June 13, 1950 J. T. BRUBAKER 2,511,243

FEEDING MECHANISM FOR PENCILS, LIGHTERS, ETC

Filed Aug. 11, 1944 2 Sheets-Sheet 1

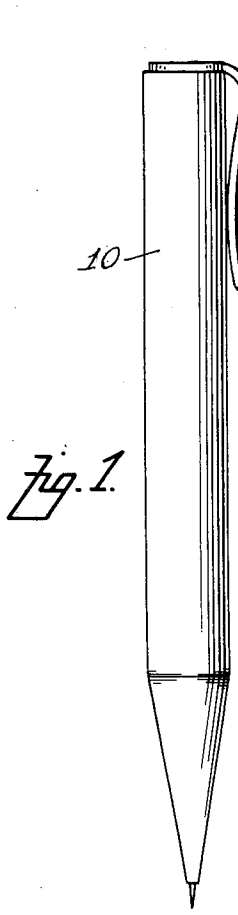


Fig. 1.

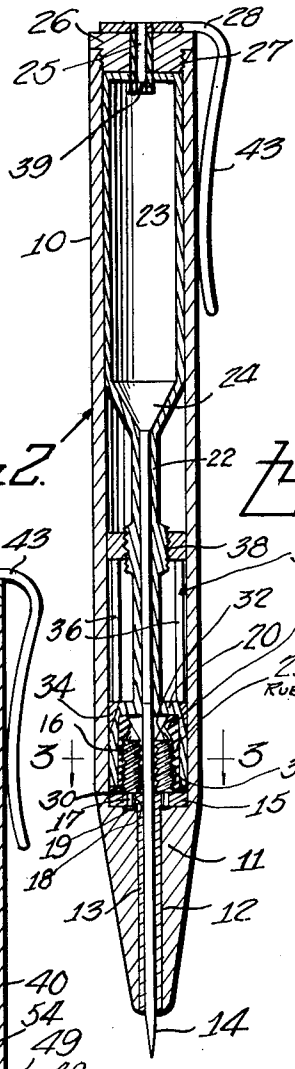


Fig. 2.

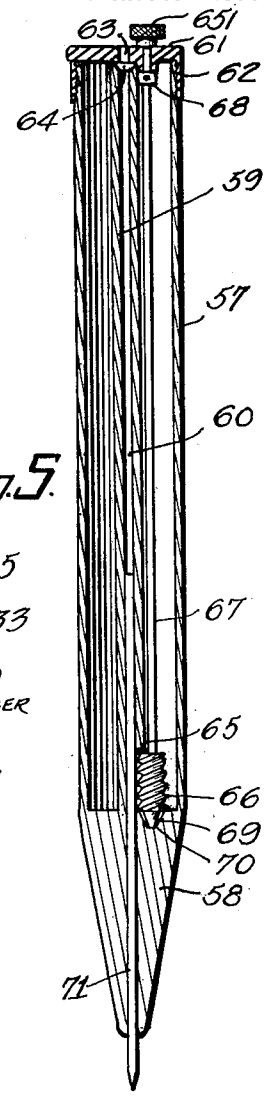


Fig. 5.

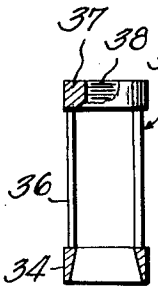


Fig. 3a

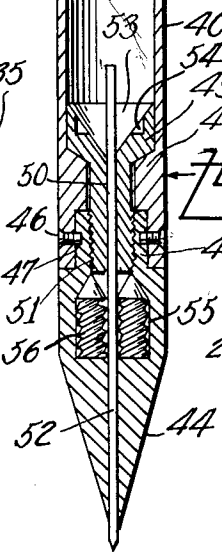


Fig. 4.



Fig. 3.

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Fig. 6.

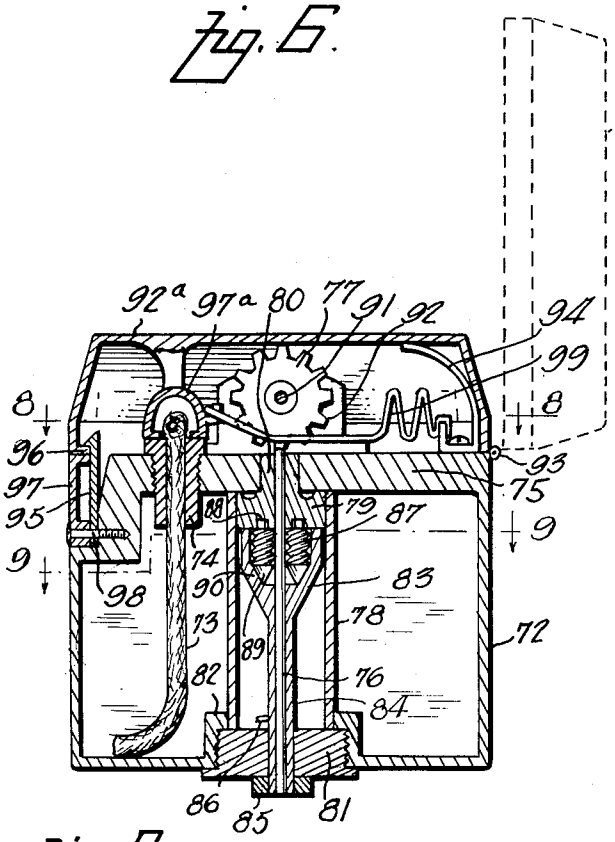


Fig. 7.

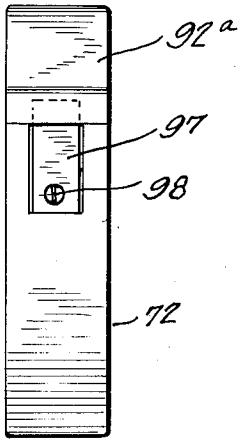


Fig. 8.

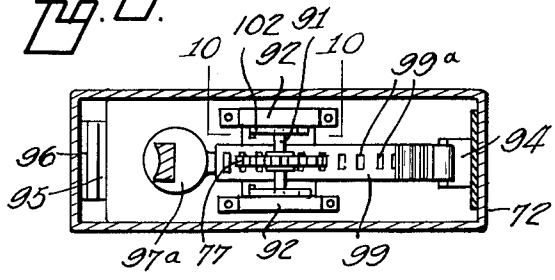
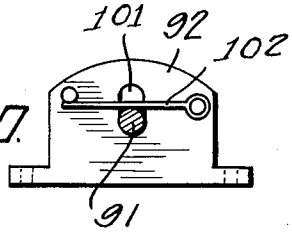


Fig. 10.



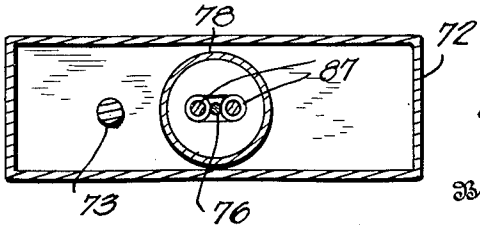


Fig. 9.

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UNITED STATES PATENT OFFICE

2,511,243

FEEDING MECHANISM FOR PENCILS, LIGHTERS, ETC.

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Application August 11, 1944, Serial No. 549,072

18 Claims. (Cl. 120—18)

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This invention relates to the feeding mechanism of leads in a pencil, spark-producing elements in a cigarette lighter, or other purposes.

It is especially aimed to provide a novel means comprising one or more suitably mounted and operable gripping or feeding studs having spiral thread means to directly engage the leads, spark producing elements or the like so that through their rotation, the leads and elements will be axially moved or fed.

A further object is to provide novel, simplified, inexpensive and durable embodiments of the invention in the form of a pencil.

Still further, an aim is to provide a novel, simple, durable and inexpensive embodiment of the invention in a cigarette lighter or the equivalent.

I also aim to provide a novel cigarette lighter having mechanism to urge the closure of a cigarette lighter to open position when unrestrained, and which coacts in the production of the spark during movement of the closure to said open position.

The more specific objects and advantages will become apparent and in part be pointed out in the consideration of the description following taken in connection with accompanying drawings illustrating operative embodiments as examples.

In said drawings:

Figure 1 is a side elevation of a pencil embodying the invention;

Figure 2 is a view thereof approximately in central longitudinal section;

Figure 3 is a cross section taken on the line 3—3 of Figure 2;

Figure 3a is a detail, approximately in central vertical section of the compressor for the feeding studs or elements;

Figure 4 is a central longitudinal sectional view through a modified form of pencil;

Figure 5 is a central longitudinal sectional view through a further modified form of pencil;

Figure 6 is a view in substantially vertical central section through a cigarette lighter embodying the novel feeding mechanism for its spark producing element;

Figure 7 is an end elevation of said cigarette lighter;

Figure 8 is across section taken on the line 8—8 of Figure 6;

Figure 9 is a cross section taken on the line 9—9 of Figure 6; and

Figure 10 is a detailed section taken on the line 10—10 of Figure 8.

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Referring specifically to the drawings, and first, to the pencil illustrated in the form of Figures 1 to 3a, the same has a suitable casing or barrel generally designated 10, which is made in any desired shape, size and material. Such barrel, for the most part, is hollow, open at the top, and thicker at the bottom as at 11 centrally of which a bore 12 is provided in which a guide tube 13 for a lead 14, is removably or otherwise disposed.

Said guide tube 13 is part of a mounting 15 which may be a horizontal disk occupying the base of the hollow or cavity of the barred 10 and seated on the thickened portion 11. The unitary parts 13 and 15 may be applied and removed through the open top of the barrel.

In order to feed the lead 14 axially through the tube 13 beyond the lower end of the pencil, I provide a plurality of coacting feed studs 16. Such studs have pins 17 depending therefrom and extending loosely through enlarged openings 18 in the mounting or disk 15 and below the same have upset heads 19 to prevent detachment of the studs or feeding elements.

Since the plurality of feeding elements are loosely mounted, they are adjustable toward and away from each other to accommodate different diameters of lead 14. Said studs are surrounded by an inverted bell 20 which is split at one or more longitudinal lines 21 to enable the bell to be compressed. This bell has a longitudinal neck 22 extended upwardly therefrom and which is hollow so as to guide and retain the lead as best shown in Figure 2. Above the neck, and integral therewith, is a magazine 23 having a funnel-shaped portion 24 at the connection with the neck so as to guide the leads 14 into the same.

The leads may be supplied to magazine 23 through a short tube or reduced portion 25 located at the top thereof and extending through a plug 26 loosely mounted thereon and having screw engagement at 27 with the upper end of the barrel 10. The upper end of the tube or reduced portion 25 is rigidly connected to a retaining clip 28 which functions dually as a means to turn the bell 20 and parts rigid therewith and also as a means to secure the pencil in place to the wall of a pocket in clothing or the like.

Vulcanized to the inner annular wall of the bell 20 or otherwise immovably fastened within the bell is a resilient rubber lining 29 which may have an outwardly extending flange 30 upon which the lower edge of the bell 20 rests. Lining 29 is of such shape and size that it is penetrated

by the spiral threads 31 of the feeding studs or elements 16. Thus, when the bell 20 is turned, the rubber lining will cause the feeding studs 16 to turn and through the medium of their spiral threads 31, to bite into and feed the lead 14 axially.

It will be realized that the bell 20 and parts rigid therewith or connected thereto may be applied to and removed from the barrel as a unit through the top of the latter.

As previously stated, bell 20 is split as at 21 so that the studs 16 may be moved relatively to each other in order to accommodate varying thicknesses of lead. The loose mounting of the feed studs 16 at pins 17 and openings 18 greatly aids in accomplishing this end. In addition, it will be noted that the upper ends of the studs are conical as at 32 and are engaged by an angular or cam wall 33 provided on the lining 29. Thus through axial adjustment of the position of the bell relatively to the studs, the latter may be moved toward each other or permitted to move away from each other to a slight extent.

In order to effect the aforesaid adjustment of the studs, through compression of the split shell or bell 20, the same is surrounded by a wedge shaped cam 34 at one end, the cam forming part of a cage-like structure generally designated 35 and having arms 36 connecting the cam to a ring nut 37 screw-threaded at 38 to an enlarged portion on the neck 22. The portion of the bell engaged by cam 34 is preferably inclined as shown in Figure 2. Since the bell and parts rigidly connected thereto and mounted thereon are removable as a unit through the upper end of the barrel, element 35 is adapted for adjustment when the unit is thus removed.

Said feed studs 16 may be made of any suitable material, for instance, entirely of lead or any other metal or partly of metal with an exterior including the threads thereon of rubber or plastic material, or entirely of rubber, plastic material or any substitute or equivalent.

It will be realized that the magazine 23 will be filled with leads 14 through the short tube 25 and that the leads cannot readily fall therefrom if the pencil is inverted, since tube 25 forms a short guard as it depends at 39 into the magazine 23. From the magazine, the leads can, one at a time, fall into the tube or neck 22 through the funnel 24, thence between the feed studs 16 and through the turning of the bell and connected parts by rotating the clip 28 or equivalent, cause the threads 31 of the feed studs to engage and axially feed the leads through the feed tube 13 as suggested in Figure 2, the studs holding the lead against retraction as they have sufficient frictional or threaded engagement therewith.

Various changes may be resorted to provided they fall within the spirit and scope of the invention. For instance, I may use the embodiment of Figure 4. In this figure, a barrel or casing is provided at 40 having a hollow or magazine 41 at its upper end to function as a magazine to receive leads through the top which is adapted to be normally closed by a screw plug 42 carrying an attaching clip 43. At the lower end, a rotatable gripping head 44 is provided with an extension 45 telescoped and swiveled within the lower end of the casing 40 and removably held in place therein by the extension of one or more set-screws 46 through the casing 40 into an annular groove 47 formed peripherally of extension 45.

Casing 40 has an interior enlargement 48 against which the upper end of extension 45 bears.

A guide element 49 bears against the upper end of enlargement 48 and has a tubular portion 50 passing through the extension and being detachably screw-threaded at 51 to the extension 45. The parts 44 and 49 thus will form a unit, the parts of which are relatively adjustable to engage the shoulders of enlargement 48 and which adjustment will be maintained so that the unit is capable of swiveling relatively to the casing 40 through the provision of one or more of the screws 46.

Said parts 44 and 49 have central bores through which leads 52 may be passed, entering through a funnel-shaped cavity 53 at the top of the feed element 49 and in the wall of which cavity, recesses such as 54 may be provided to enable engagement thereof by a special wrench inserted through the top of casing 41 when attaching or adjusting the parts 44 and 49.

Head 44 has an internal recess 55 which houses a plurality of feeding studs 56 constructed like and of the same material as those at 16, the pins 17, however, usually being omitted. Such studs are loose within the recess 55.

It will be understood that the leads 50 will fall through the bore of the guide 49 between the feed studs 56 and that the latter at their screw-threads will engage the leads so that through turning or swiveling of the unit 44—49 relatively to the casing 40, the leads will be axially fed through the bore of the point 44.

In Figure 5, I have disclosed another form wherein a casing 57 has a head 58 from which a tube 59 rises for the supply of the leads through an axial bore 60 extending through such tube and the head 58. Tube 59 is rigid with the casing and head and may even be formed integral therewith as shown. A screw cap 61 is detachably fastened by threads at 62 to the top of casing 57 and it centrally abuts the upper end of tube 59 and has a central opening 63 through which the leads may be supplied to the bore 60, guided by a flared enlargement 64 at the entrance to the tube 60.

Adjacent the base of the tube 59, its wall is cut away forming an opening at 65 so that a feed stud 66 may occupy the same. This stud is constructed like those described at 16 and 56, being of metal, rubber, a plastic or composite. Stud 66 is rigid on an operating rod 67 arranged parallel to the tube 50 and having its upper end journaled in an opening in the closure 61 so that it may be rotated by manipulation of a knob 651 thereon located outside of the pencil. Interiorly of the pencil, rod 67 has an abutment 68 thereon to engage the underside of cap 61 to prevent longitudinal displacement of the rod. The lower end of stud 66 is conical at 69 and it is located in a conical recess 70 so that according to the degree of tightening of the closure 61, the stud will be adjusted or positioned differently with respect to the lead, in order to engage the lead 71 with different degrees of pressure and to accommodate leads of slightly differing diameters. Thus it will be seen that the leads 71 are supplied through the opening 63 and bore 60 into engagement with the thread of the stud 66. With such stud at the proper axial adjustment, knob 65 may be turned so that the threads of the stud will engage the lead and axially feed it and hold it at such pressure as to prevent retrogression thereof.

In Figs. 6 to 10 I have illustrated the use of my improving feeding mechanism or studs in connection with the flint or pyrophoric element

of a cigarette lighter or the equivalent. This lighter has a container section for the liquid hydrocarbon at 72 into which a wick 73 extends, being threaded through a screw tube 74 secured in the top wall 75 of the container section 72. A flint, pyrophoric or other spark-producing element 76 is located for coaction of a friction or abrading wheel 77 with its upper end to produce a spark to ignite fuel at the upper end of the wick 73.

Removably disposed in the container section 72 is a barrel 78 which may have a head 79 press-fitted or otherwise secured to its top and which in turn has a reduced portion 80 removably fitted in an opening in wall 75. A screw plug 81 is threaded into the bottom of said container section and is overlapped by a flange 82 on the bottom wall of such section. Said flange centers the barrel 78 and the plug 81 secures it in place sealed against the entrance and escape of the fuel within the container section. At the same time, in the absence of the plug, casing 78 and parts carried thereby may be readily inserted and removed through the bottom of section 72.

Located within the barrel 78 is a bell member 83 having a neck or tubular extension 84 rotatable in the plug 81 and exteriorly of the latter having a manipulating knob 85 thereon. Bell 83 and extension 84 have a slight axial sliding movement in the plug to the extent limited by a pin or abutment 86 carried by extension 84.

The element 76 is supplied through tube 84 from the bottom and is adapted to be axially fed toward the wheel by feeding studs 87 employed in any desired number. These studs are constructed like those at 16, 56 and 96, that is partly or entirely of rubber or metal or compositely or of any desired material either rigid or elastic, with an exterior screw thread thereon. These feed studs 87 have pins 88 at one end loosely mounted in sockets in the head 79 and at their other ends they are preferably conical at 89. These studs are housed within the bell 83 and the conical wall 90 of the latter are adapted to coact with the conical surfaces 89. As a result, the bell 83 may be turned and if necessary slightly axially moved as well to adjust the position of the studs 87 so that the threads of the studs will engage the element 76 and feed it axially toward the wheel 77 when desired.

Said wheel 77 is journalled by means of a pin 91 in bearings 92 carried by wall 75. A closure 92a is pivoted at 93 to said wall and is urged to the dotted lined open position of Fig. 6 by the expansion of a leaf spring 94 secured to said wall. This closure is held against opening by the engagement of a latch 95 with an inwardly extending flange 96 thereof. Latch 95 is a resilient metal strip or the equivalent and the same and an actuator 97 thereof, are held in place to wall 75 by a screw or fastening 98. Actuator 97 is also resilient and it is normally flush with the exterior of the container 72, avoiding any exterior projection. However, it may at any time be pressed inwardly with the finger nail for example to disengage the latch 95 from flange 96 so that the closure will spring to open position.

A snuffer or small hood for the flame end of wick 73 is carried by the closure and a flexible metallic web or strip 99 fastened to wall 75, is secured to a hook 100 thereon. Web 99 has a series of openings therethrough enmeshed with the teeth of wheel 77 so that as the closure 92a is sprung open by spring 94, the teeth of wheel 77 will be turned as web 99 has a spring extension action, and the turning of the wheel causes its teeth to produce sparks by abrasive or friction action with the upper end of element 76 which ignite fuel at the upper end of the wick 73. The closure is depressible by hand to snuff the flame and automatically latch at flange 96 and element 95. Pin 91 has bearing in elongated slots 101 in bearings 92 and is resiliently mounted therein since a spring 102 at each bearing bears against the top of the pin as well shown in Fig. 10.

What is claimed is:

1. Feeding mechanism for a cylindrical attenuated element comprising a loose stud to engage the element, and means movable longitudinally with respect to the stud to move the stud laterally into frictional engagement with the element and turn the stud to feed the element.

2. Feeding mechanism for a cylindrical element comprising a plurality of loosely mounted threaded studs to surround and engage the element, and means positioning the studs about the element, and operable to move the studs toward each other to grip the elements and to turn the studs to feed the element longitudinally with respect to the studs.

3. Feeding mechanism for a cylindrical element comprising a stud rotatable on an axis approximately parallel thereto having an elastic spiral thread to contact the element so that through rotation of the stud the element will be fed.

4. Feeding mechanism for a cylindrical element comprising a plurality of loose studs to surround and frictionally engage the element, said studs having spiral threads to contact the element, and a bell enclosing the studs and movable longitudinally with respect to the studs and having a cam surface operable thereagainst to move them laterally toward each other and position them in feeding engagement with the element.

5. Feeding mechanism for a cylindrical element comprising a plurality of loose studs to surround and frictionally engage the element, said studs having spiral threads to contact the element, a mounting loosely positioning the stud at one end, and a bell movable longitudinally with respect to the studs enclosing and compressing the studs in feeding engagement with the element.

6. A pencil having a casing, loose gripping studs to feed lead therethrough, means confining said studs comprising a bell having a cam surface contacting the studs and movable axially with respect thereto to move the studs laterally to grip the lead, and means operable to turn and slide the bell to cause the studs to feed the lead.

7. A pencil having a casing, studs therein having spiral threads to engage and feed lead, a bell surrounding the studs having gripping material therein to contact said threads and turn the studs.

8. A pencil having a casing, studs loose therein having spiral threads to engage and feed lead, a compressible bell surrounding the studs to move them toward each other and operable to turn them, and means carried by the bell operable to compress the same.

9. A pencil having a casing, studs loose therein having spiral threads to engage and feed lead, a mounting for the studs, a split bell surrounding the studs, a resilient means within the bell to engage the studs to turn them so that they will turn a lead, a compressor means carried by the bell, a tubular neck carrying the bell, and a

screw threaded connection between the compressor means and the neck.

10. A pencil having a casing, a point member rotatably mounted thereon, a feed member threaded to the point member, the casing having an internal construction engaged on opposite ends by said members, and feed studs for lead loosely mounted in the point member having exterior spiral threads to engage and feed the lead.

11. A pencil having a casing provided with a tube for the feed of lead therethrough, said tube having an opening, a recess within the casing having a cam wall, a cap on the casing, a rod journaled in the cap, and a stud carried by the rod having threads engageable with lead to feed the same, said stud extending through said opening and having engagement with said cam wall so that its position may be varied relative to a lead.

12. A lighter having means operable to produce a spark including a spark-producing element, a plurality of feed studs having spiral threads to engage the element and feed the same, a mounting loosely positioning the studs, and a bell rotatable and slidable to engage the studs to contact their threads with the lead and move the studs for feeding of the element.

13. A lighter according to claim 12 having a closure, a wheel to contact the element to produce sparks, and means enmeshed with the teeth of the wheel, extensible through opening of the closure to turn the wheel against the element.

14. A lighter according to claim 12 having a casing section, a barrel therein having a head constituting said mounting, a plug secured to the casing section and bearing against the barrel, said bell having a tube extending through said plug.

15. A lighter according to claim 12 having a closure, a spring latch on the lighter interiorly

thereof engageable with the closure, and a spring operator on the lighter depressible against the latch and disposed normally flush with the exterior of the casing of the lighter.

16. An article of the class described having a plurality of studs provided with spiral threads to engage and feed a cylindrical element, said studs at one end being approximately conical, means adjacent the other end of said studs loosely mounting the same for relative approximately radial bodily sliding movement, and an axially movable bell enclosing said conical ends and having a cam surface operable thereagainst to move the studs radially toward each other.

17. An article of the class described having studs provided with spiral threads to engage and feed a cylindrical element, means adjacent one end of said studs loosely mounting the same for relatively approximately radial sliding movement, and an axially movable bell having a cam surface operable against said studs adjacent the other ends to move them radially toward each other.

18. A pencil according to claim 9 wherein said resilient means has an outwardly extending flange disposed between said mounting and the adjacent portion of said bell.

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