Dec. 8, 1959 H. BROSS 2,916,014

RETRACTABLE WRITING INSTRUMENT, PARTICULARLY OF THE BALL POINT TYPE

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Fig. 1

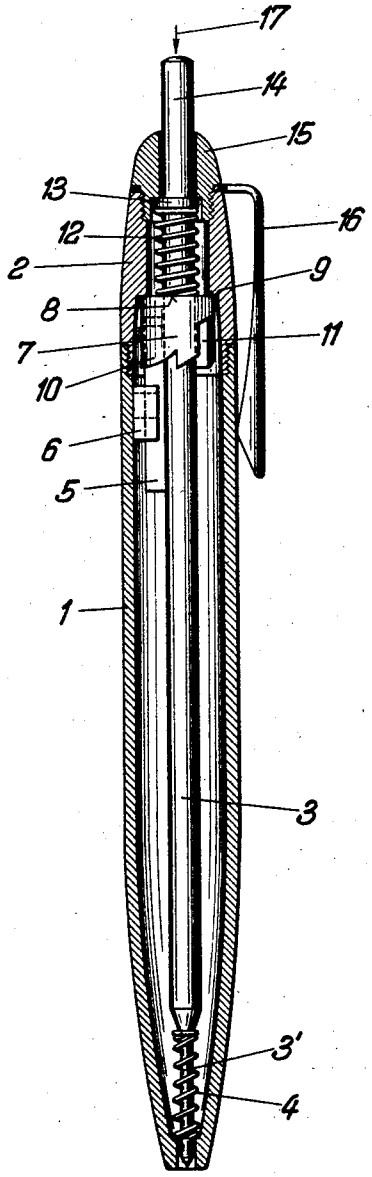
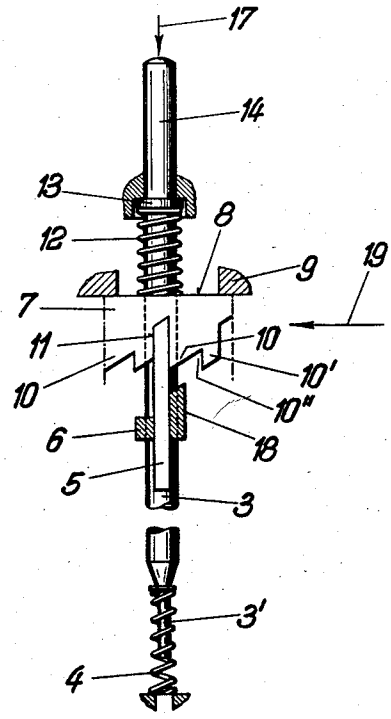


Fig. 2



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RETRACTABLE WRITING INSTRUMENT, PARTICULARLY OF THE BALL POINT TYPE

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4 Claims. (Cl. 120—42.03)

The present invention relates to a retractable writing instrument of the type having a hollow stem or sheath member accommodating a carrier member for the writing means proper, which carrier member is displaceable by finger pressure longitudinally of said stem or sheath member and is spring-urged in such a manner that a toothed sleeve member connected with said carrier member rests against suitable abutments provided in the stem or sheath member, said abutments being respectively provided for the inoperative and the operative position of said carrier member, and more particularly the present invention relates to a ball point pen of the aforeindicated type. It is one of the main objects of the invention to simplify the mechanism serving to produce the necessary movements and to improve the dependability in operation of the said ball point pen.

One essential feature of the invention resides in the fact that the said sleeve member is supported within the said sheath member for longitudinal as well as rotary motion independently of both the press button and the said carrier member and that teeth are provided on one end face only of the sleeve member, the said teeth being in the form of indexing teeth of different depth and being engaged by a longitudinally movable stop projection which is held against rotation. Another feature of the invention resides in the fact that the end face of the said sleeve member remote from the said indexing teeth abuts an internal shoulder of the sheath member against the action of a spring which is weaker than the return spring for the carrier member.

In a preferred embodiment of the invention the said carrier member is provided with an elongated, preferably rail-shaped projection which the said return spring is adapted to engage in the teeth of the said sleeve member. It is convenient, according to the invention, to provide for the said rail-shaped projection to be guided by suitable means provided within the sheath member, which latter has a fixed stop portion adapted to co-operate with the indexing teeth of the sleeve member.

Other objects, features and advantages of the present invention will be readily apparent from the following detailed description of a preferred embodiment thereof taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view, partly in elevation, of a preferred embodiment of the invention; and

Fig. 2 a fragmentary side-elevational view of the mechanism, the sleeve member being developed into the drawing plane.

Referring now more in particular to the drawings, there is provided within a hollow sheath member, which may, for example, comprise two threadedly connected parts 1 and 2, a tubular ball point carrier 3 which is movable in a longitudinal direction and carries at one end a ball point insert 3'. The ball point carrier is acted upon by a return spring 4 one end of which abuts against an internal shoulder of the sheath part 1. The ball point carrier has a longitudinally extending rail-shaped projection 5 which is guided in a groove provided in an internal projection or boss 6 of the sheath member 1. The rear end of the ball point carrier 3 is surrounded by a sleeve member 7 the plane rear face 8 of which abuts against an internal shoulder 9 of the sheath member 2. The opposite end face of the sleeve member 7 has formed therein a plurality of teeth 10 of which every second tooth has a slot 11 of such width as to permit the slot to be engaged by the rail-shaped projection 5. The end face 8 of the sleeve member 7 is acted upon by a spring 12 one end of which rests against a collar 13 of a substantially cylindrical press button member 14 of which one end projects outwardly of the interior of the sheath. The inner end of the press button member 14 rests directly against the adjacent end of the ball point carrier 3. Part of the press button member 14 is surrounded by a closure member 15 which is threaded into the sheath member 2 and which may, if desired, serve to retain a clip member 16. It will be noted that the spring 12 is weaker than the spring 4.

Fig. 1 shows the aforementioned parts in their respective positions of rest. In order to move the ball point carrier 3 into its operative position, the button member 14 is depressed in the direction of arrow 17. This will cause the tubular carrier 3 to be advanced with the rail-shaped projection or boss 5 sliding along the groove of the sheath projection 6. The sleeve member 7 follows the movement of the ball point carrier 3 under the influence of spring 12 until one tooth 10 engages a sloping abutment 18 provided on the top of internal projection 6. After this point has been reached, only the ball point carrier 3 will continue to advance. As soon as the rail-shaped projection 5 emerges from the slot 11 of the sleeve member 7, the spring 12, under the influence of the inclination of tooth 10, will turn the sleeve member 7 in the direction of arrow 19 until the next following tooth 10' engages the sloping abutment 18. Upon the button member 14 being released, the return spring 4 will return the ball point carrier 3. During this latter action the rail-shaped projection 5 will engage the tooth gap 10'' and, during its further withdrawal, will return the sleeve member 7 against the force of spring 12 until the sleeve member rests against the shoulder 9. Now the ball point carrier is in its advanced or operative position in readiness to be used for writing purposes.

To withdraw the ball point carrier, the button member 14 is again depressed in the direction of arrow 17. This will again cause the ball point carrier 3, the rail-shaped projection 5 and the sleeve member 7 to be advanced. Upon the projection 5 emerging from the tooth gap 10'', this being possible because the sloping abutment 18 prevents the sleeve member 7 from being advanced any further, the sleeve member 7 is indexed round by one tooth, this action placing in readiness for the next operation of the mechanism a tooth having a slot 11 therein. Upon the button member 14 being released, the ball point carrier will be retracted, the rail-shaped projection 5 engaging in a slot 11, thus permitting the ball point carrier to be fully retracted, the result being that the various parts again assume the positions shown in Fig. 1.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim:

1. A writing instrument of the ball point type comprising in combination a hollow sheath, a ball point carrier slidably mounted in said sheath for motion between a writing position and a retracted position, a spring fixed between one end of the carrier and the sheath and urging the said carrier toward retracted position, a press button fixed to the other end of said carrier to move the carrier against the spring force and toward the writing posi-

tion, a sleeve embracing said carrier and movable therewith and also slidably and rotatably movable relative thereto, a series of teeth formed on one end face of the said sleeve and directed toward the ball point, a series of relatively deep notches formed in the sleeve end face and arrangd in alternately successive teeth, an elongated projection fixed to the said carrier to engage at one end thereof against a tooth or into a notch in said sleeve, the retracted position of the carrier being defined by the said elongated projection entering into a notch in the sleeve and the writing position being defined by the projection engaging against a tooth of the series of teeth on the sleeve and means formed on the internal surface of the sheath to be engaged by a sleeve tooth during said movement of the carrier and sleeve to halt movement of said sleeve, permitting said carrier then to continue moving relative to said sleeve, said means camming the sleeve one tooth pitch during the last portion of travel of the said sleeve for movement of said projection between said tooth and said notch.

2. The invention as set forth in claim 1, including a shoulder formed on the said carrier adjacent the other end thereof, a second spring disposed between said

shoulder and said sleeve and exerting an inward bias on the sleeve, said second spring being weaker than the first recited spring.

3. The invention as set forth in claim 1, wherein the said projection is rail shaped and the end facing the said sleeve has the same slope as the teeth formed on the sleeve end face.

4. The invention as set forth in claim 3, wherein the said last recited means comprises a boss, a groove formed in the said boss to serve as a guide for the said projection formed on the said carrier, the end face of the said boss having the same slope as the teeth of the sleeve and positioned to engage a tooth at the end portion of the sleeve travel.

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