

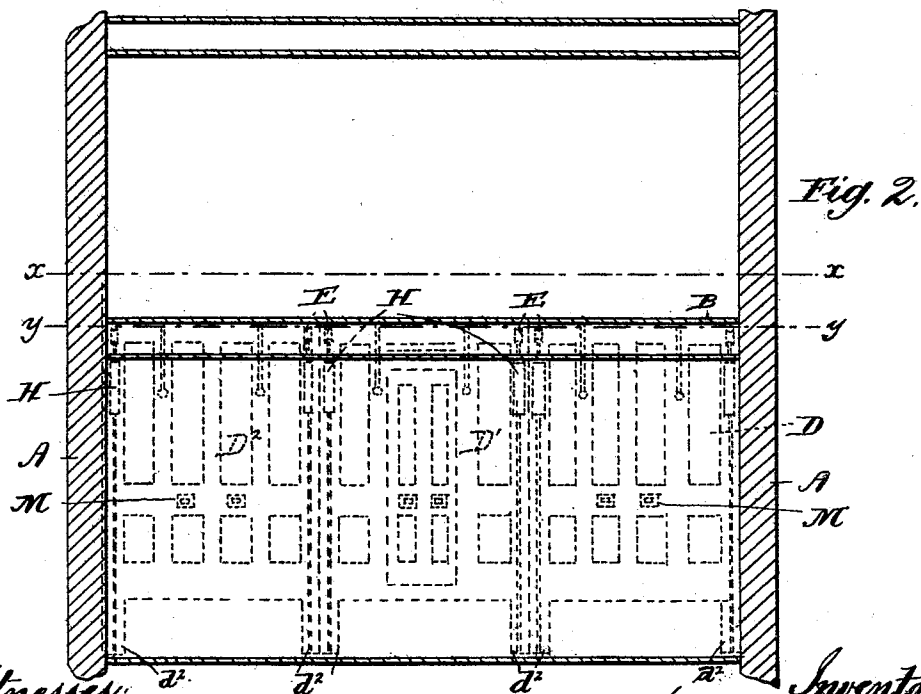
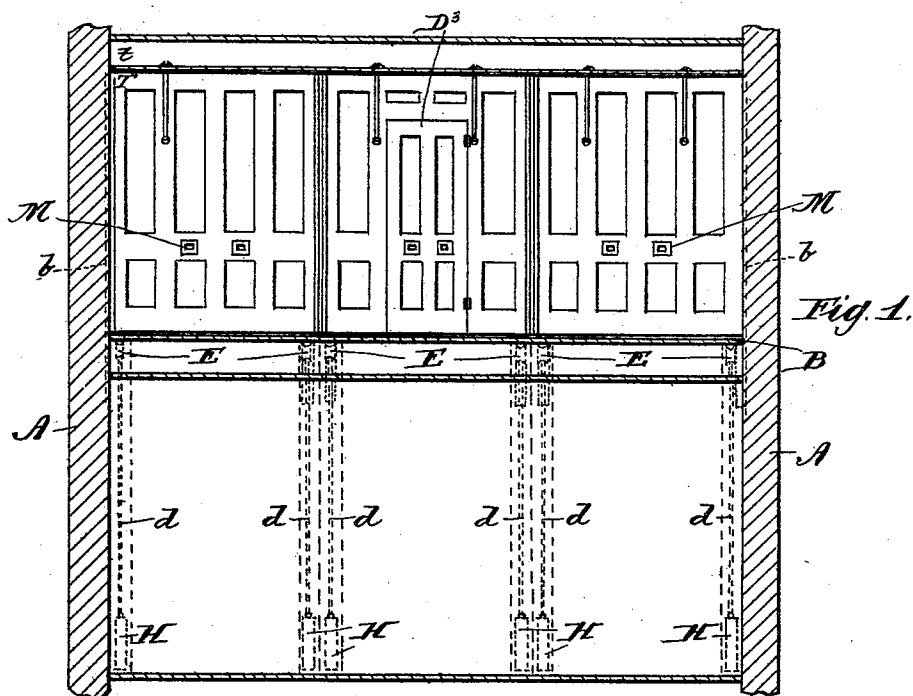
(No Model.)

4 Sheets—Sheet 1.

H. J. LOHMAN.  
SLIDING DOOR.

No. 500,016.

Patented June 20, 1893.



Witnesses:  
J. E. Fowler.  
M. E. Cowell.

Inventor:  
Henry J. Lohman.  
by attorney  
S. B. W. C. S. 104.



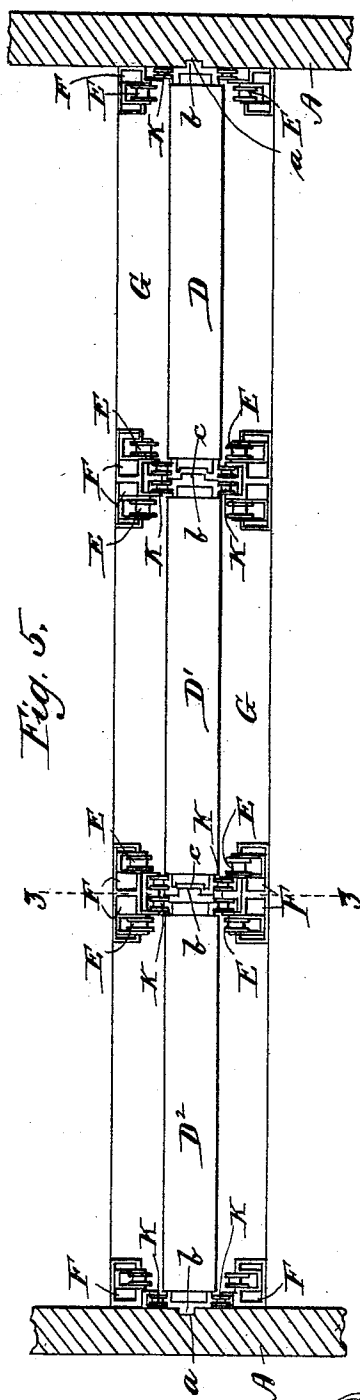
(No Model.)

4 Sheets—Sheet 3.

H. J. LOHMAN.  
SLIDING DOOR.

No. 500,016.

Patented June 20, 1893.



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(No Model.)

4 Sheets—Sheet 4.

H. J. LOHMAN.  
SLIDING DOOR.

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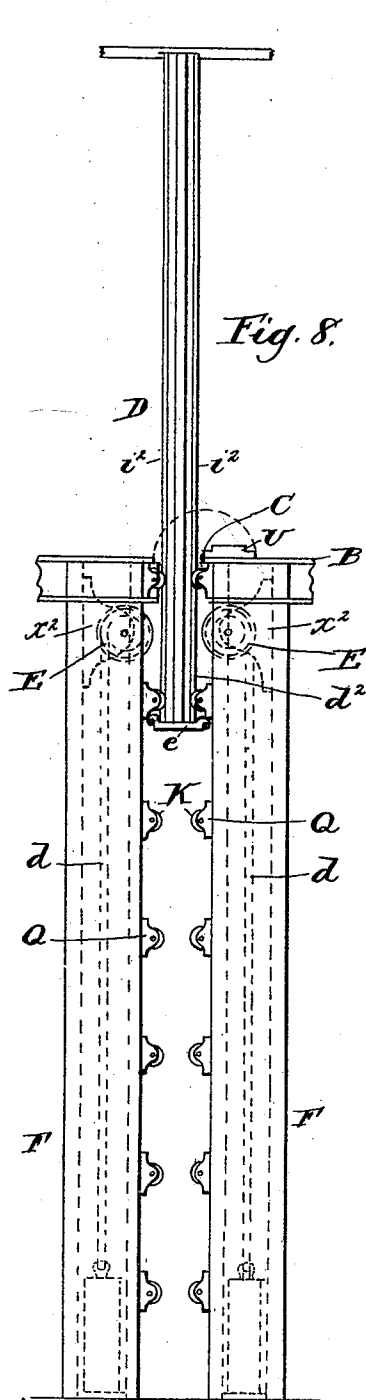


Fig. 8.

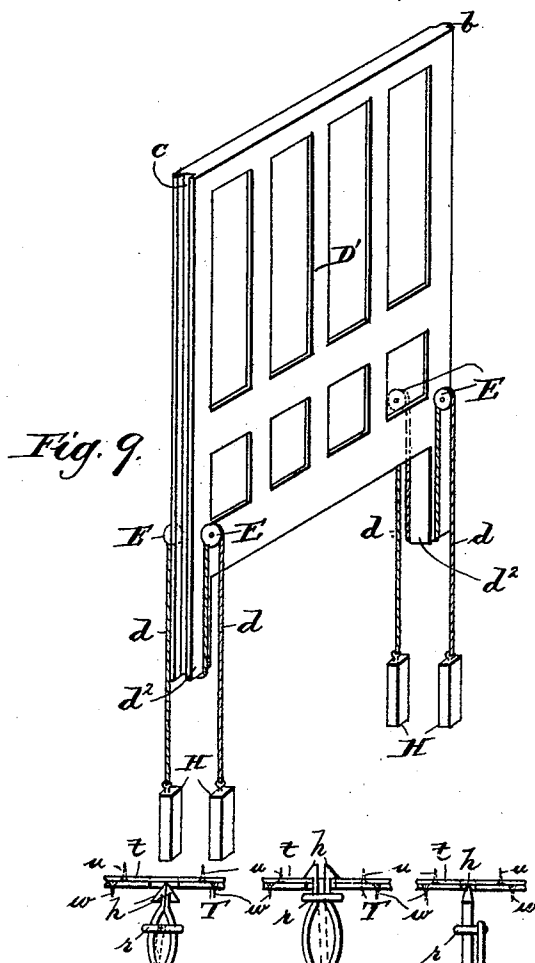


Fig. 9.

Fig. 10.

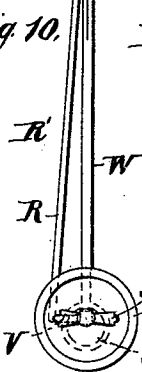


Fig. 11.

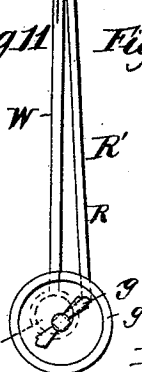
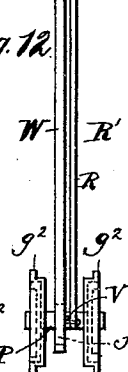


Fig. 12.



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# UNITED STATES PATENT OFFICE.

HENRY J. LOHMAN, OF MCKEESPORT, PENNSYLVANIA.

## SLIDING DOOR.

SPECIFICATION forming part of Letters Patent No. 500,016, dated June 20, 1893.

Application filed November 3, 1892. Serial No. 450,829. (No model.)

*To all whom it may concern:*

Be it known that I, HENRY J. LOHMAN, a citizen of the United States, residing at McKeesport, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Sliding Doors for Buildings; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention has relation to the construction of buildings and relates more particularly to the arrangement of a vertically-sliding door or doors arranged within one large room or between two adjoining or connecting smaller rooms, and among the objects sought to be attained is to provide a simple and inexpensive arrangement of vertically-sliding doors which are adapted to be conveniently operated to divide the large room into two smaller rooms, or to throw the smaller rooms into communication with each other whereby I obtain practically one large room, which often becomes desirable for various purposes.

A further object of my invention is to provide means whereby the door or doors will be prevented from falling in case of the breaking of the suspending ropes, and with the above and other objects in view which will become apparent from the description given hereinafter, my invention consists in the construction, arrangement and combination of parts, all as hereinafter fully described, illustrated in the accompanying drawings, and pointed out in the appended claims.

In the drawings: Figure 1 is a front elevation of a room provided with my arrangement of sliding doors, showing the latter raised to close the opening between the adjoining rooms. Fig. 2 is a similar view showing the doors lowered to throw the two rooms into communication with each other. Fig. 3 is a horizontal section of Fig. 2 on line  $x-x$  and showing the carpet sill or threshold thrown open. Fig. 4 is a like view showing the carpet sill or threshold closed. Fig. 5 is an enlarged horizontal section of Fig. 2 on line  $y-y$

showing the connections between the doors and the guideways. Fig. 6 is a detail view of a part of two of the doors on an enlarged scale showing one form of track, and the construction of the weight pockets and pulleys, and the position of the same; Fig. 7 a similar view showing another form of track. Fig. 8 is a detailed vertical section on line  $z-z$  in Figs. 5 and 6. Fig. 9 is a detail perspective view of one of the doors and its suspending ropes and weights and showing the pulleys or sheaves over which the ropes pass. Fig. 10 is a detail view of a device for locking or preventing the dropping of a door in case of a breakage of the ropes the device being shown in the unlocked position. Fig. 11 is a similar view of same as it appears locked. Fig. 12 is an edge view of Fig. 10. Fig. 13 is a detail elevation of a portion of one of the vertical extensions  $d^2$  on the lower ends of the doors and the hooks  $e$ , to which the weight ropes  $d$ , are fastened.

In adapting a building for the use of my arrangement of sliding doors or partitions, no radical changes are necessary in the construction of the walls or partitions thereof; and my improved arrangement of doors is more particularly intended to be used in buildings which are provided with rooms located below the story on which the doors are arranged.

Another method of arrangement I shall describe is to arrange the guard pulleys in the face of the doors and near the lateral edges of the doors and on each side and put the track on the pocket jambs so the doors will work between the tracks and the pulleys travel upon the tracks; any ordinary L-track put up with screws will suffice.

In practice I would doubtless apply my invention more generally to the class of buildings having a cellar or room below the main story or floor, since it will be evident that my invention is better adapted for such class of houses, and I shall so describe my invention.

A A indicate a portion of two walls of a building or room; these walls may be constructed in the usual manner of studding or of brick according as said walls form the interior or the exterior walls of the building. Above the main floor B of the building said

walls are provided with guideways *a*, preferably of the configuration shown and of sufficient width and depth not to bind the tongue *b*, which would cause abrasion of the same and prevent their free working.

Within the floor *B* and extending the entire width of the room or space in which the doors are to operate between the walls *A, A*, I form an opening or slot *C* of a width sufficient to readily and easily accommodate the doors *D D' D²* which fit within and are adapted to freely slide vertically through said opening *C*. These doors, of which I show three in the drawings, are adapted when raised as in Fig. 1 to divide the room into two smaller rooms, and when lowered, as in Fig. 2, to throw said rooms into communication with each other, forming practically one large room.

It will be understood that although I have shown three doors I do not wish to be restricted to the precise number employed, since a greater or less number may be used with equal facility, though, to secure perfect freedom and convenience in operation I would probably use three for a room of ordinary size.

My arrangement of sliding doors or partitions is specially adapted for Sunday school rooms, class rooms, halls, lodge rooms, or parlors where communication between rooms is desired or smaller rooms preferred.

Each of the doors *D, D'* is provided on its edges with a tongue and groove *b*, and *c*, respectively, while the door *D²* is provided with two tongues *b*, one on each edge, so that when the doors are fitted in position, tongue and groove joints are formed between them, whereby said doors are adapted to be readily slid vertically upon each other or independently of each other each door when at rest forming as it were a guide for the adjoining doors when the same are moved.

The tongue *b*, on the door *D* and the outer tongue *b*, on door *D²* fit and are adapted to slide within the guideways *a*, in the walls *A, A*.

For the purpose of balancing the doors to adapt them to be readily lowered or raised when desired, I employ an arrangement of ropes and weights.

In the drawings I have shown each of the doors as provided with four ropes or cords *d*, which are secured at one end to the hooks *e*, which are fastened to the vertical extensions *d²* of each door, said ropes thence passing upwardly and over sheaves *E* with weights *H* attached to the other end of rope *d*; sheaves *E* are mounted upon shafts or axles journaled in suitable boxes *x²* and fastened to upper ends of the weight pockets *F* by screws or bolts *o*. Said pockets *F* are built in walls *G* below main floor *B*, said pockets forming as it were a boxing to receive said sheaves *E* and weights *H*.

To the opposite ends of the ropes *d* are se-

cured weights *H* the combined weight of four of which should be sufficient to slightly overcome the weight of the door suspended thereby, and said weights are fitted and adapted to slide in the pockets *F* on the opposite sides of the door.

To separate the weights of one door from the weights of the adjoining door and thus prevent any entanglement which would cause the improper working of the doors, I provide suitable separating strips *f*, in the pockets *F* as shown.

By the described arrangement of the balancing of the doors said ropes *d*, and sheaves *E* are secreted below the floor *B* and thus do not render my arrangement unsightly.

For the purpose of rendering easy the sliding movements and prevent any vibration or rattling of the doors, so that a person may with but little if any exertion raise and lower the doors when desired, and so that any or all of the doors may be operated independently or in conjunction, I preferably employ the construction and arrangement of tracks and pulleys shown in Figs. 5, 6, and 7.

In Fig. 6 I show one of the doors provided at one of its edges with a vertically arranged track or guard *I* and the adjacent door with a like track or guard *I'*. The tracks or guards *I* and *I'* consist of a metallic rail or plate secured to the doors by screws *z*, and having the central projecting tongue *b*, and the lateral projecting tongues *z²* which lie flush with the face of the door. The track *I'* is substantially like track *I* with the exception that it is formed with a vertical socket or groove *c*, adapted to receive the tongue *b*, on track *I*. Between the pocket jambs *F, F*, are a series of grooved pulleys *K* suitably journaled in boxes *Q* and fastened to pocket jambs *F* with screws *S* which, when the doors are lowered work upon the track *z²* thus rendering the vertical movement of the doors smooth and easy. It will be understood that when the described construction of track is used, as in Figs. 5 and 6, the grooves and tenons *b*, and *c*, described hereinbefore as being formed in the doors themselves are rendered unnecessary.

Inasmuch as the tracks *I* and *I'* must be specially constructed for use with the doors I might for the sake of cheapness employ the ordinary T-track as seen in Fig. 7, such as are used with the horizontally sliding doors; in this case the tongues *b* and grooves *c*, would be formed and provided in the edges of the doors themselves, as in Fig. 7. Furthermore, by this arrangement the pulleys act to keep the doors firm and not liable to shake or rattle and give them free and easy working.

To prevent the doors from falling in case of a breakage of the suspending ropes *d*, and as a lock for the doors, I employ a suitable catch or locking device as seen in Figs. 10, 11 and 12.

Fig. 10 shows the catch or lock turned down or unlocked, the top end of which comes flush

with the top of the guard plate T which is fastened by screws  $w, w$ , to the top of the door the hole through the plate T being large enough to admit of the heads  $h$ , when closed together; the flange  $r$ , is riveted to the end of arm R and which is connected by a loose joint with arm or crank V; the rod W is split as seen, at the top end, and the lower end is mounted upon a cam center J which when turned half way round brings the heads  $h$  up and through the plate  $t$ , which is fastened to the ceiling with screws  $u$ , and which has a slot large enough to admit of the heads  $h$  when closed as in Fig. 10, but when locked will appear as in Fig. 11; the handle  $g$  is to operate the lock by simply turning to the right on one side of the door and to the left on the other side; the handles  $g, g$ , are to be put on both sides of the doors and countersunk in the face of the doors within the escutcheons  $g^2$ .

Fig. 12 shows the position of cam J, crank V, and escutcheon  $g^2$ , which latter is let in flush with the face of the door and has round openings in the back which slip over the square ends of the shaft or axle on which the handle works. The handle has a square hole in the back to fit over the square end of the axle or cam roll P.

For the purpose of covering the opening C when the doors have been lowered, I provide a wooden threshold or carpet sill U hinged as at  $v^2$  to the floor at one side of the opening C and adapted to be thrown across and close the opening C to conceal the same. This sill U may be provided with rabbeted edges to allow it to fit snugly into the opening C.

In practice I would provide the doors at their upper ends with suitable spring handles, so that when the doors are down in the pockets they can be started upward.

The doors may each be provided with flush hand-holds or lifts M, M, at convenient points, of any desired construction to enable the person to more readily operate the doors.

Fig. 13 shows the hooks  $e$ , at the lower extensions  $d^2$  of the doors to which are fastened the weight ropes  $d$ , and said hooks are secured to the extensions by screws N.

I am aware that it is old to vertically slide doors either upward or downward, and I lay no claim thereto, as they do not in any way answer the purposes of my invention.

If desired, I may provide any one of the doors with a hinged fly door  $D^3$  so that communication may be had between the two adjoining rooms when the doors  $D D' D^2$  are in their raised position.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with the walls of a building provided with guideways as described, and a floor having a slot or opening extending the entire width of the room between said walls, of vertically-sliding doors arranged between the walls and adapted to slide through the opening in the floor independently of each

other, tongues and grooves on the edges of the doors connecting the latter with each other and with the guideways in the walls, vertical extensions at the lower ends of the doors, sheaves mounted in boxes secured to the studding below the floor, cords or ropes secured at one end to the lower ends of the extensions and passing upwardly and over the sheaves and then downwardly between said studding, and weights secured to the opposite ends of the ropes, all arranged for cooperation, substantially as and for the purpose specified.

2. The combination with the walls of a building provided with guideways as described, and a floor having a slot or opening extending the entire width of the room between said walls, of vertically sliding doors arranged between the walls and adapted to slide through the opening in the floor independently of each other, tongues and grooves on the edges of the doors connecting the latter with each other and with the guideways in the walls, vertical extensions at the lower ends of the doors, sheaves mounted in boxes secured to the studding below the floor, cords or ropes secured at one end to the lower ends of the extensions and passing upwardly and over the sheaves and then downwardly between the studding, weights secured to the opposite ends of the ropes, grooved pulleys mounted in the studding below the floor, and tracks secured to the doors at their adjacent edges and adapted to be engaged by the pulleys, in the manner and for the purpose specified.

3. The combination with the walls of a building provided with guideways as described, and a floor having a slot or opening extending the entire width of the room between said walls, of vertically-sliding doors arranged between the walls and adapted to slide through the opening in the floor independently of each other, tongues on the outer edges of the doors adjacent to the walls and adapted to engage the guideways in the latter, vertically-arranged tracks secured to the doors at their meeting edges, said tracks being constructed substantially as described and adapted to form a connection between the doors, grooved pulleys mounted in the studding below the floor and adapted to engage the tracks, vertical extensions at the lower ends of the doors, sheaves mounted in boxes secured to the studding below the floor, cords or ropes secured at one end to the lower ends of the extensions and passing upwardly and over the sheaves and then downwardly between the studding, weights secured to the opposite ends of the ropes, all arranged for operation, substantially as and for the purpose specified.

4. The combination with a door frame and a door adapted to slide vertically therein, of a device for locking said door in its raised position, consisting of the rod W split or forked at its upper end and provided with heads  $h$ , a cam bearing upon which said rod

is mounted at its lower end, a shaft carrying  
said cam bearing and passing through the  
door, a crank arm on said shaft and to which  
arm is loosely jointed the lower end of rod R,  
5 an operating handle carried by said shaft; and  
a slotted plate with which is adapted to en-  
gage the heads *h*, all arranged for coopera-  
tion, as and for the purpose specified.

In testimony whereof I affix my signature in  
presence of two witnesses.

HENRY J. LOHMAN.

Witnesses:

W. SWARTZWELDER,  
CHARLES MOORE.