No. 762,770. PATENTED JUNE 14, 1904.

H. S. STEWART.

DOOR OPENING APPARATUS.

APPLICATION FILED MAR. 24, 1904.

NO MODEL. 3 SHEETS—SHEET 1.

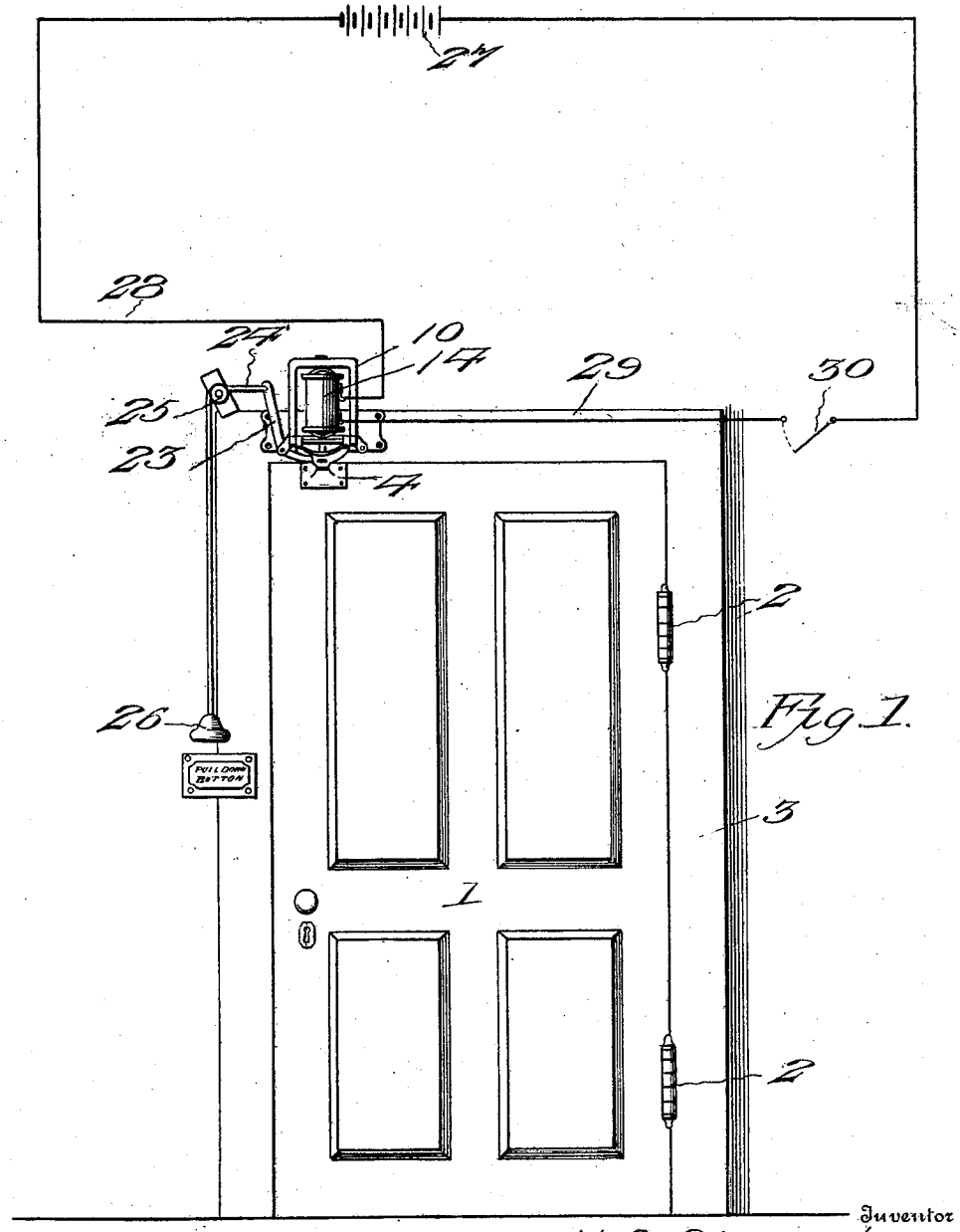


Fig. 1.

Witnesses
Wm. L. Boerth,
Robert D. Lawson.

Inventor
H. S. Stewart,
By Victor J. Evans
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 762,770. PATENTED JUNE 14, 1904.

H. S. STEWART.

DOOR OPENING APPARATUS.

APPLICATION FILED MAR. 24, 1904.

NO MODEL. 3 SHEETS—SHEET 2.

Fig. 1.

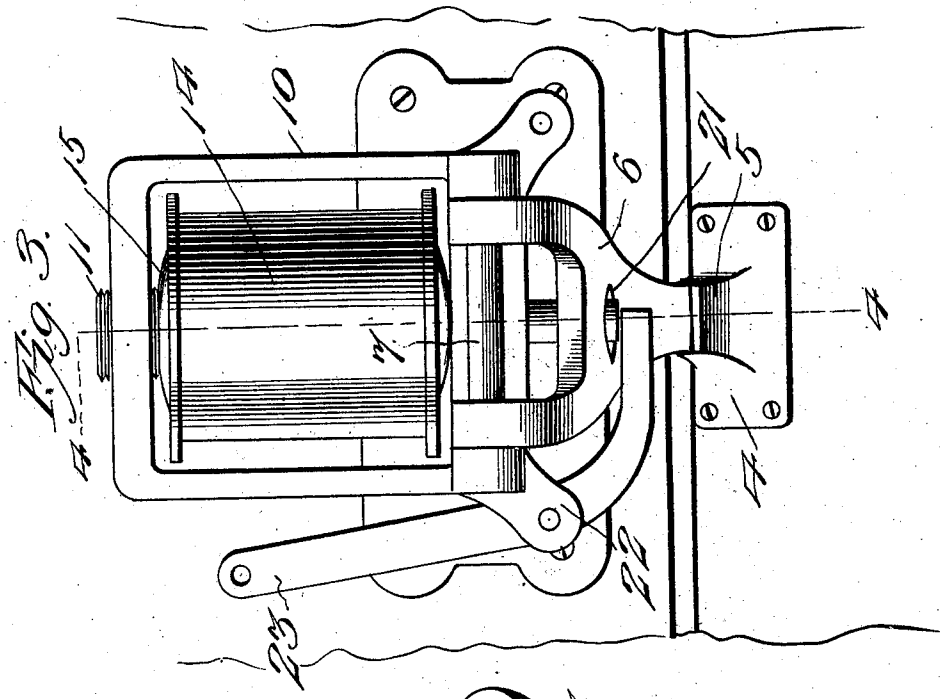
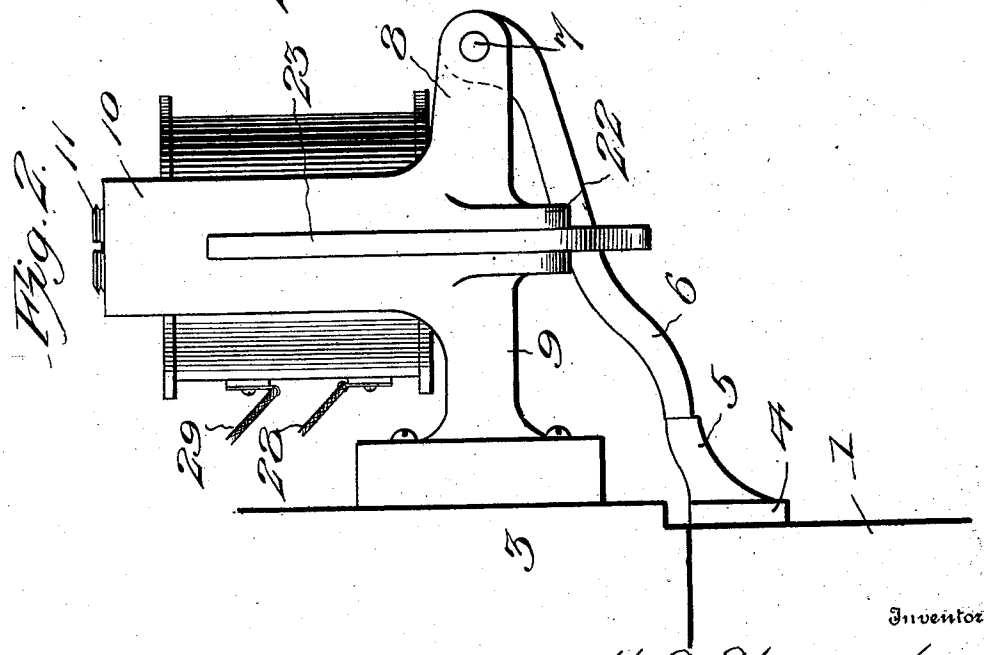


Fig. 2.



Witnesses

W. M. Roberts.

Robert D. Lawson.

Inventor

H. S. Stewart,

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

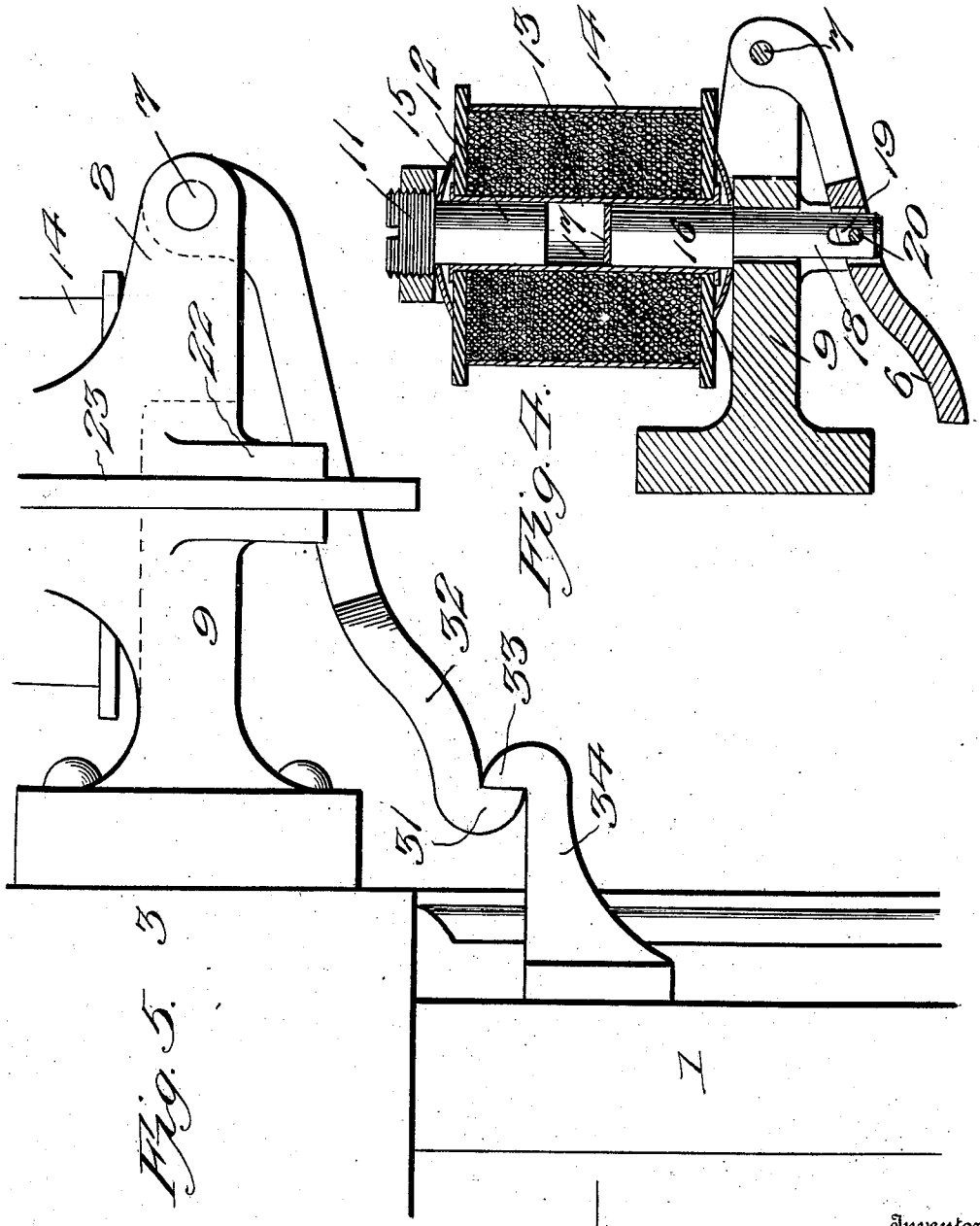
No. 762,770. PATENTED JUNE 14, 1904.

H. S. STEWART.

DOOR OPENING APPARATUS.

APPLICATION FILED MAR. 24, 1904.

NO MODEL. 3 SHEETS—SHEET 3.



Witnesses

Wm. L. Goerth.

Herbert B. Lawson.

Inventor

H. S. Stewart,

By Victor J. Evans

Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 762,770. Patented June 14, 1904.

UNITED STATES PATENT OFFICE.

HENRY S. STEWART, OF CHICAGO, ILLINOIS.

DOOR-OPENING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 762,770, dated June 14, 1904.

Application filed March 24, 1904. Serial No. 199,890. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. STEWART, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Door-Opening Apparatus, of which the following is a specification.

My invention relates to new and useful improvements in door-opening apparatus; and its object is to provide electromechanical means whereby one or a series of doors may be simultaneously opened by closing the circuit in which the opening means are included.

Another object is to provide mechanism whereby any one of a series of doors may be opened independently of the other doors of said series.

With the above and other objects in view the invention consists of a solenoid-magnet, the core of which is connected to a catch which is adapted to engage a projection upon a door and prevent the same from opening except when desired. The magnet is included in a ciruit provided with a circuit-closer, and when a current is directed into the magnet the core thereof is drawn thereinto and the catch is removed from engagement with the projection and permits the door to swing open automatically. The door is provided with spring-hinges, so that the same will open whenever the catch is disengaged therefrom.

The invention also consists of a releasing-arm which is adapted to raise the catch out of engagement with the door whenever it is desired to open the door independently of the action of the electrical apparatus.

The invention also consists in the further novel construction and combination of parts hereinafter more fully described and claimed, and illustrated in the accompanying drawings, showing the preferred form of my invention, and in which—

Figure 1 is an elevation of a door having my improved opening apparatus connected thereto and showing diagrammatically the circuit including the magnet. Fig. 2 is a side elevation of the magnet and the parts connected thereto and showing the catch holding a door against outward movement. Fig. 3 is a front elevation of the parts shown in Fig. 2. Fig. 4 is a section on line 4 4, Fig. 3, and Fig. 5 is a side elevation of the catch and showing a modification which is employed for holding doors against inward movement.

Referring to the figures by numerals, 1 is a door having spring-hinges 2, connecting it to a door-frame 3. Secured to the outer face of the door, at the upper edge thereof, is a casting 4, having a projection 5, which is adapted to be contacted by one end of a catch 6, which is pivoted upon a pin 7, arranged within ears 8, which extend from the supporting-plate 9 of the door-opening apparatus. This supporting-plate is adapted to be secured to the door-frame at a point adjacent and above the door and has a yoke 10 thereon and preferably integral therewith. Adjustably mounted within this yoke is the threaded head 11 of a plug 12, and the plug projects downward into the upper end of a tube 13, which is arranged at the center of a solenoid-magnet 14. Spring concavo-convex washers 15 are interposed between the ends of the magnet and the head 11 and the base 9, respectively. The magnet has a reciprocating core 16 arranged in the lower end of the tube 13 and provided at its inner end with a plate 17, of brass or other suitable material, whereby said core is prevented from adhering to the plug 12. The core 16 has a stem 18 projecting downward therefrom and slidably mounted within the base-plate, and this stem has a slot 19, through which projects a pin 20, which extends transversely within an aperture 21 formed within the catch 6. Ears 22 extend laterally from the plate 9, and pivoted therebetween is a bell-crank lever 23, the lower end of which projects under the stem 18. A cord 24 is secured to the upper end of the bell-crank lever and extends over a pulley 25 and thence downward to a point within convenient reach and is provided at its free end with a knob 26. A source 27 of electricity is connected to the magnet 14 by means of wires 28 and 29, and a circuit-closer 30 is arranged within one of these wires.

In Fig. 1 I have shown but one door included in a circuit; but it will be understood that any number of doors may be included therein. When it is desired to close the doors,

the same are swung inward, as ordinarily, and the extensions 5 thereon raise catches 6 until the doors are entirely closed, when said catches will drop by gravity into positions in the paths of the extensions 5. In Fig. 2 I have shown one door held in this manner. The downward movement of the catch is limited by the core 16, which, as shown in Fig. 4, is adapted to rest upon the plate 9 when in lowered position. Should it be desired to open the door independently of any of the electrical apparatus employed, the knob 26 is drawn downward, and this will cause the bell-crank lever 23 to swing upon its fulcrum and raise the catch 6 and core 16. The springs upon the door will promptly throw it open. Should it be desired to open the door by means of the electrical apparatus employed, the circuit-closer 30 is operated to complete the circuit from the source 27 to the magnet 14. The core 16 is thus drawn into the tube 13 and lifts the catch 6 therewith, thereby releasing the door. It will be understood that where two or more doors are connected to the same circuit all of them will be opened simultaneously in this manner.

The apparatus herein described and shown is for use in connection with doors that open inwardly. Where it is desirable to use the apparatus in connection with doors opening in the opposite direction, it is merely necessary to place a hook 31 on the catch 32 and to form a hook 33 on the extension 34, which is secured to the door. This construction I have shown in Fig. 5. It will be seen that as soon as the catch 32 is raised the springs on the door will cause the same to move in the direction of the arrow shown in Fig. 5.

My improved door-opening apparatus is especially adapted for use in theaters and other large auditoriums, where it is often desirable to quickly unlock all of the doors, so as to permit the occupants of the room to rapidly leave the same.

In the foregoing description I have shown the preferred form of my invention; but I do not limit myself thereto, as I am aware that modifications may be made therein without departing from the spirit or sacrificing any of the advantages thereof, and I therefore reserve the right to make such changes as fairly fall within the scope of my invention.

Having thus described the invention, what is claimed as new is—

1. In an apparatus of the character described, the combination with a base having a catch pivoted thereto; of a magnet mounted upon the base, a sliding core therein and connected to the catch, and a source of electricity and a circuit-closer included in a circuit with the magnet.

2. In an apparatus of the character described, the combination with a base, and a catch pivoted thereto; of a magnet supported upon the base, a sliding core therein and connected to the catch, a source of electricity and a circuit-closer included in a circuit with the magnet, and mechanical means for operating the catch independently of the electrical means.

3. In an apparatus of the character described, the combination with a base having a catch pivoted thereto; of a solenoid-magnet supported by the base, a sliding core therein connected to the catch, a source of electricity and a circuit-closer included in a circuit with the magnet, a lever connected to the base and extending under the catch, and means for operating the lever to raise the catch.

4. In an apparatus of the character described, the combination with a base having a yoke thereon, and a catch pivoted to the base; of a solenoid-magnet mounted upon the base and within the yoke, spring holding devices at the ends of the magnet, a source of electricity and a circuit-closer included in a circuit with the magnet, and a movable core within the magnet and connected to the catch.

5. In an apparatus of the character described, the combination with a base having a yoke thereon, and a catch pivoted to the base; of a solenoid-magnet mounted upon the base and within the yoke, spring holding devices at the ends of the magnet, a source of electricity and a circuit-closer included in a circuit with the magnet, a movable core within the magnet and connected to the catch, a lever connected to the base and extending under the catch, and means for operating the lever to raise the catch.

6. The combination with a door having an extension thereon; of a base secured adjacent the door, a solenoid-magnet included in a circuit with a source of electricity and a circuit-closer, a catch pivoted to the base and normally held by gravity in the path of the extension, a movable core within the magnet and connected to the catch, and mechanical means for raising the catch from engagement with the extension.

7. The combination with a door having a hooked extension thereon; of a base secured adjacent the door, a solenoid-magnet included in a circuit with a source of electricity and a circuit-closer, a hooked catch pivoted to the base and normally held by gravity in the path of the extension, a movable core within the magnet and connected to the catch, and mechanical means for raising the catch from engagement with the extension.

In testimony whereof I affix my signature in presence of two witnesses.

HENRY S. STEWART.

Witnesses:
EDNA M. JUBB,
L. O. BILLINGS.