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March 30, 1926. 1,578,907

R. E. NAUMBURG

MIRROR RING

Filed Sept. 26, 1925

Fig. 1

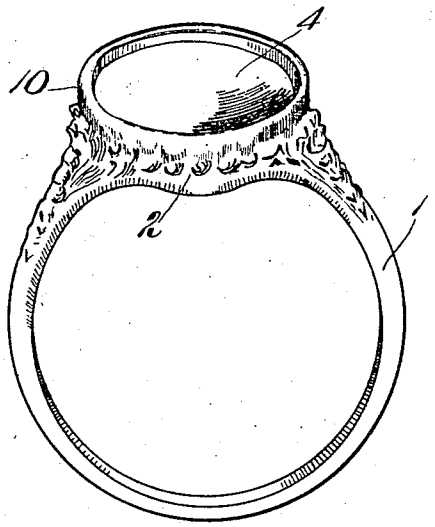
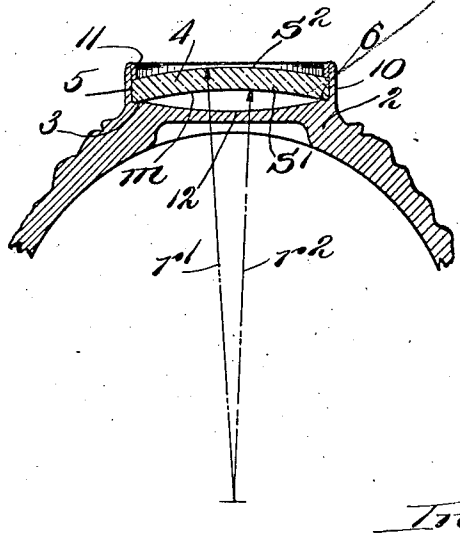


Fig. 2



Reflecting surface (Hongin mirror)

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Patented Mar. 30, 1926. 1,578,907

UNITED STATES PATENT OFFICE.

ROBERT E. NAUMBURG, OF WINCHESTER, MASSACHUSETTS.

MIRROR RING.

Application filed September 26, 1925. Serial No. 58,955.

To all whom it may concern:

Be it known that I, ROBERT E. NAUMBURG, a citizen of the United States of America, and resident of Winchester, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Mirror Rings, of which the following is a specification.

Young women find continual occasion for consulting the appearance of their complexions, hair, headgear and neckwear, and effecting suitable readjustments. Mirrors mounted in the portable hand bags, cosmetic boxes and other personal furniture in vogue are observed to be in frequent use in assemblages such theatre audiences, at tables in restaurants, in public vehicles, in shops, and offices, as well as in private company. Ease of access to the mirror and capacity to use it gracefully without disqualifying use of at least one hand to remedy the deficiency in toilet, if any, disclosed by the mirror; and a competent reflected image of the entire head and shoulders on a surface at a convenient hand-reaching distance from the eyes of the user are of the essence of utility, but so far as I am aware, no reflector wholly responsive to these requirements, excepting large-apertured and relatively heavy hand-mirrors, is accessible to the user. These and other types of hand-mirrors lack intrinsic capacity as decorative accessories to the person, and are often of unpleasantly utilitarian appearance.

An object of this invention is to provide a mounted mirror essentially of a decorative and inoffensive appearance in such compass as to be capable of wear as jewelry, particularly as a finger ring, which shall nevertheless be an efficient reflector for the required utility. The conditions of this use dictate capacity of the actual reflector to show the head and shoulders, limit the distance at which the mirror shall be placed from the eyes (and therefore from the head and face of the user) to a convenient position of the hand of the user, and limit the angular aperture of the mirror to a size of unobtrusive extent. The qualities of the mirror should be such to permit a close view of particular features, for example the eyes, nose and cheeks, when desired.

In the accompanying drawings,

Fig. 1 is a perspective of a finger ring embodying the invention; and

Fig. 2 is a diagram in section on an axial plane of the optical element.

Referring to the drawings, a preferred form comprises a ring of any suitable sculptural design, preferably made of one of the white metals such as silver, platinized silver, a white-metal alloy or white gold, provided with a recessed setting central upon a plane of symmetry of the band portion 1. The top of the structure is provided with any type of bezel 2 having an intaglio seat, which may be of any appropriate size and cross-section, but preferably is circular, the seat in any case comprising a raised flange 10 and a ledge 3 preferably lying in a plane, but which may be conical or any surface of revolution incident upon cutting or finishing the intaglio seat by a revolving cutter. The ledge 3 provides a non-distorting bearing for a mirror setting 4. This in a preferred form is a concavo-convex spherical optical glass meniscus, preferably having a cylindrical or elliptical edge contour 5 to fit within the raised margin or flange 10 of the intaglio seat, and preferably having an annular surface 6 formed by grinding to fit the seat 3. It is recommended that the glass meniscus have a mean axial thickness of the order of 1 mm.

In a preferred instance having optical qualities corresponding to the severe limitations alluded to above, the curvature of the concave spherical reflecting surface s' is upon a radius r' of 27.2 mm., and the exterior convex spherical surface s^2 is upon a radius r^2 of curvature of 28.3 mm. This corresponds to the index of refraction of optical glass of good quality as the material for setting 4 upon a postulated angular magnitude of the reflected cone sufficient at a normal reaching distance of the hand of 50 cm. to comprise the image of the head and shoulders of the wearer within an aperture of 10 mm. of spherical surface. The optical constants stated of thickness, index of refraction and radius of curvature of the surfaces are of course mutually complementary, so that variation of any one of them may be compensated for by variation of another; the numerical values given are therefore relative only, and may be changed within the relation expressed. It will be noted that the proportion of diameter of aperture of the mirror to the radius of curvature of the exterior surface S^2 of the ele-

ment 4 is approximately as one is to three in the typical instance mentioned. This ratio remains good, if it should be found desirable to vary either aperture or radius, without changing the field of view reflected at a convenient reaching distance of the hand wearing the ring.

Surface s' preferably bears a silver or mercury amalgam reflecting layer m which serves together with the refraction of the lenticular setting 4, to constitute a negative or convex mirror of the said appropriate optical constants. The apparent convexity of this mirror is so considerable as to render the mirror an object of intrinsic interest and beauty as a miniature reflector of the surrounding landscape, hangings or lights when it is not in use for its self-observing function. The size, convexity and mounting of the mirror are accordingly such as to contribute substantially to a whole appearance which will commend the ring containing it to persons of good taste, solely on the score of beauty.

The aperture of the setting 4 is preferably of the order of 10 to 11 mm., for example 10.4 mm., in the case of a circular contour of the mirror setting 4 and its mounting seat; in the case of an oval contour, the minor axis should not be much less than 10 mm. and the major axis not much more than 15 mm.

Preferably as an integral part of the ring the seat 3 is provided with the surrounding bezel flange 10 having an unfinished projection considerably greater than the marginal thickness of the mirror setting 4, and adapted to be turned in upon the margin of the setting 4 as at 11 by any suitable gem-setting operation; preferably in the case of a round setting 4, by the spinning action of a suitable tool revolved about the optical axis of the mirror. The finished height of the flange edge, as will be perceived from the drawing, is sufficient to provide an upstanding bead which serves as a protection of the surface s^2 against scratching or breakage by contact with hard objects. In the preferred form, the intaglio seat in the bezel 2 comprises a concavity 12, at the margins of which the seat 3 is formed.

What I claim is:

1. A combined ring and hand mirror comprising a finger ring having a seat for a setting, and having as a setting a spherical reducing reflector of which the diameter of the exposed aperture of the reflector and the effective curvature of its spherical surface are proportioned to each other substantially as one to three, whereby to reflect the head and shoulders of the wearer at a normal reaching distance of the hand from the observing eyes, the reflecting surface being of a customary size for decorative gem settings.

2. A mirror ring comprising a metallic finger ring having a seat for a setting and a concavo-convex mirror of transparent material mounted in said seat and having a spherical reflecting surface of substantially 25 to 30 millimeters radius of curvature, the transparent material having an exposed convex optical surface of a greater radius of curvature and constituting a refractive element.

3. A mirror ring having a negative reflecting setting of a minimum aperture of the order of 10 millimeters, the said setting having a spherical convex reflecting surface and a transparent refracting layer having a convex optical surface, the curvatures of the optical surfaces being upon radii of the order of three diameters of the aperture and substantially concentric, whereby to provide within the minimum aperture of the setting a cone of reflected vision from a point at a distance of 50 centimeters of sufficient angular magnitude to comprise the head and shoulders of an observer at said distance.

Signed by me at Boston, Massachusetts, this twenty-fifth day of September, 1925.

ROBERT E. NAUMBURG.