

Dec. 27, 1932.

W. E. GUYOT

1,892,145

MECHANICAL PENCIL

Filed June 28, 1930

5 Sheets-Sheet 1

Fig. 1.

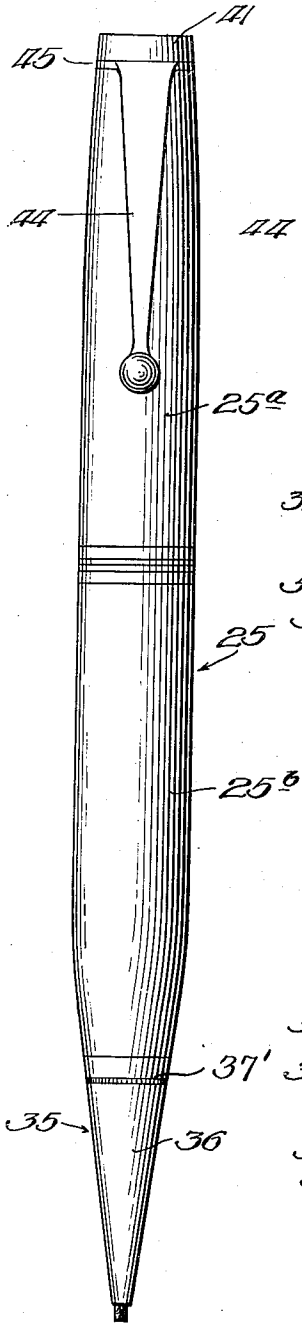


Fig. 2.

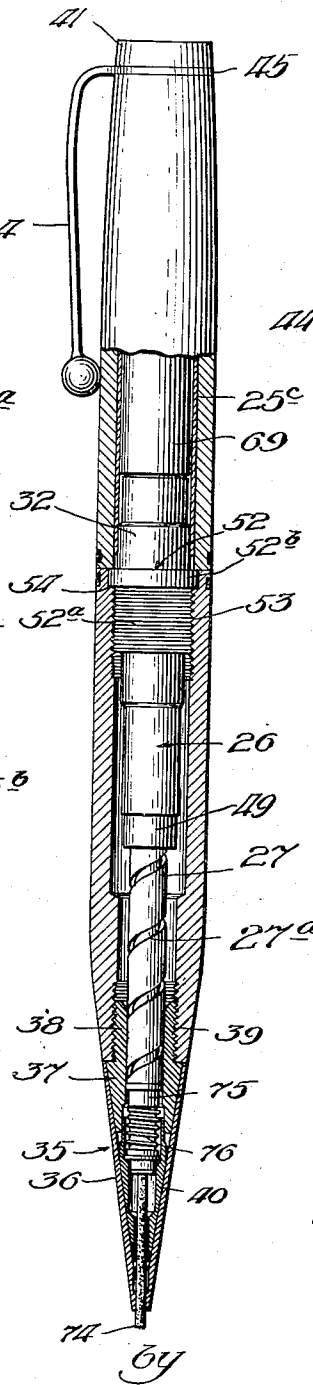
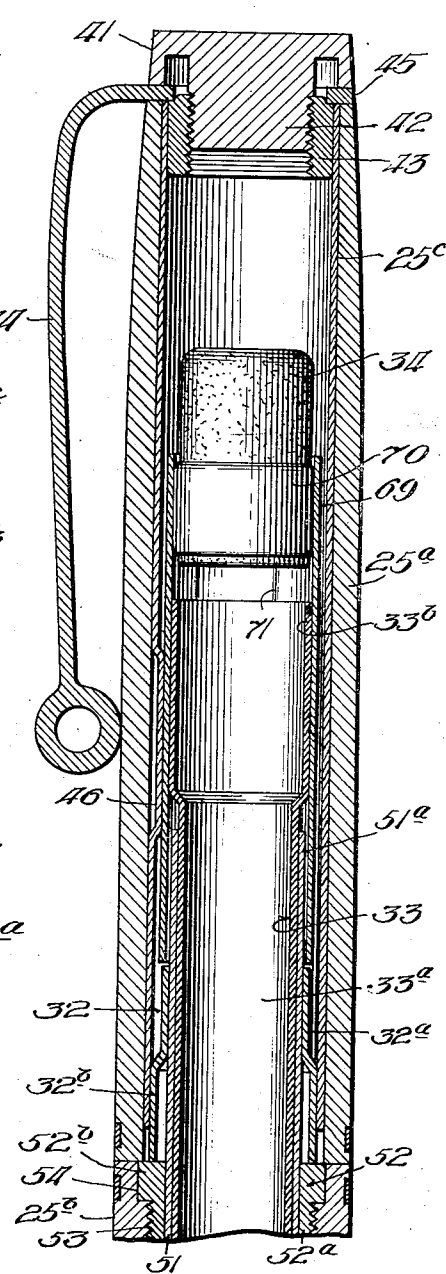


Fig. 3.



Inventor:  
Walter E. Guyot  
Ivan W. Taff  
Att'y

Dec. 27, 1932.

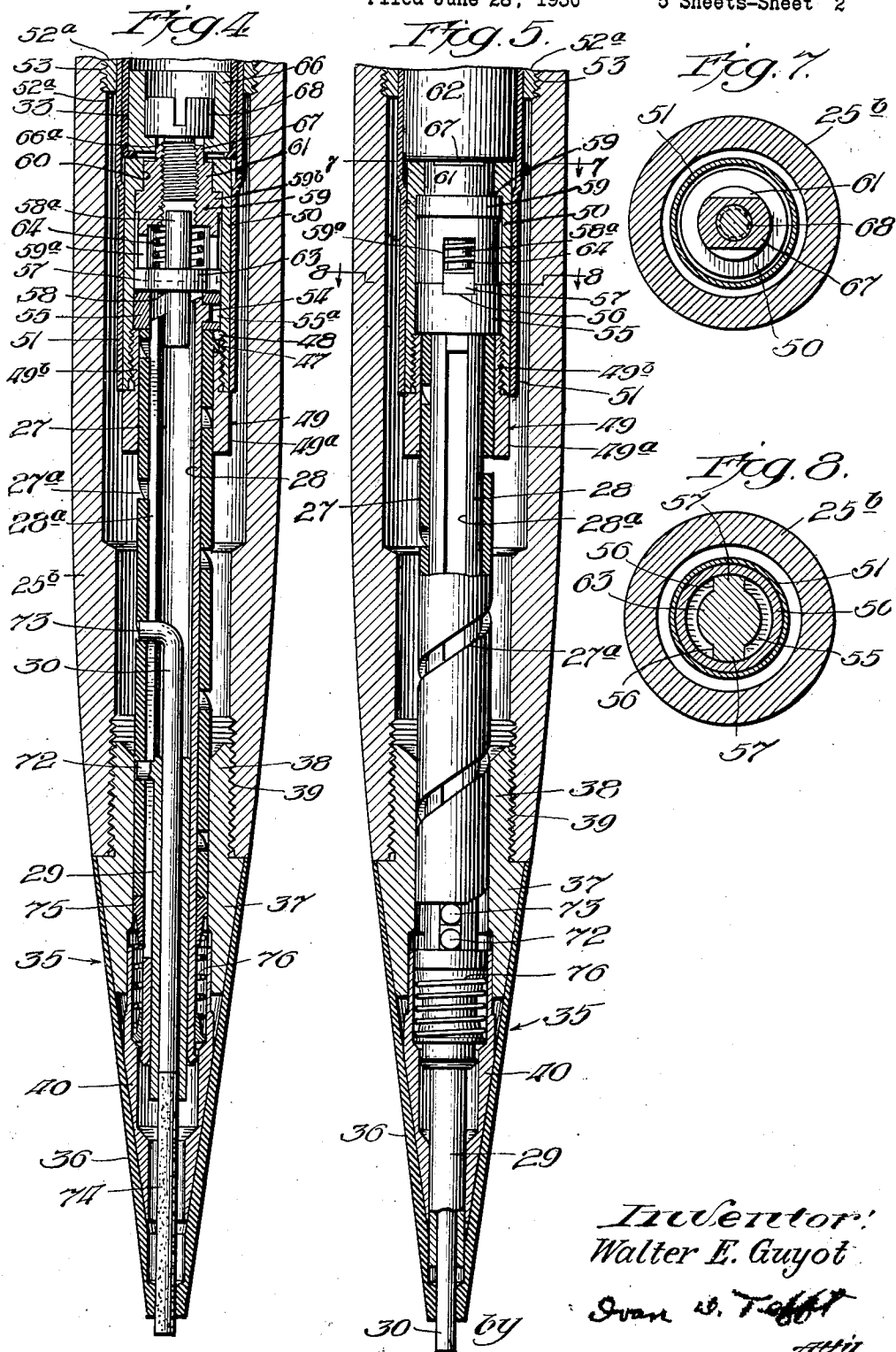
W. E. GUYOT

1,892,145

MECHANICAL PENCIL

Filed June 28, 1930

5 Sheets-Sheet 2



*Inventor:*  
Walter E. Guyot

*Swan W. Telford*  
*Att'y*

Dec. 27, 1932.

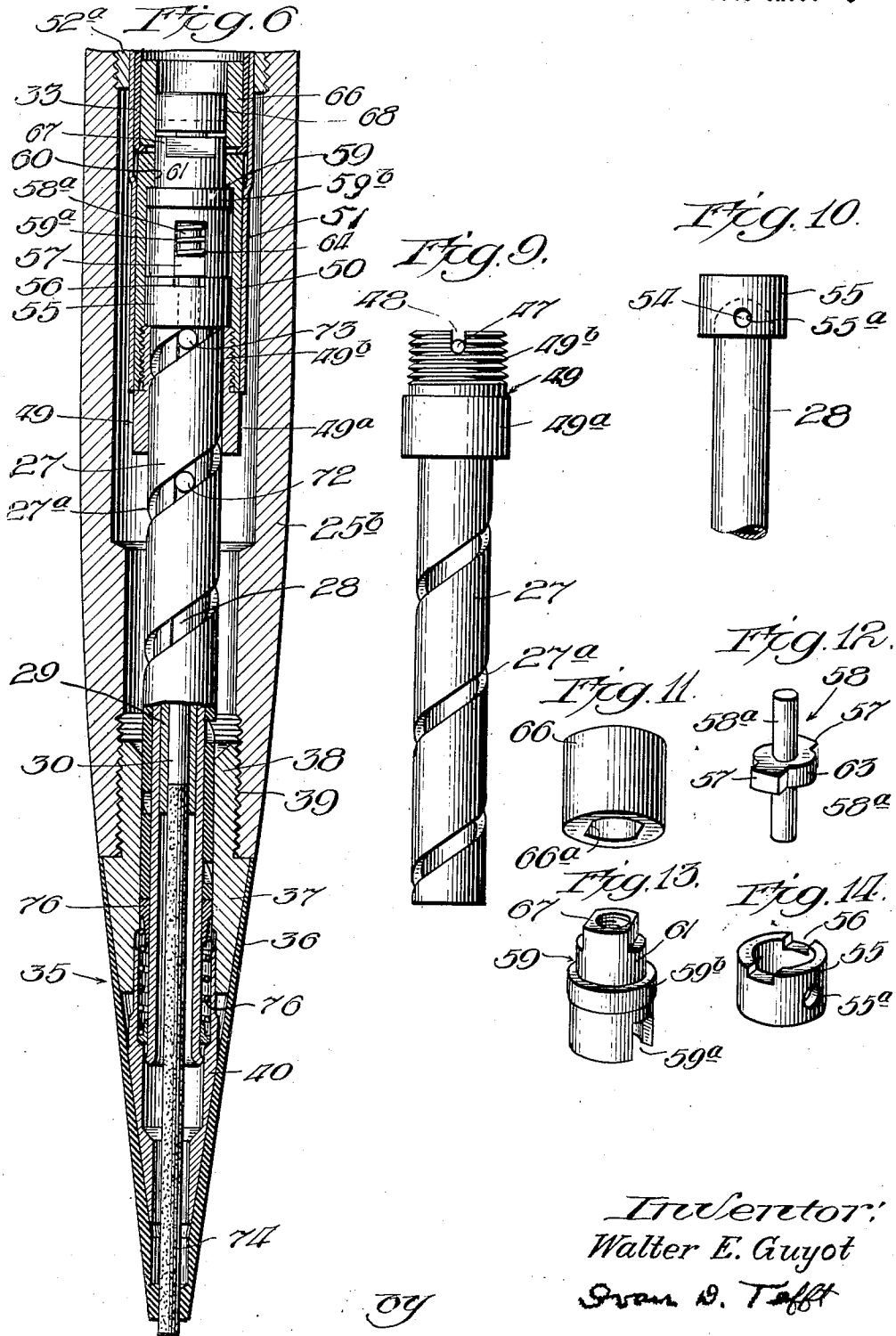
W. E. GUYOT

1,892,145

MECHANICAL PENCIL

Filed June 28, 1930

5 Sheets-Sheet 3



Inventor:  
 Walter E. Guyot  
 Frank D. Telfer

Atty

Dec. 27, 1932.

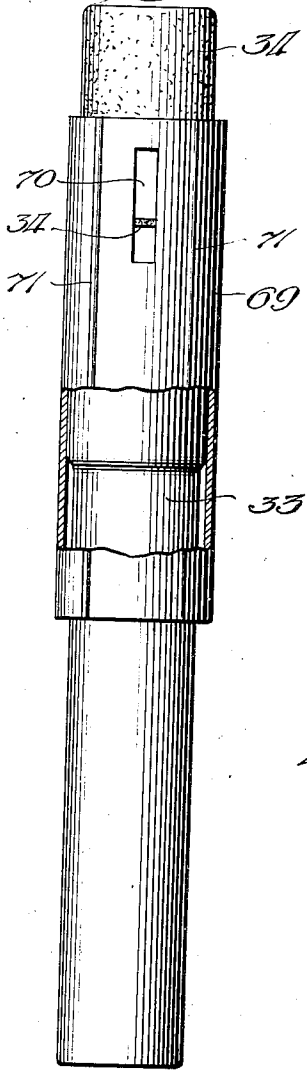
W. E. GUYOT  
MECHANICAL PENCIL

1,892,145

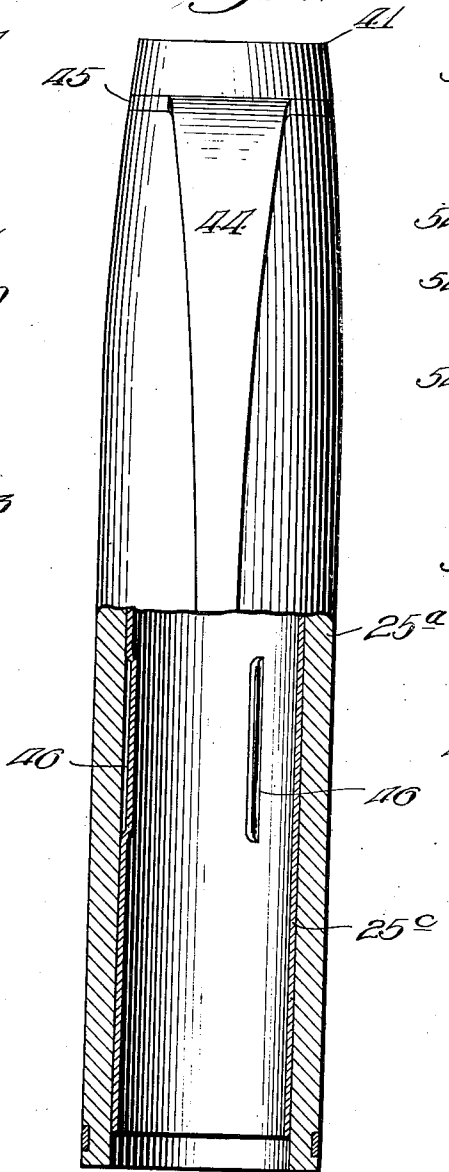
Filed June 28, 1930

5 Sheets-Sheet 4

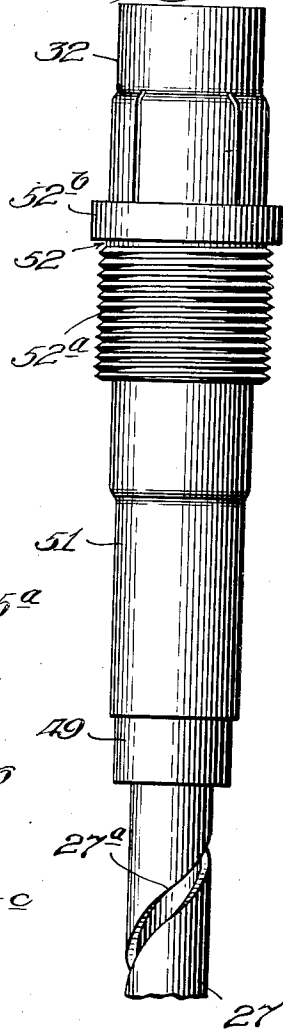
*Fig. 15.*



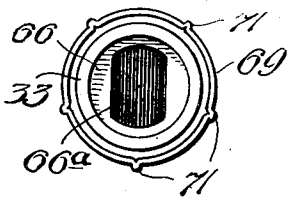
*Fig. 17.*



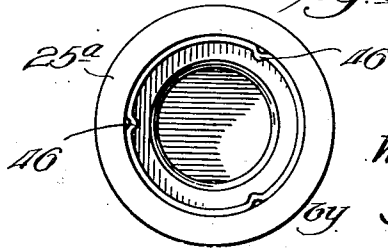
*Fig. 19.*



*Fig. 16.*



*Fig. 18.*



Inventor:  
Walter E. Guyot

by Ivan S. Telft

*Ivy*

Dec. 27, 1932.

W. E. GUYOT

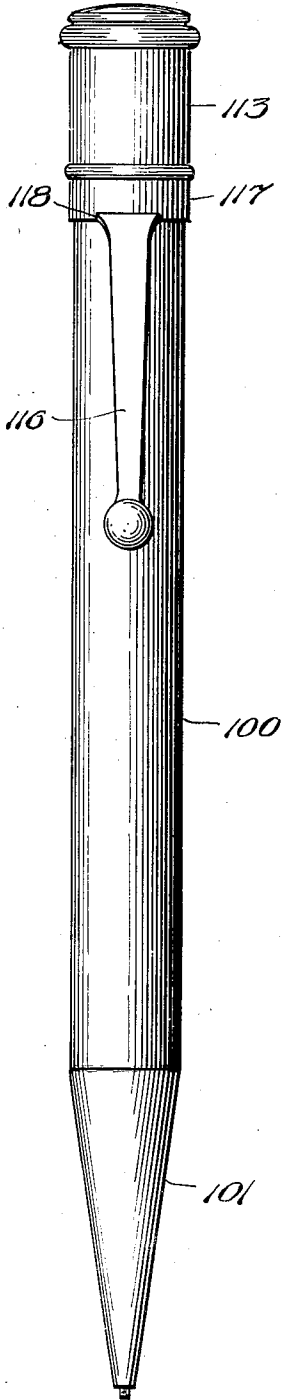
1,892,145

MECHANICAL PENCIL

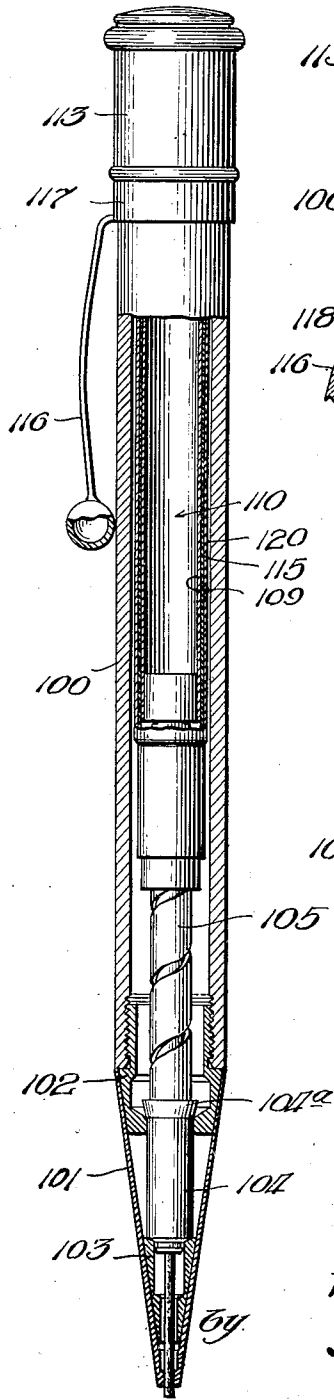
Filed June 28, 1930

5 Sheets-Sheet 5

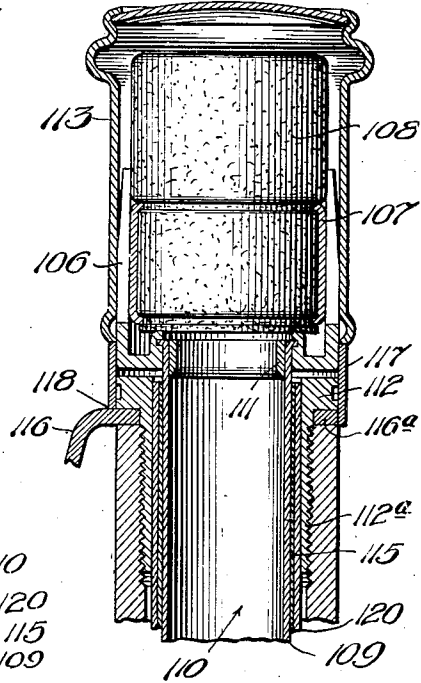
*Fig. 20.*



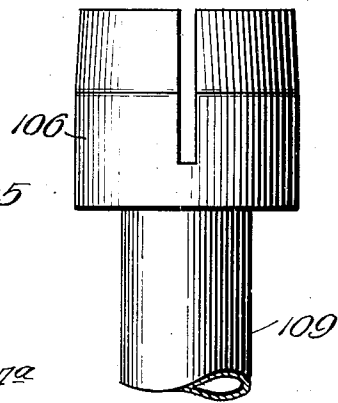
*Fig. 21.*



*Fig. 22.*



*Fig. 23.*



*Inventor:*  
Walter E. Guyot  
*John W. Tefft*  
*Atty*

# UNITED STATES PATENT OFFICE

WALTER E. GUYOT, OF JANESVILLE, WISCONSIN, ASSIGNOR TO THE PARKER PEN COMPANY, OF JANESVILLE, WISCONSIN, A CORPORATION OF WISCONSIN

## MECHANICAL PENCIL

Application filed June 28, 1930. Serial No. 464,692.

My invention relates to mechanical pencils embodying movement mechanism including parts relatively rotatable for advancing and retracting the writing lead.

5 One of the objects of my invention is to provide a self-contained movement mechanism for a mechanical pencil of the foregoing character which includes a plurality of novel coating parts, all of which may be easily and quickly assembled together and detached from each other, whereby the cost of manufacture and repair and replacement costs are materially reduced. My invention further provides an arrangement wherein each of the movement mechanism parts is so related to the other parts that it may be readily replaced whereby defect in one part, or improper operation of one part, does not require discarding of the entire pencil, but merely replacement of the affected part.

Another object is to provide a pencil movement mechanism which is so simple in construction and which is so mounted in the pencil barrel or casing that it may be readily and quickly repaired by unskilled persons. Distributors, dealers, and others, contacting directly with the purchasing public may readily handle repairs of such pencils without the necessity of acquiring expensive repair equipments and without depriving the user of his pencil for any substantial length of time.

A further object is to provide a pencil movement mechanism which, at all times, propels and retracts the entire length of writing lead with a smooth action, free from back-lashing, and the like, objectionable conditions.

An additional object is to provide a pencil of the foregoing character which is more efficient in operation, is more positive in actuation, and which may be more readily and easily handled in writing than pencils heretofore provided.

45 A more specific object of my invention is to provide a pencil of the foregoing character which includes a sectional non-rotatable unit; a sectional rotatable unit including lead carrier-ejector means actuated upon relative rotation of said units; and clutch means con-

trolled by the carrier-ejector means and adapted to break the rotating drive connection between the rotatable unit sections at the end of the retractive movement to cause a cessation of the retractive and other movement of the writing lead, and to prevent jamming and injury to the movement parts when the backward limit of the mechanism is reached. With this arrangement, continued rotation of an accessible section of the rotatable unit will not result in continued rotation of the entire rotatable unit, and the retractive movement of the writing lead is stopped.

Other objects and advantages, having to do with details of construction, and otherwise, will become more apparent as this description progresses and by reference to the drawings illustrating one embodiment of my invention.

In the drawings,

Figure 1 is an elevational view of one form of pencil embodying my invention;

Fig. 2 is another view of the pencil shown in Fig. 1, a portion of the barrel structure being shown in section and the movement mechanism, for the most part, being shown in elevation;

Fig. 3 is an enlarged sectional view through the rear end part of the pencil showing the relationship between the detachable barrel section and the rotatable part of the propelling mechanism;

Fig. 4 is an enlarged sectional view of the forward end of the pencil, showing the movement mechanism. This view is a continuation of Fig. 3 whereby Figs. 3 and 4 taken in conjunction constitute substantially an enlarged sectional view of the entire pencil mechanism, the scale of these two figures being such as to clearly show the relationship between the rather small detail parts of the movement mechanism.

Fig. 5 is a view similar to Fig. 4, except that some of the parts of the propelling mechanism are shown in elevation, and the lead carrier-ejector means is shown in the position the same assumes at the end of the forward movement;

Fig. 6 is a view similar to Figs. 4 and 5 except that the lead carrier-ejector mechanism

55

60

65

70

75

80

85

90

95

100

is shown at the end of its backward movement, the clutch means between the sections of the rotatable portion of the movement mechanism being shown in position to disconnect such sections;

Fig. 7 is a section taken substantially on line 7—7 of Fig. 5;

Fig. 8 is a section taken substantially on line 8—8 of Fig. 5;

Fig. 9 is a separated elevational view of the spirally-slotted tube and the means associated therewith for detachably securing it to the other parts of the movement mechanism, as shown in Figs. 4 and 5;

Fig. 10 is an elevational view of the upper portion of the rotatable longitudinal slotted tube and a portion of the clutch mechanism associated therewith as shown in Figs. 4 and 5;

Figs. 11, 12, 13 and 14 are perspective views of details of the clutch mechanism associated with the rotatable part of the movement mechanism as shown in Figs. 4 and 5;

Fig. 15 is a separated elevational view of the rear rotatable section of the movement mechanism which is enclosed by the rear barrel section as illustrated in Fig. 13;

Fig. 16 is a bottom plan view of the structure shown in Fig. 15;

Fig. 17 is a separated, elevational view, partially in section, of the rear detachable section of the barrel;

Fig. 18 is a bottom plan view of the structure shown in Fig. 17;

Fig. 19 is a separated elevational view of the rear of the fixed portion of the movement mechanism, showing the brake means associated therewith, the rear rotatable section of the movement being omitted;

Fig. 20 is an elevational view of modified form of pencil embodying my invention;

Fig. 21 is a view of the pencil shown in Fig. 20, the barrel and movement mechanism being shown partially in section;

Fig. 22 is an enlarged sectional view of the rear portion of the pencil of Figs. 20 and 21; and

Fig. 23 is a separated elevational view of the eraser supporting part of the structure shown in Fig. 22.

Referring particularly to the drawings, the pencil illustrated takes the form of a barrel or casing 25 in which a movement mechanism (Fig. 2) 26 is detachably housed. In general, the movement mechanism takes the form of a stationary unit which is detachably secured to the barrel, and another unit which is rotatably supported by the stationary unit. The stationary unit includes a spirally-slotted tube 27 (Figs. 2, 4 and 5) and the rotatable part includes a longitudinally slotted tube 28 (Figs. 4 and 5). The writing lead is supported by a socketed lead carrier 29 which is in driving engagement with the slots of both tubes 27 and 28, the arrangement be-

ing such that upon relative rotation of these tubes (and the stationary and rotatable units) the lead-carrier and lead are advanced or retracted, dependent upon the direction of rotation of the rotatable unit. An ejector or knockout pin 30 (Figs. 4 and 5) is associated with the lead carrier 29, and it is similarly driven for ejecting unused lead from the lead carrier and from the pencil at the end of the propelling movement. Provision is made for continued relative rotation of parts of the stationary and rotatable units at the end of the propelling and retracting movements without further propelling or retracting action so as to avoid jamming of the movement mechanism which might result in injury to the parts thereof. Continued movement of the mechanism at the end of the propelling movement is provided for in a manner disclosed in U. S. Letters Patent No. 1,632,371, granted to George W. Gilman, dated June 14, 1927, for pencil; while at the end of the retracting movement, this feature is provided by disconnecting the longitudinally slotted tube 28 from its actuating part or section by means of a clutch structure (Figs. 5 and 11-14) actuated by the ejector pin 30.

The actuating section 33 of the rotatable unit has positive, but detachable, drive connection with a rear and rotatable section 25<sup>a</sup> of the barrel 25, and a brake device 32 (see Figs. 3 and 19) fixedly supported by the stationary unit of the movement mechanism coacts with the rotatable section of the barrel in such a way as to brake and frictionally resist rotational movement of the rotatable unit of the movement mechanism. This feature avoids accidental adjustment of the movement mechanism (and the lead) by movements of the hand while writing. The rotatable section of the movement mechanism which has drive connection with the longitudinally slotted tube 28 by means of the clutch structure constitutes a lead chamber 33<sup>a</sup> (Fig. 3), the closure of which takes the form of an eraser 34 (Fig. 3), all of which is readily accessible by mere removal of the rear barrel section 25<sup>a</sup>.

I will now describe in detail the several parts hereinabove generally referred to, with particular reference to the several features having to do with my invention.

#### *The barrel*

The barrel section 25<sup>b</sup> is provided at its forward end with a tip 35 formed preferably, but not necessarily, as follows: An outer conical shell 36 receives in its upper end a tubular connection plug which has a conical part 37 secured in the shell (preferably, by crimping the shell as at 37'—Fig. 1), and a reduced threaded stem 38 engaging suitable threads 39 formed in the forward end of the barrel section 25<sup>b</sup>. The shell 36 is of such size and shape that when the plug 38 is

screwed into the barrel, it serves as a continuation of the barrel surface as shown in Figs. 1, 4, 5 and 6. The lower or forward end of the tip shell has fitted thereinto a conical bushing 40, the lower end of which extends near the forward end of the shell, and which is provided with a central bore of varying diameter. This bushing serves as a support for the wall of shell 36 as well as a guide for the movement mechanism and the writing lead. The extreme forward end of the shell 36 has a thickened wall portion with an axial bore therethrough slightly larger than the diameter of the lead for guidance and support of the latter.

The rear section 25<sup>a</sup> of the barrel is mounted upon the forward barrel section by means of the movement mechanism. The rear end of this rear section is provided with a detachable plug 41 for removably attaching a clip 44. This plug has a central depending threaded part 42 which engages an internally threaded sleeve 43 fixedly mounted in the rear of this barrel section. The clip 44 has a ring-shaped body 45 through which the part 42 of the end plug passes to secure the clip in place (Fig. 3).

The inner wall of the rear barrel section 25<sup>a</sup> is provided with a metal lining 25<sup>c</sup> which, at a point near the center of this section, is provided with an annularly arranged group of inwardly extending, spaced ribs 46 which coast with sleeve section 69 of the rotatable unit of the movement mechanism to actuate the latter, as will be referred to more particularly hereinafter.

#### *The movement mechanism*

The movement mechanism is a unitary structure comprised of relatively rotatable units, one of which I may term the stationary unit and the other the rotatable unit.

*The stationary unit.*—This portion of the movement mechanism consists of the tube 27 having a spiral slot 27<sup>a</sup> extending throughout its length. This spirally-slotted tube is provided at its upper end with an outwardly extending pin 47 which is adapted to be received in a slot 48 (Figs. 4 and 9) of a tubular lock nut 49 adapted to pass snugly over the spirally-slotted tube 27 to the position shown in Fig. 9. The lock nut 49 is provided with an enlarged head 49<sup>a</sup> and a reduced threaded portion 49<sup>b</sup> which threadedly engages the lower end of a bushing 50 preferably force-fitted in the lower end of the spiral-supporting casing 51. By screwing the lock nut 49 up so that its enlarged head 49<sup>a</sup> seats against the lower end of the bushing 50, the spiral is detachably fixed to the casing 51. The forward end of the spiral tube passes into the bore of the connection plug 37, which aids in support of such tube in the barrel.

The rear end of the casing 51 (Figs. 2, 3 and 4) is preferably force-fitted within a

movement locking sleeve 52 which is provided with an externally threaded part 52<sup>a</sup> engaging the threads 53 in the rear end of the barrel section 25<sup>b</sup>. This movement locking sleeve is provided with an enlarged head 52<sup>b</sup> which when screwed into place on the barrel seats in an enlarged shallow counterbore 54 in the rear end of the barrel section 25<sup>b</sup> substantially flush with the rear end of that section, whereby it is inaccessible for removal except with proper tools.

The spiral-supporting casing 51 is long enough to extend rearward through and beyond the movement locking sleeve, as shown at 51<sup>a</sup> in Fig. 3, so as to give added support to the rotatable part of the movement mechanism as will be obvious from the description which follows. The casing extension 51<sup>a</sup> fixedly carries the brake device 32 which takes the form of a metal sleeve having one portion 32<sup>a</sup> securely fastened (in any desired manner) to the outer end of the casing extension 51<sup>a</sup>, and another and enlarged depending skirt portion 32<sup>b</sup> which may be slitted lengthwise. The diameter of this skirt portion of the brake device is slightly greater than the inside diameter of the shell or lining 25<sup>c</sup> of the barrel section 25<sup>a</sup> so that when the rear barrel section 25<sup>a</sup> is inserted upon the movement to the position shown in Figs. 2 and 3, the enlarged skirt 32<sup>b</sup> of the brake device is slightly compressed and it is tensionally engaged with the lining 25<sup>c</sup> to frictionally resist relative movement between such device and the rear barrel section.

*The rotatable unit.*—This portion of the mechanism is journaled, so to speak, in the stationary portion above described and it includes several sections and parts arranged as follows:

The tube 28 which is mounted within and rotatably guided by the spirally-slotted tube 27 is provided with a longitudinal slot 28<sup>a</sup> extending from its rear end to near its forward end. The rear end of this tube 27 is cut away obliquely and is provided with a lateral pin-like projection 54, which is received in an opening 55<sup>a</sup> in the wall of a collar 55 (Figs. 4, 10 and 14). The obliquely-cut end permits of the ready entry of the same within the collar 55, facilitating the assembly of the collar 55 upon the tube in a manner obvious from the drawings. The collar 55, being mounted upon the inner end of the tube 28, seats upon the inner end of the spiral tube 27 thereby supporting the former for rotation within the latter.

The upper edge of the locking collar 55 (the edge opposite that which is seated upon the tube 27) is provided with diametrically opposed rectangularly-shaped notches 56 (Figs. 5, 6 and 14) which are adapted to receive the lower part of the oppositely extending arms 57 of a floating clutch member 58



(Figs. 4, 5, 6 and 12). The upper part of the float arms 57 are received in somewhat deeper notches 59<sup>a</sup> in a clutch supporting and guiding member 59 (Figs. 4, 5, 6 and 13), which member is snugly and rotatably received in the upper part of the bushing 50. The rear end of the bushing 50 is provided with an opening 60 through which the rear reduced cylindrical part 61 of the member 59 passes for attachment to the actuating section 33 of the rotatable unit. The member 59 reciprocally receives the cylindrical clutch body part 63 supporting a clutch actuating-guide stem 58<sup>a</sup> which is long enough to project both above and below the clutch body. Inward movement of the clutch body 63 is opposed by a spring 64 which surrounds the clutch stem and is confined between such body and the end wall of the clutch receiving bore of the member 59. The notches 56 and 59<sup>a</sup> of the collar 55 and member 59 are aligned, and the spring 64 tends normally to move and hold the clutch arms 57 downwardly with their lower portions seated partly within the notches 56 and partly within the clutch guide member notches 59<sup>a</sup> so as to positively connect the collar 55 and member 59 for rotary movement together.

A cup-shaped insert 66 is force-fitted into the lower or inward end of the tubular actuating section 33 of the rotatable unit, the lower end of this section being turned inwardly beneath the bottom of the insert for further securement of the same. The bottom of the insert 66 is provided with a rectangularly-shaped opening 66<sup>a</sup> in which is received a short, correspondingly-shaped extension 67 of the clutch-guide member 59. The shoulder portion formed by the reduced extension 67 seats against the bottom of the insert 66 and such extension is provided with a threaded opening adapted to receive the threaded stem of screw 68 which has its enlarged head supported and confined within the bushing 66 (see Figs. 4, 11 and 13). When the screw 68 is set up to its assembled position, the shoulder of extension 67 is drawn up firmly against the insert 66, preventing the member 59 from being drawn up to a point where its shoulder 59<sup>b</sup> would bind against the adjacent surface of the bushing 50. The lock nut 49 serves to retain the member 59 in position when screw 68 is removed, and the foregoing parts are all so related that the member 59 is always free to rotate for rotation of section 33, member 59, tube 28, lead-carrier 29 and ejector pin 30 as a unit.

The actuating section 33 extends rearwardly through and finds rotatable support in the spiral-supporting casing and its extension 51<sup>a</sup>. The part of this section member which extends on rearwardly of the casing extension 51<sup>a</sup> is slightly enlarged as at 33<sup>b</sup> and it is force-fitted (or otherwise secured) within an enlarged drive sleeve 69 which is long enough

to extend forwardly over and in rotatable telescopic relation to the spiral-supporting casing extension 51<sup>a</sup>. This sleeve 69 also extends rearwardly of the section 33 to slidably receive an eraser gripping band 70 (Fig. 3). It will be noted that the section 33 and the extension sleeve 69 (Figs. 3 and 4) constitute the lead-receiving chamber 33<sup>a</sup> which is closed by the eraser 34.

The drive sleeve 69 is provided with an annular group of spaced, outwardly projecting ribs 71 (Figs. 3, 15 and 16) which are received between the ribs 46 of the rear barrel section lining 25<sup>c</sup> when such barrel section is in place upon the pencil thereby providing a positive drive interlock between the rear barrel section 25<sup>a</sup>, the sleeve 69, section 33 and connected parts of the rotatable unit hereinbefore described.

*The lead carrier and ejector.*—The lead carrier takes the form of a tube having its bore at the forward end of such diameter as to grippingly receive one end of the writing lead. This tube is of an outside diameter adapted to fit rather snugly within the longitudinally slotted tube 28 for guidance, and its inward end is provided with a lateral, pin-like projection 72 which is long enough to extend through both the slot 28<sup>a</sup> and the slot 27<sup>a</sup> in the tubes 28 and 27, respectively.

The ejector takes the form of a pin 30 which is of such size as to fit freely within the bore of the lead-carrier tube 29, and this pin has its inward end turned over to provide a lateral, pin-like projection 73 of sufficient length to engage both the slots 28<sup>a</sup> and 27<sup>a</sup> in the spiral and longitudinally slotted tubes. The projections 72 and 73 of the carrier tube and ejector pin engage the spiral slot 27<sup>a</sup> of the spiral tube in a predetermined spaced relation for a reason which will be well understood.

#### Operation

Assuming that the movement mechanism parts are in the position shown in Fig. 6 and it is desired to advance the writing lead 74,—the forward barrel section 25<sup>b</sup> may be grasped in one hand while the rear barrel section is rotated by the other hand. As the rear barrel section is rotated, in a clockwise direction, a like movement is transmitted through the lead-chamber section 33 and the clutch structure to the longitudinally slotted tube 28 causing a like movement of the lead carrier 29 and ejector pin 30. As the lead carrier and projector pin are thus rotated, they are advanced in the usual manner by the spiral groove 27<sup>a</sup>. As this propulsive movement is continued, the pin 72 of the lead carrier finally passes through the forward end of the spiral slot 27<sup>a</sup> and rotates between the forward end of the spiral tube and spring-pressed washer 75. After the carrier pin 72 thus passes out of the end of the spiral slot,

the ejector pin 30 continues to advance and finally assumes the position shown in Fig. 5 wherein it projects beyond the forward end of the lead carrier to entirely eject the lead therefrom and from the pencil.

On the retractive movement, the action is somewhat like that above described, except that the rear barrel section and the rotatable unit are rotated counterclockwise and the lead carrier and ejector are moved rearwardly. With the spring 76 pressing the washer 75, lead-carrier 29 and ejector pin 30 upwardly toward the forward end of the spiral tube 28, both the ejector pin and lead carrier are engaged with the slot in the spiral tube in the order mentioned as the rotatable unit is rotated. It is also highly desirable to avoid injury to the movement parts due to further actuation or attempted actuation of the movement parts when the end of the retractive movement is reached. I provide this feature at the end of the retractive movement by disconnecting the lead-chamber or actuating section 33 from the longitudinally slotted tube 28 as follows: As the ejector pin 30 travels rearwardly, it eventually strikes the lower end of the stem 58<sup>a</sup> of the floating clutch raising the clutch member 58 sufficiently for slipping of its arms 57 from the notches 56 in the collar 55 upon continued rotation of the rear barrel section (and section 33) in the direction stated. When these parts are thus disengaged, the clutch arms ride upon the top of collar 55 until they again reach the collar notches 56 which they releasably engage with a click-like action. In continued retractive movement of the section 33 (and rear barrel section 25<sup>a</sup>) there is a noticeable clicking sound which warns the operator that the end of the retractive movement is reached. Obviously, such continued rotation of the rear barrel section 25<sup>a</sup> and lead chamber section 33 of the rotatable unit will not result in a like movement of the longitudinally slotted tube 28 due to the disengagement of the clutch; that is to say, the longitudinally slotted tube 28, lead carrier, and lead remain stationary upon rotation of the accessible portion of the rotatable unit. This condition exists so long as the ejector pin 30 remains at the end of its retractive movement. As soon as the propel movement is again started by opposite rotation of the rear barrel section, and the ejector pin 30 has moved forwardly (due to engagement of the clutch arms 57 with notches 56), the spring 64 presses the clutch member 58 downwardly into full engagement with the collar notches 56 whereby the parts are again positively connected for movement of the rotatable parts as a unit.

If the rotary movement of the rear barrel section were free, or dependent solely upon the frictional engagement between the several relatively rotating parts of the move-

ment mechanism, there might be a tendency for the rear barrel section and the rotatable unit of the movement mechanism to rotate or "creep" due to the movement of parts of one's hand in writing. To avoid this, the inward end of the rear barrel section frictionally and tensionally engages the skirt portion 32<sup>a</sup> of the brake device 32. This brake device also serves as a rotatable guide for the forward end of the rotatable barrel section as well as frictionally resisting longitudinal movement (or detachment) of such barrel section for access to the lead chamber.

In Figs. 20 to 22, inclusive, I show another form of pencil embodying my invention. In this form, the barrel 100 supports a tip 101 at its forward end which tip is secured to the barrel by a conically headed connection plug 102 quite similar to that previously described. The forward end of the tip 101 is provided with a tapered bushing 103 which serves to guidingly receive the forward end of the movement mechanism and the lead as illustrated in Fig. 21. In this form, the bushing 103 and connection plug 102 are bridged by a tubular sleeve 104 having a flared mouth 104<sup>a</sup> for receiving and giving support to the spirally-slotted tube 105 and associated parts of the movement mechanism.

The so-called stationary unit of this modified form of pencil is substantially the same as that previously described. It is supported in the barrel in substantially the same manner and serves as the support for the rotatable unit of the movement mechanism.

The rotatable unit is also similar to that previously described, except at its rear end it is provided with a cup-shaped, eraser-receiving, split sleeve 106 in which is slidably received the band 107 supporting the eraser 108. This eraser holding sleeve may be fixed to the rotatably actuating tube 109 in any desired manner, but preferably as shown in Fig. 22. The tube 109 serves as a lead chamber 110 which is closed by the eraser 108. The rear end of the tube 109 is provided with a reducing sleeve 111 restricting the entrance to the lead chamber 110.

The sleeve 112 for locking the movement in the barrel supports a band 117 which together with the removable cap 113 conceals the rear projecting part of the movement mechanism. The cap 113 is grippingly received upon the eraser sleeve 10 so that upon rotation of such cap, the rotatable movement of the movement mechanism is also effected.

This modified form of pencil also includes a brake device which takes the form of rawhide, fibre or any other suitable friction material 115 disposed between the rotatable tube 109 and the spiral-supporting casing 120 of the stationary unit. This brake device may take any suitable form, but preferably a cylindrical sheet form of such thickness of material as to give the proper, and desired, fric-

tional resistance between the relatively rotatable tube and casing 120.

This pencil is also provided with a clip 116 having an angularly-disposed, ring-shaped body 116<sup>a</sup> through which the depending threaded portion 112<sup>a</sup> of the movement locking sleeve passes. The band 117 is provided at one side with a notch 118 for receiving the laterally-projecting part of the clip 116 so that the clip may be secured in place upon the pencil with its body 116<sup>a</sup> concealed by such band as illustrated in Figs. 20-22. Other than the foregoing, this latter form of pencil is of substantially the same construction and operates in substantially the same manner as the form previously described.

Other changes in details and arrangement of parts may be made without departing from the spirit and scope of my invention as defined by the claims which follow.

I claim:

1. In a mechanical pencil, a propelling mechanism including a pair of relatively rotatable telescoping tubes, a support, means securing one of said tubes to said support non-rotatably, and means supporting the other of said tubes rotatably and detachably upon the said one tube, said first securing means preventing disassembly of said tubes except upon detachment of said one tube from its support.

2. In a mechanical pencil, a propelling mechanism adapted to be mounted in a casing including a support having detachable non-rotary engagement with said casing, a tube, means for detachably securing said tube non-rotatably to said support, a second tube, means for rotatably supporting said second tube upon the first, said two tubes being non-separable except on detachment of said first means, and a rotatable drive element journaled in said support and having drive connections with said second tube.

3. In a mechanical pencil, a propelling mechanism adapted to be mounted in a casing which includes a support detachably secured to said casing, a tube detachably secured to said support, another tube journaled in said first mentioned tube, a rotatable member journaled in said support, and floating clutch means between the adjacent ends of said member and said second tube for drive-connecting said member and said second tube.

4. In a mechanical pencil, a propelling mechanism adapted to be secured to a casing which comprises a tubular support, a spirally-slotted tube, means for detachably securing said support to said casing, means for detachably securing said spirally-slotted tube to said support, a longitudinally-slotted tube disposed within said spirally-slotted tube, means attached to said longitudinally-slotted tube and supported by said spirally-slotted tube for supporting the former tube rotatably in the latter, a drive element ro-

tatably supported by said support, and clutch means connecting said element to said longitudinally-slotted tube supporting means.

5. In a mechanical pencil, a propelling mechanism adapted to be secured to a casing which comprises a tubular support, a spirally-slotted tube, means for detachably securing one end of said support to said casing, means for detachably securing one end of said spirally-slotted tube to the other end of said support, a longitudinally slotted tube disposed within said spirally-slotted tube, means attached to one end of said longitudinally-slotted tube and supported by the attached end of said spirally-slotted tube for supporting the former tube rotatably in the latter, a drive element rotatably supported by said support, and clutch means within said support connecting said element to said longitudinally-slotted tube supporting means.

6. In a mechanical pencil, a propelling mechanism adapted to be supported in a casing comprising a stationary unit and a rotatable unit; said stationary unit comprising a tubular member adapted to be detachably secured to said casing, a spirally-slotted tube, and a lock nut carried by said spirally-slotted tube and detachably engaging said tubular member; said rotatable unit comprising a longitudinally-slotted guide tube, means carried by said guide tube and engaging said spirally-slotted tube for supporting said guide tube rotatably upon said spirally-slotted tube, a member rotatably mounted in said tubular member and projecting through the latter, floating clutch means between said rotatable member and said guide tube supporting means for rotation of said guide tube, and means engaging the projecting part of said rotatable member for movement of the rotatable unit.

7. In a mechanical pencil, a propelling mechanism adapted to be supported in a casing comprising a stationary unit and a rotatable unit; said stationary unit comprising a tubular member adapted to be detachably secured to said casing, a spirally-slotted propel tube, and a lock nut carried by said spirally-slotted tube and detachably engaging said tubular member; said rotatable unit comprising a longitudinally-slotted guide tube, means carried by said guide tube and engaging said spirally-slotted tube for supporting said guide tube rotatably upon said spirally-slotted tube, a member rotatably mounted in said tubular member and projecting through the latter, floating clutch means between said rotatable member and said guide tube supporting means for rotation of said guide tube, and means engaging the projecting part of said rotatable member for movement of the rotatable unit; said tubular member, spirally-slotted tube, and guide tube being readily detached from each other by disengaging said lock nut.

8. In a mechanical pencil, a propelling mechanism adapted to be mounted in a casing comprising two relatively rotatable tubes, one of which rotatably and detachably supports the other, a supporting member adapted to be detachably secured to said casing, said one tube being detachably carried by said supporting member so as to lock said member and said two tubes together detachably as a unit, a rotatable member detachably supported by said supporting member, and clutch means between said rotatable member and said other of said tubes for rotation of the latter as said rotatable member is rotated.

9. In a mechanical pencil, a propelling mechanism adapted to be mounted in a casing comprising two relatively rotatable tubes, one of which rotatably and detachably supports the other, a supporting member adapted to be detachably secured to said casing, said one tube being detachably carried by said supporting member so as to lock said member and two tubes together detachably as a unit, a rotatable member detachably supported by said supporting member, clutch means between said rotatable member and said other of said tubes for rotation of the latter as said rotatable member is rotated, and means for rotating said rotatable member.

10. In a mechanical pencil, propelling mechanism including a stationary unit and a sectional rotatable unit, lead-carrier means moved forward and retracted by relative rotation of said units, clutch means between two of the sections of said rotatable unit, and means associated with said lead-carrier means and engageable with said clutch means in the fully retracted position of said lead carrier means for actuating said clutch to disconnect said clutch-connected sections of said rotatable unit.

11. In a mechanical pencil, propelling mechanism including a stationary unit and a sectional rotatable unit, a lead-carrier and an ejector means, both moved forward and backward by relative rotation of said units, and means engaged by said lead ejector means as the latter is moved backwardly for breaking connection between certain of the sections of said rotatable unit to permit one of said sections of said rotatable unit to rotate relative to the other.

12. In a mechanical pencil, propelling mechanism including a stationary unit and a sectional rotatable unit, lead-carrier means moved in forward and backward directions by relative rotation of said units, and having lead-ejector means associated therewith and likewise propelled, a clutch between two of the sections of said rotatable unit, said clutch being adapted to be disengaged by said lead ejector means only when the latter has reached a predetermined backward position.

13. In a mechanical pencil, propelling mechanism including a sectional rotatable

unit and a stationary unit, lead carrier means and lead ejector means both moved in forward and reverse directions by relative rotation of said units, means for permitting continued free relative rotation of said units at the end of the reverse movement, a clutch between two of the sections of said rotatable unit, said clutch being actuated by said ejector means at the end of its reverse movement to disconnect the clutch-connected sections of said rotatable unit to permit free continued rotation of one of said clutch-connected sections without further reverse movement of the other of said clutch-connected sections.

14. In a mechanical pencil, propelling mechanism including a sectional rotatable unit and a stationary unit, lead-engaging means propelled and retracted by relative rotation of said units, and means for connecting certain of the sections of said rotatable unit, said latter means being adapted to be engaged by said lead-engaging means in its retractive movement for breaking the connection between said certain sections.

15. In a mechanical pencil, propelling mechanism including a sectional rotatable unit and a stationary unit, means engaging the lead to eject the same and propelled and retracted by relative rotation of said units, and clutch means controlled by said lead-ejecting means for breaking the connection between the sections of said rotatable unit when said lead-ejecting means has reached the end of one of its movements.

16. In a mechanical pencil, a propelling mechanism including a stationary unit and a rotatable unit; lead carrier and ejector means propelled and retracted by said units; said rotatable unit comprising a tubular member rotatably mounted in said stationary unit, a driving element therefor, and a clutch between said member and element adapted to be engaged by said ejector means to break the driving connection between said member and element.

17. In a mechanical pencil, a propelling mechanism including a stationary unit and a rotatable unit; lead carrier and ejector means propelled and retracted by said units, said rotatable unit comprising a tubular member rotatably mounted in said stationary unit, a clutch element carried by said tubular member, a driving element therefor, a clutch element carried by said driving element, and a floating clutch member between said tubular member and drive element and normally engaged with both said clutch elements and adapted to be disengaged from one of said clutch elements by and as said ejector means reaches the end of its retractive movement.

18. In a mechanical pencil, a propelling mechanism comprising a stationary unit, a sectional rotatable unit and lead carrier and

ejector means propelled and retracted by relative rotation of said units, and clutch means between two of the sections of said rotatable unit for breaking rotation connection therebetween which comprises, a clutch element carried adjacent the end of one section, another clutch element carried adjacent the end of the other section, a clutch member between said elements and held normally engaged with both said elements, said clutch member having a part adapted to be engaged by said ejector means at the end of its retractive movement for disengaging said clutch member from one of said clutch elements to disconnect said two clutched sections.

19. In a mechanical pencil, a propelling mechanism comprising a stationary unit, a sectional rotatable unit and lead carrier and ejector means propelled and retracted by relative rotation of said units, and clutch means between two of the sections of said rotatable unit for breaking rotation connection therebetween which comprises, a clutch collar carried by the end of one section and having notches therein, another clutch collar carried by the end of the other section, and having notches therein, a floating cross-shaped clutch member between said collars with its arms held normally engaged with the notches of both said elements, said clutch member having its stem adapted to be engaged by said ejector means at the end of its retractive movement for disengaging said clutch member from one of said clutch collars to disconnect said two clutched sections.

20. In a mechanical pencil, a propelling mechanism comprising a stationary unit which includes a spirally-slotted tube, a rotatable unit which includes a plurality of sections one of which is a longitudinally slotted guide tube, a lead carrier and lead ejector engaged with the slots of said two tubes for forward and retractive movement thereof, and clutch means between said guide tube and the adjacent section of the rotatable unit comprising a clutch element supported by the end of said guide tube adjacent said latter-mentioned section, a clutch element supported by the adjacent end of said clutched section, and a clutch member between said clutch elements and normally positively engaged with both of the latter and adapted to be disengaged from one of said elements by and when said ejector reaches the end of its retractive movement.

21. In a mechanical pencil, a propelling mechanism comprising a stationary unit which includes a spirally-slotted tube, a rotatable unit which includes a plurality of sections one of which is a longitudinally slotted guide tube, a lead carrier and lead ejector engaged with the slots of said two tubes for forward and retractive movement thereof, and clutch means between said guide tube and

the adjacent section of the rotatable unit comprising a notched clutch collar detachably supported by the end of said guide tube adjacent said latter-mentioned section, a notched clutch collar detachably supported by the adjacent end of said clutched section, and a cross-shaped clutch member between said clutch collars and normally positively engaged with the notches of both of the latter and adapted to be disengaged from the notches of one of said collars by and when said ejector reaches the end of its retractive movement.

22. In a mechanical pencil, propelling mechanism which comprises a stationary unit including a non-rotatable support, a spirally-slotted tube, and a lock nut carried by said spirally-slotted tube and detachably engaging said support to secure said parts together as a unit, a rotatable unit including a longitudinally slotted guide tube, a notched clutch collar detachably carried by one end of said guide tube and resting on the adjacent end of said spirally-slotted tube to rotatably support said guide tube in said latter tube, a drive section detachably and rotatably carried by said support and having on its inner end a notched clutch collar, a cross-shaped clutch member between said clutch collars and having its arms of such thickness as to normally engage the notches of both said collars, spring means acting on said clutch member to normally engage it with the notches of both said collars for positive drive connection between said guide tube and said drive section; and lead carrier-ejector means which includes an ejector pin having engagement with both said tubes and adapted at the end of its retractive movement to engage the stem of said clutch member and actuate the latter for disengagement from the notches of the clutch collar carried by said guide tube.

23. In a mechanical pencil, propelling mechanism comprising two relatively rotatable units one of which is sectional, lead carrier and ejector means propelled and retracted by relative rotation of said units; and clutch structure for disconnecting two of the sections of the sectional unit which comprises a notched clutch element carried by one of the clutched sections, a notched clutch element carried by the other of the clutch sections, a clutch member between said elements, a spring normally holding said member in positive engagement with the notches of both of said elements, said member being adapted to be engaged by said ejector means to disengage it from the notches of one of said elements when said ejector means reaches the end of its retractive movement.

24. In a mechanical pencil, propelling mechanism comprising two relatively rotatable units one of which is sectional, lead carrier and ejector means propelled and re-

tracted by relative rotation of said units; and clutch structure for disconnecting two of the sections of the sectional unit which comprises a notched clutch collar carried by one of the clutched sections, a notched clutch collar carried by the other of the clutched sections, a cross-shaped clutch member between said elements, a spring within one of said collars engaging and normally holding said member in positive engagement with the notches of both of said collars, the stem part of said member being adapted to be engaged by said ejector means to disengage it from the notches of one of said collars when said ejector means reaches the end of its retractive movement.

25. In a mechanical pencil, a propelling mechanism adapted to be secured in a barrel or casing comprising a support detachably secured to said barrel, a spirally-slotted tube detachably secured to said support, a longitudinally-slotted guide tube rotatably and detachably supported by said spirally-slotted tube, an element rotatably and detachably supported by said support, lead carrier and ejector means detachably engaged with both said tubes, and detachable means detachably engaging said element for rotating the same.

26. In a mechanical pencil, a propelling mechanism adapted to be secured in a barrel or casing comprising a support detachably secured to said barrel, a spirally-slotted tube detachably secured to said support, a longitudinally-slotted guide tube rotatably and detachably supported by said spirally-slotted tube, an element rotatably and detachably supported by said support, lead carrier and ejector means detachably engaged with both said tubes, detachable means detachably engaging said element for rotating the same, and clutch members detachably carried by and between said element and said guide tube for positively connecting said latter tube and element at all times in one rotational movement and to disconnect the same at a time in the other rotational movement as determined by the position of said ejector means.

27. In a pencil, comprising a barrel having stationary and rotatable sections, said stationary section housing and supporting a movement mechanism which includes a clutch device and lead carrier-ejector means, said rotatable section having driving connection with said clutch member to operate said movement mechanism to feed lead toward and from the writing point, said carrier-ejector means being adapted in its movement to actuate said clutch to de-clutch said rotatable section.

28. In a pencil, comprising a barrel having a plurality of sections, one of said sections being rotatable relative to the other, one of said sections housing a lead propelling and retracting mechanism, the other of said section

having a driver, clutch means associated with said driver to actuate said propelling and retracting mechanism, upon rotation of one barrel section relative to the other, a part of said propelling and retracting mechanism being adapted to engage and actuate said clutch at a predetermined time during retractive movement to de-clutch said driver.

29. In a pencil comprising stationary and rotatable sections, said stationary section housing and supporting an actuating mechanism, said rotatable section having a driver, clutch elements associated with said driver and actuating mechanism, said elements having recesses, the recesses of one of said elements being of a greater depth than the other element, a floating clutch member normally adapted to seat in said recesses for positive clutching engagement between said elements, said floating member also adapted to be actuated by a part of said actuating mechanism to seat in the recesses of greater depth for disengagement of said clutch elements.

30. In a mechanical pencil, propelling mechanism comprising two relatively rotatable units one of which includes a rotatable guide tube, a rotatable member, clutch means between said member and tube connecting the same for positive drive movement, and means to throw out said clutch at a predetermined time in the rotation of said member so that upon continued rotation of said member said tube will remain stationary.

WALTER E. GUYOT.