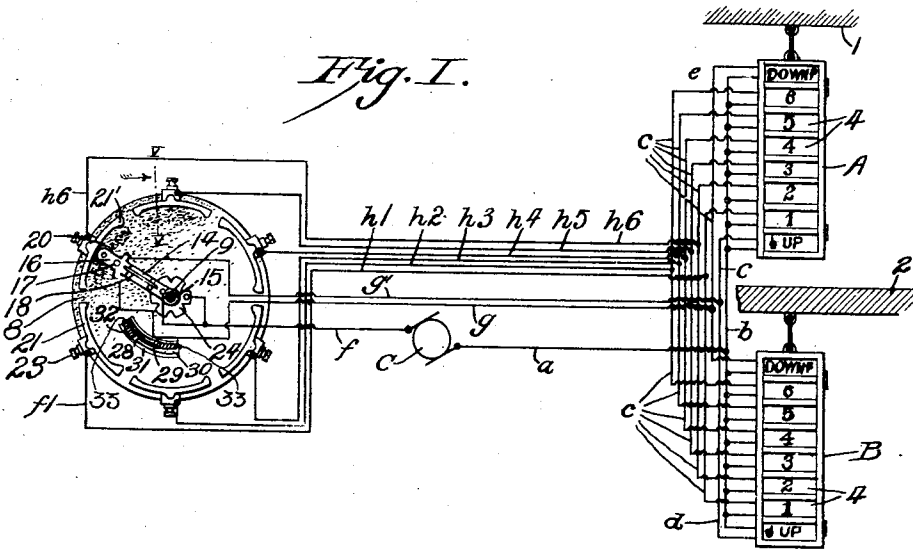


E. E. CRAIG.  
ELECTRICAL INDICATOR.  
APPLICATION FILED JUNE 16, 1909.

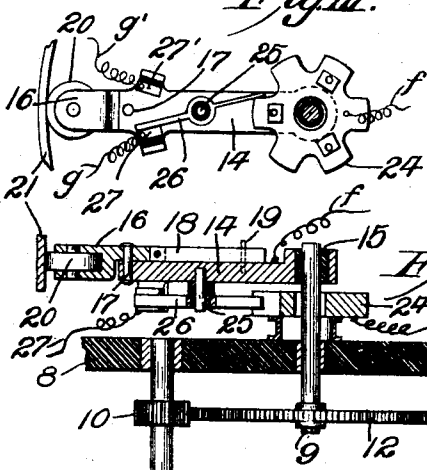
972,682.

Patented Oct. 11, 1910.

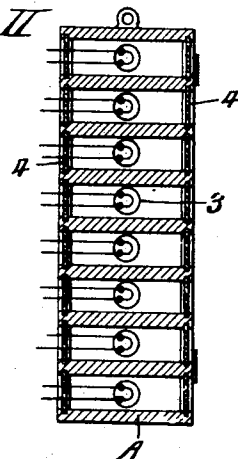
*Fig. I.*



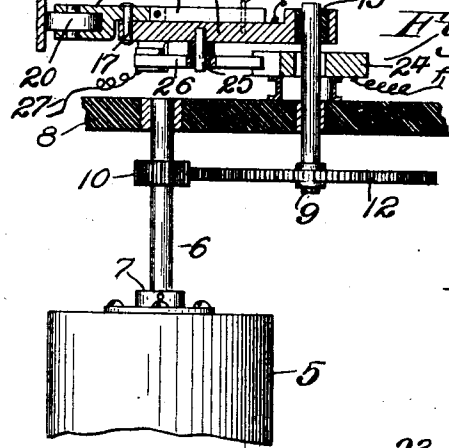
*Fig. III.*



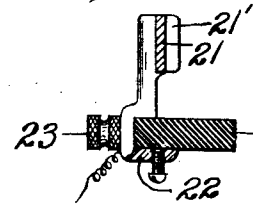
*Fig. II.*



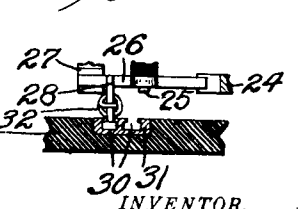
*Fig. IV.*



*Fig. V.*



*Fig. VII.*

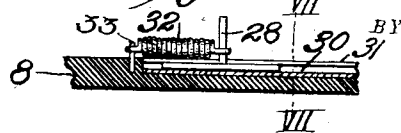


WITNESSES:

*E. A. Hill*

*Myrtle Jackson*

*Fig. VI.*



INVENTOR.  
*Edward E. Craig*

BY *Arthur C. Brown*  
ATTORNEY.

# UNITED STATES PATENT OFFICE.

EDWARD E. CRAIG, OF KANSAS CITY, MISSOURI.

ELECTRICAL INDICATOR.

972,682.

Specification of Letters Patent.

Patented Oct. 11, 1910.

Application filed June 16, 1909. Serial No. 502,497.

*To all whom it may concern:*

Be it known that I, EDWARD E. CRAIG, a citizen of the United States, residing at Kansas City, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Electrical Indicators; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to automatic electrical indicators for indicating the position and the direction of travel of elevators.

The object of the invention is to provide a simple and reliable indicator of the kind, and which may readily be attached to the elevator driving machinery.

The invention is herein fully described and claimed, and illustrated in the accompanying drawings, in which:—

Figure I is a diagrammatic view of the wiring system, switch and indicator which I prefer to employ, the equipment for two floors being shown. Fig. II is a diagrammatic sectional view of one of the indicator boxes. Fig. III is a detail view of the selecting switch arm and one of the contact segments. Fig. IV is a plan view, in section, of the selecting switch and its driving gear. Fig. V is a sectional detail, viewed on line V—V of Fig. I. Fig. VI is a sectional detail view of certain parts of a reversing device. Fig. VII is a transverse section taken on line VII of Fig. VI, showing arm 14 in contact with pin 28.

Referring more in detail to the parts:— In Fig. I, the sections 1 and 2 represent parts of two adjacent floors or ceilings of a building. A and B designate boxes or casings which are shown as suspended from the ceilings of the said two floors. Each of these boxes contains a number of compartments equal to the number of elevator stations, (which in this case is six) and two additional compartments. In each compartment is an electric lamp, 3. The front of each box is provided with a glass door 4, on which is painted the numbers of the floors, as shown; also, over the top compartment, the word "Down" and over the lower compartment the word "Up" or vice versa.

The sides of the box may be of opaque material, or, if preferred, of glass.

Referring now to Fig. IV, the broken away part 5 represents the end of the cable drum shaft of the elevator. To the end of this shaft I secure a small shaft 6, by means of a flanged collar 7. A rigidly supported plate 8 is provided with a bearing for shaft 6, also with a bearing for a second shaft 9. A pinion 10 and a gear 12 are fixed upon the shafts respectively. The gear and pinion are so proportioned that one complete trip of the elevator from top to bottom of its run, will cause the gear to turn through about seven-eighths of one revolution. Securely fixed upon shaft 9 is the selecting switch arm 14. It is insulated from the shaft, as shown at 15. This arm comprises an inner member 14 and an outer member 16, pivoted thereon at 17. The outer member 16 carries a flat spring 18 which extends between two pins 19 set in the inner member 14. The outer member carries a contact roller 20. The plate 8 is of insulating material and is circular, as shown in Fig. I. Secured to its periphery are contact segments 21, one for each elevator landing. They are provided with a clamp foot 22, preferably, for attachment. 23 is a binding nut for wire connection to each. The inner face of each segment 21 is formed with a rise 21' at each end thereof, and the ends are spaced apart. As the arm 14—16 revolves the roller 20 will be retarded and the spring 18 flexed. As soon as the roller can pass from a segment the spring 18 will quickly react, thereby throwing the pivoted arm quickly forward, causing the roller to jump across the air gap quickly. The purpose of this is to reduce sparking between roller and segments. Secured to plate 8, concentric with shaft 9, is a non-rotary star wheel 24. Preferably the points of this wheel should be numerous and small, with small recesses between them. Pivoted on the arm 14, on a stud 25, is a resilient contact finger 26. Its inner end is adapted to pass over the points of the star wheel, and its outer end is adapted to form contact with either of two pieces of metal 27 or 27', suitably supported on and insulated from said arm 14.

Means are provided for reversing the throw of switch arm 26 at the ends of the elevator's travel, so that when the car is at the bottom of the shaft the "up" lamps

- will be lighted instead of the "down" and when the car is at the top station the "down" lamps will be lighted instead of the "up". To this end I provide abutment studs 28 and 29, for engaging the finger 26 at the respective ends of said finger's travel. Said studs are mounted slidably in grooves 30 in a metal plate 31, secured to the non-metallic switch base 8.
- Studs 28, 29 are tensioned by springs 32, to resist the thrust of the finger 26, and said springs are stiffer than said finger, so that they will not yield unless the finger is carried on by excess travel of the elevator.
- Said springs are connected at one end to the studs 28, 29 and at the other end to studs 33, set in the switch base 8. Preferably the grooves 30 are curved as shown, for mechanical reasons.
- The electrical connections are as follows:—From a source of electricity, C, a wire *a* leads to a common lamp wire *b* which feeds in multiple all the lamps in the boxes A, B. Lamps bearing the same numbers in the boxes A, B, are connected by wires *c*, thus lamp 1 in box A is connected to lamp 1 in box B, and so on for all the lamps. The "up" lamps are connected by a wire *d*, and the "down" lamps, by a wire *e*. From the current source C, a wire *f* leads to a branch, as shown in Fig. I and is connected to switch arm 14, also to star wheel 24. From one contact piece 27, a wire *g* leads to the wire *d* connecting the "up" lamps, and from the other contact piece 27', a wire *g'* leads to the wire *e* connecting the "down" lamps. The contact segments 21 are connected in rotation to the lamp wires *c* by wires *h*<sup>1</sup>, *h*<sup>2</sup>, *h*<sup>3</sup>, *h*<sup>4</sup>, *h*<sup>5</sup> and *h*<sup>6</sup>.
- The operation is as follows:—When the elevator is moving up, the action of the star wheel 24 on finger 26 will cause said finger to contact with whichever contact 27 or 27' is connected to the "up" lamps, and the "up" lamps will be lighted, as a circuit will be closed through said lamps as long as said parts are in contact. When the elevator starts down, the action of the star wheel 24 on finger 26 will cause said finger to shift its angle and contact with the other point 27 or 27', thereby lighting the "down" lamps. When the car approaches the bottom station, (the finger 26 being on the "down" point) said finger will impinge on abutment stud 28 and be thrown over into contact with piece 27', thereby extinguishing the "down" lamps and lighting the "up" lamps. If the car drops sufficiently below the normal stop, one of the springs 32 will yield, and likewise, if the car passes sufficiently above the uppermost landing, the other spring 32 will yield, to the movement of stud 28 or 29 by the traveling finger 26. The same operation will occur at the top station of the elevator, involving the other abutment stud 29. In regard to the indication of the elevator's position, it is clear that whenever the contact roller 20 is in contact with any segment 21 a circuit will be closed through the correspondingly numbered lamps in boxes A, B, etc. The illumination will of course display only the particular number desired, because the partitions between the lights are of opaque material.
- Having thus described my invention, what I claim as new therein and desire to secure by Letters-Patent is:—
1. In an electric selector switch for elevator indicators, a circular series of contact segments each having a rise on its end portion, and a rotary switch lever carrying a yieldably mounted roller adapted to engage said segments.
  2. An electric direction-indicating switch for elevators, comprising a rotary arm, a pair of spaced contact pieces mounted on said arm, and a resilient contact member mounted on said arm and adapted to shift its position according to the direction of rotation and to contact with one or the other of said contact pieces.
  3. The combination of a switch-arm geared to a shaft of an elevator drive, a resilient contact finger carried by said arm, spaced contact points carried by said arm, and arranged to be contacted singly by said finger, means for automatically reversing said finger at either end of the elevator's normal travel, and means for maintaining the position of said finger at all other times.
  4. The combination of a switch base, a switch arm geared to a shaft of an elevator drive, a resilient contact finger carried by said arm, opposed contact points carried by said arm, abutments mounted yieldably on said base in positions to reverse said finger at the ends of the normal travel of said arm, and means for thereafter maintaining said finger's position at all other times.
  5. The combination of a switch base, a rotary switch-arm mounted on a shaft extending through the base, a non-rotating circular member concentric with said shaft, a resilient contact finger carried by said arm, its inner end frictionally engaging said circular member, and contact points carried by said arm in position to be engaged singly by the other end of said finger.
  6. An elevator indicator system comprising a circular series of contact segments each having a rise on its end portion, a rotary switch arm carrying a yieldably mounted roller adapted to engage said segments, signal boxes on respective floors, each containing a plurality of electric visual signals, a source of current, and connections between said source, segments, switch arm and signals, whereby said signals will be successively energized by travel of the switch arm.

7. An elevator indicator system comprising a switch-arm geared to a shaft of an elevator drive, a resilient contact finger carried by said arm, spaced contact points carried by said arm, and arranged to be contacted alternately by said finger, means for automatically reversing said finger at either end of the elevator's normal travel, means for maintaining the position of said finger at other times, signal boxes on respective floors, each containing two electric visual signals indicating upward and downward respective directions of the car, a source of current, and connections between said source, contact finger, contact points and signals, for the purpose set forth. 15

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD E. CRAIG.

Witnesses:

MYRTLE M. JACKSON,  
E. A. CAHILL.