

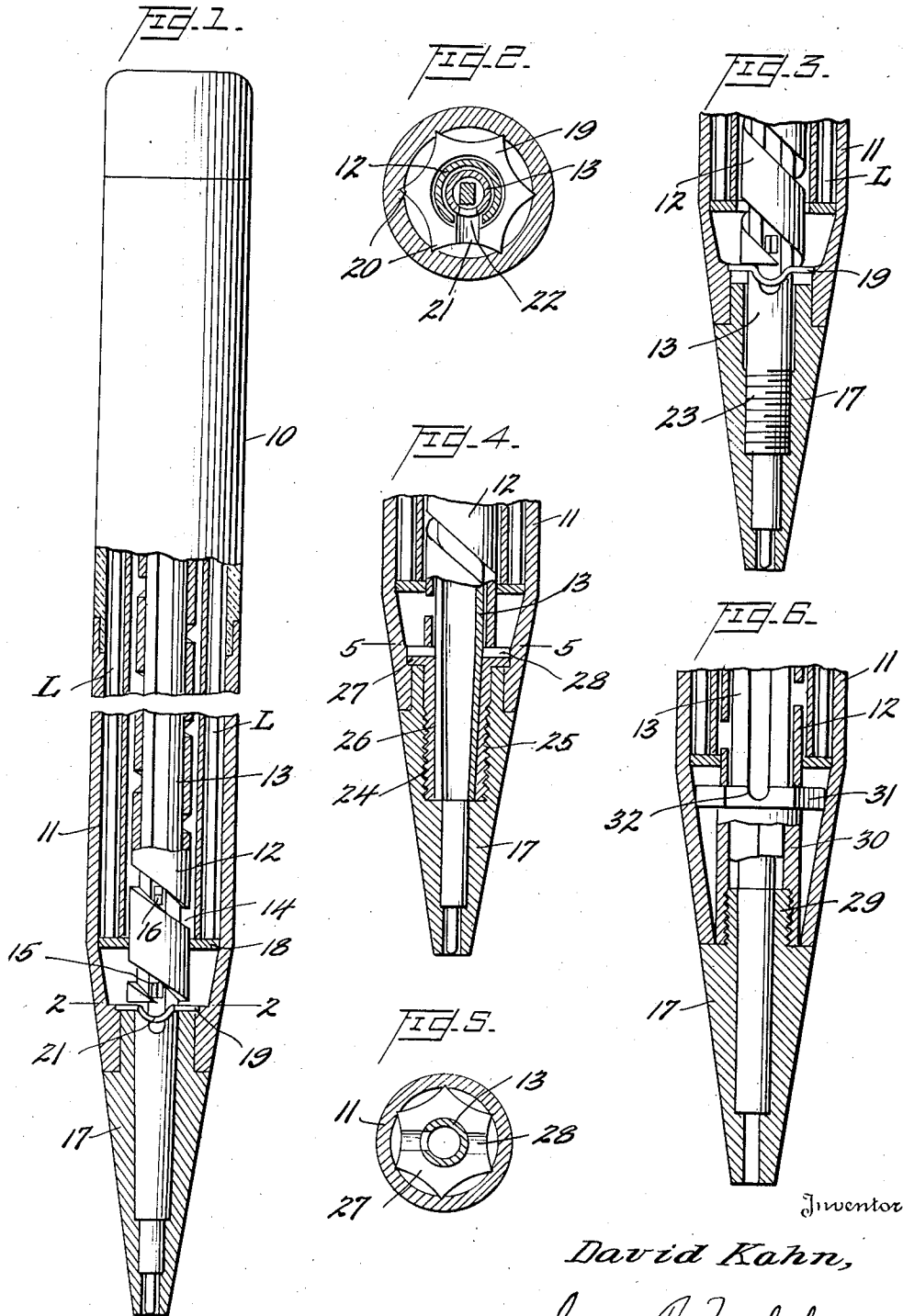
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MECHANICAL PENCIL

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MECHANICAL PENCIL

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This invention relates to mechanical pencils of the type wherein a movable lead is employed, the lead being actuated by a spiral member for projection, retraction and expulsion.

5 In pencils of the above character the tip is frequently made as a part independent of and separable from the barrel. It is essential in such pencils that the part of the pencil known as the runner tube should be so fitted into the tip that it is immovable relative thereto. In the manufacture of these pencils all of the parts within the barrel are necessarily made of very thin material and, for the purposes of commercial production, it is common to make such parts as the runner tubes of thin stamped sheet metal, rolled or otherwise formed into a tube. Within such runner tubes is a member known as a lead carrier and externally of the runner tube there is provided a spiral tube, that is to say a tube having a spiral slot therein. The lead carrier has a lug which engages in the slot of the spiral tube which is commonly known as the actuating tube. The lead carrier being within the rubber tube and the actuating tube being without the runner tube, it is essential that a slot be provided through which the lug of the lead carrier may project. Furthermore, this slot in the runner tube serves to hold the lead carrier from rotation and to hold its lug so that relative rotation of the runner tube and the actuating tube will effect longitudinal movement of the lead carrier.

It is an important object of the present invention to provide means on the runner tube for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel. In the preferred form of the invention, the means on the runner tube are provided with a plurality of pointed members. Illustratively, the runner tube may have thereon or associated therewith a flange member of polygonal form with its sides concaved to form cusps at its angles.

In one form of the invention, the runner tube, which is provided with a longitudinal slot, has therein a lead carrier provided with a lug projecting through the runner tube slot. There is also provided means on the runner tube for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel, said means being provided with seating means in alignment with the slot of the runner tube to receive and seat the runner tube.

The means on the runner tube for engaging into the material of the barrel may be mounted slidably on the runner tube and illustratively,

said means may be provided with a projection member projecting inwardly into the runner tube slot.

In the more specific form of the invention, the barrel member of the pencil is provided with a tip at its lower end and a sleeve member engages the tip. There is formed on the sleeve member a bearing washer of polygonal shape of a character hereinbefore set forth. The bearing washer is preferably, non-rotatably mounted at the upper end of the barrel tip. A rotatable and a movable actuating tube is mounted in the pencil barrel and has its lower end engaging in the washer while the runner tube is immovably fitted into the barrel tip, the runner tube being provided with a lead carrier having a lug projecting through the slot of the runner tube and engaged by the actuating tube of the pencil. The bearing washer is, preferably, provided with a radial groove and an inward projection in alignment therewith. The lug of the lead carrier tube is adapted to seat in the radial groove and the projection member engages in the runner tube slot.

Other objects and advantages of the present invention will appear from the following detailed disclosure.

Broadly stated, the invention consists in the novel structure and combination of parts illustrated in the accompanying drawing and specifically claimed.

Figure 1 is a side view of a pencil partly in section showing the hexagonal washer according to the present invention.

Figure 2 is a section on the line 2—2 of Figure 1.

Figure 3 is a section similar to Figure 1, but showing a further modification of the tip portion of the pencil.

Figure 4 is a vertical section of the lower part of the tip of the pencil showing a still further modification.

Figure 5 is a section on the line 5—5 of Figure 4.

Figure 6 is a section similar to Figure 4 but illustrating another modification.

Referring to Figure 1 of the drawing, a pencil having the usual barrel which may be of any suitable material is indicated in general at 10. Located within the barrel 11 of the pencil is an actuating spiral 12 which is rotatably mounted about a runner tube 13. Located within the runner tube 13 is a suitable lead carrier not shown in detail as the construction thereof is immaterial to the present invention. However, a lug on the lead carrier engages within the slot

14 of the spiral 12. This lug is designated in Figure 1 by the reference numeral 15. Located within the lead carrier is a lead ejector having a lug 16 projecting laterally therefrom and passing through the slot in the runner tube and also engaging in the slot 14. The lead carrier and the ejector function in a manner well known in the art.

In the form of the invention disclosed in Figure 1, the runner tube 13 is frictionally fitted at its lower end in the tip of the pencil 17. There is also provided means for supporting the lower ends of leads L which in this type of pencil are carried in a magazine located between the actuating mechanism and the barrel. This means for supporting the leads is a washer 18 which is wedged in the barrel at the beginning of the taper thereof.

In the pencil construction in accordance with the invention, there is also provided a second washer 19 which may be of substantially hexagonal form, having spurs or teeth 20 which engage into the material of the barrel 11 to prevent rotation thereof. This hexagonal washer is slidably and non-rotatably mounted on the runner tube 13 and serves to retain the runner tube immovably within the barrel.

In the modification disclosed in Figure 1, as particularly shown in Figure 2, the hexagonal washer 19 is provided with one or more depressed portions 21 and a lug 22 extending from a depressed portion which fits into the slot of the runner tube, thus serving to hold the runner tube against rotation within the barrel.

In the modification disclosed in Figure 3, the runner tube, instead of being frictionally fitted into the tip 17, is provided with external threads 23 which cooperate with a suitable threaded portion in the tip 17.

In the modification disclosed in Figures 4 and 5, the tip 17 may be provided at its upper end with a bore having a lower threaded portion 24, and a sleeve 25 may be screwed therein having an internally tapered socket 26 for the reception of the lower end of the runner tube 13. The upper end of the sleeve 25 has formed thereon a hexagonal washer or flange 27 provided with a groove 28 in alignment with the runner tube and adapted to seat the lead carrier lug 15.

In the modification disclosed in Figure 6, the upper end of the tip 17 is provided with a reduced and externally threaded extension 29 on which is screwed a sleeve 30 having its upper end formed as a hexagonal washer or head 31. The head 31 is provided with a groove 32 which is in alignment with the slot of the runner tube and also serves to seat the lead carrier lug as hereinbefore described in connection with the other modifications. It is understood that a similar oppositely disposed groove may also be provided.

In assembling the device as is clearly understood, the hexagonal washer being slidable longitudinally of the barrel may be positioned therein by sliding the washer down the barrel. It is also understood that the tip 17 may be attached to the barrel in any desired manner. For example, it may be engaged in the barrel by means of a reduced portion as shown in Figure 1. As shown in Figure 3 the tip may be screwed on the lower end of the runner tube, the latter being held against rotation by the hexagonal washer 19 as hereinbefore described. Furthermore, in such construction, the actuating tube or spiral has its lower end supported on the washer. In

constructions of the aforementioned type, it may be noted that the tip is not threaded to the Celluloid or other plastic material forming the barrel. This saves considerable losses resulting from stripping of the threads as the hexagonal washer 19 is depended on to hold the assembled pencil mechanism to the barrel.

This application is a continuation, in part, of my co-pending application Serial Number 733,524, filed July 2, 1934, for Mechanical pencil.

What is claimed is:

1. In a mechanical pencil, a barrel having a tip carried by the lower end of the barrel, a bearing washer at the upper end of said tip, a rotatable actuating tube mounted in said barrel to have its lower end engage on said washer, said washer being of polygonal form and having its angles engaging the material of the barrel to prevent rotation of said washer.

2. In a mechanical pencil, a barrel having a tip at the lower end of the barrel, a bearing washer at the upper end of said tip, a rotatable actuating tube mounted in said barrel to have its lower end engage on said washer, said washer being of polygonal form with its sides concave to form cusps at its angles, said cusps engaging the material of the barrel to prevent rotation of the washer therein.

3. In a mechanical pencil, a barrel having a tip carried by the lower end of the barrel, a bearing washer non-rotatably mounted at the upper end of said tip, a rotatable actuating tube mounted in said barrel to have its lower end engage on said washer, said washer having a projection on its under side and the tip having a corresponding recess wherein the projection fits to prevent rotation of the washer.

4. In a mechanical pencil, a barrel having a tip carried by the lower end of the barrel, a bearing washer non-rotatably mounted at the upper end of said tip, a rotatable and immovable actuating tube mounted in said barrel to have its lower end engage on said washer, a runner tube immovably fitted in said tip and having a longitudinal slot therein, a lead carrier in said runner tube and having a lug projecting through said slot and engaged by the actuating tube, said washer having in its upper face a radial groove and an inward projection aligned therewith, the lug of the lead carrier being adapted to seat in the radial groove and the washer projection engaging in the runner tube slot.

5. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a bearing washer mounted at the upper end of said tip, the washer being of polygonal form and having its angles engaging the material of the barrel to prevent rotation of the washer relative to the barrel, a rotatable actuating tube mounted in said barrel to have its lower end engage the washer, a runner tube immovably fitted in said tip and having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, said washer being provided with a depressed rib portion having aligned therewith a projection member engaging the slot of the runner tube, said lead carrier lug being adapted to seat in said depressed rib portion.

6. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a bearing washer mounted at the upper end of the tip, said bearing washer being of polygonal form and having its angles engaging the material of the barrel to prevent rotation of the bearing washer relative to

the barrel, and a sleeve on said bearing washer engaging the tip.

7. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a bearing washer mounted at the upper end of the tip, said bearing washer being of polygonal form and having its angles engaging the material of the barrel to prevent rotation of the bearing washer relative to the barrel, said tip having a threaded bore in its upper part and a sleeve on said washer externally threaded and screwed into said bore.

8. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a runner tube immovably fitted in said tip and having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, a bearing member of polygonal form and having its angles engaging the material of the barrel to prevent rotation of the bearing member relative to the barrel, said bearing member having a slot therein in alignment with the slot of the runner tube to seat the lead carrier lug.

9. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a sleeve member engaging the tip member, said sleeve having formed thereon a bearing washer of polygonal form and having its angles engaging the material of the barrel to prevent rotation of the sleeve and washer relative to the barrel.

10. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a runner tube immovably fitted in said tip and having a longitudinal slot therein, a lead carrier in said tube having a lug projecting through said slot, a sleeve member engaging the tip, said sleeve having formed thereon a bearing washer of polygonal form and having its angles engaging the material of the barrel to prevent rotation of the sleeve and washer relative to the barrel, said washer having a slot therein in alignment with the slot of the runner tube to seat the lead carrier lug.

11. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a sleeve member engaging the tip, said sleeve having formed thereon a bearing washer of polygonal shape with its sides concaved to form cusps at its angles, said cusps engaging the material of the barrel to prevent rotation of the sleeve and washer relative to the barrel.

12. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a runner tube immovably fitted in said tip and having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, a bearing member having a plurality of pointed members for engaging into the material of the barrel to prevent rotation of the bearing member relative to the barrel, said bearing member having seating means thereon in alignment with the slot of the runner tube to seat the lead carrier lug.

13. In a mechanical pencil, a barrel, a tip at the lower end of the barrel, a runner tube fitted in said tip having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, a bearing member slidably and non-rotatably mounted on the runner tube and having a plurality of pointed members for engaging into the material of the barrel to prevent rotation of the bearing member and runner tube relative to the barrel, said bearing member having a slot therein in alignment with the slot of the runner tube to seat the lead carrier lug.

14. In a mechanical pencil, a barrel, a tip member at the lower end of the barrel, means for feeding lead through the tip member including a runner tube, and means on the runner tube provided with a plurality of pointed members for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel.

15. In a mechanical pencil, a barrel, a tip member at the lower end of the barrel, means for feeding lead through the tip member including a runner tube, and means slidably mounted on the runner tube provided with a plurality of pointed members for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel said runner tube and last-mentioned means being relatively non-rotatable.

16. In a mechanical pencil, a barrel, a tip member at the lower end of the barrel, means for feeding lead through the tip member including a runner tube having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, means on the runner tube for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel, said means being provided with seating means in alignment with the slot of the runner tube to receive and seat the lead carrier lug.

17. In a mechanical pencil, a barrel, a tip member at the lower end of the barrel, means for feeding lead through the tip member including a runner tube having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, means on the runner tube provided with a plurality of pointed members for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel, said means being provided with seating means in alignment with the slot of the runner tube to receive and seat the lead carrier lug.

18. In a mechanical pencil, a barrel, a tip member at the lower end of the barrel, means for feeding lead through the tip member including a runner tube having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, means on the runner tube for engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel, said means being provided with a projection member projecting into the runner tube slot and with seating means in alignment with the slot of the runner tube to receive and seat the lead carrier lug.

19. In a mechanical pencil, a barrel, a tip carried by the lower end of the barrel, a bearing washer at the upper end of said tip, a rotatable actuating tube mounted in said barrel to have its lower end engage on said washer, said washer having a projection on its underside and the tip having a corresponding recess wherein the projection fits to prevent rotation of the washer relative to the tip, and means on said washer engaging into the material of the barrel to prevent rotation of the tip and washer relative to the barrel.

20. In a mechanical pencil, a barrel, a tip carried by the lower end of the barrel, a bearing washer at the upper end of said tip, a rotatable actuating tube mounted in said barrel to have its lower end engage on said washer, said washer having a projection on its underside and a tip having a corresponding recess wherein the pro-

jection fits to prevent rotation of the washer relative to the tip, a runner tube having a longitudinal slot therein, within said washer, a lead carrier in said runner tube having a lug projecting through said slot, said runner tube being so positioned within said washer that the upper surface of the projection on the washer forms a seat for the runner tube lug.

21. In a mechanical pencil, a barrel, a tip member at the lower end of the barrel, means for feeding lead through the tip member, includ-

ing a runner tube having a longitudinal slot therein, a lead carrier in said runner tube having a lug projecting through said slot, a washer non-rotatably mounted on the runner tube and provided with seating means in alinement with the slot of the runner tube to receive and seat the lead carrier lug and means on the periphery of said washer engaging into the material of the barrel to prevent rotation of the runner tube relative to the barrel.

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