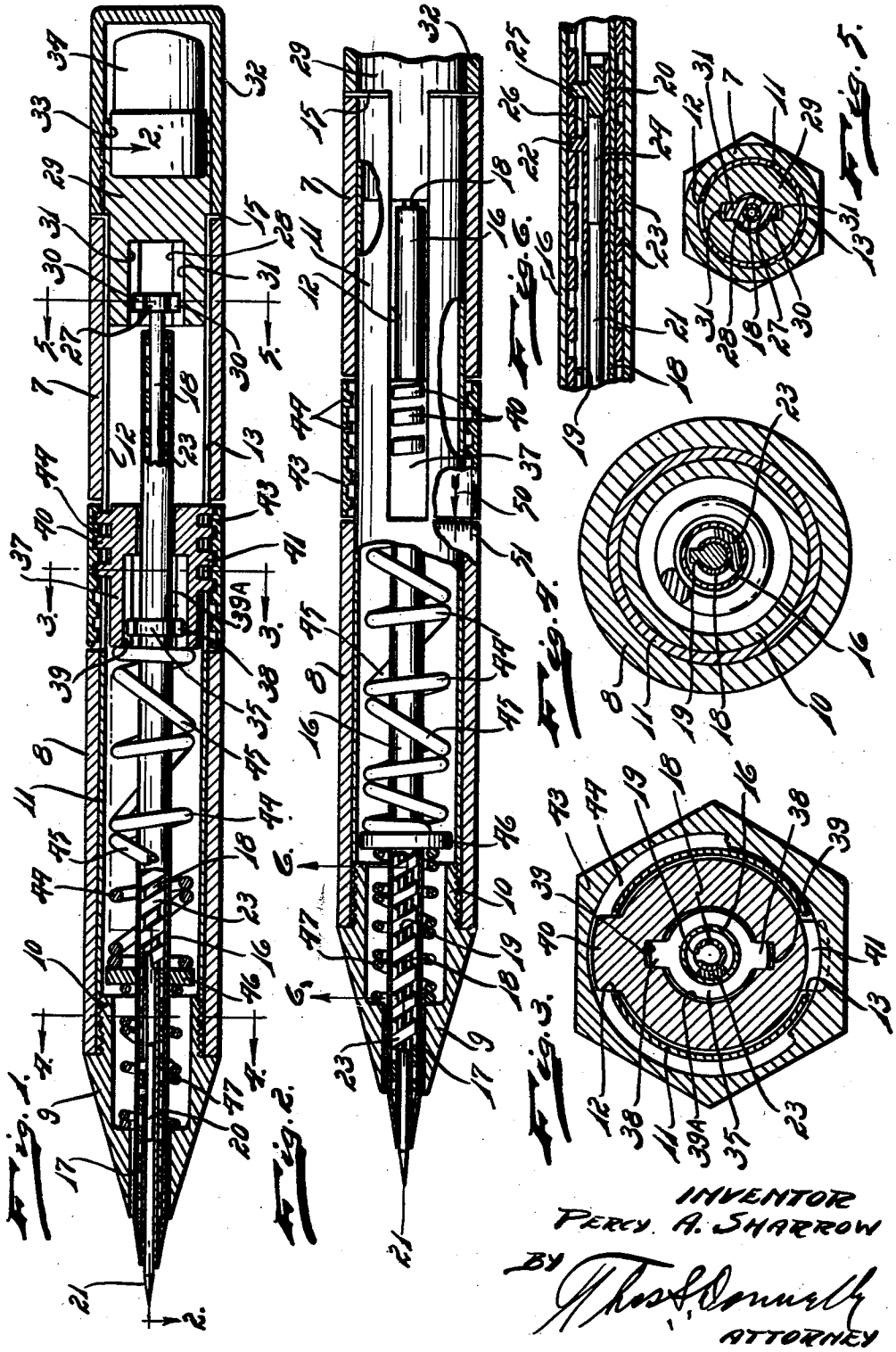
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SCREW FEED TYPE PENCIL WITH CUSHIONED LEAD HOLDING MEANS

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SCREW FEED TYPE PENCIL WITH CUSHIONED LEAD HOLDING MEANS

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1 Claim. (Cl. 120—9)

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My invention relates to a new and useful improvement in a screw feed type pencil with cushioned lead holding means and of that type in which the lead is fed through a tube so that when the lead has been used it may be replaced with another stick of lead.

It is an object of the present invention to provide a pencil of this type so constructed and arranged that the lead may be moved inwardly and outwardly of the pencil during a writing operation so that fatigue resulting from writing may be reduced to a minimum.

Another object of the invention is the provision in a pencil of this type of a spring means for resisting the inward movement of the lead relatively to the pencil so arranged and constructed that it may be adjusted to various tensions.

Another object of the invention is the provision in a pencil of this type of a spring resisting inward movement of the pencil and comprising a plurality of closed tight wound separate coils which are connected to each other but positioned in spaced relation to each other.

Another object of the invention is the provision in a pencil of this type of resilient means for resisting inward movement of the lead while the pencil is being used and so constructed and arranged that a free and easy movement of the lead inwardly may be effected and various coils of a spring coiled into action at different stages of inward movement of the lead.

Another object of the invention is the provision in a pencil of this type which will be simple in structure, economical to manufacture, durable, compact, light and highly efficient in use.

Other objects will appear hereinafter.

It is recognized that various modifications and changes may be made in the detail of structure illustrated without departing from the invention itself and it is intended that such variations and changes may be embraced within the scope of the claim which forms a part hereof.

Forming a part of this specification are drawings in which,

Fig. 1 is a longitudinal, central, vertical, sectional view of the invention,

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1,

Fig. 3 is an enlarged sectional view taken on line 3—3 of Fig. 1,

Fig. 4 is an enlarged sectional view taken on line 4—4 of Fig. 1,

Fig. 5 is a sectional view, slightly enlarged, taken on line 5—5 of Fig. 1,

Fig. 6 is a slightly enlarged fragmentary view

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of the metal tube and parts contained therein, constituting the lead holder, taken on line 6—6 of Fig. 2.

As shown in the drawings the invention comprises a pair of tubular parts 7 and 8 and an end piece or nose 9 having a threaded neck 10 which threads into the metal lining tube 11. Throughout a portion of the length of this tube 11 are formed diametrically opposite axially directed slots 12 and 13. It will be noted that the tubes 7 and 8 are in an alignment and that the tube 11 extends from the member 10 through the remaining portion of the tube 8. This tube 11 also extends into the tube 7, the tubes 7 and 8 being spaced apart at their adjacent ends by a structure which will be described. This tube 11 has at its end the diagonally directed flange 15, which engages the end face of the tube 7.

A lead holder is associated with these parts and will be described.

A metal tube 16 projects through the bore 17 formed in the point 9. Slidably projecting through the closed end of this tube 16 is a metal tube 18 having a longitudinally directed slot 19 formed therein from end to end. Slidably mounted in this tube 18 is the plunger containing tube 20 into which the end of the lead 21 is adapted to project to engage the end of the plunger 24 which is positioned in the tube 20. Positioned within the tube 16 and embracing the tube 18, so as to extend the full length of the tube 16, is a spirally wound ribbon 23 of metal to provide a spiral thread. Projecting outwardly from the tube 20 through the slot 19 in tube 18 and engaging in the space between the turns of the spiral 23, is a lug 22. Projecting outwardly from the plunger 24 is a lug 25 which extends through a slot 26 formed in the tube 20 and which also extends through slot 19 of tube 18 and engages in this spiral thread between the turns 23.

Fixedly mounted in the end of the tube 11 is a block 29 having a recess 28 formed therein which includes at opposite sides thereof the axially directed grooves 31. Fixedly mounted on the end of the tube 18 is a head 27 having the diametrically opposite lugs 30 projecting outwardly therefrom and engaging in the grooves 31. The construction is such that when the point 9 is rotated the tube 11 will also rotate and carry with it the block 29 thus effecting a rotation of the tube 18. The spirally wound ribbon 23 is in fixed relation to the tube 16 so that a rotation of the tube 18, relatively to the tube 16, would effect a movement of the plunger 24 either inwardly or outwardly

depending upon the direction of rotation of the tube 11.

A cap 32 is fitted over the end of the block 29 to cover the eraser 34 which is seated in the socket 33 formed in the end of the block 29. This cap 32 bears against the flange 15.

Fixedly mounted on the tube 16 is a collar 35 projecting diametrically opposite from which are the lugs 38 which engage in the axially directed grooves 39 formed on opposite sides of the bore or socket 39a formed in the adjusting plug 37 through which the tube 16 projects. Projecting outwardly from the periphery of the adjusting plug 37 are the diametrically opposite teeth forming projections 40 and 41 which project through the slots 12 and 13 respectively through the rear end of tube 11 and mesh with threads 44 formed on the inner surface of the adjusting sleeve 43.

Bearing against one end of the member 37 is a coil spring the opposite end of which bears against a collar 46 fixedly mounted on the tube 16. This coil spring comprises a plurality of closed coils 44a which are spaced apart from each other and connected by the diagonally extending active or yieldable part of the wire as at 45. It is preferred that there be one or more turns to make the closed coils 44a and that the coils be spaced apart a distance not less than the diameter of the coil with the extending parts acting as resilient means. Experience has shown that a spring of this type is quite desirable in order that the action required may be obtained. Experience has also shown that the ordinary wound coil is too slow as torsion is exerted on the full length of the wire, the thrust being slower to arrive at starting point thus the short wire results in a quicker recoil.

A smaller coil spring 47, constructed similarly to the spring embodying the coils 44a, bears at one end against the opposite face of the collar 46 and at its opposite end against the bottom of the socket 48 formed in point 9. The purpose is to cushion the recoil as the writer relaxes his pressure on the pencil and prevent the collar 46 from forcibly striking the head 9.

In the use, the user of the pencil would, while holding the part 7 in the hand, rotate the point or head 9 so that the plunger 24 would be retracted. The lead 1 would then be placed in position within the tube 18 and the plunger then moved so that the lead 21 would project beyond the tapered point of the tube 16 and the spirally would band 23.

When the pencil is being used the pressure directed inwardly on the lead 21 would have a tendency through engagement with the plunger 24 to move the tube 16 longitudinally inwardly together with the parts assembled in association with the tube 16, this tube and these parts constituting the lead holder. This inward movement would, of course, be resisted by the spring embodying the spaced section of wire of the coils 44a and assisted by the spring embodying the coils 47. By rotating the member 44 the member 37 may be moved to either increase or diminish the compression or resistance of the spring embodying the coils 44a. The amount of rotation may be indicated by the arrow 50 cooperating with the graduations 51. When the proper tension has been arrived at, the inward thrust of the pencil will be resisted by a predetermined pressure of a spring embodying the coils 44a. When the inward pressure is released the coils 44a will, of course, move the point 21 outwardly and the spring 47 will serve to cushion this outward movement. Experimentation has shown that in order to obtain a desired flexibility or floating arrangement of the point with a spring resisting the inward movement, a coil spring constructed as described is most efficient.

Buoyant cushioned effect is had with perfect freedom of movement, also the point adheres to the paper more than does the rigid point.

In construction of the coils 44a and 45, one or more of the close wound coils are formed and spaced apart from the next adjacent coil or coils not more than the diameter of the coil, and these coils are connected by a resilient means or wire. Each coil part acts as a seat or support for yieldable part connecting the coiled parts.

If desired by the writer the pencil may be adjusted to provide a rigid or stationary point instead of the floating point by rotating the adjusting sleeve 43 until the adjusting plug 37 has traveled to abut against a face of collar 35 preventing relative travel of the tube 16 to the plug 37. This also compresses the springs sufficiently so that the collar 46 rests against the head 9 thereby preventing the sleeve 16 from moving outwardly of the pencil beyond a fixed position.

Thus there is provided a pencil where the point can be held rigid or easily adjusted to suit the requirement of the writer in a floating point.

What I claim is:

In a pencil of the class described, a tubular body; a lead holder mounted in said body and extending axially thereof and movable axially inwardly and outwardly of said body; a normally stationary abutment member in said body; a collar mounted on said holder between the ends thereof and projecting radially therefrom; a spring embracing said holder and engaging at one end with said body and at the opposite end with one face of said collar; a second spring embracing said holder and engaging at one end with the opposite face of said collar and at its opposite end with said abutment member, said springs each comprising a plurality of groups of axially spaced apart coils, the opposed turns in adjacent groups being connected by a diagonally directed resilient portion, the spacing of the groups of each spring being not more than the diameter of the coils.

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