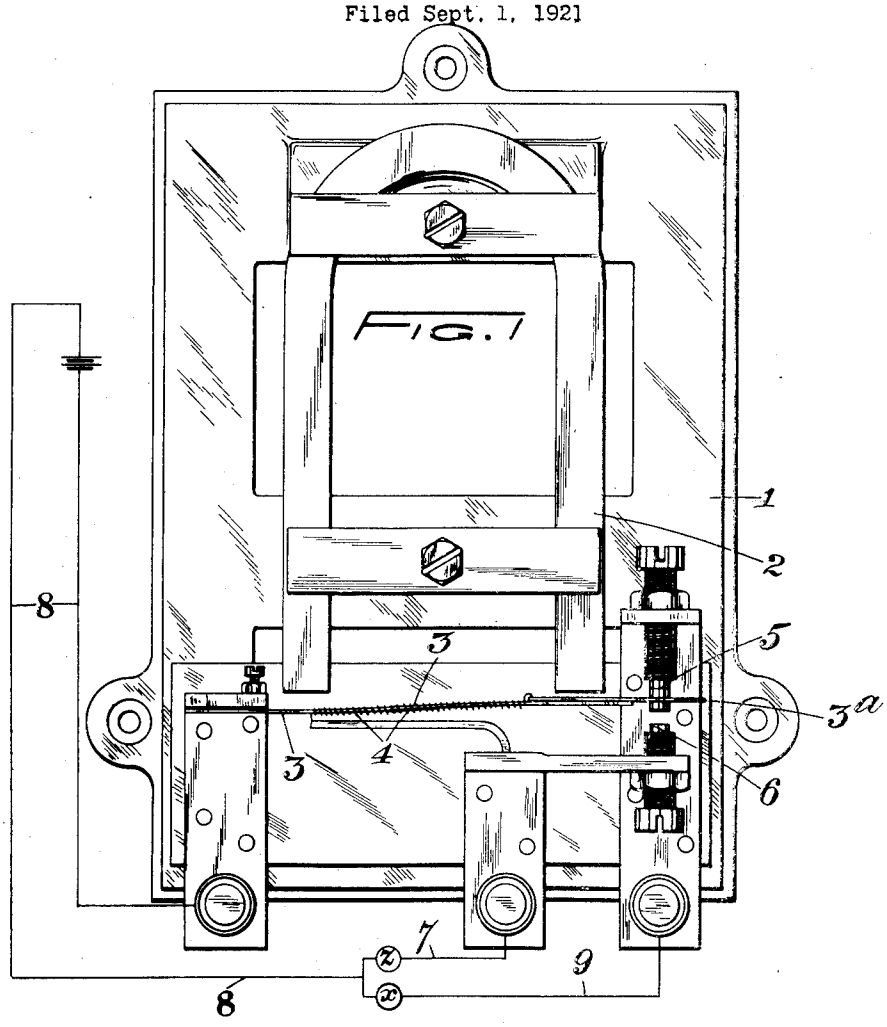
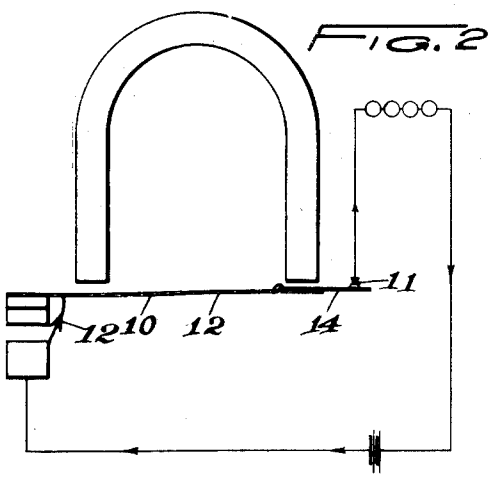
Oct. 20, 1925. 1,558,331

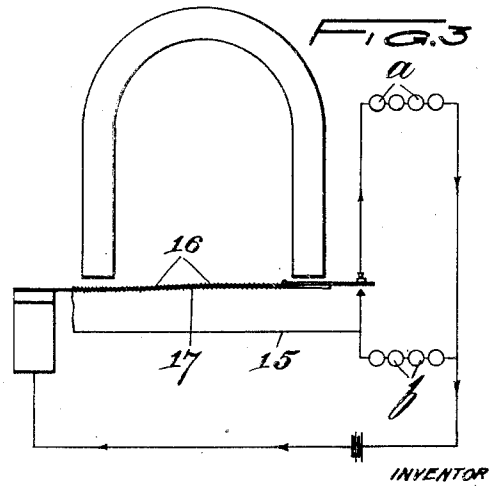
P. W. BAKER

THERMALLY ACTUATED ELECTRIC SWITCH

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UNITED STATES PATENT OFFICE.

PERCY WILLIAM BAKER, OF PUTNEY, LONDON, ENGLAND.

THERMALLY-ACTUATED ELECTRIC SWITCH.

Application filed September 1, 1921. Serial No. 497,644.

To all whom it may concern:

Be it known that I, PERCY WILLIAM BAKER, a subject of the King of England, and resident of 49 Werter Road, Putney, London, S. W., England, have invented certain new and useful Improvements in or Relating to Thermally-Actuated Electric Switches, of which the following is a specification, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to thermally actuated electric switches suitable for various purposes including the control of flash light advertising devices.

The chief object of the invention is to construct a switch with a quick make and quick break and the main novel feature is the employment of a magnet, preferably a permanent magnet, in combination with a member, say a bi-metallic plate or strip, which can be distorted or otherwise moved by heat from the electric current, and can also be moved by the magnet.

A simple and well-known manner of effecting the said distortion is to wind the said plate or strip with a fine wire arranged in the electric circuit it being understood that the movement of the said plate or strip opens and closes the circuit in substantially usual manner. The arrangement of the circuits may vary and the device may control more than one circuit if desired.

In the preferred form, the thermal member will, when in position away from the magnet, open the heating circuit so that as the member cools, its resiliency reduces and the attraction of the magnet overcomes the tendency of the spring and the member is moved by the magnet into a circuit closing position. When reaching this position, the heating circuit is closed and the member gradually heated until the spring tendency overcomes the attraction of the magnet and the member springs away from the magnet.

The invention can be carreid out in many forms in which the magnet and the cooling of the thermally-actuated member alternately shift the said member and thus bring about in any desired manner the quick make and quick break of the main electric circuit and the consequent control of the lamps, electric mechanism or the like which are in that circuit.

The employment of the magnet and the consequent quick make and quick break enables the switch to satisfactorily control two circuits, one in each of its two positions without flickering.

My invention is illustrated in the accompanying drawings in which:—

Fig. 1 shows the general construction of one form of the apparatus and Figs. 2 and 3 illustrate the invention in diagrammatic manner.

In Fig. 1 the apparatus comprises a base 1 of insulating material carrying a permanent magnet 2 opposite the poles of which a bi-metallic member 3 carrying an iron plate 3^a is mounted. The member 3 is wound with insulated wire 4 and is adapted to alternately make and break at electrical contacts 5 and 6.

In the position shown contact 5 is closed and is in circuit 9 and lights lamp x. A circuit is also closed through the wires 4 and 7, but the current is insufficient to light the lamp z.

Both circuits have part 8 in common. The wire 4 heats the member 3 and springs it away from the magnet thus breaking contact 5 and closing contact 6, this opens circuit 9 and extinguishes the lamp x.

The circuit through 7 is closed from contact 6 and lamp z lighted. The closing of circuit 7 through contact 6 "shorts" the wire winding and allows it and the bi-metal strip 3 to cool until the strip is drawn back by the magnet and contact 6 broken and contact 5 closed when the re-warming occurs and the action is repeated.

Fig. 2 shows diagrammatically much the same apparatus as designed for a single way installation. In this case the current passes through a (comparatively) thick winding wire on the bi-metal strip 10, and heats the same until it springs away from the magnet and breaks circuit at 11. When cooled enough the strip springs to the magnet under attraction therefrom and closes the circuit. In this construction the full current passes through the winding wire 12 which is connected to strip 10, and the magnet armature (small iron plate) 14.

Fig. 3 shows diagrammatically the connection as described in Fig. 1, which can be used either for controlling one or two circuits as desired.

The circuit is seen closed through the line with arrow heads and lamps a. The wind-

ing wire is heating owing to current passing through circuit 15, said current being insufficient to light lamps *b*.

The strip heats and springs away from the magnet, breaks the arrow head circuit *a* and closes lighting circuit through the lamps *b* thereby short-circuiting heating wire 16 on strip 17, allowing both to cool down until the magnet again attracts them and again closes circuit *a* until the operation is repeated.

As above indicated, any suitable form of magnet may be employed and any suitable device capable of being moved by warmth from the current may be used in which the construction and arrangement is such that a quick make and break is obtained.

What I claim is—

A thermally-actuated electric switch, comprising a base, a horse shoe magnet arranged thereon, a block secured on the base, a spring member held at one end in the block, a plate of magnetic material secured to the opposite end of the member and in line with one of the poles of the magnet, said plate being extended and provided with a contact, opposing contacts carried by the base to be engaged by the contact on the plate in the respectively opposite positions of the member, and a circuiting wire coiled about the member, and means for energizing said wire when the member is in position incident to the attraction of the magnet.

In witness whereof I have hereunto set my hand.

PERCY WILLIAM BAKER.