

[54] **BEHIND MIRROR FOCUS LIGHT GATHERING DEVICE**

[76] Inventors: **Chester A. Franklin**, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway; **George Spector**, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10017

[22] Filed: **Mar. 12, 1973**

[21] Appl. No.: **340,096**

[52] U.S. Cl. **350/294, 350/199, 350/288**

[51] Int. Cl. **G02b 5/10**

[58] Field of Search **350/288, 299, 293, 294, 350/199**

[56] **References Cited**

UNITED STATES PATENTS

1,085,795 2/1914 Boyle 350/294
2,198,014 4/1940 Ott 350/294

OTHER PUBLICATIONS

Gunn, "Method of Zone Melting," I.B.M. Technical

Disclosure Bulletin, Vol. 10, No. 1, June 1967, p. 76.

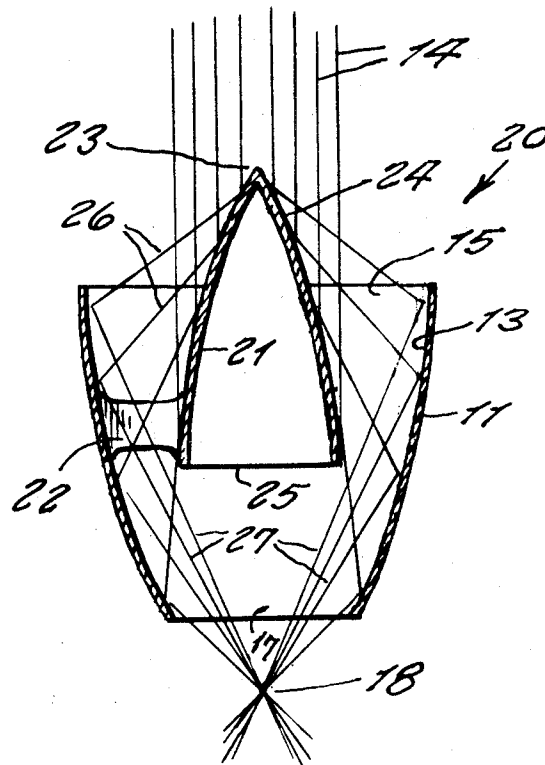
Arrabito et al., "Laser Perforation Technique" I.B.M. Technical Disclosure Bulletin, Vol. 13, No. 10, March 1971, p. 3098.

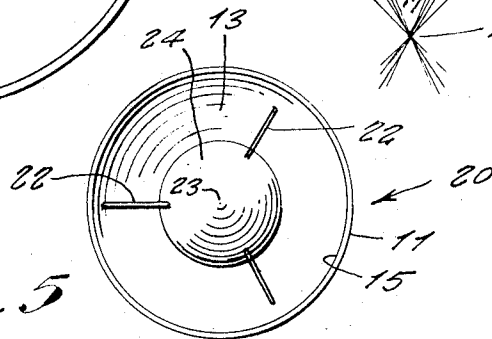
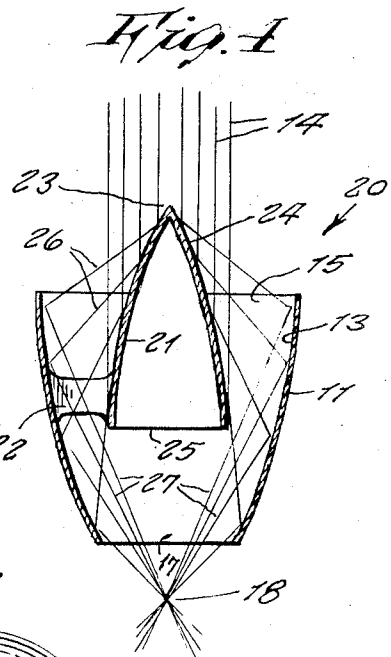
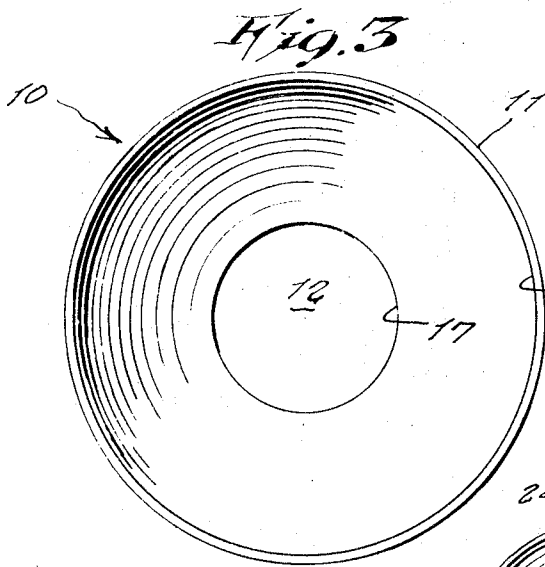
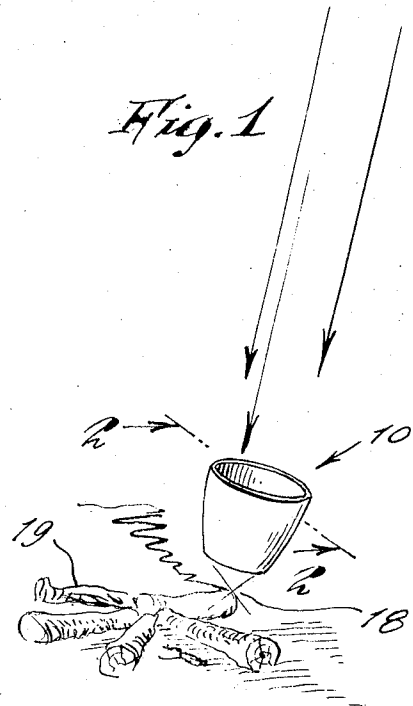
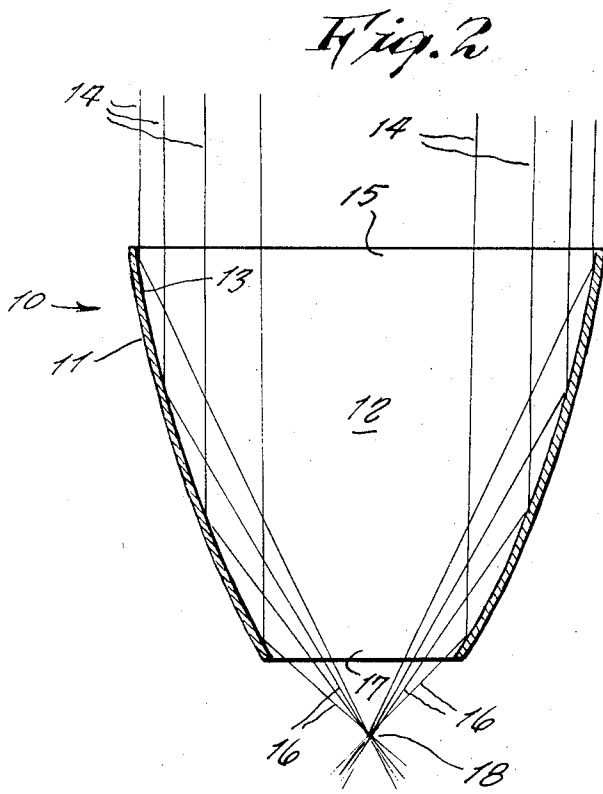
Primary Examiner—Ronald L. Wibert
Assistant Examiner—Michael J. Tokar

[57] **ABSTRACT**

A device for converging sunlight beams so to be able to ignite a fire or do solar cooking; the device consisting of a cylinder of frusto-conica, shape which is outwardly arcuate, the cylinder inner surface forming a reflector of the light beams so that when positioned with its axis parallel to the light beams, and with its wider mouth end toward the sun, the light rays reflected from the inner surface pass out the rear smaller mouth and the light rays converge together at a point rearward of the small mouth.

2 Claims, 5 Drawing Figures





BEHIND MIRROR FOCUS LIGHT GATHERING DEVICE

This invention relates generally to light focusing devices. More specifically it relates to devices for concentrating light rays.

A principal object of the present invention is to provide a light gathering device which can start a fire or do solar cooking by utilizing sun light rays.

Another object is to provide a light gathering device in which the sun rays are gathered to a common point that is located rearwardly or behind the device, thus differing from reflectors where such point is forwardly thereof.

Another object is to provide a light gathering device which can be made in any of various sizes, and which for practical purpose can be small so that it is convenient to be carried in a pocket by a sportsman or scout out-of-doors.

Other objects are to provide a BEHIND MIRROR FOCUS LIGHT GATHERING DEVICE which is simple in design, inexpensive to manufacture, rugged in construction, easy to use, and efficient in operation.

These and other objects will be readily apparent upon a study of the following specification and the accompanying drawing wherein:

FIG. 1 is a perspective view of the invention shown in use.

FIG. 2 is a cross section on line 2—2 of FIG. 1.

FIG. 3 is a top view of the device.

FIG. 4 is a view similar to FIG. 2 and showing a modified design that includes a central cone for reflecting central light rays so to be more efficient by utilizing all the rays that otherwise would pass through the center opening without benefit.

FIG. 5 is a top view thereof.

Referring now to the drawing in detail, and more particularly to FIGS. 1 to 3 at this time, the reference numeral 10 represents a behind mirror focus light gathering device according to the present invention, wherein there is a one piece shell 11 that consists only of a side wall around a central opening 12. The shell wall is of frusto-conical shape which is outwardly bulged or arcuate. The inner surface 13 thereof is mirror polished so to reflect light rays with maximum efficiency.

In operative use, the longitudinal axis of the device is made parallel to sun light rays 14 and the large mouth 15 of opening 12 is positioned toward the direction of the sun. Thus direct light rays 14 from the sun strike the surface 13 from which they reflect as reflected light rays 16 that pass outward of small mouth 17 of the opening 12, the reflected light rays 16 crossing each other at a point 18 that is rearwardly a distance away from the device 10. If the point 18 is located on a fire-wood 19 (as shown in FIG. 1), the concentrated light

rays will be sufficient to ignite the same.

In FIGS. 4 and 5 a modified design of the device 20 is shown which includes the structure of above described device 10, and which additionally includes a concentric central conical shell 21 secured rigidly to shell 11 by means of three radial, thin fins 22 therebetween. The shell is positioned within the mouth 15 of shell 11 and has its conically pointed end 23 in a direction toward the sun. The side wall of the shell is outwardly bulged or arcuate, and the outer surface 24 thereof is mirror polished for maximum reflective efficiency. It is to be noted that the outer diameter of the base end 25 of the shell 21 is a same size as the mouth 17 so to utilize all the light rays entering the device without blocking any of the surface 13 from the direct sun rays.

In operative use, thus direct light rays 14 which otherwise would pass out of the mouth 17 without useful work, are intercepted by the shell 21 so to cause such direct light rays 14 to reflect on surface 24 and reflect therefrom as reflected light rays 26 which strike on surface 13 and reflect therefrom as re-reflected light rays 27 which pass outward of mouth 17 and cross at the same point 18 where the reflected light rays 16 cross. Thus greater efficiency is obtained so that the device is equally operative when the sun is less bright.

It is to be noted that the shells 11 and 21 when viewed in a horizontal cross section, such as in FIG. 4 may have the arcuate bulges thereof either elliptical or circular about a constant point.

What is claimed is as follows:

1. A mirror device for focusing sun rays at a predetermined point comprising a larger shell having an inner concave reflecting arcuate surface, said shell having a circular inlet opening of larger diameter tapering to a concentric sun ray outlet opening of smaller diameter whereby the inner surface curves regularly in a longitudinal direction from the larger inlet opening to the smaller outlet opening forming a surface that reflects sun rays entering the inlet opening to a focal point outward of the outlet opening in combination with a smaller second shell having an arcuate convex outer surface which curves regularly from a point to an open circular end, said smaller shell being affixed concentrically within the larger shell by spaced radial fins wherein the point of the smaller shell projects towards the sun and beyond the inlet opening of the larger shell, with the large end the smaller shell positioned between the inlet and outlet openings of the larger shell.

2. A device as in claim 1 wherein the large end of the smaller shell is midway between the inlet and outlet openings of the larger shell and whereby the outer diameter of the smaller shell at its large end is equal to the diameter of the outlet opening of the larger shell.

* * * * *