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GABRIEL LARSEN, OF SPRINGFIELD, NEW JERSEY, ASSIGNOR TO L. E. WATERMAN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

PENCIL.

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To all whom it may concern:

Be it known that I, GABRIEL LARSEN, a citizen of the United States, residing at Springfield, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Pencils, of which the following is a specification.

My invention more particularly relates to a mechanical pencil comprising comparatively few parts which are easily assembled and which form a simple and cheap construction.

Another object of my invention is a pencil of this character in which it is not possible for the lead to jam and in which the parts do not get out of order.

Other objects of my invention will appear in the specification and will be particularly pointed out in the claims.

My invention will best be understood by reference to the accompanying drawings, in which Figure 1 is a longitudinal section, partially in elevation, taken through the axis of the preferred form of pencil embodying my invention; Fig. 2 is a cross-section taken on the line 2—2 of Fig. 1; Fig. 3 is a fragmentary sectional view illustrating a slightly modified form of my invention; Fig. 4 is a cross-sectional view, taken on the line 4—4 of Fig. 3; Figs. 5 and 6 are sectional views similar to Fig. 3, illustrating further modifications of my invention, Fig. 7 is a longitudinal section, partially in elevation, of a pencil made in accordance with my invention, and illustrating a novel form of magazine, and Fig. 8 is a plan view of the member which is frictionally held in position within the casing.

Like reference characters indicate like parts throughout the drawings.

Referring, now, to the drawings, and first to Figs. 1 and 2, the pencil shown comprises a barrel or outer casing 10, preferably formed of rubber or the like, though obviously it may be formed of metal or other material, and internally threaded at 11 for at least a portion of its length. A member 12 is adapted to be retained within the barrel 10, and preferably at an intermediate point thereof. In the form of my invention illustrated in Fig. 1, the member 12 is threaded to engage the screw threads 11 of the barrel 10, the member being so formed with reference to the barrel that the frictional engagement between the two is sufficient to

prevent the member turning relatively to the barrel when the lead is fed forwardly in a manner which will now be described. A carrier 13 is received within the barrel 10 and is swivelled to the member 12, preferably by a stem 14, which, in the form shown in Fig. 1, is integral with the carrier 13 and which passes through an opening 15 in the member 12. The end of the stem 14 is provided with a head, as at 16, a washer 17 preferably being interposed between the head 16 of the stem and the member 12. The carrier 13 is preferably rotated relatively to the barrel 10 by a tip or nose 18, preferably conical in form, as shown, engaging, in its assembled position, the end of the barrel 10 and secured to the carrier 13 (it being understood that in practice the nose is usually held by one hand while the barrel is rotated with the other). Preferably the tip 18 is provided with a recess 19, in which a contracted part 20 of the carrier forms a tight fit.

In the pencil illustrated, the carrier forms a guide on the propelling member, and in the form illustrated, the carrier 13 is provided with a transverse slot 21 extending the major portion of the carrier and adapted to receive the head 22 of a propelling member, indicated generally at 23, the propelling member also comprising a stem 24 extending downwardly from the head 22 and received in an axial opening 25 in the lower end of the carrier. The head 22 is screw threaded, as at 26, to engage the screw threads of the barrel 10. The upper end of the barrel is preferably closed by a cap 27, which is preferably provided with a screw-threaded contracted portion 28 engaging screw threads 29 formed in the upper part of the barrel 10. The upper portion of the barrel forms a convenient magazine for leads, the member 12 forming the lower wall of the magazine.

To assemble the parts, the tip 18 is secured to the carrier 13 and the propelling member placed in position within the carrier, with the stem 24 in the opening 25 of the carrier and the head 26 located in the slot thereof. The member 12 is then screwed into the barrel, the same preferably being provided with notches or openings (not shown), which may be engaged by an appropriate tool inserted from the top of the barrel, until the tip 18 engages the lower end of the

barrel. The head 22 of the propeller is screwed into the barrel by turning the tip 18 and the carrier attached thereto. By providing both the member 12 and the cross head 22 with screw threads of the same pitch which engage the same screw threads of the casing or barrel 10, the parts are readily assembled with the tip 18 engaging the end of the barrel 10, and any subsequent separation between the tip and the barrel may readily be corrected by adjusting the position of the member 12.

To operate the pencil, assuming that there is no lead in the pencil, the tip 18 is rotated in a direction to run the head 22 of the propeller to the rear of the slot 21. A lead 30 is then inserted through the tip and against the stem 24 of the propeller. Then, by rotating the barrel 10 relatively to the tip 18, which may be held by one hand, the propeller, and with it the lead, is moved forwardly, as desired, the tip 18, which is preferably formed of rubber, forming an easy bearing for the lead, which frictionally retains the same in position.

The upper part of the barrel 10 preferably forms a magazine for the leads, the wall of the bottom of the magazine being formed by the member 12 and the top being closed by the cap 27.

In the form of my invention illustrated in Figs. 3 and 4, the retaining member consists of a split collar 12^a, to which the carrier is swivelled in the same manner illustrated in Fig. 1. The split ring, which has a tendency to expand to a diameter greater than the internal diameter of the barrel, is forced into the barrel (with the carrier) by a straight longitudinal movement, and its tendency to expand retains the same in position, with the tip of the pencil against the end of the barrel.

In the form of my invention illustrated in Fig. 5, the member 12^b is integral with the barrel 10. A screw 14^b passes through the opening in the member 12^b and the screw-threaded end thereof is received in a screw-threaded opening in the end of the carrier, as illustrated.

In Fig. 6, the member 12^b is also formed integral with the barrel. The carrier 13, however, is swivelled to the member 12^b by a connecting member 14^c having the head engaging above the member 12^b and having a split stem 31, the ends of which are enlarged, as at 32, and engaging an opening 33 in the end of the carrier 13. This arrangement has the advantage that the carrier can be separated from the member 12^b by a simple longitudinal pull and without a turning movement.

In Fig. 7 I have illustrated a novel form of magazine adapted for the pencil illustrated. The member 14, carrier 13 and as-

sociated parts are the same as those shown in Fig. 1, and need not further be described. The magazine in this form of my invention comprises a casing 34 which may be attached to the cap 27, as by a screw 35, which is preferably permanently attached to the magazine. The casing 34 is cut away at one side, as at 36, to provide an opening through which the magazine may be charged, and which, at the same time, furnishes ready access to the upper ends of the leads, particularly when the magazine is inclined, for the removal of the leads. To obtain a new lead, it is only necessary to withdraw the cap 27 and the attached magazine 35 and a lead can be taken from the side of the magazine.

One of the important features of this form of magazine is that the same may be sold separately as a refill. For this purpose, the magazine, with the screw 35 secured thereto, would be sold filled with leads, and the user, instead of being subjected to the usual annoyance in recharging his pencil with leads, would purchase a new filled magazine, and it would only be necessary for him to throw away the old magazine 34, and attach the new magazine 34 to the cap 27 by the screw 35.

What I claim and desire to secure by Letters Patent of the United States is:

1. In a pencil, an outer casing internally screw-threaded throughout the lower portion of its length, a screw-threaded member adapted to engage the screw threads of said casing and to be frictionally retained in position therein, a carrier swivelled to said member, a nose through which the lead is propelled secured to said carrier, whereby rotation of said nose effects rotation of said carrier, and a propelling member guided by and rotatable with said carrier and comprising a screw-threaded part adapted to engage the screw threads of said casing.

2. In a pencil, an outer casing internally screw-threaded throughout the lower portion of its length, a screw-threaded member adapted to engage the screw threads of said casing and to be frictionally retained in position therein, a carrier swivelled to said member, a nose through which the lead is propelled secured to said carrier, whereby rotation of said nose effects rotation of said carrier, and a propelling member guided by and rotatable with said carrier and comprising a screw threaded part adapted to engage the screw threads of said casing, said member being provided with means, whereby a tool may operatively engage said member to turn the same and thereby remove said member and carrier through the nose end of the pencil.

GABRIEL LARSEN.