

PATENT SPECIFICATION

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179,145

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COMPLETE SPECIFICATION.

Improvements in Pencils.



We, THE DICTATOR FOUNTAIN PEN COMPANY, INC., a corporation organized under the laws of the State of Delaware, of 342, Madison Avenue, in the City, County and State of New York, United States of America, Assignees of DONALD LADD, a citizen of the United States of America, of 228, Glenwood Avenue, Elmira Heights, County of Chenning, State of New York, United States of America, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

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 our 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 the parts 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 slop-

ing 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

[Price 1/-]

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.

5 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.

15 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.

20 Figure 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.

25 Figure 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.

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

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

45 Figure 6 is a cross sectional view of the modified form of guide tube showing a separate spring finger attached thereto.

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

50 Figure 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.

55 Figure 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.

60 Figure 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.

65 Figure 11 is a side elevational view, partly in section and in end elevation, of

another contemplated form for the plunger rod.

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

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

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

80 Referring more in detail to the accompanying drawings, and in particular to Figures 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 cut into the edge of the head 5 of the guide tube 4, and also into the notch 7¹ 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.

85 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 Figure 9.

90 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 5¹ 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.

95 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 Figures 2 and 3 for engaging the side or end or both of the lead.

100 This spring finger also acts in another capacity. When the plunger 14 is in the extreme forward position 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 130

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.

5 The lead feeding mechanism includes a plunger rod 14 and support therefor, the support embodying the disk 7 having a peripheral notch 7¹, Figures 4 and 5, to be slidably received in the casing 1 with
10 the bead 3 extending into the notch 7¹ to prevent rotation thereof in the casing. A tube 8 internally threaded as at 8¹ has the inner end thereof flanged outwardly as at 9, Figure 3, to act as a swivel connection in conjunction with the disk 7
15 through the medium of the annular flange 10 shown more clearly by Figure 3. An operating button or head 11 carries a screw plug 12 connected thereto by a
20 reduced neck 13, the plug being threaded into the tube 8, with the outer end of the tube rolled inwardly as at 8¹¹ to engage the reduced neck 13 for securing the button head 11 permanently to the
25 tube 8.

A modified means of making a rotatable head for attachment to the threaded tube 8 is shown by Figure 9 which shows the end of the tube slotted and forced
30 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
35 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
40 rotate within the cap 33. The cover 34 having a friction fit on the cup 31 is 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
45 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.
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The lead-feeding plunger 14, rectangular in cross section, as shown by Figures 4 and 5, may be of various other cross-sections as shown by Figures 10 and
55 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
60 Figures 5 and 7 for pivotal mounting upon a pin 17 carried by an externally-threaded thimble 18 working in the internally threaded tube 8.

65 The storage magazine for the leads as

shown by Figures 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
70 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 grove 21, the rod 14 adjacent to the tip 19 being angularly offset at 22 and 23 with both end portions in axial
75 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.
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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
85 head 5 of the guide tube 4, after which the lead feeding mechanism is replaced in the casing with the notch 7¹ 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
90 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 Figure 1, the rod 14 during this operation moving on the pivot pin 17.
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A modified form shown by Figure 10, contemplates the rigid attachment of the plunger 14^a to a threaded cup or thimble 18, said thimble being sufficiently loose
100 within the threaded tube 8 as to permit of the lateral displacement of the tip 19^a 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.
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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
110 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
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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 Figure 2. When the plunger 14 has the tip end 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 Figure 2 to that shown by Figure 1 is gradual as is the restoration of the plunger rod to its axial position.

Modified forms of the plunger rods contemplated are shown by Figures 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 19¹ round and otherwise constructed as in the preferred form, but contrasting therewith by having very abrupt angles at 22¹ and 23¹, the abrupt angle at 22¹ causing a quicker lateral movement of the tip end of the plunger rod when the said angle portion 22¹ 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.

Figure 10 shows a plunger rod 14^a made circular in cross section and which has instead of the offset as shown by plunger illustrated by Figure 7, two slots 36 and 37 milled on opposite sides which receive projections 40 and 41 in the modified type of cam plate 7^a shown by Figure 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.

Figure 11 shows another modification

of a plunger rod 14^b in which the offset portion instead of being bent consists of a portion of the rod being sheared and forced out as shewn 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 7¹¹ the apertures in the cam plate, through which the rod passes, being shown by 44.

A modified form of guide tube is shown by Figure 6, the same being designated by the numeral 4¹, 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 4¹ with its opposite end securely fastened either to the disk head 5^a as shown or by other suitable means.

Figure 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 11¹ journaled through the head 26 and carrying a cup-shaped socket 12¹ upon the inner end thereof for permanent attachment to the outer end of the internally threaded tube 8^a. By rotation of the button 11¹ the tube 8^a 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 co-operatively 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 Figure 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

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Figures 2 and 8 the feed tubes 8 and 8^a for operating the plunger rods 14, carrying the button caps 11 and 11¹ 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.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. A magazine pencil comprising a casing, a guide tube for leads at the outer end thereof, and means within the casing adapted to be moved backwards and forwards relative to the casing to force leads through the outer end of the casing and guide tube, the said means being automatically shifted laterally relative to the casing when withdrawn backwards therein to permit a lead to be positioned in the guide tube.

2. A magazine pencil according to Claim 1, characterized by the said reciprocating means being in the form of a rod provided with a bend therein, the rod

being polygonal shaped, and passing through a similarly shaped opening in a disk held in a stationary position by the casing, whereby the bent portion of the rod passing through the disk secures the lateral movement of the rod.

3. A magazine pencil according to either Claims 1 or 2, characterized by the rod being provided with means at its end for engaging the rear end of the lead whereby the backward and forward movement of the rod retracts or projects the lead from or through the end of the casing.

4. A magazine pencil according to Claim 3, characterized by the provision of means for preventing the retraction of the lead upon backward movement of the rod after the rod has reached the limit of its forward movement in the casing.

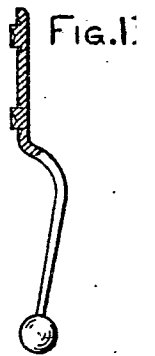
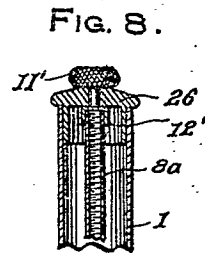
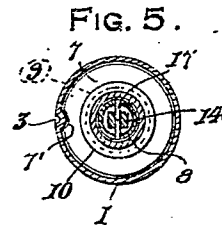
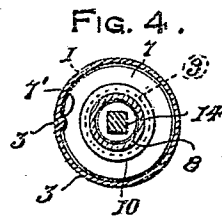
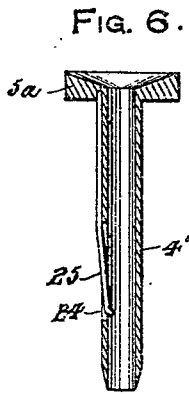
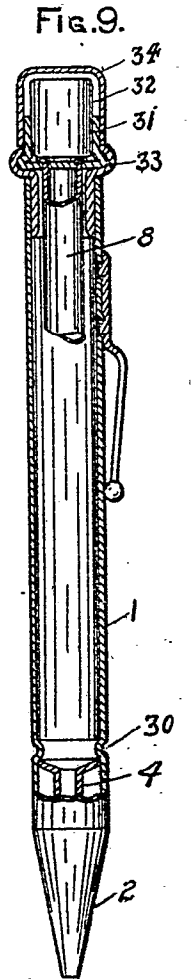
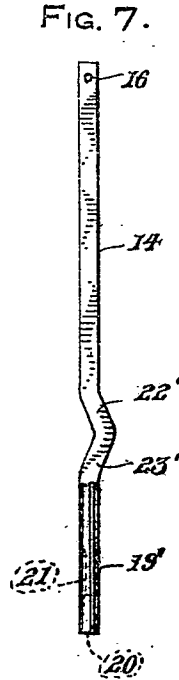
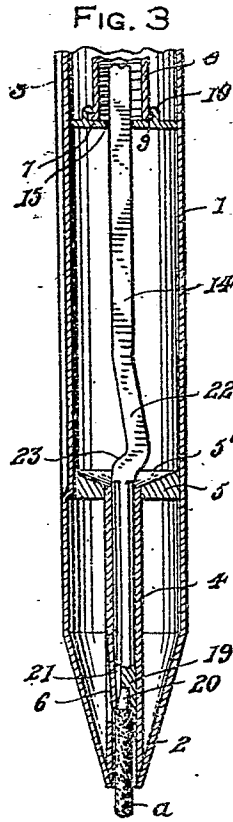
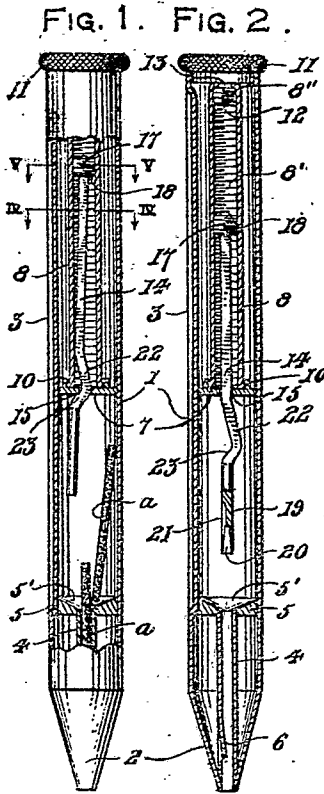
5. A magazine pencil according to Claim 4, characterized by the said means comprising a spring carried by the tube and adapted to slip behind the rear end of the lead when the rod has reached the limit of its forward movement relative to the casing whereby the spring, on the retraction of the rod, serves to disengage the lead from the rod.

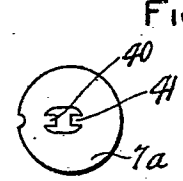
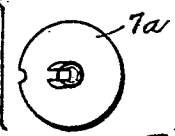
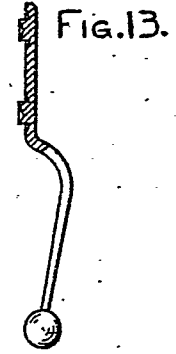
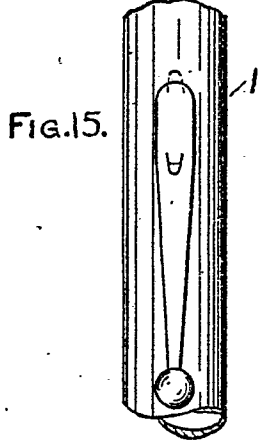
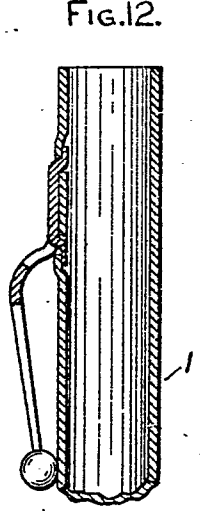
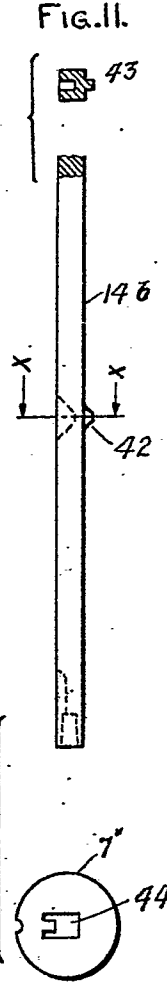
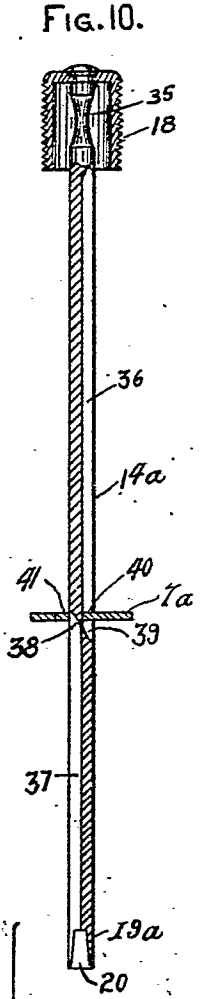
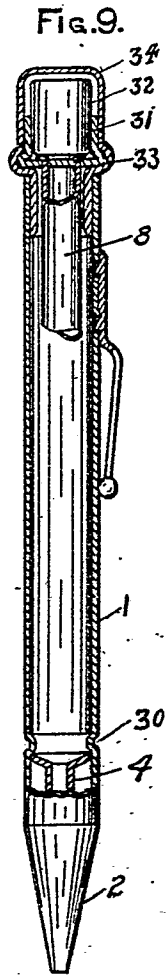
6. A magazine pencil substantially as shown and described.

Dated the 20th day of March, 1922.

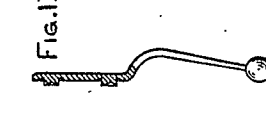
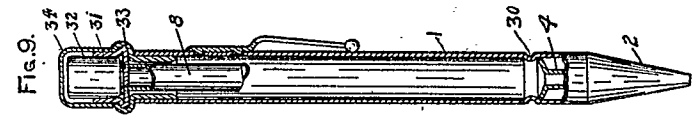
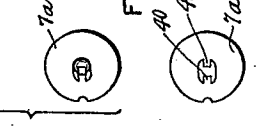
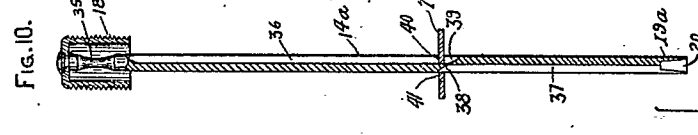
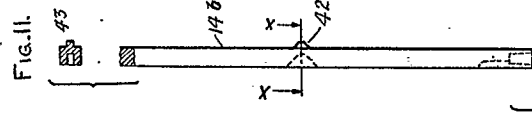
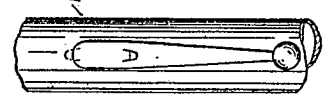
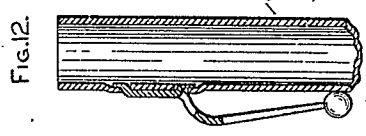
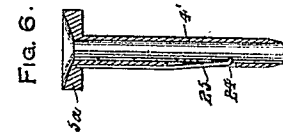
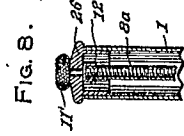
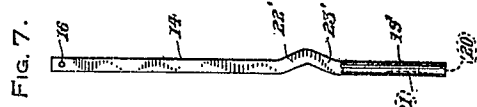
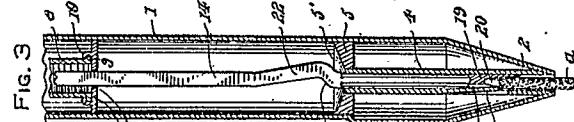
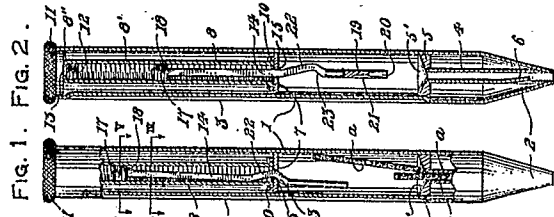
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