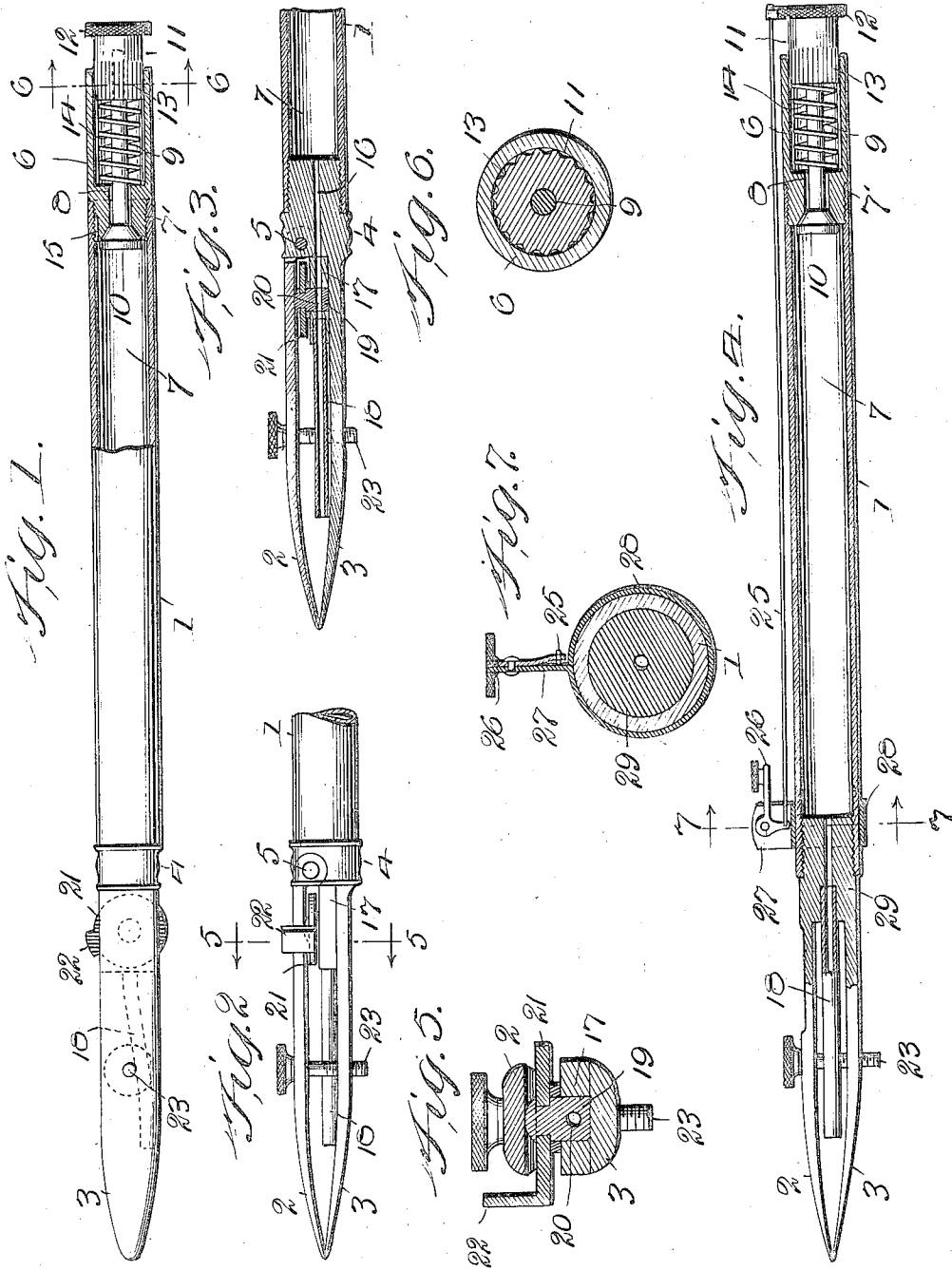


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PATENTED AUG. 7, 1906.

G. P. SMITH & P. STOKES.
FOUNTAIN DRAFTING PEN.
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Witnesses

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GEORGE P. SMITH AND PERCY STOKES, OF PHILADELPHIA, PENNSYLVANIA.

FOUNTAIN DRAFTING-PEN.

No. 827,758.

Specification of Letters Patent.

Patented Aug. 7, 1906.

Application filed January 3, 1905. Serial No. 239,867.

To all whom it may concern:

Be it known that we, GEORGE P. SMITH and PERCY STOKES, citizens of the United States, and residents of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Fountain Drafting-Pens, of which the following is a full, clear, and complete disclosure.

Our invention comprises the providing a valve for the admission of air to the upper end of the pen to allow atmospheric pressure to permit the ink to flow from the lower end of the pen by the force of gravity, said valve being also arranged to give a positive internal pressure independent of the outside air to aid in expelling the ink from the reservoir.

The invention also comprises a connection between the means for admitting air to the upper end of the pen and the lower end of the pen, so that the said means can be manipulated without disengaging the fingers from the pen.

For a full, clear, and exact description of our invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which—

Figure 1 is a side elevation of our improved pen, showing one end thereof in section to disclose the details of the valve for admitting air to the ink-chamber. Fig. 2 is a plan view of the operative end of the pen, showing the valve for controlling the flow of ink. Fig. 3 is a longitudinal sectional view similar to Fig. 2. Fig. 4 is a longitudinal sectional view of our improved pen, showing the means for operating the air-admission valve from the lower end of the pen. Fig. 5 is a transverse sectional view taken substantially upon the line 5 5, Fig. 2. Fig. 6 is a transverse sectional view taken substantially upon the line 6 6, Fig. 1; and Fig. 7 is a transverse sectional view taken substantially upon the line 7 7, Fig. 4.

Referring to the drawings, the numeral 1 indicates the holder barrel or body of the pen, which is hollow and preferably cylindrical in form. Said holder has the nibs 2 and 3 attached thereto by means of a yoke or head 4, the nib 2 being preferably pivoted or hinged, as indicated at 5. The upper end of the barrel, or the end opposite to that carrying the nibs, is provided with a separate chamber or

section 6, which is reduced at one end and screw-threaded, so as to engage interiorly with the cylindrical portion of the ink-reservoir 7, as indicated at 7'. The reduced portion of the section 6 is provided with a central opening 8, through which passes the stem 9 of the longitudinally and inwardly moving valve member 10. The outer end of the valve-stem 9 is detachably screw-threaded to a slidable plug or plunger 11, having a milled head 12. The inner end of said plunger 11 is preferably fluted or provided with one or more grooves 13, as indicated in Fig. 6. The plunger 11 may also be slightly tapered toward its inner end to allow the valve member 10 to more perfectly engage the valve-seat and to permit greater freedom of movement of said plunger when the same is in its outer position. The taper of the plunger 11 also allows air to enter in a manner similar to that of the grooves 13. A coiled spring 14 is interposed between the end of the plunger 11 and the reduced portion of the cylindrical section 6 to keep the valve member 10 and plunger 11 in their outer or normal positions. The reduced screw-threaded portion 7' is provided with a groove or recess 15, which extends for such a distance from the end of said reduced portion adjacent the valve 10 toward the larger portion of the section 6 that when the said section is partly unscrewed from the body portion 1 of the pen the end of the groove 15 will communicate with the outside air.

The head 4, to which is attached the nibs 2 and 3 of the pen, is preferably reduced in diameter and screw-threaded for engaging the interior of the ink chamber or holder 1, which is also screw-threaded, as plainly indicated in Fig. 3. Said head 4 is also provided with a cylindrical passage or opening 16. Forming an extension of the head 4 is a block or casing 17, which communicates at its outer end with a small tube or conduit 18, the latter of which extends a sufficient distance between the nibs of the pen to deliver ink at the proper point. The member 17 is provided with a transverse opening or recess, within which revolvably fits a pin 19, forming a valve member, said pin 19 having a transverse opening 20, which forms a portion of the conduit 18 when said opening 20 is in alignment therewith. The outer end of the pin 19 is

slightly reduced and passes through an opening in a disk or plate 21, upon which said pin is headed down. The disk or plate 21 is provided with a lateral projection or lug 22, forming a finger-piece by which said disk and pin is turned. The pin 19 is held within the opening in the member 17 by reason of the fact that the pivoted nib 2 of the pen engages the headed end of the pin 19 with a spring-pressure, thereby not only holding the parts of the valve in their operative positions, but also allowing the same to be easily separated for cleaning, adjustment, and repair. The nibs 2 and 3 of the pen are provided with the usual thumb-screw 23 or other similar device by which the width of the line to be drawn is adjusted.

As means for operating the valve member 10 and plunger 11 from the lower end of the pen without the necessity of disengaging the fingers therefrom we provide the construction shown in Fig. 4. This consists of a rod or wire 25, which is attached at one end to the mill-head 12 of plunger 11 and its other end to a bell-crank lever 26. Said bell-crank lever 26 is preferably pivoted to a projection 27, carried by a band 28 or other device mounted upon the body of the pen. It is obvious that the ink-controlling valve may be used with this form of pen as well as with that form in which the air-admission valve is not connected with the lower end of the pen, as above described. When the ink-controlling valve is omitted, the tube or conduit 18 is connected directly with the yoke 29 of the pen, as clearly shown in section in Fig. 4.

In the use of our improved pen the ink-reservoir 7 is filled with ink by unscrewing the section 6 of the barrel and the ink inserted in the usual manner. The section 6 is then replaced, and the pen is then in condition for drawing.

The ink-feed may be controlled in two ways:

First, the valve 19 may be set to give the requisite opening for the flow of the ink to the nibs of the pen, and when it is desired to force the ink between the nibs of the pen the plunger 11 is forced inward. This opens the valve formed by the valve-member 10 and allows the air to enter the upper part of the ink-reservoir. As the plunger 11 is further depressed, so that the grooves 13 are entirely within the cylindrical section 6, air is compressed within the chamber and in the ink-reservoir, thereby forcing the ink positively from the conduit 18 at the lower end of the pen. This operation may be repeated as often as the ink becomes exhausted from between the nibs of the pen.

Second, the valve at the lower end of the pen may be entirely closed, the cylindrical portion 6 unscrewed until the end of the groove 15 extends beyond the end of the casing forming the holder 1, thereby allowing air to have free access to the interior of the

pen at all times. When it is desired to fill the pen or admit ink between the nibs, the valve 19 is opened by rotating the disk 21 and sufficient ink is allowed to flow under atmospheric pressure and gravity to its usual position between the nibs of the pen. The valve 19 is then closed and the drawing proceeded with in the usual manner. This operation may be repeated as often as the ink becomes exhausted from between the nibs of the pen. If the ink becomes thick or sluggish in movement, owing to the small size of the conduit and evaporation, the cylindrical section 6 may be screwed inward, as first described, and the ink forced downward through the conduit 18.

The operation of the pen as shown in Fig. 4 is substantially the same as that first above described, with the exception that the plunger is operated by depressing the outer end of the bell-crank lever 26 at any time when the ink is desired to be forced into the space between the nibs.

Instead of forming a separate chamber in the upper part of the barrel 1 we may eliminate the valve and valve-seat, thus converting the entire barrel into an ink-reservoir. In such a case any resilient means might be utilized to return the plunger to its initial position, and, further, the barrel portion may be made in one piece instead of being separated near its upper end by the screw-threads 7'.

Other changes in the details and arrangement of the various parts may be made without departing from the spirit and scope of our invention; but

What we claim, and desire to protect by Letters Patent of the United States, is—

1. In a fountain-pen, the combination of a barrel having an air-admission valve including an inwardly-moving member near the upper end thereof and a plunger adapted to operate in the upper end of said barrel at such a distance above said valve as to always leave a chamber between the said valve and said plunger, the said plunger having channels therein to admit air below the same during the initial part of its inward stroke, the moving valve member and plunger being so connected that the valve will always remain open during the inward stroke of the plunger.

2. In a fountain-pen, the combination with a barrel, having an air-admission valve having an inwardly-moving member near the upper end thereof, of a plunger adapted to operate in the upper end of said barrel at such a distance above said valve as to always leave a chamber between said valve and plunger, the said plunger having channels therein to admit air below the same during the initial part of its inward stroke, the moving valve member and plunger being rigidly connected so that the valve will always remain open during the inward stroke

of the plunger, and resilient means adapted to resist said inward stroke and to return the plunger to its initial position.

3. In a fountain-pen, the combination with a barrel, having an air-admission valve including an inwardly-moving member near the upper end thereof, a plunger adapted to operate in the upper end of said barrel at such a distance above said valve as to always leave a chamber between said valve and plunger, the said plunger having channels therein to admit air below the same during the initial part of its inward stroke, the valve member and plunger being so connected that the valve will always remain open during the inward stroke of the plunger, and means to return the plunger to its initial position after its inward stroke.

4. In a fountain-pen, the combination with a barrel, having an air-admission valve including an inwardly-moving member near the upper end thereof, a plunger adapted to operate in the upper end of said barrel at such a distance above said valve as to always leave a chamber between said valve and plunger, the said plunger having channels therein to admit air below the same during the initial part of its inward stroke, the moving valve member and plunger being so connected that the valve will always remain open during the inward stroke of the plunger, and means, including a spiral spring, to return the plunger to its initial position after its inward stroke.

5. A fountain-pen having among its parts a barrel having its outer end detachably screw-threaded to its body portion, the said outer end having an air-inlet valve and a plunger beyond said valve constructed to admit air during the initial part of its inward stroke.

6. A fountain-pen having among its parts a barrel having its outer end detachably screw-threaded to its body portion, the said outer end containing an air-inlet valve and means beyond said valve for admitting and compressing air into the reservoir.

7. A fountain-pen having among its parts a barrel, means for admitting and compressing air at the upper end of same, and mech-

anism located near the point of the pen for operating said means.

8. In a fountain-pen the combination with a barrel of means for admitting air into the upper end of same and means including a bell-crank lever located near the point of the pen for operating said means.

9. In a fountain-pen a barrel, a chamber located in the upper end thereof, a reservoir below said chamber, means for admitting and compressing air in said chamber and means for establishing communication between said chamber and said reservoir.

10. In a fountain-pen the combination with a barrel of a valve, including an inwardly-moving member, located near the upper end thereof, a plunger adapted to reciprocate above said valve, means for admitting and cutting off a supply of air during the inward stroke of said plunger and a rigid connection between said plunger and said moving member.

11. In a fountain-pen the combination with a barrel of a valve including a longitudinally inwardly moving member and a plunger adapted to operate in the upper end of said barrel above said valve, the said plunger being rigidly connected with the longitudinally-moving valve member and having channels therein to admit air below the same during a part of its inward stroke.

12. In a fountain-pen the combination with a barrel of a valve including a longitudinally inwardly moving member, a plunger adapted to operate in the upper end of said barrel above said valve, the said plunger being rigidly connected with the longitudinally-moving valve member and having channels therein to admit air below the same during a part of its inward stroke, and resilient means adapted to resist said inward stroke.

In witness whereof we have hereunto set our hands this 31st day of December, A. D. 1904.

GEORGE P. SMITH.
PERCY STOKES.

Witnesses:

JOHN F. GRADY,
EDW. W. VAILL, Jr.