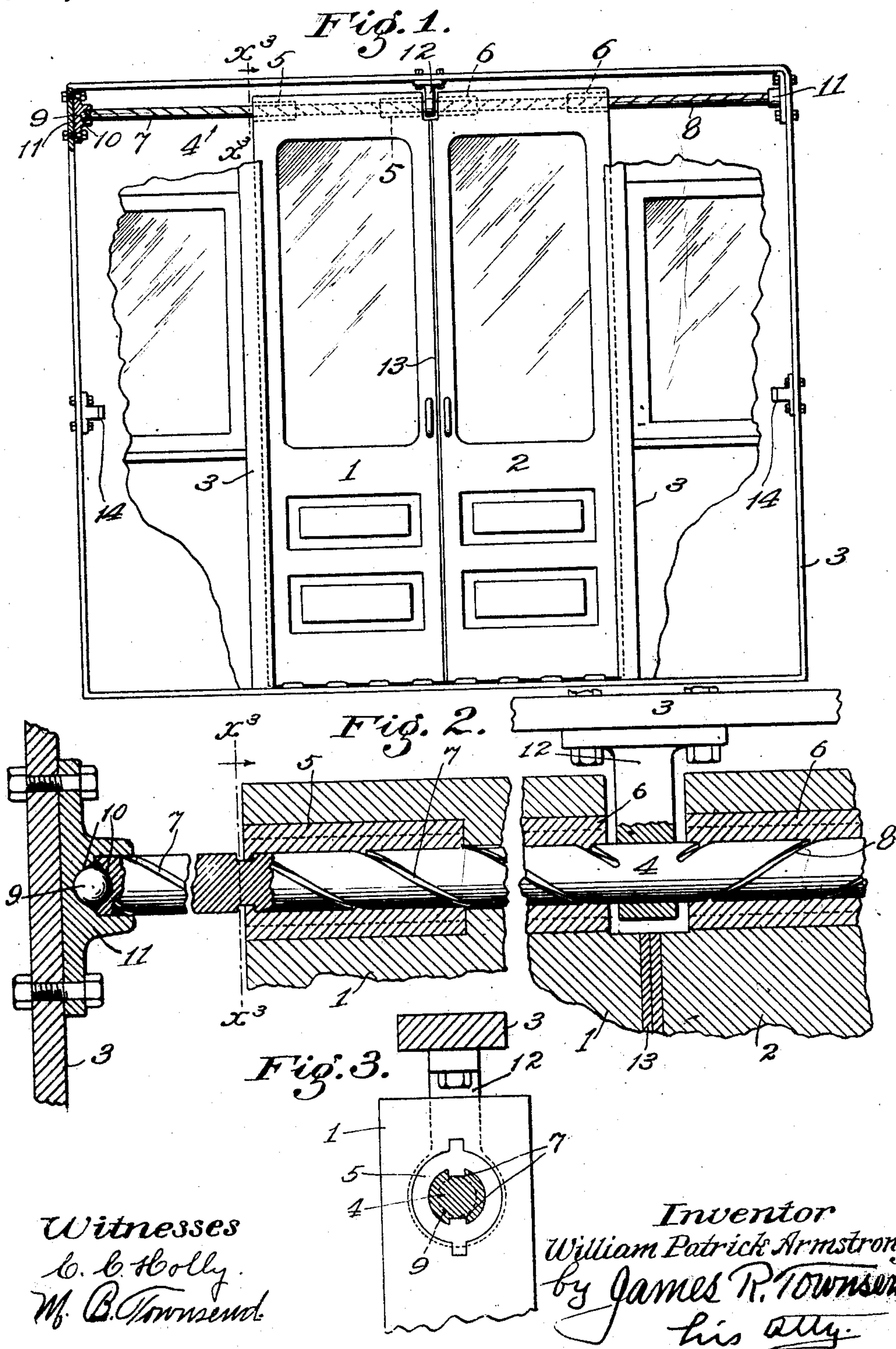


W. P. ARMSTRONG.  
DOUBLE ACTION DOUBLE DOOR.  
APPLICATION FILED MAY 6, 1907.

931,247.

Patented Aug. 17, 1909.





# UNITED STATES PATENT OFFICE.

WILLIAM P. ARMSTRONG, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-FOURTH TO ELIZABETH KINGSBURY, OF LOS ANGELES, CALIFORNIA, AND THREE-FOURTHS TO ARMSTRONG SLIDING DOOR COMPANY, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

## DOUBLE-ACTION DOUBLE DOOR.

No. 931,247.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed May 6, 1907. Serial No. 372,279.

*To all whom it may concern:*

Be it known that I, WILLIAM PATRICK ARMSTRONG, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Double-Action Double Door, of which the following is a specification.

This invention relates to edgewise moving doors in which two closures are hung at opposite sides of an opening, and are arranged to move simultaneously toward and from each other for closing and opening the door, the operation of one of the doors serving to operate the other; the purpose being to provide a thoroughly satisfactory means for closing and opening the doorway in the most expeditious manner. To accomplish this it is necessary that the doorway be closed by two closures which simultaneously move toward or from the mid-line of the door-way, so that by moving one of the doors across half the space of the door-way, the door-way is fully open across its entire width.

An object of this invention is to provide a simple door of this character which will operate with maximum ease and smoothness and without liability of catching or sticking.

The accompanying drawings illustrate the invention.

Figure 1 is a view of a door constructed in accordance with this invention, portions of the closures and door-frame being broken away to expose interior construction. Fig. 2 is a fragmental, longitudinal section of the same. Fig. 3 is a sectional elevation from line X<sup>3</sup>, Figs. 1 and 2.

The pair of sliding doors 1 and 2 is hung in a door-frame 3. The supporting shaft 4 is mounted in a pair of bearings 11 near the top corners of the door-frame, and a third hanger 12 near the center of the top of the door-frame, said shaft being smooth and true as required to form a good sliding support.

The bearing-blocks 5 and 6 are slidably mounted upon the shaft, and tongues extend from the bearing-blocks into the spiral grooves 7 and 8, the groove on one side of the third hanger being right-handed and the groove on the other side being left-handed.

The doors 1 and 2 are hung upon the bearing-blocks 5 and 6, the tongue-and-groove connection between the supporting shaft and

the doors forming a connection between the doors so that when one door is moved one way the other door is moved in the opposite direction.

Balls 9 are placed in cavities 10 in the bearings 11 to support the end thrust upon the supporting shaft.

In order to hold the parts plumb and rigid it is preferable to form the frame 3 of a heavy strap of iron.

The supporting shaft 4 and bearing blocks may be of steel or any other suitable material. The bearing blocks are fixed to the closures, preferably being housed or bedded therein, and said bearing blocks may be set at any suitable place on the doors, preferably at the edges thereof, as shown in the drawings.

The principle of operation is apparent; that is to say, when pressure is applied to either one of the doors to move it edgewise, the force is transmitted by the tongue of the bearing-block of said door and the spiral groove engaging therewith to rotate the supporting shaft; and the other spiral groove on said supporting shaft acts on the tongue of the bearing-block of the other door to drive the other door along the supporting shaft in the direction opposite to that in which the first-mentioned door is being moved. This fact results no matter which door is moved, nor whether the movement is to open or close the door. By the means shown, the doors are swung free, and are not subject to rattle, and there are no cords nor pulleys to get out of order. The supporting shaft is smooth and the bearing-blocks run smoothly thereon. It is to be noted that the doors are hung from a supporting shaft at the top of said doors, and that the bearing blocks in the doors are held thereby from any rotation, while gravity holds the doors in true vertical position, the supporting shaft being preferably arranged midway between the sides of the door so that the center of gravity will be vertically beneath the axis of the supporting shaft.

A cushion formed by any suitable material, as a rubber strip 13, may be applied between the doors as a buffer to check the doors when they come together.

14 designates buffers to stop the doors when they are thrown open.

It is evident that the dimensions of the



parts may be varied to suit different purposes and different conditions, and that the invention is not limited to any particular size or specific construction. I have determined that a desirable diameter of supporting shaft or rod for a door having an opening of about four feet, is approximately one and one-half inches, more or less, and that the spiral grooves may be constructed with a pitch of two inches more or less; that is, the spiral groove makes one turn around the rod or supporting shaft in every two or three inches of the length thereof. All these matters, however, may be varied within the skill of the constructor.

I have shown conventional bearing-blocks fixed to the doors, respectively to slide on the shaft and it is to be understood that the form of such bearing-blocks is immaterial, it being simply necessary that the device for transmitting motion from one of the doors to the other, shall comprise a fully rotatable supporting shaft and non-rotatable means fixed to the freely movable doors to engage the spiral grooves of the shaft, whereby the movement of one of the doors in one direction will cause the supporting shaft to rotate and will thereby drive the other door in the other direction.

It is evident that it is immaterial to the essence of this invention whether the spiral grooves are of like or of different pitch. If the opposite spiral grooves are of the same pitch both doors will move at the same speed, and will travel like distances.

If the spiral grooves are made of various pitches the movement of the doors will vary in speed and in distance, traveled according to the variation of the pitch of the spiral grooves.

Each door is provided with a bearing-block at each edge, and the supporting shaft is cylindrical and spirally grooved, and runs through and fits and acts on both bearing blocks uniformly and simultaneously, there-

by avoiding any liability of cramping or sticking. Both the doors are thus caused to respond freely and smoothly to pressure applied to either.

What I claim is:—

1. In a double action double door, a door-frame, bearings supported by the frame near the top of the opening, a hanger near the center of the opening forming a third bearing, a smooth supporting shaft rotatably mounted in said bearings, there being a right-hand spiral groove in said shaft upon one side of the third bearing and a left-hand spiral groove upon the other side of the third bearing; bearing-blocks mounted upon said shaft, tongues carried by the bearing-blocks and extending into said grooves, and doors hung upon the bearing-blocks so that when one door is operated the supporting shaft is rotated to operate the other door in a reverse direction.

2. In a double action double door, a middle door-frame, bearings secured to the frame near the upper corners, a third bearing at the center of the top of the frame, a smooth supporting shaft mounted in said three bearings, said shaft having a right-hand spiral groove upon one side of the third bearing and a left-hand spiral groove upon the other side of the third bearing, balls in the end bearings at the ends of the supporting shaft, bearing-blocks slidingly mounted upon the supporting shaft, tongues extending from the bearing-blocks into the grooves of the supporting shaft, and doors hung upon the bearing-blocks so that when one door is operated the other door is operated in the opposite direction.

In testimony whereof, I have hereunto set my hand at Los Angeles California this 1st day of May 1907.

WM. P. ARMSTRONG.

In presence of—

JAMES R. TOWNSEND,  
M. BEULAH TOWNSEND.