

"R R are rays coming from the source of light, be it sunlight or the electric light, and an image of the one or the other is formed by the lens L_1 on the slit S_1 of the collimator C. The parallel rays produced by the lens L_2 are partially refracted and partially reflected. The former pass through the prisms P_1 , P_2 , and are focused to form a spectrum at D by the lens L_3 . D is a movable screen in which is an aperture S_2 , the width of which can be varied as desired. The rays are again collected by a lens, L_4 , and form a white image of the surface of the last prism on the screen E. If the light passing through S_2 is alone used, the image at E is formed practically of monochromatic light. Part of the rays falling on P_1 are, as just said, reflected, but as it and the refracted part are portions of the light passing through the slit S_1 , they both must vary proportionally. If then we use the reflected portion as a comparison light to the spectrum colors, the relative intensities of the two, though they may vary intrinsically will remain the same. The rays reflected from P_1 fall on G, a silver or glass mirror, and by means of another lens, L_5 , also can be caused to form a white patch on the screen E, alongside the patch of color. At M, or anywhere in the path of the beams, an electro-motor driving a sector with apertures which can be opened or closed whilst rotating, is placed, and the illumination of either beam can be altered at will. To obtain a large spectrum on the screen E, all that is necessary is to interpose a lens of fairly short focus in front of L_4 , when a spectrum of great purity and brightness can be formed."

In the Lovibond instrument the depth of color in liquids and solids can be accurately measured in degrees, placed in their position in a permanent color scale, and registered. The instrument consists (see Figs. 2, 3, 4, and 5) of a graded series of standards, made of colored glasses, numbered according to their depth of color, and an instrument for holding the glasses and the object to be measured. Only three color scales are necessary for investigation work; these are red, yellow, and blue; but for some special purposes, such as for brewers, for the estimation of carbon in steel, for urinalysis, etc., scales in other colors are found convenient. Each ordinary scale consists of glass slips all of one color but differing in depth, the divisions of difference being regular, forming degrees or units as in the case of temperature degrees on a thermometer scale, or inches on a foot-rule.

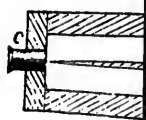
The color units are not only of equal depth throughout each scale, but have also a color equivalence in relation to each other; that is, a given number of units in one scale has an equivalence of

color value in the other scales, so that three a color mental terms measured and

The instrument consists of a wooden tube, for viewing the color, and a series of color measurers at the end of the tube. The reflector from the tube and also for the color measurements. The color (eyes) which are necessary condition for view are even effected, either affecting the measurement.

The color is viewed through one tube or other; this standard color glasses are used, when the color is off. I append Lovibond's book:

"A longit which consists



in the middle by the eye-piece C. This color

"At the other end of the tube, equal but separated, that, on looking through the tinted view of both inside the range