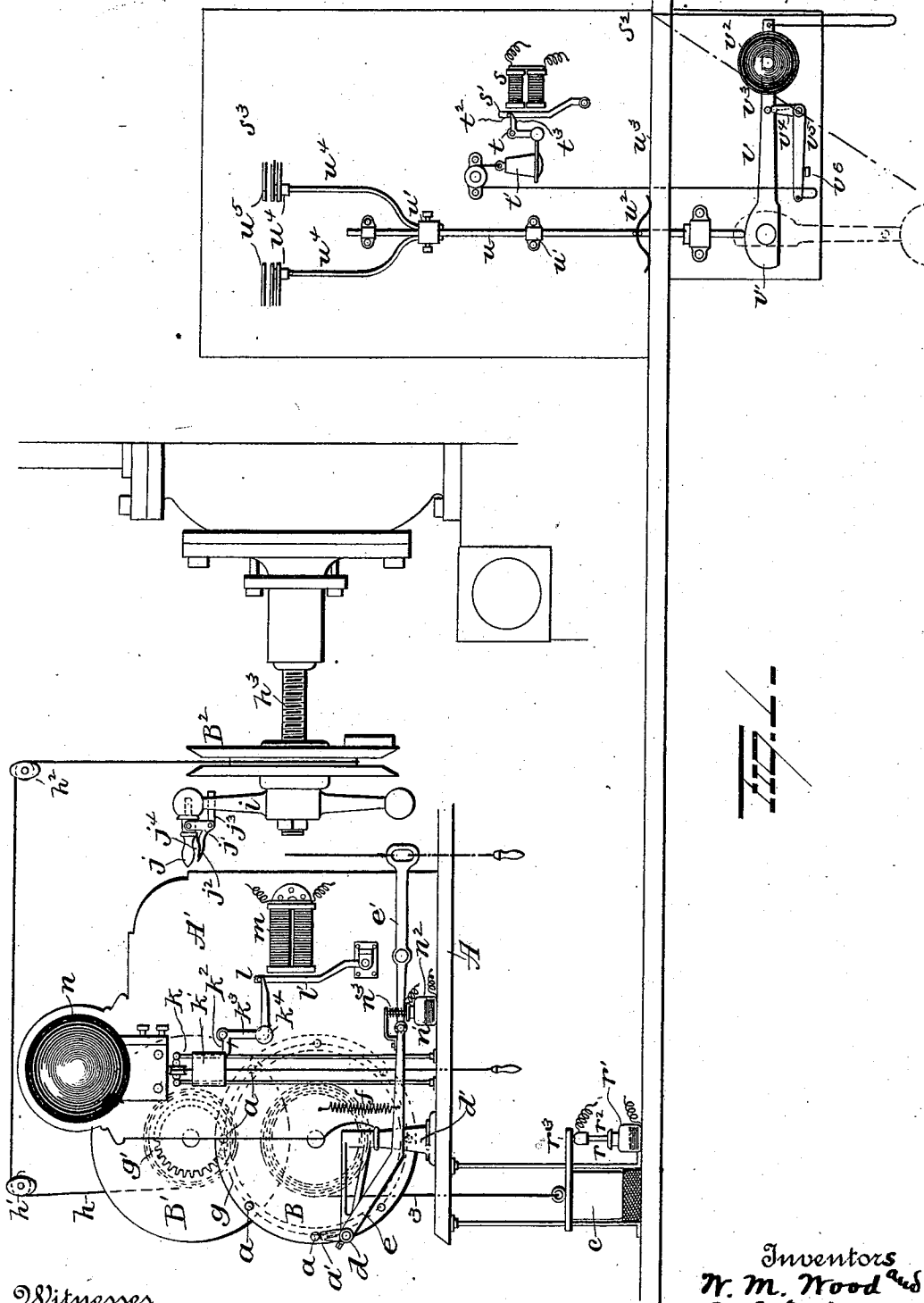


2 Sheets—Sheet 1.

No. 548,280.

Patented, Oct. 22, 1895.



Witnesses
E. J. Nottingham
G. F. Downing

Inventors
W. M. Wood and
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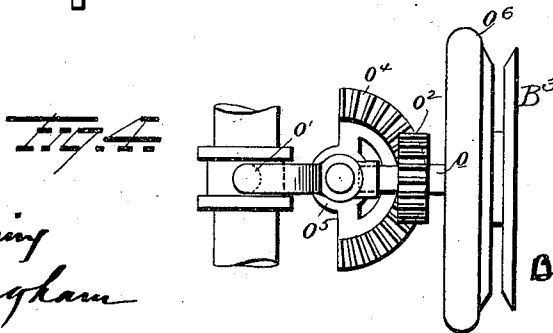
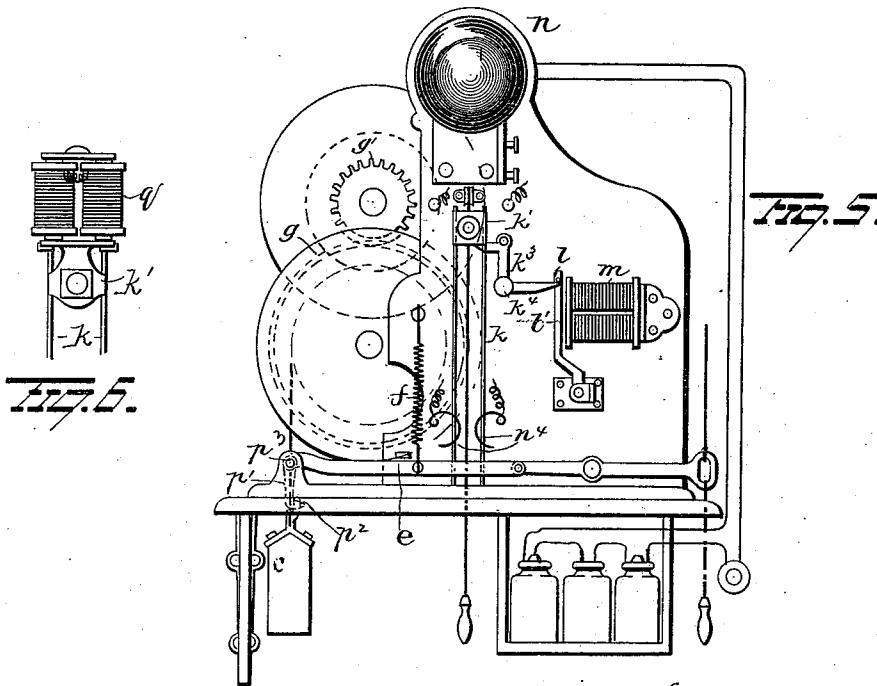
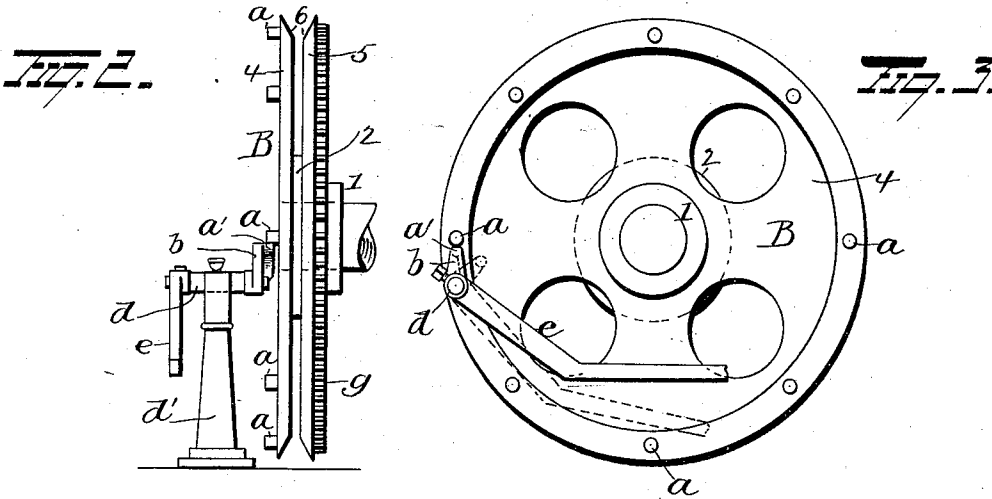
(No Model.)

2 Sheets—Sheet 2.

W. M. WOOD & J. C. MILLER.
ELECTRIC STOP MECHANISM.

No. 548,280.

Patented Oct. 22, 1895.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM M. WOOD AND JAMES C. MILLER, OF ELMIRA, NEW YORK.

ELECTRIC STOP MECHANISM.

SPECIFICATION forming part of Letters Patent No. 548,280, dated October 22, 1895.

Application filed June 7, 1894. Serial No. 513,819. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM M. WOOD and JAMES C. MILLER, citizens of the United States, residing at Elmira, in the county of Chemung and State of New York, have invented certain new and useful Improvements in Electrical Stop Mechanism; and we do hereby 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.

Our invention relates to an improvement in electric stop or starting mechanism, the object of the invention being to produce means whereby to release devices constructed and adapted to transmit motion to other devices to stop or start the operation of mechanism quickly and effectually, said stop mechanism being constructed and adapted to be operated by the use of electrical devices so arranged as to be manipulated from various places more or less distant from the stop mechanism and the mechanism to be stopped or controlled.

A further object is to produce a stop mechanism so constructed and arranged that it can be made to operate (from a distant point) to stop the operation of the driving-power of an electrical generator and simultaneously short-circuit said generator, so as to stop the flow of current from it over the line whether said line include electric lamps, motors, or other translating devices.

A further object is to generally improve the construction and arrangement of an electrical stop or starting mechanism, whereby to render the same simple in construction, accurate in operation, and effectual in all respects in the performance of its functions.

With these objects in view the invention consists in certain novel features of construction and combinations and arrangements of parts, as hereinafter set forth, and pointed out in the claims.

In the accompanying drawings, Figure 1 is an elevation illustrating our improvements. Figs. 2, 3, and 4 are detail views. Figs. 5 and 6 are views illustrating certain modifications.

A represents a suitable base, on which a framework A' is located, and in said framework a drum or flanged wheel B is revolvably mounted.

The drum or flanged wheel B comprises a hub 1, a body portion 2, on which a cord or chain 3 is adapted to be wound, and disks 4 5 55 at the respective sides of the body portion 2, said disks being about twice the diameter of the body portion 2 and produce flanges 6 6, between which the cord or chain will be wound on the drum or body portion 2, said flanges 60 preferably having the inner edges of their peripheries beveled, so as to properly direct the cord or chain between them, each coil winding over another.

From the outer face of the disk 4, in proximity to its periphery, pins *a* project outwardly, one of said pins being held normally in engagement with a lug *a'* on an arm *b* by means of a weight *c*, attached to the cord or chain 3, the function of said weight being to cause the drum to revolve when released, for a purpose which will hereinafter appear. The arm *b* is secured to one end of a horizontal shaft *d*, and the latter is loosely mounted in the upper end of a standard *d'*, secured to the base A. The arm *b* is made A-shaped, and the lug *a'*, which projects from one edge of said arm, is flattened at its upper end to properly receive a pin *a* without liability of accidental displacement.

To the end of the shaft *d* one end of a lever *e* is secured, said lever extending from its connection with the shaft first in a diagonal and then in a horizontal direction, and to the free end of the horizontal portion one end of a lever *e'* is connected, said lever *e'* being pivotally supported at a point between its ends. The levers *e e'* are maintained in their normal positions, so that the lug *a'* on the arm *b* will be normally retained in proper position to receive one of the pins *a* by means of a comparatively light spring *f*, secured at one end to the lever *e* and at the other end to the framework. By locating the lug at one edge of the A-shaped arm *b* the pins *a* on drum B will be permitted to readily pass the same during the revolution of the drum, the engagement of the pins with said lug tending to reset or move it in position to receive a pin *a* on the drum. A drum or flanged wheel B' is also mounted in the framework and is constructed in the same manner as the drum B, omitting the pins *a*.

The drum B carries a gear-wheel *g*, adapted

to mesh with and transmit motion to a pinion g' , carried by the drum B' . A cord or chain h is wound at one end on the drum B' , and after passing over pulleys h' h^2 , carried by pulley-frames secured to the ceiling of the room in which the apparatus is located, the other end of the cord or chain is wound on a drum or flanged wheel B^2 , the construction of which is the same as the drums B and B' .

The drum B^2 is located immediately in line with the pulley h^2 and is mounted loosely on the stem h^3 of a valve. A hand-wheel i is secured to said valve-stem in close proximity to the drum B^2 , and to said wheel a handle j is secured. To the shank of the handle j a lever j' is pivotally connected and provided with a finger-bar j^2 , normally disposed parallel with said handle. At the free end of the lever j' a dog j^3 is loosely connected and adapted to engage teeth (or perforations) on the drum B^2 . Thus it will be seen that the wheel i and drum B^2 will be normally locked together, so that when the drum is rotated the wheel and valve-stem will also be turned and the valve closed or opened, the dog being retained in engagement with the drum by means of a spring j^4 . When it is desired to manipulate the valve manually, the finger-bar j^2 will be pressed to move the dog j^3 out of engagement with the drum B^2 , whereupon the valve can be turned without turning the drum.

From this construction and arrangement of parts it will be seen that while the valve can be operated manually, still when it is not so operated the drum will always be locked to the wheel i , so that when the mechanism above described is operated the valve will be automatically closed or opened.

Guides k are secured to the front of the framework A' for the accommodation of a vertically-movable weight k' , said weight being normally retained at the upper end of its movement by a tooth k^2 , projecting from an L-shaped lever k^3 , said lever being pivoted at its upper end in close proximity to the tooth k^2 to the framework A' and at k^4 is weighted to insure the proper position of the tooth k^2 to receive the weight k' when the latter is moved up to resist it. The lever k^3 is normally maintained in position to retain the weight at the upper end of its movement by a pin l , projecting from an armature-lever l' , the free end of said lever being adapted to normally engage said pin. In proximity to the armature-lever l' an electromagnet m is located and adapted to attract said armature, so as to move the pin l out of line with the lever k^3 , and thus release the weight k' . The electromagnet m is included in circuit with a suitable battery or other electric-current generator and circuit-closers located at any desired places. An electric bell n is mounted in the framework A' and included in a normally-open circuit with a suitable battery and a circuit-closer n' . The circuit-closer n' preferably comprises a metallic vessel n^2 , contain-

ing mercury, and a contact rod or plunger n^3 , the latter being operated by the lever.

From the construction and arrangement of parts above described it will be seen that when the circuit through the electromagnet m closed the armature of said magnet will be attracted and the weight k' released, as above explained. The weight, being thus released, will fall upon the lever e and turn it to cause the lug a' on the arm b to move out of the path of a pin a , projecting from the drum B , and thus release said drum. The drum B being released the weight c will descend, causing the drum to rotate, which rotation will be imparted through the gear g and pinion g' to the drum B' , the rotation of which will cause the cord or chain h to be wound thereon and unwound from the drum B^2 , thus rotating the latter. The drum B^2 being normally locked to the stem of the valve when it is rotated in the manner just described said valve-stem will also be rotated and the valve closed, (or opened, as the case may be.) The quick and accurate stopping of the engine may in this manner be assured, the apparatus being operated by means of a circuit-closer located at a distant point. When the weight k' strikes the lever e , the contact or plunger n^3 will be made to move downwardly and make contact with the mercury in the vessel n^2 , thus closing the bell-circuit and causing the sounding of the bell as long as the weight k' remains on the lever e .

Instead of the form of circuit-closer n' above described two contact-springs n^4 may be secured to the framework and adapted to receive the weight k' between them, so that when the weight descends it will close the bell-circuit.

Instead of causing the mechanism above described to operate the throttle-valve of an engine, it may be made to operate a clutch or other device in order to stop certain machinery, in which case a drum B^3 (similar in construction to the other drums above described) may be secured to the lever o , which engages the collar o' of a suitable clutch and the cord h wound on said drum. In order to impart the proper motion to the clutch when the drum B^3 is rotated, a pinion o^2 is secured to the shaft or lever o and adapted to travel on a rack bar or segment o^4 , supported by a suitable standard o^5 , as shown in Fig. 4. The shaft or lever o may also be provided with a wheel o^6 , by means of which to operate the clutch manually, if desired.

Instead of releasing the weight c for the purpose of starting the stop mechanism in the manner above described, the construction and arrangement of parts shown in Fig. 5 may be adopted. In this form of the invention the lever e is secured to a shaft p , mounted in suitable brackets on the base A , and from said shaft an arm p' depends through said base, said arm being provided at its lower end with a hook p^2 , adapted to engage a suitable loop

on top the weight c . When the lever e is turned by the engagement therewith of the weight k' , the arm p' will be moved in the arc of a circle and the hook p^2 withdrawn from the loop carried by the weight c , thus releasing the latter and causing the operation of the mechanism, as above explained.

It may sometimes be desired to work the apparatus on an open instead of a closed circuit, and this can be accomplished by the construction of parts shown in Fig. 6. The electromagnet m and the L-shaped lever k^3 will be omitted, and the weight k' will be normally held at the upper end of its movement by means of an electromagnet g , said weight carrying an armature to be attracted by said magnet.

To the lever e' a cord may be attached for releasing the weight c by a governor or by other means, if desired.

The weight c is adapted to operate a circuit-closer r when it reaches the lower end of its movement. This circuit-closer may conveniently consist of a vessel r' , containing mercury, and a spring-sustained contact rod or plunger r^2 , adapted to be made to make contact with said mercury by the engagement with said rod or plunger of an arm r^3 , projecting from the weight c , or by weight striking directly on top of plunger. An electromagnet s is included in circuit with the circuit-closer r and adapted to attract an armature s' , pivotally supported in a suitable casing s^2 , secured to or below a switchboard s^3 . An L-shaped lever t is pivoted at its upper end in the casing s^2 and adapted at its free end to support a weight t' , said lever being retained normally in such position by the engagement of a pin t^2 on the armature-lever s' with a tooth t^3 , projecting from said L-shaped lever.

A vertically-movable rod u is located on the switchboard s^3 and adapted to move in suitable guides u' , the lower end of said rod being adapted to project below the bottom of the switchboard and normally supported by spring-arms u^2 , secured to said rod and resting on a suitable base u^3 . To said rod, near its upper end, contact-arms u^4 are secured and adapted when the rod is moved upwardly to engage contact-plates u^5 , said contact-plates being electrically connected with the poles of a generator and with a line including translating devices. Below the base u^3 a lever v is pivotally supported at a point in proximity to one end, said lever being provided on its end nearest its pivotal support with a cam or shoulder v' and at its opposite end with a weight v^2 . At a point near the weighted end of the lever v a pin v^3 projects laterally therefrom and is adapted to normally rest on a lug or pin projecting laterally from the arm v^4 of a lever v^5 . The arm v^4 projects at right angles from one end of the lever v^5 , and the latter is pivotally supported at one end at a point directly beneath the pin v^3 of the lever v , the other end of said lever v^5 being normally supported in a horizontal position by a lug v^6 .

From this construction and arrangement of parts it will be seen that the lever v is normally supported in a horizontal position by the pin or lug carried by the arm v^4 of lever v^5 and that should the latter be moved said lever v would be released. The free end of the lever v^5 has one end of a cord w attached thereto. The other end of said cord, after passing over a pulley w' , mounted above the weight t' , is connected to said weight.

Now it will be seen that when the electric circuit is closed through the electromagnet m , above alluded to, the mechanism will be set free and the throttle-valve of the engine or a clutch or other device will be operated and the machinery stopped. As the weight c reaches the lower end of its movement, the circuit through the electromagnet s will be closed, thus causing it to attract its armature to release the L-shaped lever t , and the latter being thus released the weight t' will descend, thus turning the lever v^5 on its fulcrum through the medium of the cord w . The lever v^5 being thus turned, the lever v will be thereby released, as above explained, and the weight at one end thereof will cause said lever v to assume a vertical position, as indicated in dotted lines in Fig. 1. As said lever v^5 is moving to this position, the cam or shoulder v' will engage the lower end of the vertically-movable rod u and move the same upwardly, thus causing the arms u^2 to engage the contact-plates or circuit-breaker u^5 , thereby short-circuiting an electrical generator and stopping the supply of electricity to or from the translating devices on the line.

From the construction, arrangement, and operation of apparatus above described it will be seen that our improvements are not only capable of stopping machinery quickly and effectually, but are also adapted to automatically short-circuit an electrical generator, so that when the apparatus is employed in the power-house of an electric railway or in an electric-lighting plant by the manipulation of a single operated circuit-closer not only will the engine or driving power of the generator be stopped, but the source of electrical energy will be also stopped.

Having fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In an electric stop mechanism, the combination with a motor mechanism, the machinery to be stopped and a switch device connected with an electrical generator, of trip devices for releasing the motor mechanism and switch devices and electrical devices constructed and adapted to operate all of said trip mechanism by the use of a single circuit closer, whereby to stop the machinery and cut out the source of electrical energy simultaneously, substantially as set forth.

2. In a stop mechanism, the combination with a shaft connected with the machinery to be stopped, and a drum carried by said shaft, a framework, a drum or flanged wheel car-

electrical circuit through said last mentioned electro-magnetic devices, substantially as set forth.

10. In a stop mechanism, the combination
5 with a revoluble drum, a cord or chain wound on said drum, a weight attached to said cord or chain and electrically controlled devices for releasing said drum and weight, of contact plates connected with the poles of an
10 electrical generator, a movable rod, contact arms carried by said rod, a weighted lever pivoted below said rod and having a shoulder to engage and move the same when released, a trip-device for normally supporting said
15 weighted lever, a weight connected with the trip device, trip devices for retaining said weight normally elevated, an electro-magnetic device for controlling said last mentioned trip device and a circuit closer included in an electrical circuit with said magnet, said first mentioned weight being adapted to automatically
20 close said circuit closer, substantially as and for the purpose set forth.

11. In a stop mechanism the combination
25 with a revoluble drum, a cord or chain wound thereon, a weight attached to said cord or chain and electrically controlled devices for releasing said drum and weight, of contact plates connected with the poles of an electrical generator, a movable rod, contact arms
30 carried by said rod and adapted to make contact with said plates to short-circuit the generator, a weighted lever pivoted below said rod and having a cam or shoulder to engage the same to move it, a trip lever pivoted below said weighted lever, a pin projecting from the weighted lever, an arm or pin carried by the trip lever and adapted to receive the pin
35 on the weighted lever to normally support the latter in a horizontal position, a weight connected with the free end of said trip lever, an L-shaped lever for normally supporting said weight, a tooth or shoulder on said L-shaped

lever, an armature lever carrying a pin to engage said tooth, an electro-magnet for actuating said armature lever to release the L-shaped lever and weight whereby to trip the trip lever to release the weighted lever, and a circuit closer included in circuit with said electro-magnet, the first mentioned weight
50 being adapted to automatically close said circuit closer, substantially as set forth.

12. In a stop mechanism, the combination with a revoluble drum, a cord or chain wound on said drum, a weight connected to said cord
55 or chain, and electrically controlled devices for releasing said drum and weight, of mechanism constructed and adapted to receive motion from said drum to stop machinery, a movable rod carrying contact arms, contact plates
60 adapted to be connected with an electrical generator, a pivoted lever weighted at one end and having a shoulder at the other to engage said rod and move the contact arms into contact with the contact plates whereby to
65 short-circuit the generator, a trip device normally retaining said weighted lever in a horizontal position, a weight connected with said trip device, a trip device for normally retaining said weight elevated, an electro-magnetic
70 device for controlling the operation of said last mentioned trip device, and a circuit closer included in an electrical circuit with said last mentioned electro-magnetic device, said first mentioned weight being adapted to auto-
75 matically close said circuit closer, substantially as and for the purpose set forth.

In testimony whereof we have signed this specification in the presence of two subscribing witnesses.

WILLIAM M. WOOD.
JAMES C. MILLER.

Witnesses:

JOHN C. GALLAGHER,
FRANK D. CROW.