Sept. 3, 1946. A. P. SHELLY 2,407,106

PENCIL

Filed March 3, 1944

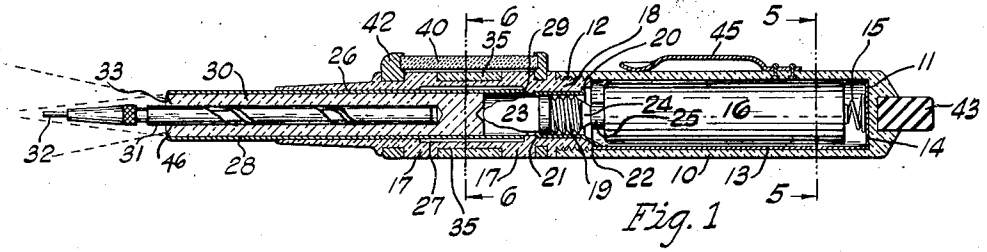



Fig. 1

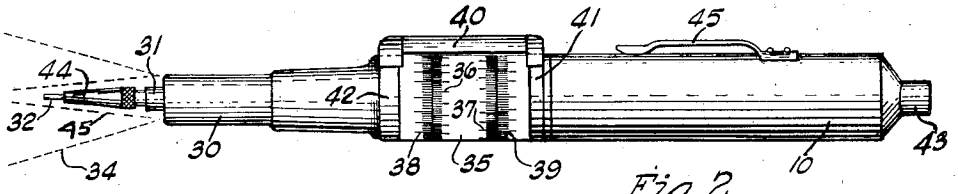



Fig. 2

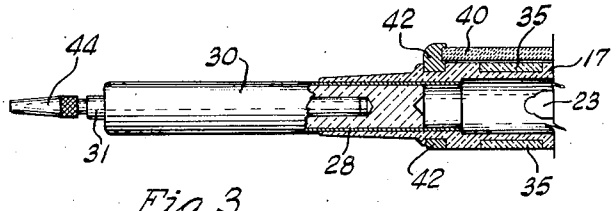



Fig. 3

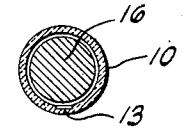



Fig. 5

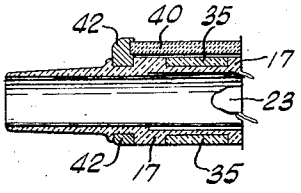



Fig. 4

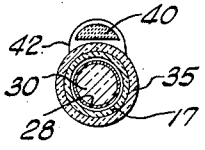



Fig. 6

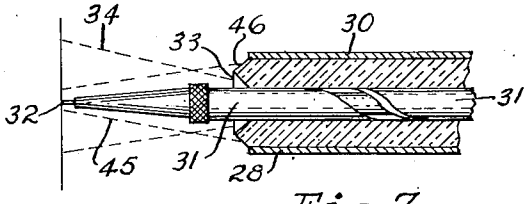



Fig. 7

INVENTOR.
ALLEN P. SHELLY

BY Martin E. Anderson
ATTORNEY.

Patented Sept. 3, 1946

2,407,106

# UNITED STATES PATENT OFFICE

2,407,106

## PENCIL

Allen P. Shelly, Denver, Colo.

Application March 3, 1944, Serial No. 524,943

4 Claims. (Cl. 240—6.46)

1

This invention relates to improvements in pencils and has reference more particularly to an improved pencil that is provided with means for illuminating the paper.

It frequently occurs that it is necessary to write at times when sufficient light is not available to see the paper and the writing. This is true more particularly in connection with airplane pilots and more particularly during wartime when the plane cannot be properly illuminated. It also frequently happens that merchants and others taking inventory must work in dimly lighted basements where a self-illuminating pencil or writing implement is of great advantage.

It is the object of this invention to produce a pencil of such construction that it can be operated as an ordinary mechanical pencil and which, in addition thereto, can be used as a spotlight and which will illuminate the paper during the time when it is used for writing.

It is the further object of this invention to produce a pencil or writing implement of a simplified construction which can be made at a minimum cost and which will be both rugged and substantial.

Another object is to provide a pencil of such construction that a section thereof shall be sufficiently translucent to permit matters printed on the outer surface to be read by means of the light positioned within the pencil and which will therefore adapt the pencil for use in connection with special calculating devices incorporated therewith and positioned on the outer surface thereof.

Another object of this invention is to produce a pencil of the type described in which the writing implement is carried by a tubular element that is telescopically connected with one portion of the pencil and which can be so positioned that it will form an opaque shield between the lamp and the translucent member and which can be moved outwardly so as to expose the inner surface of the translucent member to light.

A still further object of the invention is to produce a pencil of the type described in which that portion which carries the writing implement can be entirely removed whereupon the remaining portions of the pencil will function as a spotlight.

A further object of the invention is to produce a pencil of the type described in which the switch, by means of which the lamp is controlled, can be readily operated by one hand and which, in addition thereto, will be of a very simple and substantial construction.

2

A still further object of the invention is to produce a pencil in which the tubular member that carries the writing implement is provided on its inside with a transparent cylindrical member from the outer end of which an opening extends inwardly for the reception of the pencil portion, thereby leaving an annular body for transmitting light, the outer end of which is inclined in such a direction as to produce an outwardly flaring light beam.

Having thus described the invention in a general way and having pointed out the object thereof, the invention will now be described in detail, and for this purpose reference will now be had to the accompanying drawing in which the invention has been illustrated in its preferred form and in which:

Figure 1 shows a diametrical section of the pencil;

Figure 2 is a side elevation thereof;

Figure 3 is a fragmentary view in which parts are shown in elevation and parts in section;

Figure 4 is a view showing a portion of the pencil in diametrical section;

Figure 5 is a section taken on line 5—5, Figure 1;

Figure 6 is a section taken on line 6—6, Figure 1; and

Figure 7 is a fragmentary section similar to that in Figure 1, showing the construction to a larger scale.

In the drawing reference numeral 10 designates a tubular casing having one end closed as indicated at 11, and the other end provided with a threaded section 12. A strip of metal 13 is positioned in a longitudinally extending recess in the inner surface of the casing and terminates in a transversely extending section 14. A spring 15 of the shape shown or of any other suitable shape, is positioned in electrical contact with the transversely extending part 14 and serves to effect an electrical connection between the battery 16 and strip 13.

A tubular member, which has been designated in its entirety by reference numeral 17, is threadedly connected with the tubular casing as shown in Figure 1. Member 17 is provided at its inner end with a cylindrical section 18 in which is positioned an electrical socket 19. This socket is not provided with threads in the embodiment shown, but has its inner end provided with an outwardly extending flange 20 and its outer end with an inwardly extending flange 21. The inner end of the socket is provided with an inwardly extending tongue 22, which overlaps the

outer end of strip 13 and forms an electrical connection between the socket and this strip when the tongue is rotated into a position in which it engages the strip. A miniature electric lamp 23 having a base of ordinary construction and the contact 24 is positioned in the socket and the center contact is normally in engagement with the center contact 25 of the battery. When tongue 22 contacts strip 13, a current will flow through the filament of the lamp and cause the same to become illuminated. By turning the tubular member 17 relative to casing 10, the circuit to the lamp can be broken. Tongue 22 serves as a movable switch element for controlling the operation of lamp 23. The parts are so adjusted that when member 17 is screwed tightly into engagement with the casing, the switch will be opened and therefore to close the switch, the two members must be rotated in a direction to slightly separate the abutting ends.

Tubular member 17 is provided with a cylindrical opening having sections of two different diameters. The outer section has been designated by reference numeral 26 and the other or intermediate section by reference numeral 27. Telescopically connected with tubular member 17 is a pencil portion comprising a tube 28 of metal, such as brass, and of a diameter which forms a sliding fit with the tubular section 26. This tube normally extends inwardly to the point indicated by reference numeral 29. Positioned within the tube and filling the same completely, is a transparent cylinder 30 which is preferably formed from some transparent plastic such as that which is sold under the trade name of "Lucite." The transparent member 30 has an axial opening in which is positioned a mechanical pencil 31. The lead has been designated by reference numeral 32. Since the mechanical pencil portion forms no part of this invention except in so far as it forms an element of the combination, it will not be described in detail. The diameter of the axial opening is less than the outside diameter of the transparent member and this leaves an annular body through which light from lamp 23 will pass when the lamp is lighted. The light emerges through the rearwardly tapering frustoconical end surface 33 and due to refraction is directed outwardly at a small angle as indicated by dotted lines 34 in Figure 2. The light strikes the paper around the lead 32 and gives sufficient illumination to enable the writing to be seen.

Attention is called to the fact that the cylindrical section 27 is of somewhat larger diameter than the tube 28 so that any dust particles that may be trapped in the pencil will fall into the annular space thus formed and by means of this enlarged section, the thickness of the translucent member 17 can be decreased to any desired extent. When the parts are in the position shown in Figure 1, lamp 23 is lighted and light traverses the transparent member 30, but no light shows through the wall of the translucent member because the inner end of tube 28 forms an opaque shield.

In the commercial form of the pencil, the translucent section 17 is provided with a ring 35 having two scales 36 and 37. The adjacent outer edge of tubular member 17 is provided with a scale 38 that cooperates with scale 36 and with a scale 39 that cooperates with scale 27. The movable ring and the stationary scales on the translucent member form a slide rule which can be used for various purposes. These slide rules



are well known, the special construction of the slide rule will not be described. The structure of the pencil, however, that adapts it for this purpose is believed to be novel. When tube 30 is withdrawn to the position shown in Figure 3, light from the lamp will pass through the translucent member 17 in sufficient quantity to enable the slide rule to be read at any time. Since the divisions on the slide rule are comparatively small, a magnifying glass 40 has been provided. The ends of this magnifier are positioned in rings 41 and 42 that are rotatably mounted in external grooves on member 17. The closed end of the tubular casing is provided with a recess for the reception of an eraser 43.

The pencil portion comprising the tube 30 and parts associated therewith can be completely removed from the tubular member 17 as shown in Figure 4 and when so removed the remaining portions will function as a spotlight that can be used for whatever purpose may be desired. In addition to illuminating the scale of the slide rule, the construction by means of which light is permitted to shine through the translucent member also serves to facilitate the locating of the pencil in the dark, because the translucent section will permit light to pass when the parts are in the position shown in Figure 3. The position of the lead can be controlled by means of the rotatable end portion 44 in the usual manner.

A clip 45 is secured to the tubular casing and serves to attach the pencil to the welt of a pocket or to any other support.

From the above description it will be apparent that the pencil described is of a simple and substantial construction; the switch can be controlled by one hand which is a great convenience for airplane pilots and others who may have only one hand free to manipulate the pencil. The outwardly flaring beam of light is also very desirable because unless the light is directed outwardly in the shape of a cone and merely extends forwardly in the form of a cylinder, the area illuminated is so small as to make it difficult for the writer to follow the lines. The combination of elements, aside from the pencil assembly, forms a spot light that can be controlled by the switch which is operated by the relative rotation of the casing and the tubular member.

Particular attention is called to the construction of the lamp socket which has its inner end provided with an outwardly extending flange and the outer end with an inwardly extending flange and which is also provided with a tongue 22. This socket is of simple construction and can therefore be made without the necessity of providing expensive tools which simplifies and lessens the cost of manufacture and which also makes it possible to insert and remove the lamp from the inner end of the socket. It is evident that an ordinary screw base employed in a position like that shown in Figure 1 would require the lamp to be inserted from the outside and in order to do this the socket would have to be removed and inserted or else a special tool provided for manipulating the lamp.

Attention is called at this point to the fact that the outer end of the transparent member 30, is also provided with a narrow frusto-conical surface 46 which refracts some of the light inwardly along lines 45 for the purpose of illuminating the paper adjacent the point of the lead 32. The surface 46 is quite narrow, but refracts an annular beam of sufficient intensity to illuminate

the circular area about the lead which would otherwise be shaded.

Having described the invention what is claimed as new is:

1. A combined flashlight and pencil comprising, in combination, a tubular casing having one end closed and the other open, a strip of conducting material extending from the closed end to a point adjacent the open end, the casing having a threaded section extending inwardly from the open end, a tubular member threadedly connected with the casing, a lamp socket positioned in the inner end of the tubular member, the outer end of the socket having an inturned flange forming a stop for the base of a miniature electric lamp, the inner end of the socket having an outwardly directed flange terminating in an inwardly extending tongue positioned to contact with and overlap the outer end of the conducting strip, that part of the socket between the flanges being free from threads, a lamp positioned in the socket, a battery positioned in the casing, resilient means for urging the battery outwardly and electrically connecting it with the conducting strip, the center contact of the battery being positioned to engage the center contact of the lamp, whereby when the tubular member and the casing are rotated relative to each other to bring the tongue into engagement with the strip the lamp will be lighted, a cylindrical member of transparent material positioned in the tubular member, said transparent material having an axial opening, and a pencil in the opening.

2. A combined flashlight and writing implement, comprising in combination, a tubular casing having one end closed, a strip of conducting material extending from the closed to a point adjacent the open end, the casing having a threaded section extending inwardly from the open end, a battery in the casing, resilient means for effecting an electrical connection between the



battery and the strip of conducting material and for urging the battery outwardly, a tubular member of translucent material threadedly connected with the casing, a lamp socket free from threads positioned in the inner end of the tubular member, the outer end of the socket having an inturned flange forming a stop for the base of a miniature electric lamp, a miniature electric lamp positioned in the socket with the center terminal facing the battery and normally in contact with its center contact of the latter, a resilient tongue of conducting material extending inwardly from the socket, in position to engage the outer end of the conducting strip, whereby the lamp will be lighted by a relative rotation of the casing and the tubular member, a metal tube telescopically connected with the tubular member, a cylindrical member of transparent material positioned in the metal tube, terminating some distance from the inner end of the metal tube, whereby the tube forms an opaque shield between the lamp and the inner surface of the translucent member when it is in its innermost position, the transparent member having an axial opening extending inwardly for the reception of a pencil, and a pencil in the opening.

3. A device in accordance with claim 1 in which the outer end of the transparent cylinder has an inwardly and rearwardly tapered frusto-conical surface whereby the beam of light will be outwardly flaring.

4. A device in accordance with claim 1 in which the outer end of the transparent cylinder has an inwardly and rearwardly tapered frusto-conical surface for refracting an outwardly flaring beam of light, and an outwardly and rearwardly flaring conical surface for refracting a tubular beam of light inwardly towards the tip of the pencil to illuminate the area directly adjacent the point where the pencil contacts the paper.

ALLEN P. SHELLY.