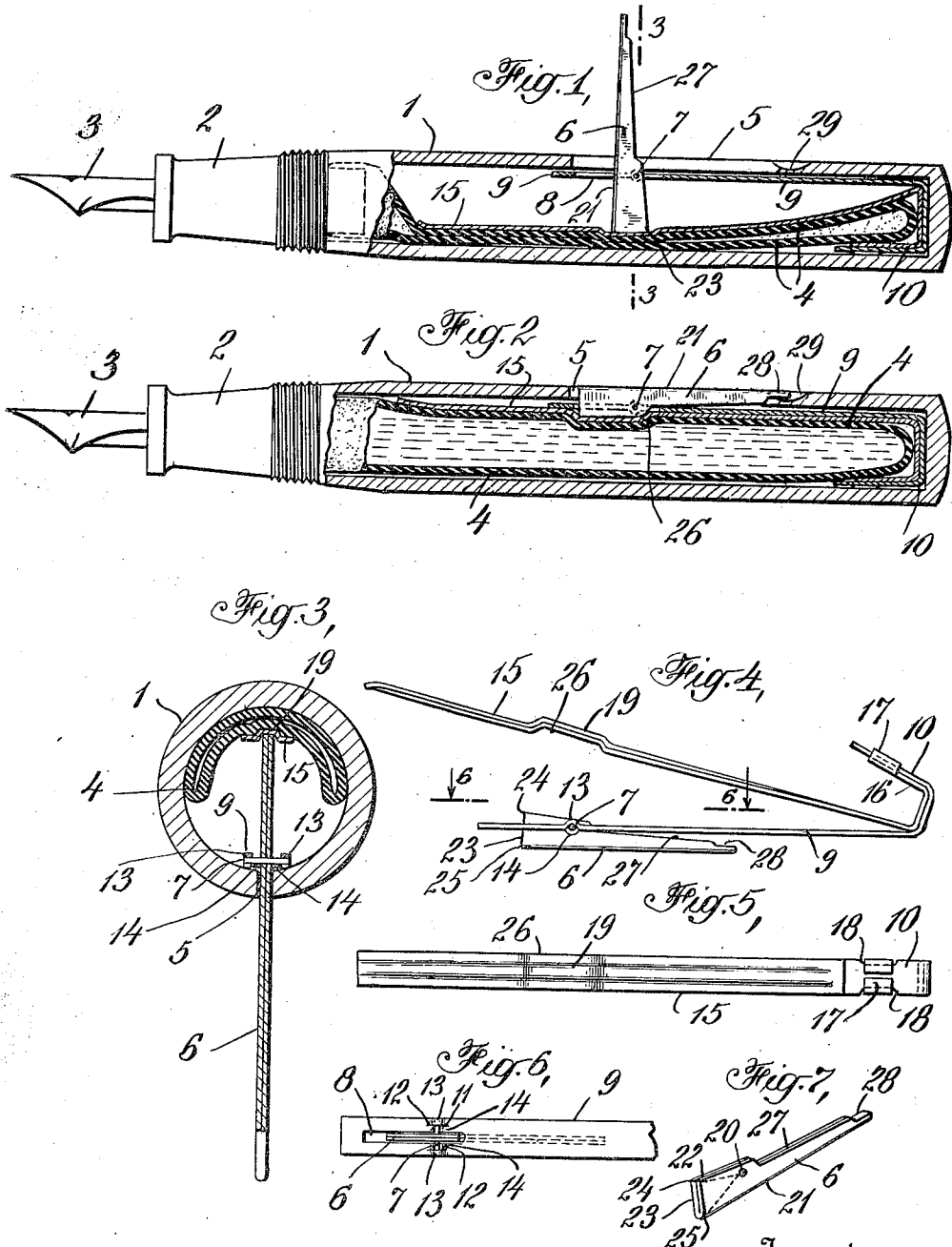


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SELF FILLING FOUNTAIN PEN.
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UNITED STATES PATENT OFFICE.

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SELF-FILLING FOUNTAIN PEN.

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To all whom it may concern:

Be it known that I, DAVID W. BEAUMEL, a citizen of the United States, residing in Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Self-Filling Fountain Pens, of which the following is a specification.

My invention relates to improvements in what are known as self-filling fountain pens, in which there is generally employed a barrel containing a collapsible ink-holding font or sack made of suitable liquid-proof material, such as soft rubber, the font being collapsed by means of a presser-member engaging its side longitudinally thereof, and which member is actuated by a device accessible to the operator from the exterior of the barrel of the fountain-pen, said member being so mounted as to return to normal position when the pressure is released and the font is distended. In filling this construction of fountain pen, the operator moves with his finger the device for actuating the presser member which upon being depressed serves to collapse the font and expel therefrom the contained air and any remaining ink, whereupon he dips the pen-nib into the ink in the ink-well so as to submerge the nozzle which is connected with the font, and then releases the pressure on the presser-member and the ink font at once distends itself, sucks in the ink and thereby fills itself.

It is the object of my present invention to provide simple, positively operating mechanism, by means of which the operator may quickly re-fill the ink-font without liability of overthrowing the operating-lever beyond a position substantially normal to the presser-member, and in which the lever in its sliding connection with the presser-member is so guided as to prevent lateral displacement of the parts, and also to provide a simple and durable mounting for the spring presser-member and in which close contact or juxtaposition of the parts is secured, when the parts lie in normal positions with the ink-font distended; and further to provide a simple form of bearing for the pivot-pin of the operating device. I also provide a novel construction of lever, which can be readily made from sheet-metal then doubled on itself to form a finished device without requiring any finishing operation.

There are other novel features and arrangement of the several different parts of my invention, all of which are more fully hereinafter set forth and then pointed out in the claims.

I have illustrated a type of my invention in the accompanying drawings, wherein,

Fig. 1, is a side view of my improved fountain-pen, with part shown in central longitudinal section and part thereof broken away. In this view the operating lever is shown as moved into a position normal to the presser-bar, to completely depress it and to collapse the font, and in which condition the pen-nib is dipped into the ink-well to fill the font by closing down the lever, into the position shown in Fig. 2.

Fig. 2, is a similar view to that shown in Fig. 1, with the lever closed down and the ink-font distended and filled with ink ready for use.

Fig. 3, is an enlarged view in cross-section, the plane of the section being indicated by line 3—3, Fig. 1.

Fig. 4, is an enlarged side view of the presser-bar, its support and the operating lever mounted on the support, the parts being secured together ready for insertion in the pen barrel.

Fig. 5, is a plan view of the presser-bar and support.

Fig. 6, is a plan view of one end of the support with the operating lever mounted thereon.

Fig. 7, is a perspective view of the operating lever.

Referring to the drawings in which like numerals of reference designate like parts throughout, 1 is a cylindrical barrel closed at the butt end and open at the other end on which is mounted the nozzle 2, carrying the pen-nib 3, and its feed device. To the inner end of the nozzle is secured the mouth of the ink-font or sack 4, the construction and arrangement of all of the described parts being well known.

The side wall of the barrel is formed with a longitudinally extending slot or opening 5, in which fits and operates a pivoted operating-lever 6, which is fulcrumed on a pin 7, which is placed across an opening or slot 8, in the support 9, made from a strip or plate of resilient metal, with its rear end bent on itself at 10, hooked-shaped, and of a size to fit snugly within the barrel and re-

tain itself therein by friction. At each side of the opening 8, in the support 9, is formed a bearing 11, for the corresponding end of the pivot-pin 7, the bearing being constructed by slitting the metal at 12, parallel with the slot and bending one part 13, outwardly from the plane of the metal to form a half-bearing, and bending the other part 14, outwardly from the plane of the metal in the opposite direction to form a half-bearing, the two halves together forming a substantial bearing for the end of the pin, as clearly indicated more particularly in Figs. 3, 4, and 6. I thus provide a simple and substantial form of bearing requiring but little work to form it by means of dies, and without soldering.

The operating lever 6, is mounted so that the short arm engages the presser-bar 15, to depress it and the engaging end of the lever is of a peculiar shape which will be hereinafter more fully described, the action between the two said parts being like that of a cam.

The presser-bar 15, is likewise made of a resilient metal piece and is somewhat longer than the support 9, to which the bar is secured at the rear end by bending the bar hooked-shaped at 16, and nesting it within the bent end of the support. The end of the bar is formed with lateral ears 17, and they are bent around the end of the support 9, taking into the notches 18, formed in the edge of the support, as indicated more particularly in Fig. 5, and the two members are thereby secured firmly together in operative positions. By virtue of this construction, the collapsing means for the ink font 4, which lies between the presser-bar 15, and the interior of the wall of the barrel at the opposite point from the bar, is a unitary article or device comprising the operating-lever, its support and the presser-bar, and when once assembled and inserted in the barrel, the lever snaps into the slot 5, in the barrel with a snug fit so that the parts remain permanently in place in the barrel, the lever or actuating part, assisting in so retaining the unitary device at the same time being accessible from the exterior for manipulation by the operator, the outer longitudinal edge of the lever lying flush with the periphery of the barrel and the operative or engaging end of the lever being adjacent the forward end of the slot 5, and preventing withdrawal of the device from the barrel until the entire lever is pushed down to allow the end thereof to escape the end of the slot, leaving the device free to be withdrawn in case it is necessary to do so. This simple composite device renders it easy for the workman to put the fountain pen together, by inserting the device endwise in the open end of the barrel before the nozzle is applied and pushing it to the rear until the

bent end 10, seats itself against the end of the barrel while the operating-lever by virtue of its resilient mounting, snaps into operative position in the barrel slot 5, and locks the device in operative position. The ink-font 4, which is fastened at its outer end to the inner end of the nozzle 2, is then slid into place beneath the presser-bar 15, and with its butt end seated against the rear end of the bent bar and finally the nozzle is screwed onto the barrel as shown in the drawings. The font may then be collapsed for filling it, by lifting the long end of the lever with the finger, so that the short end of the lever engages the back of the presser and slides along the same as it depresses the bar into its lowest position, the lever is then reversed in its movement and the presser-bar restored to normal position, likewise the lever, by reason of the resiliency of the metal support and metal bar, and also the distension of the rubber ink sack or font.

The hooked parts 10 and 16, of the resilient members 9 and 15, respectively, are so constructed and arranged that the ends or beaks thereof and the main part or stems of said members, spring apart when unconfined and stand out of parallel, as shown particularly in Figs. 4 and 5, so that when the device is inserted in the barrel 1, the hooked parts and main parts are forced into parallelism and exert a spring pressure upon the opposite walls of the barrel, and thereby retains the device securely in place and maintains the two members 9 and 15, under spring tension and pressed outwardly against the interior wall of the barrel. Both of the resilient members 9 and 15, being free and unobstructed from their point of connection at 17, to their outer ends, act like fixed springs, and the presser-bar 15, has a free and wholly unobstructed sweep in its depressing movement against the side of the ink-font, so that it serves to collapse the font to a great degree, as indicated in Fig. 1.

In order to keep the presser-bar and operating-lever from relative lateral displacement, I provide the bar with a guideway 19, in the form of a longitudinal groove and the engaging end of the lever slides back and forth in this groove in its operations.

The operating-lever 6, is of a peculiar shape and is made from sheet metal out of which a blank is cut with clean edges, double the width to be used, and then is doubled on itself and pressed together as shown in Fig. 7, so as to form the finished article and thereby dispensing with machine or tool work. The short-arm of the lever is provided with a hole for reception of the pivot-pin 7, the hole being indicated at 20, and passes through both layers of the folded sheet-metal, being formed in the blank as it is cut from the flat. This pivot or fulcrum hole is located in eccentric position, that is

to one side of the longitudinal center-line of the lever and toward the lower or under edge of said lever when the lever stands in normal position. The engaging end of the lever is broadened and flares outwardly towards the end and the lower or under edge is inclined relatively to the upper edge 21, as indicated at 22, while the engaging edge 23, of the lever is inclined or beveled, sloping from the point 24, towards the point 25, of said edge, and the pivotal radius 20—24, is shorter than the radius 20—25, the radius increasing from the point 24 to 25, thereby providing a cam-like structure, so that when the presser-bar has been forced down firmly against the side of the font as it is pinched or squeezed between said bar and the side of the barrel which thus limits the downward movement of the bar, the low part of said edge 23, may pass over the bar, the high part cannot do so and binds thereon, stopping the lever in a position somewhat short of normal to the bar, as indicated in Fig. 1. Thus the high part 25, serves to stop the lever from going beyond normal position and hence the lever cannot overthrow such position, and consequently there is no liability of the presser-bar being depressed to its full limit and then raised slightly and again depressed, which action would cause accidental expulsion of the ink which is most objectionable and would make the pen unsalable. In Fig. 1, the parts are shown in their respective positions assumed when the lever is moved into its full open position and the presser-bar is forced down firmly against the collapsed font which in turn is pressed against the wall of the barrel which thus acts as an abutment, at the same time the upper side of the support 9, bears against the side of the interior of the barrel also as an abutment. As the short-arm of the lever is so proportioned as to stop the lever in the position shown in Fig. 1, such part acts like a wedge or cam between the fulcrum and presser-bar when the latter is depressed to its full limit, and the tendency is to reverse the movement of the lever which nevertheless remains locked by virtue of the high-part of its end wedging itself against the presser-bar, and the extended contact between the presser-bar and the sloping end 23, of the lever. Under this condition the endwise pressure against the open lever keeps it firmly in open position, but a slight reverse movement of the outer end of the lever by the operator, will cause the lever to quickly snap back into closed position, the action being like the movement off a dead-center. Thus the return movement of the operating-lever is practically automatic, after an initial movement is given it by the operator.

It will be observed that in case the fountain-pen is to be taken apart, this may

be readily done by unscrewing the nozzle 2, and removing therewith the attached ink-font 4, and then by depressing the closed lever so that it will escape the end of the slot 5, in the barrel, and removing the unitary structure of the metal parts including the operating-lever, its support and the presser-bar, so that the unitary structure is not only of importance in assembling the fountain-pen, as hereinabove pointed out, but also in taking the same apart. In fact the fountain-pen thus made comprises but three unitary parts, namely, the slotted barrel, the nozzle and attached ink-font and the operating-lever, with its support and presser-bar.

As the lever 6, is pivoted to the support 9, the wide part of the lever, indicated at 22, extends below the underside of the support, and accordingly the presser-bar is formed with a depression 26, to receive such part of the lever and thereby permit the presser-bar to lie against the support when the parts are in normal positions, as shown in Fig. 2, and this makes the device more compact and gives more space for the ink-font when it is filled. The long-arm of the lever 6, is cut-away on an incline at 27, on its under edge, to clear the support 9, when the lever is in closed position, and its outer end is notched at 28, for easy engagement by the finger of the operator from the exterior of the barrel which is cut-away at 29, to receive the end of the lever and cause it to lie flush with the periphery of the barrel when the lever is closed.

I wish to be understood as not limiting my invention to the particular construction herewith shown, as it is evident that many variations may be made in the several different parts of the structure, without however departing from the spirit of my invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. A self-filling fountain pen comprising a barrel having an opening for the operating lever to move through, a collapsible ink-font, a resilient lever-support disposed inside the barrel with its outer end free and an operating-lever pivoted thereto and accessible through said barrel-opening, a resilient presser-bar connected with said lever-support with its outer end free and acting like a fixed spring and engaged by one end of said operating-lever to actuate the bar, the said lever-support covering said opening in the barrel and being constantly maintained in contact with the interior wall of said barrel by the inherent resiliency of said support and acting as a closure for said opening in all positions of the said operating-lever.

2. A self-filling fountain pen comprising

a barrel, a collapsible ink-font, a presser-bar for collapsing said font, a pivoted operating-lever for engaging and actuating said bar, means for limiting the range of depressing movement of said bar, one end of said lever engaging said bar when the lever is moved from normal horizontal position to a position substantially normal to said bar, the said engaging end of the lever being substantially straight and having the pivotal radius gradually increasing in length from the point of said straight end which first engages said bar to the point thereof which last engages said bar and acting to lock the said lever against further movement on its pivot and said lever being otherwise unchecked in its movement so that its said engaging end alone causes said lever to bind against the bar and prevents said lever from overthrowing said position.

3. A self-filling fountain pen comprising a barrel, a collapsible ink-font, a lever-support within said barrel and an operating-lever pivoted to said support, a presser-bar fixedly mounted by its rear end at the rear end of said barrel and yielding on said mounting and being resilient and yielding throughout its length when engaged and depressed by said lever. the said lever-support being secured to the rear end of said presser-bar so that the latter is free and unobstructed from its point of mounting as its rear end to its outer end, thereby permitting a more complete depression of said presser-bar.

4. A self-filling fountain pen comprising a barrel, a collapsible ink-font, a resilient metal support disposed inside the barrel and an operating lever pivoted thereto, a resilient metal presser-bar secured by its rear end to the rear end of said support and bent together on themselves so as to fit within said barrel, said lever adapted to engage and depress said bar to collapse the font.

5. A self-filling fountain pen comprising a barrel having a longitudinal opening in its side substantially the length of the operating-lever, a collapsible ink-font, means for collapsing said ink-font constructed and arranged as a unitary device for insertion and withdrawal as such with respect to said barrel and comprising a resilient presser-bar having its inner end formed hooked-shaped and normally sprung open so as to be compressed and maintained under spring tension when inserted in place in said barrel, a resilient lever-support member having its rear end attached to the rear end of said presser-bar, and an operating-lever pivoted to said support member and adapted to snap into said opening in the side of the barrel so that the ends of said lever are confined within said opening when said device is inserted in place in said barrel and serving to lock said device in place longitudinally as well as laterally.

6. A self-filling fountain pen comprising a barrel, a collapsible ink-font, a support within said barrel provided with an opening and an operating-lever pivoted to said support within said opening, bearings for said pivot-pin formed on said support at both sides of said opening, said bearings each comprising portions slit of the material of said support bent out of the plane of the material in opposite directions and a pivot-pin extending between said bent-out portions of the support.

7. A self-filling fountain pen comprising a barrel, a collapsible ink-font, a presser-bar for collapsing said font, a pivoted operating-lever for engaging and depressing said presser-bar and said engaging end of the lever having two relatively widely spaced points, one of which points engages said bar first in depressing it and the other when said bar is depressed to its limit of downward movement, the pivotal point of said lever being off-set with respect to a normal line bisecting a line including the said two engaging points of said lever so that said pivotal point lies to the side of said normal line nearer the said point which first engages said bar in the depressing movement, than the said point which last engages said bar, said last-engaging point acting to bind said lever against said presser-bar and to lock the lever against overthrowing.

8. A self-filling fountain pen comprising a barrel, a collapsible ink-font, means for collapsing said font comprising a metal support having an operating-lever pivoted thereto, a presser-bar having its rear end placed in contact with the end of said support and the two said ends being bent on themselves, and a clamp for securing said two ends together.

9. A self-filling fountain pen comprising a barrel, a collapsible ink-font, a presser-bar for engaging the side of said font longitudinally thereof to depress it, said presser-bar comprising a strap of resilient metal bent hook-shaped at its rear end with the end or beak thereof normally springing open out of parallel with the main part when unrestrained and said parts being compressed and under spring tension when inserted in place in said barrel, and means accessible from the exterior of said barrel for engaging and depressing said presser-bar.

10. A self-filling fountain pen comprising a barrel, a collapsible ink-font, a presser-bar for engaging the side of said font longitudinally thereof to depress it, said presser-bar comprising a strip of resilient metal bent hook-shaped at its rear end with the beak thereof normally sprung outwardly from the main part thereof, a resilient lever-support having its rear end bent hook-shaped and nesting with the hook-shaped end of said presser-bar and normally sprung

outwardly therewith, the two nested hook-shaped parts being compressed and under-spring tension when inserted in place in said barrel, and an operating-lever mounted
5 on said lever-support and accessible from the exterior of said barrel for depressing said presser-bar.

In testimony whereof, I have hereunto set my hand in the presence of the two subscribing witnesses.

DAVID W. BEAUMEL.

Witnesses:

JOHN O. SEIFERT,
WILLIS FOWLER.