

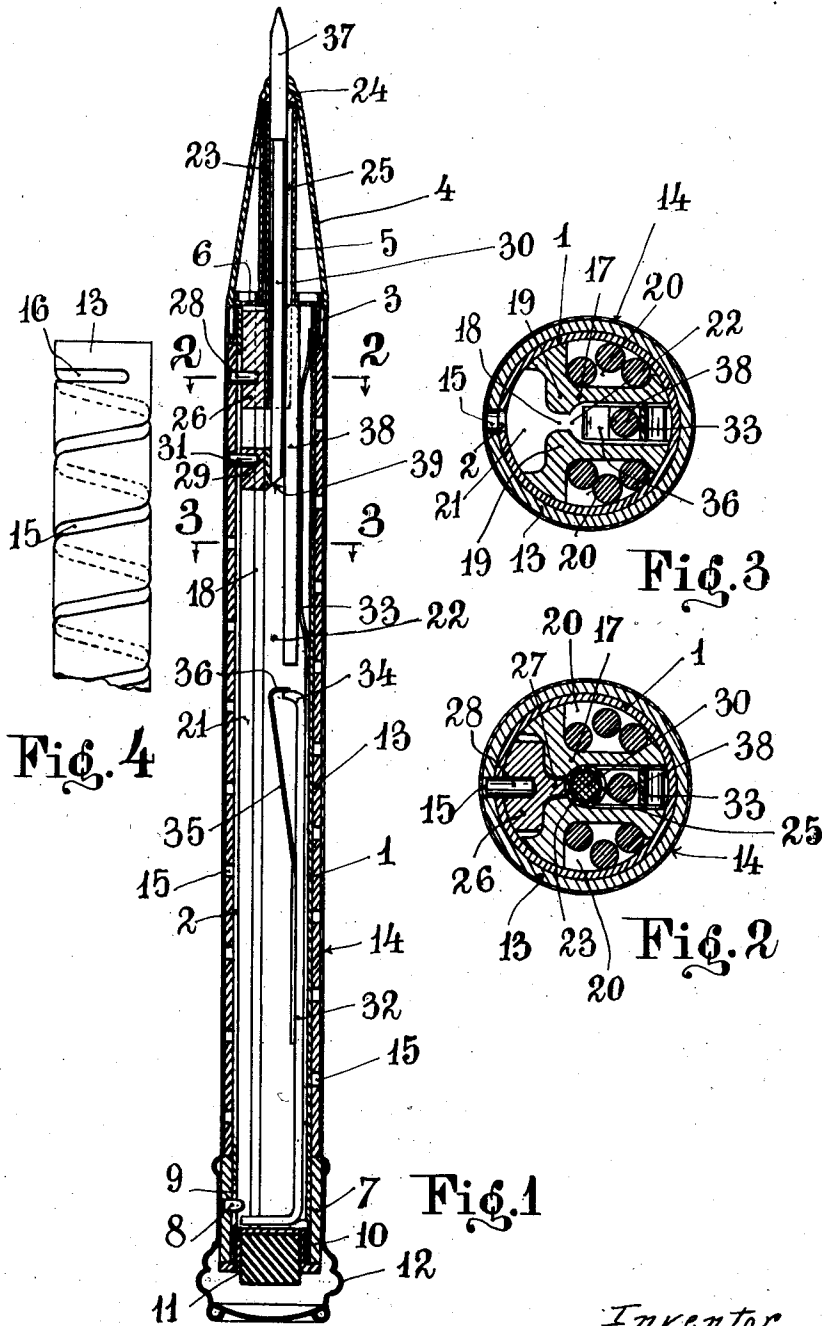
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PENCIL

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UNITED STATES PATENT OFFICE.

RODOLFO DEBENEDETTI, OF TURIN, ITALY, ASSIGNOR TO FABBRICA ITALIANA DI PENNE A SERBATOIO AURORA, OF TURIN, ITALY, A FIRM OF ITALY.

PENCIL.

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The present invention relates to magazine lead pencils and more particularly to pencils of the class provided with screw actuated means for feeding the lead and for automatically expelling the stub of used lead and inserting a fresh lead in the lead carrier.

The present invention comprises means for holding the lead which is intended to be substituted for the used one, in proper position for engagement by the lead carrier in the operation of recharging said carrier.

On the annexed drawing is shown by way of example an embodiment of the present invention and

Figure 1 is a longitudinal central section of the pencil,

Figure 2 is a transverse section of the same to an enlarged scale on line 2—2 of Figure 1;

Figure 3 is a transverse section of the same on an enlarged scale on line 3—3 of Figure 1;

Figure 4 is a fragmentary side view of the pencil screw-slotted sleeve.

As shown on the drawing, the pencil comprises a barrel 1 having a longitudinal slot 2 and having a collar 3 solid thereon at one end. A tip 4 is screwed on said collar 3 and said tip comprises a central guide tube 5 which opens in the open end of said tip and is fastened thereon by means of a flanged annular disk 6.

On the opposite end of said barrel 1 is located a sleeve 7 which is connected therewith by means of a pin 8 engaged in a slot 9 of barrel 1, and is held in position by means of a nipple 10 screwed in said barrel 1 and carrying an eraser 11.

A protecting and removable hollow knob 12 is frictionally engaged upon said sleeve 7.

On barrel 1 and rotatable thereon, is mounted a sleeve 13 which is engaged in position between collar 3 and sleeve 7 and is enclosed by a casing 14; said sleeve 13 has a helical slot 15 extending along it and leading to a semi-circular slot 16.

Within said barrel 1 are fastened a pair of guide members 17 having the shape shown in Figures 2 and 3, and providing in said barrel a restricted intermediate gap 18 in register with the barrel slot 2 as well as side spaces 20 and spaces 21 and 22 interconnected through said gap 18; said gap 18 is provided by opposed longitudinal ribs 19 of said bars 17 and has a reduced width with respect to the diameter of leads to be used in the pencil.

A lead carrying tube 23 is mounted to move

in space 22 along ribs 19 said tube being provided with an enlarged mouth 24 and a longitudinal slot 25; said tube 23 is secured to a slider 26 mounted to reciprocate in space 21 and having a web 27 extending through gap 18 for connection with tube 23. A pin 28 is fastened in said slider 26 and extends through slot 2 into slot 15—16.

Said slot 25 is intended to impart resiliency to the lead carrying tube 23 and to enable it to receive and grasp leads in the pencil operation as hereinafter described.

In the rear of the carrier slider 26 is provided a plunger slider 29 adapted to move along space 21 and extending through gap 18 for connection with a plunger 30 extending into lead carrier tube 23 and concentric therewith; said plunger slider 29 has a pin 31 extending through slot 2 and engaging helical slot 15.

Spaces 20 are used for storing a supply of leads which may be introduced therein by unscrewing the tip 4 from collar 3 and barrel 1, while space 22 acts as a magazine by which spare leads are recharged automatically in the lead carrier 23.

For holding leads as 38 located in the space 22 in position for engagement by lead carrier 23, in the said space extends a longitudinal bar 32 fastened to barrel 1 and having at its end a spring 33 adapted to act on the lead 38 existing in front of it and to push the same against ribs 19 in conditions to be engaged by lead carrier 23 when this latter is moved forward in the manipulation of the pencil as hereinafter described.

In the drawing in space 22 a single lead is shown, but of course a number of leads may be located in said space adjacent to each other, and then one of the said leads is acted on by the spring 33 and imparts the spring pressure to the other lead or leads so as the last one of them is held in contact with ribs 19.

Further, to prevent leads as 38 stored in space 22 from moving endwise in the barrel 1 or being shifted back by frictional engagement by lead carrier 23 when this latter is retracted, said bar 32 has an upturned lug 34 projecting in said space 22 and on said bar 32 is fastened a resilient blade 35 having a tongue 36 which extends over said lug 34 and adjacent to ribs 19 to resiliently restrict the space 22 in front of spring 33.

The operation of the pencil is as follows: assuming the pencil to be provided with a

lead stub 37 engaged in the lead carrier 23, the casing 14 with sleeve 13 and knob 12 are grasped respectively and caused to rotate with respect to each other, thus causing a respective rotation of sleeve 13 with respect to the lead carrier slider 26 and plunger slider 29 which are engaged in rotation with section bars 17 and barrel 1, this latter being in turn carrier slider 26 and plunger slider 29 are thus caused to move forward along ribs 19 between bars 17 owing to the engagement of their pins 28 and 31 with helicoidal slot 15 and the lead carrier 23 is moved forward with the lead 37 located therein and supported by plunger 30. At the end of the forward stroke, as shown in Figure 1, pin 28 of slider 26 moves in the circular end portion 16 of slot 15 and its forward motion is stopped, while the pin 31 of the plunger slider 29 is still in a helicoidal portion of slot 15 and therefore said plunger slider is caused to move with respect to slider 26 and lead carrier 23 thus advancing its plunger 30 and expelling the stub of the worn-out lead 37 from carrier 23.

Then the pencil parts 13—14 and 1—17—7—12 are respectively rotated in opposite directions and at the beginning of this operation the slider 29 and plunger 30 are retracted with respect to slider 26 and tube 23 and thereafter the whole of said sliders 26 and 29 and parts 23 and 30 carried thereby move back along barrel 1, while the lead existing in space 22 and pushed against tube 23 by spring 33 is prevented from being moved back by friction owing to the provision of parts 34—36 engaging its end and stopping it; in said back stroke the said slider 29 shifts off by its sloping portion 39 the tongue 36 and the resilient blade 35 carrying it while these parts are still operative to prevent displacement of leads.

After the back stroke of the lead carrying parts is completed, that is after the mouth 24 of tube 23 has reached a point in the rear of lead 38, this lead is free to move under the action of magazine spring 33 and is carried in contact with ribs 19 while being prevented by its size from passing through gap 18, and thus it is carried into alignment with lead carrier 23 while being prevented by tongue 36 from dropping along space 22.

Thereafter the casing 14 with sleeve 13 on one side and the knob 12, on the other hand, are respectively rotated in the direction in which the sliders 26 and 29 are caused to move towards tip 4, and then the lead 38 in its present position is engaged by the mouth 24 of tube 23 and is caused to enter the same until it abuts on the end of plunger 30, it being moved then forward through tube 5 and end bore of the tip 4 until its end portion projects for use from tip 4; the lead is advanced by the described manipulation until it is worn out, and finally its stub is expelled

as above described and the operation is repeated in respect of other leads located in space 22.

As above described the parts 35—36—34 act to prevent undue motion of leads as 38 ready in the magazine space 22 without affecting the free motions of the lead carrier and stub ejector.

Leads are introduced in space 22 by removing the tip 4 which closes the end mouth of said space and a supply of leads may be stored in side spaces 20, said leads being removed therefrom and introduced by hand in space 22 for automatic charging operation at the time of need.

What I claim as my invention and desire to secure by United States Letters Patent is:—

1. A pencil comprising a barrel, lead carrying means mounted to move along said barrel, means for expelling the used-lead stub from said lead carrying means, means for actuating said lead carrying means and said stub expelling means, means defining a magazine for spare leads in said barrel said magazine being passed through by said lead carrying means and means in said magazine to push said spare leads into position for engagement by said lead carrying means.

2. A pencil comprising a barrel, guide members along said barrel, lead carrying means mounted to move along said guide members, means for expelling the used lead stub from said lead carrying means, means for actuating said lead carrying means and said expelling means, a bored tip member at one end of said barrel, displaceable means extending in said barrel and in the path of said lead carrying means, said guide members, tip member and displaceable means defining a magazine for spare leads in said barrel, and means in said magazine to push said spare leads into position for engagement by said lead carrying means.

3. A pencil comprising a barrel, guide members along said barrel, lead carrying means mounted to move along said guide members, means for expelling the used lead stub from said lead carrying means, means for actuating said lead carrying means and said expelling means, a bored tip at one end of said barrel, resiliently displaceable means extending in said barrel in the path of said lead carrying means, said guide member bored tip and resiliently displaceable means defining a magazine for spare leads in said barrel and means in said magazine to push said spare leads into position for engagement by said lead carrying means.

4. A pencil comprising a barrel, spaced guide members along said barrel, lead carrying means mounted to move between said guide members, means for actuating said lead carrying means, a bored tip member at one end of said barrel, a member projecting in the

space between said guide members substantially in register with the lead-engaging end of said lead carrying means when in its most remote position from said tip member, a resilient member extending across said space and beyond said projecting member, said tip member guide members, resilient member and projecting member defining a magazine for spare leads in said barrel, and means in said magazine to push said spare leads in position for engagement by said lead carrying means.

5. A pencil comprising a barrel, spaced guide members along said barrel, lead carrying means mounted to move between said guide members, means for expelling the used-lead stub from said lead carrying means, means for actuating said lead carrying means and said expelling means, a bored tip member at one end of said barrel, a member projecting across the space between said guide members substantially in register with the lead-engaging end of said lead carrying means when in its most remote position from said tip member, a resilient member extending across the said space and over said projecting member, said guide member, bored tip member and projecting and resilient members defining a magazine for spare leads in said barrel, and means in said magazine to push said spare leads into position for engagement by said lead carrying means.

6. A pencil comprising a barrel, spaced guide members along said barrel, abutments on said guide members, a lead carrying tube mounted to move along said abutments, a slider mounted to move along said guide members and solid with said lead carrying tube, means for actuating said slider, a bored tip member at one end of said barrel, a resilient member extending in said barrel in the space between said guides substantially in register with the lead-engaging end of said tube when in its most remote position from said tip member, said abutments tip member and resilient member providing in said barrel a magazine for spare leads, and means in said magazine to push said spare leads against said abutments for engagement by said lead carrying tube.

7. A pencil comprising a barrel, spaced guide members along said barrel, abutments on said guide members, a lead carrier mounted to move along said abutments, a slider mounted to move between said guide members and solid with said lead carrier, means for actuating said slider, a bored tip member at one end of said barrel, a member projecting in the space between said guides substantially in register with the lead-engaging end of said lead carrier when in its remote position from said tip member, a resilient blade extending in said space beyond said projecting member, said tip member, abutments, projecting member and resilient blade providing in

said barrel a magazine for spare leads, and means in said magazine to push said spare leads against said abutments for engagement by said lead carrier.

8. A pencil comprising a barrel, spaced guide members along said barrel, abutments on said guide members, a lead carrier mounted to move along said abutments, a slider mounted to move between said guide members and solid with said lead carrier, means for actuating said slider, a bored tip member at one end of said barrel, a stationary member projecting in the space between said guides substantially in register with the lead-engaging end of said lead carrier when in its remote position from said tip member, a resilient blade extending in said space beyond said projecting member, said abutments tip member and projecting stationary member and resilient blade providing a magazine for spare leads in said barrel, and a spring blade extending from said stationary member into said magazine and acting to push said spare leads against said abutments for engagement by said lead carrier.

9. A pencil comprising a barrel, spaced guide members along said barrel, abutments on said guide members, a lead carrier mounted to move along said abutments, a slider mounted to move along said guide members and solid with said lead carrier, a used-lead stub expelling plunger mounted to move in line with said lead carrier, a second slider carrying said plunger, a bored tip member at the tip end of said barrel, means for actuating said sliders and causing a motion of said plunger with respect to said lead carrier on the said lead carrier being at the tip end of its stroke along said abutments, a resilient member extending in said barrel in the space between said guides substantially in register with the lead-engaging end of said lead carrier when in its remote position from said tip member, said abutments tip member and resilient member providing in said barrel a magazine for spare leads, and means in said magazine to push said spare leads against said abutments for engagement by said lead carrier.

10. A pencil comprising a barrel, spaced guide members along said barrel, abutments on said guide members, a lead carrier mounted to move along said abutments, a slider mounted to move between said guide members and solid with said lead carrier, a bored tip member at one end of said barrel, a used-lead stub expelling plunger mounted to move in said lead carrier, a second slider carrying said plunger, means for actuating said sliders and causing a motion of said plunger with respect to said lead carrier on the said lead carrier being at the tip end of its stroke along said abutments, a member projecting in the space between said guides substantially in register with the lead-engaging end of said

lead carrier when in its remote position from said tip member, a resilient blade extending in said space beyond said guides, a resilient blade extending in said space beyond said projecting member, said tip member abutments stationary member and resilient blade providing in said barrel a magazine for spare leads, and means in said magazine to push said spare leads against said abutments for engagement by said lead carrying tube.

11. A pencil comprising a barrel, spaced guide members along said barrel, abutments on said guide members, a lead carrier mounted to move along said abutments, a slider mounted to move between said guide members and solid with said lead carrier, a bored tip member on one end of said barrel, a used-lead stub expelling member mounted to move in said lead carrier, a second slider carrying said plunger, means for actuating said sliders and causing a motion of said plunger with respect to said lead carrier on the said lead carrier being at the tip end of its stroke along said abutments, a stationary member projecting in the space between said guide members substantially in register with the lead-engaging end of said lead carrier when in its most remote position from said tip member, a resilient blade extending in said space beyond said projecting member, said abutments tip member stationary member and resilient blade providing a magazine for spare leads in said barrel and a spring blade extending from said stationary member in said magazine and acting to push said spare leads against said abutments for engagement by said lead carrier.

12. A pencil comprising a barrel having a longitudinal slot, spaced guide members along said barrel at the sides of said slot, abutments on said guide members, a lead carrier mounted to slide along said abutments, a bored tip at the end of said barrel passed through by said lead carrier, a slider mounted to move between said guide members and solid with said lead carrier, a sleeve rotatable on said barrel and having a helical slot, a pin solid with said slider and extending through said barrel slot and engaging said sleeve helical slot, means cooperating with said tip and abutments to define a magazine for spare leads in said barrel, and means in said magazine to push said spare leads into position for engagement by said lead carrier.

13. A pencil comprising a barrel having a longitudinal slot, spaced guide members

along said barrel at the sides of said slot, abutments on said guide members, a lead carrier mounted to slide along said abutments, a bored tip at the end of said barrel passed through by said lead carrier, a slider mounted to move between said guide members and solid with said lead carrier; a sleeve rotatable on said barrel and having a helical slot including a circular portion at its end adjacent to said tip, a used lead stub expelling plunger mounted to move in said lead carrier, a second slider carrying said plunger, a pin solid with said plunger slider in the rear of said lead carrier slider and extending through said barrel slot and into said sleeve helical slot, a pin solid with said lead carrier slider and extending through said barrel slot and into said sleeve helical slot intermediate said tip and plunger slider pin, means cooperating with said tip and abutments to define a magazine for spare leads in said barrel and means in said magazine to push said spare leads into position for engagement by said lead carrier.

14. A pencil comprising a barrel, a bored tip member at one end of said barrel, guide members along said barrel, lead carrying means mounted to move along said guide members, means for actuating said lead carrying means, resiliently displaceable means extending in said barrel and in the path of said lead carrying means, said guide members, tip member and resiliently displaceable means defining a magazine for spare leads in said barrel, and a spring blade in said magazine acting to push said spare leads into position for engagement by said lead carrying means.

15. A pencil comprising a barrel having a longitudinal slot, a bored tip member at one end of said barrel, guide members along said barrel, a lead carrier mounted to move along said guide members, a sleeve rotatable on said barrel and having a helical slot, a pin solid with said carrier and extending through said barrel slot into engagement with said sleeve helical slot, means defining a magazine for spare leads in said barrel, said magazine being passed through by said lead carrier in its motion, and a spring blade in said magazine to push said spare leads into position for engagement by said carrier.

In testimony whereof I have signed my name to this specification.

RODOLFO DEBENEDETTI.