

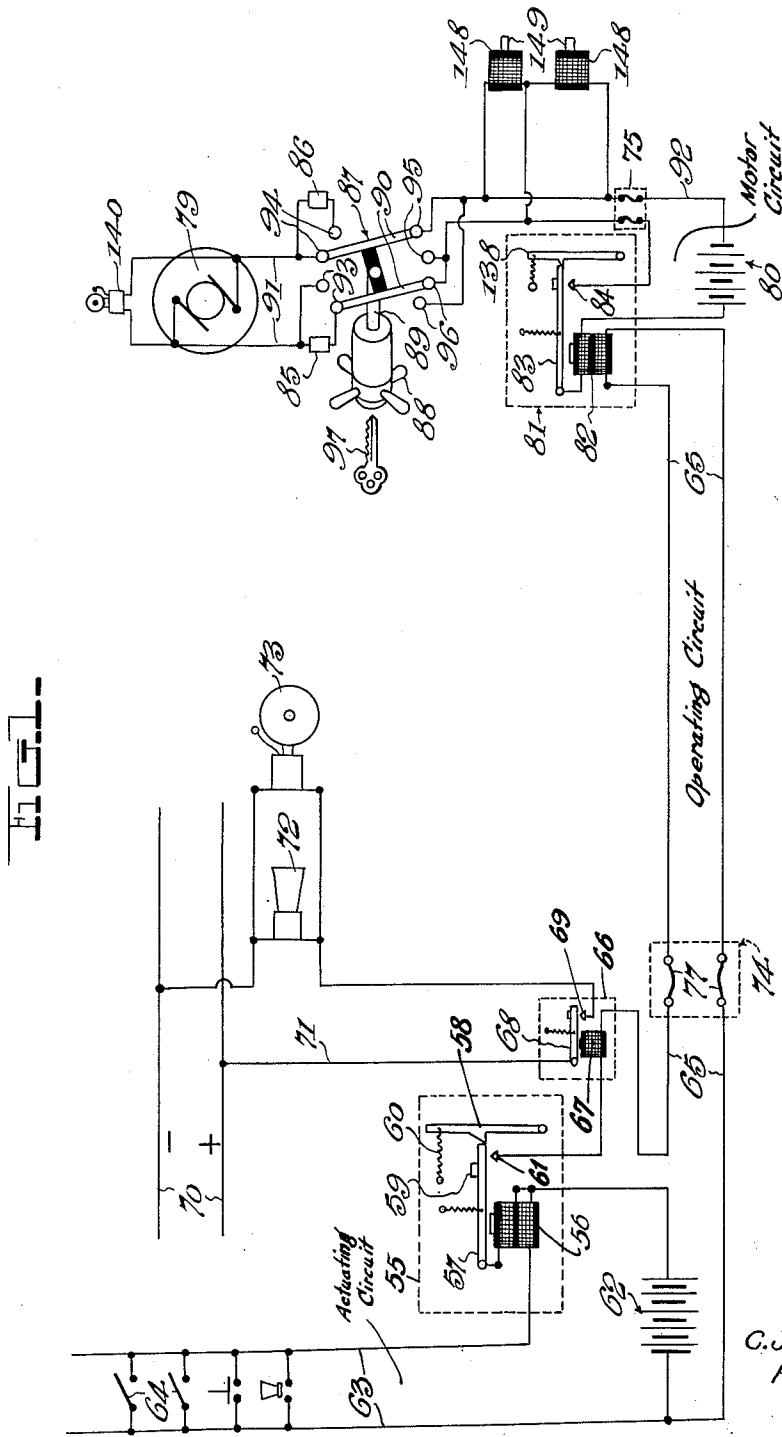
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C. J. MEUNIER ET AL

2,053,624

BANK PROTECTING DEVICE

Original Filed Sept. 4, 1934 3 Sheets-Sheet 1



Inventors
C. J. MEUNIER
H. BOMBOY

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attest

Attorney

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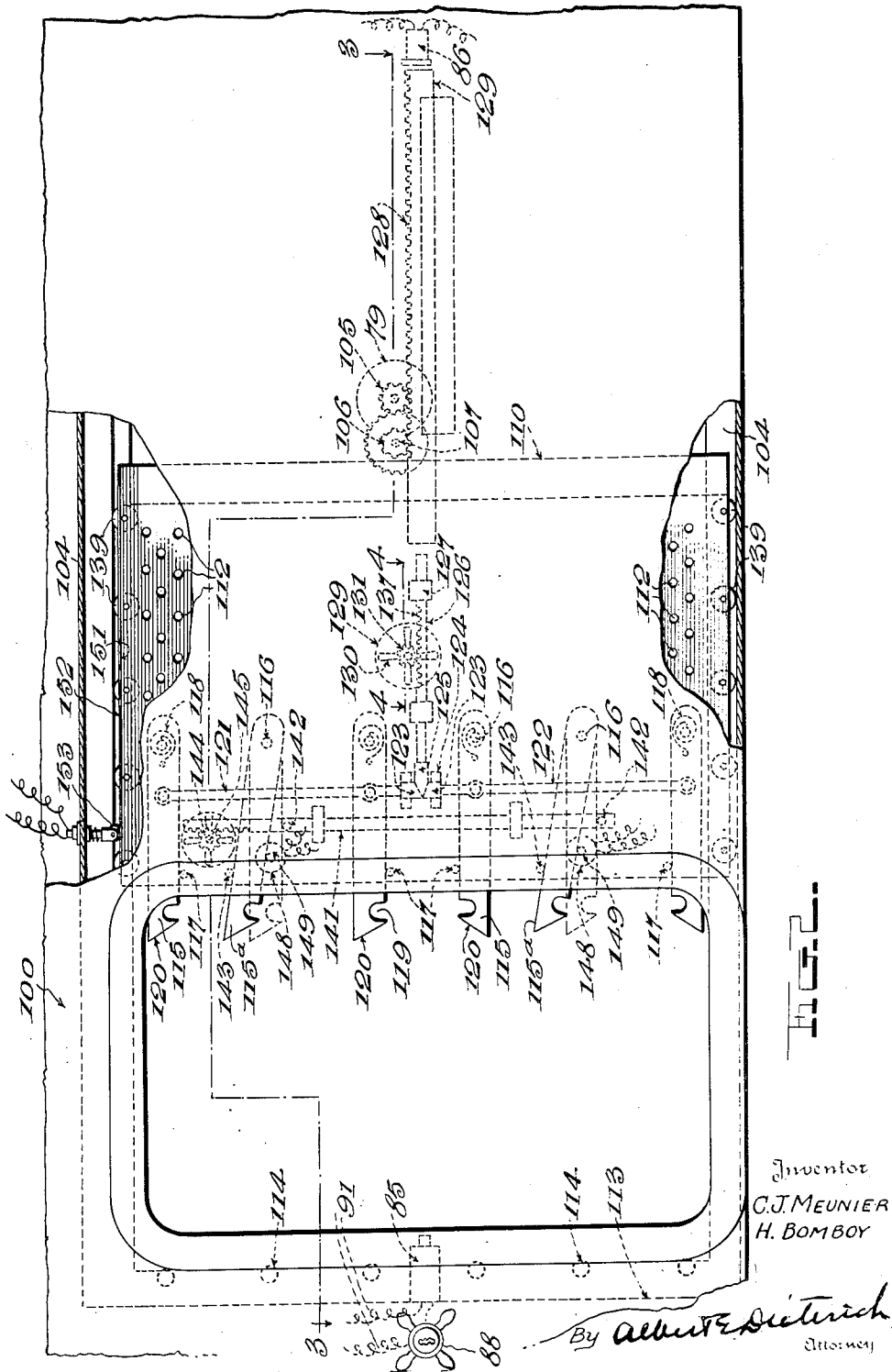
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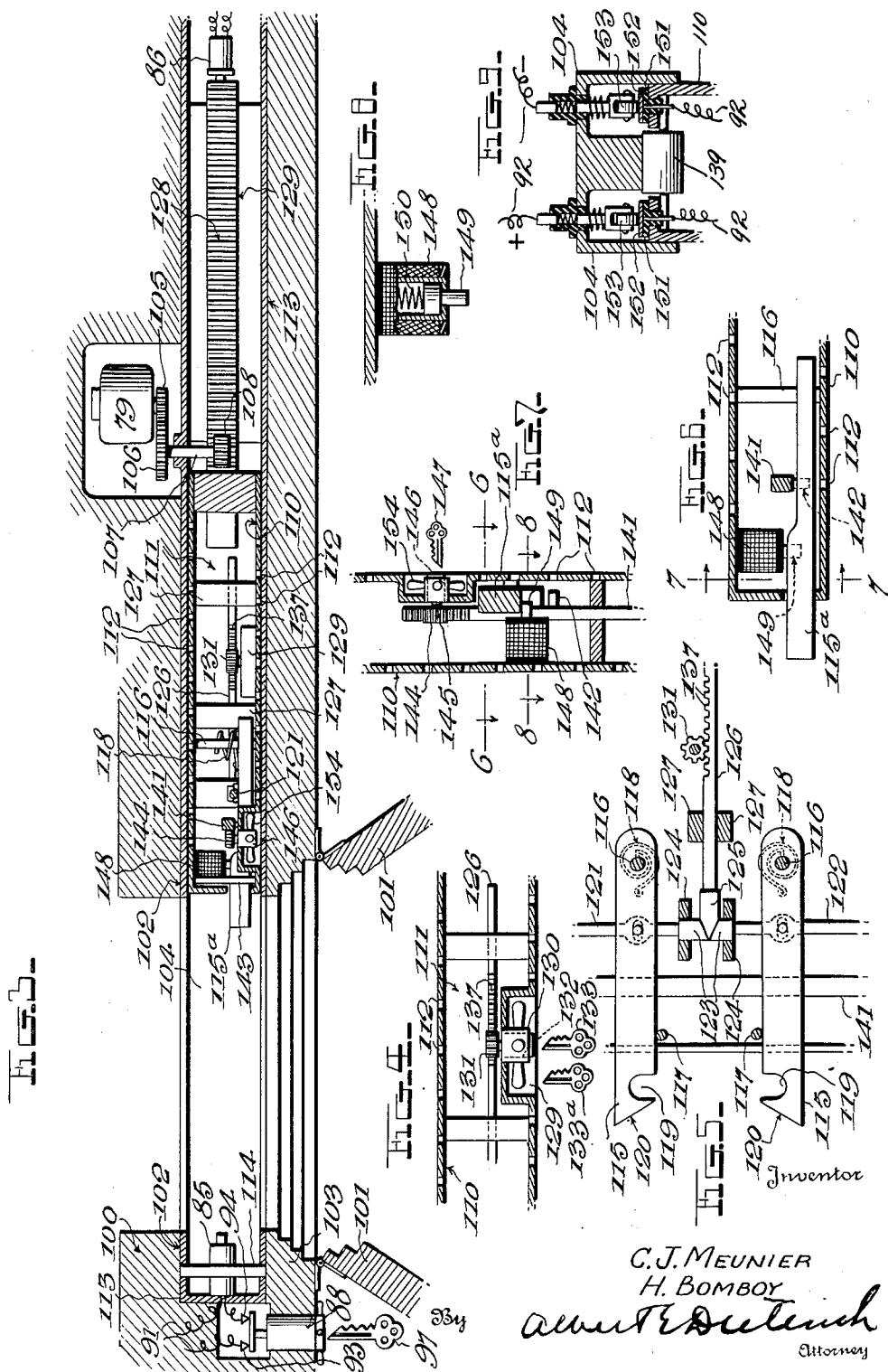
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UNITED STATES PATENT OFFICE

2,053,624

BANK PROTECTING DEVICE

Christian Joseph Meunier and Harold Bomboy,
New Orleans, La.Original application September 4, 1934, Serial No.
742,700. Divided and this application January
31, 1935, Serial No. 4,396

13 Claims. (Cl. 20—1.01)

Our invention has for an object to protect from robbery banks and other places where money is kept.

Primarily the present invention has for its object to protect safes and vaults from robbers and holdup men, and it is especially designed for cooperative use with the equipment for protecting cashiers' cages or money counters that constitutes the subject matter of our application Ser. No. 742,700, filed September 4, 1934, of which the present application is a division.

Another object is to provide means whereby the safe or vault door may be closed manually without interfering with the normal alert setting of the electrical equipment.

Further, it is an object to provide an auxiliary door for the bank safes, which door may be automatically closed and locked upon the approach of a bandit without necessitating the closure of the outer doors of the safes, which outer doors bear the time locks.

Further, it is an object to provide an auxiliary door for the vault or safe which is composed of armor plates held rigidly as a unit but spaced apart, the plates being perforated at intervals, the perforations of one plate being located out of register with those of the opposite plate in order to prevent passage of bullets through the perforations and yet permit air to pass through, so if someone becomes imprisoned in the vault when the door is automatically closed he will not become suffocated.

A further object is to provide an alarm bell in the safe or vault, with means to set the bell into operation immediately the operating circuit is closed, to begin the closing of the door, in order that those in the vicinity may be warned.

A further object is to provide a bank protecting system in which, after the operating circuit has once been closed and the doors locked, they may not be restored to their normal position save by the use of a key or keys in the hands of someone located at a place sufficiently remote as not to be under the control or influence of the bandits. Such a person, for instance, may be the chief of police who retains the keys at some secret location.

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends, the invention still further resides in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, and then be particularly pointed out in the

appended claims, reference being had to the accompanying drawings, in which:—

Figure 1 is a diagrammatic view of the electric circuits employed.

Figure 2 is a front elevation of a vault or safe equipped with our safety door.

Fig. 3 is a section on line 3—3 of Figure 2.

Figure 4 is a detail horizontal section on line 4—4 of Figure 2.

Figure 5 is an enlarged detail view of the latch releasing mechanism for the latches 115.

Figure 6 is a horizontal section on the line 6—6 of Figure 7.

Figure 7 is a vertical section on the line 7—7 of Figure 6.

Figure 8 is a detail horizontal section approximately on the line 8—8 of Figure 7.

Figure 9 is a detail vertical section later referred to.

Referring now to Figure 1, especially, it will be seen that we provide a main relay 55 having a magnet 56 connected in the actuating circuit 63 which contains the source of electrical energy (preferably a storage battery) 62 and which contains the circuit closers 64. The circuit closers 64 are distributed at different points in and about the bank or other building which is to be protected in order that they may be operated by any of a number of persons at different places. The circuit closers 64 may be of any type, some push buttons, some switches and others may be actuated by sound waves.

Thus it will be seen that when a circuit closer 64 is operated the magnet 56 of relay 55 will be energized to draw its armature 57 down into engagement with a fixed contact 61. This permits the latch 58 to be drawn over by the spring 60 to hold the armature 57 down mechanically. A stop 59 limits the upward movement of the armature 57.

65 is the operating circuit. This circuit includes the battery 62, magnet 56, armature 57, fixed contact 61 and the magnet 67 of a second relay 66. The circuit 65 is provided with master fuses 77 in box 74 for opening the circuit in event of a dangerous overload on the wires.

The relay 66 is provided for the purpose of closing a power circuit 70—71 which contains one or more sirens 72 and gongs 73 which may be located on the outside of the building being protected and/or at the office of the chief of police of the city or the office of the captain of the precinct in which the protected building is located. The signals 72 and 73 are preferably operated from the outside power lines 70 which

supply the electricity for lighting and other purposes. So far as described, it will be seen that when a circuit closer 64 is operated relay 55 closes and locks, and at the same time relay 56 becomes energized to close the circuit 70—71 and operate the distant signals.

By referring now more particularly to Figure 2 and Figure 3, the construction of the auxiliary door for the vault or safe will be clearly understood. The wall of the safe is built to enclose an operating motor 79 which is geared down through a reducing gear train 105—106—107—108 to engage the teeth 128 of the rack bar 129, the rack bar being secured to the sliding door 110.

In Figures 2 and 3 the number 100 designates the vault (which may be of the ordinary construction and, per se, constitutes no part of our invention) and 103 indicates the vault door frame to which the usual doors 101 (which carry the time locks, etc.) are hinged. The frame 103 is recessed at 102—102 for the reception of the sub-frame or casing 113 in which the door 110 operates. The casing 113 includes grooved trackways 104 in which the door slides. The sliding door 110 is preferably formed with a chamber or space 111. The side plates of the door are provided with air holes 112, those of one side plate being out of register with those of the other so that the bandit may not by firing through the holes in the outer face of the door cause the bullets to pass through holes in the inner face of the door.

The sub-frame 113 is provided with fixed rods 114. These rods 114 serve as a holding means for cooperating with the pivoted latches 115. These latches are pivoted on fixed pivots 116, and normally rest against stops 117, they being held against the stops by suitable means, as for example volute springs 118 (see Figure 5). The pivoted latches 115 have beveled ends 120 and latch rod receiving recesses 119, the latter lying over the latch rods 114 when the door is closed.

Suitable means are provided for operating the latches 115 to unlatch the door when desired. We prefer to arrange the latches 115 in two groups, an upper and a lower group. When this is the case the means for releasing the latches may consist of connecting rods 121 and 122 for the respective groups, the connecting rods at their adjacent ends being provided with wedges 123 operating in guides 124. The wedges 123 cooperate with an operating wedge 125 on a bar 126 mounted to slide within the chamber of the door in suitable guides 127. The door is recessed at 129 and in this recess is mounted the latch releasing or disengaging wheel 130 and the lock 132 which cooperates therewith. The lock is of a construction requiring the use of two keys (as in safety deposit boxes) to operate, whereby when the keys 133—133a are inserted and turned the wheel 130 will be connected with the shaft of a pinion 131 so that by turning the wheel 130 the pinion 131 is turned to move the wedge operating bar 126 in a direction to force the wedges 123 apart and thereby rock the latches 115 so as to disengage the rods 114, it being understood that the bar 126 has rack teeth 137 for meshing with the pinion 131.

In addition to the latches 115 we provide another set of latches 115a which are moved to the latching position by gravity. These latches 115a are normally held in an inoperative position by means of hold-up dogs 149 that constitute portions of the armatures of magnets 148 (one

magnet for each latch 115a) and the latches 115a are lifted to the positions where they will disengage the rods 114 and be held up by the dogs 149, by means of a latch lifting rack bar 141 having lugs 142 to engage under the latches 115a when the bar 141 is raised. The bar is moved up and down by a pinion 144 on a shaft 145 that can be operated only when the hand wheel 154 is connected to the shaft 145 by the lock mechanism 146 when key 147 is used. A stop 143 limits the raising of the latches 115a beyond a predetermined distance.

The dog 149 is projected, when its magnet 148 is de-energized, by a suitable spring 150.

The positive and negative terminals of the magnets 148 are connected together with the positive and negative contact strips 152 which are located on, but insulated at 151 from, the top of the door. Roller contact members 153 are mounted in insulated fashion in the frame 104, and are connected to the circuit wires 92 so that when the circuit 92 is closed the magnets 148 will be energized to withdraw the dogs 149 from beneath the latches 115a and permit them to drop to a latching position.

Returning now to a further examination of the diagram, Figure 1, it will be noted that the safe door operating motor 79 is preferably actuated by an auxiliary battery 80 through the medium of a relay 81 one winding of the magnet 82 of which is connected in the circuit 65. The relay 81 has its armature 83 connected through a second winding of the magnet 82 to battery 80.

84 designates the fixed contact of the relay 81 which is connected by one of the wires 92 of the sub-circuit to a pole changing switch controlled by a suitable lock 88.

85 and 86 designate circuit opening switches which normally hold the circuit closed, but which are actuated by the door for opening the circuit. For instance, when the sliding door is in the closed or locked position it will have engaged the button of the switch 85, pushed it in and opened the circuit at that place, whereas as the sliding door reaches the fully opened position the rack bar 129 will push the button of switch 86 in and open the circuit at that point.

37 designates generally the lock controlled reversing or pole changing switch, which includes a shaft 89 that carries the pole changers 90, the latter cooperating with the contact groups 93—96 and 94—95. The wire 92 from the contact 84 runs to the left hand contact 95 and the right hand contact 96 of the switch 87, while the other wire 92 from battery 80 runs to the right hand contact 95 and the left hand contact 96 of the switch 87. One of the wires 91 from the motor 79 is connected directly to the right hand contact 93 and indirectly through switch 85 to the left hand contact 93 of the reversing switch 87; the other wire 91 from motor 79 connects directly to the left hand contact 94 of the switch 37 and indirectly through switch 86 to the right hand contact 94, see Figure 1. When the key 97 is inserted in the lock 88 the shaft 89 may be turned to reverse the connections of switch 87 and thereby effect a reversal of the motor 79. Normally when the key 97 is out of the lock 88, the parts are positioned as shown in diagram in Figure 1 so that the motor 79 is ready at all times to move the open door 110 to the closed position.

The latches 115a are normally kept in the open or inoperative positions day and night, even though the vault door is closed each night and

opened each morning. In this way we intend to have our vault door act as an extra precaution during the night for the bank's funds, or it may be used as a substitute, if desired, for the regular vault door.

After the dogs 149 have been withdrawn, by energization of the magnets 148, the latches will drop so that the dogs will engage the sides of the latches 115a, upon de-energization of the magnets 148, and be in positions to be projected under the latches after the latches are again raised through the use of the key 147 in lock 146, and the turning of the wheel 154.

Only the normal weight of the latches 115a rests upon the dogs, so that there will be as little strain as possible upon the magnets, and so that little current will be required to withdraw the dogs.

Operation

Assume the parts to be positioned as diagrammatically illustrated in Figure 1, and that a bandit, or bandits, have entered the bank for the purpose of robbing it. Anyone seeing or knowing of the presence of the bandits, and being adjacent a circuit closer 64, will close the circuit 63. Circuit 63 being closed by the circuit closer, current will then flow from battery 62 through circuit 63 to energize magnet 56 of relay 55. This causes armature 57 of that relay to be pulled down into engagement with contact 61 and at the same time permits latch 58 to latch the armature down so that any opening of the circuit closer 64 will not affect the following action that takes place. Circuit 65 being now closed between 57 and 61, current flows from the battery 62 through the wires 65, thereby energizing magnet 67 of relay 66 and closing the outside signal circuit 70-71 by drawing the armature 68 into engagement with fixed contact 69 to sound the siren 72 and ring the gong 73.

When the circuit 65 is closed by relay 55 the current flows through one of the windings of magnet 82 of the relay 81, thereby closing the circuit between contacts 83 and 84 of relay 81. Current then flows from battery 80 through the sub-circuit 92, further energizing magnet 82 to hold the armature 83 down. (A latch 138 similar to latch 58 of Figure 1 may be used if desired.)

Current now flows from battery 80 through motor 79 via the pole changing switch. This starts motor 79 to turning for the purpose of closing the door 110. As soon as the door 110 shall have reached its closed position the circuit of the motor 79 will be opened by switch 85 as before described. Alarms 72 and 73 are still ringing. The door, having been closed electrically by the actions initiated through the closing of circuit closer 64, may now be opened or restored to the normal position in the following manner: Master key 147 is inserted in the lock 146 and latches 115a are raised so as to be held up by the dogs 149, after which the key is withdrawn.

During this time the circuit of motor 79 remains closed at relay 81. The keys 133-133a are inserted into the lock 132 and the latches 115 released. The key 97 is now inserted into the lock 88 and shaft 89 is rocked to change the polarity of the current to the motor 79, thereby reversing it and moving the door back to the open position under the power of the motor. The door 110 may be mounted on roller bearings 139 so that if desired it may be moved to the open position manually. Soon after the door

begins to open keys 133-133a are withdrawn so as to leave the latches 115 free again to operate. In other words the key 97, which is used to reverse the motor circuit contacts and thereby reverses the motor, is inserted before keys 133-133a are withdrawn and those keys 133-133a are not withdrawn until the latch bar 126 has been moved back to release latches 115 to their latching positions. Keys 133 and 133a may be withdrawn as soon as the door has been moved slightly on its opening journey.

Having opened the door, the latch 138 in relay 81 is moved to release armature 83, and the shaft 89 is turned back to restore the switch 87 to the position shown in Figure 1, after which the key 97 is removed, whereupon the parts will be restored to the normal position, as shown in Figure 1, and the cycle of operation will have been completed.

The fuse boxes 74 and 75 are provided for the usual safety purposes, it being understood that under normal operating conditions these fuses do not blow, but if for any reason an overload on the lines should occur, one or more of the fuses will blow to protect the circuits. It should also be understood that the circuit closers 64 are normally open and when not engaged remain open.

A suitable signal 140 (see Figure 1) may be located in the vault at any convenient place to be set into operation when motor 79 is energized, thereby warning persons within the vault that the door is being closed.

With this arrangement we can permit banks to have separate employees hold keys 133 and 133a. These two keys will be used every morning at opening time. The man with key 133 will go to the vault and if everything appears to be all right he will give a secret signal to the holder of key 133a. The holder of key 133a will enter the bank only if this signal is given to him, as pre-arranged. When he receives the signal he enters the bank and joins the first employee in opening the vault door by the use of the two keys, leaving the door in position to respond instantly to the electric mechanism upon the closing of contact 64.

At closing time the same two men, one to check the other, are to see that the vault is closed manually. In closing the vault manually the latches 115 will close upon the fixed rods 114 in the sub-frame 113. These alone will hold the door closed at night and during holidays, taking the place of the regular vault door where desired, or supplementing it.

As before stated, when a holdup takes place the contact switches are thrown and the motor and magnets are operated to close the door and close all the latches 115a. The latches 115 are released upon opening the door by the lock 132, as already arranged for, and the remaining 60 latches 115a are released upon the master key 147 from police headquarters being inserted in the lock 146.

During the day, if a holdup takes place, the electric mechanism will operate to close the door and then all latches 115 and 115a will operate to hold the door, and it will require the operation of the two locks 132 and 146, incorporated in the door, as well as the third lock 88, to be operated before the door can be released. To restore the system to operative position will therefore require the master key 147 from police headquarters, or secret place off the premises, as well as the three keys, 97, 133, and 133a, carried by the employees of the bank. During the night, if the bank is

entered, the bandits will have to blow the regular vault door and the present auxiliary vault door. This will take entirely too much time and energy and make too much noise to be practical. If
5 torches are used to burn the regular safe, the torches will hardly burn through our vault door because the walls are separated. If, however, the doors could be burned through, the time element would make the job impracticable. Likewise with
10 burning and blowing by the use of nitroglycerin.

If a holdup occurs during the day, the two trusted employees can even give the bandits their keys 133a and 133 and the bandits will still be
15 unable to open the vault or safe door without the master key 147 which is not on the premises.

In the practical use of our invention it is the intention that the master key or keys be kept outside of the bank at some source where they will not be under the control or influence of the bandits, as hereinbefore mentioned, and furthermore
20 in order to prevent the bandits from interfering with the operations of the safety devices all wiring, the fuse boxes and switches contained in the system will be well protected by embedding the
25 same in suitable armor or concrete and locating the fuse boxes and relays in concealed places. Since the only wires which enter or leave the building are the power wires 70 and signaling
30 sub-circuit wires 71, it matters little if these wires are cut, since that would not interfere with the proper functioning of the vault protecting instrumentalities.

By locating the control switches at various places about the bank at convenient locations
35 to the employees and officers of the bank, anyone knowing the presence of robbers can throw the switch to set the system into operation, thereby shutting off access to the money in the vault so that no matter what else the bandits may do
40 they will not be able to get any money. As the obtaining of money is the thing that bandits hold up a bank for, the fact that they are thus prevented from getting the funds will stop them and other bandits knowing thereof from holding up
45 banks so protected. As the cashier is the one who is usually molested and whose life is usually in danger, the fact that he cannot open the vault even under duress will cause all bandits, when they come to know this, to leave all places pro-
50 tected by our invention entirely alone.

Not only may the circuit closing switches be located within the bank proper, but they may be located in public places where anyone seeing a
55 bank being held up may operate the switch to set the safety system into operation. Therefore if a bank is held up by a number of bandits and all of the bank clerks and executives are under duress so that none of them can operate the secret switches, nevertheless an outsider seeing
60 the holdup can close one of the public switches and effect the operation of the safety system.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the complete construction, operation
65 and advantages of our invention will be clear to those skilled in the art to which it appertains.

What we claim is:

1. In a system for the protection of banks and the like, a vault having a door, electro-mechanical means for opening and closing the door, a
70 latch for securing the door in the closed position, key-controlled manually operated means to release said latch, a second latch to secure the door in the closed position, electro-mechanical means
75 normally to hold said second latch inactive, and

means actuated upon energization of said first mentioned electro-mechanical means for releasing said holding means to permit said second latch to operate.

2. In a system for the protection of banks and the like, a vault having a door, a motor for
operating said door, a motor circuit for effecting the action of said motor which motor circuit includes a source of energy, an actuating circuit
including circuit closers at different locations and
10 including a source of energy, an operating circuit, a relay whose magnet is connected in said operating circuit and whose armature and fixed contact are connected in said motor circuit,
15 means cooperative with said door for opening the motor circuit when the door is fully closed, a key-controlled lock device for the motor circuit which device when unlocked will cause the motor to move the door to open the vault, a latch for
20 securing the door in closed position, key-controlled manually operated means to release said latch, a second latch to secure the door in closed position, electro-mechanical means normally to hold said second latch inactive, and means actuated upon energization of said motor for releasing
25 said holding means to permit said second latch to operate.

3. In a system for the protection of banks and the like, a vault having a door, an electric motor, mechanical connections between said motor and
30 said door for opening and closing the door, a door-latching device normally held inoperative, electro-magnetic means for releasing said latching device upon energization of said motor, and a key-controlled instrumentality for restoring
35 said latching device to normal position.

4. In a system for the protection of banks and the like, a vault having a door, an electric motor, mechanical connections between said motor and
40 said door for opening and closing the door, a door-latching device normally held inoperative, electro-magnetic means for releasing said latching device upon energization of said motor, a key-controlled instrumentality for restoring said
45 latching device to normal position, a second door latching device, means constantly tending to hold said second door latching device in its active position, and a key-controlled means for moving
50 said second door latching device to the inoperative or door releasing position.

5. In a system for the protection of banks and the like, a vault having a door, an actuating circuit, and an operating circuit, a source of energy for said actuating circuit and said operating circuit, circuit closers at different locations included in said actuating circuit, a door operating
55 motor, a motor circuit including a source of energy, a relay whose magnet is connected in said operating circuit and whose armature and fixed contact are connected in said motor circuit, 60 means cooperative with said door for opening the motor circuit when the door is fully closed, and a key controlled lock device for the motor circuit which device when unlocked will cause the motor to move the door to open the vault.

6. In a system for the protection of banks and the like, a vault having a door, an actuating circuit, including circuit closers located at different
65 places, an operating circuit, means to energize said circuits, a relay whose magnet is connected in said actuating circuit and whose armature and fixed contact is connected in said operating circuit, a door operating motor, a motor circuit
70 including a source of energy, a second relay whose magnet is connected in said operating circuit
75

cuit and whose armature and fixed contacts are connected in said motor circuit, means cooperative with said door for opening the motor circuit when the door is fully closed, and a key controlled lock device for the motor circuit which device when unlocked will cause the motor to move the door to open the vault.

7. In a system for the protection of banks and the like, a vault having a door, an actuating circuit, including circuit closers located at different places, an operating circuit, means to energize said circuits, a relay whose magnet is connected in said actuating circuit and whose armature and fixed contact is connected in said operating circuit, a door operating motor, a motor circuit including a source of energy, a second relay whose magnet is connected in said operating circuit and whose armature and fixed contact are connected in said motor circuit, means cooperative with said door for opening the motor circuit when the door is fully closed, a key controlled lock device for the motor circuit which device when unlocked will cause the motor to move the door to open the vault, and other means cooperative with the motor circuit for opening the motor circuit when the door is fully open, said key controlled device including a pole changing switch for purposes described.

8. In a system for the protection of banks and the like, a vault having a door, a motor for operating said door, a motor circuit for effecting the action of said motor which motor circuit includes a source of energy, an actuating circuit including circuit closers at different locations and including a source of energy, an operating circuit, a relay whose magnet is connected in said operating circuit and whose armature and fixed contact are connected in said motor circuit, means cooperative with said door for opening the motor circuit when the door is fully closed, a key controlled lock device for the motor circuit which device when unlocked will cause the motor to move the door to open the vault, a latch to secure the door in closed position, electro-mechanical means normally to hold said latch inactive, and means actuated upon energization of said motor for releasing said holding means to permit said latch to operate.

9. In vault doors having electrically actuated door opening and closing mechanism, a set of latches, electro-magnetic means normally holding said latches in their unlatched positions, means cooperative with said electrically actuated mechanism for effecting said electro-magnetic means to release the latches upon operation of said electrically actuated mechanism, and key controlled means for effecting said electro-magnetic means and said latches to restore them to their unlatched positions.

10. In a system for the protection of banks and the like, a vault having a door, an actuating circuit, and an operating circuit, a source of energy for said actuating circuit and said operating circuit, circuit closers at different locations included in said actuating circuit, a door operating motor, a motor circuit including a source of energy, a relay whose magnet is connected in said operating circuit and whose armature and fixed contact are connected in said motor circuit, means cooperative with said door

for opening the motor circuit when the door is fully closed, a key controlled lock device for the motor circuit which device when unlocked will cause the motor to move the door to open the vault, a power line circuit, alarm signals in a sub-circuit connected to the power line circuit, and a relay whose magnet is connected in the operative circuit and whose armature and fixed contact are connected in said sub-circuit whereby upon energization of said operating circuit the alarm signals will be operated.

11. In bank protecting means, a vault having the usual hinged doors, in combination with an auxiliary sliding door, an electric-motor-operated door opening and closing mechanism, an electric circuit including the motor of said mechanism and a set of circuit closers distributed about the premises, a set of sliding-door latches positioned automatically to latch upon closing the door, key actuated means for unlatching said latches, another set of sliding-door latches, means normally holding said second set of latches in their unlatched positions, and means governed by the motor energizing circuit for releasing said second set of latches to their latching positions when said motor circuit is energized to close said sliding door.

12. In bank protecting means, a vault having the usual hinged doors, in combination with an auxiliary sliding door, an electric-motor-operated door opening and closing mechanism, an electric circuit including the motor of said mechanism and a set of circuit closers distributed about the premises, a set of sliding-door latches positioned automatically to latch upon closing the door, key actuated means for unlatching said latches, another set of sliding-door latches, means normally holding said second set of latches in their unlatched positions, means governed by the motor energizing circuit for releasing said second set of latches to their latching positions when said motor circuit is energized to close said sliding door, and key controlled manually actuated means for restoring said second set of latches to their normal positions.

13. In bank protecting means, a vault having the usual hinged doors, in combination with an auxiliary sliding door, an electric-motor-operated door opening and closing mechanism, an electric circuit including the motor of said mechanism and a set of circuit closers distributed about the premises, a set of sliding-door latches positioned automatically to latch upon closing the door, key actuated means for unlatching said latches, another set of sliding-door latches, means normally holding said second set of latches in their unlatched positions, means governed by the motor energizing circuit for releasing said second set of latches to their latching positions when said motor circuit is energized to close said sliding door, and key controlled manually actuated means for restoring said second set of latches to their normal positions, said sliding door comprising a hollow structure having inner and outer walls provided with a plurality of perforations those of one wall being staggered with respect to those of the other wall.

CHRISTIAN JOSEPH MEUNIER.
HAROLD BOMBOY.