

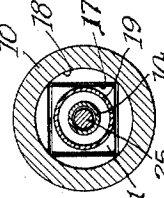
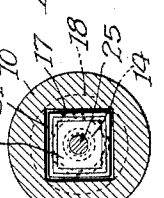
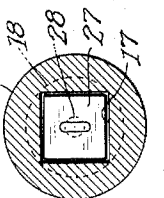
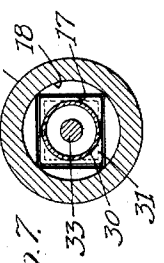
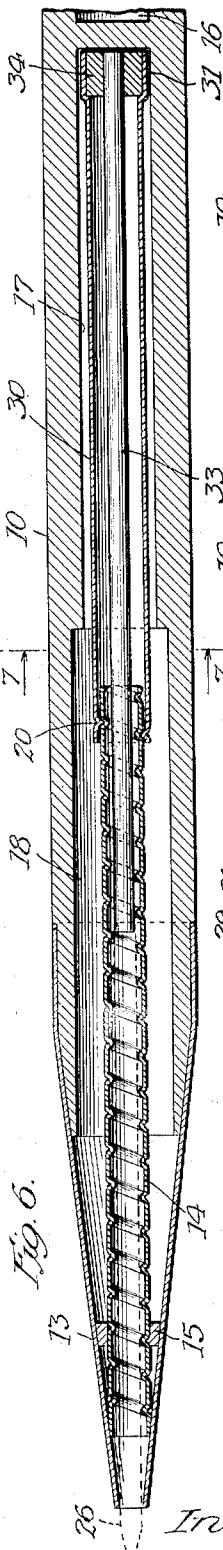
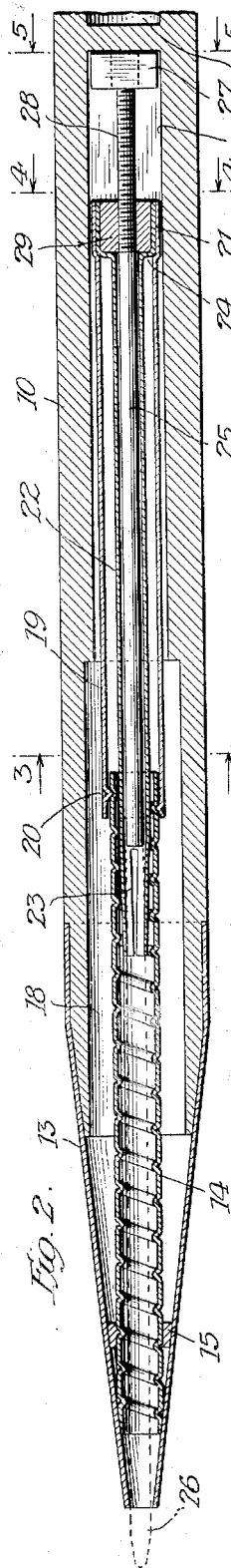
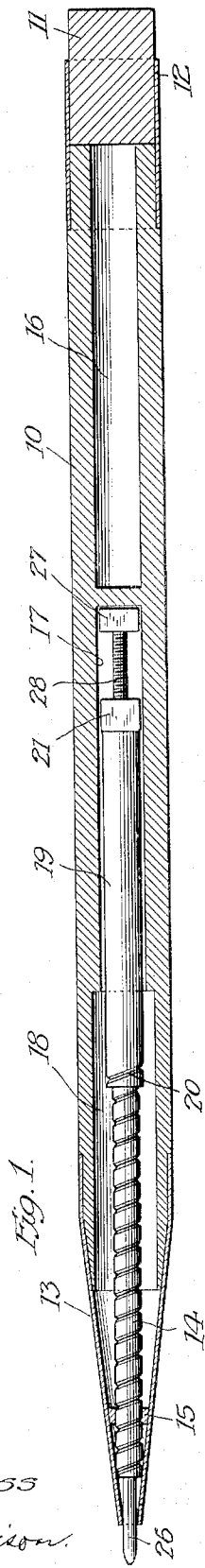
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F. C. DELI

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PENCIL

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UNITED STATES PATENT OFFICE

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PENCIL

Application filed January 23, 1929. Serial No. 334,520.

My invention relates to pencils and particularly to mechanical pencils of the propel-repel type.

One of the objects of my invention is to provide a pencil of the propel-repel type in which the utmost strength and rigidity is secured in the mechanism, thus insuring a longer life and less liability to damage and injury in using the pencil.

Another object of my invention is to provide a pencil of the propel-repel type wherein the screw means for advancing the lead is larger and stronger than heretofore utilized. This is possible in a construction wherein the screw means is outside the lead tube instead of being received inside.

A further object of my invention is to provide a lead advancing screw thread mechanism with the threads of a steeper pitch. In the usual lead advancing plunger of relatively small cross-section, the forming of threads thereon necessarily weakens the plunger and the production of a steep pitch on such a small size wire has been found to be quite impractical.

However, the threads on the tube utilized herein are of relatively steep pitch and it is thus possible to make the threaded tube of sufficient size to render the use thereof entirely practical.

The invention will be more readily understood by reference to the accompanying drawings, in which

Fig. 1 is a longitudinal sectional view of a pencil constructed in accordance with my invention;

Fig. 2 is an enlarged fragmentary sectional view thereof;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2;

Fig. 4 is a sectional view on the line 4—4 of Fig. 2;

Fig. 5 is a sectional view on the line 5—5 of Fig. 2;

Fig. 6 is an enlarged fragmentary longitudinal sectional view of a modified form of my invention; and

Fig. 7 is a section on the line 7—7 of Fig. 6.

By referring to the drawings, it will be

seen that I have shown a pencil construction having the barrel 10, eraser 11, eraser holder 12, tip 13, and the relatively steeply threaded tube 14, suitably secured in the tip by the solder 15.

The barrel has the lead chamber 16, non-circular mechanism chamber 17 and circular safety zone 18.

As best shown in Fig. 2, the lead advancing mechanism comprises the tube 19 having a single complete thread 20 formed in the lower end thereof. The upper end, 21, of the tube 19 is formed into a non-circular shape thereby preventing the rotation of the tube 19 as long as it remains in the non-circular chamber 17.

Within the tube 19 and projecting from the lower end thereof is the tube 22, the lower end 23 of which is split to receive and retain a lead. The upper end 24 of the tube 22 is suitably secured to the inner wall of the large tube 19.

Disposed within the small tube 22 is the plunger 25 contacting the lead 26 within the split portion 23 at the lower end, and terminating in the non-circular head 27. A portion 28 of the upper end of the plunger is threaded for engagement with the nut 29 tightly contacting the inner walls of the non-circular portions of the tubes 19 and 22 for a purpose to be hereinafter set forth.

In operation, the parts being dis-assembled, a lead 26 is placed in the split socket 23 until it contacts the plunger 25 in the tube 22, and is then associated with the tip assembly by inserting the lead 26 and split socket 23 inside the threaded tube 14. The thread 20 will then engage the threads in the tube 14. The entire tip and plunger assembly may then be inserted into the barrel where they will occupy the positions shown in Fig. 2.

As the lead 26 is used at the point, the pencil is taken with the tip held in one hand and the barrel in the other. A short turn of the barrel in a clockwise direction will serve to advance the plunger construction toward the point. This for the reason that all the parts of the plunger assembly being prevented from rotating within the chamber

17 must necessarily be drawn forward by the screw action on the tube 14.

It is obvious that continuous rotation of the barrel will advance the entire plunger assembly until the tube 19 contacts the solder 15, thus limiting its travel. However, the tube 19 is constructed of such a length that it will lie entirely within the circular chamber 18 prior to the contact with the limit stop 15.

When the tube 19 has reached its limit of forward travel, it will turn freely within the chamber 18 and will not advance the lead. The head however, is still within the non-circular chamber and further rotation of the barrel will advance only the head 27 and the plunger 25, thus forcing the lead out of the split socket 23. Continued rotation will eventually bring the head 27 where it will rotate freely, and the plunger 26 will be advanced no further, thus the circular chamber 18 is a safety zone to prevent jamming the parts in an effort to advance the lead.

In Fig. 6 I have shown a modified and more simple form of my invention. It comprises the same tip assembly, and barrel, but the plunger assembly comprises merely the tube 30 having a noncircular head 31, a single thread 32 at the lower end thereof, and the plunger 33 anchored at the upper end in the nut 34.

In the modified form, the withdrawing feature is not present, and the lead is simply placed in the threaded tube 14. The plunger 33 is then inserted in the tube 14 and the tube 30 placed over the tube 14 until it comes into screw engagement with the tube 14. The entire tip and plunger assembly may then be inserted inside the barrel. Thereafter, rotating the barrel will advance the tube 30 and plunger. The tube 30 is formed of such length that the entire length thereof will eventually come within the circular chamber or safety zone 19, and further advance of the lead is impossible.

Obviously, I have provided a pencil that is of relatively simple construction and operation. I have also accomplished the object of providing a simple and durable means of rapid advance and withdrawal of a lead without the necessity of enlarging the size of the common pencil. These and other advantages are apparent from an inspection of the drawings, and I do not wish to be limited except as indicated in the appended claims.

I claim:

1. In combination, a pencil barrel having an axial opening, some portion of which is non-circular in cross-section, a tip rotatably mounted on the barrel, a threaded tube carried by the tip, a second tube having a non-circular portion adapted to co-operate with the noncircular part of the barrel and to slide relative thereto, means on the interior of the said last named tube for engaging the threads

on the exterior of the threaded tube, and a plunger carried by said second tube and adapted to project into the threaded tube.

2. In a pencil, the combination of a barrel having an axial opening, a portion of which is noncircular in cross-section, a tip rotatably and removably mounted on the lower end of the said barrel, a tube carried by the tip and provided with threads on its exterior, a second tube adapted to telescope over the threaded tube and provided with a projection adapted to engage with the exterior threads on said threaded tube, a portion of said second tube being non-circular to slidably co-operate with the non-circular portion of said axial opening, and a plunger axially mounted within said second tube and adapted to travel therewith.

3. In a pencil, the combination of a barrel having an axial opening, a portion of which is non-circular in cross-section, a tip rotatably and removably mounted in the lower end of the said barrel, a tube carried by the tip and provided with threads on its exterior, a second tube adapted to telescope over the threaded tube and provided with a projection adapted to engage with the exterior threads on said threaded tube, a portion of said second tube being non-circular to slidably co-operate with the non-circular portion of said axial opening, and a plunger axially mounted within said second tube and adapted to travel therewith, said tubes, tip and plunger being adapted for removal from the barrel in any position of adjustment of the parts.

4. In combination, a pencil barrel having an axial opening, some portion of which is non-circular in cross-section, a tip rotatably mounted on the barrel, a threaded tube carried by the tip, a second tube having a non-circular portion adapted to co-operate with the non-circular part of the barrel and to slide relative thereto, a portion only of the second tube having an interior thread for engaging the threads on the exterior of said threaded tube, a plunger carried within said second tube and adapted to be received within said threaded tube.

5. In a pencil, the combination of a barrel having an axial opening, a portion of which is non-circular in cross-section, a tip rotatably mounted and removable on the lower end of the said barrel, a tube carried by the tip and provided with threads on its exterior, a second tube adapted to telescope over the threaded tube and provided with a projection adapted to engage with the exterior threads on said threaded tube, a portion of said second tube being non-circular to slidably co-operate with the non-circular portion of said axial opening, a third tube within said second tube and projecting from the lower end thereof, and a plunger axially mounted within said third tube and adapted to slide therein.

6. In a pencil, the combination of a barrel having an axial opening, a portion of which is non-circular in cross-section, a tip rotatably and removably mounted on the lower end of said barrel, a tube carried by the tip and provided with threads on its exterior, a second tube adapted to telescope over the threaded tube and provided with a projection adapted to engage with the exterior threads on said threaded tube, a portion of said second tube being non-circular to slidably cooperate with the non-circular portion of said axial opening, a third tube within said second tube and projecting from the lower end thereof, and a plunger axially mounted within said third tube and adapted to slide therein, the upper end of said plunger having threaded engagement in all positions of adjustment with the upper end of said second tube.

7. In a pencil, the combination of a barrel having an axial opening, a portion of which is non-circular in cross-section, a tip rotatably and removably mounted on the lower end of the said barrel, a tube carried by the tip and provided with threads on its exterior, a second tube adapted to telescope over the threaded tube and provided with a projection adapted to engage with the exterior threads on said threaded tube, a portion of said second tube being non-circular to slidably cooperate with the non-circular portion of said axial opening, a plunger having its upper portion threaded and axially mounted within said second tube, a portion of said plunger projecting beyond the limits of said second tube, and a head on said projecting portion of said plunger.

8. In a pencil, the combination of a barrel having an axial opening, a portion of which is noncircular in cross-section, a tip rotatably and removably mounted on the lower end of the said barrel, a tube carried by the tip and provided with threads on its exterior, a second tube adapted to telescope over the threaded tube and provided with a projection adapted to engage with the exterior threads on said threaded tube, a portion of said second tube being non-circular to slidably cooperate with the noncircular portion of said axial opening, a plunger having its upper portion threaded axially mounted within said second tube, a portion of said plunger projecting beyond the limits of said second tube, and a head on said projecting portion of said plunger, said head being non-circular in cross-section and adapted to slidably engage the non-circular portion of said axial opening in said barrel.

9. In a pencil, the combination of a barrel having an axial opening, a portion of which is non-circular in cross section, a tip rotatably and removably mounted on the lower end of said barrel, an exteriorly threaded tube carried by said tip, a second tube having

a single interior thread on the lower end thereof, said second tube being adapted to telescope over said threaded tube and engage the threads thereof, a third tube within said second tube, the lower portion thereof being split to receive a lead, a plunger slidable within said third tube and a non-circular head on the upper end of said plunger, said second and third tubes and said head being adapted to slidably engage the walls of said non-circular axial opening.

10. In combination, a pencil barrel having an axial opening, some portion of which is noncircular in cross section, a tip rotatably mounted on the said barrel, a threaded tube carried by the tip, a second tube having a non-circular portion adapted to cooperate with the noncircular part of the barrel and the slide relative thereto, means on the interior of the said last named tube for engaging the threads on the exterior of the threaded tube, and a plunger carried by said second tube and adapted to project into the threaded tube, said second tube in its extreme advanced position being entirely within the circular portion of said barrel.

11. In combination, a pencil barrel having an axial opening, some portion of which is noncircular in cross section, a tip rotatably mounted in the barrel, a threaded tube carried by the tip, a second tube having a non-circular portion adapted to cooperate with the non-circular part of the barrel and to slide relative thereto, means on the interior of the said last named tube for engaging the threads on the exterior of the threaded tube, and a plunger carried by said second tube and adapted to project into the threaded tube, said second tube and said plunger in their extreme advanced positions being entirely within the circular portion of said barrel.

In testimony whereof I have affixed my signature.

FRANK C. DELI.