

# RESERVE COPY PATENT SPECIFICATION

412,286

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Complete Left: Oct. 5, 1933.

Complete Accepted: June 28, 1934.

PROVISIONAL SPECIFICATION.

## Improvements in or relating to Pencils.



I, WILLIAM LIVSEY, (British Nationality), of 13, Hope Street, Liverpool, in the County of Lancaster, do hereby declare the nature of this Invention to be as follows:—

This Invention relates to propelling pencils of the type or kind having a propeller action or screw for effecting the usual propelling and repelling motions and final ejection of the writing lead or point upon rotation of one part of the pencil casing relative to another part thereof or by relative rotation of both parts of the casing, and in which pencils means are provided also to permit of overwinding of the parts with the object of preventing damage to the propeller mechanism.

In propelling pencils of this kind it has hitherto been usual to impart the necessary longitudinal movement to the lead-carrying holder socket or tube by the aid of a propeller rod frictionally engaged at one end with the lead socket and having a lateral portion at its other rear end engaging a spiral spring and a longitudinally slotted sleeve or tube surrounding the rod, but in such constructions the said lateral portion of the propeller rod is allowed to move out of engagement with the spiral spring, or the slot of the tubular sheath, and the spiral spring is made of such strength as to yield axially against the resistance of the lateral portion of the propeller rod to permit of overwinding of the propeller mechanism. By reason, therefore, of the fact that the lead socket is resiliently held in required position during writing, care must be exercised that only reasonable pressure is imposed on the writing point, otherwise the spring will be sprained and the functioning of the propeller mechanism impaired, but even with such precaution there exists a tendency for the yieldable spring to become axially distorted in a comparatively short time and so considerably lessen the effective life of the pencil.

The object of our Invention is to provide a simple and more practicable construction of propelling pencil which permits of overwinding yet obviates the defects referred to.

[Price 1/-]

Broadly, our Invention resides in utilising, in combination with a longitudinally slotted member, a spiral or spirally-slotted element which is incapable of yielding axially under all normal conditions of use and so maintains a constant length, and in relying upon a light coiled wire spring mounted on the propeller rod between the lead-holder socket or tube on the one end of the rod and a stop at the other end of the mechanism to permit of overwinding of the pencil and to cause automatic re-engagement of the lateral portion of the propeller rod with the normally inflexible spiral or spirally-slotted element of the action at the termination of the longitudinal movement of the propeller rod in one or, preferably, both directions.

According to my Invention, such overwinding of the mechanism and automatic re-engagement of the propeller rod with said spiral or spirally-slotted element may be attained, at the forward or pointed writing end of the pencil, by axially compressing the coiled wire spring during continued outward movement or projection of the propeller rod subsequent to the arrest of the lead-holder socket or tube until the lateral portion or pin of the propeller rod moves out of engagement with the outer end of the spiral or spirally-slotted element, when the now compressed spring operates upon said lateral pin to re-engage it with the spiral or spirally-slotted element immediately the pencil parts are actuated in the appropriate manner to cause reverse longitudinal motion of the propeller rod. At the opposite end of the spiral or spirally-slotted element a similar overwinding and re-engaging action may be attained by arresting the longitudinal motion of the adjacent rear end of the coiled wire spring by the stop referred to during the latter part of the inward movement or retraction of the propeller rod until the lateral portion or pin of the propeller rod moves out of engagement with the adjacent end of the spiral or spirally-slotted element, when the now compressed spring operates to re-engage the lateral pin with the spiral or spirally-slotted element immediately the pencil parts are appropriately actuated

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to impart reverse longitudinal movement to the propeller rod.

In one convenient mode of embodiment of my invention, the normally inflexible spiral or spirally slotted element may constitute a sheath or envelope for the longitudinally-slotted member which, in turn, contains the propeller rod and the coiled wire spring mounted on the latter. Said spirally-slotted element is soldered or otherwise secured at its forward end to the customary screw-connecting member of the tapered pencil point and carries at its rear end a small sleeve or tube which forms an extension of the spirally-slotted element and has an internal diameter at least equal to the external diameter of the spirally-slotted element. Situated in a convenient position at the rear part of the mechanism is a stationary band, collar, or disc consisting preferably of a small piece of tubing similar in configuration to the longitudinally slotted member, and having an opening or slot in register with the slot of said member, the object of such band or collar being to provide an abutment for the rear end of

the coiled wire spring or for a second collar mounted at the rear of the spring on the propeller rod. By this means, longitudinal motion of said spring during the latter part of the repelling motion of the propeller rod is resisted in order that the necessary spring pressure to definitely ensure re-engagement of the pin of the propeller rod with the spirally-slotted member will be imposed on the propeller rod.

In another form of embodiment of the invention, said stationary spring-retaining band or collar is omitted, the same effect being obtained merely by reducing the diameter of the longitudinal slotted member at the appropriate part thereof sufficiently to form a stop for the rear end of the coiled spring or the collar mounted on the propeller rod at such end of the spring.

Dated this 29th day of December, 1932.

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and

125, High Holborn, London, W.C. 1,  
Agent for the Applicant.

## COMPLETE SPECIFICATION.

### Improvements in or relating to Pencils.

I, WILLIAM LIVSEY, (British Nationality), of 13, Hope Street, Liverpool, in the County of Lancaster, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to propelling pencils having a propeller action or screw for effecting the usual propelling and repelling motions and final ejection of the writing lead or point upon rotation of one part of the pencil casing relative to another part thereof or by relative rotary motion of both parts of the casing, and in which pencils means are provided also to permit of overwinding of the parts with the object of preventing damage to the propeller mechanism.

In propelling pencils it has hitherto been usual to impart the necessary longitudinal movement to the lead-carrying holder or tube by the aid of a propeller rod frictionally engaged at one end with the lead holder socket or carrier and having a lateral portion at its other-rear-end engaging a spiral spring and a longitudinally slotted sleeve or tube surrounding the rod, but in such constructions the

said lateral portion of the propeller rod is allowed to move out of engagement with the spiral spring and the longitudinal slot of the tubular sheath, and the spiral spring is made of such strength as to yield axially against the resistance of the lateral portion of the propeller rod to permit of overwinding of the propeller mechanism. By reason, therefore, of the fact that the lead socket is resiliently held in required position during writing, care must be exercised that only reasonable pressure is imposed on the writing point, otherwise the spring will be injured and the functioning of the propeller mechanism impaired, but even with such precaution there exists a tendency for the yieldable spring to become axially distorted in a comparatively short time and so considerably lessen the effective life of the pencil.

The object of my invention is to provide a simple and more practicable construction of propelling pencil or pencil action which permits of overwinding yet obviates the defects referred to.

Broadly, my invention resides in utilizing in combination with a longitudinally slotted member, a rigid or inflexible spiral or spirally-slotted element which is incap-

able of yielding axially under all normal conditions of use and so maintains a constant length, and in relying upon a spring disposed between the lead-holder socket  
 5 or tube on the one end of the propeller rod and a stop at the other end of the mechanism to permit of overwinding of the pencil and to cause or effect automatic re-engagement of the lateral position  
 10 of the propeller rod with the normally inflexible spiral or spirally-slotted element of the action at the termination of the longitudinal movement of the propeller rod in one or, preferably, both directions; the arrangement  
 15 being essentially characterised in that operative engagement between said propeller rod and the spiral is effected by a single lateral pin or projection of the propeller rod, and a common spring is  
 20 utilised for re-engaging the action after overwinding at each end of the travel and also for returning the parts to normal positions after expulsion of a lead.  
 25 According to my Invention, freedom of the mechanism to overwind and automatic re-engagement of the propeller rod with said spiral or spirally-slotted element is attained, at the forward or  
 30 pointed writing end of the pencil, by axially compressing the coiled wire spring during continued outward movement or projection of the propeller rod subsequent to the arrest of the lead-holder  
 35 socket or tube until the lateral portion or pin of the propeller rod moves out of engagement with the outer or forward end of the spiral or spirally-slotted element, when the now compressed spring operates  
 40 upon said lateral pin to re-engage it with the spiral or spirally-slotted element immediately the pencil parts are actuated in the appropriate manner to cause reverse longitudinal motion of the propeller rod.  
 45 At the opposite end of the spiral or spirally-slotted element a similar overwinding and re-engaging action is attained by arresting the longitudinal motion of the adjacent rear end of the  
 50 coiled wire spring by the stop referred to during the latter part of the inward movement or retraction of the propeller rod until the lateral portion or pin of the propeller rod moves out of engagement  
 55 with the adjacent end of the spiral or spirally-slotted element, when the now compressed spring operates to re-engage the lateral pin with the spiral or spirally-slotted element immediately the pencil  
 60 parts are appropriately actuated to impart reverse longitudinal movement to the propeller rod.  
 In one convenient mode of embodiment of my Invention, the normally inflexible spiral or spirally slotted element may con-

stitute a sheath or envelope for the longitudinally-slotted member which, in turn, contains the propeller rod and the coiled wire spring mounted on the latter. Said spirally slotted element is soldered or  
 70 otherwise secured at its forward end to a connecting sleeve or ferrule and located at the rear end of the longitudinally slotted member is a small closure cap, or the like, which is created with a slot in register with that of the longitudinally  
 75 slotted member and forms, in effect, an extension of the spirally-slotted element. Situated in a convenient position at the rear part of the propeller mechanism, but preferably mounted in a slidable manner upon the rear part of the propeller rod, is a bearing member consisting, for  
 80 example, of a small piece of tubing having an opening or slot in register with the slot of the longitudinally slotted member for the passage of the lateral pin of the propeller rod, the object of such bearing member being to provide an abutment for the rear end of the coiled  
 85 wire spring or for a second collar, or the like, mounted on the propeller rod at the rear of the spring. Thus by engagement of said bearing member with said cap extension of the spirally-slotted member, longitudinal motion of the spring during  
 90 the latter part of the repelling motion of the propeller rod is resisted in order that the necessary spring pressure to definitely ensure re-engagement of the pin of the propeller rod with the spirally-slotted member will be imposed on the  
 95 propeller rod, and likewise a similar re-engaging action is attained during the lead-ejecting motion of the propeller rod by resisting the longitudinal motion of the lead socket.

In a further embodiment of the Invention, said spring-retaining bearing member is omitted, the same effect being  
 110 attained merely by reducing the diameter of the longitudinal slotted member at the appropriate part thereof sufficiently to form a stop for the rear end of the coiled spring; or, alternatively, said  
 115 reduced part of the longitudinally slotted member may constitute a stop for the bearing member mounted on the propeller rod at such end of the spring.

I will further describe my Invention with the aid of the accompanying sheet  
 120 of explanatory drawings which illustrate, by way of example only, one mode of carrying the same into effect.

In said drawings:—

Fig. 1 is a longitudinal section of a part of a propelling pencil provided with our improved propelling and overwinding mechanism, the parts, in this  
 130 view, being shown in the respective posi-

tions they assume when overwinding takes place subsequent to repelling or retractory movement of the parts.

Fig. 2 is a sectional view, similar to Fig. 1, but showing the respective positions of the parts when overwinding takes place subsequent to lead-expelling movement of the components.

Fig. 3 illustrates, in detail, the construction of the longitudinally slotted member employed in the mechanism; and

Fig. 4 similarly shows the formation of the displaceable lead-carrier assembly of the mechanism.

Fig. 5 is a detail illustration of the bearing member mounted on the rear part of the propeller rod of the assembly.

In these views 1 generally designates a spiral or spirally slotted element which is made of brass or other suitable metal and is of such strength or thickness as to be incapable of yielding axially in the usual manner of a spring under all normal conditions of use, and 2 denotes a longitudinally slotted member or sleeve, preferably made of brass or metal similar to that of which the spiral 1 is made, such sleeve being, in part, sheathed or enveloped by the spiral which, as shown, is shorter in length than the sleeve.

The sleeve 2, at its forward end, is pushed into and firmly secured within the central passage portion 3 of a tapered metal point 4, whilst the spiral 1 is securely anchored by, say, a lateral pin 5 engaged in a small slot or recess 6, or in other convenient manner, within the enlarged or cup-shaped part 7 of a metallic tubular connecting member 8, a portion 9 whereof freely extends into a socket 10 provided for its reception in the rear part of the tapered point 4; thus the spiral 1 together with its connecting member 8 is capable of being freely revolved upon the slotted sleeve 2 and is normally held against endwise or axial displacement thereon by the tapered point 4 at the forward end of the sleeve and by a small metal closure cap 11 soldered or otherwise firmly secured upon the opposite end of the sleeve. Said cap 11 is furnished with a slot 12 which is in register or alignment with the corresponding slot 13 of sleeve 2 and is also arranged to co-operate with the helical slot 14 of the spiral, and has, moreover, an external diameter equal to that of the spiral so that it forms, in effect, an extension of the latter.

Contained within the interior of said longitudinally slotted sleeve or tube 2 is a displaceable lead-carrying assembly embodying a propeller rod 15 provided at its rear end with an integral lateral pin or projection 16 which, in the normal

position of the parts, is in engagement with the respective longitudinal and helical slots 13, 14 of sleeve 2 and spiral 1. Consequently by imparting relative rotary motions to the tapered point 4 and the main body or casing 17—which is securely attached in any convenient manner to the portion 7 of the connecting member 8 and is made of metal, vulcanite, or any other customary material of which pencil casings are usually constructed—, or by rotation of one of said parts relative to the other part, propeller rod 15 will be moved axially within the pencil in one direction or the other as may be required.

Provided on the front or forward end of said propeller rod 15 and slidable on the rod is a lead holder socket which is conveniently in the form of a small split tube 18, and mounted on said rod between such lead holder and the lateral portion 16 of the rod is a light coiled wire spring 19. Located on the propeller rod 15 at the rear end of said spring is a bearing member conveniently made in the form of a small split tube 20 which is slidably carried upon the rear end of the propeller rod and constitutes an abutment for spring 19, said tube being also formed, in register with the slot 13 of sleeve 2, with a slot 21 wherethrough said lateral portion 16 of the propeller rod extends. To the lead holder socket 18 there is soldered or otherwise firmly secured a longer tube or other suitable member 22 which surrounds the propeller rod 15 and conveniently serves as a sheath for the coiled spring 19 upon the rod and as a guide for the tubular bearing member 20 but is more especially provided to rigidly connect a projection 23 situated at the rear of the lateral portion 16 of the propeller rod with the lead holder socket 18, said projection 23, in the particular example illustrated, being conveniently shown as an integral part of the tubular member 22 which is itself formed with a longitudinal slot 24 wherethrough the lateral portion 16 of the propeller rod passes. Said projection 23 is adapted to bear upon one side of the lateral portion 16 of the propeller rod and is arranged to co-operate with a second projection 25 which is adapted to bear upon the opposite side of said lateral pin 16 of the rod, this latter projection being formed on the spring-retaining bearing member 20 as shown more particularly in Figs. 4 and 5.

In the operation of the pencil it will be seen that when one or both of the parts 4, 17 of the pencil is or are rotated by hand to cause—by engagement of the lateral pin 16 of the propeller rod with

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the slots 13, 14 of the sleeve and spiral 2, 1 respectively—repelling motion of the lead-carrier assembly, said lateral pin 16 will, at the termination of the longitudinal rearward movement of the propeller rod 15, move out of engagement with the spiral slot 14 and enter—without disengagement from the longitudinally slotted sleeve 2—the slot 12 of end closure cap 11, and during the latter part of this movement the tubular bearing member 20 will come into contact with said closure cap and be held thereby against longitudinal displacement. Consequently, during the subsequent retractory movement of the lead carrier assembly the adjacent end of the coiled spring is arrested by said bearing member 20, whilst the opposite end of the spring, through engagement of the projection 23 of tube 22 with the lateral pin 16 of the propeller rod is caused by the lead holder socket 18 associated with said tube 22 to be projected inwardly in accordance with the movement of the propeller rod, as shown in Fig. 1, and by such action the effective spring pressure upon the lateral pin 16 of the propeller rod is increased to such an extent that whilst the parts are revolved by hand in the same direction overwinding may occur without imposition of undue stress on the components, but immediately reverse motion is imparted to the parts the lateral pin 16 of the propeller rod will, under the influence of spring 19, automatically re-engage with the spiral slot 14 and be projected by the spiral in order that the bearing member 20 may regain its original position to relieve the spring pressure on the lateral pin 16 during the initial projectory movement of the lead-carrier assembly.

On the other hand, when the lead-carrier assembly is projected along the longitudinally slotted sleeve 2 towards the pointed end of the pencil, the lead holder socket 18 comes into contact with the internal shoulder or stop 26 of the tapered point 4 and is thereby held against further displacement in this direction, whilst the propeller rod 15 continues its outward movement to eject a lead or lead stump from the pencil by way of the tip passage 27, as shown in Fig. 2, and during this expelling movement the lateral pin 16 of the propeller rod moves—without disengagement from the slot of sleeve 2—out of engagement with the spiral slot 14 and enters the socket portion 7 of the connecting member 8; at the same time movement of the outer or forward end of spring 19 is arrested by the—now stationary—lead socket 18 and the opposite end of the spring is pro-

jected outwardly in accordance with the movement of the propeller rod due to the bearing member 20 being moved together with said pin 16 consequent on the engagement of the latter with the projection 25 of the bearing member. Thus similar conditions to those previously described are obtained at this end of the pencil so that overwinding may occur whilst the parts are rotated in the appropriate direction and automatic spring re-engagement of the lateral pin 16 with the spiral 1 will take place immediately the parts are rotated in reverse direction to permit the components of the lead carrier to regain their normal positions of use as illustrated in Fig. 4.

It is to be noted that operative engagement between said propeller rod 15 and the spiral 1 is effected by the single lateral pin 16 of rod 15, and that the common spring 19 is utilised for re-engaging the action after overwinding at each end of the travel and also for returning the parts to normal positions after expulsion of a lead.

It is to be understood that I do not confine myself to the precise details of construction and arrangement of parts as hereinbefore described, as obviously various alterations or modifications may be made without departing from the spirit and scope of the same as defined by the claims. For example, any other suitable means for stopping or arresting the motion of the coiled spring 19 during the latter part of the repelling motion may be employed, such means consisting say of a reduced part of the longitudinally slotted member 2 such reduced part being adapted to arrest the rear end of the spring or a band, or the like, fitted on the propeller rod 15 in lieu of the relatively long bearing member 20. Further, the overwinding means may be omitted at one end of the propeller action if so desired. For example, by extending the spiral 1 into the base of the socket portion 7 of the connecting member 8 overwinding means may be dispensed at the forward or pointed end of the pencil action. It is also to be noted that the novel propelling and overwinding action may be fitted as a complete self-contained unit into a pencil casing.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A propelling pencil or action having a longitudinally slotted member, a rigid or inflexible spiral or spirally-slotted element, a propeller rod provided at or near its rear end with a lateral pin or projec-

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tion engaging said longitudinal slotted member and adapted to move into and out of engagement with one or both ends of said spiral or spirally-slotted element, a spring disposed between said lateral pin or projection and a lead carrier located at the forward end of the rod, and stop means whereby said spring is axially compressed during the final part of the longitudinal movement of the propeller rod in one or both directions for the purpose specified; the arrangement being essentially characterised in that operative engagement between said propeller rod and the spiral is effected by a single lateral pin or projection of the propeller rod, and a common spring is utilized for re-engaging the action after overwinding at each end of the travel and also for returning the parts to normal positions after expulsion of a lead.

2. A propelling pencil or action as claimed in the preceding Claim, provided at the rear end of the propeller rod with a stop which engages the adjacent end of the spring and is held against movement during the latter part of the repelling motion of said rod, and having at the forward end of the propelling mechanism a lead holder socket or carrier engaging the adjacent end of the spring and adapted to be held against movement during the lead-ejecting motion of the propeller rod.

3. In a propelling pencil or action as claimed in either of the preceding Claims, the provision on the rear end of the propeller rod of a bearing member which constitutes an abutment for the rear end of the spring provided on said rod, or for a collar, or the like, mounted on the rod at the rear of said spring.

4. In a propelling pencil or action as claimed in the preceding Claim 3, a bearing member for the spring, which bearing member is in the form of a tube slidably mounted on the rear end of said rod and provided with a slot wherethrough the lateral portion of the propeller rod extends, and a stop or closure provided at the end of the longitudinally slotted member and adapted to hold said tube against rearward movement during the final repelling movement of the propeller rod, for the purpose specified.

5. In a propelling pencil or action as claimed in any one of the preceding Claims, a tubular member firmly secured to the lead holder socket or tube and preferably forming a guide for a tubular bearing member upon the rear end of the propeller rod and a sheath for the spring and having a longitudinal slot wherethrough the lateral portion of the propeller rod freely extends, and a projection at the rear end of said tube adapted to

transmit spring pressure to said lateral portion of the propeller rod in the appropriate direction when overwinding occurs with said rod in its retracted position, for the purpose specified.

6. In a propelling pencil or action as claimed in the preceding Claim 5, the provision on the tubular bearing member located upon the rear end of the propeller rod of a projection adapted to transmit spring pressure to the lateral portion of the propeller rod in the appropriate direction when overwinding occurs with said rod in its projected position, for the purpose specified.

7. In a propelling pencil or action as claimed in any one of the preceding Claims, a longitudinally slotted member which is closed at its rear end and is firmly secured at its forward end within a central passage of a tapered writing point.

8. A modification of the subject matter of any one of the preceding Claims 3, 5 or 7, inclusive, in which the rear part of the longitudinally slotted member is reduced to provide a stop whereby longitudinal displacement of the spring mounted upon the propeller rod is arrested as said rod approaches the limit of its movement in a rearward direction, for the purpose specified.

9. In a propelling pencil or action as claimed in any one of the preceding Claims, the provision on the longitudinally slotted member of a rotatable spiral or spirally-slotted element which is shorter in length than said longitudinally slotted member and is so arranged with respect to the latter as to allow the lateral portion of the propeller rod to move out of engagement with the spiral or spirally-slotted element at one or both ends thereof against the spring resistance, and to permit of overwinding of the mechanism without disengagement of the lateral portion of the propeller rod from the slot of the longitudinally slotted member.

10. In a propelling pencil or action as claimed in any one of the preceding Claims, a rigid or inflexible spiral or spirally-slotted element which is mounted to revolve freely upon a portion of the longitudinally slotted member and is pinned or otherwise securely attached to a connecting member extending freely into a socket of the tapered writing point.

11. In a propelling pencil or action as claimed in any one of the preceding Claims 1, 4 or 9, a longitudinally slotted member closed at its rear end by means of a cap, or the like, which, in effect, forms an extension of the spiral or spirally-slotted element and is furnished with a slot in register or alignment with

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that of the longitudinally slotted member, for the purpose specified.

12. A propelling pencil incorporating propelling mechanism with provision for overwinding substantially as hereinbefore described and illustrated in the accompanying drawings.

Dated this 28th day of August, 1933.

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and

125, High Holborn, London, W.C. 1,  
Agent for the Applicant.

Redhill: Printed for His Majesty's Stationery Office, by Love & Malcomson, Ltd.—1934.

[This Drawing is a reproduction of the Original on a reduced scale.]

Fig. 1.

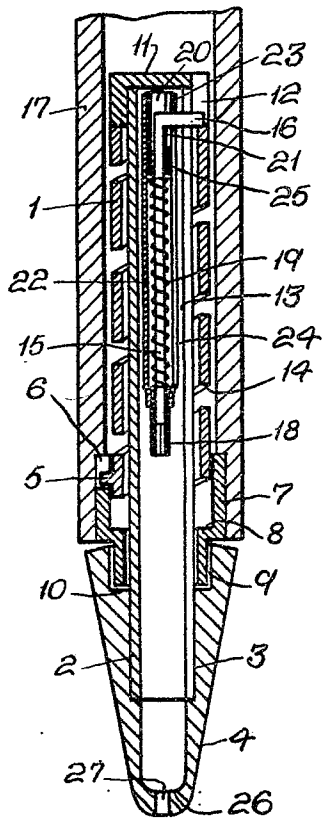


Fig. 2.

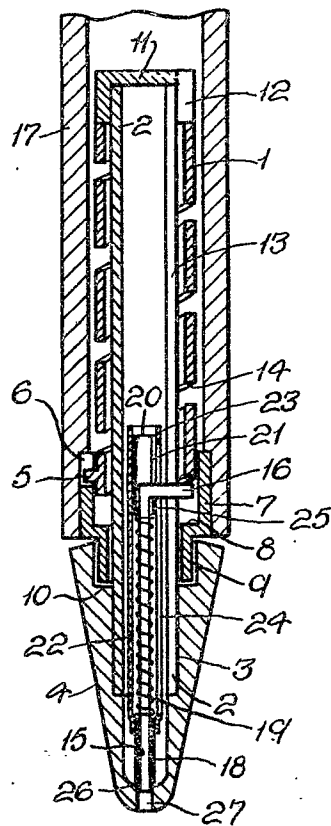


Fig. 3.

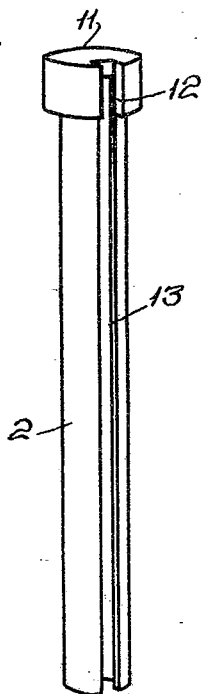


Fig. 4.

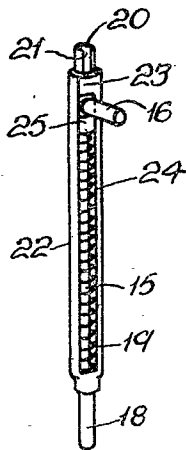


Fig. 5.

