A. J. REID.

MECHANICAL PENCIL.

APPLICATION FILED APR. 25, 1922.

1,438,504. Patented Dec. 12, 1922.

Fig. 1.

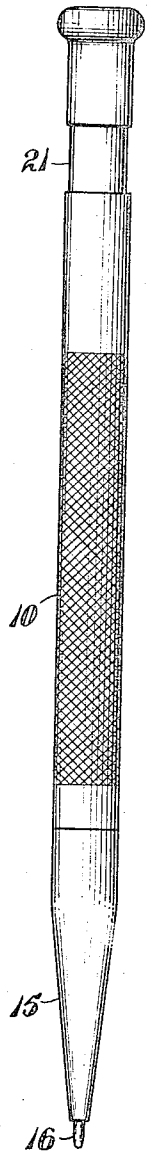


Fig. 2.

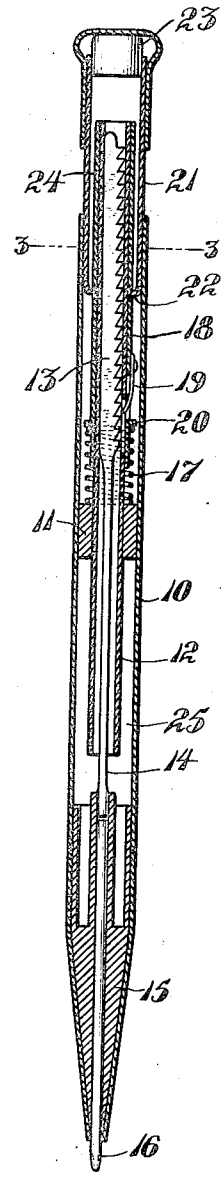
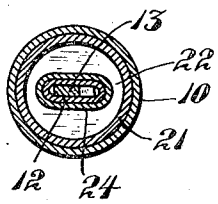


Fig. 3.



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UNITED STATES PATENT OFFICE.

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MECHANICAL PENCIL.

Application filed April 25, 1922. Serial No. 556,513.

To all whom it may concern:

Be it known that I, ALFRED J. REID, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Mechanical Pencils, of which the following is a specification.

This invention relates to mechanical pencils and has for its object to produce a pencil of this character which will be easier and quicker to adjust than the pencils heretofore in use.

In carrying out this object I provide a ratchet feed for the lead which is actuated by a pressure upon the cap of the pencil. This mechanism is such that the lead is held in advanced position by friction, so that an inward pressure on the lead may serve to retract the lead in case the latter has been fed forwardly too far or it is desired to protect the lead when the user places the pencil in his pocket. In other words, the lead can be moved in either direction by pressure upon one end or other of the pencil, thus doing away with the slow and cumbersome methods heretofore in use, and which, in every instance, required the use of two hands. My pencil can be adjusted with one hand.

One form which my invention may assume is exemplified in the following description and illustrated in the accompanying drawing, in which—

Fig. 1 shows a side elevation of a pencil embodying my invention.

Fig. 2 shows a longitudinal central sectional view of the same.

Fig. 3 shows a cross sectional view taken on the line 3—3 of Fig. 2.

In its preferred form, the pencil comprises a casing 10 having a bushing 11 near the middle portion, which bushing carries a flattened tube 12. This tube extends beyond the upper end of the casing and within the tube is a ratchet bar 13 having a close frictional contact with the walls of the tube. The lower end of the ratchet bar has a stem 14 forming a lead pusher.

Fitted removably to the lower end of a casing is a conical or tapered member 15 forming the top of the pencil. This conical member has a central bore or aperture to receive a lead 16 in alignment with the stem 14. A coiled spring 17 is arranged over the bushing 11 surrounding the tube 12. Slidably mounted over the tube 12 is a sleeve 18, which carries a pawl 19 to co-operate with the teeth on the ratchet bar. This sleeve has a flange 20 which rests upon the upper end of the spring 17 and is held by this spring in retracted position.

Fitting slidably into the upper end of the casing is a cap 21, which has a flange 22 at its inner end to seat against the upper end of the sleeve 18. The pawl 19 is in the form of a flat spring fixed to the outside sleeve 18 with its nose extending through slots formed in the sleeve and in the tube. However, when the parts are assembled and in retracted position, the position of the sleeve will be such that the pawl will strike the upper end of the slot in the tube and thus be held out of engagement with the teeth on the ratchet bar. At this time friction between the ratchet bar and surrounding tube is relied upon to hold the ratchet bar in place against the pressure of the lead when the pencil is being used.

In the operation of the device, when it is desired to feed the lead forwardly, the cap 21 is depressed, causing the sleeve 18 to be moved inwardly against the spring 17 and carrying the pawl 19 into engagement with a tooth on the ratchet bar, thereby advancing the latter one or more teeth, as desired. The stem on the ratchet bar is normally seated within the bore or aperture which carries the lead 16, and thus the lead is fed forwardly. The extent of feeding of the lead is limited by the upper end of the tube 12 striking the closed end of the cap 21. If desired, this cap 21 may be fitted with an eraser 23. As soon as the pressure is released on cap 21, the spring 17 returns the sleeve and cap to their initial positions, thus disengaging the pawl from the ratchet bar and leaving the latter held only by frictional contact with its surrounding tube. At this time, a heavy pressure on the lead 16 will force the latter inwardly in case it is desired to retract the lead.

Within the cap 21 is preferably arranged a loose sleeve 24, which is adapted to fit closely over the upper end of the tubular member 12 and form a friction latch to prevent the cap from being accidentally displaced. The space 25 between the casing and tube below the bushing 11 may be util-

ized as a magazine for extra leads. When a lead has been used up the conical extension 15 is removed and a new lead inserted in the bore thereof. The ratchet bar is then retracted and the conical extension 15 replaced with the stem 14 fitting within the bore.

The chief advantage of a pencil of this sort is the ease with which the leads may be advanced or retracted. With one hand the user may press the cap inwardly to feed the lead forwardly, or, in case he desires to retract the lead, it is only necessary to press downwardly on the casing with the tip of the lead resting against a solid object. The friction between the ratchet bar and tube is sufficient to prevent inward movement of the lead for all writing purposes.

Various changes in the construction and arrangement of the several parts herein shown and described may be made without departing from the spirit of my invention as disclosed in the appended claims.

The amount of friction between the ratchet bar and its surrounding tube can be varied by bending the ratchet bar laterally.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a mechanical pencil, a casing, a tapered extension at the lower end thereof forming a guide and holder for a lead, a tube fixed within the casing, a ratchet bar fitted slidably within the tube and having a stem at its lower end to co-operate with the lead in the tapered extension, a sleeve fitting slidably over the tube, a pawl carried by the sleeve to co-operate with the teeth on the ratchet bar, spring means for maintaining the sleeve retracted and a cap fitting slidably into the upper end of the casing and co-operating with said sleeve whereby the latter may be moved inwardly against the pressure of the spring and advance the ratchet bar for feeding the lead forwardly.

2. In a mechanical pencil, a casing, a tapered extension at the lower end thereof forming a guide and holder for a lead, a tube fixed within the casing, a ratchet bar fitted slidably within the tube and having a stem at its lower end to co-operate with the lead in the tapered extension, a sleeve fitting slidably over the tube, a pawl carried by the sleeve to co-operate with the teeth on the ratchet bar, spring means for maintaining the sleeve retracted, a cap fitting slidably into the upper end of the casing and co-operating with said sleeve whereby the latter may be moved inwardly against the pressure of the spring and advance the ratchet bar for feeding the lead forwardly, said bar having frictional contact with the tube whereby to retain it in adjusted position and means to maintain the pawl disengaged from the ratchet bar when the sleeve is retracted whereby the lead may be retracted when exterior pressure is applied thereto.

3. In a mechanical pencil, a casing, a tapered extension on the lower end of the casing forming a guide and holder for a lead, a tube fixed within the casing, a ratchet bar frictionally but slidably retained within the tube, said bar having a stem to co-operate with the lead in the tapered extension, a sleeve slidably fitted over the tube, a pawl on the sleeve for co-operating with the teeth on the ratchet bar, a spring to retain the sleeve in retracted position, a cap slidably fitted in the upper end of the casing and co-operating with the sleeve whereby to move the sleeve inwardly against the pressure of the spring and force the ratchet bar forwardly to feed the lead, said sleeve and tube having slots through which the pawl extends, said slots being relatively positioned to maintain the pawl out of engagement with the ratchet bar when the sleeve is retracted whereby the lead normally is maintained in advance position by the friction existing between the ratchet bar and its surrounding tube.

4. In a mechanical pencil, a casing, a tapered extension removably fitted on the lower end of the casing, and forming a guide and holder for a lead, a flattened tube within the casing spaced from the inner walls thereof, a bushing for retaining the tube in fixed position, a ratchet bar frictionally and slidably fitted within the tube and having a stem to co-operate with the lead, a sleeve slidably fitted on the tube, a pawl on the sleeve, a spring interposed between the bushing and sleeve for maintaining the latter in retracted position, and a cap slidably fitted in the upper end of the casing for depressing the sleeve whereby to actuate the ratchet bar.

5. In a mechanical pencil, a casing, a tapered extension removably fitted on the lower end of the casing, and forming a guide and holder for a lead, a flattened tube within the casing spaced from the inner walls thereof, a bushing for retaining the tube in fixed position, a ratchet bar frictionally and slidably fitted within the tube and having a stem to co-operate with the lead, a sleeve slidably fitted on the tube, a pawl on the sleeve, a spring interposed between the bushing and sleeve for maintaining the latter in retracted position, a cap slidably fitted in the upper end of the casing for depressing the sleeve whereby to actuate the ratchet bar, and means to retain the pawl out of engagement with the ratchet bar when the sleeve is retracted.

6. In a mechanical pencil, a casing, a tapered extension removably fitted on the lower end of the casing, and forming a guide and holder for a lead, a flattened tube within the casing spaced from the inner walls thereof, a bushing for retaining the tube in fixed

position, a ratchet bar frictionally and slidably fitted within the tube and having a stem to co-operate with the lead, a sleeve slidably fitted on the tube, a pawl on the sleeve, a spring interposed between the bushing and sleeve for maintaining the latter in retracted position, a cap slidably fitted in the upper end of the casing for depressing the sleeve whereby to actuate the ratchet bar, and a friction latch device carried within the cap and co-operating with the upper end of the tube whereby to prevent accidental displacement of the cap.

ALFRED J. REID.