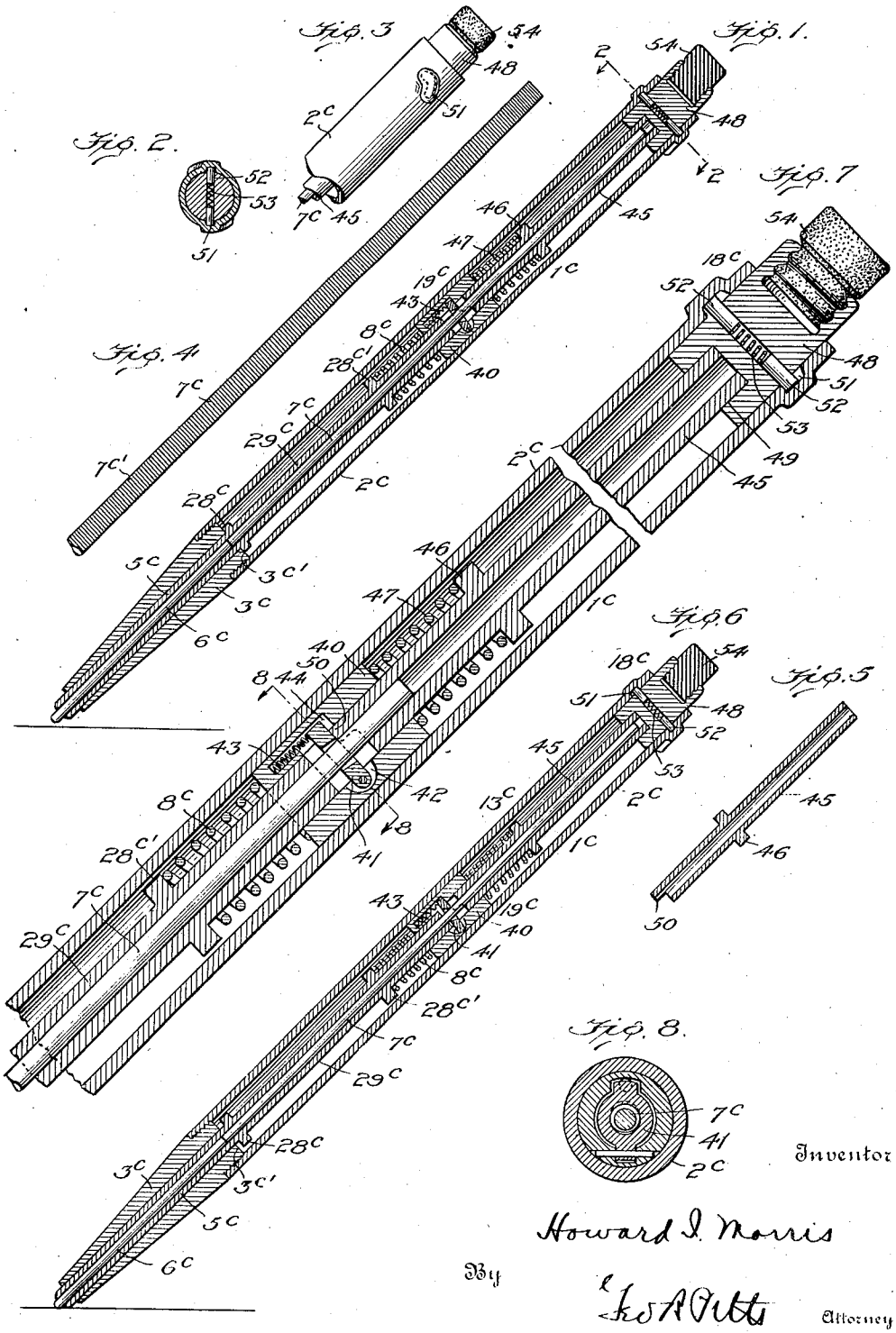
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WRITING DEVICE

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WRITING DEVICE

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This invention relates to a writing device, such as a pencil, more particularly that type of pencil in which the writing element or lead is fed endwise relative to the writing end of the holder or body portion of the device.

One object of the invention is to provide a pencil of this type having a self feeding writing element or lead.

Another object of the invention is to provide an improved pencil in which means are provided of automatically feeding the writing element or lead endwise relative to the holder or body portion of the device.

Other objects of the invention will be apparent to those skilled in the art to which my invention relates from the following description taken in connection with the accompanying drawings.

In the drawings, Fig. 1 is a longitudinal sectional view of a writing device or pencil embodying my invention.

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

Fig. 3 is a fragmentary elevation.

Figs. 4 and 5 are detail views.

Fig. 6 is a sectional view illustrating the operation of feeding the lead forward.

Fig. 7 is a fragmentary section illustrating the position of certain elements when a new lead is being inserted.

Fig. 8 is a section on the line 8—8 of Fig. 7.

In the drawings 1^c indicates a body or holder preferably comprising a barrel, cylinder or shell 2^c having at one end a tapered or conical member 3^c. The conical member 3^c is formed with a bore 3^{cx}, its inner end serving as a stop $3^{c\prime}$ for a purpose to be later set forth. The adjoining ends of the barrel 2^c and member 3^c are cut away so that the inner end of the conical member may fit within the barrel, being preferably screw-threaded therein as shown.

5^c indicates a guide element for the writing element or lead 6^c. The guide element 5^c is slidably mounted in the tapered member 3^c and is operated endwise to effect feeding of the writing element or lead 6^c in the manner to be later set forth. The bore of the guide element is of proper size to receive and support a lead 6^c but to contact with the lead with sufficient friction to move the lead with it in the manner to be later described.

28^c indicates a collar provided on the guide element 5^c and arranged to engage the stop $3^{c\prime}$ for limiting the outward movement of the guide element 5^c, as well as the writing element 6^c.

29^c indicates an extension preferably formed integrally with the guide element 5^c. The extension 29^c is preferably formed with a bore similiar in size to the bore of the guide element.

40 indicates a support or bearing member stationarily mounted within the barrel 2^c, preferably substantially midway between its ends. The support 40 preferably comprises a cylindrical member the axis of which is coincident with the axis of the barrel 2^c. The inner or upper end of the extension 29^c projects into and has sliding, supporting engagement with the inner walls of the cylindrical member 40. As the guide element 5^c and extension 29^c are formed integrally, the cylindrical member 40 supports one end of this integral member and the tapered member 3^c supports its other end to guide them as they move longitudinally, inwardly and outwardly, in the manner to be later set forth.

$28^{c\prime}$ indicates a supplemental collar surrounding the extension 29^c. 8^c indicates a spring preferably coiled around the extension 29^c and engaging the collar $28^{c\prime}$ at one end and at its opposite end engaging the cylindrical member 40. The spring 8^c tends to move the extension 29^c and guide element 5^c outwardly and normally to maintain the collar 28^c against the stop $3^{c\prime}$.

7^c indicates a feed member arranged to feed the lead 6^c forwardly. The feed member preferably comprises a rod slidably fitting and extending thru the extension 29^c and at its lower end engaging the inner end of the lead 6^c. The feed member 7^c is preferably provided with relatively fine annular serrations $7^{c\prime}$, as shown in Fig. 4, one purpose of which is to insure sufficient frictional contact between the feed member 7^c and inner walls of the extension 29^c that it will move with the latter to effect of a feeding of the lead when the extension 29^c moves out-

wardly. The feed member 7^c extends through the cylindrical member 40.

19^c indicates as an entirety devices for controlling the feed of the feed member 7^c. The control devices 19^c comprises a clutch ring 41 preferably pivoted at one side in a recess 42 formed in the support 40 and a spring 43 normally tending to maintain the ring 41 in clutching engagement with the feed member 7^c. As shown in the drawings, the opposite sides of the inner wall of the clutch ring 41 are inclined relative to its axis to form knife-like edges, which lock against opposite sides of the feed member when the ring is swung in one direction about its pivot, to prevent rearward movement of the feed member, but to permit free movement thereof in the opposite direction. The spring 43 is an expansion spring and is arranged to engage the ring 41 at that side opposite to its pivot, as shown in Figs. 1 and 6. As the spring 43 maintains the knife edges of the ring 41 in operative engagement with the feed member 7^c, the latter is always locked against rearward movement. The support 40 is formed with a recess 44 at that side opposite to the recess 42 to receive the spring 43 and the adjacent end or edge of the ring 41.

In the form of construction illustrated, the guide element 5^c and extension 29^c are maintained in their outward position, against the stop $3^{c'}$, by the spring 8^c. The lead 6^c abuts the outer end of the feed member 7^c, which, being locked by the clutch ring 41, prevents rearward movement of the lead. In the use of this form of construction I prefer to keep both the lead 6^c and outer end of the guide element 5^c in contact with the paper. As writing progresses and the lead wears away, the resulting pressure transmitted, longitudinally, or substantially so, through the holder toward the writing surface will cause the guide element 5^c to recede or move inwardly relative to the lead 6^c, against the tension of the spring 8^c, then when the pressure is relieved, for example by lifting of the holder 1^c in ending one word and commencing another, the spring 8^c will move the guide element and extension outwardly to their normal position. Due to the frictional engagement of the lead and feed member with the bores of the guide element and extension, both will be moved forwardly with the latter, thus causing a feeding of the lead. The annular serrations $7^{c'}$ (see Fig. 4) insure positive engagement of the clutch ring 41 with the feed member 7^c.

18^c indicates as an entirety devices for moving the clutch ring 41 to and maintaining it in an inoperative position, whereby a new lead 6^c may be inserted in the guide element 5^c and the feed member 7^c positioned to feed the lead forwardly. These devices preferably comprise the following instrumentalities; 45 indicates a cylinder slidably supported at one end within the upper portion of the cylindrical member 40 and provided with a collar 46. The cylinder 45 is preferably of the same size from end to end to simplify the construction and enable it to serve as a guide and support for the upper end of the feed member 7^c. 47 indicates a coiled spring interposed between the cylindrical member 40 and the collar 46 and normally acting on the latter to move the cylinder 45 rearwardly, but permitting movement of the cylinder forwardly. 48 indicates a head or cap rotatably and slidably fitting the rear end of the barrel 2^c to close it. The inner end of the head 48 is formed with a recess 49 in which the rear end of the cylinder 45 is secured in any desired manner. 50 indicates a lug projecting from the forward end of the cylinder 45 and arranged to engage the clutch ring 41 on that side opposite to its pivot to move it against the tension of the spring 43 to an inoperative position. Accordingly, if the cylinder 45 is moved endwise the lug 50 will swing the ring 41 to the position shown in Fig. 7, and release the feed member 7^c, whereupon the latter may be moved inwardly. The head 48 is preferably connected to the inner wall of the barrel 2^c by devices $18^{c'}$ which effect movement of the head and cylinder 45 longitudinally of the barrel when it is rotated. The devices $18^{c'}$ preferably comprise a pair of curved grooves 51 formed in the barrel wall and pins 52 projecting from the opposite sides of the head 48 into the grooves. It will be seen that if the head is rotated, the walls of the grooves 51 acting on the pins 52 will cause the head to move inwardly, thus effecting an endwise movement of the cylinder 45. The pins may be maintained in their respective operative position in the grooves 51 by a spring 53 interposed between them. The outer end of the head 48 may be formed with a recess to removably support a piece of rubber 54.

From the foregoing description it will be seen that the construction of pencil including the feed mechanism for the lead is relatively simple and comprises but few elements all of which may be easily manufactured and assembled. It will also be seen that these elements are so arranged that the lead may feed forwardly in a ready manner without shifting the pencil in the hand or any other manipulation of the pencil or either hand of the writer or user. By controlling and operating the feeding mechanism as described, the user is saved the annoyance of stopping his work to manipulate the lead as is required in all pencils of which I have knowledge.

The pencil is particularly advantageous where continuous writing is required or

where the writing must be effected rapidly, as in taking dictation in shorthand.

By feeding the lead automatically, as writing takes place, due to pressure of the hand in writing with the pencil, great convenience is afforded the writer as no attention is needed to maintain sufficient lead at the writing end of the pencil for continued writing.

It will further be seen that new leads may be inserted in a simple manner and without the necessity of disassembly to any of the elements.

To those skilled in the art to which my invention relates, many alterations and constructions and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope thereof. My disclosures and description herein are purely illustrative and are not intended to be in any sense limiting.

This application is a division of my application filed December 29, 1921, Serial No. 525,585.

What I claim is:

1. A pencil comprising a body having a lead projecting from one end thereof, means for supporting and automatically feeding said lead outwardly, and means operable from the other end of said body for maintaining said feeding means inoperable at will.

2. A pencil comprising a body having a lead projecting from one end thereof to permit writing, means automatically operable as writing progresses for feeding said lead outwardly, and means arranged to engage said feeding means to maintain them inoperable at will.

3. In a pencil, the combination of a body, a pair of relatively movable elements projecting from one end thereof and engageable with a surface as writing progresses, one said element comprising a lead and the other element comprising a tube through which the lead is movable endwise, means operable by the movement of said tube relative to said lead due to wearing of the latter during writing, to feed the lead outwardly, and means for maintaining said feed means inoperative at will.

4. In a pencil, the combination of a body adapted to support a section of lead with its outer end projecting from one end of said body, an element projecting from one end of said body and movably supported therein, a spring arranged to permit inward movement of said element relative to said lead, means actuated by the inward movement of said element relative to said lead due to wearing of the latter as writing progresses to feed the lead outwardly, and means for maintaining said feed means inoperative at will.

5. In a pencil, the combination of a hollow body, a support therein intermediate its ends, a pair of axially arranged tubular elements slidably mounted at their inner ends in said support and each extending to a point near the adjacent end of said body and movable inwardly, springs tending to move said elements in opposite directions, one of said elements being adapted to hold a section of lead and a feed member for said lead mounted in and frictionally engaging the inner walls of the element in which the lead is mounted, and means disposed in said support between the inner ends of said elements for locking said feed member against movement inwardly, and arranged to be engaged by the other element when it is moved toward said locking means.

6. In a lead pencil, the combination of a barrel, a lead carrying tube slidably mounted therein and projecting at the writing end thereof, a propelling device within and frictionally engaging the inner wall of said tube, so as to be moved outwardly, and engaging the lead to move it with the tube, clutch means within the barrel normally engaging the propelling device to prevent inward movement thereof and lead when the tube moves inwardly, and means operable to release the clutch at will.

7. The combination with a pencil casing, of a feeding device capable of propelling a lead, a tube capable of carrying the lead, said tube being arranged to protrude from the writing end of said casing and respond to efforts which tend to move it lengthwise, operating mechanism arranged to effect a propelling action to said feeding device through reciprocating movement of said tube, and resilient means, said resilient means being arranged to counteract inward movement of said tube relative to said casing, to yield to said inward movement when said tube is subjected to the influence of normal writing pressure, and to react with sufficient force to retrieve said tube when said pressure is removed.

8. The combination with a pencil casing, of a feeding device capable of propelling a lead, operating mechanism for said feeding device, said operating mechanism being arranged to induce said propelling action in said feeding device through movement thereof relative to said casing, means for retrieving said movement of said operating mechanism, and controlling means connected to said mechanism and exposed at the writing end of said casing, said controlling means being arranged to move relative to said casing when under the influence of normal writing pressure and impart movement to said mechanism.

9. The combination with a pencil casing, of a feeding device capable of propelling a lead, operating mechanism for said feeding device, said operating mechanism being ar-

ranged to induce said propelling action in said feeding device through movement thereof relative to said casing, and controlling means connected to said mechanism and exposed at the writing end of said casing, said controlling means being arranged to move relative to said casing when under the influence of normal writing pressure and impart movement to said mechanism.

10. In mechanism of the class described, the combination with a casing, of a tubular member slidably mounted in said casing and projecting beyond the writing end thereof for engagement with the writing surface and slidably supporting a lead and a rod engaging the lead at its rear end, a spring tending to move said tubular member outwardly and resisting inward movement thereof under the influence of normal writing pressure, means between said rod and tubular member serving as a connection therebetween to insure movement of said rod and feeding of the lead when said tubular member moves outwardly under the influence of said spring, and a clutch for preventing inward movement of said rod when said tubular member moves inwardly but permitting outward movement thereof.

In testimony whereof, I have hereunto subscribed my name.

HOWARD I. MORRIS.