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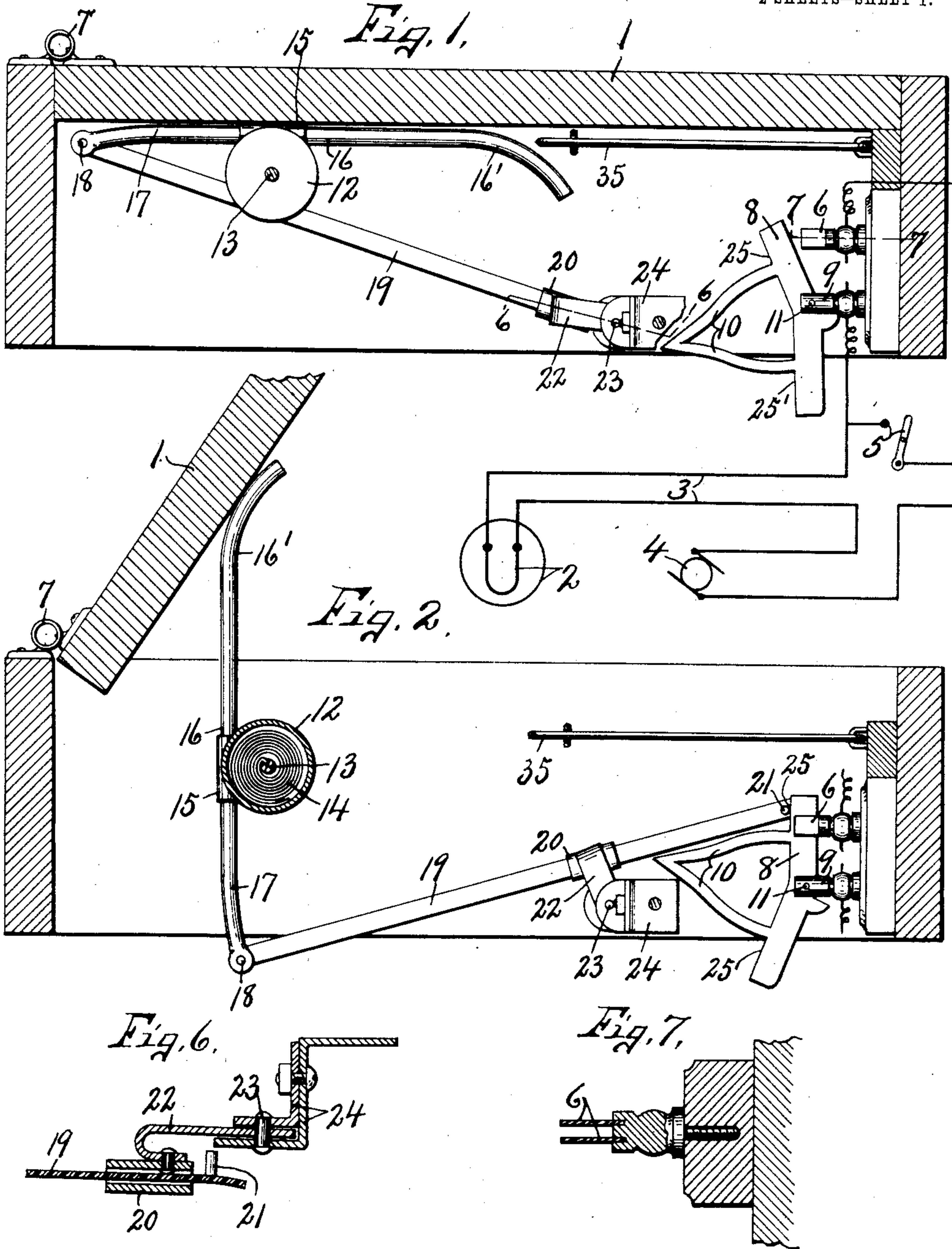
PATENTED OCT. 15, 1907.

J. KRAMER.

DOOR OPERATED ELECTRIC SWITCH FOR ELECTRIC LIGHT CIRCUITS.

APPLICATION FILED SEPT. 12, 1906.

2 SHEETS—SHEET 1.



WITNESSES:

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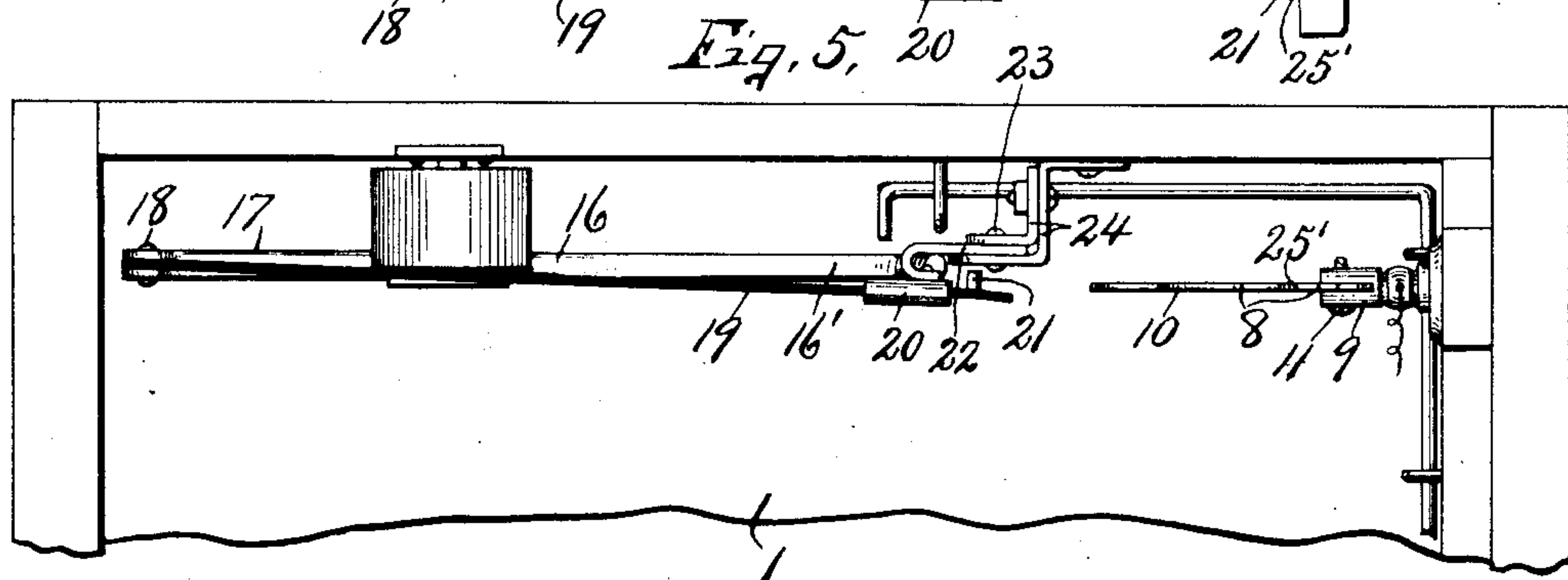
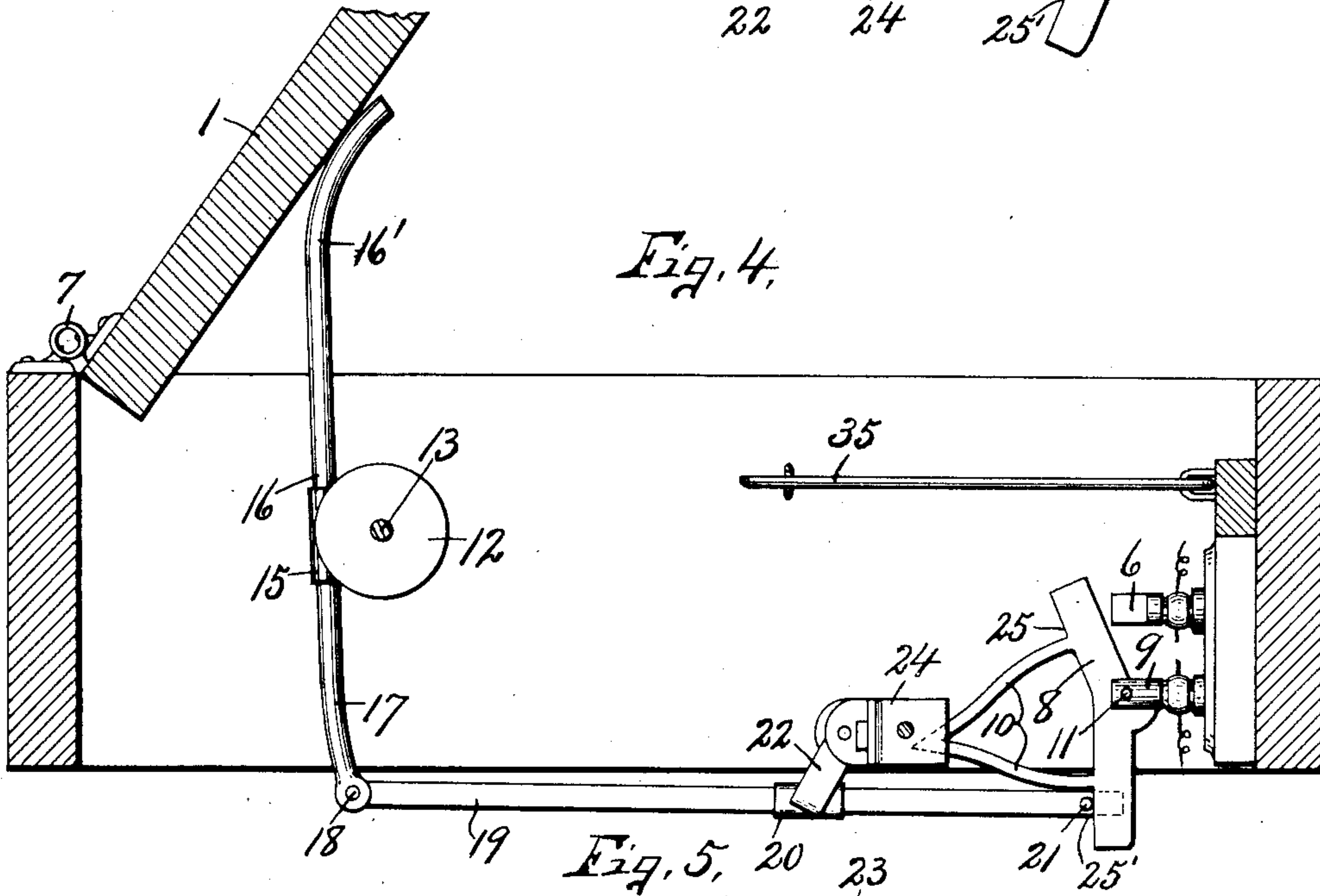
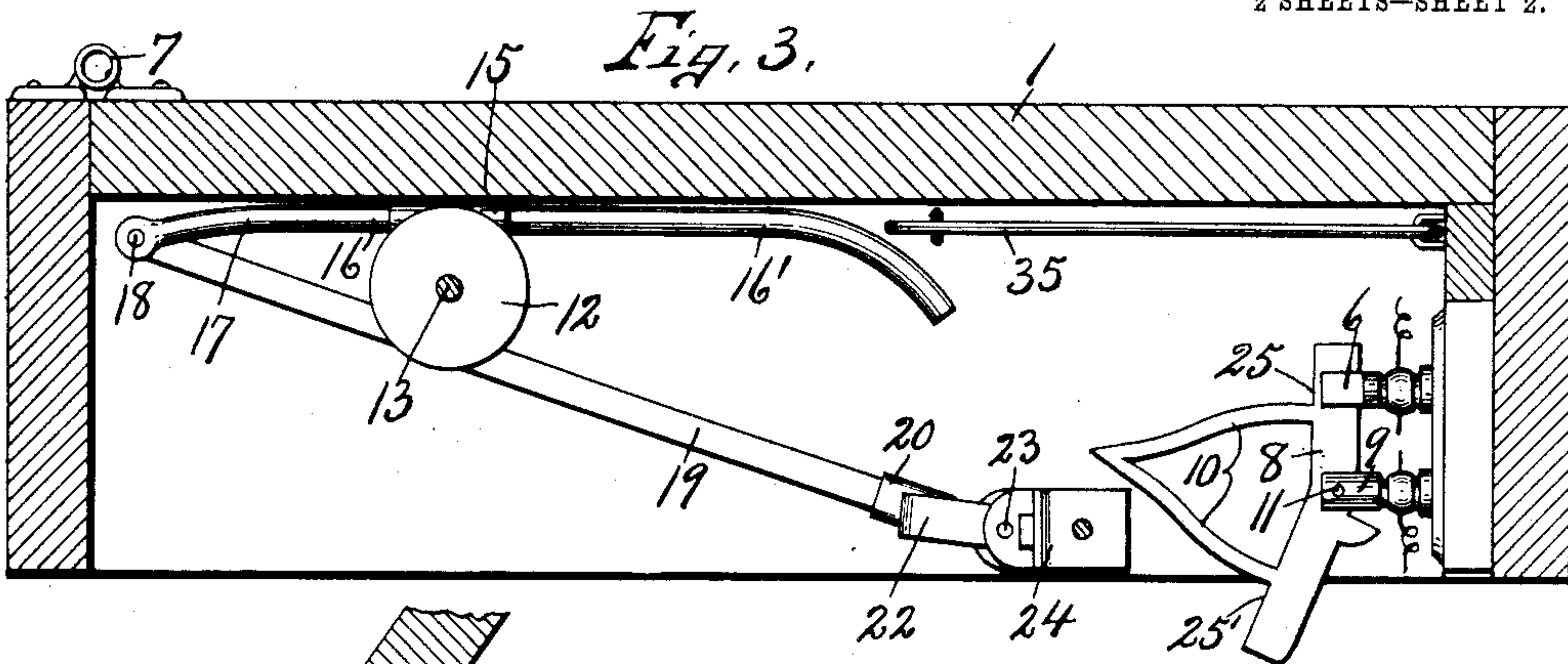
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UNITED STATES PATENT OFFICE.

JOHN KRAMER, OF SYRACUSE, NEW YORK.

DOOR-OPERATED ELECTRIC SWITCH FOR ELECTRIC-LIGHT CIRCUITS.

No. 868,348.

Specification of Letters Patent.

Patented Oct. 15, 1907.

Application filed September 12, 1906. Serial No. 334,305.

To all whom it may concern:

Be it known that I, JOHN KRAMER, of Syracuse, in the county of Onondaga, in the State of New York, have invented new and useful Improvements in Door-Operated Electric Switches for Electric-Light Circuits, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to certain improvements in door-operated electric light switches and is especially adapted for use in connection with the doors of bathrooms, coolers and other places where it is desirable to throw on an electric light in such room immediately upon the opening of the door, and to maintain such light in the room after the door is closed, and to automatically open the lighting circuit upon the re-opening of the door. In other words, I have sought to provide a simple, comparatively inexpensive means controlled by the opening and closing of the door whereby the electric light circuit may be closed upon the opening of the door for lighting the room in which said door opens and to enable such lighting circuit to remain closed during the closing of the door while the occupant is in the room and to cause said circuit to be broken upon the re-opening of the door or when the occupant leaves the room.

Other objects relating to the specific structure of the electric light switch and its operating means will be brought out in the following description.

In the drawings—Figure 1 is a top plan of my improved electric lighting switch and its operating means showing the door and part of the case in section, the door being closed and the switch open to open the lighting circuit, which latter is shown in this instance, as connected to an incandescent lamp in the room. Fig. 2 is a top plan showing the door open and the switch operating mechanism as closing the switch. Fig. 3 is a top plan similar to Fig. 2, showing the door closed after the occupant is in the room, and also showing the switch as closed and its operating mechanism in position to re-open the door. Fig. 4 is a top plan similar to Fig. 2, showing the door as re-opened and the switch operating mechanism as opening the switch to break the lighting circuit. Fig. 5 is an inner face view of the mechanism as seen in Fig. 1. Figs. 6 and 7 are enlarged sectional views taken respectively on line 6—6, and 7—7, Fig. 1.

In Fig. 1 of the drawings, I have shown a door —1— of a room in which is located an incandescent electric lamp —2— of an electric lighting circuit —3— which is adapted to receive current from any available source of electric energy, as a dynamo —4—. Within the room is located any ordinary hand-operated electric switch —5— which is connected in the circuit —3— and may be opened and closed at will. Connected in the same circuit is an automatic switch consisting of a

fixed terminal —6— and a movable terminal —8—, which latter is pivoted to a binding post —9— and is movable into and out of contact with the terminal —6—, the binding post —9— being connected in the circuit —3— and forms an electric connection with the movable terminal 8. This switch comprising the terminals —6— and —8— are shown as secured within the door opening to one side of the case and near the top of the opening so as to clear the head when passing back and forth through the door opening.

The switch member —8— is shown in Fig. 1 as open or out of contact with the terminal —6— to open the lighting circuit, and is provided with a laterally projecting arm —10— having its longitudinal edges converging to a point some distance from the pivot, as —11—.

A spring motor box —12— is shown as rotatably mounted upon a fixed spindle —13— and is actuated in one direction by an inclosed spring motor —14—, the shaft or spindle —13— being preferably secured to the header of the door casing, but within the door opening.

Rigidly secured to the motor box —12— by a clamp —15— is a tangential arm or lever —16—, or in other words, the motor box may be said to be provided with oppositely projecting arms, one of which, as 16'— lies in the path of and is spring pressed by the motor —14— against the inner side of the door —1— so that when the door is opened the arm —16'— will be automatically swung outwardly to close the switch and when the door is forcibly closed by a spring motor —7— it re-acts upon the arm —16'— to press the latter inwardly against the action of the spring motor —14—. The other arm, as —17—, of the lever —16— at the opposite side of the fulcrum —13— is pivotally connected at —18— to one end of a sliding bar or link —19— of insulating material as wood which is centrally suspended in and is adapted to slide through a loop or guide —20— and has its opposite end provided with a switch operating member, as a stud —21—, as best seen in Figs. 2, 4, 5 and 6.

The loop —20— is pivoted to oscillate horizontally upon a horizontal oscillating bracket —22—, which in turn, is pivoted at —23— to a fixed bracket —24—, the latter being secured to the head casing of the door, as best shown in Fig. 5.

The loop —20— and bar —19— are disposed in a plane below and are movable under the lower face of the bracket —24—, the stud —21— being disposed in a horizontal plane also below said bracket and substantially coincident with the horizontal plane of the swinging switch member —8—.

The lever —16— moves through an arc of substantially 90° and causes the bar —19— to be reciprocated back and forth a distance slightly greater than the distance between the pivotal axis point of the switch

member —8—. This reciprocal and rocking movement of the bar —19— causes the stud —21— to alternately ride against opposite edges of the switch-point and against suitable shoulders —25— and 25'— which form a part of the switch member —8— in the path of the reciprocating stud —21—.

The loop —20— is pivoted to the arm —22— some distance to one side of the swinging axis —23— of said arm —22—, or between the axis —23— and pivotal connection of the bar —19— with the arm —17— of the lever —16— and the length of the arm 17— and bar —18— with the stud —21— are so proportioned with relation to the loop —20— that when the door is closed the lever —16— is rocked substantially parallel with the door, thereby drawing the rod 19— to its extreme position in one direction, and causing the pin or stud —21— to engage the adjacent edge of the loop —20—, thereby rocking the arm —22— upon its pivot —23— into nearly a direct line drawn between the pivot —23— and pivotal connection of the arm —19— with the lever —16—. This lever —16— is located in a vertical plane some distance at one side of the vertical plane of the axes —11— and —23— of the switch member —8— and oscillatory element —22— respectively so that when the door is opened from the position shown in Fig. 1, the end of the lever —16— which is connected to the bar —19— is swung inwardly and forwardly thereby throwing the adjacent end of the bar —19— to the inside of a direct line drawn between the pivots of the arm —22— and loop 20—, thus throwing the stud —21— to the opposite side of said line. While in this position the point of the open switch —8— is also at the outer side of said line so that as the door continues to open the end of the bar —19— carrying the stud —21— is forced endwise at the inner side of the switch point, the stud —21— riding upon the inner edge of the point until it engages the corresponding shoulder —25—, the continued movement of the bar —19— and its stud —21— against the adjacent shoulder —25— serving to rock the switch to its closed position in electrical contact with the terminal —6—, thereby closing the lighting circuit —3—.

As soon as the door is released after being opened in the manner just described for closing the circuit, it is automatically closed by any suitable door spring —7— which is considerably stronger than the motor spring —14— for the lever —16— and therefore, operates upon the lever to rock it to and from the position shown in Fig. 2 to the position shown in Figs. 1 and 3. During this closing of the door and consequent operation of the lever —16— against the action of the spring motor —14— the bar —19— is drawn backwardly to its normal or starting position shown in Fig. 1, leaving the electric switch terminal —6— to maintain a closed electric lighting circuit, but the switch point is now shifted to the opposite side of a direct line drawn through the pivotal pins of the oscillatory member —22— and loop —20—; that is, when the bar —19— is returned to its normal position upon the closing of the door by the spring —7— or otherwise, the pin —21— is at the outside of the switch point instead of inside, as shown in Fig. 1. It is now evident that the person desiring to go into the room opens the door —1—, thereby relieving the pressure upon the lever —16—. The release of the latter allows the spring motor —14—

to rock the lever —16— upon its fulcrum —13—, which in turn, reciprocates the bar —19— and causes the stud —21— to engage the inner shoulder —25— of the open switch, the continued movement of the lever —16— and bar —19— by the spring —14— causing the stud —21— to rock the switch —8— to its closed position in contact with the terminal 6—, thereby closing the lighting circuit and lighting the lamp —2— in the room. This circuit remains closed while the occupant remains in the room; the door being closed automatically by the spring —7—, thereby returning the lever —16— and bar —19— to its normal position, leaving the switch member —8— in its closed position. Now when the occupant leaves the room the door —1— is again opened against the action of the spring —7—, allowing the operation of the lever —16— and bar —19— through the medium of the spring motor —14— and causing the stud —21— to engage the outer shoulder 25' and to thereby rock the switch member 8— out of contact with the terminal —6—, thus opening the lighting circuit and cutting out the incandescent lamp —2—, it being understood that the switch member is now returned to its normal or starting position shown in Fig. 1, and that as soon as the occupant has left the room and the door closed by the action of the spring —7— the lighting circuit is broken, and the switch operating elements are restored to the starting position ready to repeat the operation upon the next opening of the door.

It will be seen from the foregoing description that my invention involves but two essential elements or mechanisms; namely, an electric switch, and means actuated by the door for operating the switch, but I prefer to include in this application, means, as the spring —7—, for automatically closing the door, and I also prefer to include, means, as a manually operated locking element —35— which is movable into and out of the path of movement of one end of the lever —16— so that when in its locking position it operates to engage and hold the lever —16— against action by its motor spring —14— and allows the door to be opened and closed in the usual manner without affecting the operation of the electric switch. Under such conditions, as well as other conditions, it may be desirable to open and close the circuit manually and for this purpose I have shown an additional electric switch —5— connected in the lighting circuit between the automatic switch and lamp —2—.

Having described my invention, what I claim is:

1. In combination with a self-closing door and its actuating means, an electric lighting circuit and an electric switch electrically connected therein, a reciprocatory switch-actuating bar and a swinging support therefor, means on the bar for rocking the swinging support to shift the position of the bar at each successive movement of the latter in the same direction, a lever actuated by the closing of the door to move the bar in such direction, and means for actuating the lever when the door is opened to move the bar in the opposite direction, alternate movements of the bar by the lever when the door is opened operating to alternately open and close the switch.
2. In combination with an automatically closing door and its actuating means, a lever rocked in one direction by the closing of the door, separate means for rocking the lever in the opposite direction when the door is opened, an electric lighting circuit including therein an electric switch, a reciprocatory switch-operating bar actuated by the lever in one direction independently of the switch

when the door is closed, means actuated by the bar to move the switch to one position when the door is opened, additional means to shift the position of the bar when the door is closed to throw the switch shifting means into position to move the switch into another position at the next succeeding opening of the door.

5 3. In combination with a self-closing door and its actuating means, an electric lighting circuit including therein an electric switch, a lever actuated in one direction by the closing of the door, separate means for rocking the lever in the opposite direction upon the opening of the door, a reciprocatory bar actuated by said lever independently

of the switch when the door is closed, said bar operating to alternately close the switch at each successive operation of the lever by its own actuating means as the door is opened and means to shift the position of said bar at each operation of the lever by its own actuating means during such opening of the door. 15

In witness whereof I have hereunto set my hand this 1st day of September 1906.

JOHN KRAMER.

Witnesses:

H. E. CHASE,

HOWARD P. DENISON.