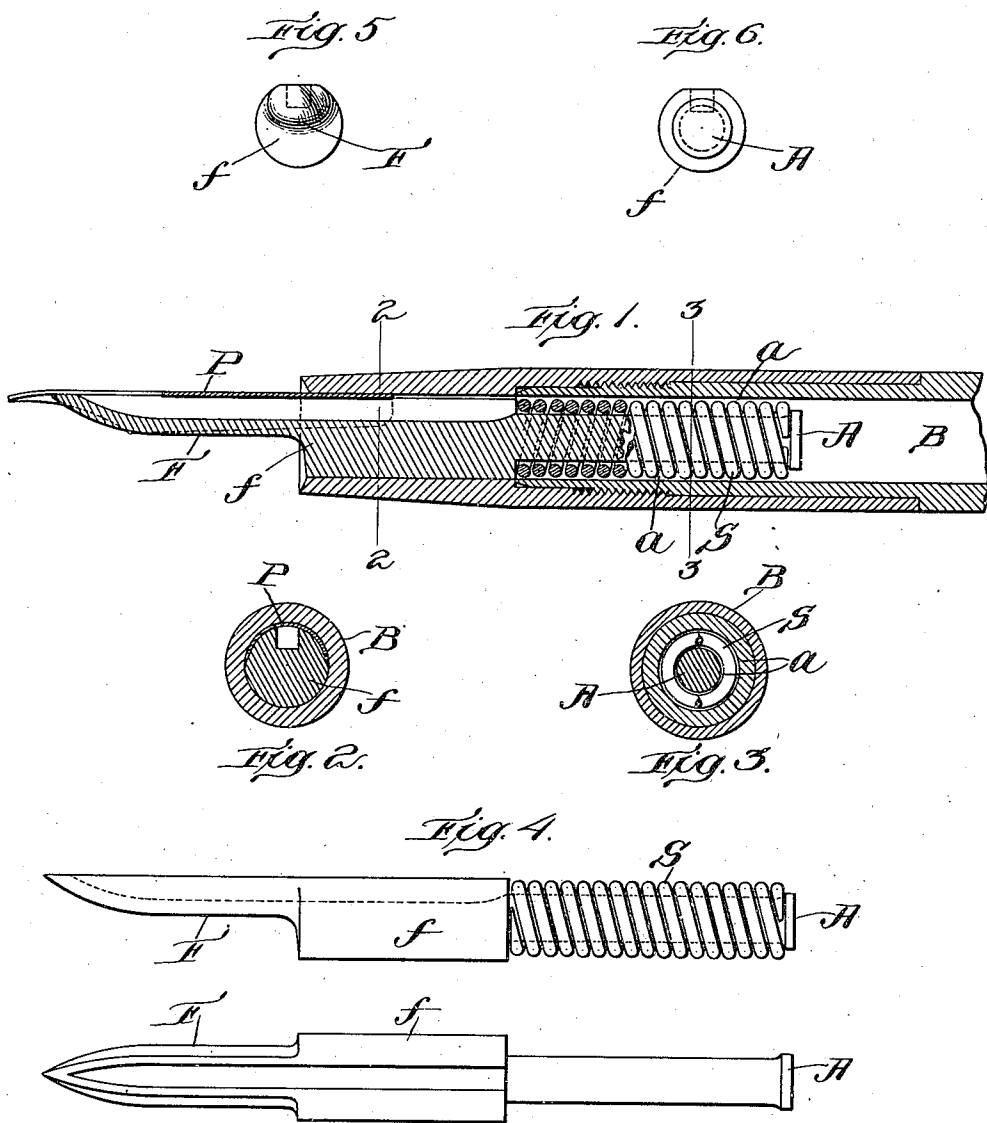


W. L. MacDONALD.
 FOUNTAIN PEN.
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1,046,821.

Patented Dec. 10, 1912.



Witnesses:
 Mary A. O'Brien
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Fig. 7.
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 by
 Mitchell, Chadwick & Kent,
 Attys.

UNITED STATES PATENT OFFICE.

WILLIAM LAURENT MACDONALD, OF ODELL, ILLINOIS, ASSIGNOR OF ONE-HALF TO
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FOUNTAIN-PEN.

1,046,821.

Specification of Letters Patent.

Patented Dec. 10, 1912.

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To all whom it may concern:

Be it known that I, WILLIAM LAURENT MACDONALD, a citizen of the United States, residing at Odell, in the county of Livingston and State of Illinois, have invented new and useful Improvements in Fountain-Pens, of which the following is a specification.

My invention is an improved fountain pen in which special provision is made for using up the ink in the fountain without any running out of the ink upon the paper when the ink supply within the fountain gets low,—which escape of ink is known to users of fountain pens as “flooding.”

In the drawings: Figure 1 is a central, longitudinal section of a fountain pen, embodying my invention; Figs. 2 and 3 are cross sections on lines 2—2 and 3—3, respectively, of Fig. 1; Fig. 4 is a side view of the feed bar and stopper; Figs. 5 and 6, front and rear end views, respectively, of the parts shown in Fig. 7; and Fig. 7 a plan view of Fig. 4 with the spring removed.

In fountain pens of the ordinary construction, as the ink is gradually withdrawn from the fountain in the act of writing, the air space, above the top of the ink within the fountain, becomes larger and larger, so that the tendency of the ink to flow out through the feed by gravity, which is restrained, when the fountain is nearly full of ink, by the vacuum tension effect created upon the relatively small body of air at the top of the fountain, becomes progressively greater and this is the cause of what is known as “flooding”, which occurs when the supply of ink in the fountain is much depleted. Another force, accessory to gravity, tending to cause ink flow, arises when the proportion of air in the barrel as compared with the ink is greatly increased, in which case, the air, more readily absorbing heat from the hand through the walls of the fountain than does the remnant of ink, by its expansion puts a slight but appreciable pressure upon the ink, tending to expel it. In my improved pen I obviate this difficulty by providing a supplementary chamber of very small dimensions adjacent to the rear end of the feed bar and I provide this supplementary chamber with channels, preferably helical in form, through which the ink in the main chamber must pass in its passage to the feed bar. The effect of this is that no considerable body of ink can move

to the feed bar in mass, but must pass there- to in small streams or bodies, through narrow spaces and passages and a small resistance of the feed bar will hold back the ink notwithstanding the fact that the vacuum tension within the holder may have become slight owing to the fact that the interior of the fountain is nearly empty of ink and is filled with air. It will be obvious that in holding back the ink when the air tension has nearly ceased to be effective for this purpose, the capillary action of the small passages or spaces will be effective and as the weight of ink to be sustained and held in place is not large when the ink is almost exhausted, these capillary forces are ample to deal with it. The result is, that when the ink is nearly exhausted a small quantity will accumulate at the feed and the feed passage being small this small quantity will not have gravity enough to force its way through the feed bar without the drawing effect of pen action, and as the ink behind is held from any direct pushing action by the narrow passages of the retaining device, “flooding” is prevented.

My results are attained by providing what I denominate a stopper at the rear of the feed bar which projects into the fountain. This stopper, A, owing to its proportions with respect to the interior diameter of the fountain, B, leaves a narrow, annular chamber, *a*, between the stopper, A, and the wall of the fountain, B. This annular chamber, if the stopper is fitted so as to make it relatively very narrow, will in itself serve to retard the flow of ink in too great volume to the feed bar, F, however little ink may be left in the fountain, but it is simpler and easier, as a matter of manufacturing, and more efficient in practice, to make the stopper somewhat smaller in proportion to the interior diameter of the fountain and to decrease the area of the annular chamber between the stopper and the fountain wall by winding a strip S of suitable material in a helix in the annular chamber between the stopper and the wall of the fountain. Such a strip will form a number of narrow paths or passages between itself and the adjacent parts, which passages by their shape cause the ink to flow in an indirect path toward the rear end of the feed bar rather than permitting it, as would be the case if no such strip were interposed, to flow directly, under

the influence of gravity. An incidental advantage of the use of such a strip as I have described is that when the fountain pen is reversed to be carried in the pocket when not in use the opposed surfaces of the strip and the adjacent parts are sufficiently close together to hold, by capillary attraction, the ink thus within the annular chamber and support any ink that may be in or about the feed bar F so that the feed bar is not drained by the reversal of the pen and the pen P, is ready to write with the first touch, when required, without any shaking or other means being necessary to force ink into a dry feed bar. It is a fact well known that liquid will not pass through dry narrow passages unless under some relatively considerable pressure since the surface tension of the liquid prevents its free flow through such spaces. When the spaces are wet as in my device the skin tension of the liquid on the wet surfaces allows the liquid to flow readily, however slight the pressure urging the liquid forward.

In practice I find it convenient to make

the stopper A integral with the inner enlarged end, *f*, of the feed bar F, so that the stopper may be supported by the feed bar.

My device is a simple and efficient means for not only preventing too rapid passage of the ink under certain circumstances but for facilitating the proper passage of the ink under certain other circumstances, as mentioned above.

I claim:

In a fountain pen, a hollow holder, open at one end; a feed bar and pen in that open end; a stopper extending from the inner end of the feed bar into the holder, a helix of suitable material surrounding the stopper and partially filling the annular space between the stopper and the wall of the holder, substantially as and for the purpose described.

Signed by me at Odell, Livingston co. Ill. this 29 day of April, 1912.

WILLIAM LAURENT MACDONALD.

Witnesses:

HENRY J. HARE,
B. F. JOHNSON.