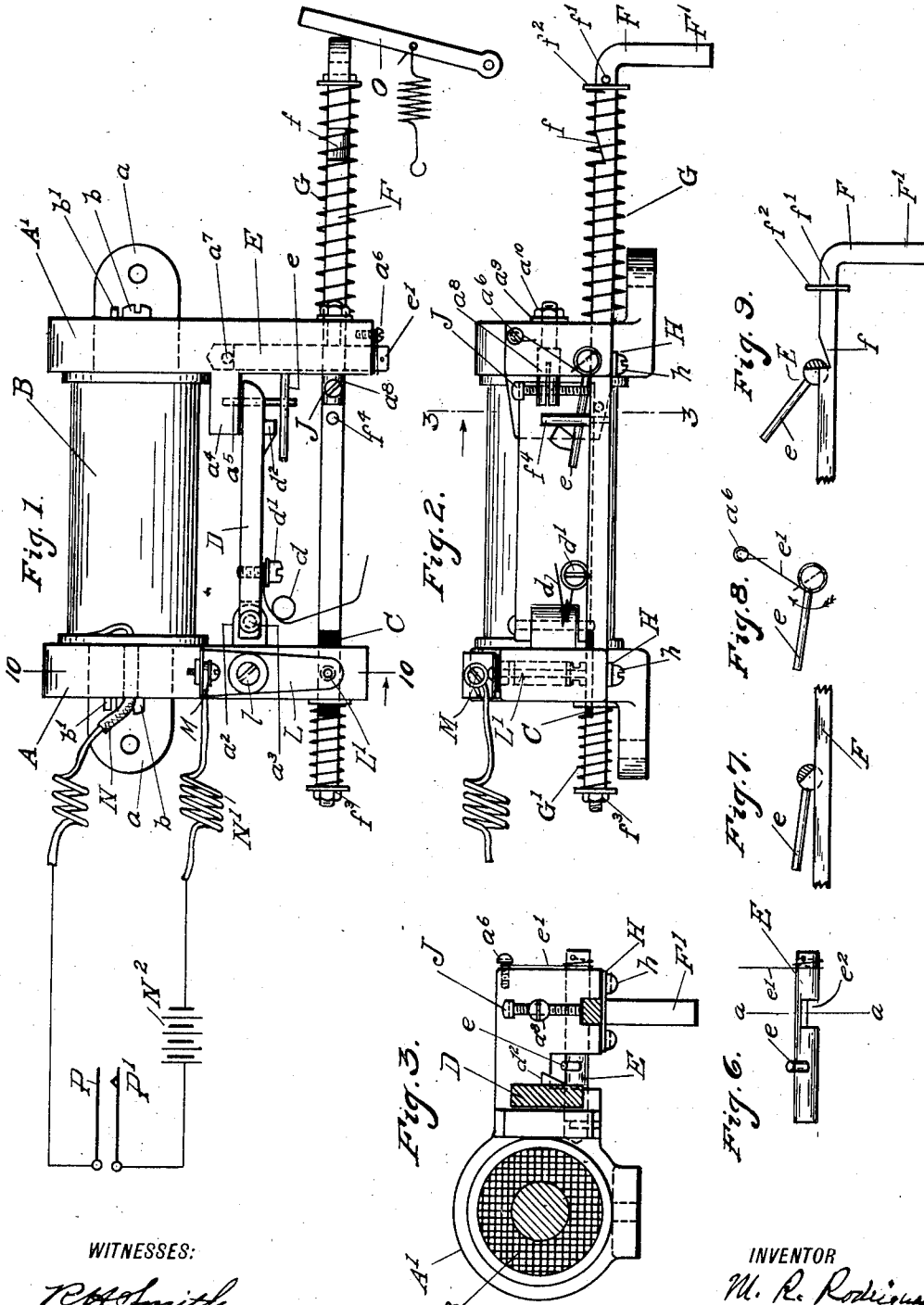


M. R. RODRIGUES.
MAGNETICALLY OPERATED TRIPPING DEVICE.
APPLICATION FILED JAN. 14, 1911.

1,061,326.

Patented May 13, 1913.

2 SHEETS—SHEET 1.



WITNESSES:

Robert Smith
J. R. Brown

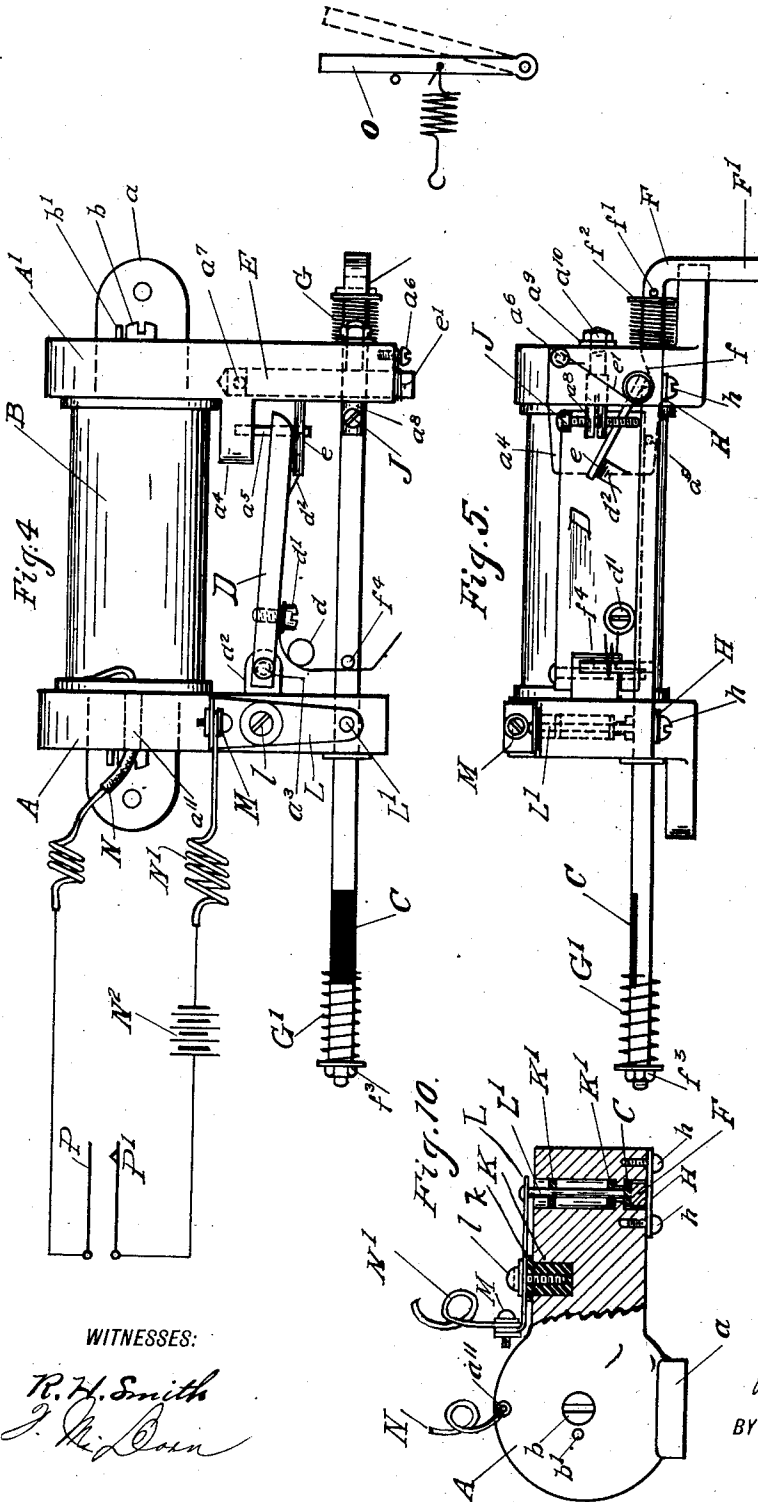
INVENTOR
M. R. Rodrigues
BY *J. O. Fowler*
ATTORNEY

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R. H. Smith
J. H. Brown

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UNITED STATES PATENT OFFICE.

MANUEL R. RODRIGUES, OF BROOKLYN, NEW YORK.

MAGNETICALLY-OPERATED TRIPPING DEVICE.

1,061,326.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed January 14, 1911. Serial No. 602,563.

To all whom it may concern:

Be it known that I, MANUEL R. RODRIGUES, a citizen of the United States of America, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a certain new and useful Magnetically-Operated Tripping Device, of which the following is a specification, the same being 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.

This invention relates to automatic tripping mechanisms for operating apparatuses of various kinds, as, for example, those wherein it may become necessary at times to use a clutch or release lever to disconnect a machine from, or to connect the same with, a source of power, or where it is desired to throw in, or release, a clutch in automatic machinery, or in cases where it may be deemed advantageous to employ an electric switch which may be adapted to be operated by a circuit changing device to open, or else to close, an electric circuit.

With these and other objects in view, the invention consists of a suitable support and a release or operating lever or tripping bar, controlled by a preferably spring controlled locking rock-shaft, and also by a magnetically actuated device, as an electromagnet.

It further consists of the constructions, combinations, and arrangement of parts whereby a comparatively simple, and efficient and reliable device is obtained, as is hereinafter described and also illustrated in the drawings which accompany and form a part of this specification, in which—

Figure 1 represents a plan view of an apparatus constructed according to my invention; Fig. 2 is a front elevation of the same; Fig. 3 is a view in section taken on the line 3, 3, Fig. 3; Fig. 4 is a plan view of the apparatus the tripping bar being shown in a locked position; Fig. 5 is a front elevation of the latter; Figs. 6, 7, 8 and 9 are views in detail representing parts of the locking mechanism; and Fig. 10 is a view in section taken on the line 10, 10, Fig. 1.

Like letters of reference indicate like parts in all the views.

Referring particularly by reference symbols or characters to the drawings, A, A' denote plates forming the support, preferably constructed with lugs *a*, and serving to hold

an electro-magnet B in proper position, ordinarily by the use of screws *b* and a steady-pin *b'*. The plate A also preferably carries a lug A², and a pin *a*³ passing through the same, the latter forming a pivot or hinge for an armature D. A spring *d* is ordinarily supported by the armature, as by means of a screw *d'*, and the armature also preferably carries a locking tooth or stud *d*². A lug *a*⁴ preferably extends inwardly from the plate A' and may in some cases serve to sustain a guide pin *a*⁵ in order to regulate any lateral movement of the armature that there may be.

E denotes a locking rock-shaft carrying a locking pin or lever *e* which shaft is preferably controlled by means of a spring *e'* one end of which ordinarily passes through the top of the same, the other extremity being fastened by the screw *a*⁶ attached to the plate A'. A pin *a*⁷ serving to form a bearing for the shaft E is preferably located at or near the lower part of the bore or orifice formed in the plate A' in which works the rock-shaft E which latter is ordinarily constructed with a groove *e*². Thin plates H, respectively secured to the support plates A, A', by screw *h*, form, in connection with grooves cut directly beneath the same in the support plates A, A', the boundaries of ways or channels in which works the reciprocatory tripping bar F, inward lateral movement of the said tripping bar being ordinarily prevented by means of an adjustable guide screw J working in a part *a*⁸ secured to the support plate A' by means of a nut *a*¹⁰ and washer *a*⁹. The tripping bar F is preferably formed with an offset or bend F' at the outer end of the same, and the said bar has a notch *f* cut in the same, and it is ordinarily provided with impelling means, as a spring G encircling the same, which spring is preferably held between the plate A' and the end of the bar F by means of a pin *f'* and washer *f*². I also prefer to use means to prevent the jar of the parts when the bar F is tripped or sprung, as, for instance, the spring G' encircling the inner end of the said bar and held in position between the plate A and the said extremity of the bar by means of the nut *f*³ working on the threaded end of the same. The part of the bar F that lies adjacent to the plate A when the said bar is tripped or sprung is preferably provided with an insulating strip

C set into the same, and intermediate the support plates A and A', a pin f^4 is ordinarily attached to the said bar.

P, P', represent the two members of a circuit controlling device of any ordinary or suitable description or conformation, and N, N', are the wires of the circuit which may be supplied with any suitable source of power or form of electromotive force, as the battery N². The wire N preferably passes through an orifice a'' in the plate A, and leads to one terminal of the coil of the electro-magnet B, the other terminal of the coil being preferably grounded to the frame of the apparatus. The other circuit wire N' is ordinarily connected with the post M and finger L insulated by electrically non-conducting material K and located on the support plate A, from which post extends the spring finger L held in position by a screw l over an insulator k , and which carries at the end of the same a contact pin L' which is insulated from the support plate A, as by a strip K' of insulating material.

An open circuit organization is disclosed in the embodiment of the invention shown in the drawings, although it is obvious that my tripping mechanism may be used with either any of the well known open, or closed, or balanced circuit organizations which are now in common use and which are well known to those skilled in the art.

The operation of the parts of the device set forth in the embodiment of my invention illustrated in the drawings, in which an open circuit organization is shown, is as follows:—The parts are brought into the position shown in Figs. 4 and 5 by pressing the end F' of the tripping bar F in an inward position. The edge of the flat side of the groove e^2 of the locking rock-shaft at first lies against the side of the tripping bar F, as shown in Fig. 7, and remains in this position until the groove f of the tripping bar registers with the groove e^2 of the rock-shaft and allows the spring e' to swing the rock-shaft around inwardly and to carry the locking pin or lever e over the inclined part of the wedge-shaped locking tooth or stud d^2 , the armature D having been meanwhile moved away from the pole of the electro-magnet B by the impingement of the pin f^4 against the spring d , in consequence of which movement of the parts the rock-shaft is held from rotation by the lever or arm e thereof resting against the abutting edge of the tooth or stop d^2 . The resilience of the compressed spring G then tends to force the tripping bar F in an outward direction and to cause the face of the groove e^2 of the rock-shaft E to abut the vertical edge of the groove or notch f of the tripping bar F, as shown in Fig. 9, at the same time that the pin e rests against the vertical face of the stud d^2 . Upon the circuit being closed, as

by the fingers P and P' being contacted, the current will flow through the wire N to the electromagnet B and thence to the frame of the device and through the tripping bar F to the contact pin L' and to the connection post M, and thence to the other circuit wire N'. The electro-magnet becoming thus energized attracts the armature D and the locking stud d^2 springs away from the pin or lever e , whereupon the rock-shaft E becomes freed and allows the tripping bar F to be impelled forward by means of the expansion of the spring G, whereupon the lever O will be operated, and may serve to perform any desired function whereby it may be adapted for use in any of the different classes of devices set forth hereinabove. When the bar F is tripped or sprung, the insulating strip C passes in front of the contact pin L' and the circuit becomes thereby opened again. When the bar F moves in a forward direction upon being released by the action of the magnet, the vertical edge of the notch f , which abuts, as stated, the face of the groove e^2 , causes the rock-shaft to turn somewhat around thus moving the lever or arm e to the position shown in Fig. 7, which movement puts the spring e' under more tension in order to allow the latter to operate the rock-shaft when the bar F is moved inwardly, whereupon the lever or arm e is again allowed to contact the stop or tooth d^2 , the rock shaft being thus controlled by a rearward movement of the tripping means.

I wish it to be understood that I do not desire to be limited to the exact details of construction shown and described herein, for various modifications within the scope of the claims will occur to a person skilled in the art.

What I claim as my invention, is:—

1. In a tripping mechanism, the combination with a circuit controlling device, and with a movable trip mechanism, of a locking rock device controlled by a rearward movement of the tripping means, an armature plate to control the locking device and hold it in a locked relation, and of an electro-magnet coöperating therewith, and of means to move the tripping means with a forward impelling movement upon the locking means being released by the armature, the said tripping means being in electrical connection with the circuit controlling device, and also of means to break the electric connection through the tripping mechanism to the two members of the circuit controlling device.

2. The combination with a suitable support, of a movable tripping means having a notch formed therein, a locking rock device having a groove to abut the said notch and provided with an arm extending therefrom, and an armature plate to control the rock

device and having a locking tooth to engage the said arm.

3. The combination with a suitable support, of a spring impelled tripping means having a notch formed therein, a spring controlled locking rock device having a groove to abut the said notch and provided with an arm extending therefrom and a stop device to control the rock device having a locking tooth to engage the said arm.

4. The combination with a suitable support, of a movable tripping means formed with conducting and insulating portions, means to hold the tripping means in a locked position when moved in one direction, an electro-magnet having one terminal connected with a source of electromotive force, and having the other terminal grounded to the said tripping mechanism, and a contact pin bearing on the said movable element and also connected with the source of electromotive force, and in electrical connection with the said tripping mechanism when the latter is in a locked position and insulated therefrom when it is in a released relation.

5. The combination with a suitable support, of a movable tripping means formed

with conducting and insulating portions, and also having a notch formed therein, an electro-magnet having one terminal connected with a source of electromotive force, and having the other terminal grounded to the said tripping means, a locking rock device engaged with the tripping means and having a groove formed therein to abut the said notch to hold the tripping means in a locked position when moved in one direction, and provided with an arm extending therefrom, an armature plate to control the rock device having a locking tooth to engage the said arm, and a contact pin bearing on the said movable element and also connected with the source of electromotive force and in electrical connection with the said tripping means when the latter is in a locked position and insulated therefrom when it is in a released relation.

In testimony of the foregoing specification I do hereby sign the same in the city of New York, county and State of New York, this 17th day of November, 1910.

MANUEL R. RODRIGUES.

Witnesses:

H. WOELFLER,
F. M. DORN.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."