

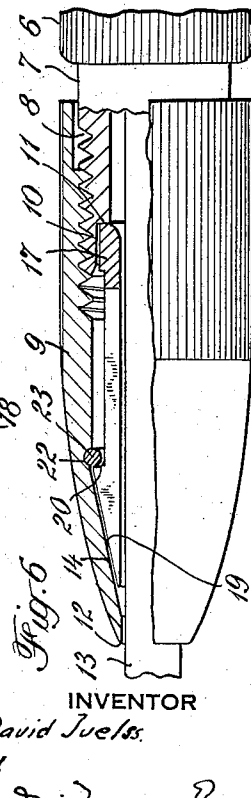
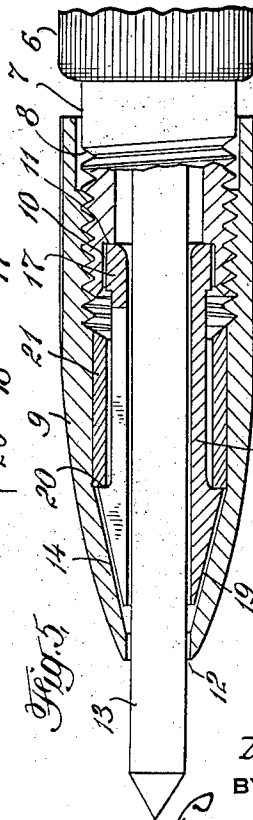
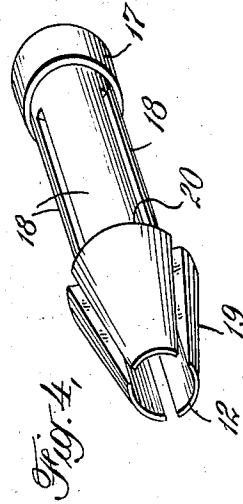
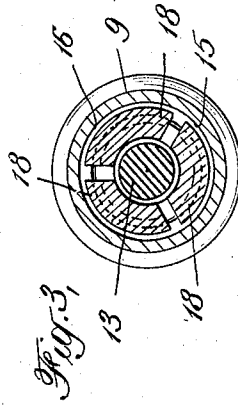
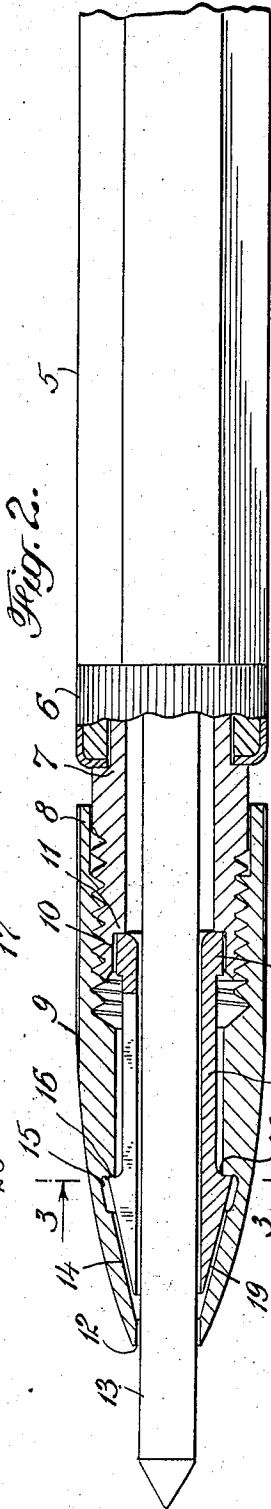
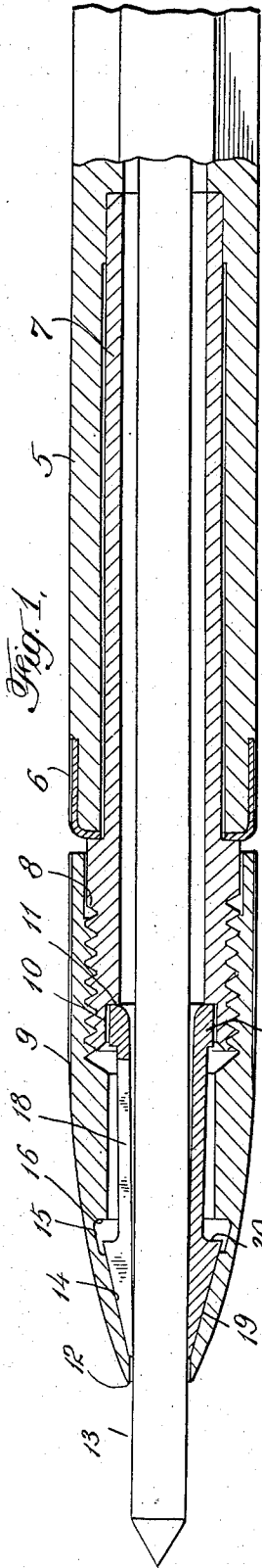
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2,365,880

MECHANICAL PENCIL

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2,365,880

MECHANICAL PENCIL

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10 Claims. (Cl. 120—21)

This invention relates to mechanical pencils of the type in which a releasable clutch is provided to hold the lead in writing position and to permit forward movement of the lead when it is released.

Pencils of the type described have been on the market for many years and are generally referred to as "draftsmen's" or "artist's" pencils. As commonly manufactured, they comprise a pencil body or lead tube having an outlet at one end, a clutch and means for engaging and disengaging the clutch. Though generally usable for their intended purpose, the known forms of clutch pencils are subject to certain structural limitations and defects and are not, therefore, entirely satisfactory.

It is the object of the present invention to provide a mechanism having a simple clutch collet assembled with and concealed within the point, affording an interchangeable unit which may be assembled readily with the body of the pencil, points of different sizes being provided to permit the use of leads of different diameters.

Another object of the invention is to provide a clutch mechanism which positively grips the lead without necessity for serrations or rifled gripping surfaces and which is substantially slip-proof and crush-proof.

Another object of the invention is to provide a clutch mechanism which is exceptionally rugged and will withstand considerable torsional stress without damage to the collet jaws.

Another object of the invention is to provide a clutch mechanism containing a point and collet assembly wherein the collet or lead-gripping member is free to float within the point so that when gripping pressure is applied the collet will remain stationary with respect to the point, thus preventing distortion of the collet jaws.

A further object of the invention is to provide a clutch mechanism of streamlined and pleasing exterior appearance, substantially without shoulders or breaks in contour so that it blends substantially with the casing of the pencil.

Other objects and advantages of the invention will be apparent as it is better understood by reference to the following specification and the accompanying drawing, in which

Fig. 1 represents a longitudinal section through a pencil embodying the invention with the collet adjusted to grip the lead and hold it in writing position;

Fig. 2 is a similar view showing the collet in releasing position so that the lead is free for adjustment;

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

Fig. 4 is a view in perspective of the collet;

Fig. 5 is a sectional view of a modified form of the device; and

Fig. 6 is a similar view illustrating another modification.

Referring to the drawing, 5 indicates the pencil casing which may be of plastic, wood, metal, vulcanized rubber or other suitable material. If material other than metal is employed for the casing, a ferrule 6 is secured at one end thereof and may be knurled or otherwise provided with means to facilitate gripping by the fingers.

A lead tube 7, preferably of metal, is inserted and secured in the bore of the casing 5 abutting the ferrule 6 and is externally threaded at 8 to receive the internally threaded end of the point 9 which is adjustable with respect to the tube 7 by rotation on the threads. The open end of the tube 7 is provided with a recess 10 affording a shoulder 11.

The point 9 is tapered, preferably in a streamlined manner, to an opening 12 at its end, through which the lead 13 projects. Internally the point 9 is provided with a cam surface 14 extending from the opening 12 to a recess 15 which terminates in a shoulder 16.

The collet comprises a flanged end 17 and is slotted to provide a plurality of arms 18 which are resiliently biased outwardly. At its end the collet has exterior cam surfaces 19 adapted to co-operate with the cam surface 14 of the point 9. The cam surfaces 19 terminate at shoulders 20 which are adapted to engage the shoulder 16 when the collet is released as shown in Fig. 2. The collet is assembled with the point 9 by introducing it through the rearward end and pushing it forwardly until the shoulders 20 pass the shoulder 16 when the arms 18 will spring outwardly so that the collet is thereafter retained as a unitary part of the point 9.

When the lead is to be gripped, the point 9 is rotated clockwise on the threads 8 until the flanged end 17 engages the abutment 11. Further movement as the result of co-operation of the cam surfaces 14 and 19 forces the ends of the arms 18 inwardly to engage the lead. If an unnecessary amount of force is employed in rotating the point 9, the frictional engagement between the cam surfaces 14 and 19 will cause the collet to rotate with the point, thus avoiding the possibility of twisting or breaking the arms 18.

To release the lead, the point 9 is simply rotated in an anti-clockwise direction, thus separating the cam surfaces 14 and 19 and permitting the arms 18 to spring outwardly to the position indicated in Fig. 2. The lead 13 can then be adjusted to project to the desired extent, whereupon it may be secured again by rotation of the point 9 in a clockwise direction.

Instead of undercutting the interior of the point 9 to provide the recess 15, I may, as shown

in Fig. 5, insert a sleeve 21 within the point 9, thus affording a shoulder for engagement with the shoulders 20 on the arms 18. Since the structure is otherwise identical with that shown in Figs. 1 and 2, no further description is necessary, and the same reference numerals have been applied.

Alternatively a groove 22 may be provided on the interior face of the point 9 and a split ring 23 may be disposed therein to afford a shoulder for engagement with the shoulders 20 on the arms 18. The structure is otherwise identical with that shown in Figs. 1 and 2.

For convenience and to facilitate rotation of the point 9, the surface thereof may be knurled. While I prefer the conventional hexagonal shape for the body 5 of the pencil, it may be of circular or other cross-section, and the adjoining end of the point 9 may be shaped to conform to the shape of the body 5 or otherwise as may be desired.

In the pencil as described, the collet is entirely concealed and is likewise protected from injury. As already indicated, the collet is assembled with the point as a unit and is independent of the remaining structure of the pencil except for its engagement with the shoulder of the lead tube. The point and collet are of simple and economical construction, and the parts can be assembled with the minimum of effort, since it is necessary merely to press the collet into the point and then thread the point onto the end of the lead tube. The structure is therefore inexpensive. It nevertheless affords a much more reliable mechanism than any heretofore available for the purpose.

Various changes may be made in the form and arrangement of the parts without departing from the invention or sacrificing the advantages thereof.

I claim:

1. In a clutch pencil, a separable unit comprising a point having a bore and a lead gripping collet concealed and secured within the bore.

2. In a clutch pencil, a separable unit comprising a point having a bore, a lead gripping collet floating within the bore and means preventing separation of the point and collet.

3. In a clutch pencil, a separable unit comprising a point having a bore and a lead gripping collet secured within the bore, the point and collet having co-operating surfaces adapted to be engaged by relative longitudinal movement.

4. In a clutch pencil, a separable unit comprising a point having a bore, a lead gripping collet mounted within and movable longitudinally of the bore and means for preventing separation of the point and collet.

5. In a clutch pencil, a separable unit comprising a point having a bore terminating in a cam surface, a lead gripping collet, having means adapted to co-operate with the cam surface, mounted within and movable longitudinally of the bore and means for preventing separation of the point and collet.

6. In a clutch pencil, the combination of a pencil casing, a lead tube mounted therein and having a threaded extension, and a separable unit comprising a point having a bore threaded to engage the extension and a lead gripping collet concealed and secured within the bore.

7. In a clutch pencil, the combination of a pencil casing, a lead tube mounted therein and having a threaded extension, a separable unit comprising a point having a bore threaded to engage the extension and a lead gripping collet disposed in floating relation to the point within the bore, and means for preventing separation of the point and collet.

8. In a clutch pencil the combination of a pencil casing, a lead tube mounted therein and having a threaded extension and a separable unit comprising a point having a bore threaded to engage the extension and a lead gripping collet secured within the bore, the point and collet having co-operating surfaces adapted to be engaged by relative longitudinal movement.

9. In a clutch pencil the combination of a pencil casing, a lead tube mounted therein and having a threaded extension and a separable unit comprising a point having a bore threaded to engage the extension, a lead gripping collet mounted within and movable longitudinally of the bore and means for preventing separation of the point and collet.

10. In a clutch pencil the combination of a pencil casing, a lead tube mounted therein and having a threaded extension and a separable unit comprising a point having a bore terminating in a cam surface threaded to engage the extension, a lead gripping collet, having means adapted to cooperate with the cam surface, mounted within and movable for preventing separation of the point and collet.

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