UNITED STATES PATENT OFFICE.

PETER COOPER HEWITT, OF RINGWOOD MANOR, NEW JERSEY, ASSIGNOR TO COOPER HEWITT ELECTRIC COMPANY, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

LIGHT-TRANSFORMING COMPOSITIONS.

1,188,777. Specification of Letters Patent. Patented June 27, 1916.

No Drawing. Original application filed July 23, 1910, Serial No. 573,557. Divided and this application filed October 20, 1913. Serial No. 796,171.

To all whom it may concern:

Be it known that I, PETER COOPER HEWITT, a citizen of the United States, and resident of Ringwood Manor, county of Passaic, State of New Jersey, have invented certain new and useful Improvements in Light-Transforming Compositions, of which the following is a specification.

My invention relates to the class of devices employed for combining rays of a source of light which is deficient in some desired portion of the spectrum with rays of other wave length produced by the transformation of certain rays or waves of one length into rays or waves of another length and of such character as to supply the ray or wave length desired, within limits.

In a patent issued to me on December 22, 1908, bearing No. 907,598 and in a companion application Serial No. 453,187, filed by me September 15, 1908, I have described certain methods of producing and utilizing light rays of the character referred to, and my present invention relates more particularly to special compounds of materials to be used for transforming light rays and, when desired, adding light waves of definite character to light from any source.

Retentiveness of the fluorescent quality, or durability of the property of transforming light, seems from experiment to be seriously modified by the internal structure or physical arrangement of the material in its final state: That is, the material retains this light transforming property better and for a longer period by reason of its being or having been in a state of internal stress or by reason of the fact that the internal structure is fibrous in nature. It is important also that the conditions of drying or hardening of the material be properly carried out, as affecting the physical relation of the materials to each other during manufacturing and as affecting the finished product.

In practice I find that, while several different materials and compounds may be used with greater or less efficiency and durability or retentiveness, most excellent results are obtained by the use of rhodamin combined in proper proportions with acetate of cellulose to which glycerin has been added. A combination or association of the materials, having a structure retentive of the light transforming property under conditions of good efficiency and durability, can be secured in the foregoing manner.

A varnish is formed consisting of 70% of acetate of cellulose; 10% of glycerin and 20% of acetic acid, the above percentages being the percentages by weight. To this is added technical acetone to make a 12% solution.

The acetate of cellulose, known in commerce as cellet may be used and prepared as follows: It may be first bleached with permanganate of potash made acid with sulfuric acid, and subsequently treated with sulfurous acid for further bleaching and removing the permanganate, and washed with water until free from salts. An amount of rhodamin, equivalent to three one-hundredths by weight of the weight of cellet and glycerin is added, the rhodamin being in solution in alcohol or acetone for convenience. The whole forms a varnish which when dry may be used either for reflecting purposes or as a light screen or filter, that is to say, it may be painted upon a suitable backing and when dry the transformed light reflected therefrom and mingled with the light from the source, or it may be made into a film or painted upon a proper transparent backing and placed wholly or partially around the source of light so that more or less of the original light and the transformed light will be mingled.

In an application filed by me September 18, 1909 Serial Number 518,325, I have described various forms of backings or supports for varnishes of this general character and also materials which may be mixed with the varnish for the purpose of increasing the light qualities thereof. When it is to be placed upon a backing or support to serve as a light reflector, I have found it advantageous to use as the immediate support for the varnish a material, such for instance, as calcimine or white lead, or other material having the characteristics of dispersing light. In some instances it may be desired to mix the light-dispersing material with the varnish.

The proportions above given may be modified to a reasonable degree, but those given above are found to produce a material having efficiency and durability combined.

In the drying of the material, the acetic acid and acetone evaporate, leaving the ace-

tate of cellulose, color (such as rhodamin), and an amount of glycerin as the light transformer.

The varnish may be painted upon a suitable temporary support and dried and then stripped off from the support and used independently of any other support as the light reflector or screen.

Any desired number of coatings of the varnish may be painted upon the support in succession. I have found, for instance, that five coats quickly flowed, one after the other, gives a very efficient result.

This application is a division of my application Serial Number 573,557, filed July 23rd, 1910.

I claim as my invention:

1. As a composition for forming light transformers, acetate of cellulose, a fluorescent dye-stuff, glycerin, and suitable volatile solvents, substantially in the proportions described.

2. As a color fast varnish, acetate of cellulose, glycerin and a fluorescent coloring material and suitable volatile solvents therefor, substantially in the proportions described.

3. In a color fast varnish, acetic acid in which acetate of cellulose has been dissolved, in combination with glycerin substantially in the proportion described, and a coloring material in a volatile solvent.

Signed at New York in the county of New York and State of New York this 16th day of October A. D. 1913.

PETER COOPER HEWITT.

Witnesses:
WM. H. CAPEL,
THOS. H. BROWN.