

Sept. 16, 1924.

L. F. SCHOELKOPF

1,508,580

DOOR SWING

Filed Dec. 4, 1922

2 Sheets-Sheet 1

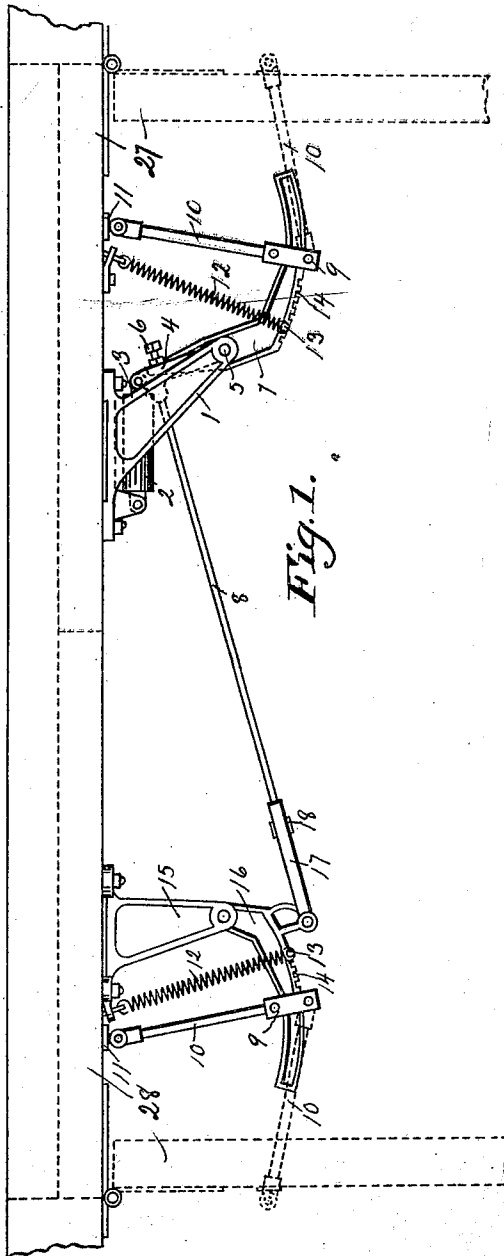


Fig. 1.

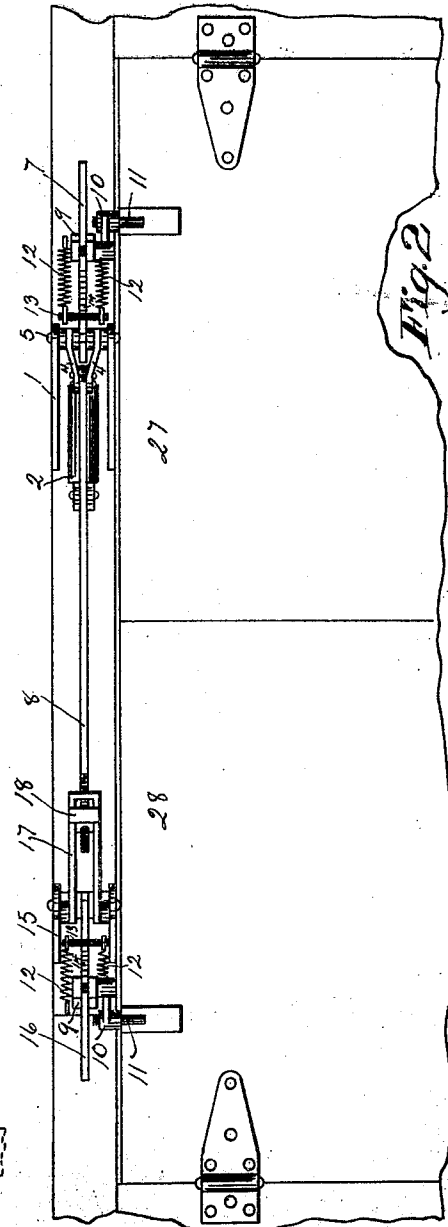


Fig. 2.

WITNESS:

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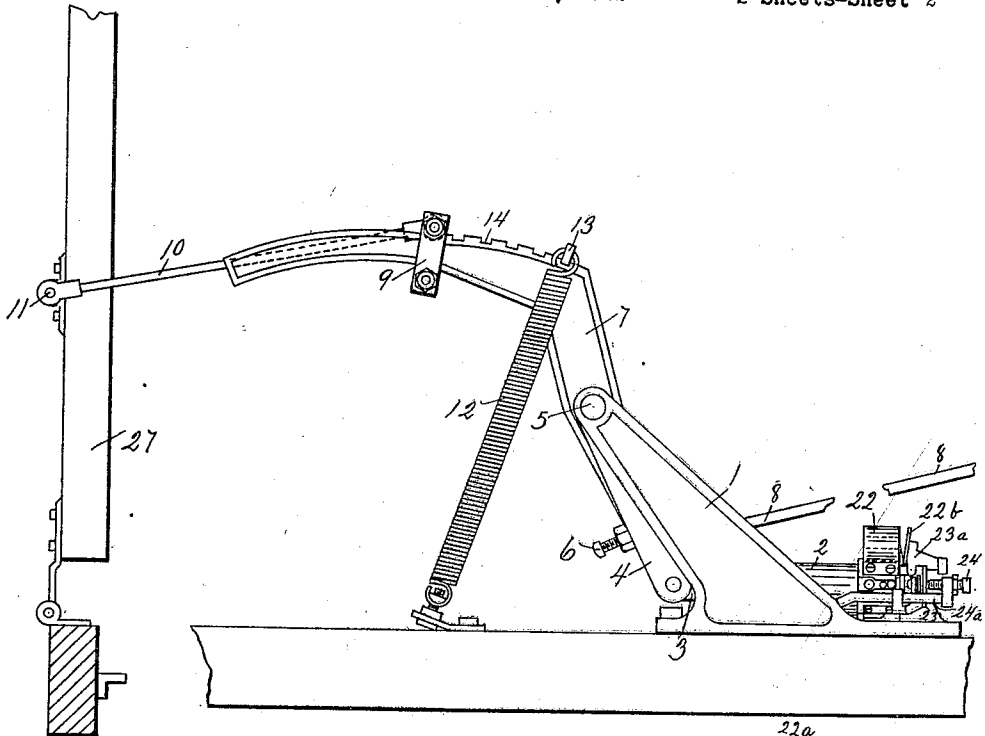


Fig. 5.

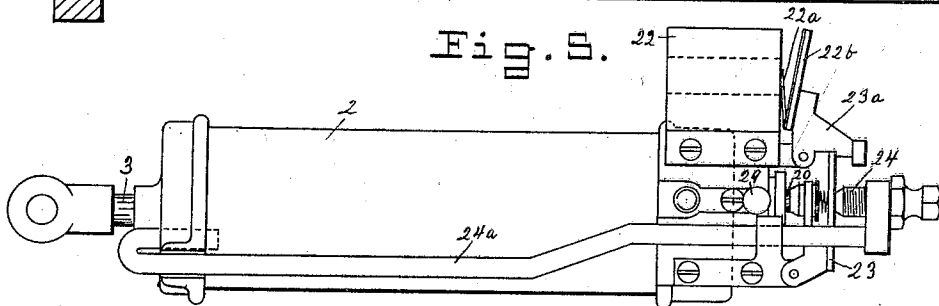


Fig. 6.

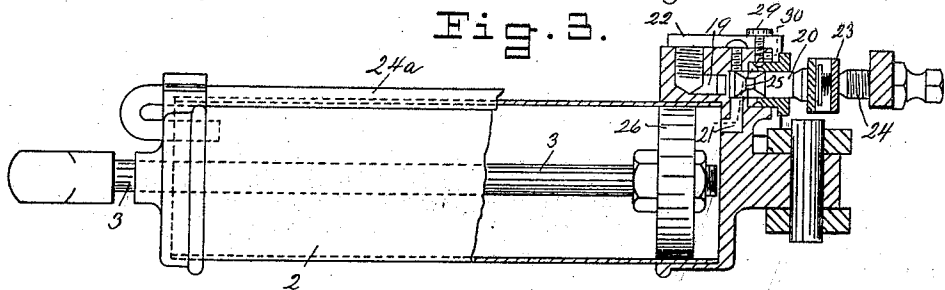


Fig. 7.

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UNITED STATES PATENT OFFICE.

LOUIS F. SCHOELKOPF, OF MADISON, WISCONSIN.

DOOR SWING.

Application filed December 4, 1922. Serial No. 604,891.

To all whom it may concern:

Be it known that I, LOUIS F. SCHOELKOPF, a citizen of the United States, residing at Madison, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Door Swings, of which the following is a specification.

My invention relates to door swings in which the force mechanically applied to operate the doors is pivotally located in the angle of travel of the door; and the objects of my invention are, first, to apply the power in the angle of travel of the door; second, to provide a suitable power located in the angle of travel, which will move the door a part of the distance and then complete the movement; third, to provide a suitable power located in the angle of the travel, which while approaching the center will store up power to be utilized for completing the travel; fourth, to provide suitable power to move the door the desired distance, and means for checking the momentum and cushioning at the end of the travel; and fifth, to provide means for electrically controlling the doors from any one of a plurality of stations.

I attain these objects by two methods shown in the accompanying drawings in which—

Fig. 1 is a plan;
Fig. 2 is a front elevation;
Fig. 3 is a side elevation of the air engine;
Fig. 4 is a partial vertical longitudinal section of the same, on line A—B, Fig. 3;
Fig. 5 is a plan of the engine, on enlarged scale, connected to one door when open, and a portion of the rod 8 which connects the two doors together.

Similar numerals refer to similar parts throughout the several views.

The bracket 1, is secured above the door and an air engine 2, is pivotally connected to the base of same, and a piston rod 3, disposed within the cylinder is pivotally connected to the inner end of a lever 4, this lever swings upon a pin 5, disposed through the outer end of the bracket and is free to move in the direction of the cylinder, but obstructed in the opposite direction by a set screw 6, through the inner end of a lever 7, which also swings upon the pin 5. A rod 8 is pivotally connected to the inner end of lever 4, in the direction of the edge of the door. An adjustable link 9, is disposed on the outer portion of the lever 7, and one

end of a rod 10, is pivotally secured thereto and the opposite end is loosely mounted on a post 11, secured to, and extending upward from the door. A pair of extension springs 12, are anchored to the wall above the door at one end, and extend outward on both sides of the lever 7, to a bar 13, which extends across the outer edge of the same and may be seated in notches 14, as required for obtaining the proper tension. When using double swinging doors, the second door is operated from a bracket 15, secured to the wall the same as bracket 1, with a lever 16, pivotally disposed at the outer end, said lever is provided with notches 14, springs 12, attached to the wall, and adjustable link 9, connected to a rod 10, and the rod to post 11. To the outer end of the lever 16, a link 17, is pivotally connected and a nut 18, is slidably mounted between the two sides. The rod 8, before mentioned as pivotally connected to the lever 4, extends from lever 4, through a hole in the outer end of the link 17, and is threaded to the nut 18.

In operation, valve lever 23, is tripped by the magnet 22, air being admitted to the cylinder 2, pushes out piston 26, which is connected by piston rod 3, to lever 4. This lever 4, comes into contact with the set screw 6, in lever 7, and is also connected pivotally to rod 8, which in turn is connected to lever 16, by the slide connection 18. The movement of the lever 4, pushes out lever 7, and lever 16, which are connected by rods 10, to the doors 27, and 28. This movement also elongates springs 12. As the doors pass the central position, by momentum, the springs 12 contract pulling the lever inward as it is pivoted at 5 to the outer end of the stationary bracket 1, thereby the springs complete the movement of the doors whether in opening or closing, for the air engine only swings the door to the center of travel, momentum carries it past that point, and the contracting of the elongated springs will carry it the balance of the way.

A means is shown for opening and closing the inlet valve 20 in the following manner; upon each outward stroke of the piston 26 it meets the inner end of the curved bumper pin shaft 24^a and forces it a distance in the direction the piston is traveling, thereby carrying the bumper pin 24 against the plate 23, the plate 23 meeting the stem 20 closes port 19 against admission of com-

pressed air, and synchronously opening the exhaust port 25 and locking the plate 23 back of the latch 23^a by a brass spring 22^a, resting against the core of the magnet 22.

5 Therefore it is seen that by closing an electric switch any place within a circuit will energize the magnet 22 and draw the plate 22^b to the magnet raising the latch 23^a, freeing the valve 20, which will be pushed outward by the air pressure in port 19, allowing compressed air to enter the cylinder through the ports 19 and 21, and will push the piston outward, when it will meet the bumper pin shaft 24^a and as before explained close the compressed air port 19, open the exhaust port 25 allowing the compressed air to escape from the cylinder 2, as indicated by the dotted line marked 30 in Fig. 3, and set the latch 23^a for the next
10 operation.

Each door can be opened or closed manually without disturbing or moving any of the rest of the mechanism. When operating door 27, lever 7, moves, leaving lever 4,
25 and piston rod 3, in their original positions. When the door is closed the set screw 6, through the inner end of the lever comes back into contact with the lever 4, restoring it to its original position. Operating door 28, lever 16, moves link 17, sliding it along nut 18, thus rod 8, the lever 4, and piston rod 3, are not disturbed.
30

My invention primarily, was the discovery of the advantage in placing the operating
35 force in opening and closing doors pivotally

in the angle of travel of the doors, and I have shown one method in Figs. 1, 2, 3, and 4, of the drawings, and another in Figs. 5, and 6, knowing that there are other connections that may be used.

Having thus described my invention, I claim.

1. In a door swing, the pivoting of the opening and closing force in the angle of travel, by means of the combining of an air engine and springs, whereby the engine moves the door through a portion of its travel, and the springs complete the travel.

2. In a door swing, an air engine with the inlet valve electrically opened from any one of a plurality of stations, and contact closed, an adjustable restricting screw in the exhaust port, to regulate compression cushioning on the return of the piston, the operating force of said engine, located pivotally between a stationary bracket and the door, in the angle of travel of the door.

3. In a door swing, the pivoting of the opening and closing force in the angle of travel, by means of an air engine, using compressed air on one side of the piston only, to move the door through a portion of its travel, and an auxiliary force to complete the travel.

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

LOUIS F. SCHOELKOPF.

Witnesses:

CHAS. B. HASSE,
PAUL R. DYE.