by Gustav E. Hoglund, of Chicago, Ill. This invention also has been patented, and relates to that class of devices for cutting up and dividing light rays emanating from an image and causing them to act upon a selenium cell capable of changing its electrical resistance under light rays of different degrees of intensity. These vibrations are sent over a line and act upon a luminous center at the other end thereof, which may be in the form of a speaking arc and cause a fluctuation in the brilliancy of said arc which will cause light rays to emanate therefrom, said rays being of varying intensity according to the handles 9 which extend from the shutters and by turning these handles, the shutters can be revolved until they are brought into proper relation with one another, the operator determining when such position has been reached by observing the completeness of the image reproduced by the receiving instrument. Once the shutters are in proper relation with one another, the motors are then supposed to operate them synchronously. By studying the illustration, it will be noted that the lamps 6 are varied into their proper luminosity due to the selenium cells 5 receiving more or less light.

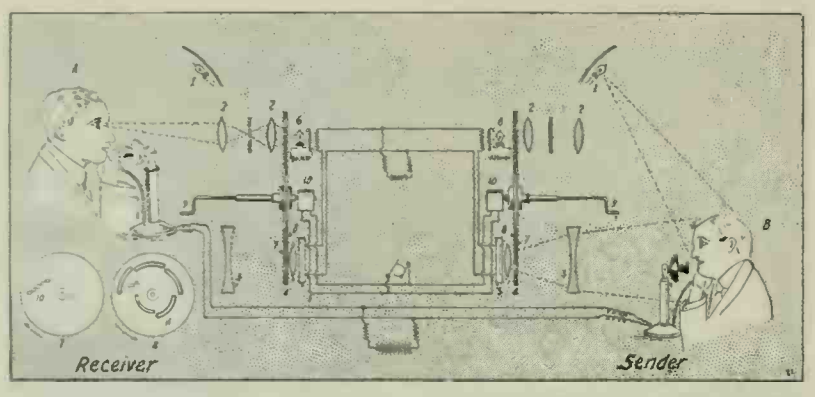

Fig. 3, the Hoglund Telephot Makes Use of Two Revolving Shutters, 7 and 8, Revolving in Opposite Directions. Selenium Cell 5 is Influenced by the Light Rays and the Picture at the Receiving Station Is Reconstructed by Means of the Light Variations of Lamp 6.

strength of the current. These rays will follow each other in the same order, and will be of comparatively the same intensity as the light rays emanating from the object. Hence, when the rays from the lamp are projected onto the retina of the eye in rapid succession, they will cause an image to be built up before the eye, which will be composed of the varying light rays of the same strength and in the same order as those emanating from the original image.

The device shown in Fig. 3 has a receiver and a sender; each of the instruments comprises a selenium cell 5, positioned in front of which is the enlarging lens 4 and the reducing lens 3. Between these lenses is a double revolving shutter composed of discs 7 and 8. These are also shown in a detail sketch. Disc 7 has a series of square perforations 10, while disc 8 has a series of slots 11. It will be seen that as these discs revolve in opposite directions, each point of the picture is cut up successively and allowed to pass thru the optical lens system. Each of the receiving instruments also comprises a lamp 1 and enlarging lenses 2, 2. Between these lenses a ground glass plate is placed, upon which the final picture appears. Both receiving and sending instruments are connected by electrical lines as shown. The oppositely revolving discs are ordinarily actuated by means of the synchronous motor 10.

An interesting part of this invention is that these revolving shutters can be corrected if they do not run synchronously by means of handle 9. It becomes apparent that the two shutters must be brought into proper relation to one another; it can be easily determined when such a relation is found by observing the image coming from the receiving instrument. If the shutters are not in proper relation, the image will be nothing more than a blur, and before it can be distinctly seen, the shutters will have to be in appropriate relation to bring the openings into the desired position. The inventor therefore provides

While this scheme looks very feasible on paper, we are afraid that the lamps 6 will not respond instantaneously to the current variations in the selenium cells 5, and at best the picture would seem to us to be formed rather blurred.

The next telephot which has also been patented in several countries is shown in Fig. 4. The inventor of this telephot is Boris Rosing of Petrograd, Russia. In order to eliminate the synchronous motor

This will be apparent further on. The optical system at the transmitting station comprises two polyhedral rotary mirrors, 1 and 2, the axis of rotation of which are at right angles to each other. They are driven at such speeds that the angular velocity of one of the mirrors is several times greater than the other; and an objective or lens 5, the focal plane of which coincides with the plane of the screen 6 and the photo-electric receiver 7. The objective 5 is arranged in such a manner that rays emitted from any point of the field of vision arrive in the photo-electric receiver only after successive reflections by the two mirrors. When the mirrors 1 and 2 are rotated, the end 8 of the optical axis thus deflected traverses the field of the picture in a zig-zag path, so that from every portion thereof light is transmitted in a certain determinate order thru the opening of the screen 6 upon the photoelectric receiver 7. Permanent electric magnets carried by the mirrors 1 and 2 and stationary bobbins 3 together form small generators producing in the corresponding bobbins pulsating currents, the periodicity of which per revolution of the mirror corresponds to the number of reflecting surfaces thereof. The currents which are produced in the conductors 9, 10, 11, 12 and transmitted thru the receiving station are proportional to the components in the directions of the axes of a corresponding system of coördinates of angular movements which the optical axis 8 executes in the field of view.

At the receiving side we find two oscillographs provided with mirrors 13 and 14. The axes of both are arranged to correspond to the axes of rotation of the mirros 1 and 2. Lens 16 directs the rays proceeding from the luminous signaling point 15 on to the small mirror 13. There will therefore be imparted to the deflected optical axis 17 at the receiving station, the same movements in space which the deflected optical axis 8 at the sending station executes at the transmitting station. It goes without saying that the moving parts of the oscillographs naturally have much

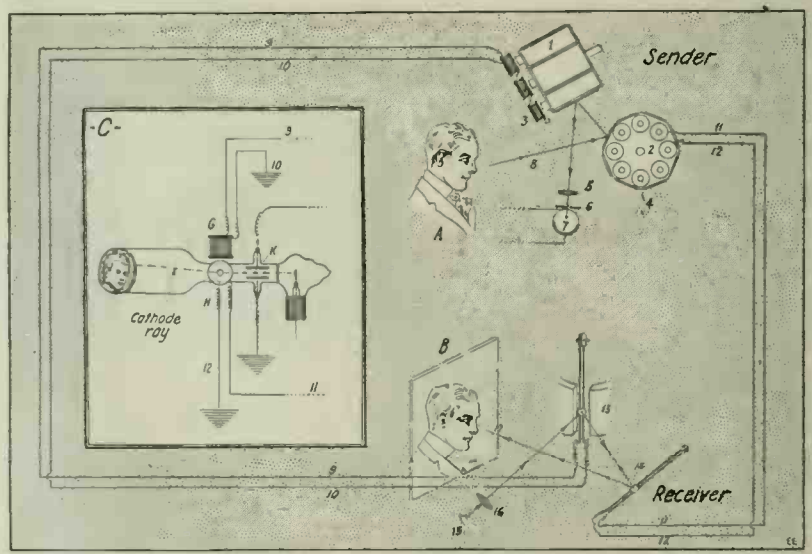

Fig. 4 Shows the Rosing Telephot. Use Is Made of Two Sets of Poly-Hedral Revolving Mirrors, 1 and 2, Throwing a Light Ray on Selenium Cell 7. At the Receiver Two Oscillographs Reconstruct the Picture Shown at B.

arrangements which have been the failure of almost all telephot schemes, Mr. Rosing does away entirely with them, substituting therefore a system comprising two oscillographs with movable reflecting surfaces. less inertia than do the revolving sets.

A different idea in Mr. Rosing's invention is shown in insert *C*, Fig. 4. Here instead of using oscillographs, the inventor

(*Continued on page* 124)