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MIRROR FOR ASTRONOMICAL PURPOSES

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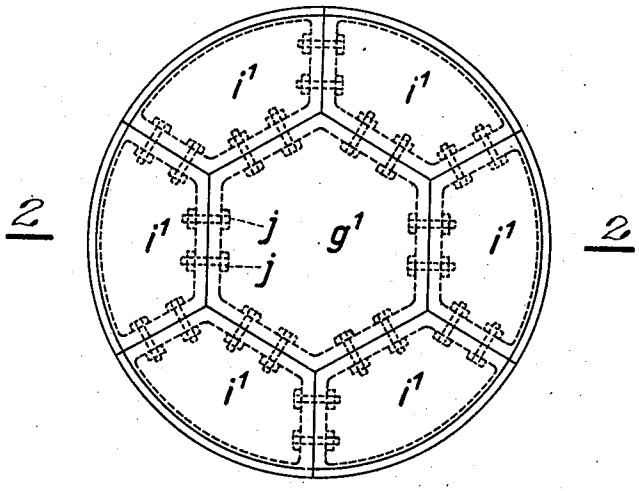


Fig. 1.

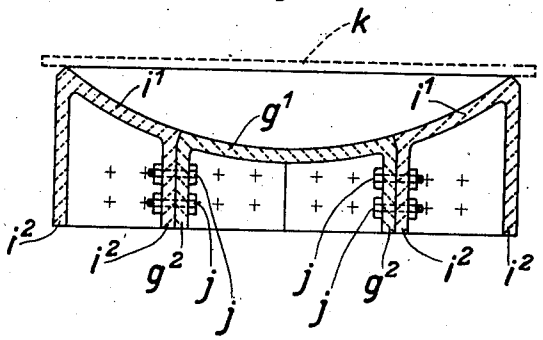


Fig. 2.

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MIRROR FOR ASTRONOMICAL PURPOSES

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2 Claims. (Cl. 88—1)

I have filed an application in Germany, July 8, 1931.

Mirrors for astronomical purposes are generally made of glass. When great dimensions are required, the manufacture of tensionless glasses is rather difficult and costly. Composing a mirror of several pieces is hardly practicable with glass, since cementing will greatly curtail the life of the mirror and the brittleness of the glass is prohibitive to the use of screws and the like. According to the invention, mirrors of comparatively great dimensions are made of a body consisting of several pieces of ceramic material, for instance of porcelain, each of these pieces, or the body in its entirety, being connected to a sheet of a polishable substance, for instance glass. This connexion is effected by fusing or agglutinating the said pieces, or the whole body, to the said sheet. To compose the said body of several pieces is possible, since it is easily practicable with ceramic material to use screws and the like for permanently holding the different pieces in their correct positions relatively to each other. The great resistance achieved with ceramic material also offers the advantage of making a mirror body consisting of one or several pieces comparatively thin and, if so required, of having it ribbed. A mirror constructed in this manner is very advantageous, especially because it reacts comparatively quickly upon changes of temperature, reassuming as it does its original form after any such change of temperature.

A comparatively thin cover, as may be produced for instance by glazing, requires the ceramic body to have at the outset the exact finally required form. To achieve this is rather difficult, the more so as slight distortions of the ceramic body cannot be avoided when this body is heated during the glazing process. For this reason it is more convenient to make the polishable cover so thick that it may be treated subsequently, the ceramic body therefore not requiring to be formed with great accuracy. The difficulties caused by fusing the glass on the said body are nevertheless considerable. They may be avoided by cementing to the prepared surface of the mirror body a glass disc conforming to the same. Also when this surface is vaulted can the said disc easily be made to conform to the surface, namely by softening it above the mirror body to such an extent that it sags and assumes the shape of this body and can be cemented thereto. The sagged disc exactly corresponding to the form of the mirror body, the agglutinant between disc and mirror body is of uniform thickness throughout and will not distort the disc.

The accompanying drawing illustrates the invention by way of an example. Figures 1 and 2 show a concave mirror in a plan view and in a section through line 2—2 in Figure 1, respectively.

The example represented in the drawing is a ceramic mirror body consisting of a central part and six peripheral parts. The central part consists of a spherical upper part g^1 which is connected below to ribs g^2. Each of the peripheral parts consists of a spherical upper part i^1 which is connected below to ribs i^2. The peripheral parts are connected to each other and to the central part by means of screws j. The upper surfaces of all seven parts are so ground that the body consisting of these parts has approximately the form which the completed mirror is to have. The mirror body having been ground, it is covered by means of a glass disc k, whereupon the said body and disc are heated to such an extent that the disc k softens and sags on the mirror body. When cooled down, the disc k is removed from the mirror body and subsequently connected to the same by means of an agglutinant. Grinding and polishing of the upper surface of the disc k is effected after the said agglutination has been effected.

I claim:

1. A mirror for astronomical purposes, consisting of a body of ceramic material, the body being composed of a plurality of parts, means interconnecting these parts, and a light-reflective glass disc connected to the said body.

2. A method for manufacturing a mirror for astronomical purposes, consisting in providing a body of ceramic material with a surface of approximately the form which the completed mirror is to have, in placing a glass disc on the body, in heating the said body and disc to such an extent that the disc sags on the body, in removing the disc, when having cooled down, from the body and in subsequently connecting this disc to the said body by means of an agglutinant, and in grinding and polishing the glass disc so as to give it the finally required form.

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