Jan. 27, 1942. E. R. JOHNSON 2,271,483

MECHANICAL PENCIL

Filed Jan. 3, 1940

Fig. 1.

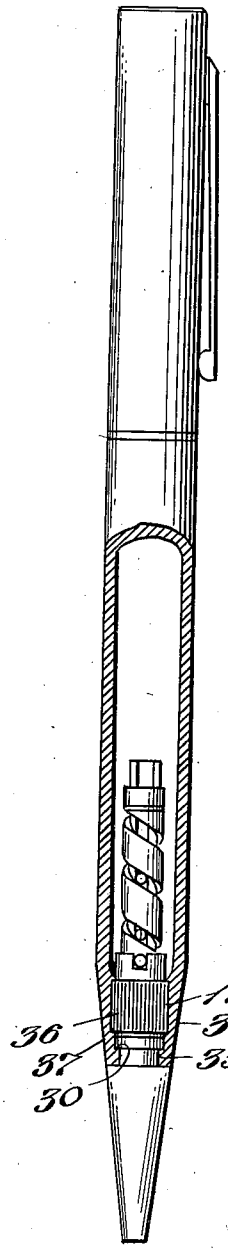


Fig. 2.

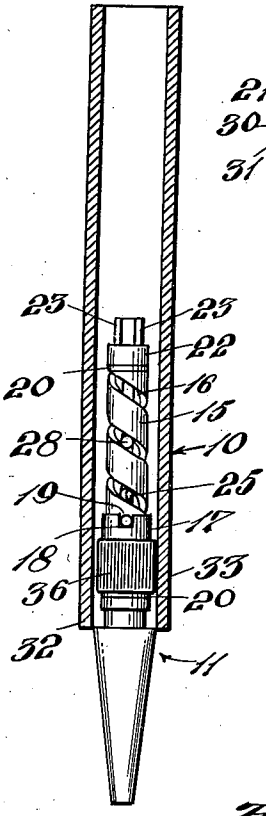


Fig. 3.

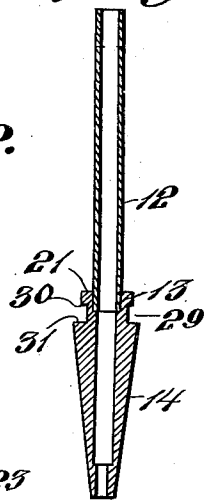


Fig. 4.

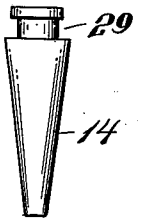


Fig. 5.

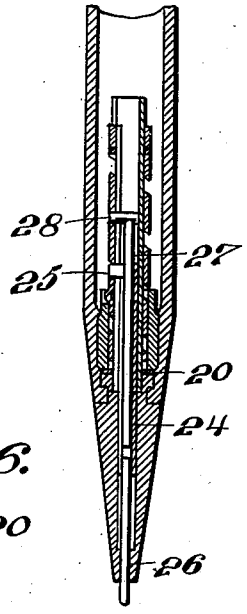


Fig. 6.



INVENTOR.

Eric Rumar Johnson

BY Barlow & Barlow

ATTORNEYS.

Patented Jan. 27, 1942 2,271,483

UNITED STATES PATENT OFFICE

2,271,483

MECHANICAL PENCIL

Eric Rumar Johnson, Cranston, R. I., assignor to Welsh Manufacturing Company, a corporation tion of Rhode Island

Application January 3, 1940, Serial No. 312,243

4 Claims. (Cl. 120—18)

This invention relates to a mechanical pencil, more particularly to that class of mechanical pencils frequently referred to as provided with a point end movement.

The invention has for one of its objects to lock the point end movement unit in the barrel against pulling out of the barrel.

Another object of the invention is to prevent a wobbling or loosening of the point end movement which is located in the barrel.

Another object of the invention is to increase the bearing surface of the surface of the unit in the barrel.

A further object of the invention is to provide a bearing which will enable the point member to be mounted in a better supported relation and which will cause the point end movement to be movable more smoothly than heretofore in mechanisms of this character.

With these and other objects in view, the invention consists of certain novel features of construction as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawing:

Fig. 1 is an elevation partly in section of a pencil equipped with my new invention;

Fig. 2 is a fragmental sectional view illustrating the barrel and the point end movement unit positioned in the barrel prior to the operation for locking the parts together;

Fig. 3 is a sectional view showing the point member and guide tube associated therewith;

Fig. 4 is an elevation of the point member;

Fig. 5 is a sectional view illustrating the various working parts in their assembled relation in the barrel;

Fig. 6 is a perspective view of a washer used in the movement unit.

In mechanical pencils where one end of the barrel is utilized for a metal pencil tip and there is provided at the other end of the barrel a pen or some other implement, the mechanical movement for manipulating the lead in the pencil tip is of a type frequently referred to as a "point end movement" which is usually inserted as a unit into an end of the barrel by pressure so that there is some friction between the barrel and the unit to hold one part of the unit firm, while an exposed part of the unit may be turned with reference to the barrel for the mechanical manipulation of the lead. The barrels are usually comprised of some non-metallic material such as Celluloid or some moldable material which is affected to such an extent by heat and cold that if the assembly is subjected to different climatic conditions, there may be such expansion that instead of the barrel gripping the unit firmly, the movement will drop out; and it has been experienced that where pencils are made in a factory where there are climatic conditions in the neighborhood of 70° F. and then shipped to a warmer climate where the temperature is around 90–100 degrees F. that a change in the size of the barrel is such that the units will fall out. I have remedied this condition by locking the point end movement units in the barrel so that when assembly is had, the point will remain locked in position and cannot fall out; and while accomplishing this result, I have also accomplished other advantageous features such as as increase in bearing and better support of the unit in the barrel; and the following is a more detailed description of the present embodiment of this invention, illustrating the preferred means by which these advantageous results may be accomplished:

With reference to the drawing, 10 designates the non-metallic tubular formed barrel into which the point end unit assembly, designated generally 11, is to be placed. This point end unit 11 consists of a plurality of different parts. The longitudinally slotted runner tube 12 and the point member 14 are held in fixed relation by firm engagement of these parts as at 13. Encircling this slotted tube 12 there is the relatively movable actuating tube 15 with its helical actuating slot 16 which has fixed therewith the collar 17 by reason of a notch 18 in the collar and the detent 19 on the tube 15 extending thereinto. The collar and this slotted tube which are fixed to operate together encircle the slotted runner tube 12 and are revolvable with relation thereto. The collar 17 is knurled as at 36 to increase its friction surface. A non-metallic washer 20 is positioned between the collar and the end 21 of the point member and a like washer is also positioned between the end of the actuating tube 15 and the washer 22 which is held in position by the spreading of the edges 23 of the slotted tube 12. A lead carrier tube 24 has projection 25 extending through the slot in the runner tube 12 and into the helical slot 16 to receive and carry the lead 26, while an ejector 27 having a detent 28 also extending through slot in the runner tube 12 and into the slot 16, provides for the manipulation of the lead as desired.

In order to lock this point end movement into the barrel, I have provided a recess 29 in the point member 14 and this recess extends circularly about the member and provides a shoulder

30 spaced form the shoulder 31 at the end of the point member.

This point unit, consisting of these parts arranged in the operative manner as above pointed out with the addition of recess 29, is inserted into the end 32 of the non-metallic tubular barrel member 10 such, for instance as a preformed tube of Celluloid, and then by swaging, either after being softened in acetone, or some other solvent, or by rendering the material of the barrel plastic by heating, the stock 33 of this barrel is forced in about the portions 17, and 29, 30 of the point movement which extends into the barrel so that the barrel will conform to the taper of the point member 14 as at 34 and extend into the recess 29 as at 35 and back of the shoulder 30 and also closely about the collar 17 which is knurled to increase its bearing surface as at 36 so that this collar will be firmly held in fixed relation to the barrel, while the point member 14 will be revolvably held in a bearing formed by the barrel but will be prevented and at the same time, prevent the point end movement from being moved longitudinally with relation to the barrel by reason of its shoulder 30 being back of the projection 35.

The fitting of this stock 37 closely about this portion of the point end movement for the extended length of the taper of the barrel provides an extended and long bearing so that when writing, the pressure on the lead is well supported by it, although acting through considerable leverage; and thus there is no wobbling of the point end movement in the barrel by reason of the lock-in construction which I have provided.

Further, the fitting of the portion 35 and the parts 37 about the point member and in the recess 29 thereof provides a non-metallic bearing in which, by reason of the extreme smoothness of the barrel which develops, the point member is easily rotated, while at the same time being locked against endwise movement should there be expansion of the parts due to heat and the different coefficients of expansion of the metal and non-metallic materials which are used.

The foregoing description is directed towards the method and construction illustrated, but I desire it to be understood that I reserve the privilege of resorting to all the equivalent changes to which the construction and method are susceptible, the invention being defined and limited only by the terms of the appended claims.

I claim:

1. In a mechanical pencil, two relatively rotatable parts, one having movable therewith a collar member and the other having movable therewith a point member, said collar member being provided with a roughened surface and said point member being provided with a circumferential recess, a barrel embracing said collar member and the portion of said point member in which said recess is located, said barrel fixedly gripping the collar and revolvably engaging the point member with a portion of the barrel entering said recess to lock the point member against longitudinal movement with reference to the barrel.

2. A point end movement unit for a mechanical pencil comprising a metal point portion for insertion into a barrel of non-metallic material for rotation relative thereto, said portion being provided with a circumferential recess to provide an annular shoulder into which recess a portion of the barrel may extend to engage said shoulder and prevent longitudinal movement of the unit with reference to said barrel but leaving the said portion free to rotate in the material of the barrel as a bearing.

3. In a mechanical pencil, a hollow barrel of non-metallic material capable of being softened and rendered flowable, and a metal tip rotatable relative to said barrel and having a portion provided with a circumferential recess and an annular shoulder, said portion of the tip being positioned within one end of the barrel, the material of the barrel at the inner surface of such end portion engaging said tip and extending into said recess on the tip to engage said shoulder and prevent longitudinal movement of the tip relative to the barrel but enabling the tip free to rotate in the material of the barrel as a bearing.

4. In a mechanical pencil, two relatively rotatable parts one comprising a collar member and the other comprising a point member, said point member having an end portion for insertion into a barrel and provided with a cylindrical portion and a reduced circumferential portion adjoining said cylindrical portion to provide a shoulder, a barrel embracing said collar member and the end portion of said point member in which the said cylindrical portion and the said reduced portion is located, said barrel fixedly securing the collar member thereto and revolvably engaging the point member with a portion of the material of the barrel surrounding said reduced circumferential portion of the point member and engaging said shoulder to lock the point member against longitudinal movement outwardly with reference to the barrel.

ERIC RUMAR JOHNSON.