L. CONROY.

SLIDING-DOORS.

No. 185,499. Patented Dec. 19, 1876.

Fig. 1.

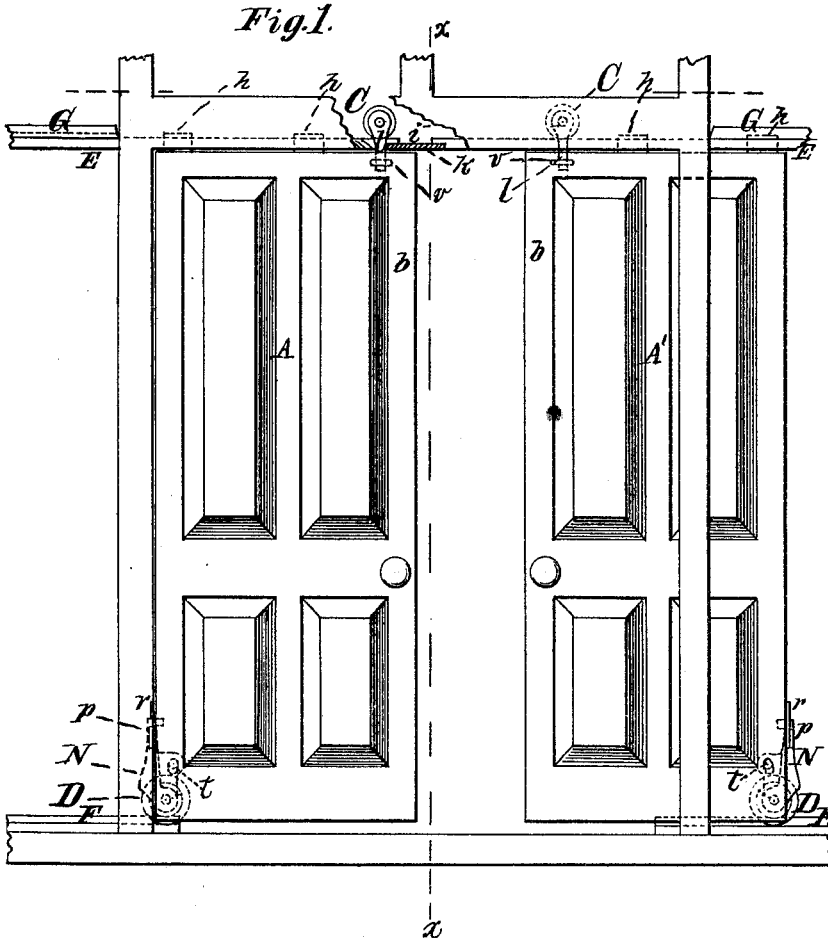


Fig 2

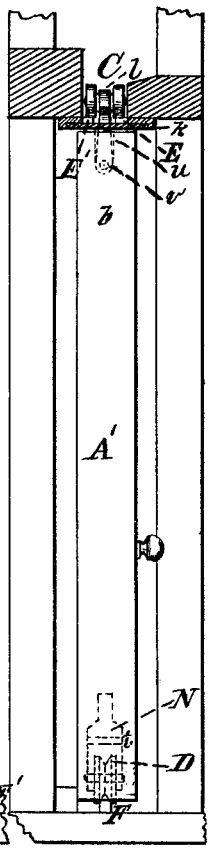


Fig. 6

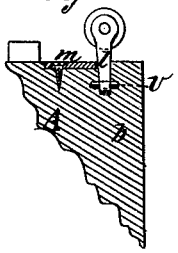


Fig. 3.

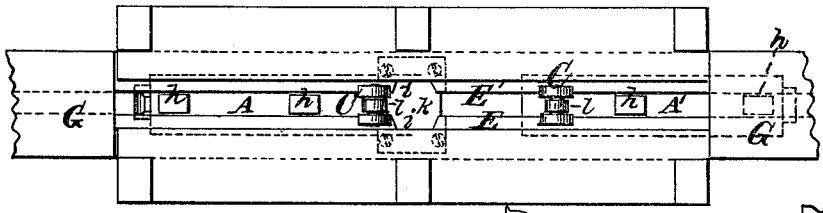


Fig. 4.

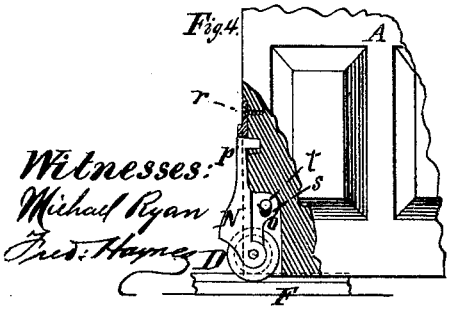
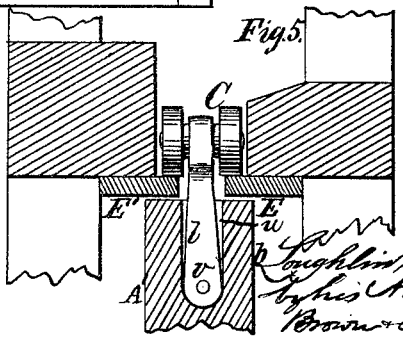


Fig. 5.



Witnesses:
Michael Ryan
Fred. Haynes

Langhlin Conroy
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

LOUGHLIN CONROY, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF OF HIS RIGHT TO PATRICK H. McMANUS, OF SAME PLACE.

IMPROVEMENT IN SLIDING DOORS.

Specification forming part of Letters Patent No. **185,499**, dated December 19, 1876; application filed October 19, 1876.

To all whom it may concern:

Be it known that I, LOUGHLIN CONROY, of the city, county, and State of New York, have invented certain Improvements in Sliding Doors; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, which forms a part of this specification.

My improvements have for their object the more easy and perfect action of sliding doors, the avoidance of the bottom rail usually employed between the sides of the door-casing, which necessitates the cutting of carpets, the facilitating the hanging and unhanging of such doors.

The invention partly consists in partially suspending such doors from the top, and partially upholding them from the bottom, by rollers placed only at or near two diagonally-opposite upper and lower corners, said rollers rolling on suitable rails or ways. The invention also consists partly in a novel construction of the upper rails or ways; partly in the peculiar attachments of the top and bottom rollers, respectively, to the door; partly in a combination of devices for stopping the door when slid as far as desired, and which, by the removal of a portion thereof, enables the doors to be easily and quickly unhung, or hung again when so unhung; partly in concealed rails placed one on each side of the doorway within the door-casing and hollow partition, into which the doors slide when opened, and partly in guides which regulate and direct the motion of the doors when sliding.

Figure 1 in the accompanying drawing is a front view of a door-casing and sliding doors constructed and hung in accordance with my invention, one door being placed as when closed, and the other being partly opened. Fig. 2 is a section made on the line *x x* in Fig. 1, presenting an edge view of a door hung as aforesaid. Fig. 3 is a top view of the doors and a portion of the casing shown in Fig. 1. Figs. 4, 5, and 6 are detail views, showing the construction of the bottom and top rollers, and methods of attaching them to the doors.

A and A′, Fig. 1, represent the doors, the door A being slid to the closing position, and the door A′ being partially opened. Attached to or near the upper part of the meeting-rail *b* of each door is a pair of rollers, C, Figs. 1, 2, 3, and 5, and at the diagonally-opposite corner of each door is a grooved roller, D. The rollers C run on flat-topped parallel ways E E′, Figs. 1, 2, 3, and 5, and the grooved rollers D run on rails F F′, Figs. 1, 2, and 4. The parallel ways E E′ are, at their opposite ends, joined by cross-pieces G, Figs. 1 and 3, the said ways so joined forming a cradle, which may, as a whole, be taken out or put into the upper part of the door-casing, and which is let into the under side of that part of the said casing which overlies the doors, and fastened thereto by means of screws or other fastenings.

In the top of each door are inserted one or more pins, *h*, Figs. 1 and 3, which, running loosely between the ways E E′, preserve sufficiently the parallelism of the top rails of the doors with the said ways.

The ways E E′ each have a recess, *i*, Figs. 1 and 2, formed in their inner and middle parts, said recesses facing each other; and covering these recesses on the under side is fastened, by screws or otherwise to said rails, a metal covering and stop-plate, *k*, Figs. 1, 2, and 3, against which the hangers *l*, Figs. 1, 2, 3, and 5, abut when the doors are slid toward the middle of the doorway, said plate forming a stop, which limits the motion of the door in the direction described.

In order to strengthen and support the hangers *l* a special device (shown in Fig. 6) is employed. This consists of a metal re-enforcing plate, *m*, let into the top rail of the door, immediately behind the upper part of the hanger *l*, and which receives the shock of the impact of the said hanger against the stop-plate *k*, and prevents its bruising the wood of the said top rail.

When the said stop-plate *k* is taken off, by the removal of its attaching-screws, the doors may be separately unhung, as follows: The door to be unhung is slid along till the upper rollers C enter the recesses *i i* in the ways E E′, which sliding also rolls the bottom roller D off from its rail F or F′. The bottom of the door is then drawn forward bringing the door

into an inclined position, which lowers the rollers C below the top rails E E′, and the door is then free to be removed.

For single doors it is, of course, only necessary to have but a single bottom rail, F or F′, arranged in relation to said door in the same manner as described for double doors; but for either single or double doors the said rails F F′ may be made laterally adjustable, in order to secure the perfect meeting of the doors with each other, or with the jamb, in case of a single door, which will be found very convenient in fitting winding or warped doors.

The bottom rollers D are pivoted to the roller-carriers N, Figs. 1, 2, and 4. Each bottom roller-carrier N is provided with a lug, *o*, Fig. 4, and a hooked neck, *p*, Figs. 1 and 4, the hooked part of which fits and passes through a slot in the supporting-plate *r*, Figs. 1 and 4, which supporting-plate is fastened to the edge of the door by screws or otherwise. In the lug *o* of said carrier is formed a vertical slot, *s*, Fig. 4. Through the back rail of the door, near the bottom, and through the slot *s* in the said lug *o*, is inserted a pin, *t*, Figs. 1, 2, and 4; the thickness of which, being the same as the width of the slot *s*, holds the carrier N firmly, so that the said carrier has no play in the direction in which the door is slid in opening and closing said door.

In hanging the door it is brought into the position which in use closes said door. The back side of the door is then lifted till the meeting-rails meet perfectly, and the roller-carrier is then adjusted up or down on the pin *t* till the correct position for the roller is found. The supporting-plate *r*, which has been previously slipped onto the hooked part of the hooked neck *p* of said carrier, is then screwed fast, which completes the attachment of said carrier N, and prevents the door from moving vertically downward.

Each pair of top rollers C is pivoted to the upper end of the hanger *l*, which partly suspends the door, as shown in Figs. 1, 2, 5, and 6, said hanger penetrating into a recess, *u*, formed in the upper part of the door, said hanger being narrowed at the top to admit of some lateral play of the same in said recess, and pivoted to the door by a pin, *v*, inserted transversely in the top of the door, and passing through the bottom of said hanger, as shown in Figs. 1, 2, 5, and 6. This arrangement allows the door to hang freely without binding, and to poise itself in such manner as to bear equally on each one of the rollers in the pair pivoted to each hanger *l*; but instead of a pair of independent rollers, a single spool-shaped roller may be used and pivoted to each hanger *l*.

I claim—

1. The combination, with a sliding door, of rollers which partly suspend it and partly support it, said rollers being placed only at or near two diagonally-opposite upper and lower corners, substantially as and for the purpose specified.

2. The combination, with a sliding door having the recess *u*, of the roller-hanger *l*, placed in said recess, and pivoted to the door, a roller or rollers, C, pivoted to said hanger, and the ways E E′, substantially as and for the purpose described.

3. The removable cradle, consisting of the ways E E′, attached to the upper part of the door-casing, and the cross-pieces G G, uniting the ends of said ways, substantially as and for the purpose set forth.

4. The combination, with a sliding door, of the ways E E′, having the recesses *i i* and the covering-plate *k*, for hanging and unhanging the door, substantially as described.

5. The combination, with the hanger *l*, inserted in the door, and having a roller or rollers, C, running on ways E E′, of the reenforcing-plate *m*, placed behind said hanger, and attached to the top of the door, and the covering and stop plate *k* for stopping the door, substantially as set forth.

6. The combination of the guide-pins *h h* and the ways E E′ with a sliding door suspended and supported by rollers arranged in diagonal relation with each other, substantially as and for the purpose set forth.

7. The bottom rail or rails F F′, constructed to stop short of the opening closed by a door or doors, suspended and supported by rollers arranged in diagonal relation with each other, substantially as and for the purpose described.

8. The combination of the roller-carrier N, having the roller D pivoted thereto, and having the hooked neck *p* and the vertically-slotted lug *o*, with the slotted supporting-plate *r* and the pin *t*, substantially as and for the purpose set forth.

L. CONROY.

Witnesses:
BENJAMIN W. HOFFMAN,
FRED. HAYNES.