March 16, 1926. 1,577,208

F. H. EELES

CONTROLLER FOR LUMINOUS ELECTRIC SIGNS

Filed Oct. 25, 1923 2 Sheets-Sheet 1

Fig.3.

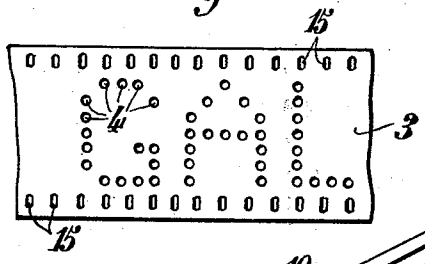


Fig.1.

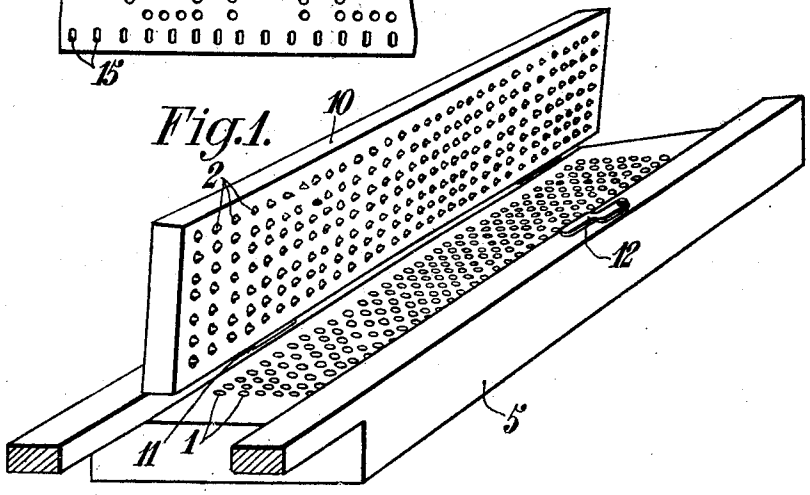
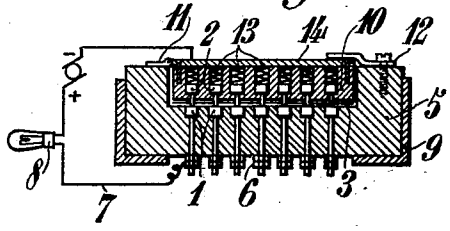


Fig.2.



Inventor
Frederick Harry Eeles
By Miller L. Norris
Attorney

March 16, 1926. 1,577,208

F. H. EELES

CONTROLLER FOR LUMINOUS ELECTRIC SIGNS

Filed Oct. 25, 1923 2 Sheets-Sheet 2

Fig. 4.

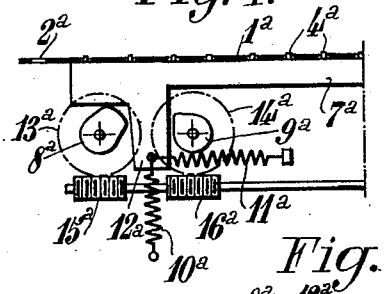


Fig. 5.

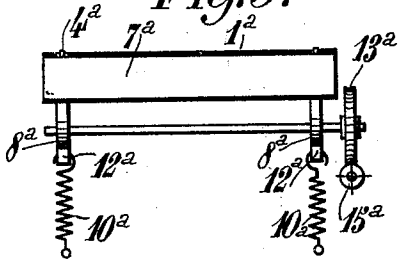
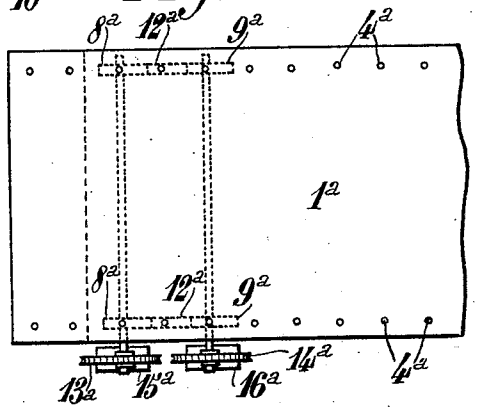


Fig. 6.



Inventor
Frederick Harry Eeles
By James L. Norris
Attorney.

Patented Mar. 16, 1926. 1,577,208

UNITED STATES PATENT OFFICE.

FREDERICK HARRY EELES, OF PARIS, FRANCE.

CONTROLLER FOR LUMINOUS ELECTRIC SIGNS.

Application filed October 25, 1923. Serial No. 670,739.

To all whom it may concern:

Be it known that I, FREDERICK HARRY EELES, a subject of the King of Great Britain, residing at 132 Rue Lafayette, Paris, Seine, France, have invented new and useful Improvements in Controllers for Luminous Electric Signs, of which the following is a specification.

The present invention relates to a circuit switch for a luminous electric sign. According to the invention, the sign comprises a board of lamps uniformly distributed, each lamp having a circuit-breaker included in its circuit, all the circuit-breakers being grouped in a similar manner to the lamps and so that they can be actuated by a perforated strip or band which is driven by hand or by a motor.

According to one form of practical realization of the invention, each circuit-breaker consists of two contact-studs situated in the prolongation of each other. One stud is fixed while the other is movable axially and is constituted by a spring-piston which tends to contact with the fixed stud so as to close the circuit, all the circuit-breakers being actuated by the movable perforated band which allows oppositely located studs to touch each other, when one of its perforations occupies a position between them, but otherwise holds them insulated from each other.

In practice, all the fixed studs are mounted in the bottom of a groove formed in a U-shaped insulating member, while the movable studs are mounted in a plate which fits in the groove, above the fixed studs, the perforated strip moving between the bottom of the groove and the lower face of the plate carrying the movable studs. The present invention further relates to a device for actuating a strip or band of material through the intermediary of perforations formed in the material, the strip being moved by the engagement of a driving member in said perforations. Up to the present, the driving member was in the form of a sprocket wheel, the teeth of which were made to engage directly in the perforations in the strip and to pull same forward, so that the effort necessary for moving the strip was borne by the material itself. This arangement is subject to the drawback that in many cases the necessary pull is great enough to cause distortion of the band or even to tear it across its width. In the case of strips of insulating material used for electric signs in which an electric circuit is closed by two sets of contact studs coming into contact through holes in the strip, this distortion causes the hole between two co-operating studs to be displaced relative to these latter with the result that contact is not made and the sign is imperfectly illuminated.

The above-mentioned drawbacks are obviated by the present invention, according to which the driving means for the film consists of a member having projections which engage in the perforations of the strip of material along a substantial portion of its length in the region where it is subject to resisting strains so that the material of the strip is relieved of tensional stress. Such driving member may consist of a plate, also having projections, said plate being adapted to be moved up and down to engage the perforations in the strip and to move said strip transversely when the projections engage in the perforations.

The invention is shown diagrammatically and by way of example in the accompanying drawings in which:

Fig. 1 is a perspective view of the circuit-breakers as a whole, the plate carrying the movable studs being raised.

Fig. 2 is a transverse section of Fig. 1, the plate being swung down into the groove. This figure also shows a diagram of the connections for one of the lamps.

Fig. 3 is a view of a portion of the perforated band.

Fig. 4 is an elevation showing the driving means for the perforated strip.

Fig. 5 is an end view of Fig. 9 and Fig. 6 is a plan view of Fig. 4.

The advertising sign proper consists of a board of lamps uniformly distributed and connected by one of their terminals to one of the poles of a source of current. All the other terminals of the lamps are connected respectively to fixed contact studs 1 distributed in the same way as the lamps, and each lamp is thus connected to the stud which occupies the same position as the lamp itself in the whole arrangement. Opposite each fixed stud 1 is arranged a movable stud 2 consisting of spring pistons. All the movable studs are connected to that pole of the source of current which is not already connected to the lamps.

Between the fixed studs 1 and the movable studs 2 there can slide a perforated

band 3 having holes 4 which are adapted to position themselves in alignment with the corresponding pair of studs 1, 2. When one of these holes is between a given pair of studs 1, 2, contact is effected and the corresponding lamp is lighted. In all other cases the contact is interrupted and the corresponding lamp remains extinguished.

All the fixed studs 1 are mounted in the bottom of a groove formed in an insulating member 5 of U-shaped cross section. The upper parts of the studs 1 are flush with the bottom of the groove. These studs 1 are constituted by bolts which carry, at their lower portion nuts and lock nuts 6 which serve to hold the studs themselves in place, and also to bind the connecting wires 7 leading to the lamps one of which is shown at 8. Figure 2. The insulating member 5 can be reinforced, if desired, by means of metallic corner pieces 9.

All the movable studs 2 are mounted in a plate 10 which fits into the groove of the member 5 and is preferably hinged as shown at 11 (Figs. 1 and 2). An interval equal to the thickness of the band 3 is left between the bottom of the groove formed in the member 5 and the lower face of the plate 10 when this latter is swung down and in place, as shown in Fig. 2. A latch 12 holds the plate 10 in its swung-down position. The studs 2 are constituted by shouldered cylinders which are urged downwardly by springs 13 which abut against conducting plates 14 connected to one of the poles of the source of current.

The perforated band 3 has perforations 4 arranged in order or form. For instance they are here shown in the shape of the letters of the alphabet and in such a manner as to correspond to the distribution of the studs 1, 2. The band 3 is provided on its edges with driving perforations 15 similar to those of cinematograph films.

The method of operation will now be easily understood.

If it is supposed for an instant that the perforated band is stopped between the studs 1, 2, all the circuit breakers corresponding to perforations such as 4 will be closed and all the lamps corresponding to the perforations 4 will be illuminated. The sign will then show an inscription similar to that of the band and formed by illuminated lamps. If it is then supposed that the band is moved progressively, the inscription will also move. The band 3 can be made of a very great length and it can carry entire phrases which will be displayed upon the luminous sign.

The perforated band 3 is held for instance, between two reels from one of which it unwinds and winds up upon the other. At a slight distance beneath the band is located a plate 7^a provided with studs or projections. This plate has an extension 12^a having a vertical face and a horizontal face. A cam 8^a is adapted to engage the horizontal face for the purpose of raising the plate 7^a at intervals so as to cause the projections 4^a to enter the perforations 3 in the band. A cam 9^a then comes into contact with the extension 12^a and moves it to the left in Fig. 4, so that the band is moved one step forward. As the cam 8^a continues to rotate, the plate 7^a sinks under the pull of a spring 10^a and after a certain interval, the cam 9^a leaves the extension 12^a and the plate 7^a is drawn to the right in Fig. 4 by the spring 11^a, said plate being, during such movement, in its lowermost position and the projections 4^a being clear of the perforations 3.

The extensions 12^a are preferably provided at each side of the plate 7^a together with the cams 8^a and 9^a for actuating them. The cams are preferably actuated by worm-wheels 13^a, 14^a mounted on their axes and driven by worms 15^a, 16^a, respectively from any convenient source of power. If desired, the driving means shown in Fig. 4 at one end of plate 7^a can be doubled by identical driving means arranged at the other end of plate 7^a.

I claim:

1. A form operated circuit switch comprising a plurality of circuit breakers, a perforate band of insulating material, the perforations of which are adapted to act upon and allow said circuit breakers to close in predetermined groups and sequences, and a driving member for said band comprising means for simultaneously engaging marginal portions of said band along the portion of its length which acts against said circuit breakers, means for moving said engaging means into operative position, means for advancing said engaging means while engaged with said band, said engaging means being movable to disengaged position, and means for retracting said engaging means while disengaged.

2. A form operated circuit switch comprising a plurality of circuit breakers, a perforated band of insulating material, the perforations of which are adapted to act upon and allow said circuit breakers to close in predetermined groups and sequences, and a driving member for said band comprising means for engaging marginal perforations in said band along the portion of its length which acts upon said circuit breakers, means for raising said member into engagement with said band, means for advancing said member, means for lowering said member out of engagement with said band and means for moving said member backwards.

3. A form operated circuit switch comprising a plurality of circuit breakers, a perforated band of insulating material, the per-

forations of which are adapted to act upon and allow said circuit breakers to close, in predetermined groups and sequences, and a driving member for said band comprising means for engaging marginal perforations in said band along the portion of its length which acts upon said circuit breakers, a cam for raising said member into engagement with said band, a cam for advancing said member, a spring for lowering said member out of engagement with said band and a spring for moving said member backwards.

4. A form operated circuit switch comprising a plurality of circuit breakers, a perforated band of insulating material, the perforations of which are adapted to act upon and allow said circuit breakers to close in predetermined groups and sequences, and a driving member for said band comprising means for engaging marginal perforations in said band along the portion of its length which acts upon said circuit breakers, a cam for raising said member into engagement with said band, a cam for advancing said member, a spring for lowering said member out of engagement with said band, a spring for moving said member backwards and a mechanical timing connection between said cams.

5. A form operated circuit switch comprising a plurality of circuit breakers, a perforated band of insulating material, the perforations of which are adapted to act upon and allow said circuit breakers to close in predetermined groups and sequences and a driving member for said band comprising means for engaging marginal perforations in said band along the portion of its length which acts upon said circuit breakers, a cam for raising said member into engagement with said band, a cam for advancing said member, a spring for lowering said member out of engagement with said band, a spring for moving said member backwards, two worm wheels fast respectively to each of said cams, two worms respectively in mesh with said worm wheels, a shaft upon which said worms are keyed and means for rotating said shaft.

FREDERICK HARRY EELES.