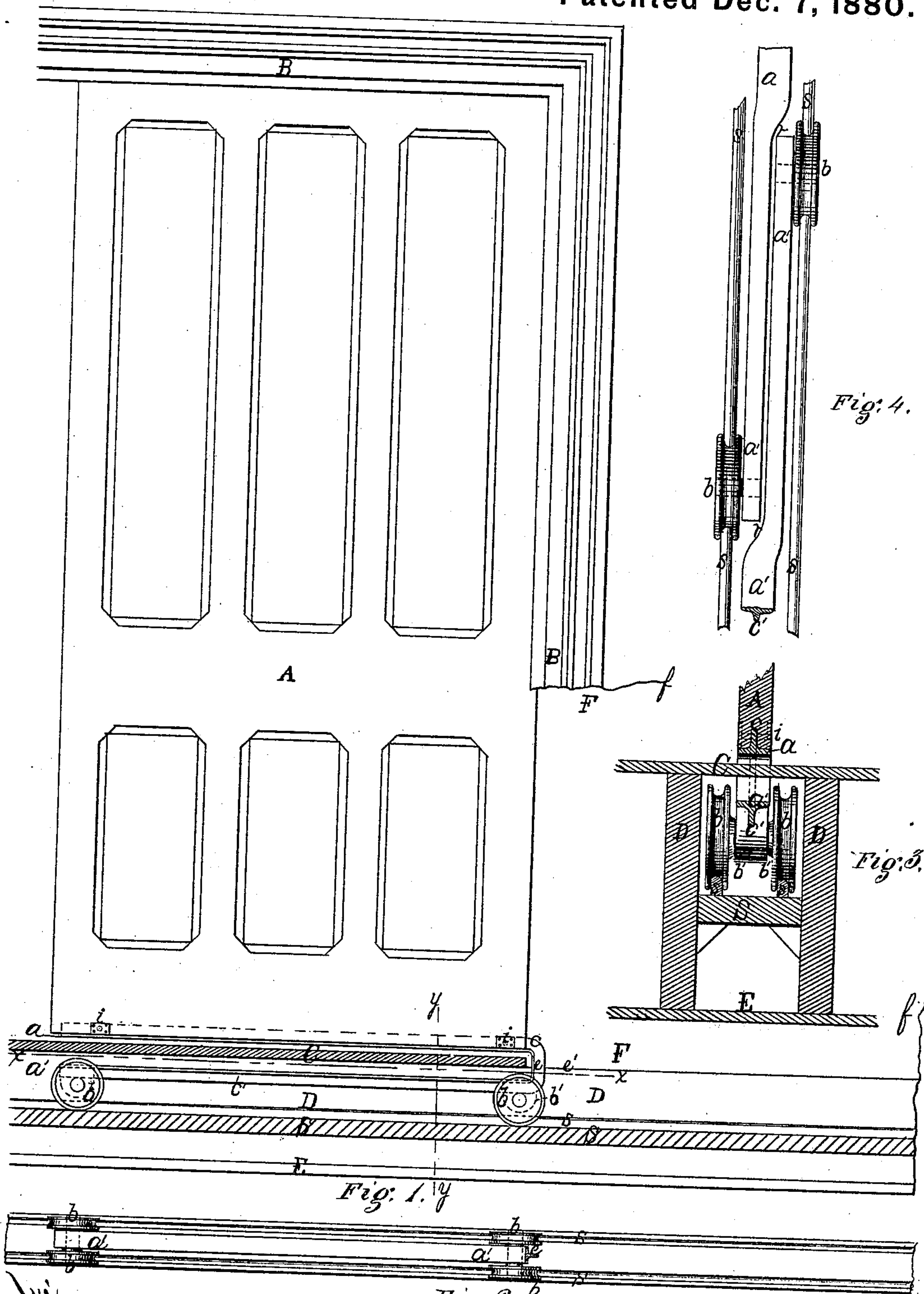


(No Model.)

D. K. MILLER.
Sliding Door.

No. 235,097.

Patented Dec. 7, 1880.



Witnessed
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UNITED STATES PATENT OFFICE.

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SLIDING DOOR.

SPECIFICATION forming part of Letters Patent No. 235,097, dated December 7, 1880.

Application filed October 29, 1880. (No model.)

To all whom it may concern:

Be it known that I, DAVID KNOX MILLER, of Knoxville, (Pittsburg P. O.,) county of Allegheny, State of Pennsylvania, have invented
5 or discovered a new and useful Improvement in Sliding Doors; and I do hereby declare the following to be a full, clear, concise, and exact description thereof, reference being had to the accompanying drawings, making a part of this
10 specification, in which—like letters indicating like parts—

Figure 1 is a sectional elevation of a sliding door and its mounting, illustrative of my invention. Fig. 2 is a sectional plan view of the
15 carriage, the section being taken in the line x x , Fig. 1. Fig. 3 shows, on an enlarged scale, a vertical cross-section taken in the plane of the line y y , Fig. 1; and Fig. 4 is a plan view, illustrative of a modification in the construction of the carriage.
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My invention relates to the mounting of sliding doors; and it consists in a carriage having a rail above the floor on which the door is secured, and a rail parallel with the first
25 below the floor, to which the wheels are secured, so as to run on a track below the floor, the upper and lower rails of the carriage-frame being connected at one end only by a bow or cross-bar, which passes through a slot or opening in the floor, which slot lies wholly within
30 the pocket, thus affording a smooth floor through the doorway without tracks or cuts, and at the same time securing all the advantages of a bottom mounting.

In the drawings, A represents a sliding door, and B the casing, both of which may be of any desired construction. The floor is shown at C, the joist at D, and ceiling at E.
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The broken lines f f are designed to indicate the breaking away of the wall and door-casing to expose the pocket F, into which the door is slid when pushed back or open.
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The door A is mounted and operated as follows: A frame, a a' , is formed by bending a bar of metal into U form. For this purpose I prefer a T-bar, and bend it with the web outward, as shown, the web c' of the lower bar, a' , projecting downward and the web c of the upper bar, a , projecting upward. Such form of bar combines
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strength, stiffness, and lightness, while the web furnishes convenient means of attachment, as presently described. An ordinary rectangular bar may be used, however, with good results. This frame is arranged, as illustrated in Fig. 1, with one arm, a , a little above and parallel with the floor, and the other arm, a' , below the floor and between the joists D, Fig. 3. The connecting-bow or U e of the frame passes through an opening or slot, e' , cut in the floor in line with the door, but back of it, and in the pocket F, between the walls. It is thus entirely covered and out of sight. The length of this slot is, of course, equal to the distance which it is desired to slide the door.
50 55 60

The space between the lower flat face of arm a and the upper surface of the floor may be varied as desired; but in any case it is preferred to adjust it so as to run clear of carpets, thresholds, or other finishing. In fastening the door A to this upper bar a groove
65 70 is plowed in the bottom edge of the door for receiving the web c , as in Fig. 3. Bolts i i may then be passed through the door and web, as in Fig. 1; or screws may be passed through the flange or flat face of the bar into the edge of the door. Other methods of fastening may be employed, however.
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The under bar, a' , of the frame is supported on wheels or rollers b b , which may be journaled directly to the under web, c' , or to brackets b' , which are riveted to and extend a little way down from the web. The purpose of this is to permit of the use of larger wheels than would otherwise be practicable.
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I prefer to make use of four wheels, b , and arrange them on opposite sides of the bar, at either end, as illustrated in Fig. 2. Two or three may be used, however, the usual rabbeted guide in the upper door-casing serving to keep the door in proper position.
85 90

In some cases I prefer to use three wheels, as presently explained. I also hollow out or groove the peripheries of the wheels, so as to fit onto rounded track-rails s , which latter are laid on a bed, S, secured in any convenient way in a horizontal position between the joists D, Fig. 3.
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In ordinary cases I prefer to extend the frame

a a' of the door-carriage about the width of the door, though either bar *a* or *a'* may be made longer or shorter, if preferred.

In the case of wide and heavy doors I prefer to make the lower bar, *a'*, and its track longer than the width of the door to insure smooth and easy movement; and in case of double doors the front extension of bars *a'* may be bent a little to one side, and the adjacent flanges along the lapping parts of the bars may be sheared off, as at *r*, Fig. 4. In such case, where the extended ends of the bars lap, I prefer to use but one wheel at the front end of each bar and journal it on the outside of the bar, as also shown in Fig. 4. As thus arranged the doors may be moved with great ease and smoothness, though in ordinary cases the relative length of truck shown in Fig. 1 will give entirely satisfactory results.

When it is desired to increase the strength or stiffness of the truck-frame *a a'* without material increase in its height, it may be done by using T-blanks having a comparatively deeper web, *c c'*.

I do not limit my invention to the particular form of frame *a a'* or arrangement of wheels or tracks shown, but include frames having bars above and below the floor, connected at one end only through an opening in the pocket, and having tracks arranged below the floor, on which the frame moves.

While I have described the device as carrying the door from below as being the method of mounting which I prefer, yet substantially the same device may be employed and arranged in a substantially similar manner for hanging the door from above.

By the means described the door can be moved with ease and convenience, and the floor of the doorway can be made smooth, without tracks, cuts, or grooves therein for guiding the door. At the same time all the advantages of a lower mounting are obtained by means of my invention.

The bar *a*, extending forward under the door to, or nearly to, its front edge, not only serves to support the door, as hereinbefore described, but it also performs a very useful purpose in preventing lateral displacement, shaking, or swinging of the front lower corner of the door, and thus one great objection which has heretofore existed to sliding doors is avoided.

While I have shown and described the door as mounted on the tracks *s* by means of wheels

b, yet I do not limit my invention to this particular means, as the bar *a'* may be secured within and arranged to slide upon ways or tracks placed in line therewith beneath the floor; and the track or ways may be made of wood or metal, and black lead or other lubricant may be employed therewith to prevent noise and insure ease in working.

I claim herein as my invention—

1. In a building, the combination of sliding door A with a carriage-frame having a bar, *a*, above the floor for securing the door, and a bar, *a'*, below the floor, the two bars being connected at one end within the pocket, two or more wheels, *b*, journaled to the bar *a'*, and a suitable track for such wheels between the joists below the floor, substantially as set forth.

2. A carriage for sliding doors having a U-frame, *a a'*, made of T-iron, as described, the web of the T being outward, in combination with wheels *b*, in any desired number, journaled to the lower bar of the frame, and a suitable track or tracks for the wheels, substantially as set forth.

3. In combination with a sliding door, A, and a slot or opening in the floor within the pocket, as described, a sliding support, *a a'*, arranged with one bar above and one below the floor, and connected at the back through the slot, the upper bar, *a*, extending forward under the door to, or nearly to, its front edge, and the lower bar, *a'*, extending forward under the floor to or beyond the front edge of the door, with a track or way in line with bar *a'* beneath the floor, and means for mounting or securing bar *a'* upon the track with freedom of endwise movement thereon, substantially as set forth.

4. The method herein described of mounting sliding doors, consisting in supporting the door on a track beneath the floor by means of a carriage-frame passing through a slot or opening in the floor within the pocket, such frame extending above the floor for attachment to the door, and also extending forward under the floor toward the front edge of the door, and adapted to rest and move upon the track, substantially as set forth.

In testimony whereof I have hereunto set my hand.

DAVID KNOX MILLER.

Witnesses:

R. H. WHITTLESEY,
C. L. PARKER.