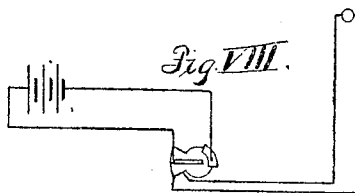
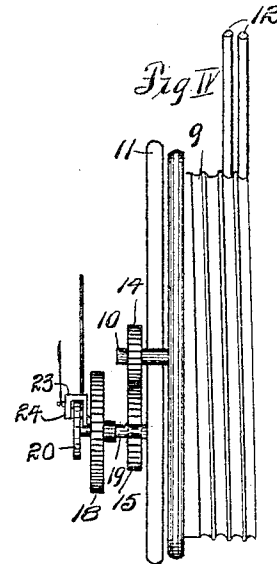
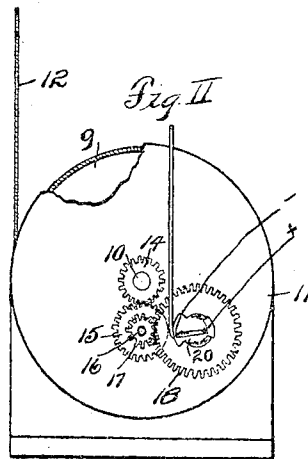
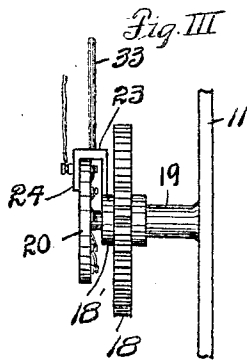
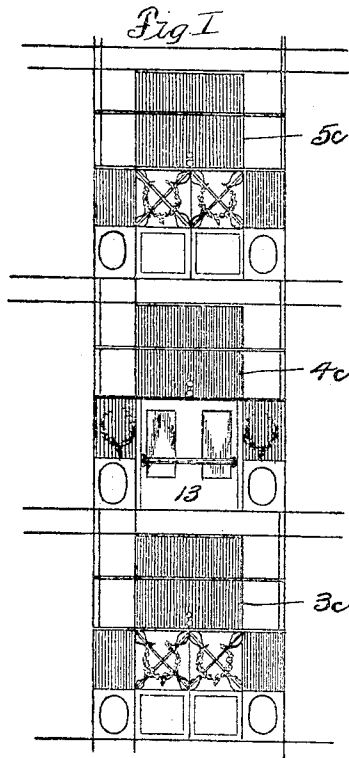


931,835.

Patented Aug. 24, 1909.

2 SHEETS—SHEET 1.



WITNESSES:
Harold E. Richards,
John F. Wade,

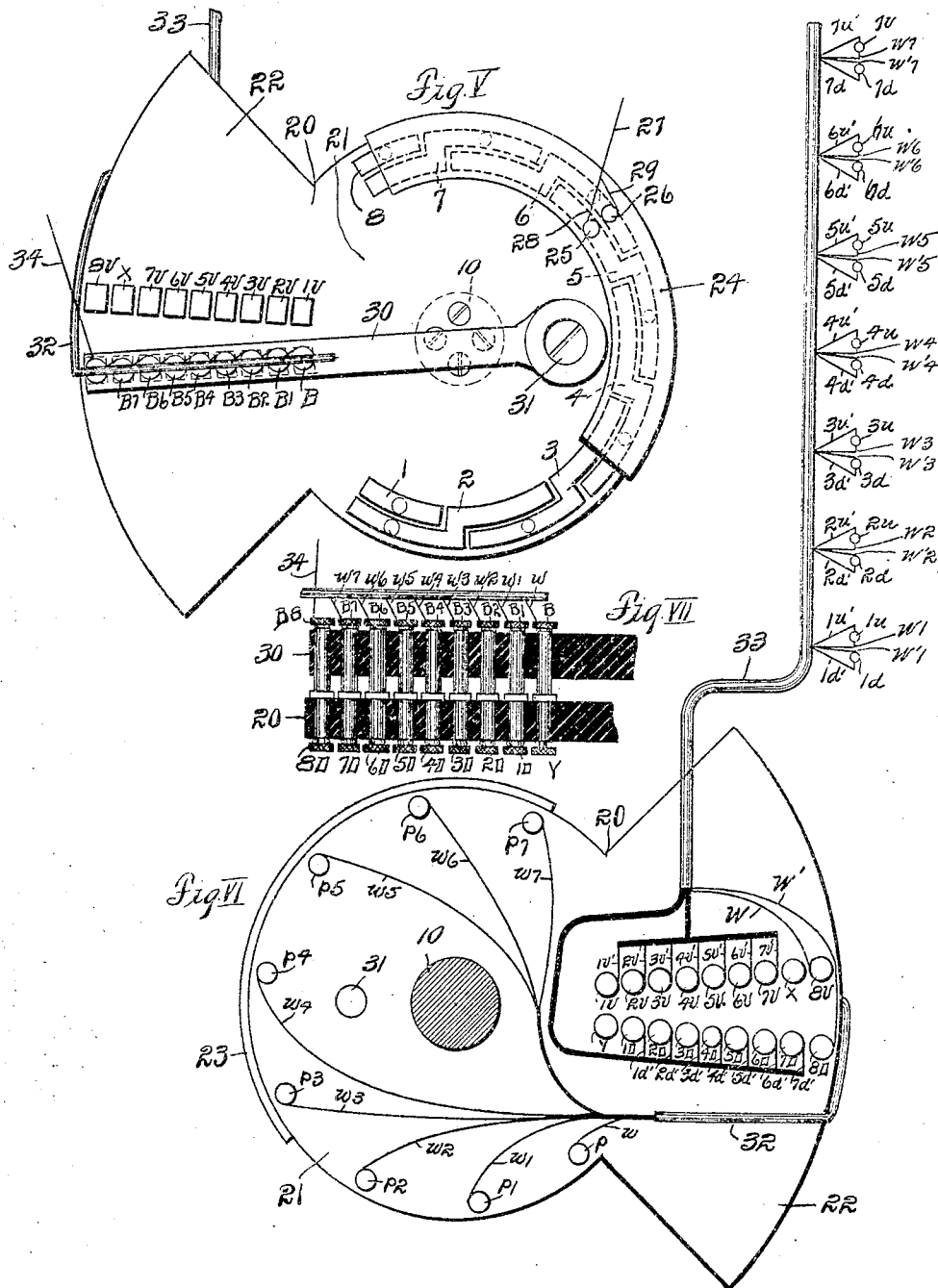
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931,835.

Patented Aug. 24, 1909.

2 SHEETS—SHEET 2.



WITNESSES:

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ELEVATOR SIGNAL SYSTEM.

931,835.

Specification of Letters Patent.

Patented Aug. 24, 1909.

Application filed October 22, 1907. Serial No. 398,567.

To all whom it may concern:

Be it known that we, JAMES F. BAKER and ARTHUR C. MOORE, citizens 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 Elevator Signal Systems; and we 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 letters and figures of reference marked thereon, which form a part of this specification.

Our invention relates to an elevator signal system and more particularly to a signal for informing waiting passengers of the approach of an elevator car; the object of our invention being to provide a signaling apparatus which will comprise lamps, located on each of the floors of a building, in a convenient position adjacent to the elevator shaft, together with simple and effective means for illuminating such lamps in advance of a car, during both its upward and downward travel.

A further object is to provide a double series of lamps, and a reversible illumination controlling mechanism, for the purpose of not only informing the waiting passengers of the car's approach, but also as to whether it is upwardly or downwardly bound.

A further object is to provide the improved details of structure which will presently be fully described and pointed out in the claims, reference being had to the accompanying drawings forming part of this specification, in which like reference characters refer to like parts throughout the several views, and in which:—

Figure I is a view, in front elevation, of a number of successive elevator cages, equipped with our improved signaling apparatus. Fig. II is a view, in side elevation, of an elevator drum and drum case, showing the manner of mounting the signal controlling mechanism. Fig. III is an enlarged edge view of the signal controlling mechanism. Fig. IV is a similar view of a portion of the elevator drum, drum case, signal controlling mechanism, and power transmission. Fig. V is an enlarged view, in front elevation, of the controller base plate. Fig. VI is a rear view of same, showing a diagram of the signal lamps. Fig.

VII is a central longitudinal section through a portion of the reversing switch arm and base plate, showing the arm brushes, and the binding posts carried by the base. Fig. VIII is a circuit diagram.

As previously stated, the object of our invention is to provide an apparatus which will cause the illumination of a lamp at the floor upon which the elevator car is located, and the simultaneous illumination of a lamp on the floor next in advance of the car. This object is accomplished by arranging the conductor plates side by side on a suitable base, and allowing the ends of adjacent plates to overlap, so that the brushes, carried by a movable bracket, may have simultaneous contact with two of the plates which control the lamps on adjacent floors, through connections with brushes on a reversing switch arm. Were it desired to signal the approach of a car during either its up or down travel alone, direct connection with the lamps could be made, but as it is our object to provide an apparatus which will separately light a double set of lamps, we have provided a separate set of binding posts for each lamp set, and a switch adapted for contact with either post set, and adapted for automatic reverse with the change in direction of travel of the elevator car. As there are two separate sets of lamps, one lamp of each set being located on each floor of the building, and as it is necessary for the lamps of each set to be illuminated independently of the other, means must be provided for separately connecting the lamp sets with a current source. This is accomplished by employing a double set of binding posts, the posts in one set being connected with the lamps in one of the lamp sets, the posts in the other set with the lamps in the other lamp set, and one post in each set having a common negative connection with all of the lamps in its set, together with a switch arm which is provided with separate brushes adapted for simultaneous engagement with all of the posts in the set over which the arm is located, each brush having a separate connection with the individual contact plates previously described, and one brush in the set having a negative lead wire running back to the common current source, in this way completing a circuit through the lamps controlled by the plates with which the bracket brushes are in contact.

It will be seen that there is one more contact plate, binding post and switch brush in the sets than there are lamp pairs, which arrangement, as well as the reversing mechanism, will be understood from the following detailed description, in which particular reference is had to the drawings, the parts in the latter being shown as operated by a descending car.

In the drawings, 9 designates an ordinary worm drum, which is rigidly mounted on a shaft 10, that projects through and is journaled in a standard 11, and the drum is provided with the elevator ropes 12, which extend to and support a car 13 in the elevator shaft; the drawings showing an apparatus adapted for a building having seven floors, the elevator cages of which, on three successive floors, are designated by numerals 3^c—4^c—5^c, each of which corresponds with the number of the floor upon which it is located.

Carried by shaft 10, and the drum standard, is a transmission mechanism, which preferably consists of a spur wheel 14, rigid on shaft 10, and meshing with a similar, but larger wheel 15, which revolves on a stub axle 16, carried by the drum standard, and rigidly secured to said wheel 15 is a small spur wheel 17, which meshes with a large wheel 18, revolvably mounted on a stub axle 19, also carried by the drum standard; such transmission being so adjusted that the wheel 18 will make but substantially three-fourths of a revolution while the elevator car is being conducted from the top to the bottom of the shaft, and vice versa.

Rigidly mounted on axle 19, is a base plate 20, preferably of non-conductive material, and provided with a circular body portion 21, having a projecting flange 22.

Mounted on the face of the circular body member, adjacent to its periphery, are the conductor plates 1—2—3—4—5—6—7—8, there being one more plate in the set than there are floors in the building, each of which, except the two end plates 1 and 8, is adapted to complete a circuit through a lamp one floor in advance of the elevator car, and retain the circuit until the car has left that floor, and preferably comprises the staggered inner and outer members shown in the drawings, with the two end plates fitting within the offset of the adjacent plate, and ending flush therewith.

Carried on the hub 18', of wheel 18, is a bracket 23, having a flange 24 extending over the edge of the base plate 20, and covering a portion of the conductor plates 1—2 etc.; said flange being preferably of non-conductive material, and provided with brushes 25—26, adapted for simultaneous, frictional contact with adjacent, overlapping conductor plates 1—2 etc.

27 designates a lead wire, having connec-

tion with a suitable source of electrical supply, indicated in Fig. VIII, and provided with branches 28—29, which are respectively connected with brushes 25—26.

Carried by, and extending through base 20, are two sets of binding posts 1^u—2^u—3^u—4^u—5^u—6^u—7^u—X and Y—1^d—2^d—3^d—4^d—5^d—6^d—7^d, arranged in separate rows, with the posts in each set insulated from each other and provided with heads, which project from the face of the base plate in position for engagement by the brushes B—B¹—B²—B³—B⁴—B⁵—B⁶—B⁷, which are carried by a switch arm 30, pivotally mounted on a pin 31, carried by base 20; the arm mounting being sufficiently close to prevent free movement of the arm, but not so close as to prevent its being shifted by the flange 24, as will presently be described.

Connected with each of plates 1—2 etc., and projecting through base 20, are the posts p—p¹—p²—p³—p⁴—p⁵—p⁶—p⁷, and connecting said posts with the respective brushes B to B⁷ on the switch arm 30, are the wires w—w¹—w²—w³—w⁴—w⁵—w⁶—w⁷, which are preferably carried in a cable 32, around the edge of base 20, which cable is secured to, and adapted for movement with, the switch arm 30, and the individual wires drawn from the cable and connected with the brush taps as indicated in Fig. VI.

Located above the elevator doors, or in a suitable position on the elevator cage, on each floor of the building, is a pair of lamps 1^u—1^d, 2^u—2^d, 3^u—3^d, 4^u—4^d, 5^u—5^d, 6^u—6^d, 7^u—7^d; one of the lamps in each pair being situated above the other, the lamps 1^u—2^u etc. being connected with posts 1^u—2^u etc. by wires 1^{u'}—2^{u'}—3^{u'}—4^{u'}—5^{u'}—6^{u'}—7^{u'}, and adapted for illumination during the upward travel of the elevator car, and the lamps 1^d—2^d etc. being connected with posts 1^d—2^d etc. by wires 1^{d'}—2^{d'}—3^{d'}—4^{d'}—5^{d'}—6^{d'}—7^{d'}, and adapted for illumination during the downward travel of the car, said wires being preferably conducted from the operating mechanism in a cable 33, and branched therefrom when adjacent to the proper lamps.

Each set of posts 1^u—1^d— contains a post 8^u—8^d, having connection with a common wire W—W', which extends through cable 33, and is provided with branches W¹—W'¹, W²—W'², W³—W'³, W⁴—W'⁴, W⁵—W'⁵, W⁶—W'⁶ and W⁷—W'⁷, leading to and forming the negative wires of the respective lamps; posts 8^u—8^d being adapted for engagement by the brush B⁸ on the switch arm, which has a negative wire 34, leading back to the source of electrical supply, and by means of which a circuit is completed through the parts previously mentioned.

It will be noted in the operation of the apparatus, that during the upward travel

of the car, a circuit through plate 2 will cause an illumination of the lamp on the second floor, and on its downward travel will cause an illumination of the lamp on the first floor; the same action being had with each of the successive plates; and that the plates 1 and 8 produce no illumination on the first and seventh floors until the switch has been reversed from "down" to "up," and vice versa.

In the operation of the apparatus, when the parts are assembled as described, the current passes through the positive lead wire, and its branches, to the brushes carried by flange 24, and from thence to the conductor plates with which said brushes are in contact, in Fig. V shown to be plates 6 and 5. Passing through the plates 6 and 5, and through posts p^5 and p^4 , the current is conducted through the wires w^5 and w^4 to the brushes B^5 and B^4 , and from thence to posts 5^D and 4^A , from which it is conducted to lamps 5^A and 4^A by wires $5^{A'}$ and $4^{A'}$, the circuit through the lamps being completed by return branches $W^{A5}-W^{A4}$, wire W' , post 8^D , brush B^8 , and the negative lead wire 34, the lamps 5^A and 4^A being illuminated to notify waiting passengers on both the fifth and fourth floors that the car is at the fifth floor and coming down. As the car moves downwardly, the cable drum actuates bracket 23, through the transmission formerly described, causing the brushes 25-26 to move over plates 6-5 until the brush 26 leaves its contact with the outer member of plate 6 and moves onto the outer member of plate 5, when the circuit through the lamp on the fifth floor will be broken and that lamp extinguished, both brushes being in contact with plate 5 until a continued movement of the bracket carries brush 25 from plate 5 onto plate 4, when the lights on the fourth and third floors will be illuminated, as described relative to the lamps on the fifth and fourth floors. This operation is continued until the brush 25 is carried over the short plate 1, which produces no illumination during the downward travel of the car, owing to its having no lamp connection from post Y, and the car has reached substantially the bottom of the shaft, when the end of bracket 23 is brought into contact with the switch arm 30, turning said arm on its pivot and moving the brushes B-B' etc. out of contact with posts Y-D' etc., and into contact with posts 1^U-2^U etc., when the lamps in the "up" set will be in circuit and the lamps 1^U-2^U illuminated, the former through plate 1 and the latter through plate 2. As the rope drum is revolved to carry the car upwardly in the shaft, the bracket 24 is moved in the opposite direction to that previously described, and the lamps on the upwardly successive floors are illuminated in the same

manner and reverse sequence to that described in reference to the "down" lights. During the "up" travel of the bracket, the contact of the bracket brush with plate 8 causes no illumination on the "up" travel, owing to the lack of connection with post X, but as the switch arm is shifted, by the bracket 24, and brush B' taken into circuit, the down lamp on the seventh floor which is controlled by plate 8 and wire 7^U is illuminated in the same manner as those previously described and the plate 7, which completes a circuit through lamp 6^A on the down movement, lights lamp 6^A , the sequence continuing as described.

With an apparatus of this description, the approach of the elevator may be signaled, and the reverse made automatically, in order to indicate the direction of the car's travel; the mechanism for accomplishing these results being both simple and economical in construction and operation, and easily applied to any elevator system.

Having thus described our invention, what we claim as new therein and desire to secure by Letters Patent is:-

1. An elevator signal system comprising an elevator, an elevator operating mechanism, signaling devices arranged on one or more floors of the building within which said elevator is operated, a common switch board having a separate contact part for and connected with each of said signaling devices, a separate brush for and adapted for contact with each contact part, and means actuated by the elevator operating mechanism whereby a circuit is made through one of said signaling devices, and its contact part and brush independently of the other.

2. An elevator signal system comprising a signaling device arranged on each of several floors of a building, an elevator, mechanism for operating said elevator, a separate contact point for and connected with each signaling device, a brush for each contact point, all of the brushes and contact points being adapted for simultaneous engagement, a separate conductor plate for and connected with each of said brushes, and means adapted for separate engagement with each of said conductor plates and having circuit connection with said signaling devices, said means being adapted for actuation by the elevator operating mechanism, and for completing a circuit through a single signaling device independently of the others.

3. An elevator signal system comprising an elevator and means for actuating same, an up and a down signal at each of the elevator landings, a switch board having an individual contact part for and connected with each signal, the parts connected with the up signals being arranged in one set and those connected with the down signals in a sepa-

rate set, a movable switch arm having brushes adapted for simultaneous contact with the contact parts in either set, contact plates, each connected with a separate brush, a bracket adapted for travel adjacent to said plates and provided with brushes adapted for selective contact therewith, and means whereby said bracket may be actuated from the elevator actuating mechanism coincidently with the travel of the elevator, said bracket being adapted to shift the switch arm as it reaches the opposite limits of its travel to alternate the contacts of its brushes with the contact post sets for the purpose set forth.

4. An elevator signal system comprising an elevator car and means for actuating same, a signaling device arranged on each of the floors of a building within which said car travels, a stationary switch plate, a set of binding posts on said switch plate, each having a separate connection with one of the signaling devices, a brush arm having individual brushes adapted for contact with said binding posts, an auxiliary brush on said arm and an auxiliary post on said switch plate, adapted for contact with each other, a common connection between said signaling devices and said auxiliary post, conductor plates carried by said switch plate, a brush adapted for separate contact with said conductor plates, and lead wires connected with said conductor plate and auxiliary arm brushes.

5. An elevator signal system comprising an elevator car and means for actuating same, signaling devices arranged on the floors of a building within which said car travels, a switch plate, a set of binding posts on said switch plate, each having a separate connection with one of the signaling devices, a brush arm having individual brushes adapted for separate contact with respective binding posts, an auxiliary post on said switch plate having a common connection with all of said signaling devices, an auxiliary brush on said arm adapted for contact with said auxiliary post, individual conductor plates carried by said switch plate and having separate connections with the individual arm brushes, a brush adapted for contact with said conductor plates, and lead wires connected with the conductor plate brush and auxiliary arm brush.

6. The combination with a set of signaling devices, of a switch plate, separate binding posts on said plate, each having a connection with one of the signaling devices, an auxiliary post having a common connection with all of said devices, brushes adapted for contact with said posts, an auxiliary brush adapted for contact with said auxiliary post, conductor plates carried by said switch plate, a connection between the individual conductor plates and post brushes, a brush

adapted for contact with the individual conductor plates, and lead wires connected with the auxiliary and conductor plate brushes, for the purpose set forth.

7. The combination with a double set of signaling devices, of a switch plate, a double set of binding posts carried by said switch plate, a double set of binding posts carried by said switch plate, each of the signaling devices in one set having a connection with an individual member of one of the binding post sets, and each of the devices in the second set having a connection with an individual member of the second post set, a switch arm having brushes adapted for contact with the individual members of the separate post sets, an auxiliary post in each set having a common connection with all of the members in the relative signal set, an auxiliary brush on said switch arm, adapted for contact with the auxiliary posts, conductor plates carried by said switch plate and each having a separate connection with one of said brushes, a brush adapted for contact with said conductor plates, lead wires connected with said conductor plate brush and with the auxiliary post brush, and means for rocking said switch arm, for the purpose set forth.

8. The combination with a double set of signaling devices, of a switch plate, a set of binding posts for each signal device set, a common brush set adapted for engagement with either post set, a set of conductor plates, the members of which are separately connected with the individual brush members, a connection between each of the signaling devices and a binding post in the relative post set, a connection between all of the devices in each set and a common post in the relative post set, a brush carried by said arm and adapted for engagement with either of said common posts, a brush adapted for engagement with said conductor plates, lead wires connected with said conductor plate and common post brushes, and means for rocking said brush arm, for the purpose set forth.

9. An elevator signal system comprising an elevator car and means for actuating same, a double set of signaling devices having one device of each set arranged on each of the floors of a building within which said car travels, a switch plate having a single set of contact members, a switch arm having brushes connected with the different contact members, a set of binding posts for and having connection with each signal set and adapted for alternate engagement with the brushes on said switch arm, a bracket adapted for travel over said contact members and for engagement with said switch arm as it approaches either limit of its travel, a brush on said bracket adapted for engagement with said contact members, a lead wire connected with said brush, a binding post in

each set, having a common connection with each of the signaling devices in the relative signal set, a brush on said arm adapted for contact with either of said common posts, and a lead wire connected with said common post brush, substantially as and for the purpose set forth.

10. An elevator signal system comprising an elevator car, a double set of signaling devices having one device of each set arranged on each of the floors of a building within which said car travels, a switch plate having a single set of contact members, a switch arm provided with brushes, each of which is connected with an individual contact member, a set of binding posts for each signal set, a post in each set having a separate connection with a signaling device in the relative signal set and one post in each set having a common connection with all of the devices in that set, a bracket movably mounted adjacent to said contact members, a drum shaft, a drum on said shaft provided with means

for raising and lowering said car, means connecting the drum shaft and bracket whereby the latter is moved over each of said contact members during both the upward and downward travel of the car, brushes on said bracket adapted for simultaneous contact with two of said contact plates, an auxiliary brush on said switch arm, adapted for contact with either of the common binding posts and having a lead wire connected therewith, and a lead wire connected with said bracket brush, the traveling bracket being adapted to rock said switch arm into alternate engagement with the two binding post sets, substantially as and for the purpose set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

JAMES F. BAKER.

ARTHUR C. MOORE.

Witnesses:

E. E. CARPENTER,
AUSTIN CHOUTEAU.