April 22, 1969 K. W. SPILLMAN 3,439,989

AUTOMATIC PENCIL

Filed Sept. 9, 1966 Sheet 1 of 2

FIG. 1.

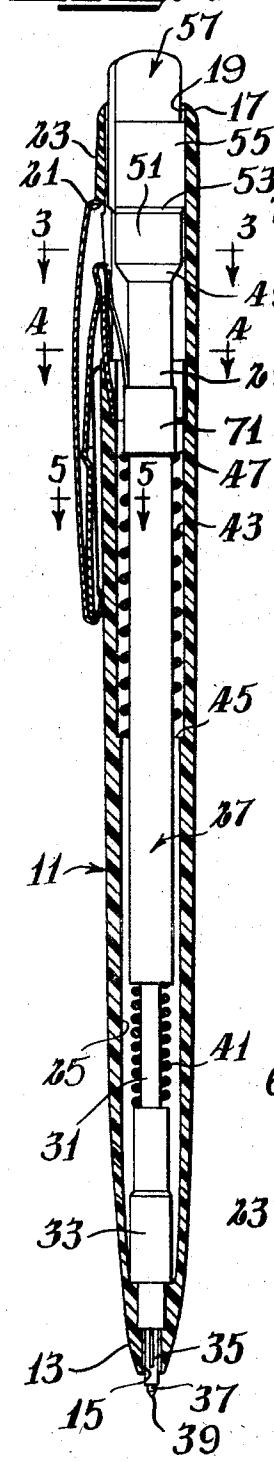


FIG. 3.

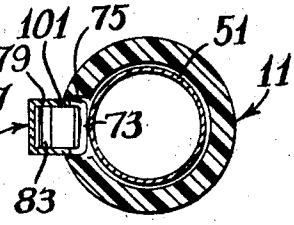


FIG. 4.

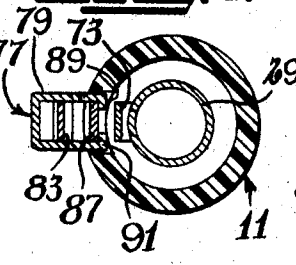


FIG. 5.

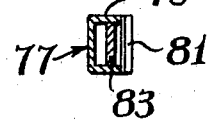


FIG. 6.

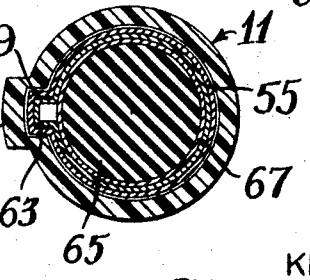
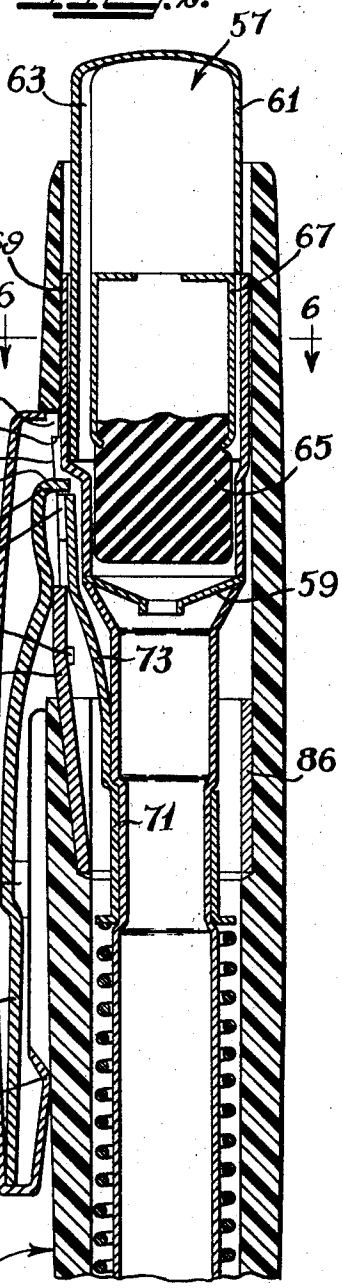


FIG. 2.



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AUTOMATIC PENCIL

Filed Sept. 9, 1966 Sheet 2 of 2

Fig. 7.

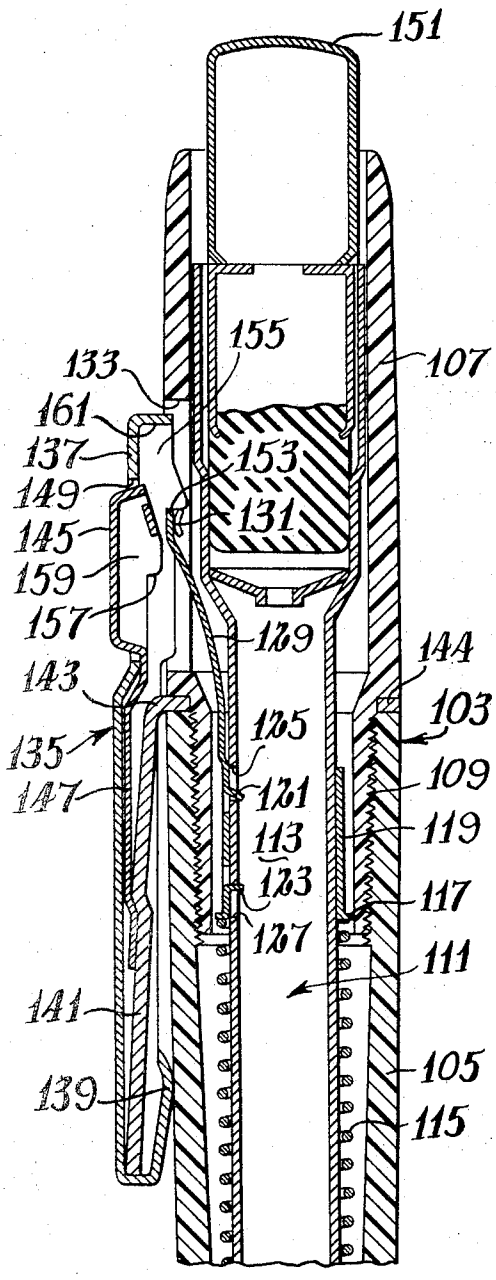
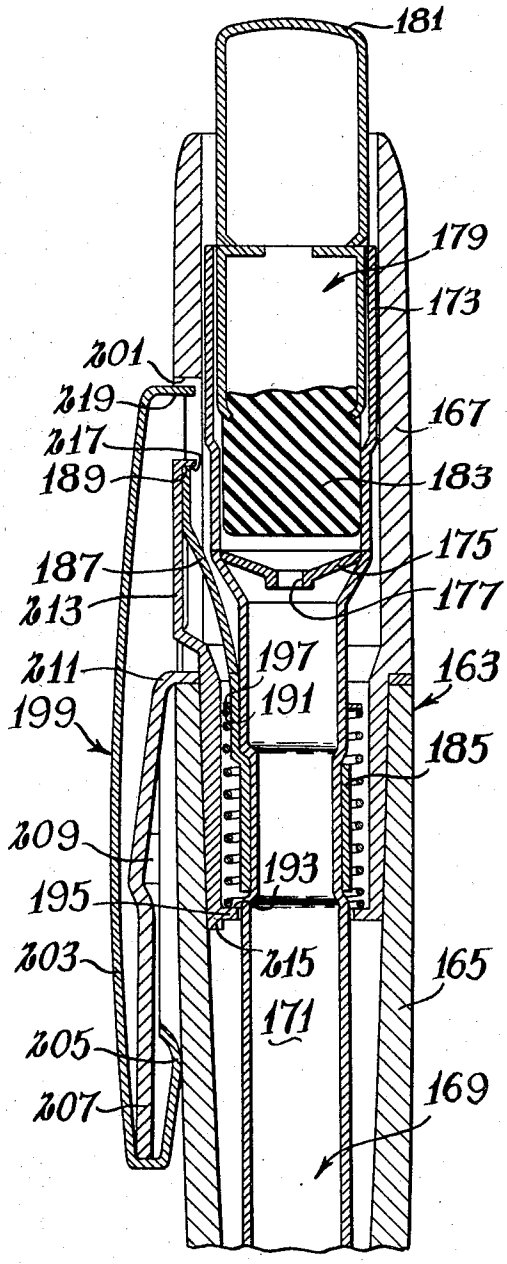


Fig. 8.



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3,439,989

AUTOMATIC PENCIL

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Int. Cl. B43k 21/16, 5/16, 7/12
U.S. Cl. 401—65 5 Claims

ABSTRACT OF THE DISCLOSURE

A retractable automatic pencil of the continuous feed type includes a barrel having a continuous lead feeding mechanism reciprocably mounted in its chamber and a reciprocably movable operating button extending from its rear end. The operating button causes the writing portion of the lead feeding mechanism to project beyond the forward end of the barrel in response to an initial axially reciprocating movement of the operating button, and it also causes the lead feeding mechanism to feed lead sticks in response to subsequent reciprocating axial movements of the operating button when the lead feeding mechanism is in the projected position. A release mechanism initiates the movement of the lead feed mechanism from the protracted position into the retracted position.

The present invention relates to a new and improved automatic pencil of the continuous feed type, and more particularly the present invention relates to a retractable automatic pencil of the continuous feed type.

Mechanical pencils of the step-by-step continuous feed type have been known for many years and because of their ease and reliability of use they are preferred over those employing screw type feed mechanisms. In a continuous lead feed system, a supply of lead sticks is stored in a magazine and the leads are fed sequentially to the writing tip by simple manipulation of the operating mechanism and without the necessity of manually handling the lead sticks after they have been placed in the magazine.

With a continuous feed type of mechanical pencil, the writing point is normally exposed during periods of nonuse so that undesirable marking sometimes occurs. Also, the exposed portion of the lead stick is subject to breakage. Therefore, it would be desirable to provide an automatic pencil of the type employing a continuous lead feeding mechanism with means for retracting the writing tip into the housing during periods of nonuse.

It is, therefore, an object of the present invention to provide an improved automatic pencil.

It is another object of the present invention to provide an improved automatic pencil of the continuous feed type.

It is yet another object of the present invention to provide an improved automatic pencil of the continuous feed type having a novel projecting and retracting mechanism.

It is a still further object of the present invention to provide a retractible automatic pencil of the continuous feed type in which a single operating mechanism is used to control both lead feed and projections of the writing point.

It is another and still further object of the present invention to provide an automatic pencil in which both lead feed and point projection are accomplished through manipulation of a single push button while point retraction is accomplished through manipulation of a release mechanism actuated by a clip or by a member associated with the clip.

The above and further objects are realized in accordance with the present invention by providing a compact, simple, continuous, lead feed mechanism in combination with a

point propelling and retracting mechanism. A push button at the top of the pencil is used to manually project the writing unit into a writing position wherein the writing unit is latched in the writing position with the tip exposed. The succeeding depression of the same push button actuates the continuous lead feed mechanism to feed lead from the unit. A pivotally mounted pocket clip or other actuating means associated with the clip is used to retract the writing unit.

In accordance with one feature of this invention, the force necessary to operate the continuous lead feed mechanism and the projection mechanism is applied through an axially movable button reciprocably mounted in the top of the pencil for facile, manual actuation.

The invention, both as to its organization and method of operation, together with further objects and advantages thereof, will best be understood by reference to the following detailed description taken in connection with the accompanying drawings, in which:

FIGURE 1 is a vertical, sectional view of an automatic pencil embodying the present invention, the longitudinally retractible parts being shown in projected position.

FIGURE 2 is an enlarged, fragmentary sectional view of the rear portion of the automatic pencil of FIGURE 1 with the parts thereof shown in their projected writing position;

FIGURE 3 is a sectional view, taken on line 3—3 of FIGURE 1;

FIGURE 4 is a sectional view, taken on line 4—4 of FIGURE 1;

FIGURE 5 is a sectional view, taken on line 5—5 of FIGURE 1;

FIGURE 6 is a sectional view, taken on line 6—6 of FIGURE 2;

FIGURE 7 is an enlarged, fragmentary sectional view of the rear portion of a modified form of the automatic pencil shown in FIGURE 1 wherein an operating button for the retracting mechanism is shown with a fixedly attached pocket clip; and

FIGURE 8 is another enlarged fragmentary sectional view of the rear portion of a further modification of the automatic pencil of FIGURE 1 showing a different means for mounting the pocket clip.

Referring now to the drawings and more particularly to FIGURES 1–6, the automatic pencil of the present invention there shown comprises a tubular housing or barrel **11** which can be made of any suitable material such as metal or plastic. The barrel **11** tapers inwardly towards its front end **13** to form a reduced, constricted aperture **15**. The rear end of the barrel **11** has a chamfered or rounded marginal edge **17** surrounding an aperture **19**. Along one side of the barrel **11** and a short distance from the rear end is a slot **21**. In alignment with the slot **21** and extending forwardly from the rear edge **17** is an integral projection **23** of ramp-shaped configuration.

As shown, within the barrel **11** is a longitudinally extending cavity **25** within which is positioned a continuous lead feed mechanism **27** of a conventional type having a lead storage magazine **29**, a lead guide tube **31**, a continuous feed clutching mechanism **33** and a tip clutch **35**, the latter clutch functioning to hold the lead stick **37** in an extended position to thereby form a writing tip **39**. One such conventional continuous lead feed mechanism is shown and described in U.S. Patent No. 2,158,991 to Stenersen.

A coil spring **41** mounted on the lead feed mechanism **27** about the lead guide tube **31** operates in conjunction with the continuous lead feed clutching mechanism **33** to bias a set of clutch jaws, not shown, into gripping relationship with the surface of the lead stick **37**.

A second coil spring **43** coaxially mounted about the

continuous lead feed mechanism **27** has opposite ends respectively engaging a rearwardly facing annular shoulder **45** integrally formed on the interior of the barrel **11** and an annular ring **47** surrounding and secured to magazine **29** of the continuous lead feed mechanism **27**. The coil spring **43** serves to bias the lead feed mechanism **27** rearwardly into the barrel **11** biasing the tip **39** into a shrouded position where it is protected by the tapered tip portion **13** of the barrel.

Above the tubular portion of magazine **29** and in axial alignment therewith is a flared portion **49**, an enlarged tubular portion **51**, a second flared portion **53** and a second enlarged tubular portion **55**. Portions **49–55** of the continuous lead feed mechanism form a receiver within which an eraser holder **57** is removably mounted. Within the flared portion **49** there is positioned a lead guide member **59** which facilitates the loading of lead sticks into magazine **29**.

The eraser holder **57** comprises a decorative cap-shaped member **61** having a guide **63** (FIGURES 2 and 6) protruding in axial alignment with the surface of the cap **61**. Within the open end of the cap **61**, an eraser **65** is removably supported by a clamping member **67**. The eraser holder **57** is adapted to be reversibly mounted in the receiver to expose either the decorative cap **61** or the eraser **65**. The guide **63** is adapted to be mounted within a recess formed by a longitudinally extending projection **69** on the surface of tubular portion **55**. The guide **63** serves to prevent rotation of the continuous lead feed mechanism **27** relative to the housing **11**.

As shown in FIGURES 1 and 2, a split metal band **71** is attached to the surface of magazine **29** a short distance below flared portion **49**. An integrally formed leaf spring **73** extends upwardly from band **71** and projects away from magazine **29**, the band **71** being fastened onto the magazine **29** to fix the spring **73** in alignment with the projection **69**. A pair of lateral projections that form a latching member **75** are provided on the upper or free end of leaf spring **73**, these projections being offset forwardly therefrom and extending laterally beynd both sides of a pivotally mounted clip **77**. The latching member **75** and upper end of leaf spring **73** cooperate with detent surfaces on the clip **77** to determine the projected and retracted position of the lead feed mechanism **27** and writing tip **39**.

Clip **77** (FIGURE 2) comprises a trough-shaped decorative metal housing **79** having a gripping portion **81** which cooperates with barrel **11** to hold the pencil in a pocket or other location. A contoured flat spring member **83** is locked within the housing **79** of clip **77** by inwardly turned tabs **85** which press spring **83** against the inner surface of the clip housing.

Clip **77** is pivotally supported on the barrel **11** within the slot **21** by a spring **87** which is held in position in the barrel by a split spring ring **86** of which it is made an integral projection. The ring **86** is forced downwardly into the barrel and positioned so that the integral flat spring **87** projects up into slot **21**.

Clip **77** has a pair of inturned tabs **89** and **91** (FIGURE 4) which grip spring **87** and hold it pressed against the spring member **83** that is mounted within the clip housing **79**. Springs **83** and **87** pivotally support clip **77** and bias the gripping portion **81** against the barrel **11**.

To assemble the automatic pencil of the present invention, the clip **77** is passed at an angle through aperture **19** and on out through aperture **21**. The gripping portion **81** is given a slight pull, seating spring **87** behind tabs **89** and **91**. The clip **77** will snap into its normal position with gripping portion **81** pressed against barrel **11**.

The continuous lead feed mechanism **27** with springs **41** and **43** thereon is then lowered into the barrel **11** through the aperture **19**. The projection **69** on the tubular portion **55** is aligned with the recess formed in the ramp **23** thereby aligning spring **73** with clip **77** as explained hereinabove. The lead feed mechanism is pushed completely into the barrel of the pencil against the bais of spring **43** until the latching member **75** on spring **73** latches with a detent surface **93** within clip **77**.

To dismantle the automatic pencil of the present invention, the above procedure is simply reversed. With the pencil in retracted position, a thin blade or pin is inserted alongside the upper portion of the clip, or through a small hole (not shown) in the clip or an aperture near the clip, to release the latching member **75** of spring **73** from its latched position against detent surface **93**. When spring **73** is released, the bias of spring **43** will move the lead feed mechanism back part way out of the barrel. The continuous lead feed mechanism **27** can then be slipped out of the barrel **11** and the clip **77** removed from the barrel by simply pulling them back out the aperture **19**.

Clip **77** provides two detent surfaces which determine the projected and retracted positions of the continuous lead feed mechanism **27** and in turn the position of point **39**. In the retracted position, the latching member **75** on spring **73** contacts the detent surfaces **93** formed by a pair of projections **95** extending from the sides of the trough-shaped clip housing **79** into the barrel **11**. In the projected position, the upper end of spring **73** is held by detent surface **97** formed by the rolled upper edge **101** of flat spring **83**.

In operating the automatic pencil of the present invention, digital pressure on cap **61** moves the continuous lead feed mechanism **27** longitudinally downward in the pencil barrel. As the lead feed mechanism moves, latching means **75** on spring **73** slides down along the contoured inner surfaces **99** of clip **77** until the upper end of spring **73** passes the edge **101** of flat spring **83**. The spring **73** is then held by detent surface **97**. The digital pressure can be released from cap **61** and the lead feed mechanism **27** will be retained in the forward position by detent surface **97**. In this position, writing point **39** projects through aperture **15** in writing position.

With the continuous lead feed mechanism in the projected position, the lead stick **37** can be advanced by depressing the cap **61** which forces the lead clutching mechanism **33** downward against the inner wall of tapered portion **13** of barrel **11**. Continued depression of cap **61** compresses coil spring **41** releasing the lead clutching jaws, not shown, within clutching mechanism **33**. The lead stick is advanced a short distance before the end of the downward stroke is reached. The cap **61** is then released, relatching spring end **73** in detent **97** and reclosing the lead gripping clutch jaws.

To retract the writing point **39** back into the pencil, the upper portion of clip **77** is pivotally depressed into the barrel causing the contoured inner surfaces **99** to move the latching means **75** inwardly to release spring end **73** from detent **97**. As soon as the spring end **73** is released, the continuous lead feeding mechanism **27** is driven rearwardly in the pencil by the coil spring **43**. In view of the outward biasing of spring **73** relative to the continuous lead feed mechanism **27**, the latching means **75** rides along the contoured surfaces **99** until it is stopped by detent surfaces **93**. The forward offset of the lateral projections that form the latching member **75** facilitate the release of the upper end of the spring **73** from the detent **97**.

In the embodiment of the automatic pencil previously discussed, pivotal movement of the pocket clip was used to initiate the retraction of the continuous lead feed mechanism. In the embodiment of the automatic pencil shown in FIGURE 7, the clip is provided with a laterally depressible actuating button for initiating retraction of the lead feed mechanism.

The automatic pencil shown in FIGURE 7 has a two-piece housing **103** made up of a barrel **105** and an attached upper member **107**. Barrel **105** and member **107** are shown coupled together by means of threaded portion **109**. Barrel **105** and upper member **107** may be made of the same or dissimilar materials and may be joined by

other means than threads, for example, the parts might be press fitted together.

A continuous lead feed mechanism **111** of conventional type is mounted within the housing **103**. About the lead magazine **113** is coil spring **115** which biases the lead feed mechanism **111** toward the rear of the pencil by acting against annular ring **117**. Annular ring **117** is an integral part of a split spring band **119** which surrounds the magazine **113** of lead feeding mechanism **111**. Band **119** is brazed securely closed about lead feeding mechanism **111** and is secured thereto by means of tabs **121** and **123** through apertures **125** and **127** in the wall of the magazine.

Integrally formed with band **119** and biased away from continuous lead feed mechanism **111** is a flat leaf spring **129** provided on its upper end **153** with a pair of lateral projections that form a latching means **131** offset rearwardly from the spring **129** and extending laterally beyond both sides of a clip housing **137**.

Mounted on the side of housing **103** and projecting into aperture **133** in upper member **107** is a clip **135**, comprising an outer decorative and supporting housing **137**, a gripping foot portion **139**, and a spring member **141** that has one end fastened within clip housing **137** and its other end formed into a ring section **144** attached to housing **103** at the joint between barrel **105** and upper member **107**. Spring member **141** is bent at **143** and this bend serves as the point about which clip **135** is pivotally movable.

An operating button **145** is formed on one end of a leaf spring **147** which is mounted within clip housing **137**. Button **145** projects through an aperture **149** in the upper end of clip housing **137**.

To operate the embodiment of the automatic pencil shown in FIGURE 7, axial pressure is applied to cap **151**. As the lead feed mechanism moves forward, the upper end of spring **129** is moved downwardly away from a detent surface **161** formed by the upper end of clip housing **137**, with the latching means **131** sliding along the contoured edges of the projecting side portions **155** of clip housing **137**. Latching means **131** is biased outwardly relative to the continuous lead feed mechanism by spring **120** and eventually snaps under detent means **153** formed on the edges of the side portions **155**. The lead feed mechanism **111** will remain in a projected position so long as latching means **131** is held by detent means **153**, and is actuated by further depressions of the cap **151** to advance the lead.

To retract the lead feed mechanism **111**, button **145** is depressed causing latching means **131** to be released from detent means **153**. As soon as latching means **131** is released, the lead feed mechanism **111** is moved rearwardly by coil spring **115**. Latching means **131** will slide back along the contoured edges of the side portions **155** until the upper end of spring **129** is stopped by detent surface **161** which restricts the upward movement of the lead feed mechanism **111**.

In FIGURE 8, another embodiment of the automatic pencil of the present invention is shown which employs a pivotal clip to initiate retraction of the lead feed mechanism. The pencil has an outer housing **163** made up of a barrel **165** and an upper member **167**. A continuous lead feed mechanism **169** of conventional type is shown mounted within the housing **163**.

The continuous lead feed mechanism **169** comprises a lead storage magazine **171** and a receiver portion **173**. An apertured disk **175** is mounted between the receiver and magazine. Disk **175** is shaped to provide sloping sides leading toward an aperture **177** to facilitate the loading of lead sticks into the magazine. A reversible eraser holder **179** comprising a decorative cap portion **181** and an eraser **183** is removably mounted within the receiver.

A split spring band **185** having an integral leaf spring member **187** is fixed to lead storage magazine **171**. A latching means **189** is formed on the free end of spring **187**.

A biasing spring **191** is positioned to operate between a ledge portion **193** provided by a flange **195** on barrel member **167** and a ring **197** fixed on continuous lead feed mechanism **169**. Spring **191** provides the force to retract the lead feed mechanism and writing point.

A pivotally mounted clip **199** is mounted along the side of pencil housing **163**. The upper portion of clip **199** is adapted to be pivoted inwardly through an aperture **201** in the upper member **167**. Clip **199** comprises an outer housing **203**, a gripping foot portion **205** and a leaf spring **207** that has one end fastened within housing **203** by means of tabs **209** and its other end formed into a ring section attached to the housing **163** at the junction of the barrel **165** and upper member **167**. Clip **199** includes a bend **211**, about which it is pivotally movable.

A leaf spring **213** is mounted within pencil housing **163** with a portion thereof held by a press fit between the inner wall of barrel **165** and the outer wall of the upper member. End **215** of spring **213** is bent to lock below the bottom of upper member **167** to prevent spring **213** from sliding upwardly in barrel **165**. A short distance above bend **211** in a flat spring **207**, spring **213** is bent outwardly and upwardly aligning the free portion of spring **213** with the exterior of upper member **167**. The free end of spring **213** is bent inwardly a short distance to provide a detent surface **217**.

As shown in FIGURE 8, the lead feed mechanism **169** is in its projected position. In this position, latching means **189** on spring **187** is held by detent surface **217** and further depressions of the cap **181** will activate the lead feed mechanism. When it is desired to retract the lead feed mechanism, the upper part of clip **199** is pivotally depressed into upper member **167**. The projecting sides of clip housing **203** push latching means **189** out from under detent surface **217**, and the rearward bias from spring **191** moves the continuous lead feed mechanism **169** rearwardly until the outwardly biased spring **187** causes latching means **189** to engage a second detent surface **219** provided at the top of clip **199**. The continuous lead feed mechanism will remain in this retracted position until moved downwardly by digital pressure on cap **181**.

The pencils illustrated in FIGURES 1–6 and 8 employ a pivotally mounted clip to retract the continuous lead feed mechanism. Should one of these pencils be in point projected position when it is clipped into a pocket, the lifting of the gripping foot on the clip will depress the upper portion of the clip to release the latching means holding the continuous lead feed mechanism in the projected position. When the latching means is released, the point of the pencil will be pulled rearwardly within the barrel of the pencil preventing undesired marking.

While there has been described what are at present considered to be the preferred embodiments of the invention, it will be understood that various modifications may be made therein which are within the true spirit and scope of the invention as defined in the appended claims.

I claim:

1. An automatic pencil of the continuous feed type comprising a housing, continuous lead feed means axially reciprocable in said housing from a first position where said continuous lead feed means is entirely covered by said housing to a second position where the writing tip portion of said continuous lead feed means projects beyond said housing and being adapted for feeding lead sticks to the writing point; axially reciprocable operating means extending from said housing for moving said continuous lead feed means from said first position into said second position in response to an initial axially reciprocating movement of said operating means and for operating said continuous lead feed means to cause the feeding of lead sticks in response to subsequent reciprocating axial movement of said operating means when said continuous lead feed means is in said second position; means for holding said continuous lead feed means in

said second position; means on said housing for releasing said continuous lead feed means from said second position holding means.

2. The automatic pencil set forth in claim 1 wherein said release means comprises a pivotally mounted clip on said housing.

3. The automatic pencil set forth in claim 1 wherein said release means comprises a laterally depressible button.

4. An automatic pencil of the continuous feed type having point propelling and retracting means comprising

a tubular housing having an aperture in the side thereof;

clip means pivotally mounted on the side of said housing so that a portion thereof is adjacent said aperture in said housing and is movable therein;

first and second detent means on said clip means;

a continuous lead feed means reciprocably mounted within said housing;

leaf spring means on said continuous lead feed means, said leaf spring means having one end thereof attached to said lead feed means and the free end thereof extending longitudinally along and away from said lead feed means;

latching means on the free end of said spring means, said latching means being positioned adjacent said aperture in said housing and cooperating with said first and second detent means on said clip means to fix the projected and retracted states of said automatic pencil; and

reciprocably movable operating means extending from said housing for moving said continuous lead feed means from a retracted state into a projected state in response to an initial axially reciprocating movement of said operating means and for operating said continuous lead feed means to cause the feeding of lead sticks in response to subsequent reciprocating axial movements of said operating means when said lead feed means is in its protracted state.

5. An automatic pencil according to claim 4 further comprising

release means on said clip means for releasing said latching means from one end of said detent means thereby allowing said latching means along with said lead feed means to move to said second detent means.

References Cited

UNITED STATES PATENTS

1,566,871	12/1925	Hudson	401—104 X
1,583,718	5/1926	Hudson	401—104 X
2,158,991	5/1939	Stenersen	401—65
3,033,167	5/1962	Spillman	401—104
3,179,086	4/1965	Owadano	401—104 X

LAWRENCE CHARLES, *Primary Examiner*

U.S. Cl. X.R.

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