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PATENTED FEB. 7, 1905.

R. H. JONES.

SWINGING SLIDING DOOR AND MEANS FOR SUSPENDING SAME.

APPLICATION FILED MAR. 16, 1904.

3 SHEETS—SHEET 2.

Fig. 4

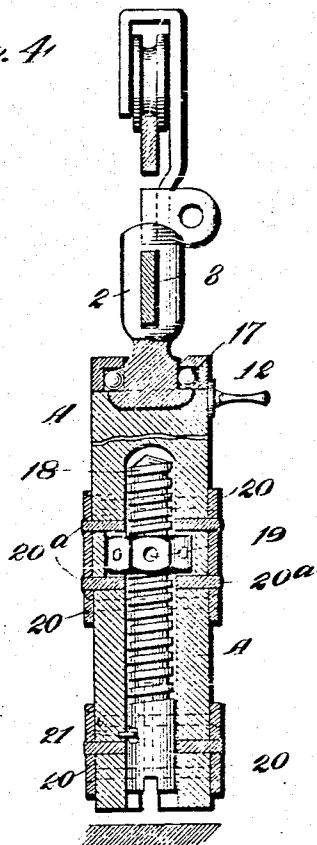


Fig. 5

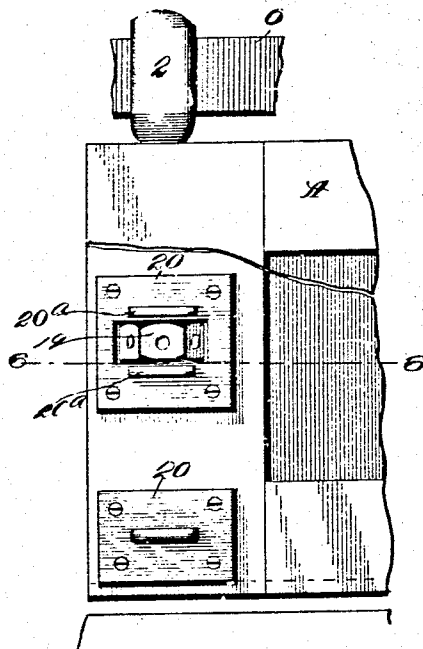


Fig. 6

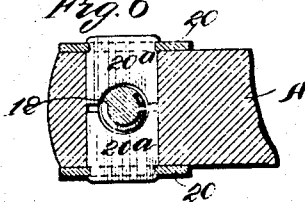
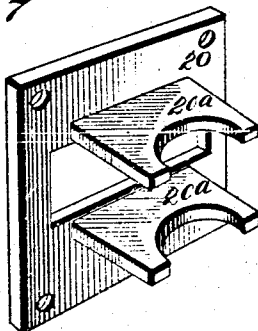


Fig. 7



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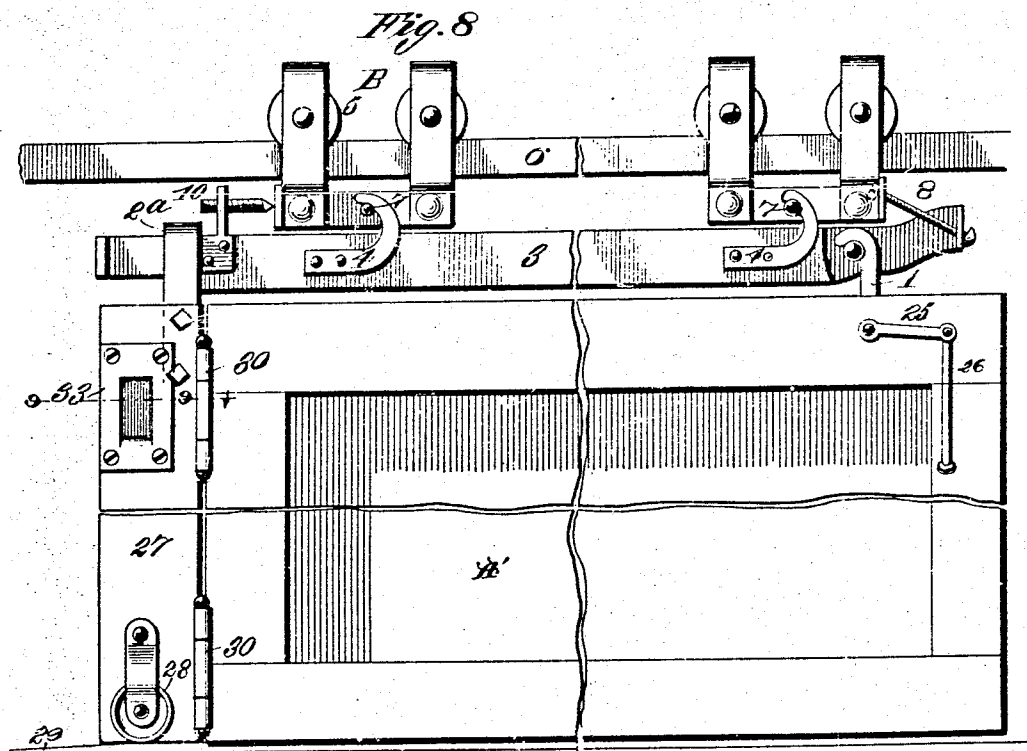
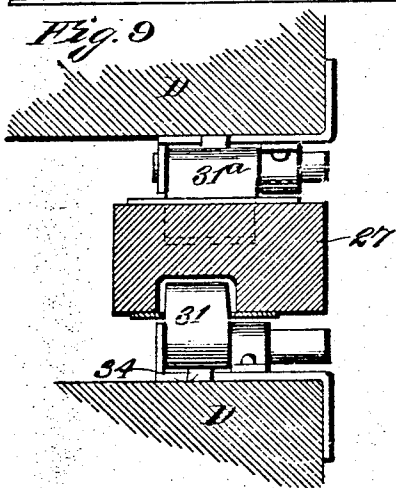
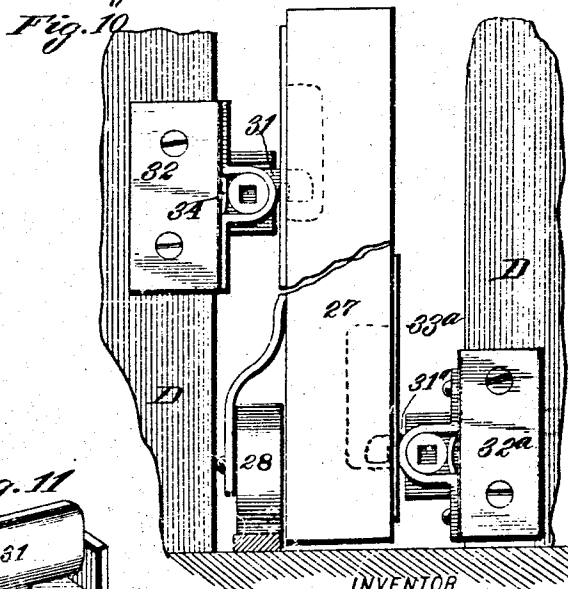
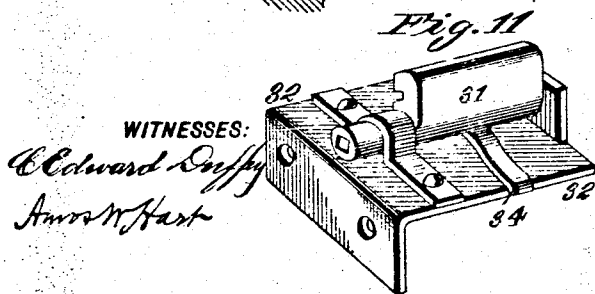
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3 SHEETS—SHEET 3.



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SWINGING SLIDING DOOR AND MEANS FOR SUSPENDING SAME.

SPECIFICATION forming part of Letters Patent No. 782,139, dated February 7, 1905.

Application filed March 16, 1904. Serial No. 198,377.

To all whom it may concern:

Be it known that I, ROBERT H. JONES, a citizen of the United States, residing at Portland, in the county of Multnomah and State of Oregon, have made certain new and useful Improvements in Swinging Sliding Doors and Means for Suspending the Same, of which the following is a specification.

The object of my invention is to provide an improvement in the class of sliding doors provided for houses, barns, stables, warehouses, &c., whereby when duly adjusted in position for closing the entrance they may be swung laterally in the same way as a hinged door. In other words, my improved door and its attachments are adapted to be slid longitudinally for opening and closing the entrance and also enable it to swing on a pivot-support, so that the entrance may be opened without sliding the door.

My invention is embodied in a principal and a modified form, as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side view, parts being broken away, illustrating my improved door and the means for suspending and pivoting the same. Fig. 2 is a horizontal section on the line 2 2 of Fig. 1. Fig. 3 is a detail view illustrating a stop for the sliding door. Fig. 4 is a vertical section of the door and means for suspending it. Fig. 5 is a side view of a portion of the door. Fig. 6 is a horizontal section on the line 6 6 of Fig. 5. Fig. 7 is a perspective view of a guide or support for the screw-bolt which serves as a pivot for the sliding door. Fig. 8 is a side view of a modification. Fig. 9 is a horizontal section on the line 9 9 of Fig. 8. Fig. 10 is an end view of the door shown in Fig. 8 and illustrates means for supporting the door-pivot while the latter is being swung laterally. Fig. 11 is a perspective view of one of the devices for holding the door as illustrated in Fig. 10.

I will first describe my invention as illustrated in Figs. 1 to 7. Referring in the first instance particularly to Figs. 1 and 2, A indicates a large door which is adapted to slide for opening and closing the entrance to a barn, stable, warehouse, or other building. It is

suspended by a hook 1 and a guide-loop 2 from a horizontal bar 3, which is in turn suspended by hooks 4 from hangers B and B'. These hangers are metal frames of a well-known construction provided with grooved wheels 5, which are adapted to run upon a stationary horizontal bar 6. The latter is supported in any approved manner in the frame of the building, and the hangers run thereon in the usual way. The hangers are each provided with a lateral and headed stud 7, with which the hooks 4 engage. The latter are riveted to the bar 3. The hooks 4 are so formed that a supplemental means is required for holding them engaged with the stud 7. In other words, they will immediately fall away from the studs but for said means. In the case of the hanger B' this means is a screw-bolt 8, one end of which is connected with the upturned end 3^a of the bar 3 and its opposite end with a lug forming a lateral projection of the hanger B'. A nut 9 is applied to the threaded end of the bolt 8 and serves to adjust the same. It will be seen that the bolt thus serves to hold the bar 3 and its hooks 4 detachably engaged with the hangers. In order to prevent the left-hand hanger B from sliding toward the left, and thus becoming disengaged from the adjacent hook 4, a screw 10 is applied in a horizontal position, the same working in a bracket 11, which is fixed to the bar 3. It will be seen that the loop 2 is permanently engaged with the bar 3. The hook 1 is attached to a pivot-bolt 12, (see also Fig. 4,) which projects laterally and is provided with a thumb-piece, so that it may be rotated. The hook being fast to the pivot 12 rotates with it, but is held normally engaged with the stud 13 of the bar 3 by means of a curved plate-spring 14, arranged below it, as indicated in Fig. 1. It will be seen that by raising the door A slightly the hook 1 may be swung out of engagement with the stud 13 and that then the door may be swung on a pivot. The means for pivoting the door are as follows: The guide-loop 2 is provided with a flange at its lower end, between which and a boxing 16, secured in the door A, is arranged a series of antifriction-balls 17. By this means the door is suspended at the rear

end and adapted to rotate so as to swing laterally. The means for supporting and pivoting the door at the lower edge are as follows: A large coarsely-threaded bolt or rod 18 is arranged vertically in a socket in the door A, and a large octagonal screw-nut 19 is applied thereto, the same being held in a lateral opening or slot in the door, as will be understood by reference to Figs. 4 and 5. For the purpose of forming a guide and boxing for the screw and the nut I employ devices 20, such as illustrated in Figs. 4, 5, 6, and 7. The same consist of a plate provided with screw-holes and an elongated horizontal slot, also with two parallel lateral projections 20^a, whose inner ends are cut out on a semicircle. This construction adapts the plates or projections 20^a to fit somewhat loosely upon the screw 18, and the nut 19 works in frictional contact with them, as will be readily understood by reference to Fig. 4. The faces of the nut 19 are provided with sockets to receive a lever for rotating it. The lower portion of the screw 18 is supported by devices resembling that shown in Fig. 7, save that there are no slots and there is but a single notched plate 20^a. The screw 18 is held from rotating by means of a pin 21, (see Fig. 4,) which enters a groove in the screw. Therefore the effect of the rotation of the nut 19 is to raise or lower the screw 18. It is shown in Figs. 1 and 4 adjusted to its highest position; but, as illustrated by dotted lines in Fig. 1, it may be lowered so as to project into and be supported in the socket of a plate which is supported upon antifriction-balls 23, the same being arranged under the horizontal flange of the socket-plate and running in a metal box arranged flush in the sill C.

It will now be understood that the door A may be run backward lengthwise when suitable force is applied, since the wheels 5 of the hangers run free on the overhead track 6, and the supports for the door, which are intermediate the hangers and the door, travel with the latter. On the other hand, when the door is run to the closed position indicated in Figs. 1 and 2 and it is desired to employ it as a swinging or pivot door the nut 19 is rotated to adjust the screw down to the position indicated by dotted lines and the hook 1 is also disengaged from the stud 13. This leaves the door free to swing easily on the pivots 2 and 18, as will be readily understood.

For the purpose of arresting the door A when moved to the left I provide a form of stud 24 which is hook shape, as indicated in Figs. 2 and 3. As illustrated in Fig. 2, I also provide studs for the door A when moving to the right, the same consisting of screws 24^a, inserted in brackets attached to the side walls C' and engaging right-angular arms 24^b, which are rigidly attached to the door proper and project laterally, as shown.

In the modification of my invention illustrated in Figs. 8 to 11 the same overhead attachments are provided, and the hook 1 is shown provided with a lateral lever-arm 25, from which a pull-and-push rod 26 is suspended for convenience of manipulation of the hook. The pivot in this case is constructed in the form of a vertical wooden bar 27, the same having a loop 2^a at its upper end, which engages the bar 3, and at its lower end a roller 28, which is adapted to run on an inclined track 29. The door A' is connected with this pivot-bar 27 by means of single or double hinges 30, the single hinges being employed when the door is to be swung in one direction only and double hinges when it is desired to swing it in either direction. The inclined track 29 is employed solely for raising the pivot-bar 27, together with the gate attached thereto, when the latter is run to the closed position indicated in Fig. 8. It will be understood that the incline is only employed at the point where the wheel rests when the door has reached the closed position. In case the door be large and heavy it is requisite that some lateral support be afforded for the pivot-bar 27 while the door is swung laterally. For this purpose I may employ swinging catches, as indicated in Figs. 9, 10, and 11. In Fig. 10 a catch 31 is shown pivoted in a boxing 32 and adapted to enter a slot in a plate 33, (see Fig. 8,) forming an attachment of the door A' and to engage the lower edge of the plate. The pivot of the catch 31 is provided with a square socket for reception of a key or device for turning the catch. As illustrated in Fig. 11, a plate-spring 34 is arranged behind the catch for holding it in either engaging or disengaging position. As will be understood from the drawings, the catch 31 is arranged near the top of the pivot-bar 27. A similar attachment is provided on the opposite side of the pivot-bar and near the lower end of the same. In other words, a catch 31^a is adapted to engage a plate 32^a, which is slotted and secured to the door A', as before described. It will be understood that the plates 32 and 32^a, to which the respective catches 31 and 31^a are pivoted, will in practice be attached to fixed supports D or portions of the framework adjacent to the track in which the door runs when slid.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination of a door with an overhead supporting-bar, hangers adapted to travel on said bar, a bar supported by the hangers and means for connecting one end of the door with such hanger-bar, and means constituting a pivotal support for the door and which is slidable therewith, substantially as described.

2. The combination of a slidable door with an overhead support on which it is adapted to

travel, a pivotal support connected with one end of the door and adapted to travel with it, and a means of support connected with the other end of said door, the same being detachable from the suspending device so that that end of the door may be left free to swing laterally, substantially as described.

3. The combination of a slidable door with an overhead support on which it is adapted to travel, means of detachable connection between one end of the door and the hanger-bar, and means of pivotal support arranged in connection with the other end of said door, and adapted for vertical adjustment preparatory for the lateral swinging of the door, substantially as described.

4. The combination with an overhead support and hangers adapted to travel thereon, and a hanger-bar having hooks adapted to detachably engage the hangers proper, movable devices for holding the hooks thus engaged, and means for attaching the door to the hanger-bar, the same including a detachable connection at one end and a pivot at the other, substantially as described.

5. The combination with an overhead support, and a suitable hanger adapted to travel thereon, of a bar supported by said hanger, a slidable door having at one end means of detachable connection with the hanger-bar, and a pivotal support at the other end of the door which comprises a device connected with the hanger-bar, and a screw arranged vertically, and a nut applied thereto as shown, whereby the screw may be adjusted vertically as required to place it in position to serve as a part of the pivot of the door when the door is to be swung, or retract it when the door is to travel endwise, substantially as described.

6. The combination of the slidable door with a supporting-bar and a hanger-bar suspended therefrom, means for detachable connection of the door with one end of the hanger-bar, a guide-loop applied to the opposite end of the door and having an antifriction-bearing in the latter, a screw arranged in the door, vertically, in line with the said loop, a nut applied thereto for adjusting the screw vertically, and a bearing in the sill upon which the screw is adapted to rest when adjusted downward to form a part of the door-pivot, substantially as described.

7. The combination of a slidable door with an overhead support and a suitable intervening hanger and a pivotal connection between the hanger and one end of the door, and a supplemental pivot arranged in line with the first-named one and consisting of a device adapted for vertical adjustment, whereby it may be

projected downward into engagement with the sill when the door is to be swung laterally substantially as described.

8. The combination with an overhead supporting-bar, and a hanger-bar, of a door adapted to both slide and swing, a device applied to one end of the door for detachably connecting it with the hanger-bar, and pivot members applied to the opposite end of the door and connecting it with the hanger-bar, the lower pivotal member consisting of a screw arranged vertically in a suitable bearing, a nut applied thereto and rotating in a box suitably constructed for the purpose, and an antifriction-bearing arranged in the sill and comprising a plate provided with a socket adapted to receive the screw-bolt and with a flange extended laterally and antifriction-balls arranged under said flange, substantially as described.

9. The combination with an overhead support and hangers adapted to travel thereon and a hanger-bar connected with said hangers, of a door adapted to slide and swing, the same having pivotal members one of which is connected with the hanger-bar and provided with an antifriction-bearing and the other is applied to the lower portion of the door and adapted for vertical adjustment, and an antifriction-bearing in the sill with which the lower pivot member coincides when the door is in position to swing, substantially as described.

10. The combination with an overhead support, and a suitable hanger, of a door suspended from the hanger and having a pivotal support comprising two members, the lower one being a screw and nut, and guides and support for said screw and nut comprising a plate having a lateral projection which bears against the screw, substantially as described.

11. The combination with an overhead support and hangers adapted to travel thereon, of a door suspended from said hangers and having a pivotal support at one end, one member thereof consisting of a vertically-adjustable screw arranged in a socket in the door, a nut applied to the screw, and guides and supports comprising plates having a slot and two parallel lateral projections in the nature of flanges having semicircular notches in their inner ends which are fitted to embrace the screw, the nut being arranged between the two flanges, substantially as shown and described.

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Witnesses:

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