Nov. 18 , 1924. 1,515,615

A. POLLAK

LEAD PENCIL

Filed Sept. 13, 1923

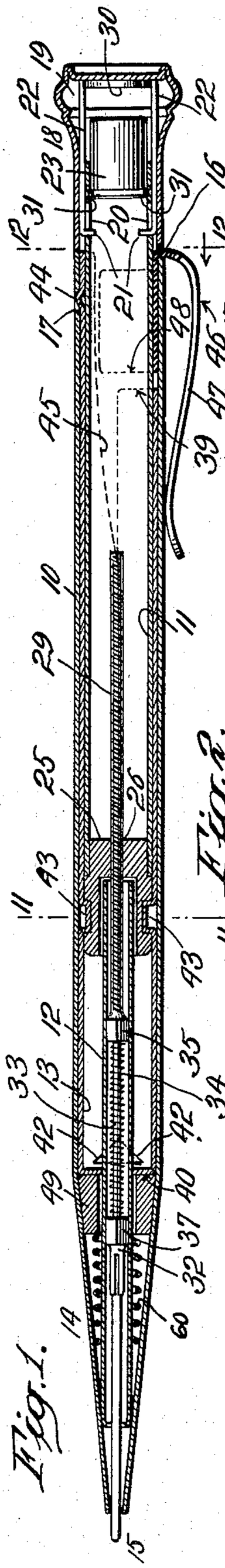

Fig. 1.

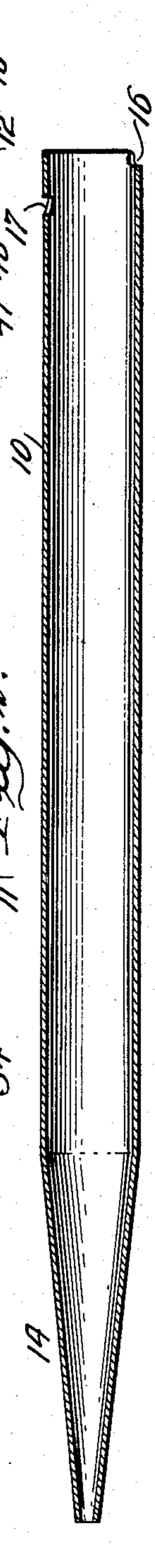

Fig. 2.

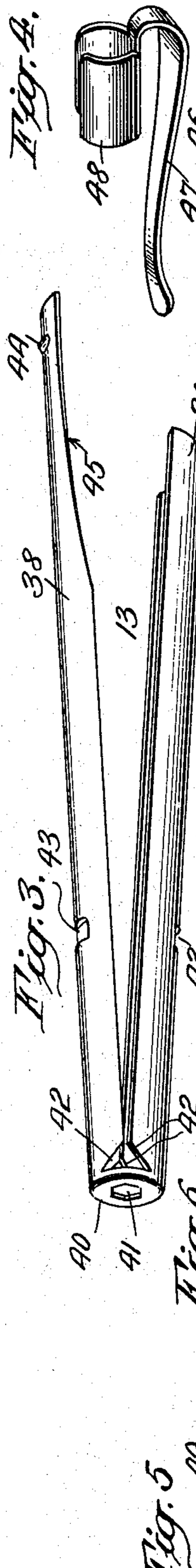

Fig. 3.

Fig. 4.

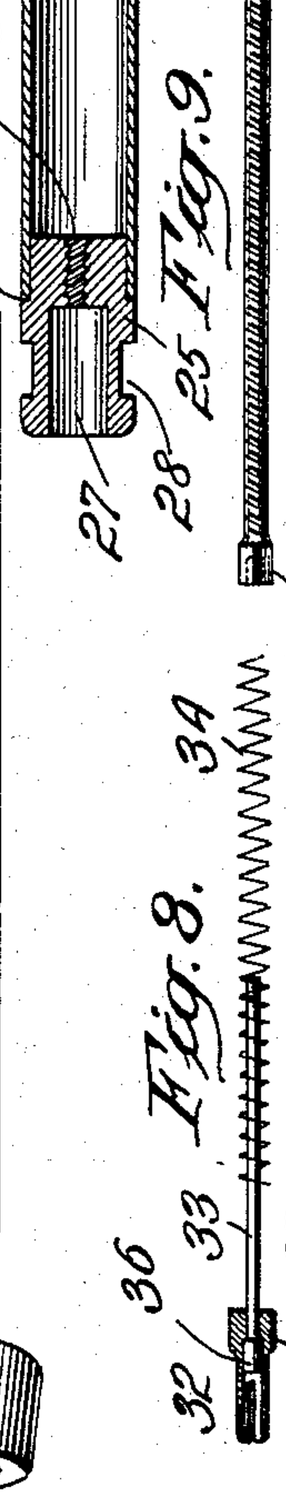

Fig. 5

Fig. 6.

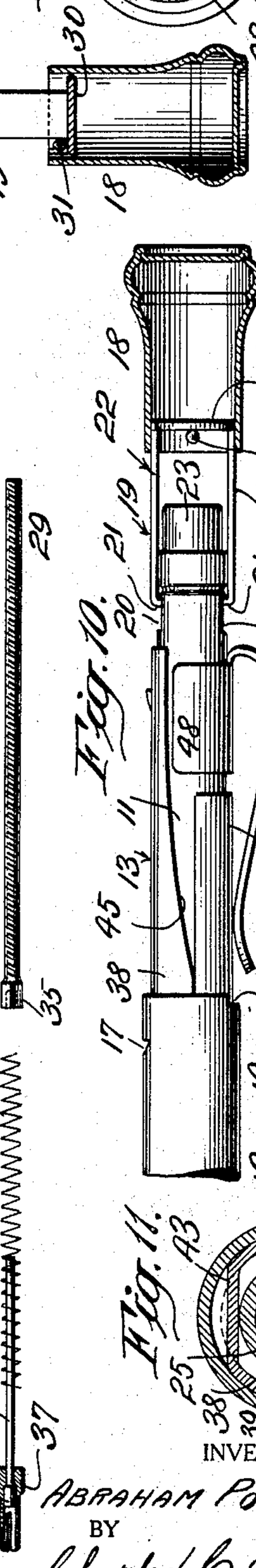

Fig. 7.

Fig. 9.

Fig. 8.

Fig. 12.

Fig. 10.

Fig. 11.

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Patented Nov. 18, 1924. 1,515,615

UNITED STATES PATENT OFFICE.

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LEAD PENCIL.

Application filed September 13, 1923. Serial No. 662,376.

To all whom it may concern:

Be it known that I, ABRAHAM POLLAK, a citizen of the United States, and a resident of New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Lead Pencils, of which the following is a specification.

The invention relates to improvements in mechanical lead pencils, and it consists in the novel features, structure and combinations of parts hereinafter described and particularly pointed out in the claims, whereby a pencil of improved character is produced.

The present invention embodies certain improvements on the lead pencil made the subject of Letters Patent No. 1,441,600, granted to me on January 9, 1923, and No. 1,454,136, granted to me on May 8, 1923.

The object of the present invention is to simplify the construction of the lead pencils disclosed in the aforesaid Letters Patent and to provide a pencil whose interior mechanism will be of durable character and reliable in operation and whose parts may be conveniently assembled and, when necessary, disassembled.

The pencil is capable of propelling the lead to exposed position for writing purposes, retracting or repelling the lead when the use thereof has concluded and finally expelling an unduly short piece of lead entirely from the pencil.

The invention will be fully understood from the detailed description hereinafter presented, reference being had to the accompanying drawings, in which:

Fig. 1 is a central longitudinal section through a mechanical lead pencil embodying my invention;

Fig. 2 is a corresponding section through the exterior barrel or casing of the pencil;

Fig. 3 is a detached perspective view of an inner split tubular member employed for locking the several parts of the pencil in assembled relation and which in the final assembly lies closely within the outer barrel or casing and becomes latched thereto;

Fig. 4 is a detached perspective view of a pocket clip having a novel relation to the pencil and which is securely connected therewith without riveting;

Fig. 5 is a detached perspective view of a filler plug and stop to lie within the inner end of the tip section of the outer barrel or casing;

Fig. 6 is a longitudinal section through a hexagonal guiding tube forming a part of the interior mechanism and which prevents rotation of the lead propelling and repelling devices, while permitting longitudinal movement thereof;

Fig. 7 is a side elevation, partly in section, of the inner rotary tubular member from which the lead actuating devices are operated and which may be utilized as a chamber for holding reserve leads;

Figs. 8 and 9 show in juxtaposed relation the several parts of the lead holding and actuating mechanism finally disposed centrally within the pencil and which parts correspond with like features shown in my aforesaid Letters Patent No. 1,141,600.

Fig. 10 is a side elevation, partly in section and partly broken away, of the rear portion of the pencil and is illustrative of the manner of assembling the interior portions of the pencil and introducing them into or removing them from the outer barrel or casing;

Fig. 11 is an enlarged transverse section through the pencil taken on the dotted line 11—11 of Fig. 1, and

Fig. 12 is a corresponding section through the same taken on the dotted line 12—12 of Fig. 1.

The pencil comprises four main tubular members 10, 11, 12 and 13, respectively, the member 11 being capable of rotation and the other members being stationary.

The member 10 constitutes the exterior shell or casing of the pencil and is preferably in one integral tube tapered at its forward end to form a tip-section or member 14 through the forward end of which the lead 15 is projected, when desired, for writing purposes. The member 10 has in its outer or rear end portion, an end recess 16 and a side aperture 17 whose purpose will be explained hereinafter.

The rear end of the casing member 10 is normally closed by a cap 18, which by means of a yoke 19, is swiveled to the tubular member 11, said member 11 having openings 20 in its opposite sides to receive the inwardly bent ends 21 of the side arms 22 of said yoke and permit said yoke, with the cap 18, when said cap is withdrawn rearwardly along the yoke and from over the openings

20 (Fig. 10), to be turned downwardly to the position shown in Fig. 7 to expose the eraser 23 which plugs the rear end of the tubular member 11.

The tubular member 11 is a plain cylindrical barrel having the openings 20 near its rear end and at its front end being secured in an annular recess 24 formed on the rear end of a nut 25 which contains a spirally threaded hole 26 in line with the longitudinal center of the tube 11 and has a hollow central portion 27 constituting a recess to freely receive the rear end of the tubular member 12, as shown in Fig. 1. The nut 25 has rounded exterior forward edges and in rear thereof is formed with an annular groove 28. The spirally threaded hole 26 in the nut 25 cooperates with the longitudinally movable spiral rod 29, as hereinafter described, and the forward end of the nut 25 is within and interlocked at the groove 28 with the tubular member 13, as hereinafter explained and as shown in Fig. 1. In the assembly of the parts the nut 25 becomes interlocked with the tubular member 13 but is capable of rotary movement with the tubular member 11 with which it is rigidly connected, the tubular member 13 remaining stationary with the outer casing 10.

The tubular member 11 is therefore, as a separate member, rotatable within the outer shell or casing 10 and carries the nut 25, cap 18 and eraser 23, as shown in Fig. 10. The tubular member 11 forms within it a chamber for reserve leads and said chamber is accessible when the eraser 23 is withdrawn from the tube and closed when said eraser is returned to position.

The cap 18 is of ornamental character and provides a chamber for the outer portion of the eraser 23 and outer end of the tube 11, which, as shown in Fig. 1, projects rearwardly beyond the adjacent end of the casing 10. The arms 22 of the yoke 19 are connected within the cap 18 by a disk 30, and the cap is slidable on said arms and disk and prevented from being withdrawn entirely from off the same by indented lugs 31 in the sides of the cap and which act as stops against the disk 30 when the cap has been withdrawn to its full outer position, as shown in Fig. 10. When the cap 18 is in its forward position over the eraser 23 and rear end of the tube 11, its forward edges abut against the rear edges of the casing 10, the sides of the cap then forming a continuation of the sides of the casing 10, as shown in Fig. 1. When the cap 18 is in the position shown in Fig. 1, it will be utilized as a key for rotating the tube 11, and at this time the indented lugs 31 will perform their second function, to wit: that of engaging the arms 22 and through said arms imparting the rotary movement of said cap to the tube 11 for actuating the screw 29 and parts associated therewith, said lugs 31 engaging diagonally opposite edges of said arms when the cap 18 is turned clockwise and the other diagonally opposite edges of said arms when the cap is turned counter-clockwise. The cap 18 and yoke 19, thus serve as means for turning the tube 11 in either direction and the cap 18 serves as a finish for the rear end of the pencil and also affords a chamber concealing the eraser 23. The cap 18 is pulled outwardly and then turned downwardly (Fig. 7) when the eraser 23 is to be used or when the eraser is to be detached for exposing the chamber for reserve leads in the tube 11.

The tubular member 12 is a plain hexagonal tube partly closed at its forward end to guide the lead 15 and at said end engaging the inner forwardly converging walls of the tip-section 14, while the rear end of said tubular member 12 is snugly, though freely, positioned within the recess 27 of the nut 25.

Within the tubular member 12 is located the forward end of the screw 29, the lead clutch or holder 32, the propeller rod 33 and the spring 34, which as shown in Fig. 1, is on the rod 33 and interposed between the holder 32 and a hexagonal head 35 on the forward end of the screw 29. The rear end of the rod 33 is screwed into the forward end of the head 35, and on the forward end of the rod 33 is a head 36 disposed within the holder 32 and which engages the rear end of the lead 15. The holder 32 has on its rear end a hexagonal head 37 which at the proper time will engage the partly closed end of the tube 12 and arrest the holder against further forward movement through said tube, this taking place when the lead 15 has become very short and it is desired to expel the same by the continued forward movement of the rod 33 and head 36 through the holder 32. The screw 29 has a direct longitudinal movement imparted to it on the rotation of the tube 11 and nut 25, and rotary movement of said screw is prevented by the engagement of its hexagonal head 35 with the inner surfaces of the hexagonal tube 12.

The screw 29 having the head 35, the holder 32 having the head 37, the propeller rod 33 having the head 36 and the spring 34 are specifically shown and described as to their assembly and mode of operation in my aforesaid Patent No. 1,441,600, and hence it is believed further detailed description of these features is not required herein. The present invention is not limited to the use of the spring 34, and in lieu thereof I may employ the clutch features described in my Letters Patent No. 1,454,136, and indicated by the numerals 33, 34 therein.

The tubular member 13 is a new feature of the pencil and it is of sheet metal and preferably in the form of a longitudinally split tube, the two parts of the tube, numbered

38, 39 respectively in Fig. 3, being joined together at their forward ends by a disk or head 40 which contains a hexagonal hole 41 of a size to snugly encompass the hexagonal tube 12 and hold said tube centrally of the pencil and particularly against rotation under the influence of the screw 29 and its head 35. The head 40 by the engagement of its hole 41 with the tube 12, not only prevents rotation of said tube but through the tube overcomes the tendency of the screw 29 and head 35 to rotate under the influence of the nut 25.

The half-sections 38, 39 of the tubular member 13 are recessed close to the head 40, as at 42, so that said sections may be opened outwardly from each other to a limited extent, as illustrated in Fig. 3. The tube sections 38, 39 are formed with corresponding inwardly pressed lugs 43 which enter the annular groove 28 of the nut 25 (Figs. 1 and 11) and hold said nut and the tube 11 against longitudinal movement without interfering with their rotary movement. The tube section 38 is formed near its outer or rear end with an outwardly pressed lug 44, and this lug in the final assembly of the parts of the pencil, snaps into the hole 17 formed in the outer casing 10, as shown in Fig. 1, and thereby said tubular member 13 becomes latched to said casing 10. The tube section 38 extends rearwardly to the rear end of the casing 10 and except for the provision of the pocket clip shown in Fig. 4, the tube section 39 would be of the same length as the tube section 38. At present the tube section 39 does not extend to the rear edge of the casing 10 and the opposite rear edges of the tube section 38 are cut away, as at 45, so as to provide for the application of the pocket clip 46 to the pencil.

The clip 46 comprises the usual tongue 47 and body member or clasp 48, and the body member 48 is applied to the tube 11 outwardly from the end of the tube-section 39, as shown in Fig. 10, and in the final assembly of the parts of the pencil said body-member is pushed into the rear end of the outer tubular casing 10, or from the position shown in Fig. 10 to that illustrated in Fig. 1, in which latter position the inner end portion of the tongue 47 extends outwardly through the recess 16 formed in the rear edge of the casing 10 and the body member or clasp 48 is concealed within the casing 10. The clip 46 thus becomes connected with the pencil without riveting and without the clasp 48 being exposed. The recess 16 receives the transverse portion of the tongue 47 and thus prevents said tongue from interfering with the seating of the cap 18 against the rear edges of the casing 10.

In assembling the parts of the pencil, the tube 11 and nut 25 secured thereto being considered a unit, the screw 29, lead holder 32, rod 33 and spring 34 are brought together as another unit and the screw is applied to the nut 25, and thereupon the hexagonal tube is slipped upon the holder 32, head 35 and forward portion of the screw 29 and at its rear end is seated in the recess 27 of said nut. The tubular member 13 may be then slipped upon the hexagonal tube 12, the hole 41 passing rearwardly over said tube, and closed upon the nut 25 and tube 11, this operation resulting in the lugs 43 entering the annular groove 28 of the nut 25 and in the tube-sections 38, 39 closely embracing said nut and the tube 11 without interfering with the subsequent rotation of said nut and tube 11. The conical filler piece 49 may then be slipped upon the tube 12 and against the head 40 of the tubular member 13, and thereupon the parts thus far assembled may be introduced into the outer tube 10 from the rear end thereof and moved forwardly to, say, about the position indicated in Fig. 10, and thereupon the clip 46 may be applied to the tube 11 and the arms 22 of the cap-yoke 19 may be sprung into engagement with the openings 20 of said tube 11, after which the tubular member 13 and its associated parts may be pushed fully into the casing 10 or until the filler piece 49 seats within the tip-section 14 and the forward edge of the cap 18 seats against the rear edge of the casing 10. On arriving at its final position the tubular member 13 carries its lug 44 to the opening 17 in the casing 10 and said lug snaps into said opening and thereby the tubular member 13 becomes latched to the casing 10 and the several parts become positioned. The lead 15 may be propelled, repelled and finally expelled by the rotation of the cap 18. When it is desired to use the eraser 23 the cap will be pulled rearwardly along the yoke-arms 22 (Fig. 10) and then turned downwardly (Fig. 7) to expose the eraser, and at this time the eraser may be withdrawn to permit access to the chamber within the tube 11.

The construction of the various parts of the pencil so as to be capable of efficient operation, of remaining in operative relation to one another even during rough handling of the pencil and of convenient assembly with the aid of the tubular member 13, are purposes accomplished by my invention.

What I claim as my invention and desire to secure by Letters Patent, is:

1. A lead pencil comprising an exterior casing having at its forward end a tip-section, a rear rotary tube therein equipped with a spirally threaded nut and having an operating head at its rear end, a non-rotary forward guiding tube associated with said nut, a spirally threaded non-rotary rod extending through said nut and into said guiding tube and movable longitudinally from said nut, a lead-clutch in said guiding

tube movable longitudinally therein from said rod, and a split tubular member having on its forward end a head through which said guiding tube passes and by means of which said tube is held against rotation, the side members of said split tubular member embracing said rotary tube within said exterior casing and said member being interlocked with said nut and latched to said casing and stationary therewith.

2. A lead pencil comprising an exterior casing having at its forward end a tip-section, a rear rotary tube therein equipped with a spirally threaded nut and having an operating head at its rear end, said nut having a recess in its forward end, a hexagonal guiding tube extending from said tip-section into said recess of said nut, a spirally threaded non-rotary rod extending through said nut and into said guiding tube and movable longitudinally from said nut, a lead-clutch in and conforming to said hexagonal guiding tube and movable longitudinally therein from said rod, and a tubular member embracing said rotary tube and latched to said exterior casing, said tubular member being interlocked with said nut and having a head on its forward end containing a hexagonal opening through which said hexagonal tube extends and by means of which said tube is held against rotation.

3. A lead pencil comprising an exterior casing having at its forward end a tip-section, a rear rotary tube therein equipped with a spirally threaded nut and having an operating head at its rear end, said nut having a recess in its forward end, a hexagonal guiding tube extending from said tip-section into said recess of said nut, a spirally threaded non-rotary rod extending through said nut and into said guiding tube and movable longitudinally from said nut, a lead-clutch in and conforming to said hexagonal guiding tube and movable longitudinally therein from said rod, and a tubular member embracing said rotary tube and latched to said exterior casing, said tubular member being interlocked with said nut and having a head on its forward end containing a hexagonal opening through which said hexagonal tube extends and by means of which said tube is held against rotation, and said tubular member being in the form of a split tube to close upon opposite sides of said rotary tube and having a lug on one of its members to snap into an opening in said outer casing, whereby said parts become latched together.

4. A lead pencil comprising an exterior casing having at its forward end a tip-section, a rear rotary tube therein equipped with a spirally threaded nut and having an operating head at its rear end, a non-rotary forward guiding tube associated with said nut, a spirally threaded non-rotary rod extending through said nut and into said guiding tube and movable longitudinally from said nut, a lead-clutch in said guiding tube movable longitudinally therein from said rod, and a split tubular member having on its forward end a head through which said guiding tube passes and by means of which said tube is held against rotation, the side members of said split tubular member embracing said rotary tube within said exterior casing and said member being interlocked with said nut and latched to said casing and stationary therewith, said tip-section having a filler-piece seated within its rear end and which has an opening through which said guiding tube extends, and said split tubular member having its forward head seated against said filler-piece.

5. A lead pencil comprising an exterior casing having at its forward end a tip-section, a rear rotary tube therein equipped with a spirally threaded nut and having an operating head at its rear end, said nut having a recess in its forward end, a hexagonal guiding tube extending from said tip-section into said recess of said nut and being partly closed at its forward end, a spirally threaded rod extending through said nut and movable longitudinally therefrom and having on its forward end a hexagonal head to guide within said hexagonal tube, a propeller rod connected with and extending forwardly from said hexagonal head, a tubular lead-holding member adapted to receive the writing-lead and slidable within said hexagonal tube and having a head to prevent its escape therefrom, a coiled spring on said rod engaging said lead-holding member head and said hexagonal head, said propeller rod extending forwardly through a hole in the head of said lead-holding member and having a head on its forward end to engage the lead and slidable within said member, said propeller rod being adapted when the lead-holding member is arrested at the end of the hexagonal tube to continue in motion to expel the remaining piece of lead, said spring then being compressed between the said hexagonal head and the lead-holding member, and a tubular member embracing said rotary tube and latched to said exterior casing, said tubular member being interlocked with said nut and having a head on its forward end containing a hexagonal opening through which said hexagonal tube extends and by means of which said tube is held against rotation.

6. A lead-pencil comprising an exterior casing having at its forward end a tip-section, a rear rotary tube therein having rigid with its forward end a spirally threaded nut formed with a circumferential groove, said tube having an operating head at its outer end, a non-rotary forward guiding-tube as-

sociated with said nut, a spirally threaded non-rotary rod extending through said nut and into said guiding-tube and movable longitudinally from said nut, a lead-clutch in said guiding-tube movable longitudinally therein from said rod, and a split tubular member having on its forward end a head through which said guiding-tube passes and by means of which the tube is held against rotation, the side members of said split tubular member embracing said rotary tube within said exterior casing and having depressed lugs freely entered within the circumferential groove of said nut, and said tubular member being latched at its rear end to the rear portion of said casing and stationary with said casing.

Signed at New York city, in the county of New York and State of New York, this 4th day of September, A. D. 1923.

ABRAHAM POLLAK.