

Nov. 8, 1938.

K. FEND

2,136,290

INTERCHANGEABLE LEAD PENCIL

Filed June 3, 1936

2 Sheets-Sheet 1

FIG. 1.

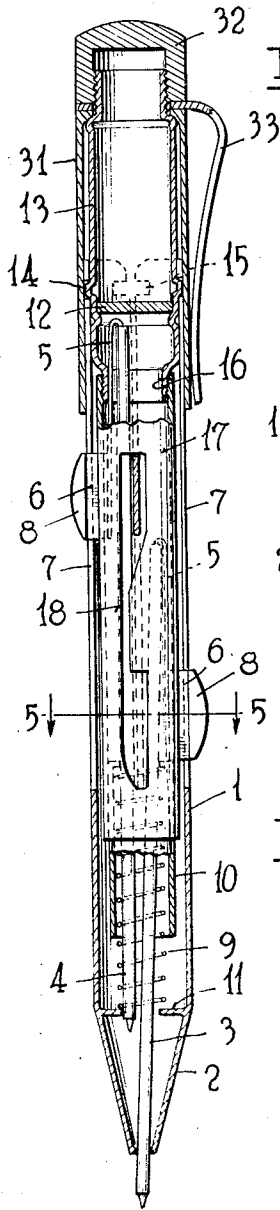


FIG. 2.

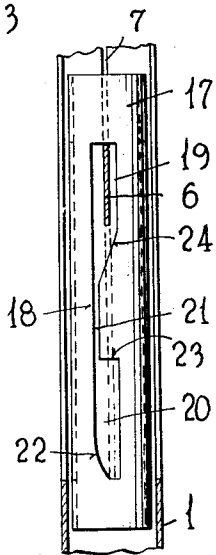


FIG. 3.

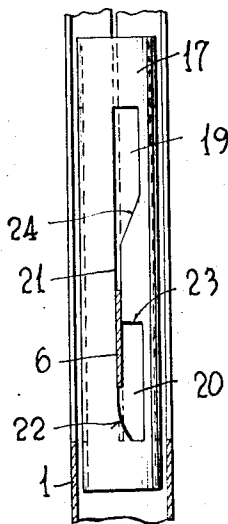


FIG. 4.

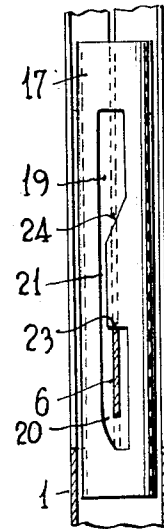


FIG. 5.

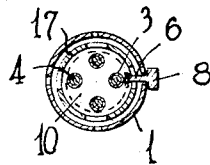
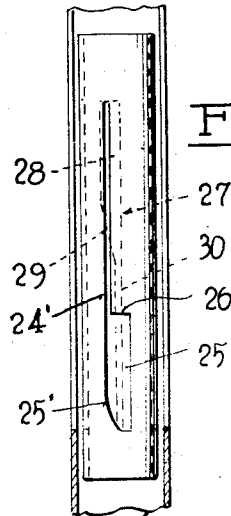


FIG. 6.



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FIG. 7.

FIG. 8.

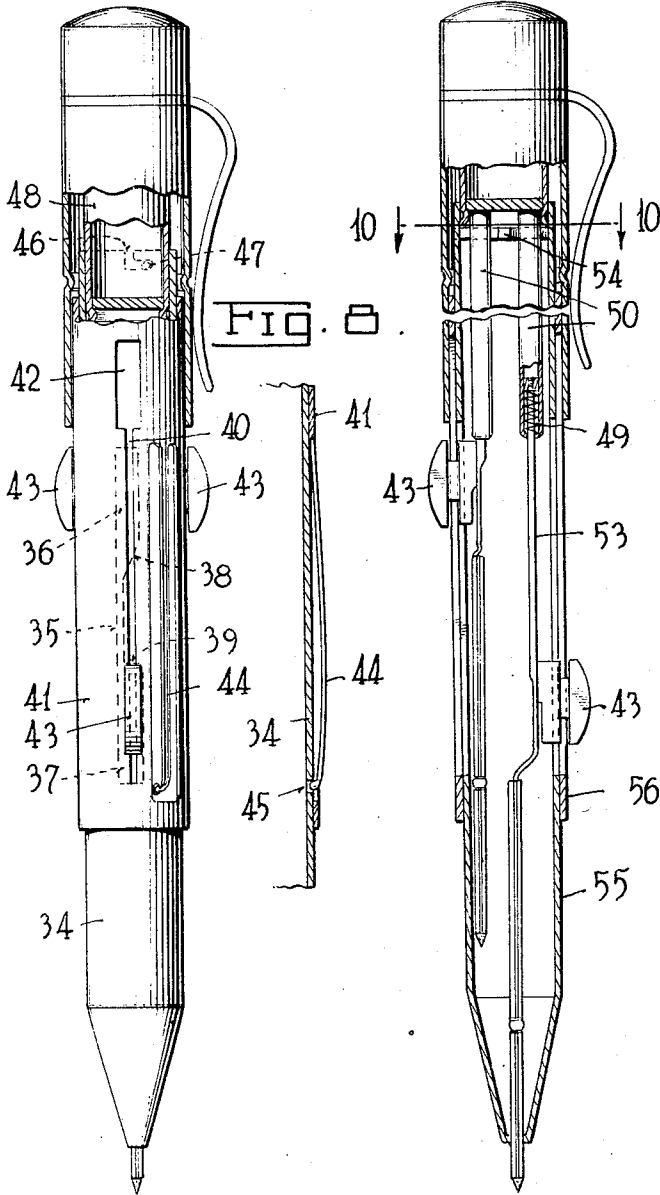
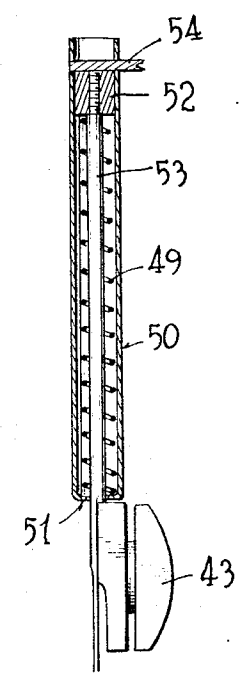
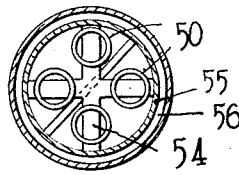


FIG. 10.

FIG. 11.



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UNITED STATES PATENT OFFICE

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INTERCHANGEABLE LEAD PENCIL

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Application June 3, 1936, Serial No. 83,394
In Germany June 11, 1935

10 Claims. (Cl. 120—14)

The present invention relates to a changeable lead pencil with interchangeable lead holders that are individually shiftable by means of slides through guides provided in the pencil casing from a non-use position into a working position and are locked there and which are moved by spring pressure into non-use position when released.

The invention consists further in that the releasing of the lead holders and their retraction to the non-use position is effected automatically by the forward movement of other lead holders to the working position. The construction, therefore, greatly facilitates the handling of the changeable pencil, since it is not necessary to push back one lead holder to non-use position before moving another to working position.

In carrying out the objects of the invention, a rotary casing is arranged in an outer casing so as to rotate relative to the outer casing, but which is not shiftable longitudinally thereof. This rotary casing is provided with longitudinal slots for the purpose of guiding the slides of the lead holders and the sides of these slots are cut at such angles as will effect a rotation of the casing to unlocking position at the beginning of the forward movement of the lead holder and will rotate the casing back to locking position after the lead holder has reached the limit of its forward movement. If desired, the slots may be so shaped that the forward movement of the lead holder rotates the casing into unlocking position only, the back rotation of the casing into locking position being effected by a spring.

With the foregoing and other objects in view, the invention consists in the details of construction and in the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

In describing the invention in detail, reference will be had to the accompanying drawings forming part of this application, wherein like characters denote corresponding parts in the several views, and in which—

Figure 1 illustrates a view of a whole pencil with parts shown in section;

Figures 2 to 4 illustrate views of the rotary casing showing different positions of the lead holders;

Figure 5 illustrates a section on the line 5—5 of Figure 1;

Figure 6 illustrates a view of a modified form of rotary casing;

Figure 7 illustrates a modified form of pencil in which the backward rotation of the rotary casing is effected by a spring;

Figure 8 illustrates a detail of the spring used in Fig. 7;

Figure 9 illustrates another form of pencil in which each lead holder is retracted by a separate spring;

Figure 10 illustrates a section on the line 10—10 of Figure 9; and

Figure 11 illustrates a detail view of a lead holder and retracting spring used in Figure 9.

The pencil shown in Figure 1 has a cylindrical casing 1 having a conical front part 2. The casing contains lead holders, preferably four, two of which, 3 and 4, are illustrated. Each lead holder is secured by means of a spring 5 to a slide 6 which extends through a slot 7 in the casing 1 and carries a button or knob 8 for operating the lead holders. The slots 7 extend to the rear end of the casing 1 so that the slides 6 are inserted in the slots before placing the rear cap on the pencil. The lead holders are urged to non-use position by a spring 9 which seats at the lower end against a ring plate 11 which is positioned in the casing and at the upper end against an inner flange 10^a on a sleeve 10. The upper edge of the sleeve 10 engages the under edge of the slides 6 to move the lead holders into non-use position, and they are moved to working position against the tension of the spring 9.

At the rear end of the casing 1 is a casing 13 having a bottom 12, the casing serving as a lead supply chamber. The casing 13 is pushed into the end of the casing 1 and is held therein by means of elevations 14 on the casing 13 engaging transverse slots 15 near the upper end of slot 7. A cover casing 31 is positioned over the end of the casing 13 and is held on by means of a cap 32 which is threaded on the end of the casing 13. A fastening clasp 33 may be held between the cap and the casing 31.

A short threaded casing 16 is arranged in the lower end of the casing 13 and to the lower end of this casing is loosely screwed the rotary casing 17. This rotary casing 17 is provided with longitudinal slots 18, one for each of the lead holders. The shape of these slots is best understood from Figures 2 to 4 of the drawings. Each slot has an enlarged opening 19 at the upper end and another enlarged opening 20 at the lower end with a straight narrow slot 21 connecting these openings. The lower portion of the opening 19 slopes at 24 toward the straight narrow portion 21. The lower portion of the opening 20 has a side portion 22 sloping opposite to the slope 24. The upper edge of the opening 20 provides a ledge for locking the lead holders in working position, as will

appear. The upper enlarged opening 19 is large enough to receive the knob 8 on the outer end of the slide 6. In assembling the pencil, the knob portion is pushed through the opening 19 from within the casing 17 and the slide portion 6 is inserted in the upper end of the slot 7 and moved down to position. This is done before the casing 13 is inserted in the casing 1. When the casing 13 is inserted in position, the plate 12 which serves as a bottom for the lead chamber also serves as a stop against which the ends of the springs 5 on the lead holders engage to limit upper movement of the lead holders as they are moved upwardly under the urge of the spring 9.

When the slide 6 is moved down by means of the knob 8, this slide first engages the sloping side 24 to rotate the casing 17 until the slide reaches the straight portion 21, and continued forward movement brings the pencil point to working position. Just before the point reaches the limit of its forward movement, the slide 6 engaging the sloping side 22 rotates the casing 17 in the opposite direction to bring the slide under the edge 23 by means of which the lead holders are locked in working position. The spring 9 then pushes the slide up against the edge 23. Figures 2 to 4 show the different positions assumed by the slide as the lead holders are moved from non-use to working position.

When one lead holder is in working position and the user moves another toward working position, the first movement of the slide against the sloping edge will operate to rotate the casing 17. This moves the edge 23 away from the upper edge of the slide on another lead holder and so releases the slide and allows the spring 9 to move the lead holder back to non-use position.

When it is desired to retract the lead holders from working to non-working position without bringing a new lead holder to working position, it is necessary only to move the slide forward a short distance until it has engaged the sloping edge 24 and rotated the casing 17 to bring the locking edge 23 away from the edge of the slide on that lead holder that is in working position. The knob is then released and the spring 9 returns the lead holders to non-use position.

Figure 6 shows different forms of slots in the casings. In this form in one casing a slot 24' is formed as a straight line at one edge. The forward end of the slot is widened at 25', one lower side being sloping at 25' and the upper edge of the widened slot forming the stop ledge 26. In the other casing the slot 27 has an upper widened portion 28 and a sloping edge 29 which extends over the straight narrow portion 30. It is immaterial which of the slots is in the outer or rigid casing and which is in the inner or rotary casing.

Figures 7 and 8 show different forms of slots and show a pencil in which the backward rotation of the rotary casing is effected by a spring. In this form, the fixed casing 34 contains four slots, when four lead holders are used. Each slot has a straight narrow central part 35, a wider portion 36 in the rear, another wider portion 37 at the front with the locking edge 39. The rear large opening has the edge 38 sloping toward the narrow portion 35. The left edge of the slot at the bottom of the enlarged opening 37 is straight and is not sloped as is the edge 22 in Figure 2. On casing 34 is arranged the rotary casing 41 having straight slots 40, one for each of the slots in the casing 34. These slots have enlarged openings 42 through which the knobs 43 are inserted in assembling the pencil. A resilient catch 44 is

cut out from the casing 41 and is bent inwardly and engages a hole 45 in the casing 34. When the slide is moved down, it engages the edge 38 and rotates the rotatable casing 41 against the tension of the resilient catch or spring 44 until the slide reaches the straight slot 35, at which time the slide continues to move down and move the lead to working position. As soon as the slide passes below the narrow portion 35, the spring 44 is free to rotate the rotatable casing back to its original position to bring the slide under the edge 39 and lock the lead holder in working position. The catch on spring 44 engaging the hole 45 also prevents relative axial movement between casings 34 and 41. When a lead holder is in working position and another lead holder is pushed forward by the knob or button 43, the casing 41 is rotated toward the left (Fig. 7) so that the slide on the lead holder that is in working position is moved from beneath the edge 39, permitting this holder to be retracted. When the operating knob or button is released, the lead holders are retracted by spring action and the rotary casing is restored to its original position by the spring 44, and the pencil is in position ready for use again. The cap 48 is held on the casing 34 by a bayonet slot 46 engaging over a pin or punched-up portion 47.

In the form shown in Figures 9, 10 and 11, a separate retracting spring is used for each lead holder. These springs 49 are carried in tubes 50 and engage at their lower ends with a turned in portion 51 of the tubes and at their upper ends with nuts 52 carried on the ends of rods 53 to which the lead holders are secured. The tubes themselves are secured on cross arms 54 which not only support the tubes but limit upward movement of the rods 53. The casings 55 and 56 are the same as those shown in Figure 7. Also these casings are slotted in the same way, the slots being omitted in Figure 9 in order to better illustrate the lead holders.

I claim:

1. A lead pencil having interchangeable lead holders, means for individually shifting said lead holders to working position and for locking them in such position, and means for releasing the locking means upon the movement of another lead holder toward working position.

2. A lead pencil having interchangeable lead holders, means for individually shifting said lead holders to working position and for locking them in such position, said means including a rotary and a non-rotary casing each having slots therein, guides in said slots, lead holders secured to said guides, the said slots being of such configuration as to effect relative rotation of the casings upon movement of a lead holder toward working position, and means for locking any lead holder in working position as the said lead holder reaches working position.

3. A lead pencil comprising a rotary and a stationary casing, lead holders mounted in said casings, means for moving said lead holders toward working position, resilient means for moving them toward non-working position, means operable upon any lead holder reaching working position for locking it in working position, and means for releasing the locking means upon the partial movement of another of the lead holders toward working position.

4. A pencil as claimed in claim 3, having means actuated by relative rotation of the casings for operating the locking and unlocking means.

5. In a changeable lead pencil with inter-

changeable lead holders which are individually shiftable to working position and which are retracted by spring pressure, means for locking a shifted lead holder in forward position, and means for releasing the locked holder upon forward motion of another lead holder.

6. In a lead pencil having interchangeable lead holders with means for separately positioning any lead holder for movement into working position, said means comprising a stationary casing and a rotary casing provided with longitudinal slots, means on said lead holders engageable with the slots in said casings whereby upon forward movement of any of the lead holders there is effected a relative rotation of the casings, means operated by opposite relative rotation of the casings for locking a forwardly moved holder in working position, and means for effecting relative rotation in the reverse direction to unlock the locking means upon the beginning of movement of another lead holder toward working position.

7. In a pencil having interchangeable lead holders, means for moving said lead holders toward working position, separate resilient means for individually retracting each of said lead holders, means for locking the lead holders in working position, and means operable upon beginning of movement of a second lead holder toward working position for releasing the one in working position.

8. A lead pencil having changeable lead holders therein and means for moving any selected lead holder to a working position, a spring for urging said holders to non-use positions, said

pencil including relatively rotatable casings, said casings being formed to provide cooperating means for locking any selected lead holder in a working position, and resilient means for relatively rotating said casings to a position to lock said lead holder in said working position.

9. A pencil having changeable lead holders, comprising a pair of relatively rotatable casings, said lead holders being selectively movable from an inoperative to a working position, means locking each of said holders in an inoperative position, means operative upon relative rotation of said casings for moving a locked and inoperative lead holder to a position for movement to a working position, means for moving said positioned lead holder to a working position, means for locking the same in said position, and means for holding said casings against relative longitudinal movement.

10. A pencil having changeable lead holders, comprising a pair of relatively rotatable casings, said lead holders being selectively movable from an inoperative to a working position, means locking each of said holders in an inoperative position, means operative upon relative rotation of said casings for moving a locked and inoperative lead holder to a position for movement to a working position, means for moving said positioned lead holder to a working position, means for locking the same in said position, means for holding said casings against relative longitudinal movement, and resilient means resisting said relative rotation of said casings.

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