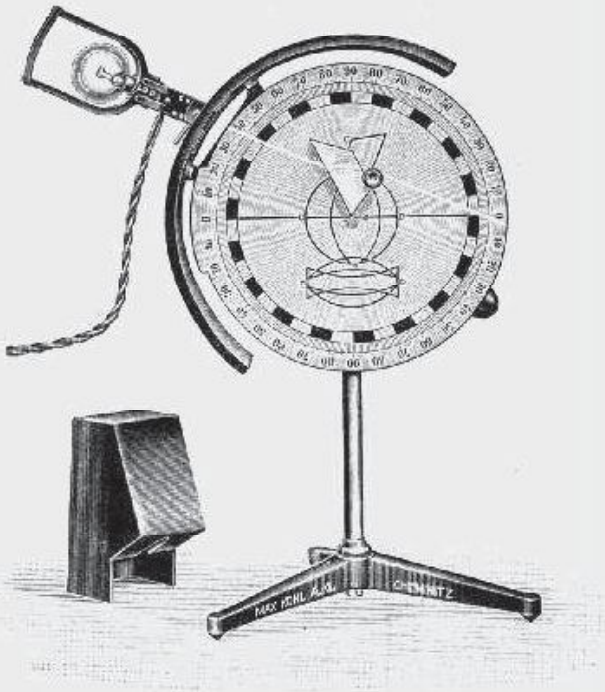
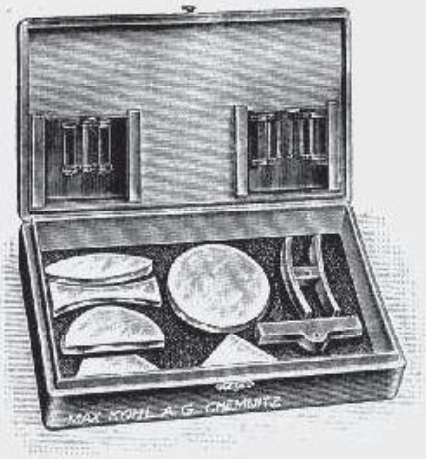
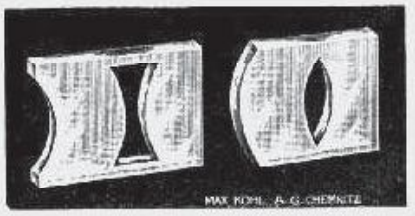


70 402. 1 : 7.5.



70 402. 1 : 7



70 407. 1 : 5. 70 408. 1 : 5.

Reichsmark

70 402. **Hartl Optical Disc,** with illuminating attachment fitted, Figure (Nos. 1—17), for demonstrating the laws of elementary optics; for experiments with single rays and pencils of ray (Ztschr. f. d. phys. u. chem. U., **9**, pag. 113; M. T. Fig. 134) . . . . . 140.—

The following are included in the apparatus: 2 gap-plates with 3 and 7 gaps; coloured glass plates and brass plate; 1 glass plane mirror; 1 glass concave and convex mirror; 1 each semi-circular and trapezoidal crystal-glass plate; 1 bi-convex and 1 bi-concave cylindrical lens (crystal glass), also an equilateral triangular prism.

The many possible ways of using the Hartl optical disc have gained many adherents for this apparatus. Hitherto, direct sunlight was necessary for conducting the experiments or a polarisation apparatus. Both these methods made the experiments rather a trouble, as the lecturer was restricted to one definite spot at which the apparatus had to be set up. By fitting a special illuminating device to the apparatus, this inconvenience is obviated. The experiments can also be made quite well in an undarkened room.

The illuminating device consists of a glow-lamp for a tension of 16 volts, placed at half the focal length of a concave mirror. The concave mirror projects a parallel pencil of rays on to the optical disc. The lighting device is fixed to the rotary diaphragm screen and moves with it, thus greatly facilitating the experiments.

The lighting device can be placed so that the pencil of rays encounters the optical disc at an angle, or runs parallel to the disc. The latter method is used for polarisation apparatus No. 70 410.

For running the glow-lamp from a 110, 120 or 220 volt circuit, a small transformer is required in the case of three-phase or alternating current, or a series resistance in the case of direct current.

Accurate directions for use are supplied with each apparatus.

70 403. **Illuminating Device alone,** for fitting to existing optical discs . . . . . 48.—

70 404. **Hartl Optical Disc, without Illuminating Device** . . . . . 100.—

70 405 a. **Alternating Current Transformer** for connecting the glow-lamp up to a 110 or 220 Volt A. C. supply . . . . . 20.—

70 405 b. — idem, for connecting to a 220 Volt A. C. supply . . . . . 20.—

70 406 a. **Series Resistance** for connecting the glow-lamp to a 110—125 Volt D. C. supply . . 15.—

70 406 b. — idem, for connecting to a 220 Volt D. C. supply . . . . . 35.—

70 407. **Device for Reversing the Action of a Lens;** consisting of a glass plate with bi-concave section cut out; for screwing to the optical disc, Figure . . . . . 10.—

A parallel pencil of light falling on the bi-concave air-lens, is combined to a focus as it would be by a glass condenser lens.

70 408. — idem, with bi-convex section cut out; acting as a dispersing lens, Figure . . 10.—

70 409. **Circular Disc** with semi-cylindrical liquid trough and degree graduation; for fixing to the optical disc . . . . . 24.—

The liquid trough is used for showing the refraction of light in liquids.