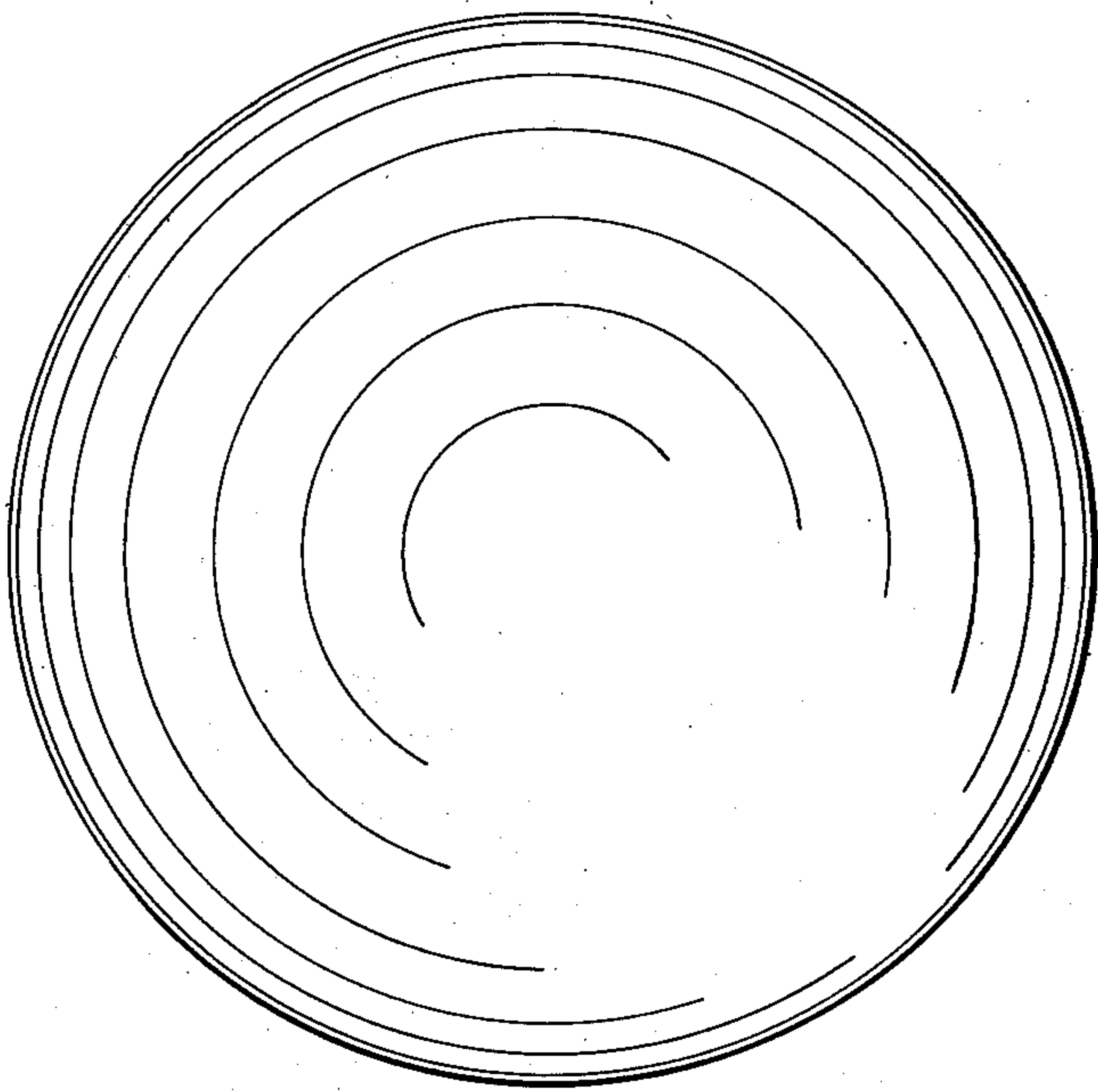


S. O. COWPER-COLES.  
MANUFACTURE OF METALLIC MIRRORS.  
APPLICATION FILED NOV. 8, 1907.

915,415.

Patented Mar. 16, 1909.  
2 SHEETS—SHEET 1.

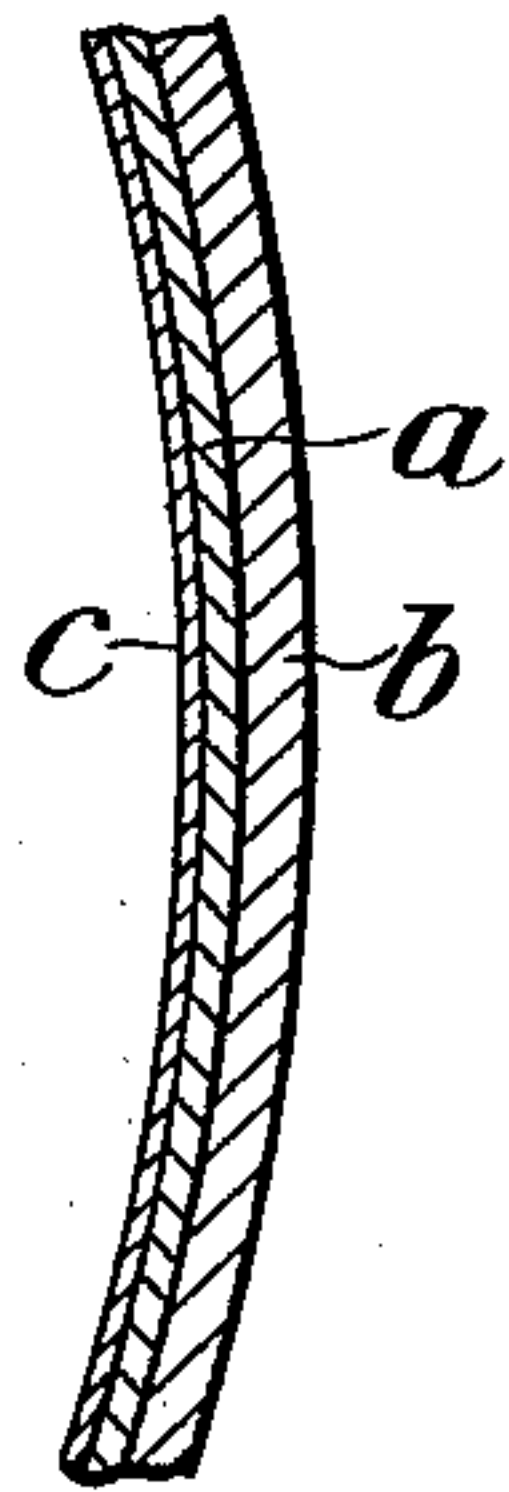
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



*Witnesses*

*J. K. Moore*

*R. E. Barry*

*Inventor*

*Sherard O. Cowper-Coles*

*By*  
*William C. Cunniff attn.*

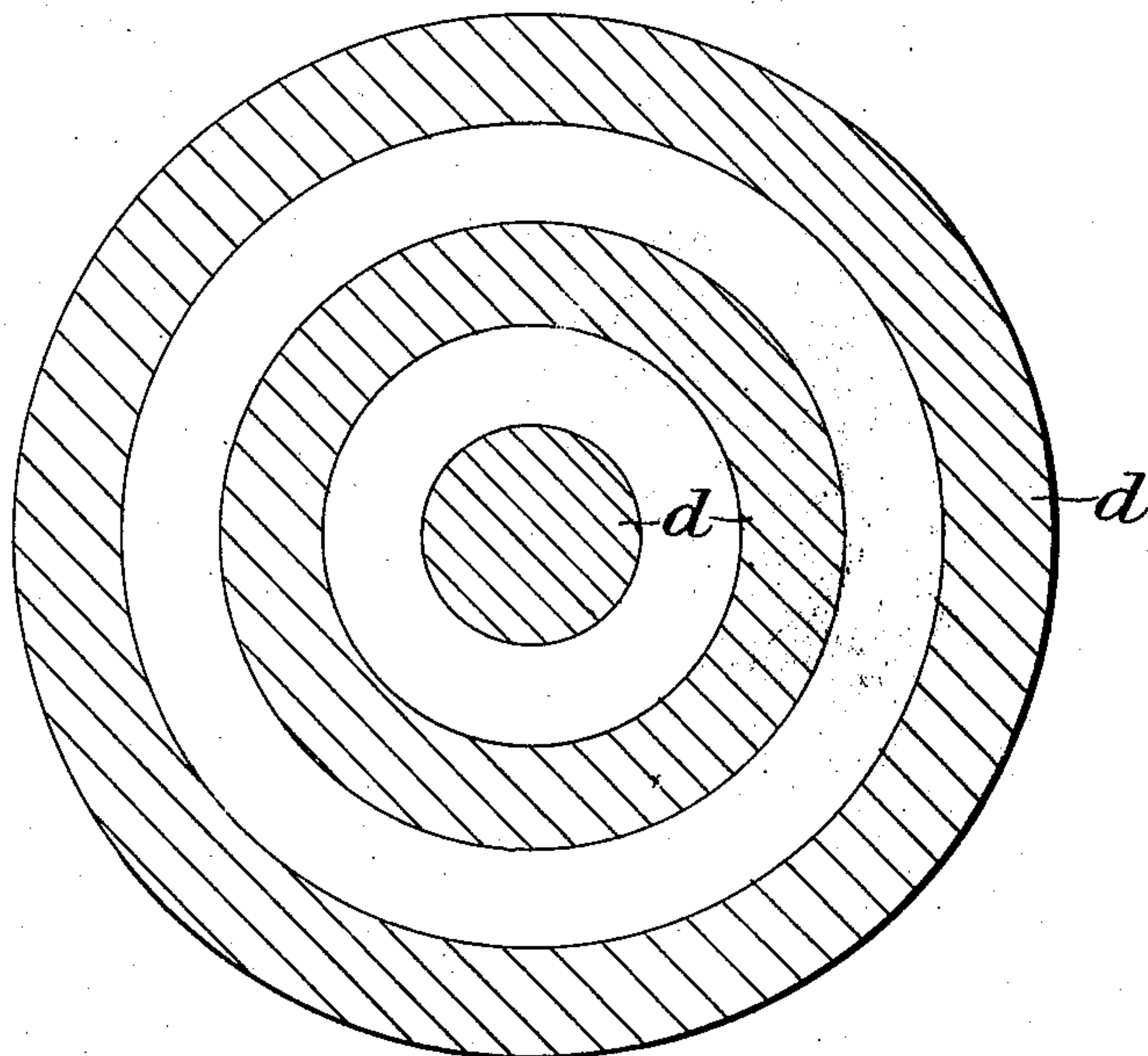
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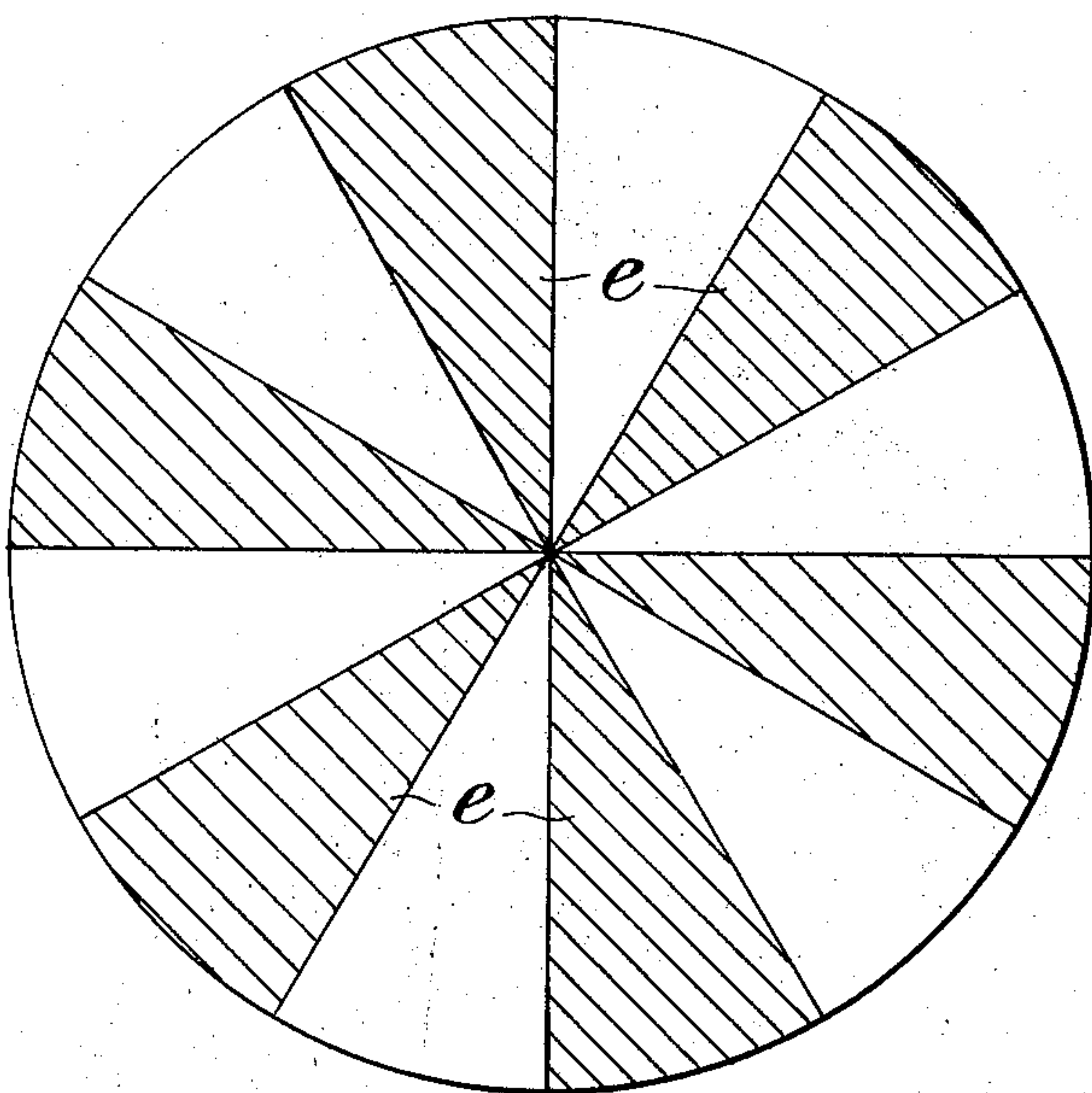
Patented Mar. 16, 1909.

2 SHEETS—SHEET 2.

*Fig. 4.*



*Fig. 5.*



*Witnesses.*

*J. K. Moore*

*R. E. Barry.*

*Inventor.*

*Stanford O. Cowper-Coles.*

*By*  
*William A. Brown* atty.



# UNITED STATES PATENT OFFICE.

SHERARD OSBORN COWPER-COLES, OF WESTMINSTER, LONDON, ENGLAND.

## MANUFACTURE OF METALLIC MIRRORS.

No. 915,415.

Specification of Letters Patent.

Patented March 16, 1909.

Application filed November 8, 1907. Serial No. 401,318.

*To all whom it may concern:*

Be it known that I, SHERARD OSBORN COWPER-COLES, a subject of the King of Great Britain, residing at Grosvenor Mansions, 82 Victoria street, Westminster, London, England, have invented new and useful Improvements in the Manufacture of Metallic Mirrors; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in the manufacture of metallic mirrors which are especially suitable for use in connection with search-lights and head-lights.

It has not hitherto been possible to successfully manufacture metallic mirrors since it is difficult to obtain cast or spun metal free from flaws and having a surface which, when highly polished, does not show the grain of the metal. Moreover, for spinning, comparatively thin metal has to be used which is not sufficiently rigid for a mirror of large dimensions.

The process described in the specification of my former British patent No. 5600 of 1895 was an improvement upon existing processes and the object of my present invention is to still further improve the manufacture of mirrors of this kind.

According to my invention I cast the mirror of any suitable metal such as iron, brass, gun-metal or German silver or I spin or stamp sheet metal to the desired curvature. The body is then placed in an electrolytic cell wherein a metal such as copper is deposited on the back thereof, until it has obtained the desired thickness to make it rigid. I then place the mirror in another electrolytic cell where silver, nickel or cobalt or a suitable silver alloy is deposited upon its reflecting surface. The surface of the mirror is then ground and polished. The above operations may be repeated any number of times until a surface is obtained which corresponds to that of glass. I may finally deposit upon the surface so prepared annular, radial concentric or like bands of gold or other suitable yellow metal, the object being

to obtain white and yellow beams which can be well seen both by day and night and also in foggy weather.

To enable the invention to be fully understood I will describe it by reference to the accompanying drawing in which:—

Figure 1 is a front view of a metallic reflector made according to the invention. Fig. 2 is a vertical section of the same, and Fig. 3 is a section of a portion of the mirror drawn to a larger scale. Figs. 4 and 5 are front views of two modified forms of mirror.

Referring first to Figs. 1, 2 and 3, *a* represents the sheet of metal which is spun or stamped to the required curvature, *b* is the backing such as copper, which is deposited upon the back of the metal form *a*, and *c* represents the surface of the reflecting metal which is deposited upon the surface of the form *a*.

Fig. 4 illustrates the form of a mirror in which the reflecting surface has deposited upon it annular rings *d*, *d* of gold or other suitable yellow metal, while in Fig. 5 the deposits of the yellow metal are in the form of radial bands *e*, *e*.

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

1. The method of manufacturing metallic mirrors comprising, producing a metal form of the desired curvature, electrolytically depositing upon the back thereof a metal such as copper and in then depositing upon the surface a reflecting metal, after which the reflecting surface is ground or polished, substantially as described.

2. The method of manufacturing metallic mirrors comprising, depositing a suitable metal upon the back of a formed metallic body and a reflecting metal upon the front surface thereof, after which the latter is ground and polished and has deposited upon it, bands of a yellow reflecting metal, substantially as described.

SHERARD OSBORN COWPER-COLES.

Witnesses:

JOHN E. BOUSFIELD,  
C. G. REDFERN.