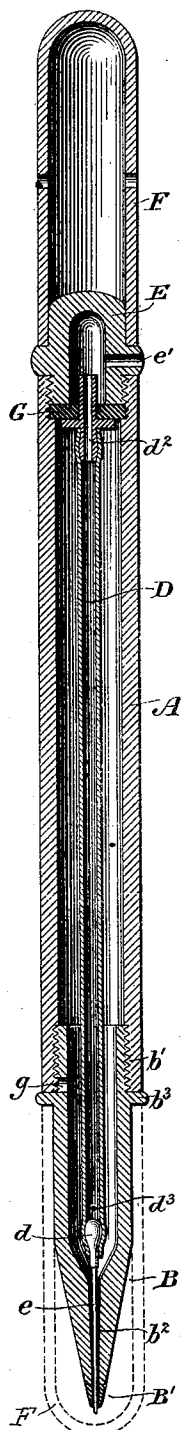


(No Model.)

M. H. KERNER.
STYLOGRAPHIC FOUNTAIN PEN.

No. 280,630.

Patented July 3, 1883.



WITNESSES

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STYLOGRAPHIC FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 280,630, dated July 3, 1883.

Application filed February 10, 1883. (No model.)

To all whom it may concern:

Be it known that I, MARION H. KERNER, a citizen of the United States, and a resident of the city, county, and State of New York, have invented certain new and useful Improvements in Stylographic Fountain-Pens, of which the following is a specification.

My invention relates especially to that class of stylographic pens which comprises an air-tight ink-reservoir and a marking-point centrally perforated with an ink-duct, in combination with a tubular air-duct and a needle or spindle loosely supported within the ink-duct and normally projecting somewhat beyond the marking-point, to which is imparted by the ordinary motion employed in writing a sufficient longitudinal movement to and fro to cause the ink to flow through the duct to the writing-point.

Hitherto, so far as my knowledge extends, the tubular air-duct for admitting air as the ink is used, and which extends through the ink-reservoir to the upper end of the handle, has been made of hard rubber, metal, or some similar non-flexible material, and the longitudinally-moving needle has been supported within the writing-point either by means of a spiral spring or other equivalent device applied to the lower extremity of the tubular air-duct, or else by such spring applied directly to the barrel or handle of the pen. This method of supporting the needle not only renders the apparatus somewhat complicated in construction, but the chemical action of the ink soon destroys the thin wire spring or other elastic material which supports the needle, and thus renders the pen useless. If the needle is rigidly attached to the air-duct, then it becomes necessary to support the air-duct by an elastic diaphragm or other equivalent device, so as to permit the requisite longitudinal vibratory movement of the needle.

The object of my invention is to simplify the construction of fountain-pens of this character, thus reducing their cost, and rendering them less liable to become disarranged or inoperative by reason of continued use.

To this end my invention consists in the use of a non-rigid or flexible air-duct, preferably formed of soft-rubber tubing or other similar

material, to the lower end of which the needle is permanently secured, while its upper end is likewise firmly attached to the inside of the upper end of the handle of the pen.

The accompanying drawing is a longitudinal section of a stylographic fountain-pen embodying my improvements.

Referring to this drawing, A represents the handle or barrel of the pen, which is preferably tubular in form, and may be constructed of hard rubber, metal, or other suitable material.

B is a conical point-section or marking-point, which screws into the lower end of the handle A, as shown at *b'*, and is preferably tipped with iridium or other suitable hard metal at its point *B'*. The marking-point B is centrally perforated with an ink-duct, *b²*, of conical tapering form, narrowing toward its lower extremity, as shown in the drawing. A washer or diaphragm, G, preferably of soft rubber, is fitted closely into the top of the handle A, and from this is supported the tubular air-duct D, extending longitudinally through the handle, and terminating within the point-section B. The air-duct D consists of a piece of non-rigid or flexible tubing of soft rubber or other suitable material.

To the lower end of the air-duct is fastened tightly the metal tip *d*, and to this tip is fastened, by soldering or otherwise, the needle or spindle *e*, of iridium or other suitable metal. The upper extremity of the air-duct D is supplied with the tip *d²*, of metal or hard rubber, which passes through the diaphragm G and fits tightly into the same. The needle *e* fits loosely within the ink-duct *b²*, and normally projects a short distance below the tip of the marking-point B.

The lower end of the air-duct D is perforated with an aperture, *d³*, which allows the air to enter the ink-reservoir which surrounds the air-duct, to displace the ink employed in writing. A similar perforation is provided in the point-section B, as shown at *g*, for the purpose of allowing the escape of the air from the ink-reservoir while the point-section is being attached after the ink-reservoir has been refilled. This perforation is placed at such a distance from the burr *b³* upon the point-section

tion that it will be covered by the handle A just before the point-section reaches its bearing when it is screwed into the handle. The escape of the ink into the air-tube D and through the ink-duct *b'*, which would otherwise be occasioned by the compression of the air in applying the point-section, is by this means prevented.

A cylindrical cap, E, is screwed into the upper extremity of the barrel A, and the cap E contains an air-chamber, into which the air-duct opens. The cap E is perforated with an opening, *e'*, which serves to permit the free access of air into the air-chamber and air-duct D.

A cap, F, fitting over the point B, as shown in the dotted lines, is provided for protecting the needle and writing-point when the pen is not in use. This cap is preferably so constructed that it may be placed upon the upper extremity of the cap E after having been removed from the point-section, as shown in full lines in the drawing.

The mode of operation of my improved pen is in most respects similar to that of the ordinary stylographic pen. In its normal position the flexible air-tube extends centrally through the handle or barrel A. When the point is pressed upon the paper, the needle *e*, together with the air-duct D, is pressed upward, and the flexibility of the latter allows it to bend out of the axial line of the handle A, thus permitting a longitudinal movement to the needle. As soon as the point is removed from the paper, the air-tube instantly becomes straight, and the needle is pushed outward to its first position. The movement of the point over the surface of the paper in the manner of ordinary writing thus produces a to-and-fro movement

of the needle and tube, which is sufficient to cause the ink to descend through the ink-duct, and thus be supplied, as required, to the marking-point.

By making use of the non-rigid or flexible air-tube D, to which the needle is directly attached, I am enabled to dispense with all springs or other equivalent devices for obtaining the longitudinal vibratory movement of the needle, and at the same time to greatly simplify the construction and improve the operation of the pen.

It is evident that the air-tube D may be composed of flexible tubing either through the whole or a portion only of its length, as preferred, as the same result would be obtained if a greater or less section of it was composed of a rigid tube. I prefer the use of flexible tubing for the entire length, but I do not narrowly confine my invention to such construction.

The essential feature of my invention consists in the use of the non-rigid or flexible air-tube, which permits by its bending the longitudinal movement of the needle, thus agitating the whole body of the ink in the tube, and supplying the proper quantity to the marking-point as required in the operation of writing.

I claim as my invention—

A stylographic fountain-pen with a non-rigid or flexible central tube or duct for conveying air to the ink-reservoir.

In testimony whereof I have hereunto subscribed my name this 9th day of February, A. D. 1883.

MARION H. KERNER.

Witnesses:

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MILLER C. EARL.