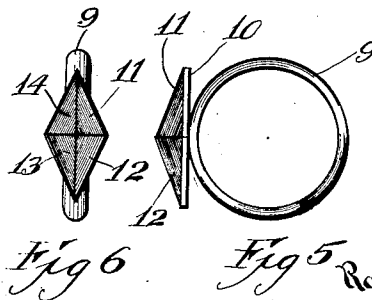
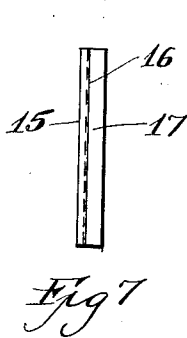
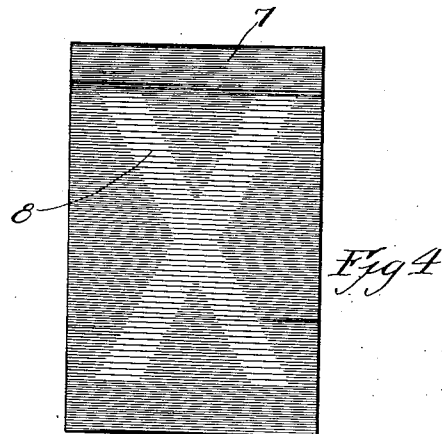
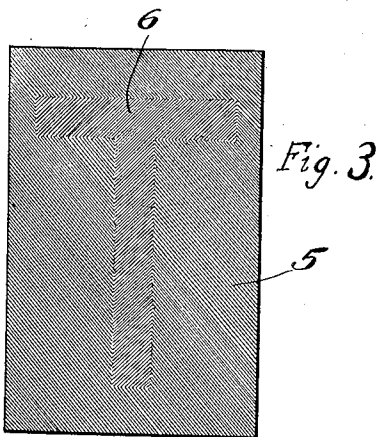
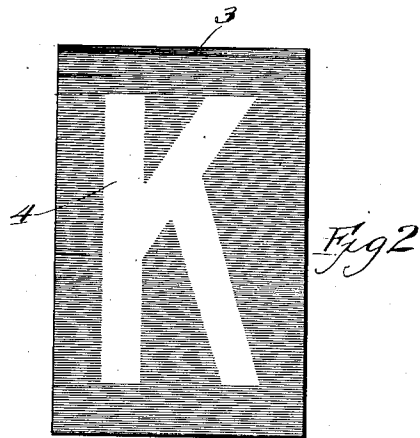
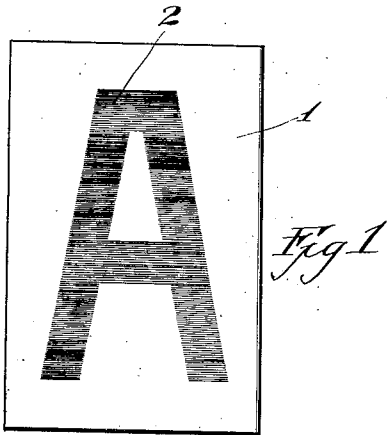


R. D. DONER.
 COLORED DESIGN AND PROCESS OF PRODUCING THE SAME.
 APPLICATION FILED OCT. 6, 1919.

1,354,471.

Patented Oct. 5, 1920.



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COLORLED DESIGN AND PROCESS OF PRODUCING THE SAME.

1,354,471.

Specification of Letters Patent.

Patented Oct. 5, 1920.

Application filed October 6, 1919. Serial No. 322,850.

To all whom it may concern:

Be it known that I, RALPH D. DOWER, a citizen of the United States, and a resident of Urbana, in the county of Champaign and State of Illinois, have invented a new and useful Improvement in Colored Designs and Processes of Producing the Same, of which the following is a full, clear, and exact description.

My invention relates to improvements in colored designs and process of producing the same, and it consists in the combinations, constructions and arrangements herein described and claimed.

An object of my invention is to provide a process, by means of which articles, such as jewelry, signs, articles having decorative borders, etc., may be provided with colored designs without the use of paints, pigments, enamels, or any other means of coloring in which the color is actually applied to the design.

A further object of my invention is to provide a process for producing novel effects of colored designs which cannot be produced by the use of colored pigments.

A further object of my invention is to provide novel designs in which color is obtained by diffraction.

A further object of my invention is to provide designs in which an unlimited combination of shades or colors may be had by varying the rulings, as by varying the number, direction, or spacing of lines which are ruled on the surface upon which the design is to appear.

Other objects and advantages will appear in the following specification, and the novel features of the invention will be particularly pointed out in the appended claims.

My invention is illustrated in the accompanying drawings, forming part of this application, in which—

Figure 1 is a face view of a design produced in accordance with my invention.

Figs. 2, 3 and 4 are views of modified forms of designs.

Fig. 5 is a side view of a ring having a design made thereon.

Fig. 6 is a plan view of the ring shown in Fig. 5, and

Fig. 7 is an end view of another modified form of the invention.

In carrying out my invention, I make use of a so called "diffraction grating." This consists of a plane surface of glass, specu-

lum, celluloid, or the like, on which are ruled, by means of a sharp point, fine parallel lines equally spaced. Heretofore, such surfaces have been used in conjunction with other optical apparatus, such as lenses, slits, collimators, etc.; that is, the ruled surface plays only an intermediate part, in that light reflected or transmitted by this surface undergoes diffraction, while the general appearance of the surface is not involved. In the present invention, I make use of this principle of diffraction to produce colored effects on the surface, which is otherwise plane and blank.

Fig. 1 illustrates one form of the invention. In this figure, the plane surface 1 is ruled with a series of very fine parallel lines 2, the rulings conforming to the outline of the letter A. For the purpose of the patent application, and to illustrate the rulings, they are shown as visible, but in actual practice, the rulings are so small and so close together, there being from one thousand to ten thousand or more rulings per inch, that the rulings themselves are substantially invisible to the naked eye. The figure or character, however, is visible when viewed from certain angles.

In Fig. 2 the rulings are made upon the background 3, while the letter 4 is left unruled. In this form the background is colored, due to the diffraction effect, while the letter itself may be uncolored, or may be of any suitable color which will contrast with the color given out by the background, when viewed from certain angles.

In Fig. 3 the contrast between the background and the letter is obtained by ruling the background 5 with parallel lines and ruling the letter 6 with parallel lines disposed at an angle to the lines of the background. In this instance the contrast in the color effect is obtained, because one always views the background and the character or figure thereon at different angles with respect to the directions of the rulings.

In Fig. 4 the effect of contrast between the background and the letter thereon is secured by ruling the background 7 with a series of parallel lines spaced at equal distances apart, and ruling the letter 8 with parallel lines spaced equally apart, but at a greater distance apart than the lines on the background.

In Figs. 5 and 6 I have shown a ring having an ornamental top in the shape

of a pyramid, the faces of the pyramid being ruled with lines 11, 12, 13 and 14 at different angles, so that when the ring is viewed, the line of sight will meet the surfaces having the ruled lines at different angles to these ruled lines, and thus giving a contrasting effect which changes as the finger on which the ring is disposed is shifted. The result is a very pleasing color effect which is constantly changing.

Obviously the same effect may be produced if the ruled surfaces are covered with a transparent medium. Thus in Fig. 7 I have shown in section an opaque plate 15, the inner face of which is ruled at 16 with a series of fine parallel lines, and is covered by some transparent medium, such as a glass plate 17. When viewed on the side of the glass plate, this surface gives the color effects which may be heightened by the use of the transparent medium.

Any suitable form of apparatus may be used for ruling or grooving these surfaces.

It will be understood that when I speak of designs, I mean to include figures, emblems, geometric forms, as well as the backgrounds upon which such figures, emblems, or geometric forms are made.

It is not necessary for a surface to be ruled by means of a sharp point in the manner described, but it may be ruled in any suitable manner which will give the desired effect, such as by stamping or impressing the lines on a surface by means of another ruled surface.

I claim:

1. The herein described process of producing colored designs and backgrounds

therefor which consists in ruling the entire area of one of said portions with a series of fine parallel grooves spaced at equal distances apart, whereby the design is made to stand out in contrast with the background.

2. The herein described process of producing colored designs and backgrounds therefor which consists in ruling the entire area of one of said portions with a series of fine parallel grooves spaced at equal distances apart, and in ruling the other portions with a series of fine parallel lines of different relative arrangement, whereby a contrasting colored effect between the design and the background is produced.

3. The herein described process of producing colored designs upon plane surfaces by configuration of portions of the surface having series of fine parallel equidistant grooves ruled thereon and other portions of the said surface having fine parallel equidistant grooves ruled thereon, the grooves in the last named portions of the surface being spaced at a different distance from the spacing of the grooves in the first named portions.

4. The herein described process of producing colored designs upon surfaces by configuration of portions of the surface having series of fine parallel equidistant grooves ruled thereon and other portions of the said surface having fine parallel equidistant grooves ruled thereon, the grooves in the last named portions of the surface being spaced at a different distance from the spacing of the grooves in the first named portions.

RALPH DOUGLAS DONER.