



# UNITED STATES PATENT OFFICE.

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## MECHANICAL PENCIL.

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*To all whom it may concern:*

Be it known that I, JOHN C. WAHL, a citizen of the United States, and resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Mechanical Pencils, of which the following is a specification.

My invention is a mechanical pencil, particularly in the class in which there is a lead of small diameter which is propelled through the tip of the pencil by a screw plunger.

The object of my invention is to provide an improved lead for pencils of this class. My invention will be best understood by reference to the accompanying figures, of which—

Fig. 1 is a longitudinal section of the pencil;

Fig. 2 is a view partly in section of the magazine for the leads, the plunger and means for actuating the same;

Fig. 3 is a perspective view of the magazine and plunger actuating means;

Fig. 4 is a section along the line 4—4 of Fig. 1;

Fig. 5 is a section along the line 5—5 of Fig. 1;

Fig. 6 is a perspective view of the lead;

Fig. 7 is a section of the same;

Fig. 8 is a section along the line 8—8 of Fig. 1;

Figure 8<sup>a</sup> is a section along the line 8<sup>a</sup>—8<sup>a</sup> of Figure 1, and

Fig. 9 is a section of a modification in the form of the lead.

My improved pencil consists of an outer casing 10, which is provided with a tapered point 11, soldered in which is a guide 12 consisting of a tube 13 having a funnel 14 at one end and a threaded portion 15 at the other. Into the threaded portion 15 is screwed a tip 16 having a hole slightly larger than the diameter of the body of the lead 17. The lead is made in a section shown in Fig. 7, and is provided with a plurality of ridges 19 extending the length thereof. The diameter of the circle circumscribing the outside of the ridges 19 is somewhat larger than the diameter of the hole in the tip 16. Said tip is made of hardened steel, or other suitable material, and as the lead 17

is forced through said tip the ridges 19 will be sheared from the body of the lead, thereby insuring that the lead 17 fits tightly in the hole in the tip 16. This is for the purpose of preventing the lead 17 from dropping through the tip 16 and also for the purpose of insuring a tight fit. The diameter of the hole 16 is slightly larger than the diameter of the body of the lead 17, but somewhat smaller than the diameter of the circle which circumscribes the outside of the ridges 19.

I shall now describe the means for propelling the lead through the tip 17. While various means may be employed, I prefer to use a construction shown in the accompanying figures. A tube 20, provided with threads 21 at its lower end and with a cylindrical surface 22 at its upper end is inserted in the casing 10. In this tube is inserted a magazine 23 and plunger 26, shown clearly in Figs. 2 and 3, reference to which will disclose that the cylindrical magazine 23 has extending from it a pair of tines 24 and 25, which embrace the threaded plunger 26 and serve to turn the same in the screw threads 21. The plunger 26 is provided with a pusher 27, which extends through a hole 28 in a plate 29, which serves to unite the tines 24 and 25.

The upper portion of the magazine 23 is provided with a contracted portion 30, to which is soldered a threaded collar 31, on which is screwed the cap 32. Obviously turning the cap 32 will turn the magazine 23 and tines 24 and 25. The plunger 26 will be moved relatively to the threads 21 and the pusher 27 consequently will advance the lead 17 as the same may be used.

The magazine 23 serves as a receptacle for extra leads (Fig. 4) and to insert these leads into the pencil it is only necessary to unscrew the magazine 23 until the plunger 26 has become disengaged from the threads 21 and withdraw the magazine from the casing 10. A new lead is then dropped in the pencil, the funnel 14 serving to guide said lead into the tube 13. The magazine and plunger is then inserted and the lead advanced by the magazine being turned.

The dust of portions of the ridges 19 which are sheared from the lead 17 by the

tip 16 will of course fall down the tube 13 into the interior of the pencil and may be readily shaken out from time to time.

In Fig. 9 I have shown a modified form of the lead 17. In this form the ridges, instead of being made of approximately rectangular section, as shown in Fig. 14, are made of approximately triangular section. Obviously the exact shape of these ridges is not a matter of importance, since the essential feature of my invention is that of providing a lead having a body portion and an outer portion capable of being sheared when the body portion is forced through a tip or suitable shearing means.

Many changes and modifications may be made in my herein described invention without departing from the spirit thereof, since I claim:

1. In a mechanical pencil having means to force a lead through a tip, the combination of a lead provided with a body portion and extending portions adapted to be sheared from said body portion and means to shear said extended portions from the body of the lead as the same is forced longitudinally through the tip, the tip and lead being held against rotation relative to each other.

2. In a mechanical pencil, the combination of a lead consisting of a body portion and having extended portions adapted to be sheared therefrom, a lead propelling means and a tip provided with means to shear said extended portions as said lead is forced longitudinally through said tip, the tip and lead being held against rotation relative to each other.

3. In a mechanical pencil, the combination of a lead consisting of a body portion having spaced fins projecting outwardly from the normal surface of the body of the lead, a holder for said lead, and instrumentalities for effecting the feeding of the

lead and a cutting away of the fins, as an incident to said feeding, substantially as described.

4. In a mechanical pencil, a tip, a lead having ribs extending the length thereof, means for propelling the lead longitudinally through the tip, and means at the inner end of the tip for engaging and shearing the ribs from the lead during the propelling movement thereof.

5. In a mechanical pencil, a tip having a central bore, a lead having a body of substantially the diameter of the tip, ribs extending from the body of the lead, means for propelling the lead longitudinally of the tip, and means at the inner end of the tip engaging and shearing the ribs from the body of the lead during the propelling movement thereof.

6. In a mechanical pencil, a lead having ribs extending the length thereof, a guide for the lead, said guide being of a diameter to receive the lead with the ribs thereon, a tip having a bore of less diameter than the guide, means for propelling the lead longitudinally of the guide and tip, and means at the inner end of the tip engaging and shearing the ribs from the lead during the propelling movement thereof.

7. In a mechanical pencil the combination of a body and tip, the body being adapted to contain a lead and the tip being formed to permit projection of the lead therethrough by a simple endwise movement of the lead, the lead having projecting longitudinally extending ridges, and means for propelling the lead, the tip having associated therewith means for cutting away sufficient only of said ridges as to cause the remaining portions of the ridges to snugly fit the tip opening.

In witness whereof I have hereunto subscribed my name.

JOHN C. WAHL.