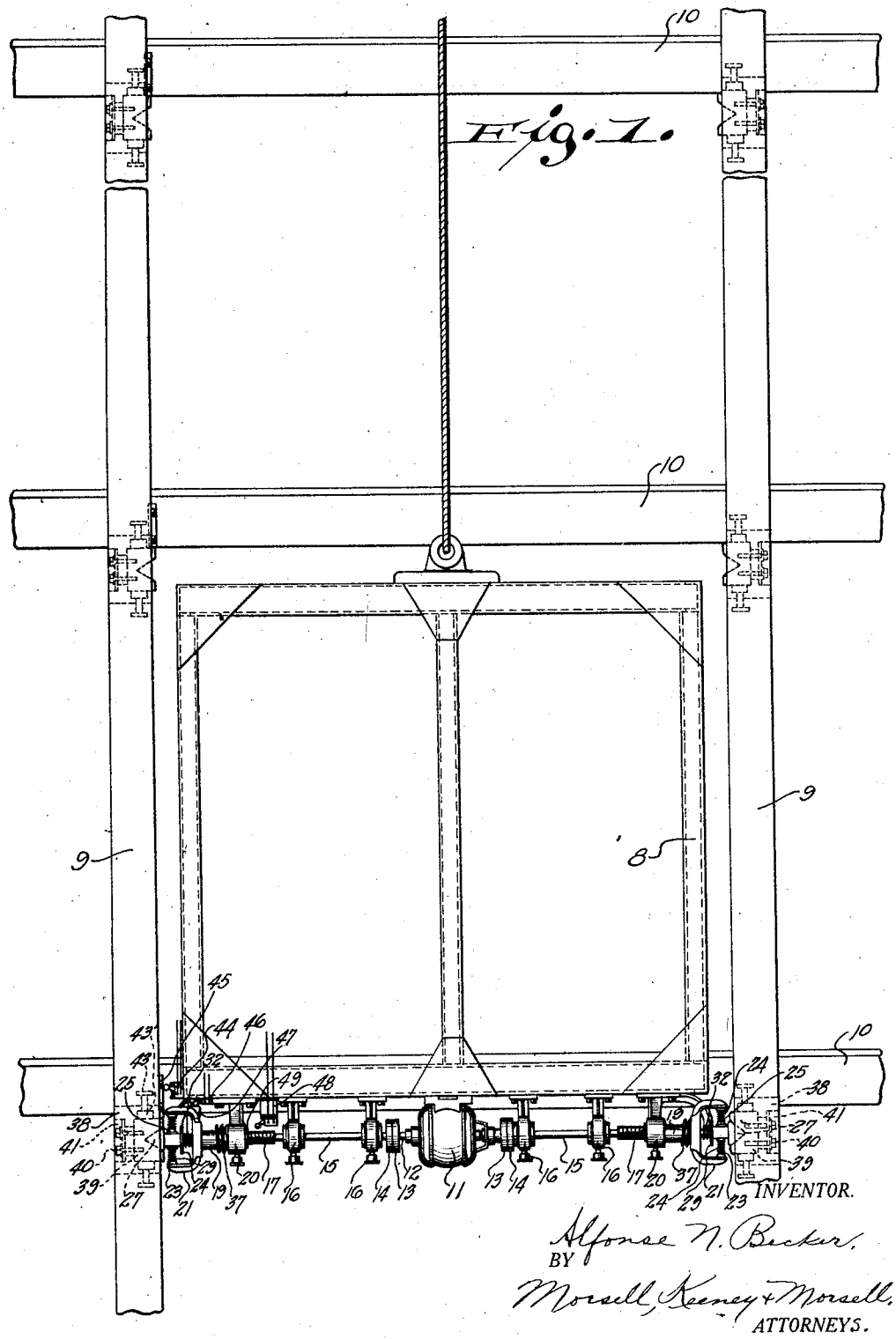
Aug. 19, 1930. A. N. BECKER 1,773,163

LEVELING DEVICE FOR CARRIERS

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Fig. 1.



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Fig. 2.

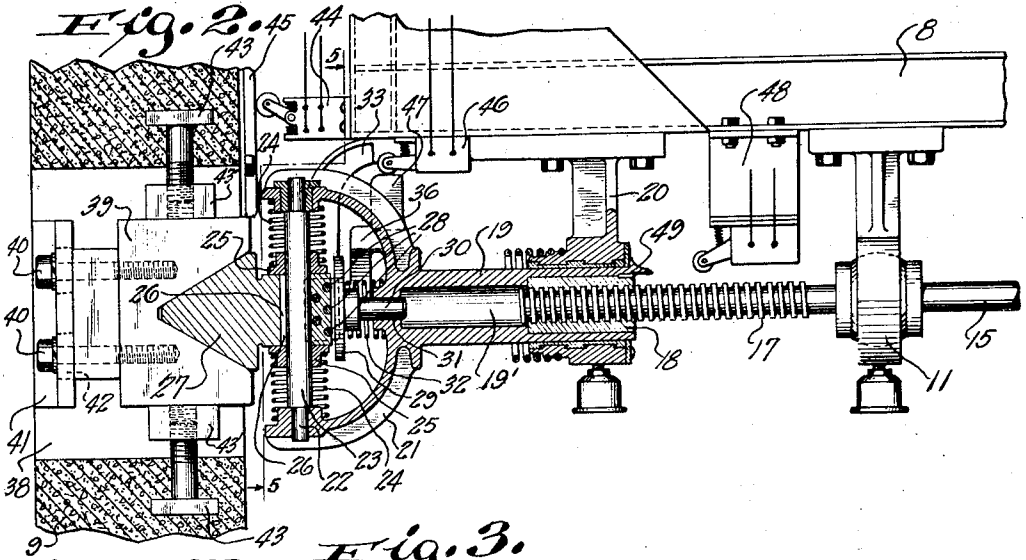


Fig. 3.

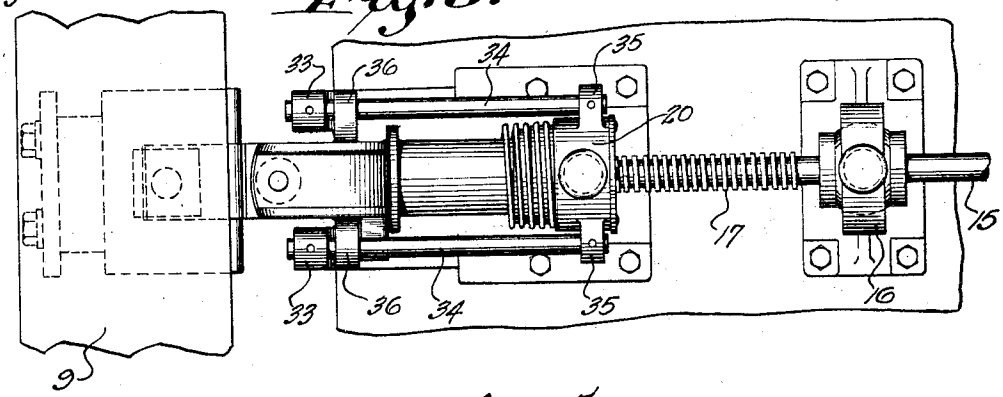
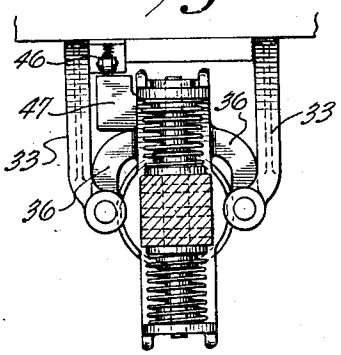


Fig. 5.



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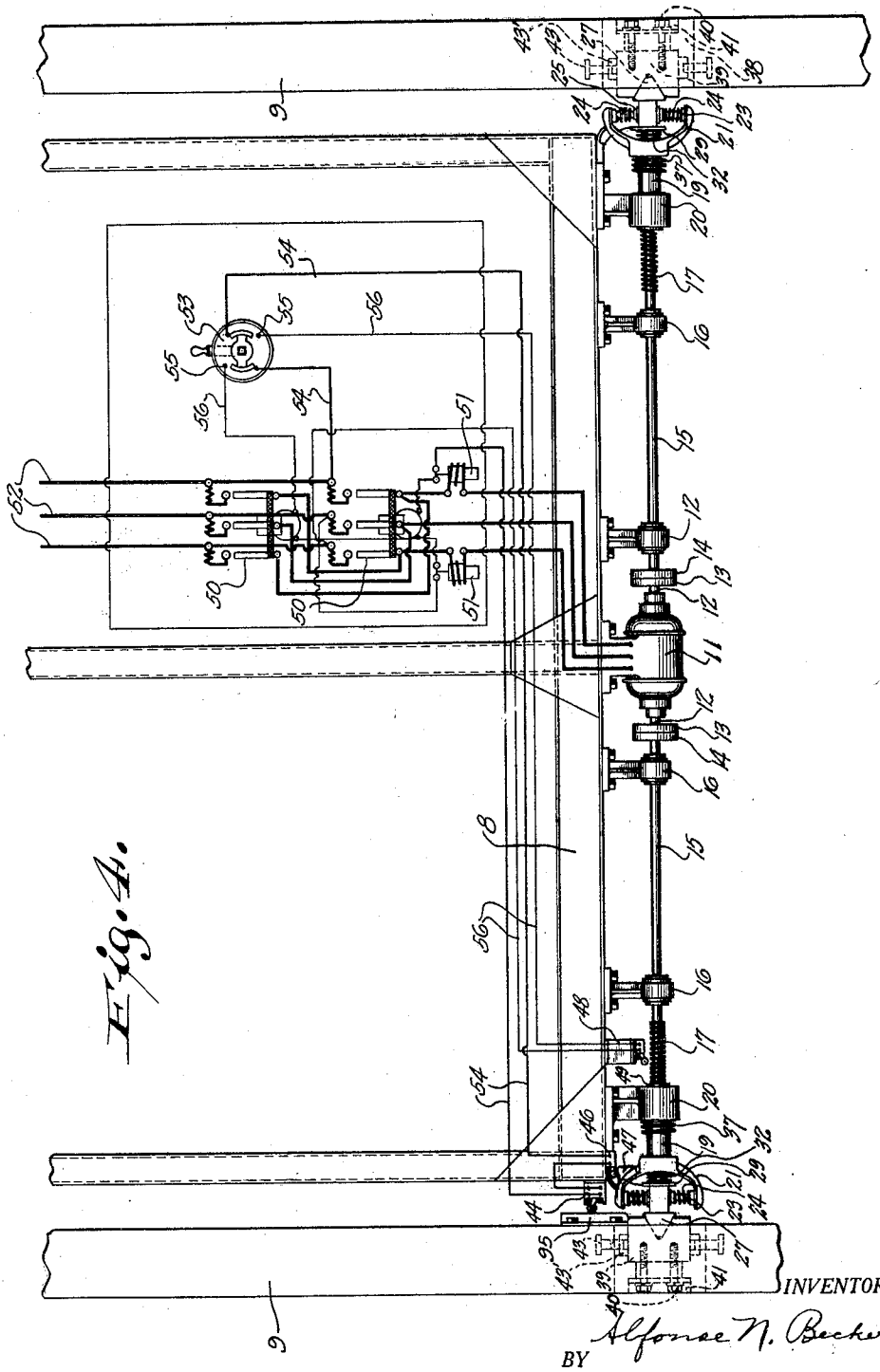


Fig. 4.

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UNITED STATES PATENT OFFICE

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LEVELING DEVICE FOR CARRIERS

Application filed September 26, 1927. Serial No. 222,105.

This invention relates to improvements in leveling devices for carriers.

It is one of the objects of this invention to provide a leveling device for use upon either horizontal or vertical carriers, which will insure the stopping of the carrier in register with a floor or other desired landing point.

It is a further object to provide a leveling device which will not interfere with the ordinary operation of the carrier.

It is a further object of this invention to provide a leveling device which is automatic in operation, and which may be arranged to cooperate with the starting and stopping lever of the carrier.

It is a further object of this invention to provide a leveling device for carriers which is ineffective between landing places.

It is a more specific object of this invention to provide a leveling device in which the sides of the carrier guideway or shaft are provided with a plurality of sockets, adjacent to each landing point, and in which the carrier is provided with wedge members arranged to automatically engage or disengage the sockets.

It is a further object of this invention to provide a leveling device for carriers which is simple in construction and operation, and is well adapted for the purpose described.

With the above and other objects in view, the invention consists of the improved leveling device for carriers, and all its parts and combinations as set forth in the claims and all equivalents thereof.

In the accompanying drawing, in which the same reference numerals designate the same parts in all of the views:

Fig. 1 is a front elevation of a vertical carrier, parts being broken away, with the improved leveling device in attachment therewith;

Fig. 2 is a detail view of one side of the leveling device, showing it in attachment with a carrier, parts being broken away and parts being shown in section;

Fig. 3 is an inverted plan view thereof;

Fig. 4 is a view of the leveling device in attachment with a portion of a carrier, the wiring arrangement being shown in detail; and

Fig. 5 is a sectional view taken on line 5—5 of Fig. 2.

Referring to the drawing, the numeral 8 designates a carrier which is positioned within a shaft or guideway comprising vertical side members 9, and landing partitions 10. Mounted on the lower side of the carrier platform is an electric motor 11, having a rotatable shaft 12 extending from each side thereof. On each end of the shaft is a disk 13 to which is secured a similar disk 14 rigidly mounted on a shaft 15 journaled in bearings 16 extending from the lower side of the carrier platform. On the outer end of each of the shafts 15 is a worm 17, one having a left hand thread and the other having a right hand thread. Each of the worms 17 turns within an internally threaded bushing 18 which is keyed within an enlarged bore in a tubular member 19. The tubular members 19 are rigidly secured to supporting brackets 20 extending from the carrier platform. The bushings 18 extend only part way within the tubular members 19, leaving a bore 19′ within which the end of the worm can extend when the device is being operated. The tubular members 19 are formed with semi-circular end portions 21, having a vertical rod 22 between each of said end portions. Sleeves 23 are mounted on the rods 22, and a pair of springs 24 surround the ends of each sleeve and are held in place by disks 25. Each sleeve extends through a bore 26 in a wedge member 27 which is positioned between the disks 25. The inner end of each wedge member is provided with rollers 28 which are adapted to provide a slidable, frictionless contact between the end of the wedge and the disk 29. The disk 29 is mounted on one end of a rod 30 which is slidable within a small bore 31 in the end of the tubular member 19. A spring 32 surrounds the rod 30. As the bore 26 in the end of the wedge is larger than the sleeve, the wedge may give slightly in a horizontal direction against the tension of the spring 32. There is also an allowance for vertical movement against the springs 24, the springs taking up the shock

when the carrier is brought to a sudden stop, and the rollers 28 making a sliding contact with the disk 29 as before mentioned.

Brackets 33, having perforated end portions, extend from the carrier platform. Rods 34 have one end secured in the perforated ends of the brackets 33 and the other end secured within lugs 35 on the bracket 20. A guiding bracket 36 secured to the semi-circular member 21, has its ends perforated and slidable on the rods 34. Springs 37 are mounted on the brackets 20 to engage the semi-circular members 21 when the tubular members slide within the brackets 20 upon the turning of the worms.

An opening 38 is provided in each side of the guideway, adjacent to each landing point. Socket members 39 to act as stops are held by bolts 40 extending from brackets 41 through slots 42. Bolts 43 having their head portions within the side members 9 of the guideway have nuts 43′ on their ends for adjusting the socket members vertically.

One side of the carrier is provided with a limit switch 44 which is arranged to engage a plate 45 on the side of the guideway. A limit switch 46 on the lower end of the carrier is arranged to engage an extension 47 of one of the semi-circular members 21. Another limit switch 48 is adapted to engage a projecting end 49 of one of the tubular members 19.

The operation of the device may be best seen from Fig. 4. Reversing switches 50, having overload relays 51, are provided. Lead in wires 52, indicated by the double lines, extend to the reversing switches, and from there to the motor 11. The control switch 53 may be made to operate with the starting lever of the elevator if it is desired. Here it is shown independently, and in the position for closing the circuit to the motor in which the wiring is indicated by a heavy single line 54. The wires 54 are connected with the limit switches 44 and 46. When the lever for stopping the elevator is manipulated, the control switch is thrown into the position shown in Fig. 4. The limit switch 46 is normally closed, and the switch 44 is normally open. When the switch 44 comes in contact with the plate 45, it is also closed and the motor 11 revolves in a direction to cause the wedge members 27 to be threaded outwardly until they are in the position shown in the figure, stopping the elevator at a point exactly level with the landing place. When the wedges are fully in, as indicated in the figure, the limit switch 46 will engage the extension 47 and open the circuit, thereby automatically stopping the motor when the wedges are fully in the sockets. When it is desired to start the elevator again, the lever on the control 53 is thrown over to contact with the points 55. This closes the circuit shown by the light single line wires 56, which are connected with the limit switch 48. As this switch is normally closed the motor 11 will revolve, this time in a reverse direction by means of automatic action of the reversing switches 50. The wedges will be threaded inwardly until the limit switch 48 engages with the extension 49, opening the circuit.

The control lever 53 may be arranged to cooperate with the starting lever of the carrier when the carrier is traveling in either direction.

The automatic reversing mechanism is of a type commonly used, as are the limit switches, the switch 44 being of the double throw type so as to operate when the carrier is going in either direction.

From the foregoing description it may be seen that the operation of the improved leveling device is positive, and that the limit switch 44 allows it to operate only at landing points. The limit switches 46 and 48 operate to stop the movement of the wedge, both when it is fully in the socket, and when it is fully out.

From the foregoing description it may also be seen that the improved leveling device is simple in construction, is strong and durable, and is well adapted for the purpose described.

What I claim is:

1. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising a rotatably mounted shaft on said carrier, a worm on said shaft, an engaging member threaded on said worm, means for rotating said shaft to cause the engaging member to be threaded in and out on said worm for engaging and disengaging a portion of the guideway when the carrier is at a landing point, automatic means for stopping the rotation of said shaft when the guideway is engaged, and automatic means for stopping the rotation when the guideway is disengaged.

2. The combination with a carrier and a carrier guideway having sockets in side portions thereof, of a leveling device therefor, comprising a rotatably mounted shaft on said carrier, a worm on said shaft, an engaging member threaded on said worm, means for rotating said shaft to cause the engaging member to be threaded in and out on said worm for engaging and disengaging one of the sockets when the carrier is at a landing point, automatic means for stopping the rotation of said shaft when the guideway is engaged, and automatic means for stopping the rotation when the guideway is disengaged.

3. The combination with a carrier and a carrier guideway having sockets in side portions thereof, of a leveling device therefor, comprising a rotatably mounted shaft on said carrier, a worm on said shaft, an engaging member threaded on said worm, means for

rotating said shaft to cause the engaging member to be threaded in and out on said worm for engaging and disengaging one of the sockets when the carrier is at a landing point, yielding means in connection with said engaging member, automatic means for stopping the rotation of said shaft when the guideway is engaged, and automatic means for stopping the rotation when the guideway is disengaged.

4. The combination with a carrier and a carrier guideway having sockets in side portions thereof, of a leveling device therefor, comprising a motor on the carrier; a shaft extending from each side of said motor; worms on said shafts; a supporting bracket having a bored portion extending from each side of the carrier; tubular members having semi-circular outer end portions, and having their inner ends slidable within the bore of the supporting brackets, and having an internally threaded portion for receiving said worm; an engaging member yieldingly mounted within the semi-circular outer end of each of the tubular members; and means for operating the motor to cause the engaging members to engage and disengage the sockets when the carrier is at a landing point.

5. The combination with a carrier and a carrier guideway having V-shaped sockets in side portions thereof, of a leveling device therefor, comprising a motor on the carrier; a shaft extending from each side of said motor; oppositely threaded worms on said shafts; an internally bored and threaded tubular member engaging each of said worms, and having a semi-circular outer end portion; a vertical rod in each of said outer end portions; a wedge member having a bored inner end through which said rod passes, the said bore being larger in diameter than the rod; yielding means on said rod operative when the wedge moves vertically; yielding means engaging the wedge member when it is moved horizontally; guiding means for the tubular members; and means for operating the motor to cause the wedge members to engage and disengage the sockets when the carrier is at a landing point.

6. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising an engaging member on said carrier for engaging and disengaging portions of said guideway, an electric motor for operating said engaging member, means on the carrier for controlling said motor, and automatic means for closing the circuit to the electric motor at the proper time to cause the engaging member to operate to stop the carrier flush with a landing point.

7. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising an engaging member on said carrier for engaging and disengaging portions of said guideway, an electric motor for operating said engaging member, means on the carrier for controlling said motor, a contact plate on the guideway, and a switch for engaging said plate to automatically close the circuit to the motor at the proper time to cause the engaging member to operate to stop the carrier flush with a landing point.

8. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising an engaging member on said carrier for engaging and disengaging portions of said guideway, an electric motor for operating said engaging member, means on the carrier for controlling said motor, automatic means for closing the circuit to the electric motor at the proper time to cause the engaging member to operate to stop the carrier flush with a landing point, and automatic means for breaking the circuit when the engaging member has fully engaged the guideway.

9. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising an engaging member on said carrier for engaging and disengaging portions of said guideway, an electric motor for operating said engaging member, means on the carrier for controlling said motor, automatic means for closing the circuit to the electric motor at the proper time to cause the engaging member to operate to stop the carrier flush with a landing point, automatic means for breaking the circuit when the engaging member has fully engaged the guideway, and automatic means for breaking the circuit when the engaging member has fully disengaged the guideway.

10. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising a stop member and an engaging member for engaging and disengaging said stop member, electric motor means for operating said engaging member, and automatic means for closing the circuit to said electric motor at the proper time to cause said engaging member to engage said stop member.

11. The combination with a carrier and a carrier guideway, of a leveling edvice therefor, comprising a stop member and an engaging member for engaging and disengaging said stop member, electric motor means for operating said engaging member, automatic means for closing the circuit to said electric motor at the proper time to cause said engaging member to engage said stop member, and automatic means for breaking the circuit to said electric motor when said engaging member has fully engaged said stop member.

12. The combination with a carrier and a carrier guideway, of a leveling device therefor, comprising a stop member and an engaging member for engaging and disengaging said stop member, electric motor means for

operating said engaging member, automatic means for closing the circuit to said electric motor at the proper time to cause the engaging member to engage said stop member, automatic means for breaking the circuit to said motor when said engaging member has fully engaged said stop member, and automatic means for breaking the circuit to said motor when said engaging member has fully disengaged the said stop member.

In testimony whereof, I affix my signature.

ALFONSE N. BECKER.