April 12, 1932. P. S. HAUTON 1,853,561

MECHANICAL PENCIL

Filed Dec. 18, 1924 2 Sheets-Sheet 1

Fig. 1.

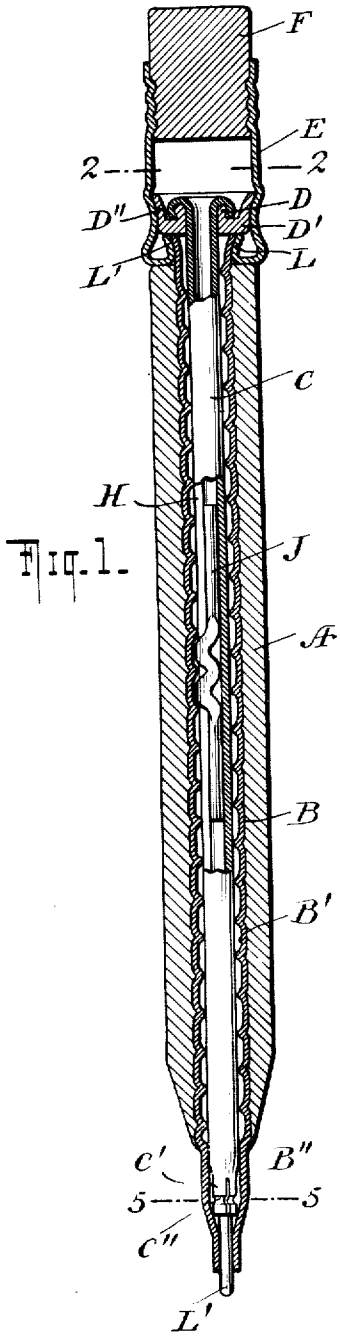


Fig. 2.

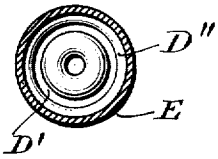


Fig. 3.

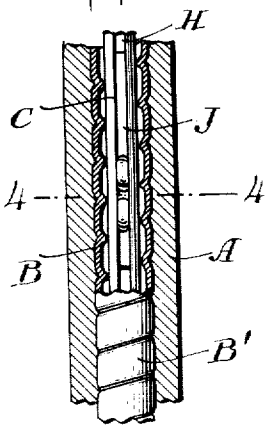


Fig. 4.

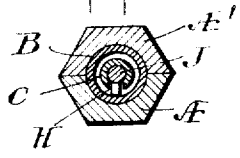


Fig. 8.

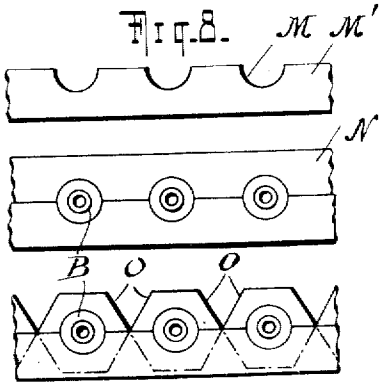


Fig. 6.

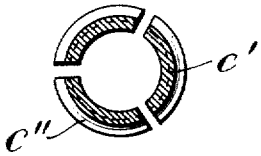


Fig. 5.

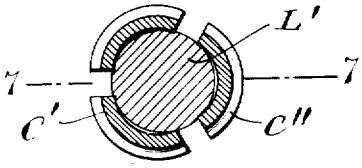
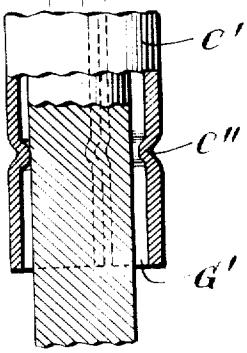


Fig. 7.



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MECHANICAL PENCIL

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Fig. 9.

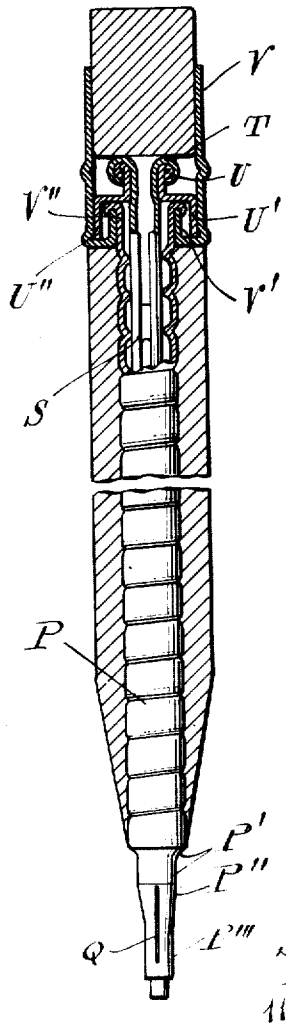

Fig. 12.

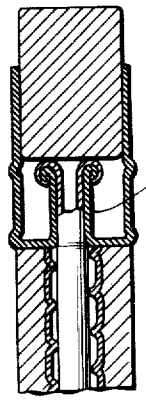

Fig. 10.

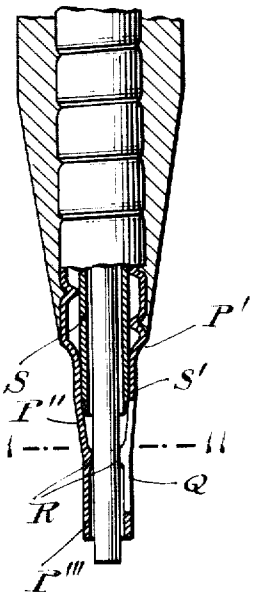

Fig. 11.

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Patented Apr. 12, 1932 1,853,561

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PAUL S. HAUTON, OF ATLANTA, GEORGIA

MECHANICAL PENCIL

Application filed December 18, 1924. Serial No. 756,635.

This invention relates to mechanical pencils and their method of manufacture.

Comprehensively stated, the present invention has reference to a pencil in which a split tube serves as a lead holder, the lead holder containing a lead follower which is moved relatively to the pencil on rotation of the tube and by exerting a pressure on the leads, causing one of them to project from the pencil tip.

The object of the invention is to provide a mechanical pencil which will effectively perform its intended purpose and which may be economically produced. This end is achieved in the pencil illustrated in the drawings which admirably lends itself to economical production because of the arrangement and character of the parts.

Heretofore mechanical pencils have in general comprehended a feed mechanism enclosed in a composition casing. These composition casings are difficult and costly to manufacture and do not simulate the ordinary non-mechanical pencil either in appearance or "feel" to a sufficient degree to easily make the habitual wood pencil user a convert to the mechanical pencil. The present invention affords a mechanical pencil which looks and feels similar to the ordinary pencil and which may be produced at a cost not much exceeding the cost of the non-mechanical wood pencil. This end is partly achieved by utilizing a wood shell or casing consisting of two or more complementary shell parts which are united to each other along vertical edges on opposite sides of an element of a lead propelling mechanism.

Another phase of the invention resides in the provision of a tip which finishes off the end of the pencil and serves as a clutch to frictionally engage and support the writing end of the lead.

A still further phase of the invention resides in the provision of an eraser ferrule which serves as a manually operable member to actuate the feed mechanism and is guided by a portion of it.

Other objects and advantages of the present construction will become apparent from the detailed description of the illustrated embodiment and while one embodiment of the invention is illustrated in the accompanying drawings it is to be understood that this embodiment merely serves as an illustration of the underlying principles of the invention so that they may be readily comprehended by those skilled in the art and is not intended as limiting the invention to the specific form disclosed therein.

In said drawings:

Fig. 1 is a vertical section of the pencil partly fragmentary.

Fig. 2 is a section of Fig. 1 on the line 2—2.

Fig. 3 is a fragmentary vertical section of Fig. 1, the section being taken at right angles to the section shown in Fig. 1.

Fig. 4 is a section of Fig. 3 on the line 4—4.

Fig. 5 is a section of Fig. 1 on the line 5—5.

Fig. 6 is a similar view to that shown in Fig. 5 with the lead removed and the parts in their normal position.

Fig. 7 is a section of Fig. 5 on the line 7—7.

Fig. 8 shows the manner of assembling some of the parts.

Fig. 9 is a fragmentary elevation partly in section.

Fig. 10 is an enlarged detail view of the tip partly in section of a modification of the invention.

Fig. 11 is a section of Fig. 9 on the line 11—11, and

Fig. 12 is a fragmentary view of another modification of the connection between the ferrule.

Continuing now by way of a detailed description, a shell or casing A preferably comprises a plurality of continuous shell strips A′ united along their vertical edges and enclosing the major portion of a lead feeding mechanism element. While the shell A in the preferred embodiment consists of a plurality of strips as indicated, the invention is not necessarily limited to the use of a plurality of shell parts since a unitary shell might be used as will be readily understood. Irrespec-

tive as to whether the shell or casing is unitary or built up from a number of strips, a feed tube B having a thread B′ formed therein is located within the shell bore and is preferably held solely by frictional engagement with the shell, although of course an adhesive might be also used between the shell and the feed tube B. The writing end of the tube B is tapered to form a guide tip B″, and is carried beyond the shell so as to give a finished appearance to the pencil and to afford a means to effectively guide and support the lead which is designed to project through its apertured end.

A lead holder C, adapted to be inserted in the threaded tube B has one end spun over an inner upstanding annular rim D of a cup D′ as shown in Fig. 1, thereby securely locking the cup to the holder. The outer rim D″ of the cup D′ extends upwardly and flares outwardly and has an annular peripheral depression as shown to lock with a correspondingly shaped portion of an eraser ferrule E which in turn carries the eraser F in the usual manner. By this arrangement the ferrule, cup and holder are securely locked together so that the ferrule E may serve as a manually operable member to rotate the feed holder. While the cup D′ is shown as having upstanding rims nevertheless they might also be dependent, the cup in this case being forced over the inside of the dependent cup rim as will be readily understood. The writing end of the holder or split tube C of the pencil is split to form the tripartite clutch C′, in the manner shown more particularly in Figs. 1, 5, 6 and 7, the split clutch parts due to their resiliency affording a substantial frictional engagement with the lead to firmly yet resiliently support the lead in conjunction with the apertured end of the tube B, particularly during the writing operation. This clutch C′ has an annular bead C″ on its internal periphery, which is in actual contact with the lead, thereby affording a slightly widened mouth G′ to facilitate the insertion of the leads into the holder C, which is loaded by pushing the requisite number of leads through its end B″ and the clutch C″. It will be observed from an inspection of Figs. 5 and 6 that when the segments of the clutch are expanded by the insertion of a lead, the sharp vertical edges of the segment "bite" the lead (due to the fact that the radius of the arc of the segment is less than that of the lead) and effectively prevent any rotation of the lead relatively to the pencil.

The lead holder C also has a vertical guide slot H and contains a follower J which is arranged to bear against the rearmost lead contained in the holder to feed the series of leads toward the tip. This follower may be and preferably is formed from a wire strip having a flattened bent sinuous portion to form the wings K which engage the threads B′ of the feed tube B. The rotation of the eraser ferrule E and its attached tube or holder C carries the follower J around due to the fact that the wings K project through the slot H and are constrained to rotate with the tube. The engagement of the follower wings K in the tube threads B′ feeds the follower toward the writing end of the pencil, the motion of the follower ejecting the lead or the foremost lead of the series in case a plurality of leads are utilized from the tip the desired distance.

The holder tube C is preferably formed from a flat ribbon which results in a tube having a slit the entire length of the tube. The ends are then closed and shaped by suitable methods to form a clutch and a seating for a locking member or as shown in modification Fig. 12, a seating for the eraser ferrule. Of course, a solid tube with a slot H cut into it may be used for the same purpose.

The threaded feed tube B is held relatively stationary in the shell or casing A, as before indicated, and has the end remote from the writing end projecting above the shell flared or spread outwardly to freely engage a correspondingly flared reentrant end L formed by turning in the lower end of the ferrule E. This arrangement holds the ferrule in position on the pencil and yet permits it to rotate freely relatively to the threaded tube B and shell A when the ferrule E and holder C are manually rotated to regulate the exposure of the writing lead L′.

As has already been indicated, the shell or casing A consists of a plurality of shell parts united to each other along vertical edges and this construction is preferred as peculiarly lending itself to the expeditious method of production shown in Fig. 8.

In view of the fact that the lead feeding mechanism consists of a unitary assemblage of elements cooperating with a feed tube, it is contemplated simultaneously forming the shell parts for a plurality of pencils, instead of forming each shell individually in order to expedite and economize production. To this end a plurality of preferably parallel recesses or grooves M are simultaneously formed in a rough shell part M′ by a suitable grooving tool. The feed tube B is then preferably inserted in each of these recesses. A plurality of parallel recesses are formed in a second rough shell part N and the two shell parts are united. These united rough shell parts are then shaped to give the desired cross sectional configuration to the individual pencil. The shaping operation may simply consist of running a V shaped groove between the recesses M to form faces O, as shown in Fig. 8. The spacing of the grooves or recesses M is preferably so arranged that the shaping operation will also separate the individual pencils as will be readily understood. The separation of the pencils from each other by a V shaped groove in the manner indicated re-

sults in the conventional pencil having a hexagonal cross section. However, the present invention is obviously not limited to the production of a pencil having any particular cross section but the shape of the grooving tool may be so selected as to afford other shapes of pencil, and, of course, instead of forming the grooves M by a grooving tool, the rough shell parts M and N might be laid together, the opening M drilled, the rough parts separated and the tube B inserted. Also, instead of using two rough parts, the shell B might be inserted in a single drilled block.

In the modification shown in Fig. 9 instead of the clutch being located within an extension of the threaded feed tube which forms the pencil tip, the pencil tip itself serves as a clutch and because of its accessibility from the outside enabling the clutch to be readily adjusted for perfect action. The shell construction of the modification shown in Figs. 9, 10, 11 and 12 is similar to that shown in Fig. 1 as is the arrangement of the split tube follower and threaded tube. The threaded tube P in the modification shown in Fig. 9 is formed in a tip of novel design. The portion P′ immediately projecting from the shell is shaped into a bearing for the holder tube S or C. This bearing provides for correct alignment of the holder S with tip P‴ at all times, even should the holder tube S fail to be perfectly straight. The bearing portion P′ is connected with tip P‴ through the taper portion P″. The portion P‴ is the guide tip proper, which supports the lead during writing. The inside diameter of P‴ is a little larger than the diameter of the lead to facilitate the loading of the holder which is done through the tip. The outside diameter of P‴ is made as small as is practical without decreasing too much the strength of the tip. The outside diameter of the tubular tip P‴ will, therefore, closely approach the diameter of the lead and by making the length of P‴ equal to or several times the diameter of the lead, a tip of novel proportion appears which gives to the writer the illusion that the lead projects much further outside of the tip than in tips of conventional design, which are simply tapered and do not have the tubular extension P″. The failure of mechanical pencils to contest successfully with the old style wood pencil in popularity has to a great extent been due to faulty design of the tip. Due to the bulkiness of these tips, the user was inclined to project the lead too far from the tip, which caused the leads to break under slight writing pressure. This tip P‴ has a plurality of longitudinal slits which begin at a point slightly remote from its writing end and extend along the tip a sufficient distance so as to afford a slightly expansible portion behind the writing end of the tip. In order that this expansible portion may become slightly distended when the lead is inserted. an annular shoulder or constriction R is formed on the inner periphery of the tip, this constriction or shoulder permitting the writing end of the tip to fit the lead point loosely to facilitate loading.

The connection between the ferrule and holder tube in the modification shown in Fig. 9 utilizes an auxiliary connecting element between the ferrule and holder tube as in the case of the constriction shown in Fig. 1. The holder tube in the present modification is slightly shouldered at T and its upper extremity T′ is crimped over the upper extremity U of the auxiliary connecting element U′. This connecting element has a dependent annular apron U″ which locks with the wall of the eraser ferrule V so that a rotation of the ferrule causes the magazine tube to rotate in a manner similar to that shown in Fig. 1. In the present modification the lower end of the eraser ferrule is turned up to form a reentrant sleeve V′ which rides freely on the extended portion V″ of the threaded tube, the upper end of the tube being loosely spun over the upper edge of the sleeve V′ with sufficient clearance to permit the sleeve V′ to rotate freely with respect to the threaded tube and shell.

In the modification shown in Fig. 12 the threaded tube terminates with the shell and the eraser ferrule has a reentrant sleeve similar to the reentrant eraser sleeve shown in Fig. 9 the sleeve being slightly longer however and serving to effectively maintain the split tube and eraser ferrule in alignment.

I claim:—

1. A mechanical pencil comprising a turning ferrule having a reentrant part, a locking cup having a reentrant part corresponding to the reentrant part of the ferrule and a lead holder carried by the cup.

2. A mechanical pencil comprising a turning ferrule having a reentrant part, a locking cup having a reentrant part corresponding to the reentrant part of the ferrule and locked thereto and having a rim and a lead holder having one end turned over the rim.

3. A pencil comprising a turning ferrule, a locking cup affixed thereto, a lead holder carried by said cup and adapted to be rotated by said ferrule, said holder presenting a slot, a threaded feed tube embracing said holder and a follower carried in the holder and having a flattened bent portion forming a wing, said wing passing through said slot and engaging the thread of the feed tube.

4. A mechanical pencil combining a turning ferrule having a reentrant part, a lead holder, and a locking cup having a reentrant part adapted to lock with a part of the ferrule and having a rim over which one end of the holder is turned.

5. A lead holder for mechanical pencils

having a split end forming a plurality of flexible lead gripping tongues, having longitudinally disposed lead engaging edges the lead engaging edges of said fingers normally forming an opening which is of smaller diameter than the lead whereby when the fingers are forced apart by the insertion of a lead, and the lead is gripped by the inwardly projecting edges of said fingers.

6. A lead holder for mechanical pencils having its lead ejecting end split longitudinally to form a plurality of tongues, each of the tongues having an internal bead for engaging the lead spaced from the end of the tongue.

7. A mechanical pencil combining a turning ferrule, a lead holder, and a locking cup adapted to lock with a part of the ferrule and having a portion over which one end of the holder is turned.

8. A pencil comprising a turning ferrule, a cup snugly fitting the inside of the ferrule, a lead holder carried by said cup and adapted to be rotated by said ferrule, said holder presenting a slot, a threaded feed tube embracing said holder and a follower carried in the holder and having a flattened bent portion forming a wing, said wing passing through said slot and engaging the thread of the feed tube.

Signed at New York city, New York, this 29th day of November, A. D. 1924.

PAUL S. HAUTON.

DISCLAIMER

1,853,561.—*Paul S. Hauton*, Atlanta, Ga. MECHANICAL PENCIL. Patent dated April 12, 1932. Disclaimer filed November 2, 1935, by the assignee, *Scripto Manufacturing Company*.

Hereby enters this disclaimer to claim 7 of said Letters Patent.

[*Official Gazette November 26, 1935.*]

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