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MECHANICAL PENCIL WITH STEP-BY-STEP LEAD FEEDING MEANS

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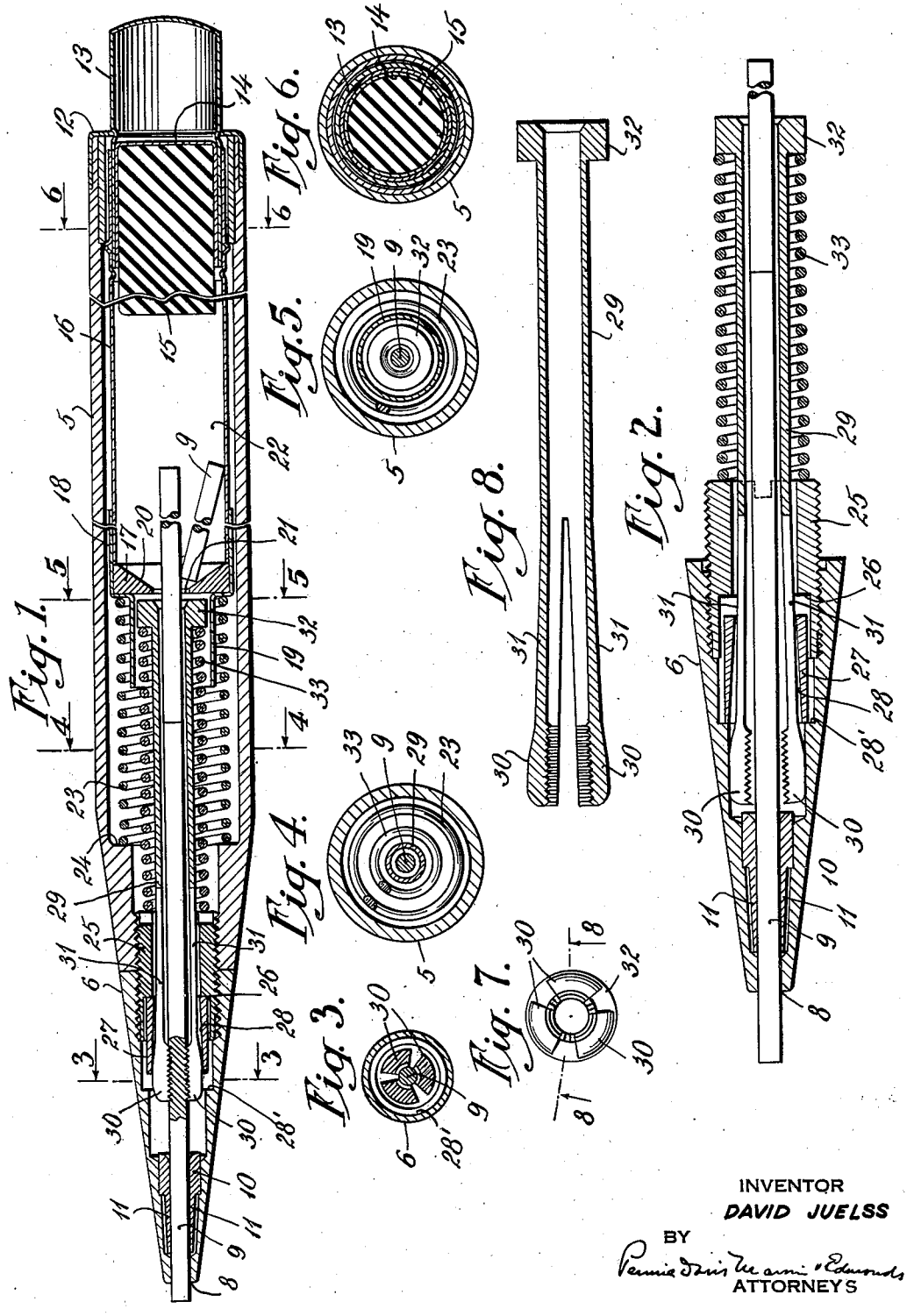


Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.

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MECHANICAL PENCIL WITH STEP-BY-STEP LEAD FEEDING MEANS

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This invention relates to mechanical pencils and particularly to improvements in pencils in which the lead is advanced by a step-by-step operation.

Pencils of the type described are known, the mechanism thereof taking various forms, most of which are relatively complicated and difficult to assemble. Owing to the delicacy of the parts, assembling difficulties may seriously increase the cost of production of the pencils. Furthermore, such structures cannot be taken apart readily for cleaning and repair.

It is the object of the present invention to provide a mechanical pencil which is simple and rugged, including an effective mechanism for advancing the leads which is easy to manufacture and especially to assemble.

A further object of the invention is the provision of a magazine pencil in which the lead-feeding mechanism is assembled as a unit which may be attached to and removed from the pencil casing so that the operating parts are readily accessible for cleaning and repair and the cost of assembling the pencil is reduced to a minimum.

Other objects and advantages of the invention will be apparent as it is better understood by reference to the following specification and accompanying drawing, in which

Fig. 1 is a longitudinal section through the pencil showing the mechanism in writing position;

Fig. 2 is a similar view of the feeding unit, showing the mechanism displaced to advance the lead;

Fig. 3 is a section on the line 3—3 of Fig. 1;

Fig. 4 is a section on the line 4—4 of Fig. 1;

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

Fig. 6 is a section on the line 6—6 of Fig. 1;

Fig. 7 is an end elevation of the collet with lead-gripping members thereon; and

Fig. 8 is a section on the line 8—8 of Fig. 7.

Referring to the drawing, 5 indicates a casing of suitable material, for example metal or plastic, which is generally cylindrical in form, though the cross-sectional contour may be circular, polygonal or otherwise to afford a pleasing exterior appearance. At one end, a tapered extension 6, which may also be of metal or plastic, is secured to the casing 5 in the manner hereinafter described. The extension 6 has an orifice 8 through which the lead 9 projects and is preferably provided with a tubular lead guide 10 having split fingers 11 at its end to frictionally engage the lead 9 and to hold it during

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one phase of the operation of the lead-feeding mechanism.

The casing 5 carries within its other end a ferrule 12 which supports the operating member 13, extending rearwardly from the pencil. A cup 14 is enclosed within the operating member and carries an eraser 15. By reversing the operating member 13, the eraser may be made available for use.

The member 13 is connected to a sleeve 16 which is slidably supported within the casing 5 and extends to a guide member 17 which is supported in a thimble 18 having an extension 19. The guide member 17 has a tapered face 20 and an opening 21 through which the leads are guided from the magazine 22. The spring 23 is disposed between an abutment 24 in the casing 5 and the thimble 18 and normally holds the thimble and the sleeve firmly against the ferrule 12 which acts as a stop to limit rearward movement of the sleeve 16.

The tapered extension 6 is adapted to receive a member 25, preferably threaded as indicated in the drawing, although it may be connected by press fitting. The member 25 affords an abutment 26 against which a constricting collar 27 having a tapered inner surface 28 is adapted to rest when the mechanism is in the position indicated in Fig. 1. The collar is movable and adapted to come to rest against an abutment 26' formed in the tapered extension 6. A collet 29 extends through a central opening in the member 25 and is provided with a plurality of gripping members 30 supported on resilient arms 31 which, when the parts are in the position indicated in Fig. 1, are forced inwardly to grip the lead 9 and hold it firmly in writing position.

The other end of the collet is provided with a flange 32 and a spring 33 is disposed between the flange and the member 25. The spring 33 biases the collet to the position indicated in Fig. 1, that is, the normal writing position.

The mechanism is assembled with the casing 5 by inserting the flange 32 in the thimble 18 and securing the parts, either by the threaded connection as shown or by frictional engagement. When the mechanism has been inserted, the pencil may be operated by depressing the operating member 13, thus actuating the sleeve 16 and causing the thimble 18 to move inwardly against the tension of the springs 23 and 33. Upon initial movement, the collar 27 is carried forwardly with the gripping members 30 of the collet, thus advancing the lead until the collar 27 strikes the abutment 26'. Thereafter the

collet moves forward independently and the gripping members 30 are released from the lead. Retracting movement is effected by the action of the springs 23 and 33. As the gripping members 30 are retracted, they engage the collar 27 and carry it rearwardly until it strikes the abutment 26. Further movement of the gripping members causes them to be forced again into engagement with the lead 9 as shown in Fig. 1. During retracting movement, the lead is held by frictional engagement with the fingers 11. The pencil is ready for writing and need not be actuated again until the projecting portion of the lead has been worn down by continued use.

The magazine 22 is adapted to hold a considerable number of leads which readily enter the opening 21 and are guided thereby into the lead tube formed by the collet 29. Hence, as the lead is consumed, fresh leads enter the lead tube and are advanced at each actuation of the pencil until the leads in the magazine are exhausted. Fresh leads may be introduced by withdrawing the actuating member 13.

The structure as described has numerous advantages. It is simple, involving a minimum number of parts, all easily manufactured. The lead feeding mechanism is assembled as a unit, it being necessary merely to first mount the spring 33 on the collet 29, slip the member 25 and the collar 27 over the gripping members 30 and introduce the latter into the recess within the tubular extension 6. The member 25 is then engaged with the tapered extension 6 by the threads or by friction. The feeding mechanism is thus completed. It may be tested for operation before it is inserted in the casing 5. It may be separated readily from the casing for cleaning or repair. Because of the compactness of the feeding mechanism, it may be shorter than usual devices of this type, thus permitting a longer magazine and the use of longer leads. These and other advantages distinguish the pencil as described from similar devices as heretofore known.

Various changes may be made in the form, construction and arrangement of the parts without departing from the invention or sacrificing the advantages thereof.

I claim:

1. In a mechanical pencil, a casing, a tapered extension secured to one end thereof, actuating means within and extending from the other end of the casing and lead feeding means operable by the actuating means and forming a unit with the tapered extension, including a movable collet having leading gripping means and a restricting collar surrounding and movable within limits with the collet.

2. In a mechanical pencil, a casing, a tapered extension secured to one end thereof, actuating means within and extending from the other end of the casing and lead feeding means operable by the actuating means and forming a unit with the tapered extension, including a movable collet having lead gripping means and a restricting collar surrounding and movable within limits within the collet, and a lead guide having split fingers to hold the lead in advanced position.

3. In a mechanical pencil, a casing, actuating means in one end of the casing, a tapered extension removably secured to the other end and lead feeding means separable with the tapered extension and operable by the actuating means when the tapered extension is secured to the casing, including a movable collet having lead gripping means and a restricting collar surrounding and movable within limits with the collet.

4. In a mechanical pencil including a casing having a tapered extension at its lower end to guide and support a piece of lead, a tubular collet slidably mounted in and removable from the casing with the tapered extension and provided at one end with a plurality of spring arms having lead gripping means thereon and means at the opposite end of the casing for causing the collet alternately to grip and to release the lead whereby the lead is propelled in a step by step movement.

5. In a mechanical pencil including a casing having a tapered extension at its lower end to guide and support a piece of lead, lead feeding means supported in the tapered extension and separable therewith from the casing, including a tubular collet having lead gripping means and a restricting collar surrounding and movable within limits with the collet and actuating means at the opposite end of the casing for the lead feeding means within the casing.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
338,332	Appleby	Mar. 23, 1886
2,385,329	Buchanan	Sept. 25, 1945