

Aug. 19, 1924.

M. RAYFORD

1,505,728

APPARATUS FOR PREVENTING THEFT

Filed July 13, 1923

2 Sheets-Sheet 1

Fig. 1

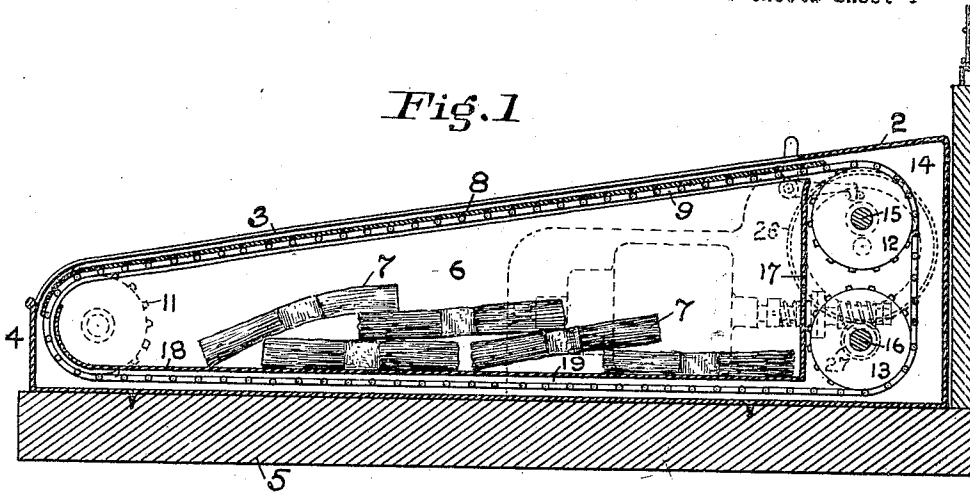


Fig. 3

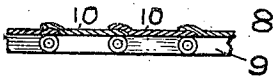
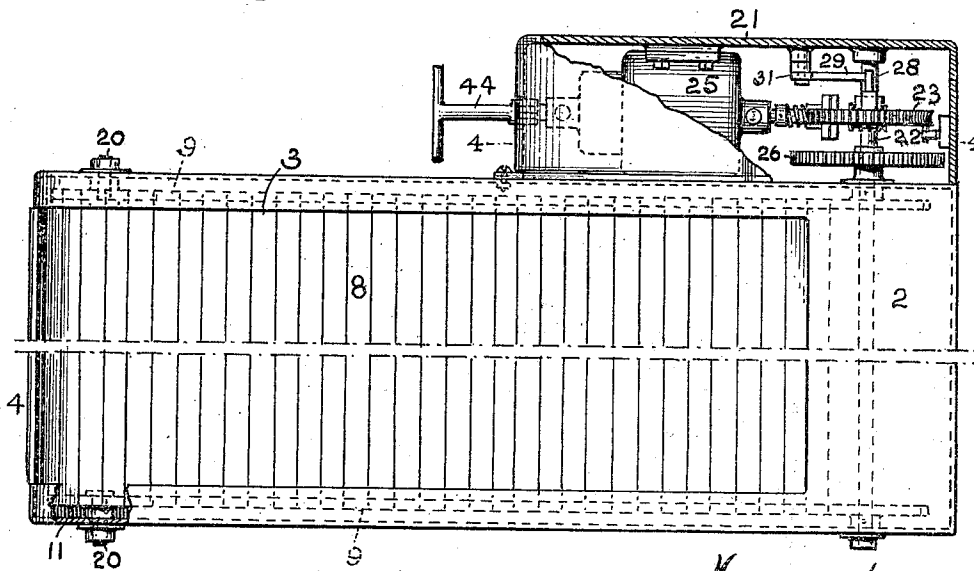


Fig. 2



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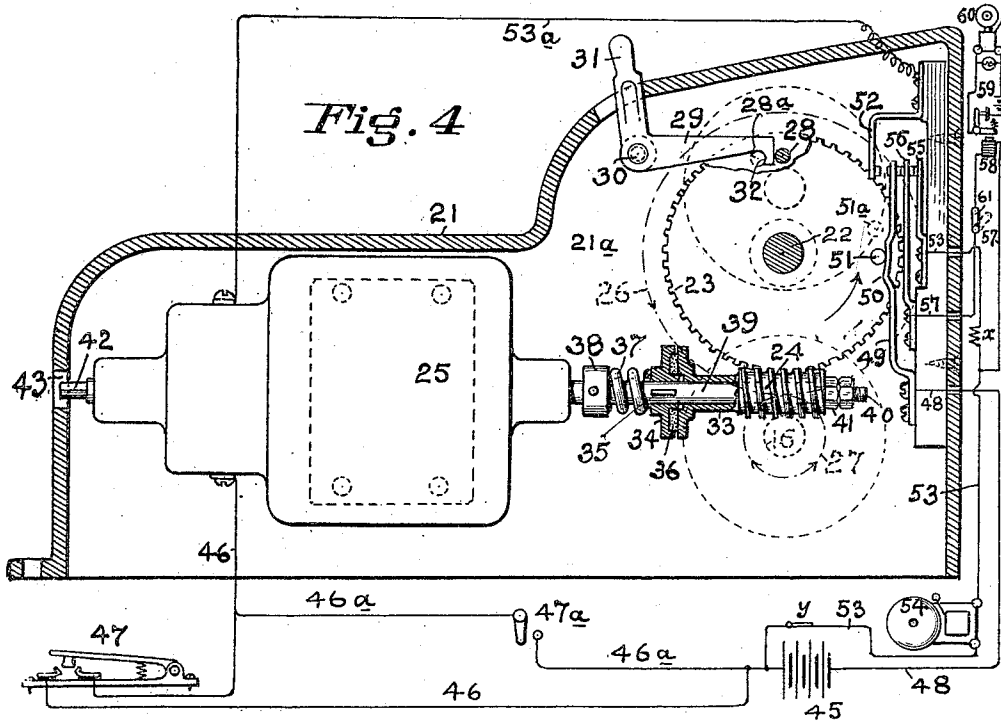
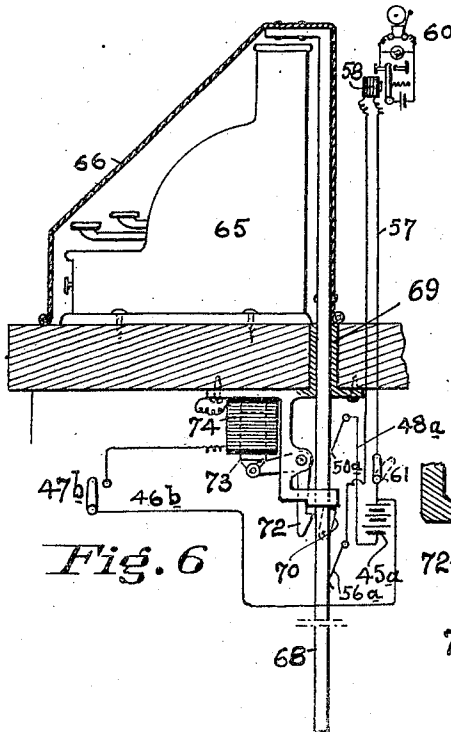
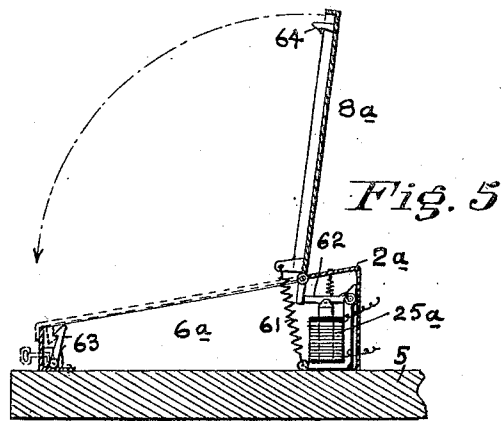
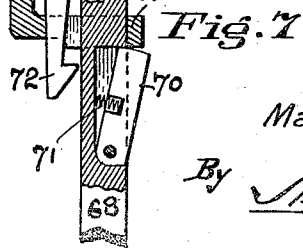
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APPARATUS FOR PREVENTING THEFT

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PREVENTING THEFT.

Application filed July 13, 1923. Serial No. 651,214.

To all whom it may concern:

Be it known that I, MATHEW RAYFORD, a citizen of the United States, and resident of Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Apparatus for Preventing Theft, of which the following is a specification.

The object of my invention is to provide an apparatus suitable for banks and other purposes where money or valuable goods are to be handled or displayed, said apparatus adapted to seal or confine the money or goods against theft or burglary and at the same time to preferably sound an alarm or operate a signal, the apparatus being put into operation by a movable switch or other means under the control of the teller or other officer of the bank or any person in attendance where the money or valuable goods are located and exposed.

My invention is useful more particularly in banking institutions where large quantities of money are being handled and exposed and especially in connection with the paying teller's department; and in applying my invention as a protective measure against thefts of a hold-up nature, the money while normally exposed for handling by the teller himself may be instantly sealed within a steel compartment arranged to automatically act in a self-sealing manner upon the teller pressing a switch with his foot or by an auxiliary switch being closed or operated at a distant place by an observer of the attempted "hold-up" or theft, it being desirable that the automatic action of the sealing means for the compartment shall be electrically operated and which having once started in action continues until the compartment is sealed.

With the above and other objects in view, the nature of which will be more fully understood from the description hereinafter, the invention consists in the novel construction of apparatus for preventing theft, as hereinafter more fully described and defined in the claims.

Referring to the drawings: Fig. 1 is a sectional view transversely of the teller's desk or counter and with my improved self-sealing cabinet thereon in sealed condition; Fig. 2 is a plan view of the same with portions broken away to show the interior construction; Fig. 3 is an enlarged sectional view of the sealing cover; Fig. 4 is a vertical

sectional view on line 4—4 of Fig. 2, showing the automatic mechanism for controlling the operation of the cover; Fig. 5 is a vertical section through a self-sealing cabinet illustrating a modification of the cabinet shown in Fig. 1; Fig. 6 is a vertical section showing a modified form of my invention especially adapted for enclosing or sealing cash registers or other objects, such as money or jewels, which may be exposed on a counter; and Fig. 7 is an enlarged view, with part in section, of the locking means employed in connection with the device shown in Fig. 6.

Referring to the construction shown in Figs. 1 to 4, inclusive, 2 is a sheet metal cabinet and arranged to rest upon and be secured to a counter 5, such as may be employed in any bank, and preferably this cabinet is closed on all sides but the top, where it is open, as shown at 3; and moreover, the cabinet is preferably shallow in a vertical direction and extended backward for the width of the counter and the side-wise width of the cabinet may be as large as desired, according to the purposes to which the apparatus is to be applied. Preferably, the rear end of the cabinet is higher than the forward end, so that the front plate 4 thereof may be quite shallow so as not to form a material obstruction for ready handling of the contents of the compartment 6 of the cabinet in which the money 7 or other articles are placed, the rear end being made higher than the forward end so as to give as great capacity to the compartment 6 as possible. 8 is a closure or cover which may be made of transverse bars 10 of sheet metal secured at each end to sprocket chains 9, said chains acting as carriers for the closure or cover 8 and guided about sprocket wheels 11 at the forward end, and 12 and 13 at the rear end of the cabinet. At the forward end, the sprocket wheels are journaled upon studs 20 secured to the sides of the cabinet, whereas at the rear end, the sprocket wheels 12 may be secured to a transverse shaft 15 journaled in the cabinet and the sprocket wheels 13 secured to a drive shaft 16 which is indirectly operated by the electric motor 25 when the closure 8 is to be operated to seal the cabinet. These sprocket wheels 12 and 13 are arranged in a chamber 14 at the rear end of the cabinet, and shielded from in front by a partition 17 of an inner casing 18 providing the com-

partment 6, and also a false floor at the bottom below and to the sides of which the sprocket chains may travel. As the sprocket chains are located close to each side of the cabinet 2, it is possible to so shape the inner casing that the floor thereof may be coincident with the floor of the cabinet itself, if so preferred, should the closure be in the form of a hinged lid, as in Fig. 5, instead of a flexible closure, as shown in Fig. 1. While I have shown a suitable construction of the closure 8 and means for operating the same, it will be understood that I do not confine myself to any particular character of closure.

In the particular instance shown, it is of a flexible nature and when the apparatus is set with the closure in open position, the sprocket chains would be adjusted so that the closure is moved forward and then backward under the floor 18 of the inner casing.

Referring now to the means for operating the sprocket chains, and more particularly as shown in Figs. 1, 2 and 4, the driving shaft 16 carrying the sprocket wheels 13 has upon it a pinion 27 which meshes with the gear 26, the latter being secured upon a shaft 22 having thereon a worm wheel 23 meshing with a worm 24 which is driven by an electric motor 25, said mechanism being enclosed within a compartment 21^a whose casing 21 is secured to the side of the cabinet 2, as indicated more fully in Fig. 2. As shown, the worm 24 is loosely sleeved upon the motor shaft 39 and has a flanged extension 33 at one end which rests against an annular friction pad 36 carried by a flanged hub 34, said hub caused to rotate with the shaft by reason of the key or spline 35 while at the same time permit it to have slight longitudinal movement thereon. The hub 34 rests against a coil spring 37 surrounding the shaft and resting at the other end upon a collar 38 secured to the shaft. 41 are nuts screwed upon the threaded end 40 of the shaft 39 for adjusting the worm longitudinally upon the shaft and for creating any desired driving friction between the flanged hub 34 and its friction pad 36 on the one hand, and the flanged end 33 of the worm 24 on the other, this friction being sufficient to insure positive driving of the worm wheel and its shaft 22 by the motor 25 but allowing slippage between the motor shaft and the worm 24 in case of the abrupt stopping of the worm wheel, for reasons hereinafter explained.

Any other suitable friction drive between the motor shaft and the worm may be employed, if so desired. The worm wheel 23 is provided with a laterally extending pin 28 which is adapted to come in contact with the end of a side arm 29, said arm being formed as a bell crank pivoted at 30 and having an operating handle extension 31 projecting through a slot in the casing, as

fully indicated in Fig. 4. As the worm wheel is driven by the motor in the direction of the arrow, it will be manifest that when the pin 28 reaches the stop arm 29, as shown in Fig. 4, the worm wheel will be prevented from having further rotation, and should the motor have any momentum sufficient to prevent its instantly stopping the friction device composed of the parts 33, 34 and 36, will permit slippage so that the worm wheel is assured of stopping positively and without excessive strain upon the motor or connecting means.

In addition to the pin 28, the worm wheel 23 is also provided with a pin 51 for operating electric switches shown more fully in Fig. 4. 49 is an electric switch and composed of a spring arm having a contact at its free end and a laterally projecting portion 50 intermediate of its ends. When the worm wheel 23 is arrested in its position shown in Fig. 4, the pin 51 will be as shown compressing upon the portion 50 of the spring switch and forcing it backward so that it breaks contact with the other contact member 52 and opens the motor circuit, so that the motor comes to rest automatically when the worm wheel 23 has its pin 28 brought in contact with the stop 29. The battery or source of electric power 45 has one terminal connected by a wire 48 with the spring switch member 49 and has its other terminal connected with the motor by circuits 46 having a foot switch 47 therein and circuits 46^a having a hand switch 47^a therein. These circuits 46 and 46^a are in parallel and connect with one terminal of the motor.

The other terminal of the motor is connected by a circuit 53^a with the fixed terminal member 52 of the switch 49. 53 is a signal circuit extending from the terminal of the battery opposite to which the motor circuit 48 is connected and leads to and is connected with a spring contact terminal 55, and also includes an electric alarm or gong 54. Intermediate between the spring contact terminal 55 and the free end of the spring switch 49 is another spring switch contact 56 having a connection with an electric circuit 57 which includes a hand switch 61 and a relay 58, said circuit 57 extending to and connecting with the circuit 48 leading to the battery 45. The relay 58 is preferably arranged at a police station and controls thereat an electric circuit 59 in which is arranged an electric bell 60 and other signal means such as an electric light, whereby when operated, the officers in charge will know that there is a call for assistance at the bank.

Considering the operation of the switches 49, 55 and 56, it will be seen that when the pin 51 presses the spring contact 49 backward, it closes the circuit from battery

through circuits 48, switch 49, switch 56, circuit 57, relay 58, circuit 53, including alarm gong 54 and back to the other terminal of the battery. At this time, both the alarm gong 54 and the call signal 60 at the police station will be operated. As a further increase in current may be needed for the gong 54, this may be had by the contact 56 pressing upon the contact 55 and dividing the current from contact 49 partly over circuit 57 and partly direct to the circuit 53 having the gong through a resistance x which would prevent any possible short circuiting of the distant relay 58. When the police have reached the bank, the switch 61 may be opened to stop the signalling at the police station, and if desired, a switch y in circuit 53 may also be opened to stop the action of the alarm gong 54. Where this switch y is employed in circuit 53, the switch 61 may be omitted as the switch y will control the operation of both the gong and the relay 58.

Any other suitable system of circuits and switches operated by the worm wheel 23, if so desired, may be employed. Furthermore, it will be understood that while I prefer to employ a worm and worm wheel drive so as to permit as small a motor as possible to be used for economy and smallness of construction, I do not limit myself to any particular power transmitting means.

It will be noted that the end of the stop arm 29 is made angular so as to provide a socket 32 directed in the opposite direction of the stop end of the arm, and the purpose of this will now be described. If we assume that either of the switches 47 or 47^a were closed and the electric motor 25 had run sufficiently to close the cabinet by bringing the closure 8 to the position shown in Figs. 1 and 2, and also to bring the pin 51 into the position shown in Fig. 4, to open the motor circuit, the parts will then be at rest and the valuable contents of the cabinet will be sealed and protected against theft. When, however, it is desired to re-set the apparatus with the closure in the open position, the stop lever 29 is raised by pressing upon the handle 31 and then with the key 44 (Fig. 2) extended through a slot 43 in casing 21 and applied to the square end 42 of the motor shaft, the motor is rotated sufficiently to rotate the worm wheel 23 to bring the pin 28 to the dotted position 28^a and the pin 51 to the dotted position 51^a and whereupon the spring switches 49, 55 and 56 spring back out of contact with each other and the spring contact arm 49 is brought into contact with the fixed terminal 52. If the switches 47 and 47^a or either of them were closed, it is manifest that when the switches 52 and 49 made contact, the motor would start up again, and, of course, it is to be understood that these switches 47

and 47^a are open before re-setting the worm wheel 23, as above stated.

It will be understood that while I have described the adjustment for putting the worm wheel 23 in its re-set or starting position, it will be necessary, however, to open the switches, not only the switches 47 and 47^a, but also the switch y , and then turn the motor shaft with the key 44 until the closure 8 of the cabinet is fully opened and thereupon the stop lever 29 is permitted to drop into the position shown in Fig. 4, and the pin 28 brought to a position 28^a in contact with the said stop lever. Thereafter, the switch y is closed and also the switch 61 (if it is used) and the apparatus is in position for automatic operation should either the switch 47 or 47^a be closed as before described.

Referring to Fig. 5, the cabinet in this case is marked 2^a and may be of sheet metal and the opening to the compartment 6^a therein may be closed when desired by a hinged cover 8^a which is normally held open by means of a trigger 62 adapted to be operated by an electro-magnet 25^a having a movable core, which, when energized, operates the trigger to release the cover which is then pulled down by a spring 61 to close the cabinet. When the cover snaps down, the hook 64 engages the spring actuated catch 63 and locks it in closed position. This latch 63 may be released in any suitable manner, as by use of a key or otherwise, as is commonly employed in boxes having lids which snap in locked position when closed. The coils of the magnet 25^a are arranged in the circuit with the battery and with the switches 47 and 47^a in substantially the same manner as in the case of the construction shown in Fig. 4, with the exception that in this case there will be no necessity for the use of the particular motor mechanism shown in Fig. 4, since one impulse of the electro-magnet is all that is necessary to insure the closing of the cabinet. It will also be understood that the signal switches 49, 55 and 56 shown in Fig. 4 may be operated by the heel extension of the cover 8^a, just as they are operated by the pin 51 in Fig. 4.

Referring now to Figs. 6 and 7, showing another embodiment of my invention, I have illustrated the same in connection with the protection of a cash register 65, though it will be understood that the protecting casing 66 may be used to close down over money, jewelry or any other things of value that are to be protected just as it will close over the cash register. It will be understood that the shape of this enclosing casing 66 may be varied either as to height or horizontal sectional area, as may be found desirable or suitable for the particular things which are to be protected, by being enclosed

under it. The counter or table upon which the cash register rests is provided with a metallic guide frame 69 in which a vertical rod 68 is guided, the upper end of the rod 5 being riveted to the casing 66, so that the latter may be held down to the counter or may be elevated above the cash register by means of the said rod. If desired, there may be more than one rod, though that is not necessary in ordinary cases. When the rod is fully raised to expose the cash register, the lower end of said rod will be engaged by a latch 72 which holds it in its raised position. The weight of the solenoid 15 core 73 tends to keep the latch in engagement. As shown, the latch is of a pivotal bell crank construction hinged to the frame or casing 69 and having its rearwardly extending arm also hinged to the core 73. 74 is a solenoid in which the core reciprocates, the said solenoid being secured to the frame 69 and having one of its terminals connected with it. The other terminal is connected by a circuit 46^b with one pole of the battery 20 45^a, the other pole being connected by a circuit 48^a with a spring contact 50^a which presses against the sliding rod 68, to complete the circuit with the solenoid when the manually operated switch 47^b in said circuit 46^b is closed. Normally, the said switch 30 47^b is in open position. 57 is a signal circuit containing the relay 58 which controls the electric signal means 60 which may be of the same construction as in the case described in connection with Fig. 4. One terminal of the circuit 57 is connected with one pole of the battery 45^a through a switch 61, whereas the other terminal of said circuit 35 57 is connected to a spring contact 56^a, pressing against the sliding rod 68. When the rod is down and the cash register enclosed and protected, as in Fig. 6, it will be seen that the circuit from the battery 45^a is closed to the contact 56^a through the circuit 48^a and 45 spring contact 50^a and the signal will, therefore, be sounded to indicate that the casing 66 has descended to protect the cash register from theft. When, however, the rod 68 is fully raised to lift the casing 66 and expose the cash register, the lower end of said rod will be supported by the latch 72 at an elevation which holds it out of contact with the spring switch 56^a, and, therefore, during this normal suspension, the signal circuit 57 will not be energized. Assuming that the rod 68 was thus supported in elevated position, it will only be necessary in case of danger of theft to close the switch 47^b (of whatever nature it may be) where- 60 upon the latch is drawn back and the rod released. The cash register will be enclosed by the casing and the descent of the rod will put the alarm 60 into operation. To prevent the cabinet casing 66 being manually lifted 65 after its descent, any suitable locking means

may be employed, and I have indicated one manner of providing such locking means, the same being shown more fully in Fig. 7. This locking means consists of a hinged bolt 70 arranged within a recess in the bar 68 70 and spring pressed outwardly by a coil spring 71. The lower end of the bolt 70 is pivoted and consequently when the rod descends through the slot in the lower part of the frame 69, the bolt acts as a pawl first 75 moving inward and as soon as it passes the guide, it snaps outwardly into locking position as shown. It will then be seen that the rod cannot be lifted and consequently the casing 66 is also retained in locked position. To raise the rod, it is only necessary to press in the hinged bolt 70 and push the rod upwardly. Any other suitable locking means may be employed. It will be further understood that this mechanism for 85 controlling the rod 68 and its casing 66 would be conveniently sealed against being tampered with, though it is not necessary to illustrate that feature of the invention, since the spirit of such sealing of the operative 90 parts is amply illustrated in Figs. 1, 2 and 3.

From the foregoing, it will be understood that my invention is adapted for protection against thefts or robbery under a variety of 95 conditions and hence while it is more especially adapted for banks and financial institutions in which large quantities of money are handled and exposed to view, it nevertheless is also adapted for use where any 100 valuables in stores or offices may require automatic protection against theft or burglary and which could not be removed or handled under such conditions to insure 105 safety.

It will now be apparent that I have devised a novel and useful construction which embodies the features of advantage enumerated as desirable, and while I have in the present instance shown and described the 110 preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that I do not restrict myself to the details, as the same are susceptible of modification 115 in various particulars without departing from the spirit or scope of the invention.

Having now described my invention, what I claim as new and desire to secure by Letters Patent, is: 120

1. In a protective device of the character stated, the combination of a cabinet in which the money or valuables may be placed, a movable closure for said cabinet, an electric motor and connecting means for 125 moving the closure from open to closed position, a source of electric energy, circuits leading from the source of energy to the motor, a manually controlled switch in the circuit for putting the motor into operation. 130

and means for arresting the movement of the closure when it has been brought to its closed position.

2. The invention according to claim 1, wherein the cabinet is open at the top and the closure consists of transverse plates hinged together and provided with operating chains, driving and guiding means for the chains, said driving means operated by the electric motor and connecting means and the chains and guiding means enclosed within the cabinet so as to be wholly protected thereby.

3. The invention according to claim 1, wherein the cabinet is provided with an inner compartment and forming a false floor under which the closure may pass when shifted to the open position.

4. The invention according to claim 1, wherein the electric motor and connecting means for driving the closure is enclosed within a casing and provided with a detachable key whereby the motor shaft may be reached through the casing, and manually rotated for re-setting the closure to the open position.

5. The invention according to claim 1, wherein the connecting means driven by the motor is provided with an electric switch mechanism for opening the motor circuit automatically when the closure has been shifted to the closed position.

6. In a protective device of the character stated, the combination of a cabinet in which the money or valuables may be placed, a movable closure for said cabinet, an electric motor and connecting means for moving the closure from open to closed position provided with an electric switch mechanism for opening the motor circuit automatically when the closure has been shifted to the closed position, a source of electric energy, circuits leading from the source of energy to the motor, a manually controlled switch in the circuit for putting

the motor into operation, means for arresting the movement of the closure when it has been brought to its closed position, and wherein the motor is provided with a friction drive which may yield under the inertia of the revolving element of the motor when the connecting means for operating the closure is brought to rest with the closure in its open position.

7. In a protective device of the character stated, the combination of a cabinet in which the money or valuables may be placed, a movable closure for said cabinet, an electric motor and connecting means for moving the closure from open to closed position provided with an electric switch mechanism for opening the motor circuit automatically when the closure has been shifted to the closed position, a source of electric energy, circuits leading from the source of energy to the motor, a manually controlled switch in the circuit for putting the motor into operation, means for arresting the movement of the closure when it has been brought to its closed position, and wherein further, the means for bringing the motor and connecting means to rest when the closure is opened is manually adjustable, whereby the connecting means between the motor and the closure may be manually set to an adjusted position which opens the automatic electric switch for the motor and positions the parts for being put into operation by the closure of the manually controlled switch.

8. The invention according to claim 1, wherein further, the closure is automatically locked against being opened, after it has been moved to closed position, and wherein further, separate manually operable means are provided for releasing the closure and re-setting it to open position.

In testimony of which invention, I hereunto set my hand.

MATHEW RAYFORD.