

No. 612,324.

Patented Oct. 11, 1898.

W. H. FRAZIER & C. M. EINFELDT.

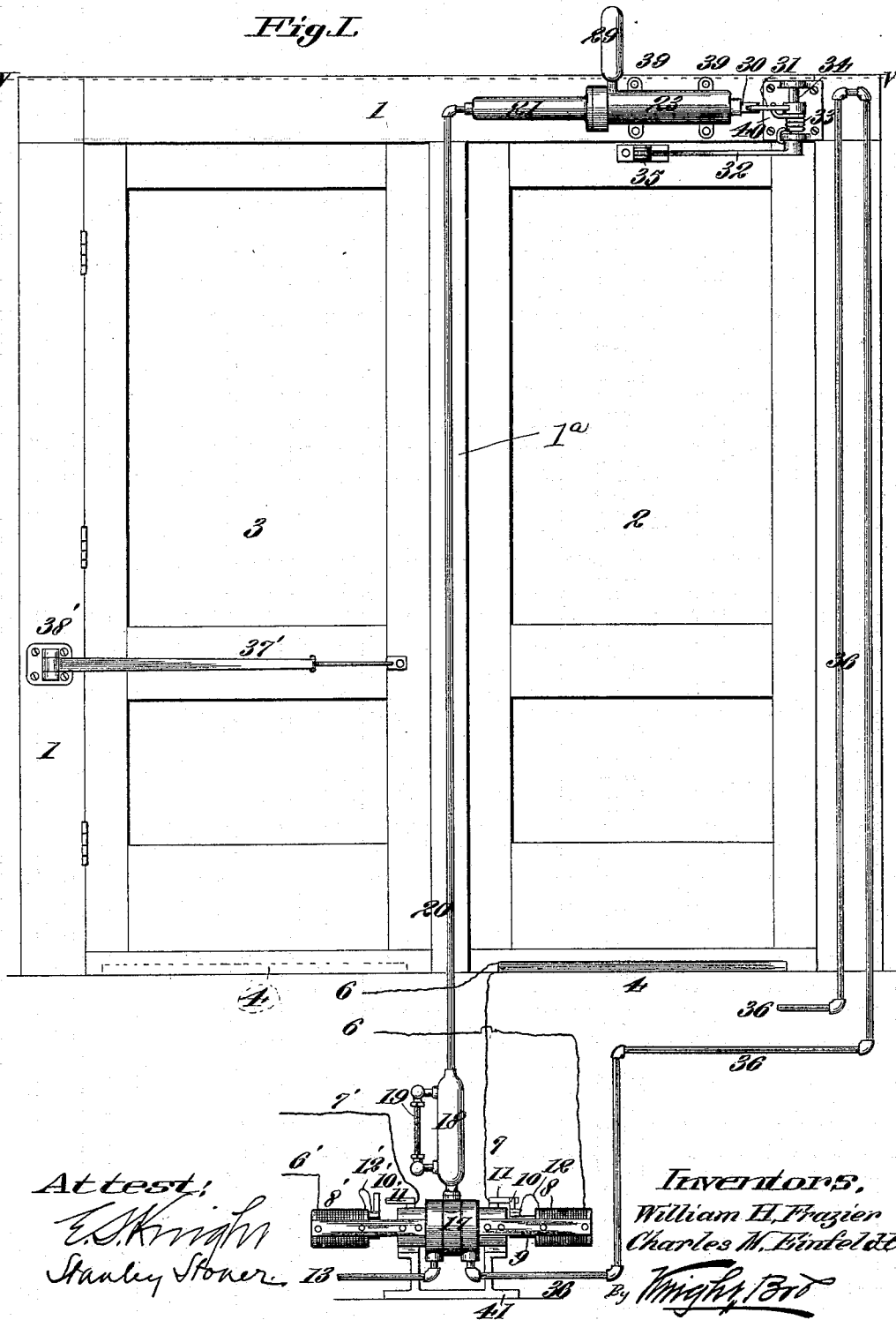
AUTOMATIC DOOR OPENER.

(No Model.)

(Application filed Nov. 15, 1897.)

2 Sheets—Sheet 1.

Fig. 1



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Fig. II.

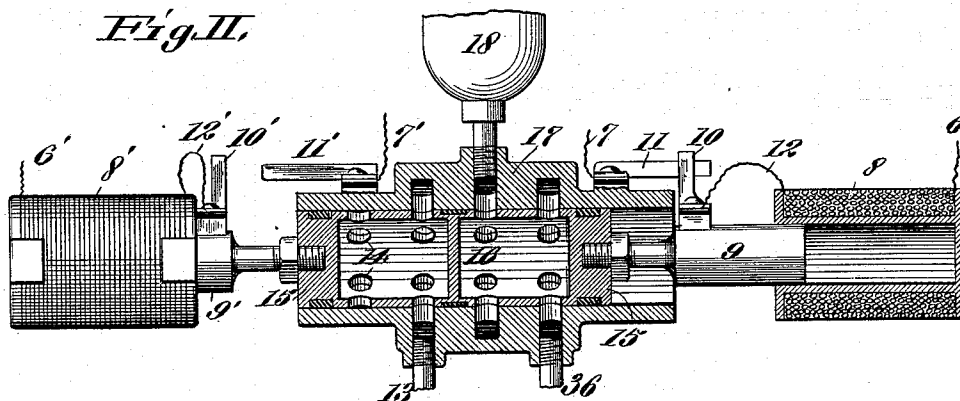


Fig. III.

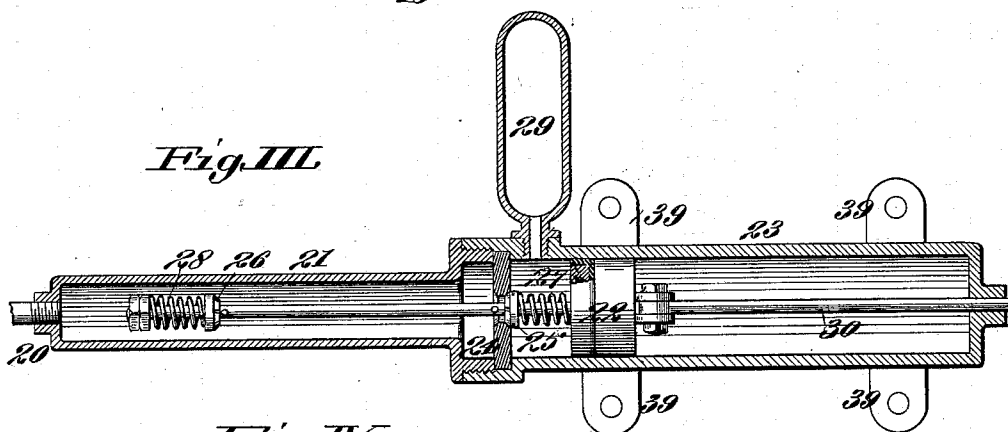


Fig. IV.

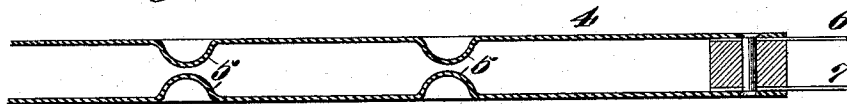
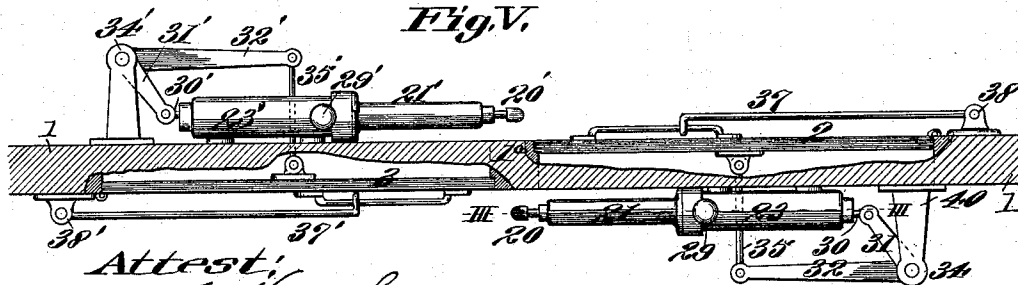


Fig. V.



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UNITED STATES PATENT OFFICE.

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AUTOMATIC DOOR-OPENER.

SPECIFICATION forming part of Letters Patent No. 612,324, dated October 11, 1898.

Application filed November 15, 1897. Serial No. 658,573. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. FRAZIER and CHARLES M. EINFELDT, citizens of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Automatic Door-Openers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

The object of our invention is to provide an improved device which will automatically open and close a door. It requires no hand manipulation to effect this result, but the object is accomplished by electric and hydraulic force, made active by the person passing through the doorway stepping on a mat, which completes an electric circuit.

The invention possesses features of novelty hereinafter specifically pointed out and claimed.

Referring to the drawings, which form a part of this specification, Figure I shows a front elevation of two doors furnished with our improvement and showing also the electric device for controlling the fluid which operates the doors. Fig. II is an enlarged detail view, taken partly in vertical section, of the magnet or solenoid. Fig. III is an enlarged detail view of a door-operating cylinder and air-cushion, taken on the line III-III, Fig. V. Fig. IV is a vertical section of the electric contact-mat which is placed in front of a door. Fig. V is a top view of the attachments placed on the top of the doors and the door-casing.

1 is the door frame or casing, and 2 and 3 are doors therein closing against a central upright 1^a and opening in opposite directions. In front of these doors on the side opposite that to which they open and placed at a convenient distance therefrom is an electric mat 4, which when a weight is thereon completes a circuit by reason of the contact corrugations 5.

6 6 are wires leading from a battery or dynamo to magnet 8, and 7 is a wire connecting the mat 4 with a plate 11. This magnet has a sliding core 9, provided with a spur 10, adapted to contact with the plate 11, the circuit being completed by means of the wire 12.

When the circuit is completed and the current turned on, as described, the core 9 is drawn to the right away from the position shown in Fig. II. This movement allows water, under the pressure of the city main or otherwise, to pass through a supply-pipe 13, whose opening is now coincident with a port 14 in a valve 15. This hollow valve is divided into two chambers by the partition 16. Secured to the top of the valve-casing 17 is a reservoir 18, which opens into the valve-chambers. It is supplied with a glass gage 19 and discharges into a pipe 20. This pipe 20 leads to a cylinder 21 and the contents press against a piston 22, which is located in a large cylinder 23. A valve 24, having two seats 25 and 26 and supplied with coiled spring-cushions 27 and 28, controls the piston's movement. An air-chamber 29 further cushions this action. Attached to the other side of the piston is a rod 30, which is linked to an arm 31, which is rigid with an arm 32 and held in position shown in Fig. V by the spring 33. These arms are mounted on a rock-shaft 34. The connection with the door 2 is made through the medium of the link 35.

We prefer to fill the reservoir 18 with oil, as it is lighter than water. When the device is operated by reason of the current of electricity being turned on, as described, the water-pressure forces the oil up in the pipe 20 and forces the piston back, which by means of the arms described opens the door. It remains open until a second electric mat is stepped upon, which renders active the magnet 8¹ and draws the valve 15 back to allow the right-hand ports to come under the opening from the reservoir 18. This releases the pressure from the piston 22, allowing the water to flow out of the discharge-pipe 36, which is made with a loop extending to the height of the cylinder 23 for the purpose of allowing no more water to escape than is displaced by the piston 22 and to prevent siphoning oil from the reservoir 18. It will be readily seen that the quantity of water used each time the door is opened is equal to this displacement and that the oil is used over and over again.

37 is a guard hinged to the door-frame 1 at 38, which serves the purpose of preventing a person from attempting to open the door 3 away from himself. It serves to direct a per-

son to the right door. The doors, however, should be constructed to swing in but one direction, so that this guard 37 is not really necessary.

5 39 are the brackets, by means of which the cylinder and accompanying parts are secured to the door-frame 1.

40 is the bracket secured to the same frame on which the arms 31 and 32 are hung.

10 41 is a standard which supports the valve and magnets with their mechanism, which need not necessarily be put under the floor, as shown. They may be located at any convenient place, as all that is necessary is that
15 the door 2 swing clear of the pipe 20. As shown, the pipe 20 is supported on an upright 1^a between the two doors instead of the doors meeting in the usual way.

The advantages possessed by this device
20 are manifold, but it is especially useful in hotels and restaurants, where the communication between dining-rooms and kitchens is necessarily kept closed and where waiters passing to and fro have heavy trays to carry,
25 which prevents the use of their hands. Our device provides a means whereby such doors are automatically opened and closed and without any use of the hands whatever.

What we claim, and desire to secure by Letters Patent of the United States, is—

30 1. The combination of a double-chambered valve, solenoid situated on either side of said valve, a means for automatically controlling said solenoids, a pipe in intermittent communication with one of said valve-chambers
35 and leading from a source of water-supply, an exhaust-pipe leading from the other of said valve-chambers, and an operating-cylinder in alternate communication with said
40 valve-chambers, substantially as described.

2. The combination of a double-chambered valve, solenoid situated on either side of said valve, a means for automatically controlling said solenoids, a pipe in intermittent communication with one of said valve-chambers,
45 and leading from a source of water-supply, an exhaust-pipe leading from the other of said valve-chambers, an operating-cylinder in alternate communication with said valve-chambers, and an interposed oil-reservoir;
50 substantially as described.

WM. H. FRAZIER.

CHARLES M. EINFELDT.

In presence of—

ELMER E. FLAMBOE,

WM. H. JONES.