

No. 679,009.

Patented July 23, 1901.

J. H. WHITAKER.  
AUTOMATICALLY OPERATING DOORS.

(Application filed May 11, 1900.)

(No Model.)

Fig. 1.

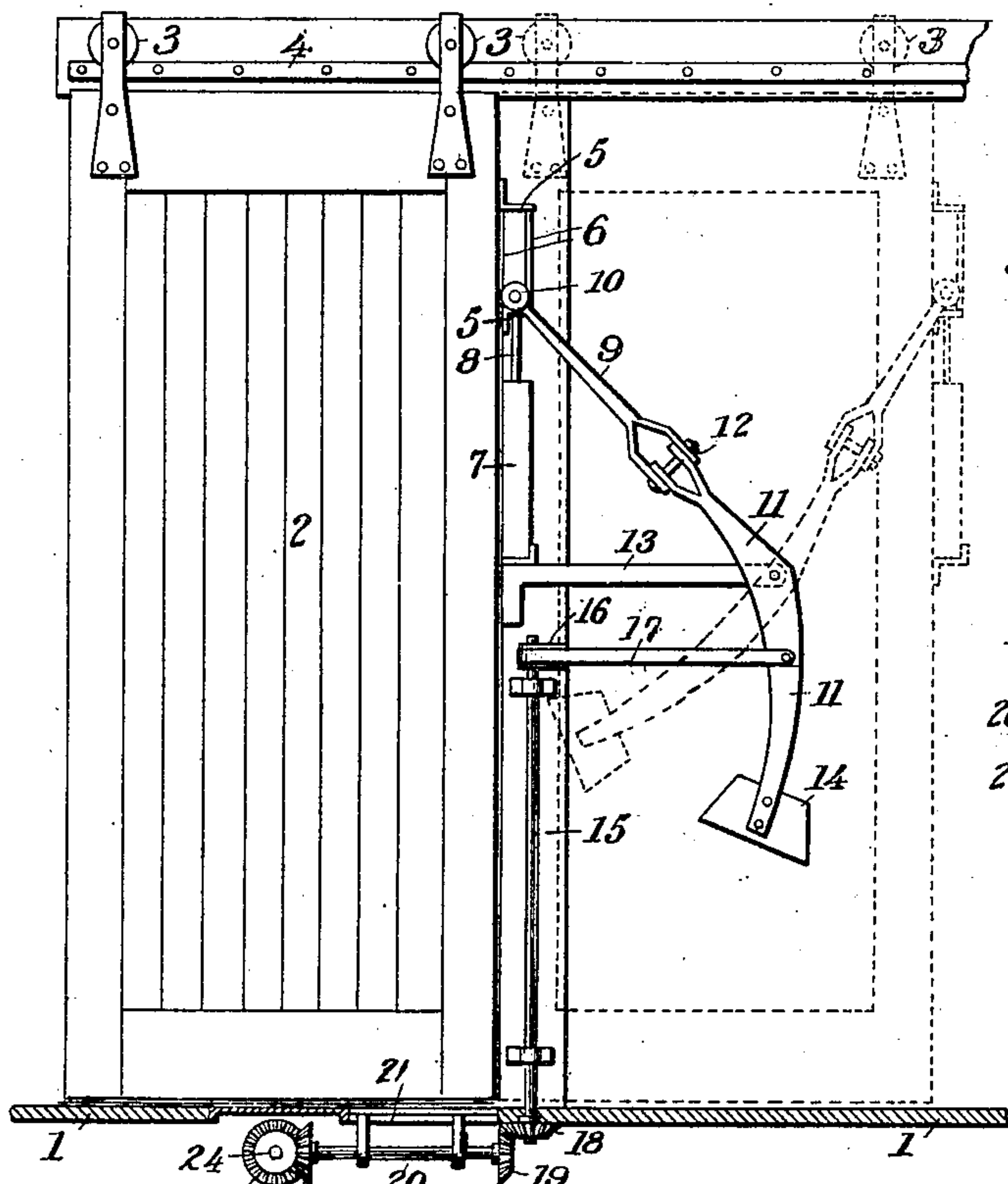


Fig. 2.

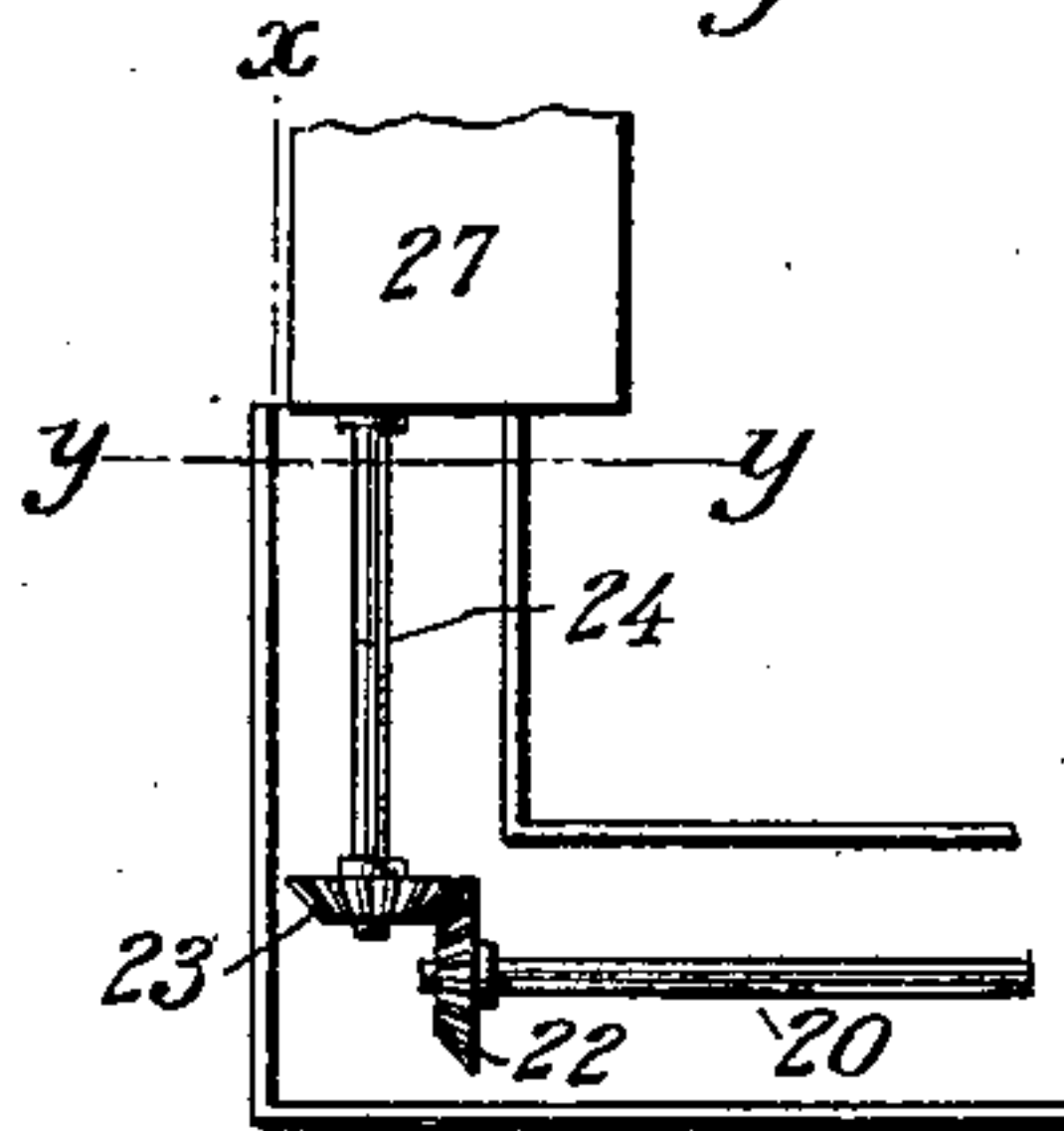


Fig. 4.

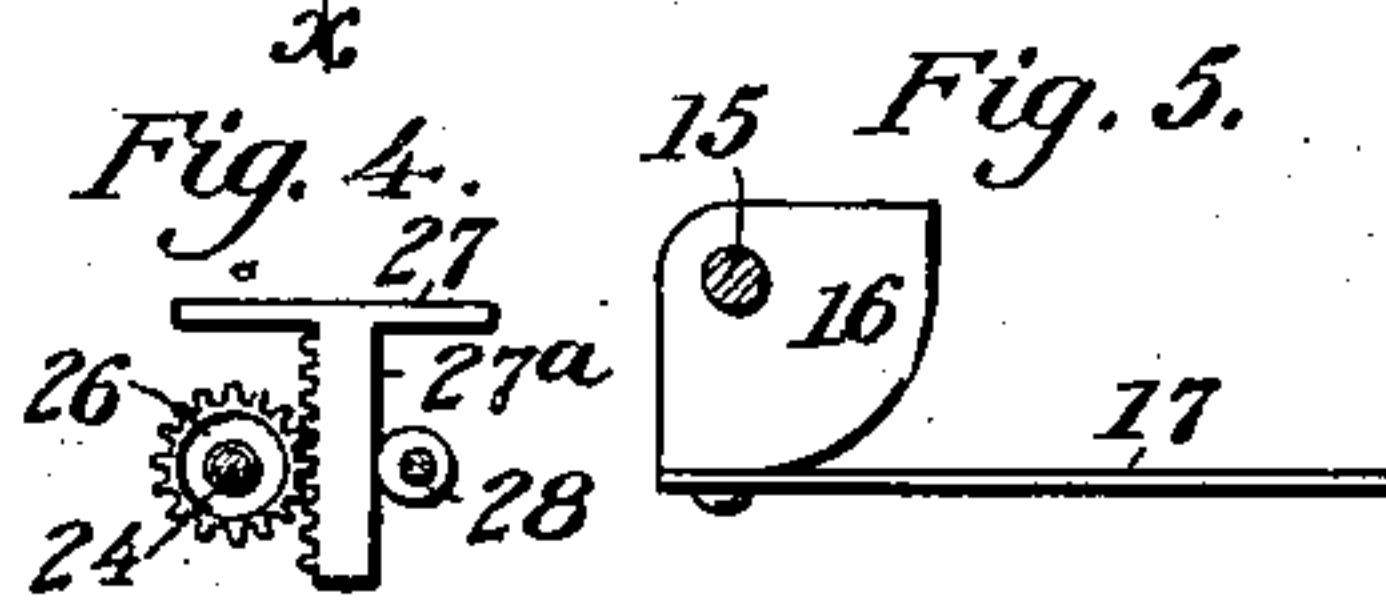


Fig. 5.

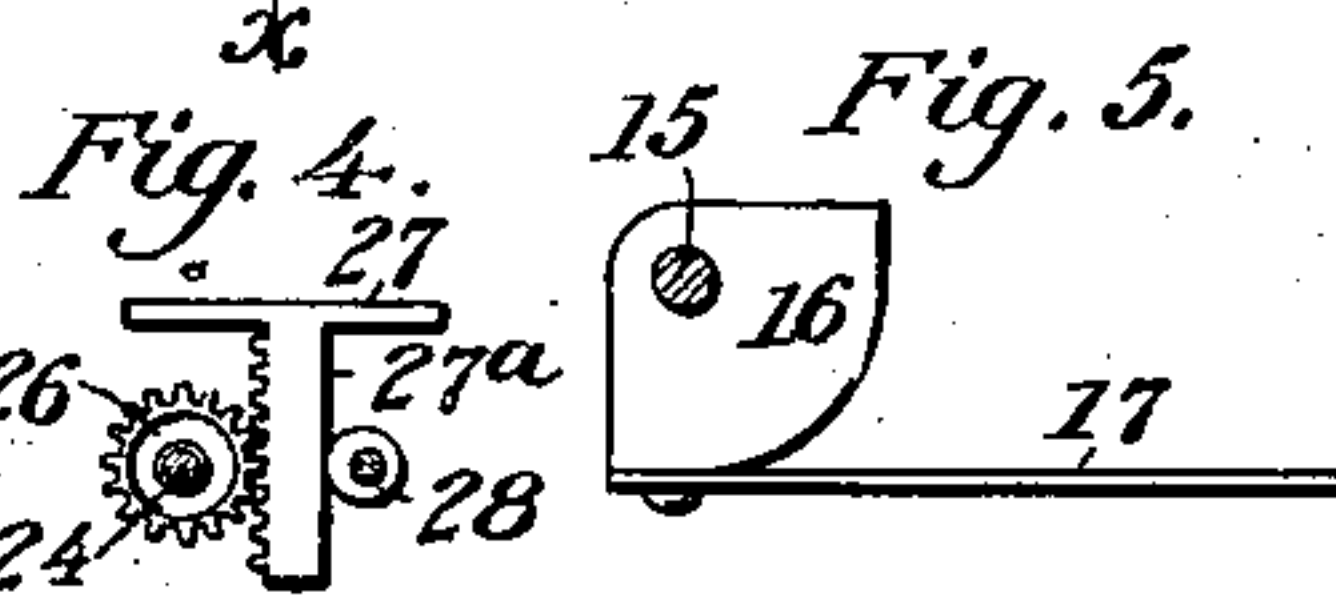


Fig. 6.

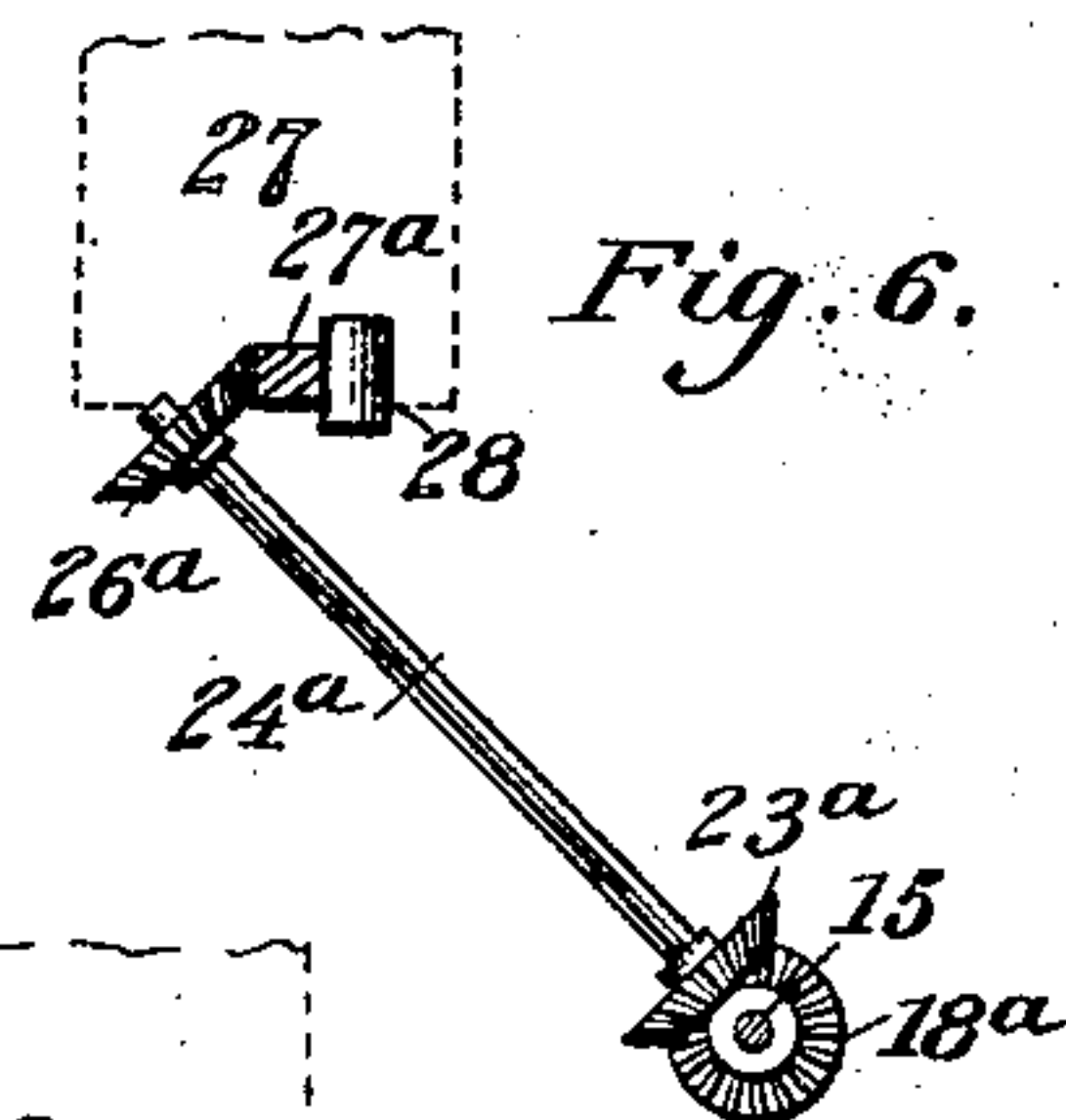


Fig. 7.

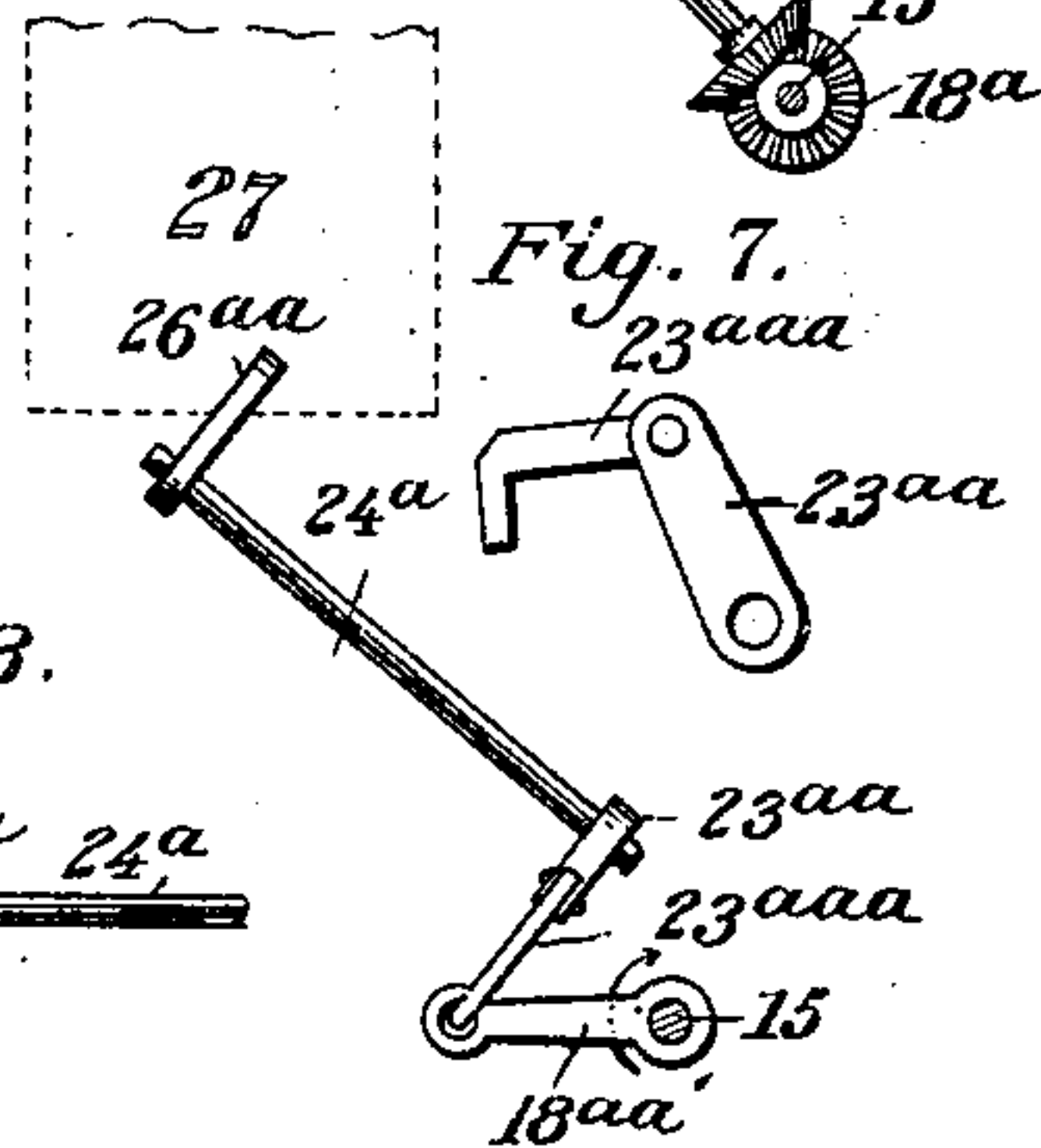
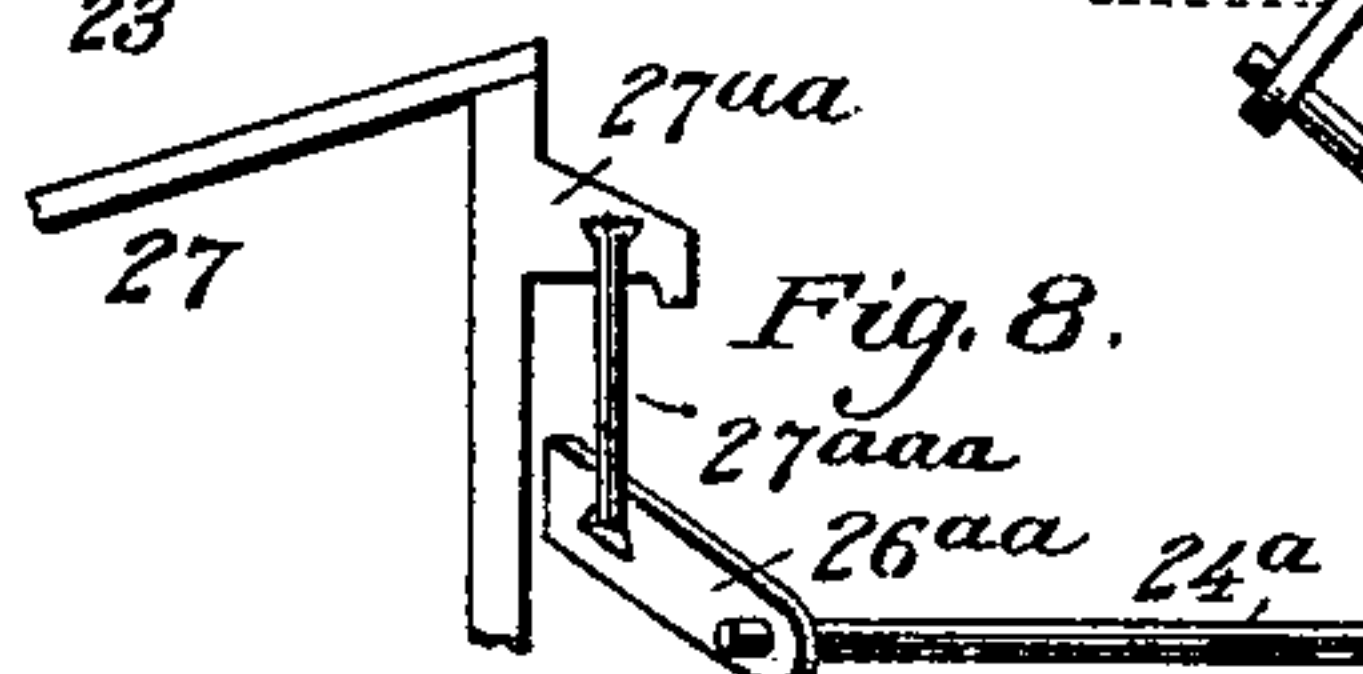


Fig. 8.



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# UNITED STATES PATENT OFFICE.

JOHN H. WHITAKER, OF DAVENPORT, IOWA.

## AUTOMATICALLY OPERATING DOORS.

SPECIFICATION forming part of Letters Patent No. 679,009, dated July 23, 1901.

Application filed May 11, 1900. Serial No. 16,281. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN H. WHITAKER, a citizen of the United States of America, and a resident of Davenport, in the county of Scott and State of Iowa, have invented certain new and useful Improvements in Automatically Operating Doors; and I do declare the following specification, taken in connection with the drawings making a part of the same, to be a full, clear, and exact description thereof.

This invention relates to devices for operating doors automatically, is especially useful in hotels, where waiters carrying large trays before them are required to pass through the doorway and are unable to use their hands to open the door because of carrying the tray, and is intended as an improvement on the mechanism shown and described in the following Letters Patent of the United States heretofore granted to me: No. 496,027, dated April 25, 1893; No. 505,376, dated September 19, 1893, and No. 632,299, dated September 5, 1899.

Each and all of the patents named, as well as the invention set out in this specification, have for one of their objects the automatic opening of doors when a raised platform or tread-plate loosely secured in the floor a short distance from the door and on either side thereof is depressed, so as to enable a person to pass through such opened doorway and automatically to close said door when the person has passed through such doorway and when the depression of the platform or tread-plate has been released.

My present invention has for its further objects the following: to simplify the mechanism by which the door is caused to open when the platform or tread-plate is depressed; to reduce the number of bearings in which the parts operate, and thus reduce the friction and wear of parts, so that the operating mechanism shall continue in working order without requiring frequent attention or repair.

With these and other objects in view the invention consists in the construction and the arrangement and combination of parts to be hereinafter more fully set forth and claimed.

Where in the following description of my invention reference is had to the drawings, the parts referred to will be designated by

numerals, and like numerals refer to like parts throughout the several views.

Figure 1 is a front elevation of a door to which one form of the mechanism which I have invented for the operation of the door is applied. Fig. 2 is a plan view showing the platform or tread-plate and two of the bevel gear-wheels which mesh together in the operation of my device. Fig. 3 is a side view of the operating mechanism below the floor and tread-plate and taken on the line X X of Fig. 2. Fig. 4 is a view of the tread-plate and cogged post extending downwardly therefrom, the plain pinion meshing with said cogged post and the guide-roller, the view taken on line Y Y of Fig. 2. Fig. 5 is a detail view of the segment hereinafter described. Fig. 6 is a modification whereby one of the shafts and two bevel gear-wheels may be dispensed with, but without changing the operation of the device. Figs. 7 and 8 show a modification by the use of which I substitute crank-arms and connecting-links for the gear-wheels upon the shafts and impart to the shafts the same motion as is attained by the use of the gears, the effect upon the door being the same as when the gears are employed.

In the drawings the floor-line is represented by 1. 2 is the door, which has secured to its top by suitable brackets the rollers 3 3. These rollers are mounted to run upon the rail 4. To the rear edge of the door I secure an oil-chamber, in which is placed a piston-rod having a plunger at its lower end and which in the operation of my invention serves as a cushion to avoid sudden jarring when the door reaches its closed or open position and to retard the movement of the door when near its open or closed positions. An angular arm pivoted to a brace secured to the wall or otherwise and an upper arm connecting the pivoted arm with the piston-rod in the cylinder are used in this improved door; but as these parts are in all respects substantially the same as shown and described in my Patent No. 632,299, dated September 5, 1899, to which reference is made, a further description thereof will be unnecessary.

15 represents a vertical shaft mounted to revolve in bearings which are secured to the wall or inside the wall near the rear of the



door when in its closed position and so as not to obstruct the door in its movement. To the upper end of the shaft 15 I secure a segmental piece 16, and to this piece I secure one end of a strap 17. Its other end is secured to the angular arm 11, some distance below its pivot point. The shaft 15 extends below the floor-line and just underneath the floor, and upon said vertical shaft is secured a bevel gear-wheel 18. This wheel 18 meshes with another like pinion 19, secured to a shaft 20, which is supported horizontally and parallel with the position of the door in bearings projecting from a plate-casting 21, secured in a space in the floor made to receive it. To the other end of the horizontal shaft 20 is secured another bevel gear-pinion 22, which engages a bevel gear-pinion 23. The pinion 23 is secured to the end of a shaft 24, mounted to turn in bearings that project downward from a plate-casting 25 let into the floor in the same manner as the plate 21 and which may, if desired, be made integral with said plate 21. The position of the shaft 24 is horizontal and at right angles to the shaft 20, as shown in Fig. 2. At the other end of the shaft 24 is secured an ordinary pinion 26, its location being some distance away from the face of the door, preferably from two to three feet. 27 represents the tread plate or platform, which may be hinged at one end to the floor, its forward end elevated slightly above the floor-line, and which has projecting downwardly therefrom a post 27<sup>a</sup>, provided with cogs or teeth on one of its sides adapted to engage the teeth on the pinion 26. A guide-roller 28 is suitably secured adjacent to the cogged post, as shown in Figs. 3 and 4.

The operation of my device will now be understood to be as follows: When a person approaches the door steps upon the raised platform, his weight will cause it to be depressed, and the cogged post 27<sup>a</sup> engaging the pinion 26 will cause it to be partially revolved. This action, by reason of the bevel-gear connections already described, will cause the other shafts to be partially revolved. The vertical shaft 15 will be caused to turn toward the closed door, carrying with it the segment 16. The angular arm 11 being connected with said segment through the strap 17, the portion of said arm below its pivot-point will be drawn forward or toward the closed door. This action will of course cause the upper portion of said arm 11, as well as the upper arm 9, to be moved backward, and through the instrumentality of the wheel or roller 10, guided and held between the two vertical rods 6 6, said door will also be moved backward until it reaches the position shown by the dotted lines in Fig. 1. In practice the cylinder 7 will contain a liquid, preferably oil, which, in connection with the piston head or plunger which is moved vertically in said cylinder when the door is operated, acts as a cushion and to retard the action of the door as it comes to a stop either when opening or closing. When the lower

end of the angular arm 11, through the influence of the weight 14, swings back to its normal position, (which it begins to do as soon as the person's weight is released from the tread-plate 27,) it of course causes the upper portion of the arm 11 and the arm 9 to swing forward or toward the doorway, the door being moved back to its closed position, the rollers 3 3 riding upon the rail 4. 70 75

It will be understood that the tread-plate may be located on either side of the door and the door may be made to operate in either direction, and if desired one door may be operated from both sides by the addition of another tread-plate and the mechanism which connects with the bevel-pinion 22. A slight modification is shown in Fig. 6. By employing a bevel-pinion 26<sup>a</sup> instead of the plain pinion 26 and securing it upon a shaft 24<sup>a</sup>, which extends toward the vertical shaft 15 and has secured to it a bevel-pinion 23<sup>a</sup>, to mesh with the bevel-pinion 18<sup>a</sup>, secured to the lower end of the vertical shaft 15, the same result is attained and some of the intermediate mechanism between the tread-plate and the vertical shaft dispensed with. I can also do away with all the gear-pinions and the cogged post 27<sup>a</sup> by substituting therefor crank-arms and links, as shown in Figs. 7 and 8. 80 85 90 95

To the shaft 24<sup>a</sup> I can secure a crank-arm 26<sup>aa</sup>, and projecting downwardly from the tread-plate 27 a post 27<sup>aa</sup>, which may be connected with the arm 26<sup>aa</sup> by a loose link 27<sup>aaa</sup>. To the other end of the shaft 24<sup>a</sup> I secure another crank-arm 23<sup>aa</sup>. To the vertical shaft 15, at or near its lower end, I secure an arm 18<sup>aa</sup>, and connect it and the crank-arm 23<sup>aa</sup> by a loose link or bar 23<sup>aaa</sup>. If the tread-plate 27 is depressed it will rock the shaft 24<sup>a</sup>, and through the connecting-arms 23<sup>aa</sup>, 23<sup>aaa</sup>, and 18<sup>aa</sup> the vertical shaft 15 will be partially revolved in the direction of the arrow. (See Fig. 7.) The upper mechanism being in all respects the same as already described, it will be seen that the door may be opened and closed, as already explained. 100 105 110

It will be seen that other modifications of the mechanism shown and described might be made which, however, would not be a departure from the scope of my invention. 115

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

1. A sliding door, guide-rods secured to the rear edge of said door, a roller movable vertically between said guide-rods, an arm upon whose upper extremity the roller is loosely mounted, an angular arm centrally pivoted, whose upper end is loosely connected with the lower end of the first-named arm and to whose lower end is attached a weight, a vertical rod or shaft supported in bearings adjacent to the rear edge of the door, means for connecting the upper end of the vertical shaft with the angular arm below its fulcrum, combined with a tread-plate or platform provided 125 130



with a downwardly-projecting cogged post and loosely secured to the floor some distance from the face of the door and at either side thereof, and means consisting of shafts mounted in bearings just below the floor, and intermeshing gears mounted on such shafts for operatively connecting the tread-plate with the vertical shaft, for the purposes stated.

2. In combination, the sliding door, brackets secured to the rear edge thereof, guide-rods sustained by and between such brackets, the wheel or roller 10 movable vertically between said guide-rods, the cylinder 7 secured to the rear edge of the door, the piston-rod 8 and a head or plunger at the lower end thereof, the arm 9 upon whose upper extremity is loosely mounted the wheel or roller 10 and upper end of the piston-rod 8, the angular arm 11, the brace 13 upon which said angular arm is centrally pivoted, the upper end of said arm 11 being loosely connected with the arm 9 by means of the bolt 12, the weight 14 secured to the lower end of the angular arm 11, the vertical shaft 15 and segment 16 secured to the upper end thereof, the strap 17 connecting the lower member of the angular arm with the vertical shaft, a pinion secured to the lower end of said vertical shaft, the tread-plate 27 having the downwardly-projecting cogged post 27<sup>a</sup>, the guide-roller 28 and means consisting of a shaft or shafts supported in bearings below the floor, and intermeshing gears secured to such shaft or shafts for op-

eratively connecting such tread-plate with the vertical shaft, all for the purposes stated and substantially as described. 35

3. In combination, the sliding door, brackets secured to the rear edge thereof, guide-rods sustained by and between such brackets, the wheel or roller 10 movable vertically between said guide-rods, the cylinder 7 secured to the rear edge of the door, the piston-rod 8 and a head or plunger at the lower end thereof, the arm 9 upon whose upper extremity is loosely mounted the wheel or roller 10 and upper end of the piston-rod 8, the angular arm 11, the brace 13 upon which said angular arm is centrally pivoted, the upper end of said arm 11 being loosely connected with the arm 9 by means of the bolt 12, the weight 14 secured to the lower end of the angular arm 11, the vertical shaft 15 and segment 16 secured to the upper end thereof, the strap 17 connecting the lower member of the angular arm with the vertical shaft, a tread-plate having a downwardly-projecting post and means for operatively connecting such tread-plate with the vertical shaft 15 for the purposes herein stated. 40 45 50 55

In witness whereof I have hereunto affixed my signature May 8, 1900, in the presence of two witnesses. 60

JOHN H. WHITAKER.

In presence of—

I. C. ANDERSON,  
A. G. SAMPSON.