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APPARATUS PROVIDING PROGRESSIVE LIGHTING AND EXTINCTION OF
ARTICLES SUCH AS LETTERS, WORDS, PHRASES, PICTURES, ETC
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Fig. 1

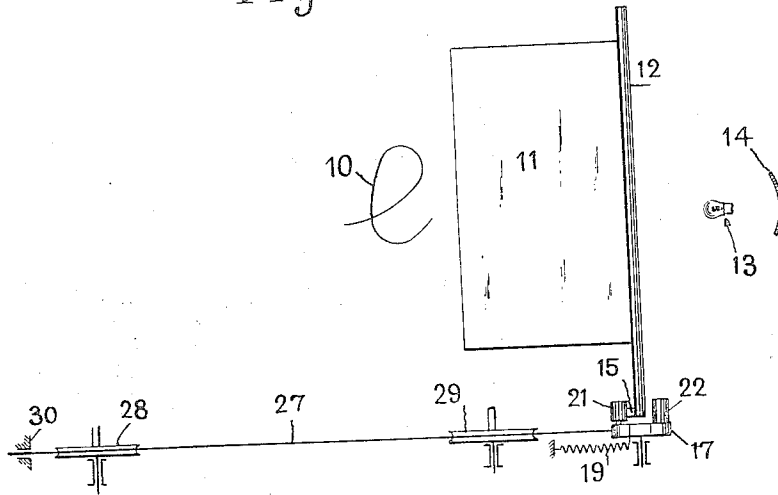
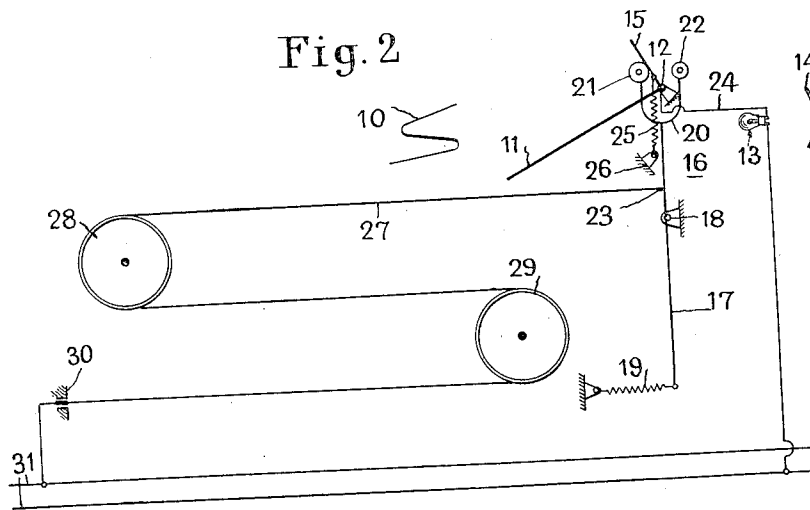


Fig. 2



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APPARATUS PROVIDING PROGRESSIVE LIGHTING AND EXTINCTION OF ARTICLES
SUCH AS LETTERS, WORDS, PHRASES, PICTURES, ETC.

Application filed April 14, 1932, Serial No. 605,322, and in France April 16, 1931.

Our invention relates to improvements in the apparatus providing progressive variations and changes of lighting, for example the progressive illumination and extinction of articles and objects such as letters, words, phrases, pictures, etc., such apparatus being applicable to teaching, to advertising, to the production of decorative schemes for festivals, etc.

According to the practical modification of the invention which will be described, an apparatus includes essentially the article to be illuminated, not contained in a plane, a source of light which projects a bundle on this article, a shutter interposed in the path of the luminous bundle, means for operating the shutter slowly in the direction of lighting, and other means enabling the shutter to be rapidly biased for the extinction. More particularly, such means may be constituted by a switching mechanism, cooperating with a thermal expansion arrangement, responsive to the flow of a current: in expanding, this latter allows the shutter to open progressively under the control of a biasing spring, and then to open the circuit at the end of the trip, whilst another spring brings the shutter suddenly into the position for extinction; the heating circuit being preferably common or combined with that of the luminous source.

In the drawing attached hereto, which is given only by way of example, Figs. 1 and 2 are schematic views, respectively in vertical elevation and in plan, of an apparatus according to our invention.

Nomenclatures.—10 the article which is to be illuminated, in this case, the letter *e* deformed and warped, in a shape analogous to that of screw or spiral—11 shutter which can be operated progressively,—12 its axis—13 luminous source with reflector—14 projecting a bundle in the direction of article 10, 15 arm of the shutter, an electrical conductor, cooperating with the switching mechanism—16 the complete switching mechanism including a lever 17 which is mounted on a pivot 18, a biasing spring 19, a fork 20, a conductor roller 21 and an isolating roller 22 mounted respectively on the two branches of

the fork, 23 and 24 taps of the circuit with the lever 17 and the axis 12 respectively, 25 another biasing spring of the switching mechanism, attached on one side to arm 15 of the shutter, and on the other side to a fixed point 26.

The thermal expansion device which is responsive to the flow of a current, includes the expansible wire 27, the guide and reversion pulleys 28 and 29, an adjustable stretching device 30 and a source of current 31, which in the example here shown, serves also to energize the luminous source 13.

The method of operation of the apparatus described is the following:

The conductor roller 21 being applied in contact on the arm 15 of the shutter by spring 25, a circuit is closed passing through: line 31 side + lamp 13, conductor 24, axis 12 of the shutter, arm 15 of this latter, roller 21, corresponding prong or branch of the fork 20, lever 17, point 23, expansible wire 27, stretching device 30, and line 31 side—.

Under the flow of the current, wire 27 (which consists, for example, of an "invariant" wire $\frac{3}{10}$ ths of a millimetre in diameter) expands, whereupon the fork 20 can, under its biasing spring 19, turn clockwise around on its pivot 18 (Fig. 2) causing arm 15 and shutter 11 to pivot around their axis 12 in the same direction: under these conditions, the luminous bundle projected by the lamp 13, progressively illuminates article 10.

In the course of the rotation of the associated devices, comprised in shutter 11—arm 15, a moment arrives when the axis of spring 25, which passes at first to the left of axis 12, is directed along the line 26—12 (Fig. 2), then progresses beyond this line towards the right, and suddenly pulls back arm 15 against the insulating roller 20. The circuit above described is thus open, lamp 13 is extinguished, and wire 27 cools, and therefore contracts. Then inverse operations, to those which have been described, are performed, the switching mechanism 16 closes again the circuit in 21—15 as pointed out at the starting of the operation, and the cycle described recommences indefinitely.

To give some more particular examples,

we may point out some details in the execution:

(a) The metallic parts of the switching-mechanism may be made of inoxydable metal.

5 (b) The rate of heating of wire 17 hot may be reduced, by giving this wire a sufficiently large size, and by surrounding it with some appropriate material such as minium (red-lead), asbestos, etc.

10 (c) The entire apparatus is enclosed in a case not shown with black walls including the necessary screens which give a black background to the letter which is illuminated. This case or box is sufficiently large to shelter
15 the letter from the daylight, while still allowing it to be seen.

A muslin veil placed in front of the box serves to mask completely that part of the letter which is not yet illuminated.

20 The letters are fixed on the vertical background of the box by one or several bolts.

(d) For the major number of the letters, the effect of the deformation due to the perspective is hardly noticeable. However, in
25 the case of the two letters "o" and "s", and for these only, a screen may be used in which these letters are cut out. Behind these open spaces, we provide an "o" or an "s" with very wide edges, and warped in such a manner
30 that they will be illuminated progressively.

Another method.—Letter "o" for example is obtained by using a flattened spiral which forms a circle. The deformation which is due to an exaggerated perspective, can be
35 corrected in part, by bringing, in a sudden slope, the point of departure of the "o", down to the level of the thin final stroke.

Moreover, from the pedagogical point of view, the effect of the perspective is not sufficient to deform the letters, especially if one
40 takes into account the following principle, which is capital in the consideration of handwriting:

Basic letters (*c, e, i, l, j, n*) will be subjected, in their entirety, to progressive illumination. But those letters which are derived from other ones such as "g", can be made in two parts: the "o" in green and by rapid illumination; the "j" in red, which, it being
50 possible to consider it as a new part, will be illuminated by a very slow progression. Each point of the "j" shall be largely spaced in depth from its next point.

It will be apparent to those skilled in the art that other modifications could be made according to this invention, and we therefore aim in the appended claims to cover any other changes and modifications falling within a fair interpretation of the spirit and scope of the invention as defined in the claims.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. A device of the class described comprising in combination the article to be illuminated, a source of light for projecting its rays on the article, a shutter interposed between the source of light and article, and means for slowly operating the shutter in one direction to permit illumination of the article and rapidly in a reverse direction to prevent illumination of the article.

2. An apparatus of the class described, comprising in combination an article to be illuminated, a source of light for projecting its rays on the article, a source of electrical energy for the source of light, a shutter interposed between the light source and article, a switch mechanism in circuit with the source of electrical energy and operable to first move the shutter slowly in one direction to permit illumination of the article and rapidly in a reverse direction to prevent illumination of the article.

3. In an apparatus as claimed in claim 2, wherein the switch mechanism includes a thermal expansion device responsive to the flow of electrical energy through the source of current.

4. An apparatus of the class described, comprising in combination an article to be illuminated, a source of light for projecting its rays on the article, a shutter interposed between the source of light and article, a source of electrical energy, a switch mechanism including a lever, a thermal expansion device in circuit with the source of energy and influenced thereby to operate the lever to slowly move the shutter in one direction and rapidly move the same in a reverse direction, as and for the purpose set forth.

In testimony whereof they affix their signatures.

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