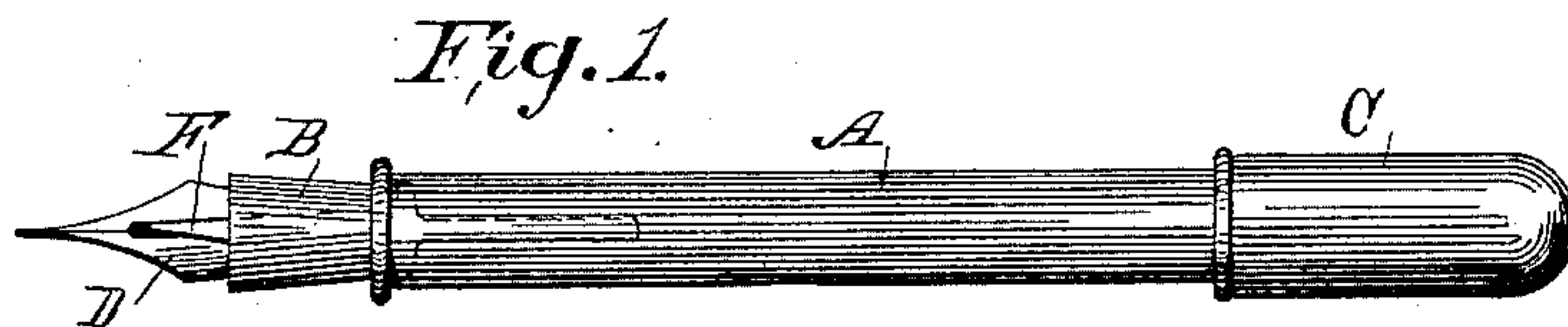
2 Sheets—Sheet 1.

F. C. BROWN & D. W. BEAUMEL.

FOUNTAIN PEN.

No. 353,399.

Patented Nov. 30, 1886.



Witnesses.
W. R. Davis.
J. M. Knobloch

Inventors
Francis C. Brown
David W. Beaumel
per Henry M. M.
Attorney.

(No Model.)

2 Sheets—Sheet 2.

F. C. BROWN & D. W. BEAUMEL.

FOUNTAIN PEN.

No. 353,399.

Patented Nov. 30, 1886.

Fig. 9.



Fig. 10.

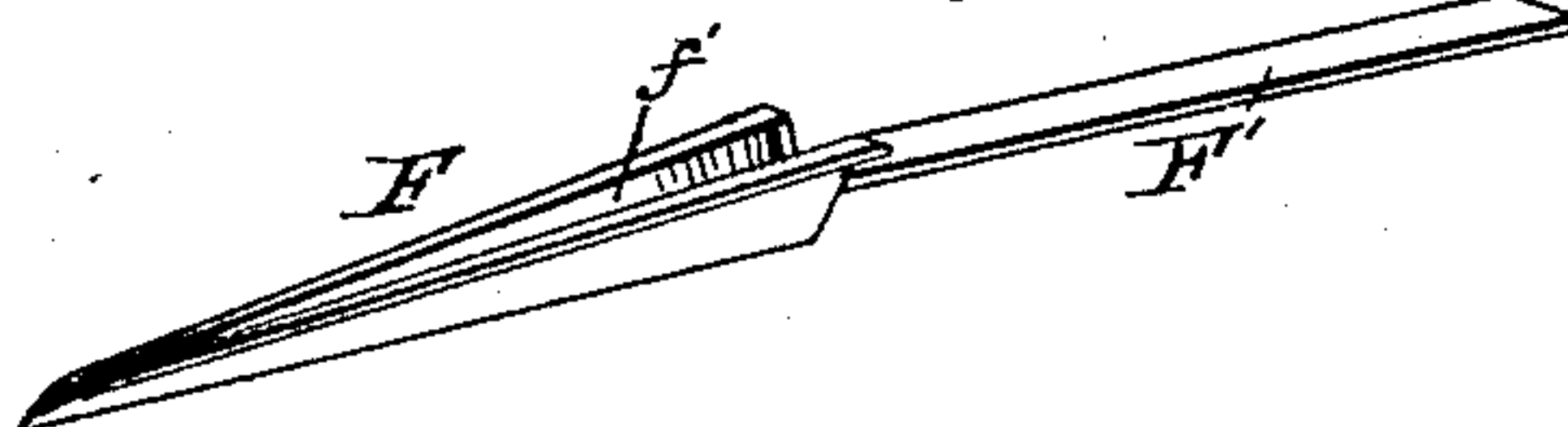


Fig. 21.

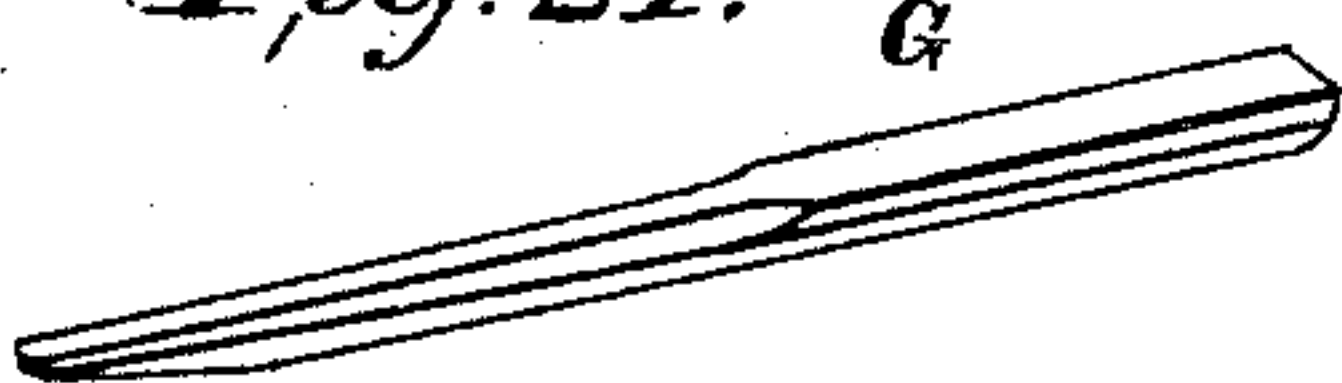


Fig. 11.

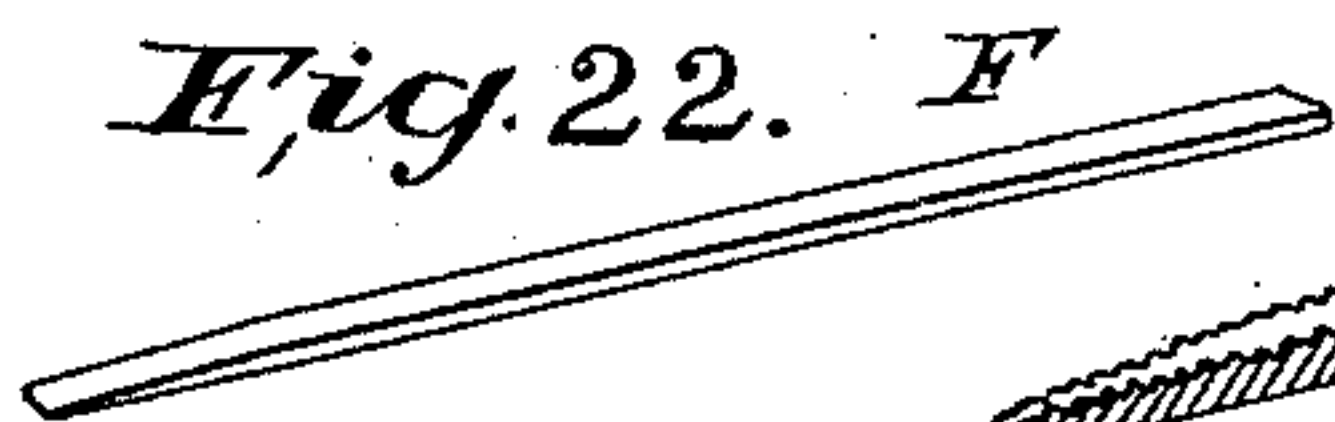


Fig. 18.

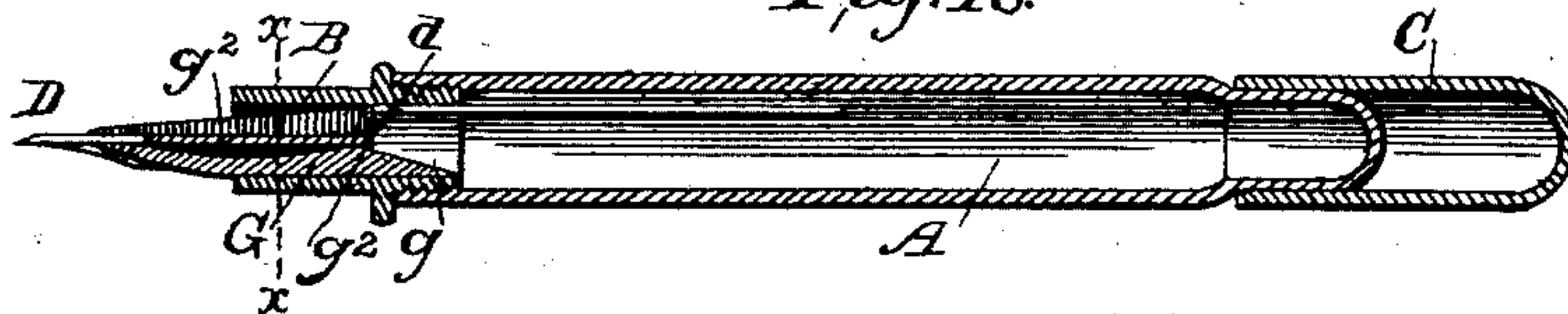


Fig. 19.

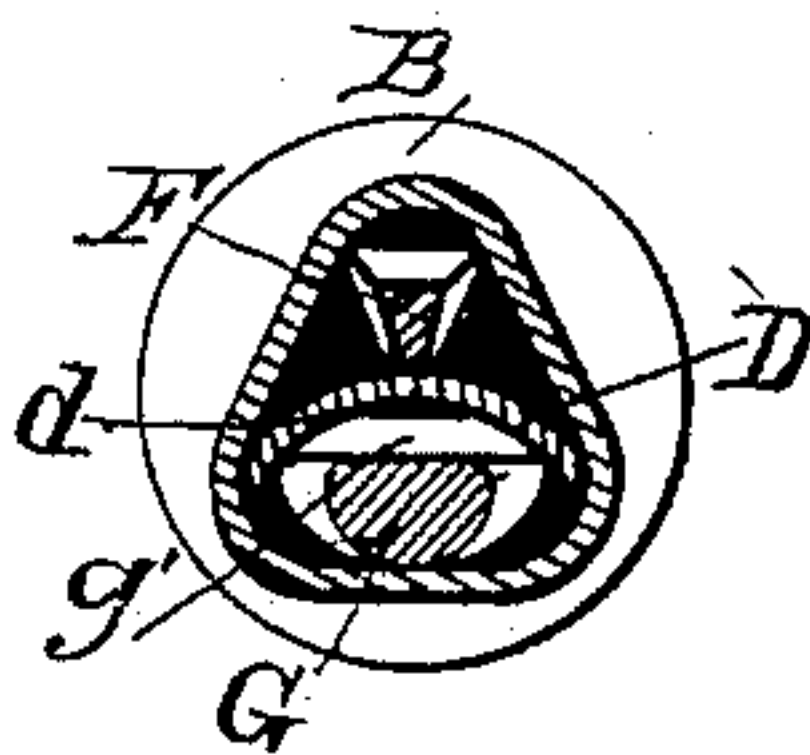


Fig. 20.

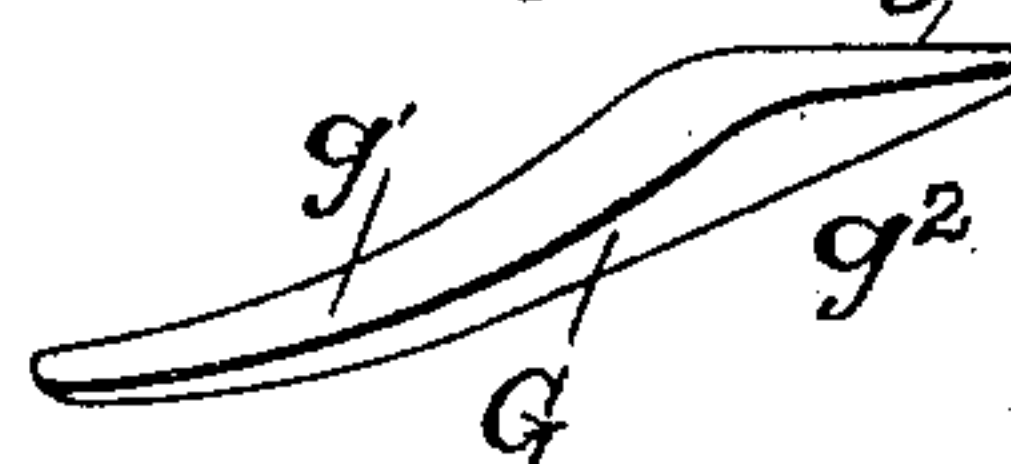
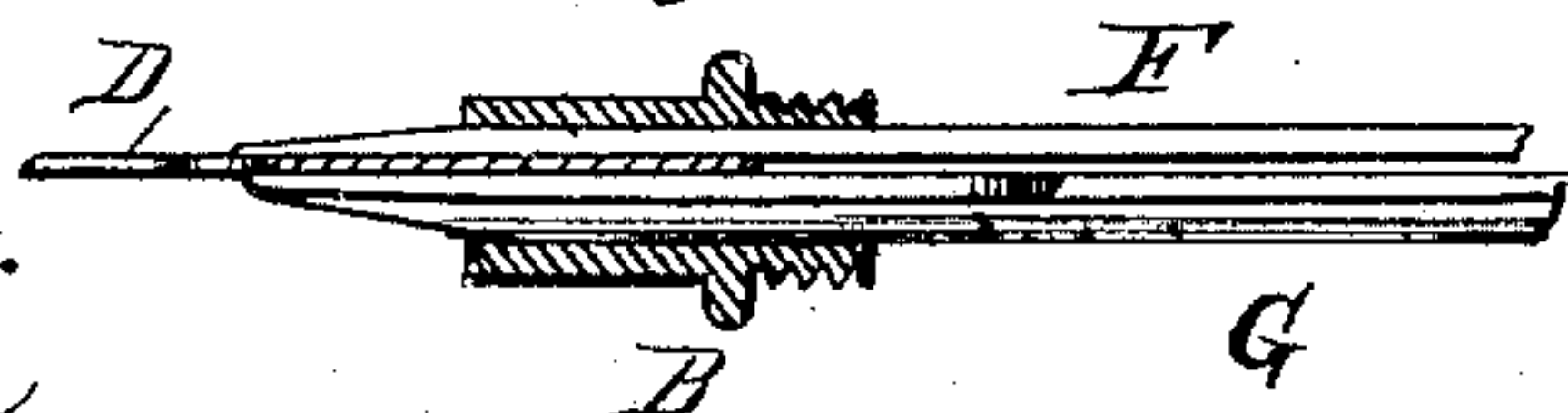


Fig. 23.



Witnesses.

W. R. Davis.

S. M. Knobloch.

Inventors

Francis C. Brown

David W. Beaumel

By Henry M. Th

Attorney.

UNITED STATES PATENT OFFICE.

FRANCIS C. BROWN AND DAVID W. BEAUMEL, OF NEW YORK, N. Y., ASSIGN-
ORS, BY DIRECT AND MESNE ASSIGNMENTS, TO MARIE BROWN, OF SAME
PLACE.

FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 353,399, dated November 30, 1886.

Application filed August 18, 1886. Serial No. 211,214. (No model.)

To all whom it may concern:

Be it known that we, FRANCIS C. BROWN and DAVID W. BEAUMEL, citizens of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Fountain-Pens; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Referring to the drawings, Figure 1 is a top plan view of a fountain-pen having a tapering pen section or nozzle. Figs. 2 and 3 are isometric views of modified forms of the pen section or nozzle. Fig. 4 is a longitudinal axial section of a fountain-pen provided with a cylindrical nozzle. Figs. 5 and 6 are end views of the nozzle shown in Figs. 2 and 3, respectively, and Figs. 7 and 8 are sections thereof. Figs. 9, 10, and 11 are isometric views of different forms of feed-bars. Figs. 12, 13, and 14 are like views showing the feed-bars provided with an enlargement or wings. Figs. 15, 16, and 17 are sections of the feed-bars shown in Figs. 12, 13, and 14, respectively. Fig. 18 is a longitudinal axial section of a fountain-pen provided with a prism-shaped nozzle, in which pen are combined a top and bottom feed, the latter serving also as a seat for the pen. Fig. 19 is a transverse section on line *xx* of Fig. 18, and Figs. 20 and 21 are isometric views of the lower feed bar or seat for the pen. Fig. 22 is a top plan view of a top feed-bar of uniform width and very narrow; and Fig. 23 is a sectional view of the pen section or nozzle, in which a seat of the form of that shown in Fig. 21 is combined with a very narrow top feed-bar, shown in Fig. 22.

This invention relates to improvements in that class of pens known as "fountain-pens," which, though very efficient and convenient for use, yet usually have the great inconvenience of either "skipping" or "dropping" in writing, or both. The former inconvenience is due to an irregular influx of air into the fount or reservoir for the writing-fluid, result-

ing in a corresponding irregular flow of ink from the fount of the pen. This skipping may also be due to air-bubbles lodging at the rear end of the ink-duct or ducts, which necessitates the shaking of the pen to dislodge or rupture them. The dropping of the ink is due to several causes—either to a too sudden or rapid influx of air into the fount or to the influx therein of too great a volume of air. In the first case the pen may skip and drop alternately or occasionally, while in the second case the pen will drop all the time.

The object of this invention is to obviate these inconveniences; and it consists in structural features and combinations of elements, substantially as hereinafter fully described, and as set forth in the claims.

The fountain-pen consists, as usual, of a fount or reservoir, A, that constitutes the holder, of a pen section or nozzle, B, screwed into the open end of said fount, and of a cap, C, adapted to be placed on the nozzle to inclose the pen when not in use, or placed upon the closed end of the fount or reservoir A when the pen is used, as is usual in this class of pens.

Formerly, in order to provide a firm bearing for the pen, so that it will not yield to the pressure in writing, grooves have been formed in the walls of the nozzle for the reception of the edges of the pen-shank, necessitating the use of pens having shanks that will fit the grooves of the nozzle. To avoid grooving the nozzle and provide means for securing the pen firmly into position therein, we employ a seat for the pen that may not only serve as such, but also closes the nozzle below the pen, to prevent either access of air to or egress of ink from the fount at that point, or that may serve as a feeding device for feeding ink to the under side of the pen, as will hereinafter appear. By means of the described construction a nozzle having any desired form in cross-section may be employed. For instance, a nozzle, B, tapering from front to rear may be used, as shown in Fig. 1, or a cylindrical nozzle, as shown in Fig. 4, or a nozzle having an ellipsoidal form or the form of a flattened cylinder, as shown in Figs. 2, 5, and 7, or a prism-shaped nozzle, as shown in Figs. 3, 6, 8, 18, and 19. It is obvious, however, that when a

nozzle is employed that is of greater diameter in one direction than in the other, as shown in Figs. 5 and 6, the pen can be more readily secured therein, the nozzle conforming more nearly to the form of the pen.

As above stated, the skipping of the pen may be due to an insufficient or irregular flow of ink to the nibs of the pen, or it may be due to air-bubbles lodging at the inner end of the duct or ducts that convey the ink to the pen. The latter inconvenience may be effectually avoided by beveling the rear end of the seat *b*, as shown at *b'*, Fig. 4, or the corresponding end of the seat *G*, as shown at *g*, Figs. 18 and 20, said beveled portion of the seat extending from the rear end of the shank *d* of the pen toward the rear end of the nozzle or through said nozzle into the fount.

In practice we prefer to use a seat, *b*, of soft rubber, having substantially the form of the nozzle in which it is used; but when said seat is employed to convey ink to the under side of the pen, as shown in Figs. 18 and 19, we make the same of hard rubber. By making the seat *b* of soft rubber it will more readily adapt itself to the shape of the nozzle, and more effectually close the space thereof below the pen, while the said pen will be more firmly held in the nozzle.

In fountain-pens of usual construction that portion of the feed-bar which serves to conduct the ink by capillary attraction or otherwise to the nibs of the pen is generally made comparatively wide, the ink being conveyed to the nibs of the pen between the pen and the feed-bar. In this arrangement, unless the admission of air to the fount is regulated very carefully, the volume of ink fed to the pen is either too copious and drops off the pen in writing, or is insufficient and causes the pen to skip. To obviate this we construct the feed-bar in such a manner that the surface thereof that lies in proximity to or in contact with the pen will have a less cross-sectional area than the body of said pen. This may be effected by giving the feed-bar various forms in cross-section. For instance, a semi-cylindrical feed-bar may be employed and arranged in the nozzle with its convex side in proximity to or in contact with the pen; or a cylindrical feed-bar, *F*, Fig. 9, may be employed for this purpose, which, when applied above the pen and in contact therewith, will divide the nozzle longitudinally and form ink and air ducts on opposite sides thereof, the proximate surfaces of the pen and feed-bar and the latter and the wall of the nozzle being in this construction reduced to a minimum, the said contacting surfaces being simply a succession of points of contact. The same result may be obtained by beveling that portion of the feed-bar which lies above the pen, so as to give it the form of a prism in cross-section, as shown in Figs. 11 and 17; or the prismatic form of the body of the feed-bar may be obtained by molding or compression in dies so as to form a channel, *f'*, in the upper face of the feed-bar, as shown in Figs. 10,

13, and 16, this construction providing at the same time an air-duct, *f'*, through which air is admitted to the fount. In these constructions it will readily be seen that air will have access to the fount on opposite sides of the feed-bar, while said feed-bar will also form ducts for the ink from the fount, which is conveyed to the nibs of the pen by capillary attraction. In either of the constructions shown in Figs. 9, 10, 11, 13, and 14 the feed-bar may be provided with an attenuated shank, *F'*, that extends into the fount and conveys the ink by capillary attraction to the body of the feed-bar, and, if desired, such a shank may be formed on the cylindrical feed-bar shown in Figs. 9 and 12, though this is not absolutely necessary.

To prevent too copious a flow of ink along the opposite sides or edges of the feed-bar, we corrugate or roughen said sides or edges, as shown in Figs. 11, 14, 16, and 17, thereby forming channels *f⁴* at an angle to the longitudinal axis of the bar, that tend to check the free flow of the ink to the nibs of the pen, and supply the same thereto as fast as it is consumed in writing, a greater supply being furnished in making the heavier strokes or dashes than in making the finer strokes.

The flow of ink from the fount and the ingress of air to the said fount may be further controlled by forming at the rear end of the body of the feed-bar *F*, or at that point which lies above or on the rear end of the pen-shank, lateral projections or wings *f²*, that will close or nearly close the space between the pen and the nozzle on opposite sides of the feed-bar, said projections or wings being provided with grooves *f³*, that form ink and air ducts, respectively, below and above the feed-bar, as shown in Figs. 12 to 16. This construction will effectually prevent too copious a flow of ink, and at the same time provide a uniform flow of air to the fount, while said projections or wings *f²* also serve as bearings for the shank of the pen *D* and assist in holding the same firmly in position.

As shown in Figs. 18 and 19, we combine a top and bottom feed, the seat *G* serving here as an under feed and taking the place of the seat *b*. This seat *G* is preferably of semi-cylindrical form, or substantially so, the convex portion thereof lying in contact with the walls of the nozzle. As shown in Fig. 20, the seat *G* is made tapering from its rear end to its forward end, and the upper face, *g'*, thereof is flat, so as to form an ink-duct between said flat face *g'* and the concave shank *d* of the pen.

Any one of the forms of feed-bars *F* hereinabove described may be used as a top feed-bar, in combination with the seat *G*. As the latter seat is of nearly semi-cylindrical form and made tapering, as set forth, the larger rear end, *g²*, thereof will nearly fill the space between the under side of the pen and the wall of the nozzle, thus performing the function of a seat and a feed-bar for the pen and of a plug that nearly closes the nozzle below the pen.

To provide means for feeding a sufficiency of ink to the under side of the pen, the seat G is scooped out from near the outer end thereof to or nearly to its beveled portion g ; or said seat may be bent between said points, so as to form an enlarged cavity or ink-chamber, g^2 , at that point to supply the required volume of ink to the under side of the pen. This result may also be attained by beveling the edges of the seat G, as shown in Figs. 21 and 23, to form ducts along said edges, as above described, or by forming a groove in the upper face of said seat or feed bar, and in combination with this the narrow top feed-bar shown in Fig. 22 may be employed with excellent results.

It will be readily seen that when a semi-cylindrical feed-bar is employed as a top feed in a cylindrical nozzle, or a nozzle of the form shown in Figs. 5 to 8, the grooves f^3 in the upper face of the wings f^2 of the bar may be dispensed with, as there will be between the feed-bar and nozzle sufficient space for the admission of the required volume of air. The same result will be obtained by the use of the feed-bar F shown in Figs. 13, 14, 16, and 17.

When a cylindrical feed-bar is employed in conjunction with a cylindrical or ellipsoidal nozzle, B, the air and ink ducts will be formed between the pen and the nozzle-wall, as will be readily understood, and the wings f^3 may or may not be used as desired, according to the diameter of the said nozzle; and when such a feed-bar F is employed with the prism-shaped nozzle an air-duct will also be formed between said bar and the wall of the nozzle, as will be readily seen by an inspection of the drawings.

It is desirable that the shank of the pen should fit as closely to or hug the wall of the nozzle as much as possible throughout the length of the shank, especially when the seat G is employed. It is obvious that pens having tapering shanks could not fit said nozzle snugly or sufficiently so to prevent ink from passing around the same. With such pens we prefer to employ the tapering nozzle shown in Fig. 1, so as to cause the edges of the pen-shank to hug the wall of the nozzle.

If the air is admitted to the fount either through the seat b or directly without passing through the nozzle, the grooves f^3 in the upper face of the wings f^2 of the feed-bar may also be dispensed with, as will be readily understood.

Having thus described our said invention, what we claim, and desire to secure by Letters Patent, is—

1. A feed-bar for fountain-pens having one or more bearing or contact faces of less cross-sectional area than the body of the bar, substantially as and for the purposes specified.

2. A feed-bar for fountain-pens having diametrically-opposite bearing or contact faces of less cross-sectional area than the body of the bar, substantially as and for the purposes specified.

3. A feed-bar for fountain-pens having one or more bearings or contact-faces of less cross-sectional area than the body of the bar, and having its lateral faces channeled or roughened, for the purposes specified.

4. A feed-bar for fountain-pens having one or more bearings or contact-faces of less cross-sectional area than the body of the bar, and having its lateral faces channeled or corrugated, said channels or corrugations being formed at an angle to the longitudinal axis of the bar, substantially as and for the purposes specified.

5. A feed-bar for fountain-pens having bearings or contact-faces of less cross-sectional area than the body of the bar, and provided with enlargements or wings projecting from opposite sides thereof, substantially as and for the purposes specified.

6. A feed-bar for fountain-pens having enlargements or wings f^2 , provided with notches or grooves f^3 along the body of the pen on the upper and under side of said wings, substantially as and for the purposes specified.

7. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of two feed-bars, between which the pen is inserted, the lower feed-bar having a groove in its upper face, substantially as and for the purposes specified.

8. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen extending in rear of the shank thereof, and having said extended portion beveled in a direction away from said shank, and a feed-bar arranged above the seat to feed ink to the top of the pen, substantially as and for the purposes specified.

9. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen extending in rear of the shank thereof, and ink-ducts between the pen and its seat, and between said seat or pen and the wall of the nozzle, substantially as described.

10. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen extending in rear of the shank thereof, and having the extended portion beveled in a direction away from said shank, and a feed-bar located above said seat, and said parts being arranged to form ink-ducts between the wall of the nozzle and the pen when inserted between the seat and feed-bar, to deliver ink to the top and under side of the pen, substantially as described.

11. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen extending in rear of the shank thereof, and having said extended portion beveled in a direction away from the shank of the pen, a feed-bar above the seat for the pen, and ink and air ducts above and below the seat or pen and between it and the wall of the nozzle, substantially as and for the purposes specified.

12. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen having a cavity in its outer

end to form a space between the seat and the pen, and a feed-bar arranged above the seat and pen, substantially as and for the purposes specified.

5 13. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen, and a feed-bar provided with lateral projections arranged above the seat and pen, to divide the nozzle longitudinally and nearly
10 close the space on opposite sides thereof, substantially as and for the purposes specified.

14. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen, a feed-bar provided with lateral projections arranged above the seat and pen to divide the nozzle longitudinally and
15 close the space on opposite sides of said feed-bar, and ink and air ducts formed on opposite sides of the feed-bar, substantially as and for
20 the purposes specified.

15. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat for the pen, a feed-bar provided with lateral projections or wings arranged above the
25 seat and pen to divide the nozzle longitudinally and close the space on opposite sides of the bar, ink and air ducts formed along the feed-bar, and an ink-duct formed above the seat and between it and the pen, substantially
30 as and for the purposes specified.

16. In a fountain-pen, the combination, with the fount, of a nozzle of greater diameter in one direction than in the other, substantially as and for the purposes specified.

35 17. In a fountain-pen, the combination, with the fount and a nozzle of greater diameter in one direction than in the other, of a seat for the pen arranged in said nozzle, and a feed-bar arranged above the seat, substantially as
40 described, for the purposes specified.

18. In a fountain-pen, the combination, with the fount and a nozzle of greater diameter in one direction than in the other, of a seat for the pen arranged in said nozzle, and a feed-bar hav-
45 ing that face which lies in proximity to or in

contact with the pen of less cross-sectional area than the body of the bar, said feed-bar being arranged above the seat or pen, substantially as and for the purposes specified.

19. In a fountain-pen, the combination, with 50 the fount and a pen section or nozzle of greater diameter in one direction than in the other, of a seat for the pen and air-ducts and ink-ducts above and below said pen when applied to its seat, substantially as and for the purposes 55 specified.

20. In a fountain-pen, the combination, with the fount and pen, of a pen section or nozzle having substantially the form of a prism, as described. 60

21. In a fountain-pen, the combination, with the fount and a nozzle of substantially prismatic form, of a seat for the pen seated on the base of the prism and a feed-bar seated in the apex of said prism, substantially as and for 65 the purposes specified.

22. In a fountain-pen, the combination, with the fount and the pen section or nozzle, of a seat or under feed-bar and a top feed-bar, between which the pen is inserted, an ink-duct 70 between the pen and its seat, and an ink-duct between the seat or pen and the wall of the nozzle, substantially as and for the purpose specified.

23. In a fountain-pen, the combination, with 75 the fount and the pen section or nozzle having that portion above the pen closed, of a seat for the pen, a feed-bar arranged above said seat or pen extending through the closed portion of the nozzle into the fount, and ink and air 80 ducts formed along the feed-bar and communicating with the fount, substantially as and for the purpose specified.

In testimony whereof we affix our signatures in presence of two witnesses.

FRANCIS C. BROWN.
DAVID W. BEAUMEL.

Witnesses:

HORACE SECOR, Jr.,
JOHN T. CORNELL.