May 17, 1927. 1,628,639

B. AVAKIAN

MECHANICAL PENCIL

Filed June 8, 1926

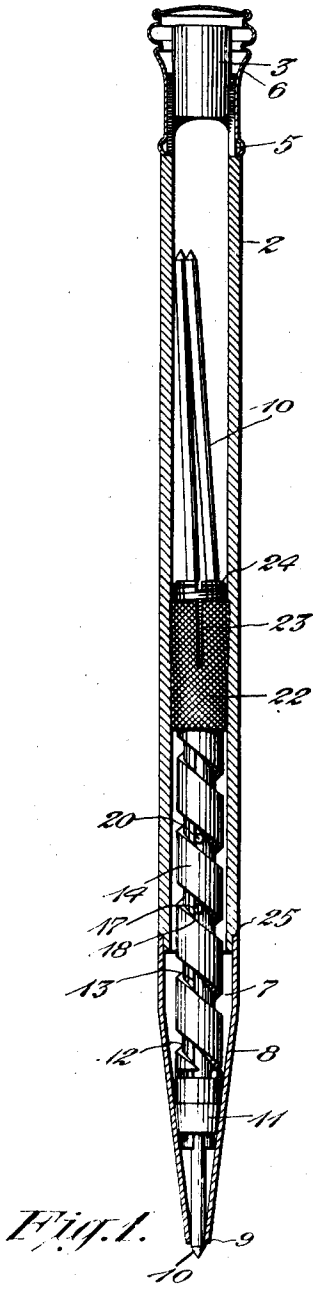


Fig. 1.

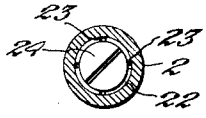


Fig. 3.

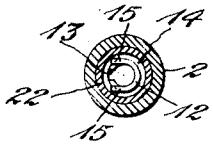


Fig. 4.

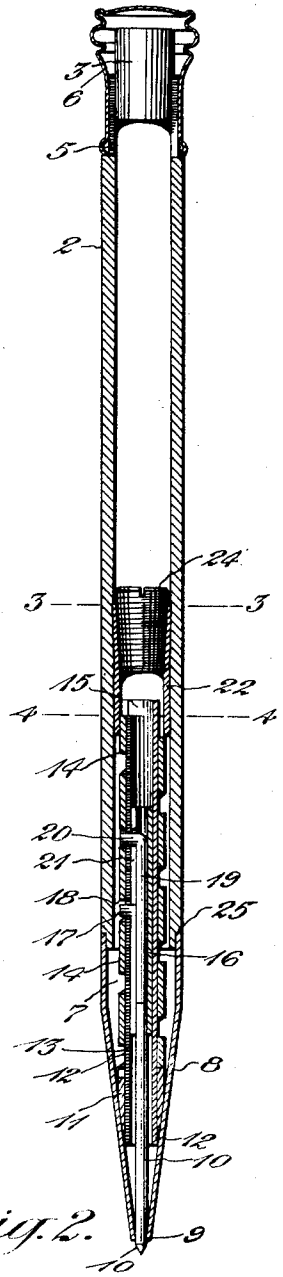


Fig. 2.

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UNITED STATES PATENT OFFICE.

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MECHANICAL PENCIL.

Application filed June 8, 1926. Serial No. 114,463.

This invention relates to an improved construction of mechanical lead pencil having a reservoir for holding a plurality of extra leads within the body of the pencil and means for projecting and retracting the lead at the writing point.

One object of the invention is to provide a mechanical lead pencil having means for conveniently assembling its operating elements in the process of manufacture and disassembling them for repair.

Another object of the invention is to provide a pencil of the type specified from which worn or broken parts may be easily removed and replaced without mutilating or destroying the main body or barrel of the pencil.

Another object of the invention is to provide a pencil of the type specified having a propelling and retracting unit which may be assembled with holders or barrels of different lengths and which is also adapted for use with holders having interior bores which vary slightly in size.

Further objects and advantages of the improvement are set forth in the following specification which describes a preferred form of construction of the invention as illustrated by the accompanying drawings.

In the drawings:

Fig. 1 is a side view of the pencil showing its body or casing in section and illustrating the relative location of its several parts;

Fig. 2 is a longitudinal sectional view of the pencil;

Fig. 3 is a cross-sectional view of the pencil taken on line 3—3 of Fig. 2; and

Fig. 4 is a cross-sectional view taken on line 4—4 of Fig. 2.

It is the usual practice in the manufacture of mechanical pencils to provide a unitary lead propelling and retracting means which may be conveniently assembled within the main sleeve or tube forming the body or barrel of the pencil. The body or barrel of the pencil is usually constructed from a sleeve or tube of vulcanized rubber or composition which may be of different sizes and lengths. Prior to the present invention the lead propelling and retracting unit has generally been assembled with the tubular barrel of the pencil by forcing the unit into the interior bore thereof. It has been found, however, that this method of assembling the pencil has many disadvantages; for instance, where the propelling unit is made to fit snugly within the bore of one barrel it will be loosely held in others which have a slightly larger bore; and again, when made to fit a barrel of the maximum bore and assembled with a holder of smaller bore the forcing of the unit into the barrel will split or crack the material of the holder. Pencils of the present type frequently become inoperative, due to derangement of the parts or clogging of the leads, and it is then necessary to disassemble the operating elements for repair and replacement. This often results in the breaking of the tubular holder or barrel of the pencil where the propelling unit is forced into a tight-fitting sleeve. To obviate these disadvantages the present invention provides an improved means for securing the lead propelling and retracting unit in place in tubular holders or pencil-barrels having bores of varying sizes, and also facilitates the easy disassembling and re-assembling of the parts of the pencil when repairs are necessary.

Referring to the drawings, the outer shell or barrel 2 constitutes the main body of the pencil, and usually an eraser 3 is inserted in the upper end of its bore and the barrel reduced in diameter at 5 to receive a cap 6 for covering the eraser. The operating unit 7 which constitutes the lead propelling and retracting means is received in a conical nozzle 8 fitted over the reduced lower end of the holder 2 and terminating in a contracted opening 9 through which the writing lead 10 is projected. A bushing 11 is soldered or brazed within the throat of the nozzle 8, and secured fast thereto is an inner tubular sleeve 12 provided with a longitudinal slot 13 in its side. A helically-wound tube 14 is rotatively mounted on the sleeve 12 and held from longitudinal displacement with respect thereto by splitting the upper end of the sleeve and swaging it outwardly to form ears 15, see Fig. 4, which project across the top of the tube 14.

The writing lead 10 is held in an inner tubular carrier 16 slidably mounted in the sleeve 12 and adapted to be adjusted therealong by means of a pin 17 projecting from the carrier into the slot 18 of the helical propelling sleeve 14. An expelling rod 19 is slidably mounted in the carrier 16 with its bent end 20 projecting through a slot 21 in the carrier 16 and through the slot 13 in the sleeve 12. The end 20 of the rod 19 projects into the helical slot 18 of the tube

14 directly above the pin 17 on the carrier 16, see Fig. 2.

The spirally slotted sleeve or operating screw 14 is connected at the top to the end of a tube 22 by soldering or brazing and the tube 22 is held fast within the interior bore of the barrel 2 by an improved construction as later described. The construction of the lead propelling and retracting means above described is in accordance with the usual arrangement so that further description thereof is unnecessary. Suffice it to state that the pencil lead is propelled in the usual manner by turning the holder or barrel 2 of the pencil with respect to its lower nozzle-portion 8 carrying the bushing 11 and inner tube 12. The helical operating sleeve 14 will thus be turned with the barrel 2 and the pins 17 and 20 engage with the groove 18 of the sleeve 14 to slide the carrier 16 and rod 19 to project the lead 10 out through the reduced opening in the nozzle 8 or to retract it thereinto.

As before noted, the present invention consists in a novel and improved means for securing the helical sleeve or operating screw 14 fast within the barrel 2. The tube 22 connected with the screw 14 is slotted on opposite sides at its upper end as indicated by the reference numeral 23 in Figs. 1 and 3, and its interior is threaded to receive a tapered screw or expanding plug 24. The propelling unit 7 is assembled with the body portion or barrel 2 of the pencil by sliding the sleeve 22 into the bore thereof until the upper end of the conical nozzle 8 seats against the shoulder 25 at the lower end of the barrel. The screw 24 is then turned down into the interiorly-threaded tube 22 until its clutch-like jaws formed by the slits 23 are expanded to grip the interior of the barrel 2. It is to be noted that the sleeve 22 is preferably knurled or roughened on its exterior to provide a secure grip in the interior bore of the holder 2.

As illustrated in the accompanying drawings, see Figs. 1 and 2, the lead propelling and retracting unit 7 extends substantially midway of the length of the barrel 2, the remaining space in the barrel between the top of the screw 24 and the eraser 3 serving as a magazine for holding a supply of extra leads 10.

It will be observed that my improved construction provides for the easy assembling of the lead propelling and retracting unit within the tubular barrel of the pencil without danger of splitting or breaking the barrel. The only operation necessary is to tighten the tapered expanding plug 24 at the top of the unit so that no fitting or forcing of the parts is required. It will also be observed that should any of the parts of the unit become disarranged or the leads clogged therein, or the operating mechanism become broken or otherwise damaged, the propelling and retracting unit may be readily removed from the barrel of the pencil by loosening the adjusting screw 24 without danger of mutilating or damaging the main parts of the pencil.

Moreover, the invention provides means for assembling the propelling and retracting unit with tubular holders or pencil barrels of different lengths and slightly varying bores whereby to facilitate the process of manufacture, and further to render the pencil more convenient to repair.

While I have herein illustrated and described a preferred embodiment of my improved device it is obvious that various modifications may be made in the structure and arrangement of its parts without departing from the spirit and scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a mechanical pencil, the combination with the barrel thereof, of a tubular member within said barrel, and means for expanding said tubular member to adapt it to grip the interior walls of the barrel to secure it rotatively therewith.

2. In a mechanical pencil, the combination with the barrel thereof, of lead propelling and retracting means comprising a screw member, a threaded bore at the end of said screw member, and an expansion screw engaging said bore to adapt it to expand the screw member to cause it to securely grip the interior of the bore in the barrel.

3. In a mechanical lead pencil, the combination with the barrel thereof, of lead propelling and retracting means contained within the barrel, said means comprising a screw member having a threaded bore at its end with longitudinal slits on its sides, and a tapered plug adapted to be screwed into said bore to expand the sides of the member to adapt them to grip the interior of the barrel.

4. In a mechanical pencil, the combination with the barrel thereof, of an operating screw contained within said barrel and rotatable therewith, an interiorly threaded sleeve at the end of said screw provided with a roughened exterior and longitudinal slits in its sides, and a tapered screw adjustable within the sleeve to expand its sides to cause them to grip the interior of the barrel.

In testimony whereof I affix my signature.

BAGDASAR AVAKIAN.