June 21, 1932. P. BARBERON 1,864,038

MECHANICAL PENCIL

Filed June 22, 1926 3 Sheets-Sheet 1

Fig. 1

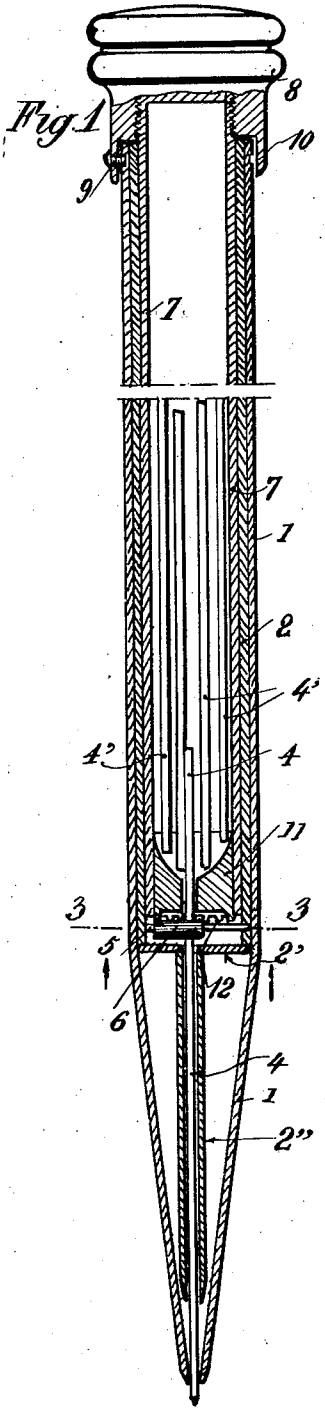


Fig. 2

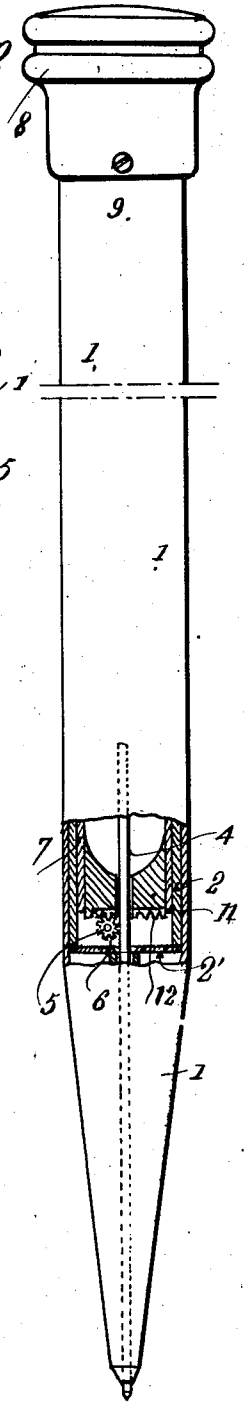
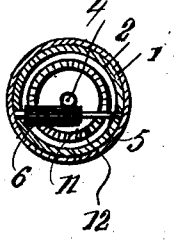


Fig. 3



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MECHANICAL PENCIL

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Fig. 4

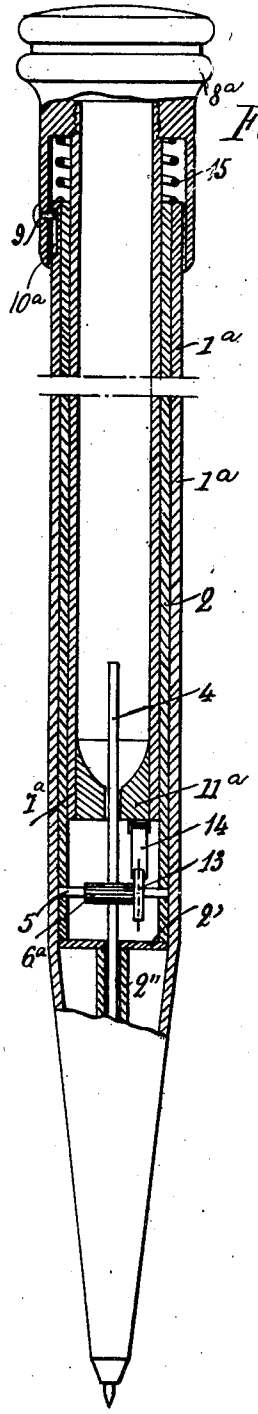


Fig. 5

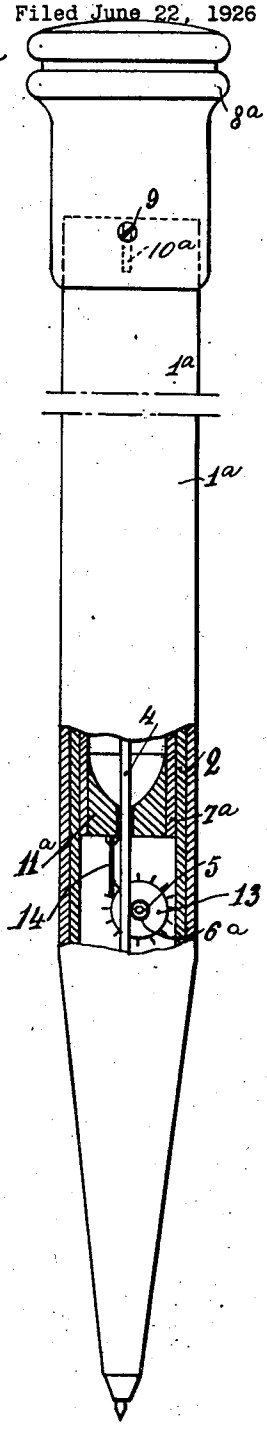
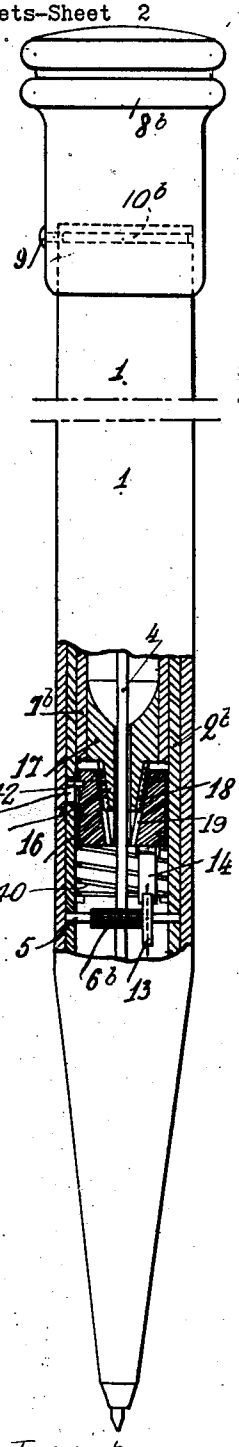


Fig. 5a

Fig. 6



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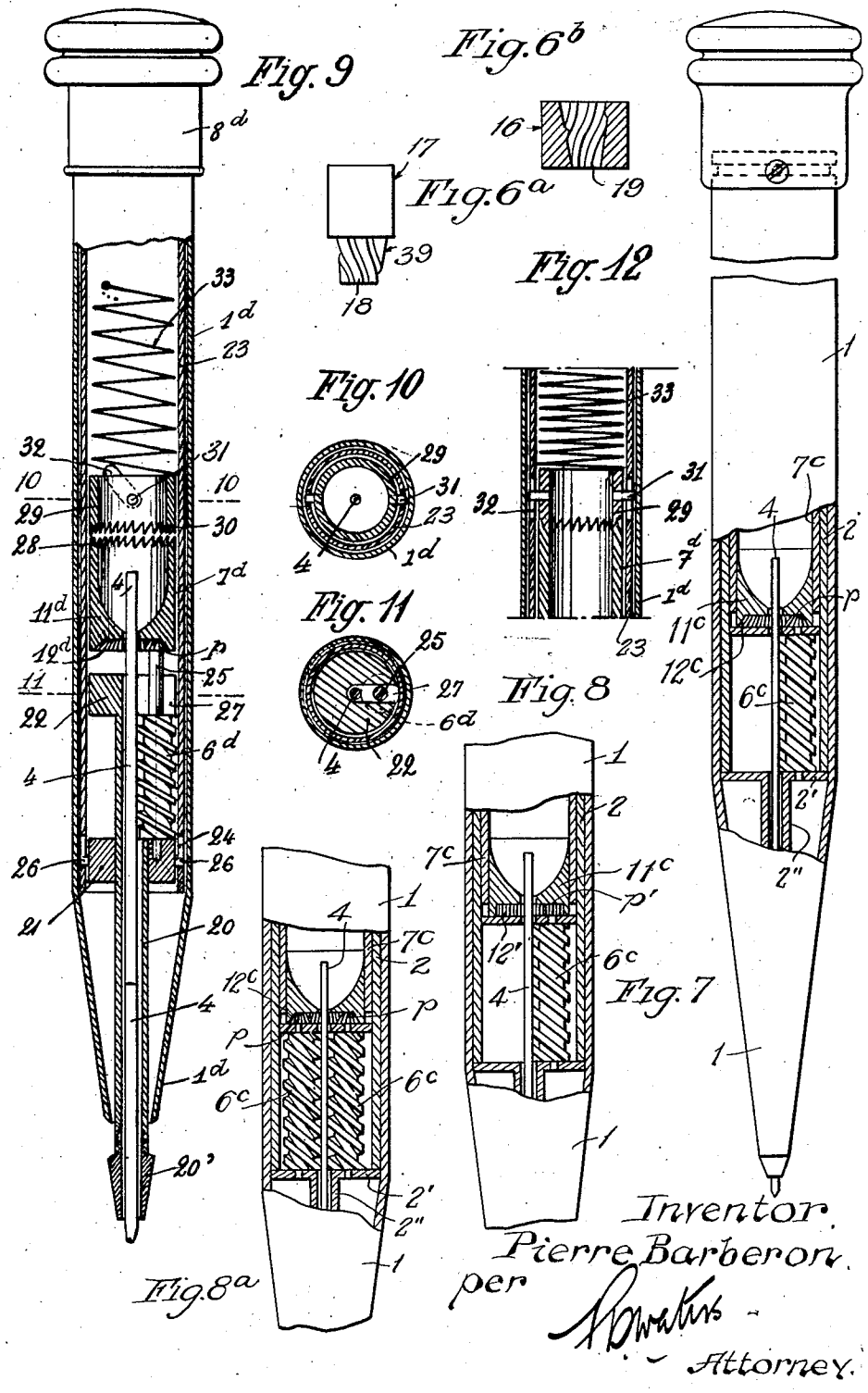
June 21, 1932. P. BARBERON 1,864,038

MECHANICAL PENCIL

Filed June 22, 1926 3 Sheets-Sheet 3



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Patented June 21, 1932 1,864,038

UNITED STATES PATENT OFFICE

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MECHANICAL PENCIL

Application filed June 22, 1926, Serial No. 117,770, and in France June 24, 1925.

The present invention relates to mechanical pencils of the class in which the length of the lead point protruding outside the casing is at will regulated by the actuation of an appropriate head.

An object of the invention is to provide a mechanical pencil which may be readily and economically manufactured, which can be easily operated, and which will efficiently serve the purposes for which it is intended.

Another object of the invention is to provide an improved type of magazine lead pencil.

Another object is to provide readily operable means for actuating a rotatable lead-propelling element.

Another object is to provide in a magazine pencil means for imparting to the lead inward or outward movements.

Another object is to provide a mechanical pencil, wherein the rotation on a longitudinal axis of one of a pair of exteriorly accessible members with respect to the other will result in propelling a strip of lead outwardly from the tip of the pencil when the rotation is in one direction and in moving the lead inwardly when the rotation is in the other direction.

Other objects of the invention will in part be obvious and will in part appear hereinafter.

The invention accordingly comprises an article of manufacture possessing the features, properties, and the relation of elements which will be exemplified in the article hereinafter described and the scope of the application of which will be indicated in the claims.

Among the features of the invention are the provision of a pencil wherein a substantially centrally guided lead is longitudinally movable by means of a device toothed, or otherwise appropriately shaped to grip the lead, said device being mounted for rotation within the pencil; this device consisting preferably of a long pinion mounted transversely to the lead, or of a worm gearing mounted parallel thereto. The pinion may be driven by a gear wheel rim with a central bore for the passage of the lead, which rim is carried by a tube mounted for rotation inside the pencil.

In one of the exemplified forms of the invention the said device consists of a pinion mounted for rotation within the pencil, the toothing of the pinion extending tangentially to the lead, that is, in such way that the lead will be moved by a slight gripping action exerted by the teeth. The pinion is driven by the movement of an inner tube provided at its outer end with a control cap or head while its inner end preferably acts as a guide for the lead above the pinion. The pinion may also be driven by a ratchet wheel actuated by means of a pawl and a spring. The pawl may be mounted upon a part having an alternating back and forth movement within the holder and lengthwise thereto. This part may, if desired, either form one integral part with the inner tube, which, in this case would be mounted for lengthwise movement within the holder, or it may be separate from the inner tube and be actuated by the rotary movement of the latter.

When using a worm gear drive the operation may be effected by displacement of the tube inside the holder; when this tube is mounted for rotation the operation may be effected by means of a small pinion mounted on the worm gear shaft together with a toothed gear rim provided at the inner tube end.

The annexed drawings show by way of example several embodiments of the invention.

Figs. 1, 2 and 3 show one embodiment with a rotatable inner tube actuating a pinion by means of a toothed gear rim; Fig. 1 is a central section; Fig. 2 a view and a partial central section taken at 90° to Fig. 1; Fig. 3 is a section on line 3—3 (Fig. 1).

Figs. 4, 5, 5[a] and 6 show embodiments in which a pinion is driven by a pawl and ratchet mechanism; Fig. 4 is a central section of one form of construction; Fig. 5 a partial view taken at an angle of 90° to Fig. 4; Fig. 5[a] is a detail of a modified construction; and Fig. 6 a partial view of a further modified form. Figs. 6[a] and 6[b] are details of certain of the parts shown in Fig. 6.

Figs. 7 and 8 show an embodiment with bevel gear (Fig. 7) or with spur gear drive (Fig. 8) arranged between a worm gear and a toothed gear rim of an actuating tube.

Fig. 8ª is a partly sectional view of a form of construction similar to that shown in Fig. 7 but having a plurality of worms;

Figs. 9 to 12 show a further modified embodiment; Fig. 9 is a central section through the pencil; Fig. 10 a section on line 10—10 (Fig. 9); and Fig. 11 a section on line 11—11 (Fig. 9).

The pencil shown in Figs. 1 to 3 comprises an outer shell or casing 1 and a tubular part 2 fitting tightly within and rigidly held by the shell. This tubular part 2 is connected to a smaller lead guiding tube 2″ by a disc 2′. The shaft 5 of a long pinion 6 is carried in bearings in the wall of the tube 2; the disposition of this pinion being such that its toothing extends tangentially of the lead 4 in the pencil and the teeth of the pinion lightly grip the same so that the rotation of the pinion will cause the lead to move either forwardly (in a downward direction) or rearwardly (in an upward direction).

Inside the tube 2 there is provided a third tube 7 the upper screw threaded part of which, extending outside the tubes 1 and 2, carries upon its outer end a cap or head 8 by means of which the tube 7 can be rotated in the tube 2. This head is connected to the outer shell 1 by a screw 9 threadedly inserted through a flange on the head and extending into a groove 10 provided in the outer shell. The lower end of the inner tube 7 carries a part 11, the lower face of which, forming a toothed gear rim 12, is adapted to engage the pinion 3 in such manner that a rotary movement of the head 8 will rotate said pinion and thus determine the displacement of the lead in respect of the point of the holder.

The tube 7 is also used as a receptacle for spare leads 4′. This receptacle becomes accessible by unscrewing the screw 9, withdrawing the tube 7 from the holder and unscrewing the head 8. The member 11, forming the bottom part of the receptacle is provided with a central bore with a diameter which is but slightly greater than that of the lead so that the latter will be guided thereby and held in engagement with the pinion 6. The upper part of the member 11 is funnel shaped. After being partially used, the upper end of the writing lead 4 recedes from the magazine into the bore provided in the part 1, whereupon a spare lead 4′ automatically follows the former, likewise entering said bore. After the lead 4 has passed beyond the pinion, the latter grips the new lead 4′ and this lead pushes lead 4 on towards the point of the holder.

Figs. 4 and 5 show another embodiment of the invention in which the lead propelling pinion is actuated through the medium of a pawl and ratchet mechanism. In the form of construction here exemplified the outer shell or casing 1*a* is formed near its upper end with a longitudinal slot 10*a* instead of with an annular groove such as 10. The flange on the head 8ª extends downwardly a greater distance than in the construction shown in Fig. 1 and carries the screw 9 at a point adjacent the lower end of the flange so as to leave a space between the upper end of the shell and the lower surface of the head. This construction permits the inner tube 7*a* which is attached to the head to be moved longitudinally instead of being rotated. A ratchet wheel 13 is mounted upon the lead-propelling pinion 6ª, and the inner tube 7 which is disposed for longitudinal sliding movement within the tube 2 carries at its lower end a spring actuated pawl 14 which engages the ratchet wheel 13. The tube 7ª, together with the head 8ª, is resiliently held in an upward position by means of a spring 15. A repeated pressure exerted upon the head 8ª will result in an intermittent forward movement of the ratchet wheel 13. The pawl may be variously shaped according to the desired effect to be obtained by the ratchet wheel 13. Thus the straight pawl 14 shown in Fig. 5 would, when lowered, exert a pressure against the ratchet wheel 13, while the bent pawl 14′, shown in Fig. 5ª, during its ascending movement, would turn the ratchet wheel in the opposite direction.

The inner tube, instead of carrying the ratchet directly, may also be built to act upon an intermediary part as shown in Fig. 6. In this exemplification, the outer shell 1 is formed with an annular groove 10 (as in Fig. 1) in which the screw 9 carried by the head 8*b* fits, so that the head and its attached inner tube 7*b* may be rotated with respect to a tubular part 2*b* which is fixed in the shell. The inner tube 7*b* carries in its lower end a funnel-shaped member formed, like the member 11 with a central lead-guiding bore, and with a downwardly projecting conical portion 39. In this case a part 16, held by a spring 40 in an upward position and carrying the pawl 14, is mounted for longitudinal sliding movement within the tube 2*b*, which in the present instance, is provided with a longitudinal slot 41 into which there projects a pin 42 carried by the part 16. The tube 7, mounted for rotation within the tube 2ᵇ, by its rotary movement imparts a slight alternating longitudinal motion to the part 16 due to the engagement of the briar teeth 18 and 19 of the two parts 17 and 16. While turning the tube 7 by means of the head 8ᵇ the part 16 is lowered at each tooth space for a certain distance corresponding to the length of one tooth.

Fig. 7 shows another embodiment of the invention in which the shaft 5ᶜ of the pro-

pelling means for the lead 4 is lodged above the bottom parts 2′ and 2″ of the tube 2. In this case the propulsion of the lead 4 is effected by means of a worm 6^c which bears with a light pressure against the lead and thus moves the same longitudinally when the worm is rotated. The worm is driven by a small pinion p mounted upon the shaft 5^c. The pinion p may engage either directly teeth provided upon the actuating tube, or those of the funnel shaped portion of the tube. Bevel gears are provided on the inner surface of the rim $12c$ of the funnel-shaped member $11c$ on the tube $7c$ and on the pinion p. Fig. 8 shows a similar arrangement with spur gearing on the pinion p' and the rim 12′.

In order to obtain a tight grip of the worm 6^c upon the lead 4 without exerting uncompensated lateral pressure upon the lead such as might force the lead to one side a similar worm may be provided diametrally opposite the first worm which is adapted to exert a similar pressure against the lead but from the opposite side thereof. The lead is thus held between two coacting worms actuated by a common gear rim. Such an arrangement is shown in Fig. 8^a, the construction being similar in all respects to the construction shown in Fig. 7, except that there are provided two worms $6c$, each equipped with a pinion p meshing with the gear rim $12c$.

The actuating tube may, if desired, also be adapted to describe a longitudinal movement, in which case the connection of this tube with the propelling worm may be realized by any appropriate mechanical means.

Fig. 9 to 12 show this disposition. The inner tube 7^d, carrying the funnel shaped part 11^d and the gear rim 12^d which engages the pinion p of the worm 6^d does not extend upwardly into the head of the pencil. The head 8^d, which in this case is not utilized for actuating the device, is stationary. The device is actuated by means of a longitudinally slidable tube 20 which also serves as a guide for the lead and protrudes beyond the end of the outer shell 1 forming the point 20′ of the pencil. The tube 20 is rigidly connected to two parts 21 and 22 mounted for sliding movement in a tube 23. This tube is frictionally held within the outer shell 1^d of the pencil. The part 21 is guided by lugs 26 adapted to slide within corresponding longitudinal slots 24 provided in the tube 23. A worm 6^d is mounted between the parts 21 and 22. The pinion p is mounted on the upper end of the worm shaft 25, and the lower part 46 of the worm shaft is carried by the part 21, while its upper part extends through a longitudinal slot 27 provided in part 22. By means of this arrangement the worm is adequately supported and the engagement of the pinion p with the gear rim 12 is secured, as the shaft 25 is thus held against lateral movement, by the lateral walls of the slot 27 (Fig. 11), and against radial movement by the pressure of the worm exerted against the lead in one direction, and by the pressure of the pinion against the gear rim in the opposite direction (Fig. 9).

The upper edge of the tubular body 7^d is provided with saw teeth 28 adapted to engage the teeth 30 of another tubular body 29 disposed above the former. The tubular part 29 is guided within the tube 23 by means of lugs adapted to be engaged within inclined or helicoidal slots 32 provided in the tube 23 in such manner that the tubular part 29 cannot be moved longitudinally without describing simultaneously a corresponding rotary movement. A spring 33 mounted in the upper portion of the tube 23 acts against the tubular part 29.

The operation is as follows:

By pressing the point 20′ against a table or any other object all of the associated parts, i. e. the tube 20 with the parts 21 and 22 and the worm 6^d, the part 11^d and the tubular part 29, move upwards, compressing the spring 33. The tubular part 29 describes a rotary movement, but because of the conformation of the teeth 28 and 30 the latter does not turn. As soon as the point is lifted from the table, all of the parts move downwardly under the influence of the spring 33, and the tubular body 29 turns in an opposite direction which motion is transmitted to the part 11^d by the teeth 28 and 30, the part 11^d actuates the worm 6^d, and the lead 4 is lowered a length corresponding approximately to said rotary movement if the slot 32 is, as exemplified, at an angle about 45°.

It is to be understood that the disposition of the various parts as well as the details thereof may be widely varied without departing from the invention.

Claims:

1. In a mechanical lead pencil, lead guiding means, a toothed lead propelling element rotatably mounted within the body of the pencil and engaging the lead tangentially, and driving means for rotating said lead propelling element.

2. In a mechanical lead pencil, lead guiding means, a toothed lead propelling element rotatably mounted within the body of the pencil and engaging the lead tangentially, and driving means for rotating said lead propelling element, said driving means including a movable inner tube within the body of the pencil and transmission means between said inner tube and said lead propelling element whereby the lead propelling element is rotated by the movement of said inner tube.

3. In a mechanical lead pencil, lead guiding means, a toothed lead propelling element rotatably mounted within the body of the pencil and engaging the lead tangentially, and

driving means for rotating said lead propelling element, said driving means including a pinion mounted within the body of the pencil and transmission means between said pinion and said lead propelling element, whereby the lead propelling element is actuated by said pinion.

4. In a mechanical lead pencil, in combination, lead guiding means, a toothed lead propelling element rotatably mounted within the body of the pencil and engaging the lead tangentially, and driving means for rotating said lead propelling element, said driving means including an inner tube rotatably mounted within the body of the pencil, a toothed gear rim connected to said inner tube, and a pinion mounted for engagement with said gear rim.

5. In a mechanical lead pencil, in combination, lead guiding means, a toothed lead propelling element rotatably mounted within the body of the pencil and engaging the lead tangentially, and driving means for rotating said lead propelling element, said driving means including an inner tube slidably mounted within the body of the pencil, and a pawl and ratchet device adapted to impart rotary movement of said lead-propelling element in response to longitudinal sliding movement of said inner tube.

6. A mechanical lead pencil, comprising an outer shell, an inner tube rotatably mounted within said shell, exteriorly accessible means for imparting rotation to said inner tube, a toothed lead guiding part connected to said inner tube and having a funnel shaped upper portion, a central bore in said toothed lead guiding part, and a pinion driven by said toothed part and engaging the lead tangentially, said inner tube forming a spare lead receptacle the bottom portion of which, formed by said funnel shaped part is adapted to direct toward said bore leads contained in said receptacle.

7. A mechanical lead pencil comprising an outer shell, an inner tube slidably mounted within said shell, an exteriorly accessible element adapted to impart longitudinal movement to said inner tube, a toothed lead guiding part connected to said inner tube and having a funnel shaped upper portion, a central bore in said toothed lead guiding part, and a pinion driven by said toothed part and engaging the lead tangentially, said inner tube forming a spare lead receptacle the bottom part of which, formed by said funnel shaped portion, is adapted to direct toward said bore leads contained in said receptacle.

8. A mechanical lead pencil comprising an outer shell, a tubular part frictionally held therein and carrying a tubular part of reduced diameter guiding the lead extending beyond the point of the holder, an inner tube mounted in said outer shell, said inner tube being formed to provide a funnel shaped portion toward its lower end, a gear provided on said inner tube at a point beneath said funnel shaped portion, a pinion adapted to be driven by said gear and mounted on the shaft of a helicoidally threaded lead propelling element engaging the lead tangentially, said inner tube forming a spare lead receptacle the bottom part of which, formed by said funnel shaped part, is adapted automatically to substitute a fresh lead for a partially used one.

9. In a magazine pencil, a casing, means providing a lead magazine in the upper end of the pencil, means for guiding leads successively from said magazine to the lower end of the pencil, lead-feeding means within the casing and adapted to move a lead either downwardly or upwardly at will, and means for operating said lead-moving means, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

10. In a magazine pencil, a casing, means providing a lead magazine in the upper end of the pencil, means for guiding leads successively from said magazine to the lower end of the pencil, lead-feeding means within the casing and adapted to move a lead either downwardly or upwardly, said means comprising a rotatable element adapted to engage the lead tangentially, and means for rotating said rotatable element in one direction or in the other at will, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

11. In a magazine pencil, a casing, an inner tube movable with respect to said casing, means including said inner tube to provide a magazine for lead strips, means mounted within said casing and operated by the movement of said tube relative to said casing and arranged for constant engagement with a lead for withdrawing strips of lead successively from said magazine and for feeding the same downwardly out of the casing, and exteriorily accessible means for actuating said inner tube.

12. In a magazine pencil, a casing, an inner tube rotatable with respect to said casing, means including said inner tube to provide a magazine for lead strips, means mounted within said casing and operated by the rotation of said tube relative to said casing and arranged for constant engagement with a lead for withdrawing strips of lead successively from said magazine and for feeding the same downwardly out of the casing, and exteriorly accessible means for rotating said inner tube.

13. In a magazine pencil, a casing, an inner tube movable with respect to said casing, means including said inner tube to provide a magazine for lead strips, a rotatable element engaging the lead tangentially and adapted

to be operated by the movement of said inner tube for withdrawing strips of lead successively from said magazine and for feeding a lead downwardly out of the casing, and exteriorly accessible means for actuating said inner tube.

14. In a magazine pencil, a casing, an inner tube mounted for movement within said casing, means including said inner tube to provide a lead magazine in the upper part of the casing, rotatable lead-propelling means within the casing and beneath said magazine, means carried by said inner tube for rotating said propelling means, and exteriorly accessible means for actuating the last named means.

15. In a magazine pencil, a casing, means providing a lead magazine in the upper end of the pencil, means for guiding strips of lead successively downwardly from said magazine, lead-feeding means mounted in the pencil within the casing at a point beneath said magazine and adapted to engage a lead tangentially and to be operated to impart downward movement to the lead, a member within said casing for operating the last mentioned means, and an exteriorly-accessible element for actuating said operating member.

16. In a mechanical lead pencil, a casing, rotatable lead-propelling means within the casing adapted to engage a lead tangentially and when rotated to impart longitudinal movement to the lead, and means to rotate said lead-propelling means, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

17. In a mechanical lead pencil, rotatable lead-propelling means adapted to engage a lead tangentially and when rotated to impart longitudinal movement to the lead, an exteriorly accessible actuating element, and means to impart rotation to said lead-propelling means in response to the actuation of said exteriorly accessible element.

18. In a mechanical pencil, in combination, a casing, a head movable with respect to said casing, rotatable lead-propelling means adapted to engage tangentially a lead in a pencil and when rotated to impart longitudinal movement to the lead, and means for rotating said lead-propelling means in response to relative movement of said head and said casing.

19. In a mechanical pencil, in combination, a casing, a head rotatable with respect to said casing, rotatable lead-propelling means adapted to engage tangentially a lead in a pencil and when rotated to impart longitudinal movement to the lead, and means for rotating said lead-propelling means in response to relative rotation of said head and said casing.

20. In a mechanical pencil, in combination, a casing, a head, a guiding recess in the outer surface of an upper portion of said casing, means projecting from said head into said guiding recess for holding the head on the casing and permitting movement of the head with respect to the casing, a rotatable lead-propelling element within the casing and adapted to engage the lead tangentially, and means for rotating said lead-propelling element in response to the movement of said head relative to the casing.

21. In a mechanical pencil, an operating member, a rotatable lead-propelling element adapted to engage the lead tangentially, and means carried by said operating member for rotating said lead-propelling element.

22. In a mechanical pencil, an operating member, a toothed lead-propelling element adapted to engage the lead tangentially, and means carried by said operating member and adapted to engage the teeth of said lead-propelling element to impart rotation to the same.

23. In a mechanical pencil, a casing, an inner tube mounted for rotation within the same, a rotatable lead-propelling element adapted to engage the lead tangentially, and means carried by said inner tube for rotating said lead-propelling element in response to the rotation of said inner tube.

24. In a mechanical pencil, an inner tube mounted for rotation on a longitudinal axis, a lead-propelling element mounted for rotation on a transverse axis, and means carried by said inner tube for rotating said lead-propelling element in response to the rotation of said inner tube.

25. In a mechanical lead pencil, lead-guiding means, a lead-propelling element rotatably mounted within the body of the pencil and engaging the lead tangentially, and driving means for rotating said lead-propelling element, said driving means including an inner tube rotatably mounted within the body of the pencil, a toothed gear rim associated with said inner tube.

26. In a magazine pencil, means providing a lead magazine at the upper end of the pencil, means for guiding leads successively from said magazine to the lower end of the pencil, lead-feeding means adapted to move a lead either downwardly or upwardly at will, and means for operating said lead-moving means, the last mentioned means including an exteriorly accessible element at the upper end of the pencil.

27. In a magazine pencil, means providing a lead magazine at the upper end of the pencil, means for guiding leads successively from said magazine to the lower end of the pencil, a lead-feeding element adapted to move a lead either downwardly or upwardly at will, and a rotatable operating element for imparting movement to said lead-feeding element.

28. In a mechanical pencil comprising a

casing, in combination, a lead-propelling element within said casing and rotatable on a longitudinal axis and adapted to engage a lead tangentially and when rotated to import longitudinal movement to the lead, and means to rotate said lead-propelling element, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

29. In a mechanical pencil comprising a casing, in combination, a worm within the casing arranged to engage a lead in the pencil and to move the same longitudinally, and means to rotate said worm, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

30. In a mechanical pencil, in combination, a worm arranged to engage a lead in the pencil and to move the same longitudinally, an exteriorly accessible actuating element, and means to rotate said worm in response to the actuation of said exteriorly accessible element.

31. In a mechanical pencil, in combination, a rotatable lead-engaging and -propelling worm, a pinion carried thereby, a rotatable operating member, said operating member being formed with teeth adapted to mesh with said pinion to rotate the same, an exteriorly accessible element, and means for importing rotation to said operating member in response to the actuation of said exteriorly accessible element.

32. In a mechanical pencil comprising a casing, in combination, a lead guide tube, a rotatable lead-propelling element within said casing and extending through an opening in said guide tube and adapted to engage tangentially a lead in the pencil, and means for rotating said lead-propelling element, the last mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

33. In a mechanical pencil comprising a casing, in combination, a lead guide tube, a worm within said casing and extending through an opening in said guide tube and adapted to engage tangentially a lead in the pencil, and means for rotating said worm, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

34. In a mechanical pencil comprising a casing, in combination, a rotatable lead-propelling element within the casing and adapted to engage a lead tangentially at a plurality of points throughout a considerable portion of the length of the lead and when rotated to impart longitudinal movement to the lead, and means to rotate said lead-propelling element, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

35. In a magazine pencil comprising a casing, in combination, means providing a lead magazine in the upper end of the pencil, a lead-guiding tube for guiding a lead downwardly from said magazine, said tube being arranged for the reception of a rotatable lead-propelling element in the side thereof, a rotatable lead-propelling element within the casing and adapted to engage tangentially a lead within said guide tube, and means to rotate said lead-propelling element, the last-mentioned means comprising an operating member within the casing and an exteriorly-accessible element for actuating said operating member.

36. In a magazine pencil, in combination, a casing, means movable with respect to said casing and serving to provide a lead magazine in the upper end of the pencil, a worm adapted to engage a lead falling from said magazine and to move the same downwardly through and out of the pencil, and means including said movable means for rotating said worm.

37. In a mechanical pencil, in combination, a casing, a longitudinally movable lead guide tube, a rotatable lead-propelling element adapted to engage tangentially a lead in the pencil, and means for rotating said lead-propelling element in response to the longitudinal movement of said guide tube.

38. In a mechanical pencil, in combination, a casing, a member extending downwardly through the lower end of the casing and adapted to be moved longitudinally by downward pressure exerted on an upper part of the pencil, a rotatable lead-propelling element adapted to engage tangentially a lead in the pencil, and means to rotate said lead-propelling element in response to longitudinal movement of said downwardly extending member.

In testimony whereof I have hereunto set my hand.

PIERRE BARBERON.