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(54) **PENCIL**

(57) **Abstract:**

(54) **STYLO-MINE**

This First Page has been artificially created and is not part of the CIPO Official Publication

This invention relates to certain new and useful improvements in pencils wherein a plurality of lengths of leads may be placed in a magazine contained within the walls of the pencil and from which they drop by gravity, one at a time as required into a suitable guide tube in alignment with which is a screw operated plunger rod that is adapted to either propel or repel them to and from the writing point.

The principal difference between my pencil and those now known is the combination in a single pencil by new and novel methods of all the desirable features now only partially provided for in the others, and in addition to combine them in such a way that there shall be as few as possible, and be simple to manufacture, and easily assembled without the use of solder which has been found by others to be a great source of trouble.

One of the objects of the invention is to provide in a pencil a suitable magazine into which a plurality of leads may be freely and loosely placed, and to have leading from the bottom of said magazine a centrally located guide tube of a slightly larger inside diameter than the outside diameter of the individual leads. The bottom of said magazine is to have sloping sides or be funnel shaped, so that when the pencil is held in a vertical position, point down, the leads will be guided to the central tube into which they will drop one at a time as required and in which position they will be in alignment with a suitable plunger rod.

Another object is to provide a suitable screw operated plunger rod so constructed as to combine in the

one rod means for both propelling and repelling the leads, and to further provide means whereby the propeller rod, as it moves backwardly out of the lead guide tube, will be thrown out of alignment with the tube to permit of the free entry of the next lead into the tube without the necessity of carrying the plunger rod back a long distance behind the lead and thereby increasing the total length of the pencil unnecessarily. The same provision which is used to throw the plunger out of alignment is employed to return it to proper position behind the fresh lead to propel the lead on the reverse movement of the plunger.

A further object relates to provision for removing the plunger and its operating mechanism from the pencil to permit of reloading the magazine with a fresh supply of leads and means whereby these parts may be replaced in no other than their exact relation to the other parts of the pencil.

Additional features are means provided for correctly locating the leads the right distance ahead of the plunger after they drop into position in the guide tube, means for preventing the leads from dropping through the guide tube, and out of the pencil, and also means for ejecting the used lead from the socket in the end of the plunger to prevent its being carried back into the magazine by the plunger on its return to position to pick up a fresh length of lead. The latter means consists of a suitable spring located on the guide tube and being attached thereto but having its free end projecting through a slot out through the walls of the guide tube as will be described later.

With the above general objects in view, and others

that will become apparent as the nature of the invention is understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described in connection with the accompanying drawings, and in which like reference characters indicate corresponding parts through the various views.

In the drawing,

Figure 1 is a side elevational view partially in section of a magazine pencil constructed in accordance with the present invention showing the plunger rod retracted and laterally offset to permit a lead to drop into the guide tube.

Fig. 2 is a longitudinal sectional view of the pencil showing the plunger rod in its axial position with the lead engaging tip thereof axially aligned with the guide tube for the lead.

Fig. 3 is an enlarged detail sectional view of the pencil partially broken away showing the plunger projecting into the guide tube and engaging with and forcing the lead ahead of it, and further shows the spring finger behind the lead at its extreme forward position to prevent its return to the magazine upon the backward movement of the plunger.

Fig. 4 is a cross sectional view taken on the line IV - IV of Fig. 1, showing the interlocking connection of the plunger rod, supporting means and pencil casing.

Fig. 5 is a cross sectional view taken on the line V--V of Fig. 1, showing the pivotal connection between the plunger rod and the screw plug for shifting it.

Fig. 6 is a cross sectional view of the modified

form of guide tube showing a separate spring finger attached thereto,

Fig. 7 is a side elevational view of the lead-feeding plunger.

Fig. 8 is a detail sectional view showing a modified form of connection between the rotatable button and the screw sleeve for operating the plunger rod.

Fig. 9 is a side elevational view partly in section showing a modified form of rotatable cap combined with eraser holder, a pocket clip, and means to prevent the guide tube from lengthwise movement relative to the casing.

Fig. 10 is a longitudinal sectional view of a modified form of plunger rod and threaded plug or cup for operating it assembled with camming disk, and a bottom elevational view of same.

Fig. 11 is a side elevational view, partly in section and in end elevation, of another contemplated form for the plunger rod.

Figs. 12 and 15 show fragmentary sectional and side elevational views of a modified form of clip with its method of attachment to the pencil casing.

Fig. 13 is a detail view, in partial cross section of the clip shown in Fig. 9 showing the rivets formed integral with the clip.

Fig. 14 is a plan view of the cam disk disclosed in Fig. 10.

Referring more in detail to the accompanying drawings, and in particular to Figs. 1 to 5 and 7, there

is illustrated a magazine pencil embodying a tubular casing 1 having a tapered outlet end 2 and an inwardly directed longitudinally extending bead 3 formed for nearly its entire length, the bead engaging with corresponding notches or grooves out into the edge of the head 5 of the guide tube 4, and also into the notch 7' of the disk 7 through which the plunger rod 14 passes serves to properly locate these parts in relation to one another when assembling them and therefore prevents any misalignment of these parts.

The guide tube 4 for the leads is positioned in the forward end of the tubular casing 1 being prevented from turning by the bead 3 and from falling out by the tapered end 2 of the casing, and is further held in place by an additional bead 30, disclosed by a modification of the invention which is better shown by Fig. 9.

The tube 4 carries at its inner end the concaved or funnel shaped head 5, which may be either a separate piece or may be formed up from the same piece from which the tube is made, the head 5 constituting the magazine bottom and the sloping surface 5' of which acts to deflect the leads a in the pencil casing into the guide tube 4, the guide tube and head being rigidly held within the casing by the means above mentioned.

To prevent the complete passage of the lead a through the guide tube 4, and also to locate it the correct distance ahead of the plunger rod 14, one side of the guide tube 4, is sheared and bent inwardly to provide a resilient finger 6 shown in Figs. 3 and 3' for engaging the side or end or both of the lead.

This spring finger also acts in another capacity. When the plunger 14 is in the extreme forward position it

it is necessary to remove the used length of lead from the socket 20 of the plunger to prevent the lead from being carried back into the magazine. This is accomplished by cutting a slot or side opening groove 21 through the wall of the socket 20 of the plunger 14 which allows the spring finger 6 to drop behind the lead a and in that position on the backward movement of the plunger 14 the lead a is forced out of the socket 20.

The lead feeding mechanism includes a plunger rod 14 and support therefor, the support embodying the disk 7 having a peripheral notch 7', Figs. 4 and 5, to be slidably received in the casing 1 with the bead 3 extending into the notch 7' to prevent rotation thereof in the casing. A tube 8 internally threaded as at 8' has the inner end thereof flanged outwardly at 9, Fig. 3, to act as a swivel connection in conjunction with the disk 7 through the medium of the annular flange 10 shown more clearly by Fig. 3. An operating button or head 11 carries a screw plug 12 connected thereto by a reduced neck 13, the plug being threaded into the tube 8, with the outer end of the tube rolled inwardly as at 8' to engage the reduced neck 13 for securing the button head 11 permanently to the tube 8.

A modified means of making a rotatable head for attachment to the threaded tube 8 is shown by Fig. 9 which shows the end of the tube slotted and forced through suitable holes punched in the bottom of a cup 31 and then spun over to retain the tube in place. The cup 31 constitutes an eraser holder, the eraser being shown by 32. In order to permit the cup to rotate, the same is assembled by spinning or pressing into the closure cap 33 by the arrangement of suitable bears as shown, this spinning or pressing being done loosely so that the cup 31 will rotate within the cap

33. The cover 34 having a friction fit on the cup 31 used to enhance the appearance of the pencil and to act as a cover for the eraser. These two parts 33 and 34 may be made to have different outward appearances from that here shown, as may be desired, that is various ornamental effects according to the grade and character of the pencil, without affecting the general idea as expressed herein.

The lead-feeding plunger 14, rectangular in cross section, as shown by Figs. 4 and 5 may be of various other cross-sections as shown by Figs. 10 and 11 which show modified forms, freely extends through a rectangular, or other suitable opening 15 formed axially through the disk 7, the inner end of the rod 14 having a hole 16 drilled there through at right angles as shown by Figs. 5 and 7 for pivotal mounting upon a pin 17 carried by an externally threaded thimble 18 working in the internally threaded tube 8.

The storage magazine for the leads as shown by Figs. 1 and 3 lies between the tube head 5 and the disk 7, the leads a being delivered by gravity to the guide tube 4, and forced therethrough by the plunger rod 14. The free end of the plunger rod 14 is provided with a tip 19 having the terminal socket 20 and a side opening groove 21, the rod 14 adjacent to the tip 19 being angularly offset at 22 and 23 with both end portions in axial alignment with one another so that said angular offsets act in conjunction with the hole 15 in the disk 7. As the offset portion is drawn back into the hole in the disk the offset portion acts as a cam to force the plunger out of, and on the reverse movement, back into alignment with the lead guide tube 4.

In the operation of the pencil, the button head 11,

carrying the threaded tube 8, disk 7 and plunger rod 14, are removed from the casing 1 to permit a supply of leads being placed within the casing in the compartment or magazine provided therefor and supported on the head 5 of the guide tube 4, after which the lead feeding mechanism is replaced in the casing with the notch 7 of the disk 7 receiving the longitudinal bead 3 to prevent rotation of the disk 7 within the casing 1. The button 11 is then rotated in one direction, and as the rectangular rod 14 projects through a rectangular opening 15, in the disk 7, the threaded thimble 18 carrying the plunger rod 14, is moved upwardly in the threaded tube 8 to withdraw the plunger rod 14 therein with the offset portion 22 received in the threaded tube 8 to laterally dispose the rod tip 19 as shown by Fig. 1, the rod 14 during this operation moving on the pivot pin 17.

A modified form shown by Fig. 10, contemplates the rigid attachment of the plunger 14a to a threaded cup or thimble 18, said thimble being sufficiently loose within the threaded tube 8 as to permit of the lateral displacement of the tip 19a without seriously straining the parts involved, or to use a tighter threaded thimble and then reduce a section of the plunger rod just ahead of the thimble as shown at 35 to give the plunger rod sufficient resilience at this point to permit of the necessary lateral movement above mentioned.

After the plunger rod has been drawn back to the limit of its movement one of the leads a is delivered to the guide tube from the magazine and then by the reverse movement of the button 11, the rod tip 19 through the medium of the offset angular portion 22 of the plunger rod 14, is restored to axial alignment with the guide tube 4, with

the socket 20 in the terminal end of the rod tip 19 receiving the inner end of the lead a and forcing it through the guide tube 4, and lead a being prevented from accidental displacement, until such time as it is forced home and frictionally held in the socket 20, by the spring finger 6 shown in Fig. 2. When the plunger 14 has the tip and 19 moved into the guide tube to its limit of forward movement, the side opening 21 will accommodate the spring finger 6 allowing it to drop behind the lead a and in that position: the return of the plunger rod 14 to its backward position, the two acting together, extract the used length of lead a from the socket 20 and prevent its being carried back into the magazine, where if it were still carried by the socket it would prevent a second lead from seating itself in the said socket.

In view of the slightly offset portion 22 of the plunger rod, the lateral movement of the plunger rod tip from the position shown by Fig. 2 to that shown by Fig. 1 is gradual as well as restoration of the plunger rod to its axial position.

Modified forms of the plunger rods contemplated are shown by Figs. 7, 10 and 11. Figure 7, the rod 14 being rectangular in cross section at its upper end and including the bent or offset portion but having the tip end 19 round and otherwise constructed as in the preferred form, but contrasting therewith by having very abrupt angles at 22 and 23 the abrupt angle at 22 causing a quicker lateral movement of the tip end of the plunger rod when the said angle portion 22 is drawn into the disk opening 15, the construction and operation of this form of plunger remaining in all other respects similar to the preferred construction.

Fig. 10 shows a plunger rod 14a made circular in cross section and which has instead of the offset as shown by plunger illustrated by Fig. 7, two slots 36 and 37 milled on opposite sides which receive projections 40 and 41 in the modified type of cam plate 7a shown by Fig. 14. These projections prevent rotation of the plunger rod and also act as camming surfaces in conjunction with the two adjacent camming surfaces 38 and 39 formed at the adjacent ends of the slots 36 and 37. This type of rod possesses the advantages that since there is no offset or raised surface above its general outline, it may be extended farther down into the guide tube, and this in connection with other factors governing the mechanical construction of the pencil allow the pencil to be made shorter than would be possible with the type of plunger rod before mentioned.

Fig. 11 shows another modification of a plunger rod 14b in which the offset portion instead of being bent consists of a portion of the rod being sheared and forced out as shown by 42, a cross section taken at this point on the line X -- X being shown by 43, while the corresponding cam plate is shown by 7' the apertures in the cam plate, through which the rod passes, being shown by 44.

A modified form of guide tube is shown by Fig. 6, the same being designated by the numeral 4', as having a longitudinal slot 24 in the side wall thereof through which the free end of a spring finger 25 projects, the finger being secured exteriorly of the guide tube 4' with its opposite end securely fastened either to the disk head 3a as shown or by other suitable means.

Fig. 8 shows a modified construction embodying the rotation of the threaded tube 8, this view showing the casing 1 having a flanged head 26 removably secured in the

end thereof with the button 11' journaled through the head 26 and carrying a cup-shaped socket 12' upon the inner end thereof for permanent attachment to the outer end of the internally threaded tube 8a. By rotation of the button 11' the tube 8' is rotated to effect axial movement of the plunger rod 14 within the casing 1.

From the above detailed description of the construction of the pencil, it is thought that the operation thereof will be at once apparent, it being noted that one of the main features of the invention resides in the provision of an axially movable plunger rod for feeding the leads through a guide tube positioned at the outer end of the pencil casing, the plunger rod and its operating mechanism being cooperatively constructed to displace the lead-engaging end of the plunger rod from its axial position within the casing to permit a lead contained within the casing being freely delivered to the guide tube. Movement of the plunger rod in the opposite direction will restore the plunger rod to its axial position and continued operation will cause a direct axial movement of the plunger rod in the casing to cause the tip thereof to engage the inner end of the lead for forcing the same through the guide tube. The spring finger 6 or 25 engaging the side of the lead a will prevent accidental discharge or displacement of the leads from the pencil, while, when the lead is forced through the guide tube to the position shown by Fig. 3, when the plunger reaches the limit of its outward movement, the spring finger will drop behind the inner end of the lead and prevent its retraction.

In the form of the invention shown by Figs. 2 and 3 the feed tubes 8 and 8a for operating the plunger rods 14, carrying the button caps 11 and 11' and also assembled with

the cam plates or disks 7 and the plunger rod 14, etc., are so arranged that the lead feeding mechanism as above mentioned may be bodily removed from the pencil casing to permit of a new supply of leads being introduced therein.

While there are herein shown and described the preferred embodiments of the invention, it is to be understood that minor changes may be made in the form, combination and arrangement of the parts without departing from the spirit and scope of the invention as claimed. And, as illustrative of the above a modification is contemplated in order to cheapen the pencil and yet produce a marketable article being the elimination of the spring 6 or 25 and the socket 20 leaving the end of the propeller rod 14 plain, and thereby provide a pencil having the features of an automatic refilling, and propelling pencil but without the repelling feature.

Having thus described my invention what I claim as new and desire to secure by Letters Patent, is:-

1. In a magazine pencil, a casing, a guide tube for leads at the outer end thereof, the means within the casing adapted to be moved in one direction for forcing the leads through the outer end of the casing and guide tube, said means being laterally shiftable within the casing to permit of leads being positioned in the guide tube.

2. In a magazine pencil, a casing, a guide tube for leads at the outer end thereof, and means within the casing adapted to be moved in one direction for the forcing of the leads through the outer end of the casing and guide tube, said means being laterally shiftable during the movement in the opposite direction to position the forcing means directly back of and in alignment with the leads.

3. A magazine pencil of the type described comprising a casing, a guide tube for leads at the outer end thereof, an axially movable plunger rod within the casing for the feeding of the leads through the tube, and means cooperating with said plunger rod during inward movement thereof to laterally dispose the same to permit a lead within the casing to be positioned ahead of said plunger and within the guide tube.

4. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the outer end thereof, an axially movable plunger rod within the casing for the feeding of the leads through the tube, means cooperating with said plunger rod during inward

movement thereof to laterally dispose the same to permit a lead within the casing to be positioned within the tube, and means carried by the guide tube to prevent accidental discharge of the lead therein, said plunger rod being constructed to provide a clearance for the lead-engaging means carried by the tube when said plunger enters the tube without engaging the lead-holding means.

5. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the outer end thereof, an axially positioned plunger rod longitudinally movable within the casing for engaging the leads to force the same through the tube, means for reciprocating said rod, said rod and reciprocating means being cooperatively constructed to provide for the lateral displacement of the plunger rod to permit a lead within the casing being positioned ahead of the plunger and within the guide tube.

6. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the outer end thereof, a disk removably mounted within the casing and cooperating therewith to prevent rotation of the disk, an internally threaded tube swiveled to said disk, said disk having axial polygonal or other suitable shaped opening therein, a plunger rod of like cross section to the opening in the disk but extending through and freely moving through the disk opening, a threaded thimble carried by the inner end of the rod and working freely within the threaded tube, and means for rotating said tube.

7. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the outer end thereof, a disk removably mounted within the casing and cooperating therewith to prevent rotation of the disk, an internally threaded tube swiveled to said disk, said disk

having an axial polygonal or other suitable opening therein, a plunger rod of similar cross section as the opening through the disk freely extending through the disk opening, a threaded thimble carried by the inner end of the rod working in the internally threaded tube, means for rotating said tube, said disk, tube and plunger rod being bodily removable from the casing.

8. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the outer end thereof, a disk removably mounted within the casing and cooperating therewith to prevent rotation of the disk, an internally threaded tube swiveled to said disk, said disk having an axial polygonal or other suitable shaped opening therein, a plunger rod of similar cross section to the opening through the disk and freely extending through said opening, a threaded thimble carried by the inner end of the rod working in the internally threaded tube, means for rotating said tube, and an angle offset portion carried by said rod adapted to enter the opening in said disk to laterally shift the free end of the said rod for axially displacing the same whereby leads within the casing may be axially disposed in said tube.

9. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the outer end thereof, a disk non-rotatably mounted within said casing, a plunger rod reciprocally mounted within the casing and maintained against rotation therein by association with said disk, and means carried by the disk cooperating with the plunger rod for reciprocating the same.

10. A magazine pencil of the type described comprising a casing, a guide tube for the leads at the

outer end thereof, a disk non-rotatably mounted in said casing, a plunger rod reciprocally mounted within the casing and maintained against rotation therein by association with said disk, and means carried by the disk cooperating with the plunger rod for reciprocating the same, said disk and plunger rod being cooperatively constructed to provide for the lateral displacement of the plunger rod when the same reaches a point adjacent to its limit of inward movement to permit leads within the casing being axially delivered to the guide tube.

11. A magazine pencil comprising a casing, a guide tube for the leads at the outer end thereof having a resilient projection inwardly of the bore of the tube adapted for preventing the retraction of the lead after passing beneath said resilient portion in its outward travel through the tube during the operation of the pencil.

12. In a magazine pencil having a tapered casing, a guide tube for leads at the tapered end thereof, resilient means projecting inwardly of the bore of the guide tube adapted for engaging the leads passing therethrough, a plunger rod reciprocally mounted within the casing having a socket adapted for the reception of the inner end of a lead positioned in the tube, and means for preventing the inward return of the lead through the tube after the lead has passed said resilient means and upon the inward retraction of the rod.

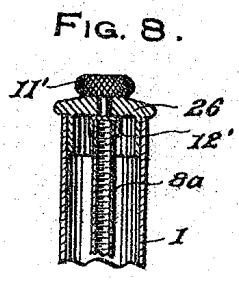
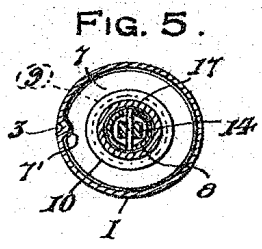
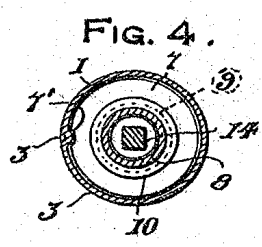
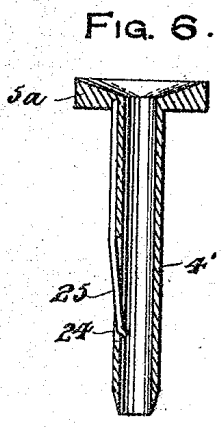
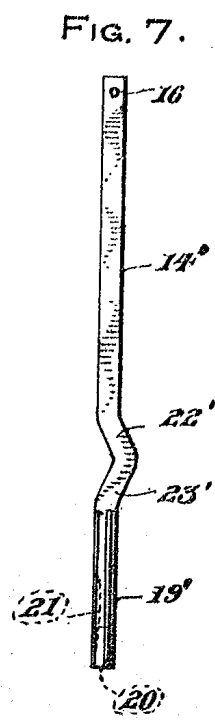
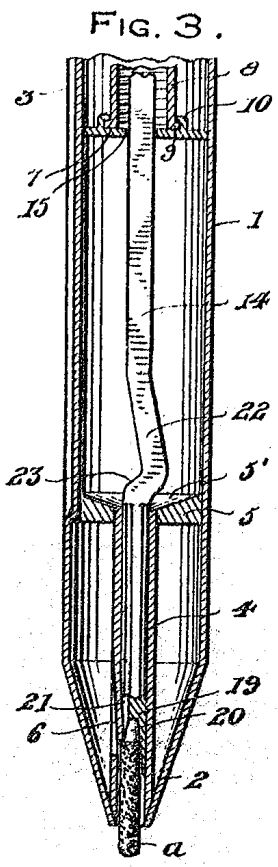
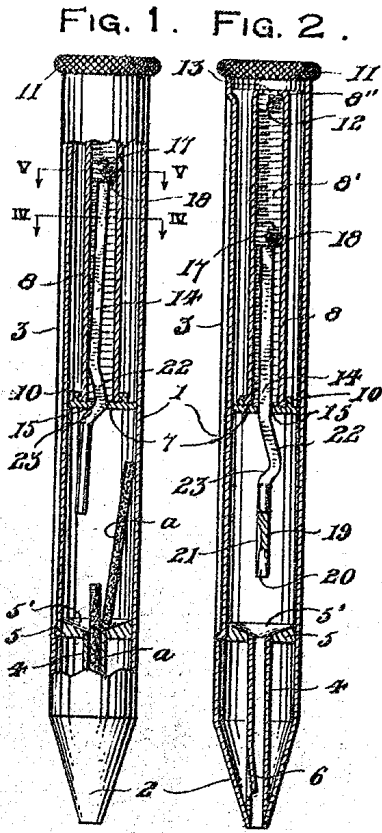
13. A magazine pencil comprising a casing, a guide tube for leads in the casing, and an expelling and repelling rod operably mounted in the casing provided with a lead-engaging socket in an end portion thereof adapted for reciprocation within said tube.

14. A magazine pencil comprising a casing, a guide tube for leads in the casing, and an expelling and repelling rod operably mounted in the casing, provided with a lead-engaging socket in an end portion thereof adapted for reciprocation within said tube, resilient means projecting within the bore of the tube adapted for engaging the lead passing therethrough, the said end portion of the rod having a side opening into said socket adapted for receiving said resilient means inwardly and backwardly of the lead during the expulsion whereby return of the lead is prevented during retraction of the rod.

15. In a magazine pencil of the type described the combination of an integral reciprocating plunger rod and a non-resilient lead gripping socket at the outer end thereof, said socket and plunger being adapted to hold the lead securely during reciprocating motion whereby the lead will follow the plunger and socket and thereby be either propelled or repelled from the pencil.

16. In a magazine pencil of the type described, a reciprocating plunger having in its outer end a non-resilient internally tapered socket for engaging and holding securely by frictional or wedging action the inner ends of the leads as they are forced into the socket by the action of the pencil or by the act of writing.

17. In a magazine pencil a reciprocating plunger having in its outer end a non-resilient internally tapered socket for engaging the leads, one wall of the socket having a clearance groove cut through, into and behind said socket, a resilient finger extending into said groove and behind the inner ends of the leads when the plunger is in its extreme forward position, said resilient finger being adapted to extract or force the leads from the socket on the backward movement of the plunger.



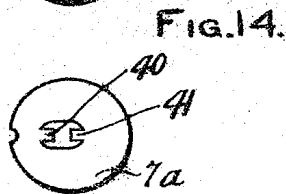
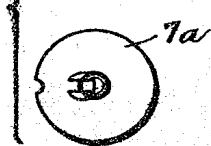
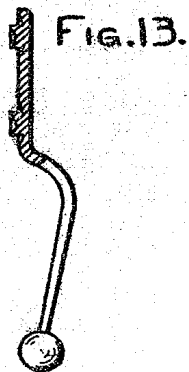
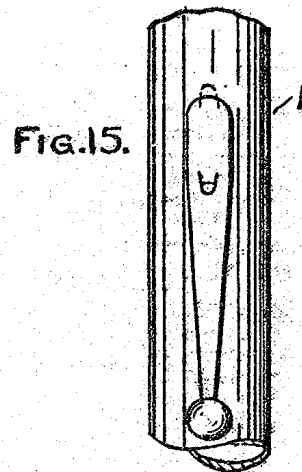
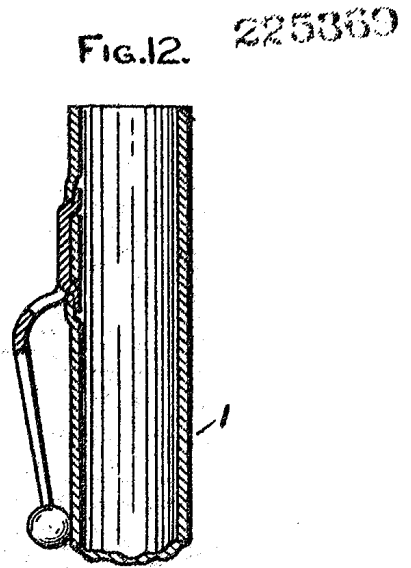
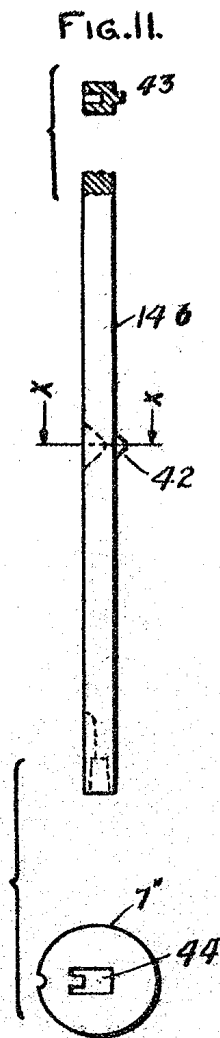
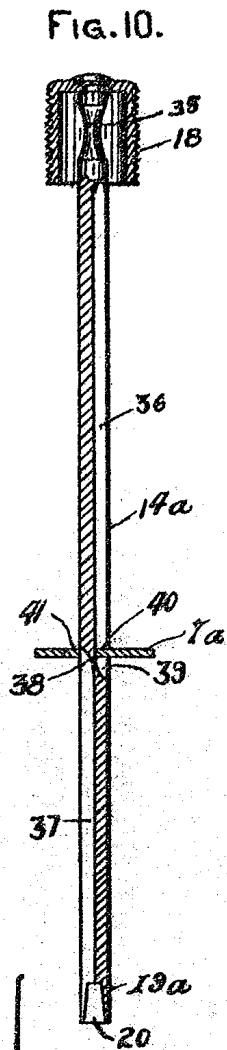
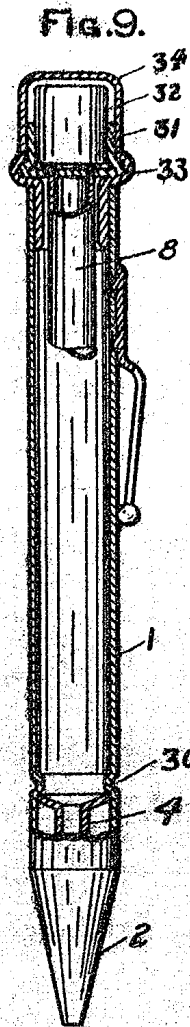
WITNESS:

Florence T. Shea
Anne Smith

Certified to be the drawing referred
to in the specification hereunto annexed.
December 15 19 21
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