

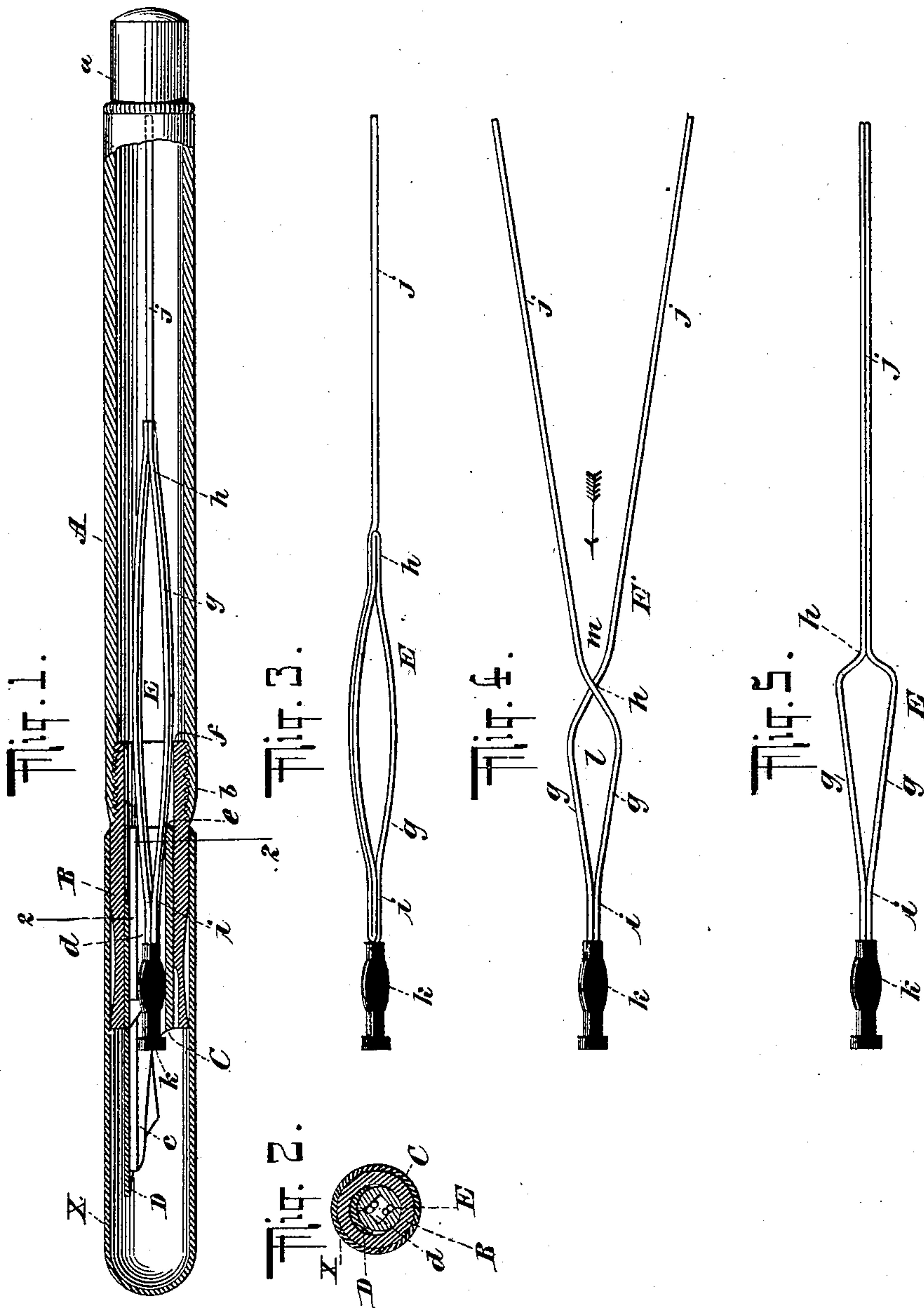
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W. W. STEWART.
FOUNTAIN PEN.

(Application filed Apr. 16, 1898.)

(No Model.)



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FOUNTAIN-PEN.

SPECIFICATION forming part of Letters Patent No. 631,909, dated August 29, 1899.

Application filed April 16, 1898. Serial No. 677,779. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM W. STEWART, residing in the city of New York, borough of Brooklyn, Kings county, State of New York, have invented certain new and useful Improvements in Fountain-Pens, of which the following is a full, clear, and exact description.

My invention relates more particularly to that class of fountain-pens in which a handle or reservoir is employed that is closed at the upper end and wherein a suitable duct is provided at the lower end of the pen to convey ink to the pen-nib and to admit air to the reservoir. In large fountain-pens of this type difficulty has been experienced heretofore by reason of the fact that a comparatively large and ready flow of ink is required at all times, and it therefore becomes difficult to regulate the flow so that there will be a sufficient supply of ink without there being at the same time too ready a flow or a liability of the ink dropping from the pen. It has likewise been found in fountain-pens of the type to which this invention relates that ink and air are "combined," so to speak, at the lower end of the pen, so that as air is admitted to the reservoir and ink is allowed to be fed to the pen-nib the air naturally forms itself into bubbles or globules on its passage to the reservoir. Some of these globules naturally conform in size to the channel or conduit through which they have to pass, and if the globules are maintained against movement they form an obstruction which retards the flow of ink through the conduit in which they are contained. Principally for this reason great difficulty has been experienced heretofore in providing a fountain-pen which will fulfil all conditions and meet all requirements.

The object of my present invention is to overcome these and other difficulties heretofore found in fountain-pens and to provide a fountain-pen in which the flow of ink can be regulated to a great nicety without the liability of the ink dropping from the pen.

To these ends my invention consists in a fountain-pen embodying the construction and arrangement of parts hereinafter described and claimed.

In the accompanying drawings, to which reference is had in the following description

of my invention, Figure 1 is a central longitudinal sectional view of one form of fountain-pen embodying my invention. Fig. 2 is a transverse sectional view of the same on the line 2 2 of Fig. 1. Figs. 3, 4, and 5 are detail side views of several modifications of what I term the "skeletons," any one of which may be employed in accordance with my invention.

The hollow handle or reservoir A (shown in the accompanying drawings) may be of the usual construction, in which the top *a* is closed, and the lower end is provided with a screw-threaded portion *b*, by which a nozzle B is secured to the handle. Adapted to be secured to the nozzle B is the usual cap or cover X. Within the nozzle B may be maintained a feeder-bar C, which is shown in the present instance to comprise a main body portion, which is adapted to be held in place by frictional contact, so that it may be withdrawn or adjusted. A slitted feeding-finger *c* projects from the main body portion of the feeder-bar and contacts with the pen-nib D, which may be held in place between the feeder-bar and the nozzle B. The feeder-bar is provided with a bore or conduit *d*, that forms a continuation of the bore of the nozzle and of the handle, so that the conduit formed by these parts is in communication with the pen-nib and is constantly open at the lower end beneath the pen-nib, so as to constitute an unsealed air-passage. It will be observed that the bore of the feeder-bar is smaller in diameter than that of the handle, so that the inner ends of the feeder-bar and the nozzle form circumferential shoulders or bearings *e f*, respectively. In other words, the ink-conduit of the pen as a whole is of unequal diameters. Now this general construction is already embodied in many existing fountain-pens, and when it is remembered that the film or globules will, if retained against movement in the conduit, constitute an obstruction to the flow of the ink it will be understood that when the globules bear against the circumferential shoulders *e f* the globules will be retained against forward movement and will act in the nature of valves forced against their valve-seats. The effect of this is to retard or obstruct the flow of ink to the feeder-bar and pen-nib. However, a further supply of air, which is con-

tinually admitted at the lower end of the nozzle, will effect the sealing-globules, and a comparatively large quantity of ink is allowed to pass below the seals at frequent intervals when the pen is in use. This intermittent supply of ink to the feeder-bar causes the dropping or too ready flow of ink from the pen, which has been hereinbefore referred to and which it is the object of the present invention to overcome.

By referring to Fig. 1 it will be seen that what I term a "skeleton" *E* is contained within the pen. This skeleton may be made in a variety of forms, as represented in the various figures of the drawings, and comprises a plurality of branches or strands *g*, which may be made of any suitable material—such, for instance, as silver. These strands converge or intersect, as indicated at *h i*, so as to form a loop or bow. The skeleton may be provided with one or more extensions *j*, which are adapted to abut against the top of the holder, as indicated in Fig. 1, to limit the inward movement of the skeleton. The outer end of the skeleton may be provided with a plug *k*, such as is disclosed in either of my Patents Nos. 588,708 and 588,709, dated August 24, 1897.

It will be observed by referring to Fig. 1 that the strands of the skeleton extend throughout that portion of the ink-conduit where there is any variation in its diameter and that the strands are made to bear against the side walls where the shoulders *e f* are formed or where the variation in diameter occurs. By this means a nucleus is formed for a steady and continuous flow of ink around the sealing-globules or film when the pen is in use and there is no liability of ink dropping from the pen. Thus by the strands bearing against the walls of the conduit where the sealing-globules are retained against movement and by the strands extending from the ink-reservoir above the sealing-globules to the feeder-bar below them a nucleus is established for the flow of ink to a point below the globules and for the passage of minute bubbles of air to a point above the globules, thereby providing for the steady and constant flow of ink when the pen is in use.

By the formation of the bow in the skeleton the movement of the sealing-globules is controlled to a considerable extent. Thus, for instance, let it be supposed that the sealing-globules are forced against the shoulders or seats *e f* by the weight of the ink above them. It will be seen that the bow, because of the gradual constriction of the strands *g* above and below the globules, will cause them to retain their position against the seats and will counteract the natural tendency of the globules to rise in the holder or to be forced down the conduit by the weight of the ink.

In practice I have found that the best re-

sults are obtained with a skeleton such as that illustrated in Figs. 1 and 2, wherein a plurality of parallel strands comprise each member of the bow. However, it is obvious that any suitable number of strands may be employed or that a single strand may be bent so as to provide a skeleton which will in effect be the same as the employment of a plurality of separate strands. The single strand bent upon itself, which has just been described, is represented in Fig. 3, and when I refer herein to "strands" it will be understood that I mean it in the sense of separate members which may be formed of a single continuous piece.

By a slight adjustment of the plug *k* in the feeder-bar *C* the flow of ink can be nicely regulated, and the withdrawal of the plug will enable the user of the pen to fill it without removing the nozzle from the holder.

In the construction represented in Fig. 4 a plurality of what I term "holding-faces" are provided for the film or globules. Thus the loop *l* constitutes a means which tends to prevent the movement of the globule or film in either direction, while the crotch *m* tends to prevent a movement of the film or globule in the direction of the arrow because of the constriction of the strands in that direction.

I do not herein broadly claim the employment of intersecting strands in a fountain-pen of any description, since I am aware that heretofore so-called "gravity" fountain-pens have been devised wherein intersecting strands were intended to be used; but

What I do claim, and desire to secure by Letters Patent, is—

1. The combination with a fountain-pen having an ink-conduit of varying diameters which conduit is in communication with the pen-nib and is constantly open at the lower end beneath the pen-nib so as to constitute an unsealed air-passage, of a plurality of converging strands contained within and contacting with the walls of said conduit for a portion of its extent at every point where the variation in diameter occurs, substantially as and for the purposes specified.

2. The combination with a fountain-pen having an ink-conduit of varying diameters which conduit is in communication with the pen-nib and is constantly open at the lower end beneath the pen-nib so as to constitute an unsealed air-passage, of a plurality of strands contained within and adapted to contact with the walls of said conduit for a portion of its extent wherever the variation in diameter occurs, the said strands converging and forming a bow or loop, substantially as and for the purposes specified.

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Witnesses:

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