C. R. KEERAN.

LEAD PENCIL.

APPLICATION FILED OCT. 28, 1914.

1,151,016. Patented Aug. 24, 1915.

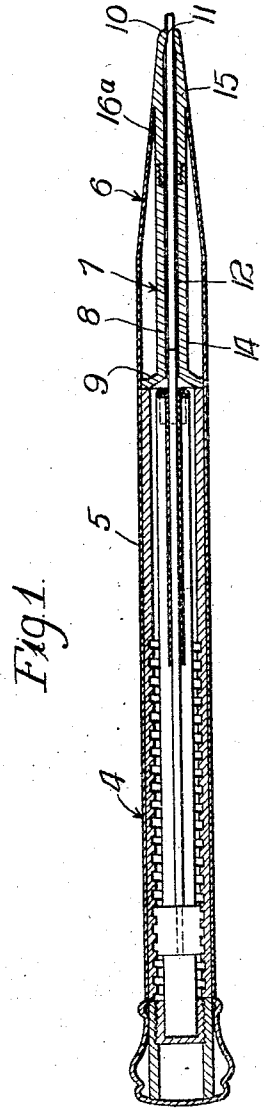

Fig. 1.

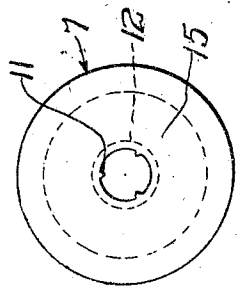

Fig. 3.

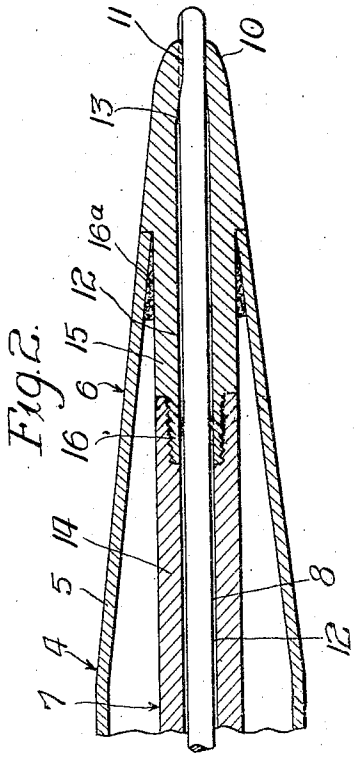

Fig. 2.

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UNITED STATES PATENT OFFICE.

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LEAD-PENCIL.

1,151,016. Specification of Letters Patent. Patented Aug. 24, 1915.

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To all whom it may concern:

Be it known that I, CHARLES R. KEERAN, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Lead-Pencils, of which the following is a specification.

The present invention relates more particularly to that type of pencil capable of receiving independent leads; in other words that type provided with a permanent body or holder in which individual leads are placed from time to time as needed, which leads are fed out from the body by suitable mechanism operable at will by the user, and deals more particularly with the construction and arrangement of that portion of the pencil known as the clutch or tip which lies at the outer end of the body and prevents the lead from falling out therefrom.

The objects of the invention are to provide a clutch or tip for the above described type of pencil which will be effective to keep the lead from falling out of the body or wabbling therein and at the same time the action of the clutch will not subject the lead to any undue pressure which would tend to break it.

A further object of the invention is to provide a clutch which is simple of manufacture and which when installed in the pencil will be effective for a long period of time. In fact several years of ordinary use would not impair its utility.

A further object of the invention is to so form the tip as to give a firm substantial bearing for the lead adjacent to the end of the tip eliminating the breaking of the lead.

A further object of the invention is to so construct the tip as to not in any way impair the movement of the lead in and out of the pencil body when such movement is desired.

The invention further consists in the features of construction and combinations of parts hereinafter described and claimed.

In the drawings: Figure 1 is a sectional view of a body of a lead pencil equipped with the tip of the present invention; Fig. 2 is an enlarged section of the tip and the outer end of the body; and Fig. 3 is an end view of said tip.

In the art to which the present invention relates, namely, that type of pencil employing a permanent body into which independent leads may be placed from time to time and fed outward from the body by suitable mechanism as the lead wears away, means must be provided to keep the lead from falling out of the body and to prevent the lead from wabbling within the body, and such pencils are usually formed with a clutch at the outer end of the body for preventing movement of the lead and it is this clutch feature which the present invention is primarily concerned with.

Referring to the drawings, and particularly to Fig. 1, the device is shown as applied to a pencil body 4 which is formed with an outer shell or casing 5 which is tapered at the outer end thereof as at 6. Suitable mechanism is provided within the interior of the shell 5 for feeding the lead outward. The feed mechanism illustrated is substantially the same as shown in Patent No. 1,130,741, issued to me March 9, 1915, for lead pencils, although the particular type of lead feeding mechanism is immaterial so far as the present invention is concerned, as is also the shape and size of the pencil body. The tip of the present invention is formed from an elongated metallic member 7 formed with an axial bore 8 and in the construction shown this tip terminates at one end in a head 9 and is tapered at its opposite end down to a point 10. Adjacent the point of the pencil are formed a series of longitudinal extending ribs 11 which are of a minute nature hardly larger in practice than the size of a hair and resemble in this respect the rifling of a gun barrel.

One method of manufacturing the clutch of the present invention is to first take the member 7 and drill a hole 12 therein for a major portion of its length which hole is slightly larger than the size of the lead employed. This hole does not extend clear to the outer end of the clutch and the bore in the outer end is initially made slightly smaller than the size of the lead. A tapered reamer is then employed and the walls of the bore are tapered as at 13 to make a sloping surface connecting the large size bore with the small size bore. A punch is then employed having any desirable number of small grooves therein. The size of the grooves may be no larger than a hair. This punch is driven into the small portion of the bore in the member 7 and the ribs 11 extend-

ing inward from the wall of the bore are thus produced. These ribs 11, therefore, will extend inward a distance whereby the distance from the inner edge of the same to the center of the bore is less than the radius of the lead employed.

After the punch has been employed the size of the reduced portion of the bore is substantially the same size as the lead. It is obvious that as the lead is forced out from the end of the pencil the ribs 11 will act to cut into the lead slightly and will, therefore, have a biting engagement with the lead, holding the lead in a manner to prevent wabbling and retarding a movement of the lead out from the pencil. Owing to the fact that the ribs 11 are constantly working against a body of a graphite nature, which is a form of lubricant, the ribs will not wear down rapidly during usage and will be efficient for their intended purpose for a very long period of time, several years in fact.

In the construction shown the member 7 is formed in two parts 14 and 15, the part 14 includes the head 9 and this part terminates in a cavity formed with an interior threaded surface. The other part 15 contains the clutch mechanism and this portion terminates at the inner end in a threaded stem 16, the threads of which engage with the threaded surface on the member 14. Of course this method of joining the two sections together is not deemed to be a limitation on the invention, and in fact in this, and other respects the invention is not limited beyond the limitations imposed by the terms of the appended claims.

In assembling the pencil the portion 15 of the tip is first dropped into position, and then by means of a small quality of solder 16^a is held against any movement. The portion 14 terminates in the head 9, which in turn abuts against a fixed part in the interior of the pencil.

From the foregoing it will be apparent that the clutch of the present invention is of a very simple nature having no parts which would be liable to get out of order and impair its efficiency, and that it will have a positive biting engagement with the lead which will efficiently retard outward movement of the lead and a wabbling of the same. This latter feature is particularly desirable since in a pencil where a wabbly point is present it has a very annoying effect on the user, and this wabbling is probably the greatest single objection to which pencils of the type involved in the present application, are subjected.

It is to be noted that in the present invention that although a biting engagement with the lead is obtained, it is nevertheless, not sufficient to cut into the lead in a manner to so weaken it as to lay it liable to breakage by reason of such weakening.

Another highly desirable effect obtained by these ribs 11 is that they prevent the lead rotating on its axis. If the lead is free to do this it has a tendency to wear flat on one side of the point.

I claim:

1. A pencil comprising a casing, means for feeding the lead through the casing with a non-rotatable rectilinear movement longitudinally of itself, a non-expansible tip at the outer end of the casing formed with a bore to receive a lead, a protuberance extending inward from the wall of said bore and lying in a direction longitudinally of the lead and adapted to bite into the lead as the lead is fed through the bore, substantially as described.

2. A pencil comprising a casing, means for feeding the lead through the casing with a non-rotatable rectilinear movement longitudinally of itself, a non-expansible tip at the outer end of the casing formed to receive a lead, a series of ribs depending inward from the walls of said bore and lying in a direction longitudinally of the lead and arranged to bite into the lead as the lead is forced through the bore, substantially as described.

3. A pencil comprising a casing, means for feeding the lead through the casing with a non-rotatable rectilinear movement longitudinally of itself, a non-expansible tip at the outer end of the casing formed with a bore to receive a lead, a protuberance extending inward from the wall of said bore and arranged at the outer end of said bore and lying in a direction longitudinally of the lead, said protuberances being arranged to bite into the lead as the lead is fed through the tip, substantially as described.

4. A pencil comprising a casing, means for feeding the lead through the casing with a non-rotatable rectilinear movement longitudinally of itself, a non-expansible tip for the outer end of the casing formed with a bore to receive a lead, a series of ribs extending inwardly from the wall of said bore and lying in a direction longitudinally of the lead and arranged at the outer end of said bore, said ribs being adapted to bite into the lead as the lead is fed through the pencil, substantially as described.

5. A pencil comprising a casing, means for feeding the lead through the casing with a non-rotatable rectilinear movement longitudinally of itself, a non-expansible tip for the outer end of the casing formed with a bore to receive a lead, said bore being enlarged at its inner end to a size greater than the size of the lead and reduced at its outer end to a size approximately equal the size of the lead, the walls of the reduced portion of the bore being configured to provide a protuberance extending inwardly therefrom, and lying in a direction longitudinally of

the lead, and arranged to bite into the lead as the lead is fed through the bore, substantially as described.

6. A pencil comprising a casing, means for feeding the lead through the casing with a non-rotatable rectilinear movement longitudinally of itself, a non-expansible tip for the outer end of the casing formed with a bore to receive a lead, said bore being enlarged at its inner end to a size greater than the size of the lead and reduced at its outer end to a size approximately equal to the size of the lead, a series of ribs inwardly extending from the walls of the reduced portion of the bore and arranged to lie in a direction longitudinally of the lead and acting to bite into the lead as the lead is forced through the bore, substantially as described.

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