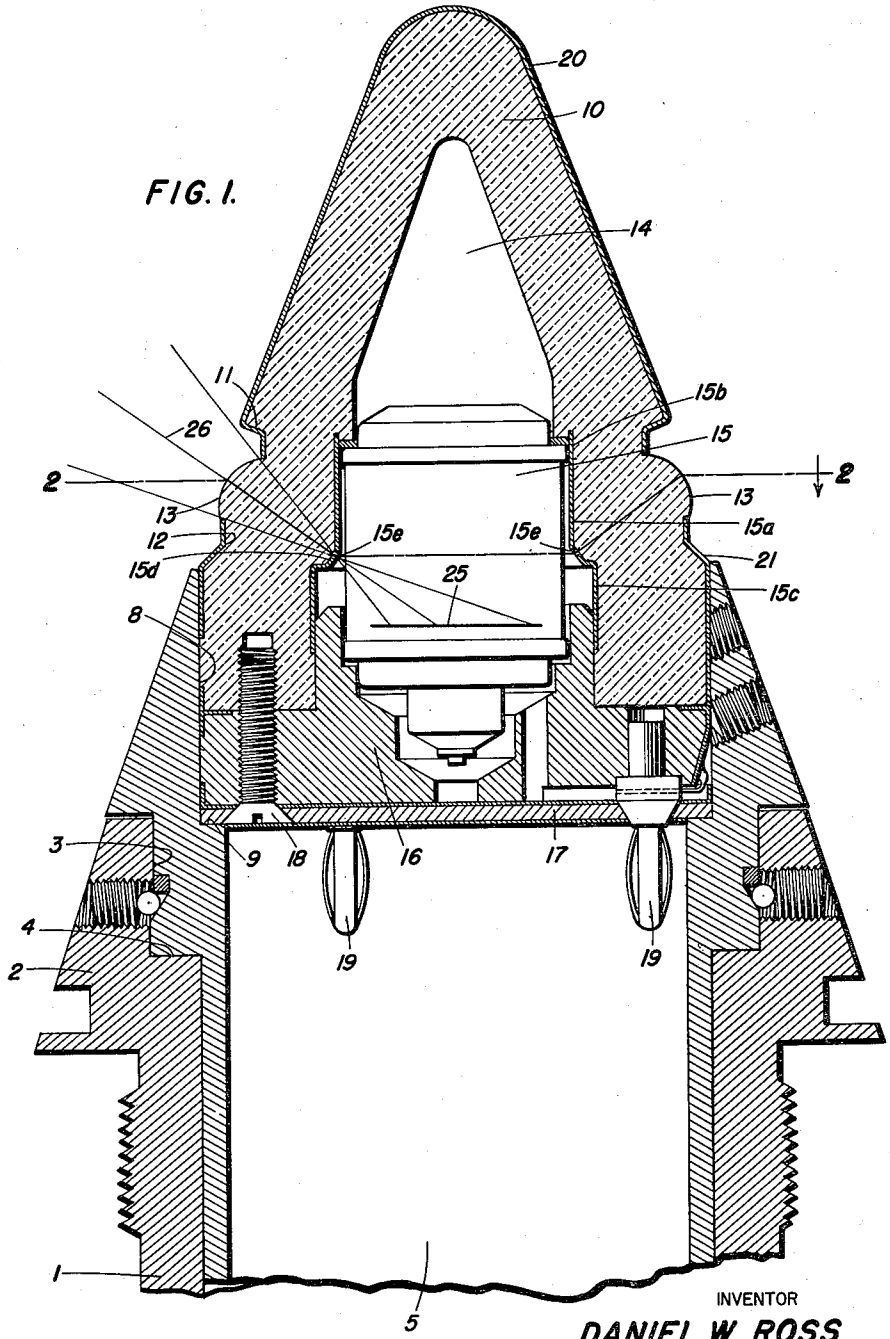
June 26, 1962 D. W. ROSS 3,040,661

PROJECTILE NOSE STRUCTURE

Filed Jan. 28, 1944 2 Sheets-Sheet 1

FIG. 1.



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Filed Jan. 28, 1944 2 Sheets-Sheet 2

FIG. 2.

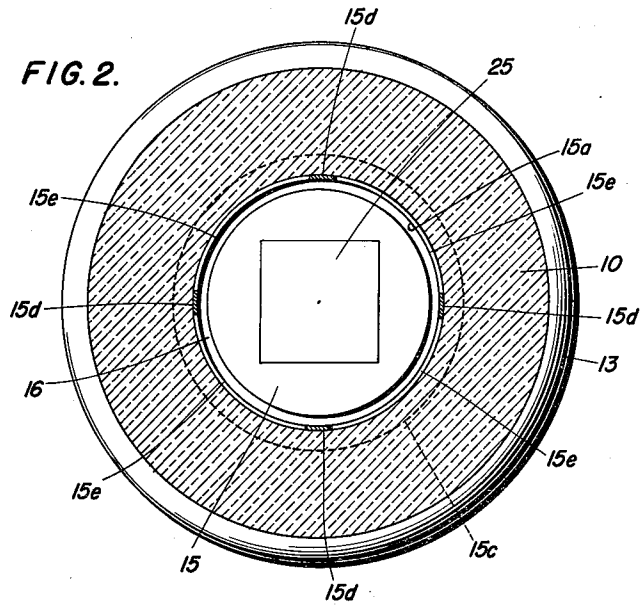
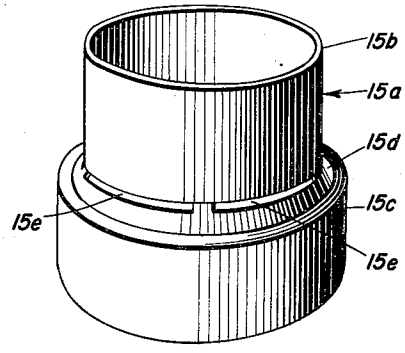


FIG. 3.



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PROJECTILE NOSE STRUCTURE

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4 Claims. (Cl. 102—70.2)

This invention relates generally to photoelectric proximity fuzes and more particularly to an improved nose fuze assembly of the general class disclosed in the copending application of Joseph E. Henderson et al., Serial No. 568,020, filed December 13, 1944, for "Fuze."

One of the principal objects of the present invention is to provide a nose assembly for photoelectric proximity fuzes wherein improved means is employed for defining the light slit through which admission of light to the photoelectric cell is controlled.

Another object of the invention is to provide a nose assembly of this character having improved shrouding, or masking, means.

Another object of the invention is to provide an improved nose assembly adapted to contain a photoelectric cell of the type used with fuzes of the indicated class.

Further objects and advantages, not mentioned hereinabove, will become apparent during the course of the following description.

In the drawings:

FIG. 1 is a longitudinal substantially diametric sectional view of the nose of a projectile construction provided with a fuze incorporating the principles of the present invention;

FIG. 2 is a cross sectional view taken substantially on the line 2—2 of FIG. 1, and looking in the direction of the arrows; and

FIG. 3 is a perspective view of the sleeve, or insert, which surrounds the photoelectric cell.

Referring now to the drawings: The numeral 1 indicates generally the outer can of a projectile fuze. The can 1 is adapted to be fitted into and retained in the body (not shown) of a projectile. A thickened forward portion 2 of the can is formed with a counterbored recess 3 defining a shoulder 4, and fitted in the recess 3 is an inner can 5. The side wall of the inner can is thickened near it forward end to overlie and seat against the shoulder 4 in the recess 3. The forward end portion of the inner can 5 is of frusto-conical or conoidal shape, having its outer surface aligned with the upper end portion of the can 1 as well as with other portions of the assembly to cooperate in forming the ogive of the projectile. The forward end of the inner can 5 is counterbored at 8 to receive the nose assembly, which seats against the shoulder 9.

A nose block 10, which is of the shape shown in the drawing, constitutes the body of the nose assembly and is formed of Lucite, ethylcellulose, or some other suitable translucent (preferably transparent) insulating material. The forward portion of the nose block is of appropriate generally conical shape, as shown, while the rear, or base, portion thereof is substantially cylindrical and fits into the counterbore 8. Intermediate the conical and cylindrical areas the surface of the nose block is relieved in such manner as to provide a partly toroidal but completely annular lens section 13. The interior of the nose block is chambered, as at 14, to receive a photoelectric cell 15, the construction of which may correspond to that disclosed in the aforementioned copending application. The cell is mounted at its rear end in a socket ring 16, the ring being held by a retaining plate 17 and screws 18. The ring 16 provides a mounting for connectors, shown as banana plugs 19. These provide electrical connection between the photoelectric cell 15 and

the other components of the fuze assembly, suitable connections being made to the upper and lower ends of said photoelectric cell.

The photoelectric cell 15 is preferably of the type disclosed in the aforementioned copending application, its entire outer cylindrical wall being transparent. Surrounding the transparent wall of the cell is a metallic sleeve or insert, 15*a*, which may be formed of copper. The sleeve is of stepped cylindrical form, having a reduced forward end portion 15*b* connected to the large rear portion 15*c* by an angular frusto-conic web 15*d*, said web being formed with an annular series of circumferentially extending slots 15*e*, the slots being relatively narrow and disposed at the junction of said web with the reduced portion 15*b*. The web 15*d* is so positioned that lines extending centrally through the slots 15*e* to the center of the photo-sensitive surface 25 (which center is at the axis of the assembly) would pass through mid-points on the outer surface of the lens section 13, as indicated by the line 26 of FIG. 1. The slots are arranged to cooperate with said lens 13 to project a beam of light upon the cathode within the photoelectric cell 15.

In order largely to restrict the passage of light to the lens I provide a masking cap 20, said cap being formed of aluminum, copper or other suitable material formed about the nose with its rear edge engaged in the groove 11. To mask the lower portion of the block 10 a thin metal sleeve 21 is similarly formed about said lower portion with its upper margin in the groove 12. It will thus be seen that the cap 20 and the sleeve 21 cooperate in masking the entire block, with the exception of the lens section 13. Entry of light is thus restricted to the lens section, which cooperates to direct the light to the cathode of the photoelectric cell. The cap 20 and the sleeve 21 are each preferably formed from a single piece of metal and may be molded with the block 10.

While I have specifically described a preferred form of the invention, it is to be understood that the actual scope of the invention is intended to be delimited only by the fair scope of the appended claims.

I claim:

1. A projectile nose fuze construction comprising a translucent chambered nose block, a partly toroidal lens section formed integrally with and encircling the chambered portion of the block, a photoelectric cell within the chambered interior of the block and positioned to receive light admitted through the lens section, a reticulated masking sleeve surrounding the cell within the chambered portion of the block, and metallic light-shielding means covering those portions of the block other than the lens section.

2. A projectile nose fuze construction comprising a tapering, translucent, concentrically chambered nose block, a concentrically disposed lens section formed integrally with the block and arranged to admit light to the interior thereof, a photoelectric cell concentrically arranged within the chamber in position to receive light admitted by the lens, a reticulated masking sleeve concentrically arranged within the chamber and surrounding the cell and adapted to control admission of light to the cell, and an opaque covering restricting admission of light to the interior of said block except through said lens section.

3. A nose structure for photoelectric proximity fuzes comprising a block of insulating material, said block having a conical nose portion and a cylindrical base portion, said block being contoured to define a plurality of annular grooves and a lens disposed between the grooves, a cap for masking the nose portion of the block and having a lower margin in one of the grooves to abut the upper rim of the lens, and a sleeve surrounding the base portion and having a margin in the other of said grooves

to abut the lower rim of the lens, said cup and sleeve cooperating for restricting entry of light to the interior of the block to said lens.

4. A nose structure for photoelectric proximity fuzes comprising a block of insulating material formed with a conical nose portion and a cylindrical base portion, said block having a pair of grooves and a lens between the grooves, said block having a recess, a photoelectric cell in the recess, and an insert mounted in the recess above the photoelectric cell, said insert having a slot cooperating with the lens for restricting entry of light into the recess, a cap molded on the nose portion of the block, and a sleeve surrounding the base portion of said block, said sleeve and cap cooperating to mask the block and restrict light passage to said lens.

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