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DOOR

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This invention relates to doors and particularly to a support and an adjustable mounting for doors.

It is well known that doors have to be adjusted with respect to their frames to properly center them and this is particularly true after the settling of a newly constructed building. The matter of adjusting doors with respect to their frames is often a difficult problem and particularly in the case of heavy doors. According to the present invention structure is provided to facilitate adjustment of doors of any weight.

Another problem in door construction is to eliminate the danger of children having their fingers pinched between the rear edge of the door and the door frame.

An object of the invention is to mount a door for ready adjustment.

Another object of the invention is to mount a door for adjustment independently of its supports.

A further object of the invention is to provide a door which has a space of constant width between the rear edge of the door and its frame when the door is open and when it is closed.

Still another object of the invention is to provide a novel support for the door.

These and other objects will be apparent from the following specification when taken with the accompanying drawing in which:

Fig. 1 is a vertical section of a door according to the present invention,

Fig. 2 is a section on the line II—II of Fig. 1,

Fig. 3 is a section on the line III—III of Fig. 1, and

Fig. 4 is a section on the line IV—IV of Fig. 1.

Referring particularly to the drawing the reference character 1 indicates a portion of a building structure including a door frame. Above and below the door frame are metallic inserts 2 and 3 having suitable bores 4 and 5. The bores 4 and 5 are for the purpose of receiving pins 6 and 7 about which the door pivots. The lower end of the pin 7 is provided with a recess 8 in which there is disposed a portion of an antifriction ball 9 disposed at the bottom of the bore 5.

The door body 15 is illustrated in the drawing as constructed of wood but, of course, it may be of metal or any other desired material. At the inner edge of the door extending from the top to the bottom is a post comprising a return bent sheet metal portion 16. The sheet metal portion 16 is provided at its outer or rear edge with a convex portion of arcuate cross-section 17. Within the convex portion 17 at the upper and

lower extremities are metallic plugs 18 provided with suitable bores 19 for receiving the pins 6 and 7. Threaded laterally into the plugs 18 and passing centrally through the bores 19 are screws 20 shown particularly in Figs. 1 and 4. The screws 20 are for the purpose of holding pins 6 and 7 in the bores 4 and 5 of the inserts 2 and 3. It will be obvious that the lower screw 20 rests on the pin 7 and thereby transmits the weight of the door and its associated structure to the pin 7.

When it is desired to remove the door from its frame the screws 20 are removed. In order to remove the lower screw 20 it will be necessary to slightly raise the door in order to remove its weight from the pin 7. When the screws 20 have been removed the pin 6 will fall into the bore 19 and out of the bore 4. The pin 7 may be raised from the bore 5 in the insert 3 by catching one of the flanges 21 or 22 on its upper end with a screw driver, for instance, inserted in the opening from which the lower screw 20 has been removed.

The adjusting mechanism for the door comprises the connection between the sheet metal portion 16 and the door body 15. The door body 15 is provided with two vertical slots 30 and a horizontal slot 31. Within the horizontal slot 31 is disposed a pin 32 eccentrically projecting from a rotatable disc 33, the disc 33 being provided with a hexagonal recess 34 for receiving a wrench. The disc 33 is rotatable in an opening 35 in one side of the sheet metal portion 16. As the disc 33 is rotated by a wrench in the recess 34 the eccentrically projecting pin 32 moves in the slot 31 to cam the door in a vertical direction, being up or down depending on the direction of rotation of the disc 33. In order to maintain the pin 32 and also the door body 15 in adjusted position a screw 36 passing through a disc 37 disposed in the other side of the sheet metal portion 16, threadably engages the pin 32, and when tightened clamps the adjustment assembly together. A similar adjustment structure is provided for the slots 30 for adjusting the door body 15 horizontally.

An additional means to secure the door body 15 and the sheet metal portion 16 in adjusted relation after adjustment has been made comprises the interengaging male and female screws 38 and 39, respectively, passing through the opposite sides of the sheet metal portion 16 and through the openings 40 in the door body 15. Each opening 40 is materially larger than the diameter of the female screw 39 and thus

does not interfere with vertical and horizontal door body 15 adjustments. It will be obvious that as the screws 38 and 39 are drawn together a part of the sheet metal portion 16 will be slightly drawn or bulged into each side of the openings 40. That there will be such a drawing in will be obvious from the fact that the heads of the screws 38 and 39 are of less diameter than the openings 40. In order to facilitate the drawing in action the under sides of the heads of the screws 38 and 39 may be slightly beveled as shown.

Before adjusting the door body 15 it will be obvious that the locking screws 36, 38 and 39 must be first loosened and then after the adjustment is made, tightened. In order to prevent the sheet metal portions 16, when clamped in adjusted position with respect to the body 15, from sinking into the door body 15, when the same is made of wood, there are provided in the door body 15 inserted plates 41.

In order to seal the back or outer edge of the door which is the convex portion 17 of the sheet metal portion 16 there is provided a sheet metal member 45 secured by screws 46 to metal inserts 47, in turn secured by screws 48 to the door frame. The member 45 is provided with a projection 49 having a channeled or concave portion of arcuate cross section 50 concentric with the convex portion 17. As the door pivots about the pins 6 and 7 at the center of the convex portion 17 the spacing between the convex portion 17 of the door and the concave portion 50 of the frame member 45 of the door remains constant. At the center of the concave portion 50 is a layer of felt or like material 51 in rubbing engagement with the convex portion 17 to provide a weather seal. As shown, the strip 51 is riveted between abutting half sections of the concave portion 50. However, other construction may be used.

It will be apparent from the foregoing specification that I have provided a door structure wherein the door is readily adjustable to correct rubbing by the door on the door frame due to sagging of the door or settling of the building and, further, that I have provided not only novel means to support a door but a door construction in which it is impossible for a child, for instance, to have its fingers caught between the rear edge of the door and the door frame. This door may not only be used in residences but also in commercial properties and public buildings. Furthermore, the adjustable feature may be applied to hinged doors as well as pivoted ones as illustrated. In small doors of light weight the locking means provided to supplement the locking mechanism associated with the cam adjustment structure may be used alone for adjustment purposes without the cam structure.

Having thus described my invention what I desire to protect by Letters Patent and claim is:

1. A device of the character described comprising a door member, means supporting said member for pivotal movement, a door body, camming means to adjust said door body with respect to said member, means on said camming means to lock the same in adjusted position, and additional means to lock said door body in adjusted position with respect to said door member.

2. A device of the character described comprising a door member, means supporting said member for pivotal movement, a door body, a vertical and a horizontal slot defined by said door body adjacent said door member, and camming means mounted on said door member and en-

gageable with said slots to adjust said door in horizontal and vertical position with respect to said door member.

3. A device of the character described comprising a door member, means for supporting said member for pivotal movement, a door body associated with said door member, and means to secure said door body to said door member, said means comprising an opening defined by said door body adjacent said door member, sheet metal means comprising a portion of said door member overlapping said opening, and means to bulge said sheet metal means into said opening to prevent relative sliding movement between said door body and said door member.

4. A device of the character described comprising a door member, means supporting said member for pivotal movement, a door body, means to adjust said door body with respect to said door member, and means to lock said door body and door member in adjusted position, said last named means comprising an opening defined by said door body, sheet metal means comprising a portion of said door member overlapping said opening, and means to bulge said sheet metal means into said opening to prevent relative sliding movement between said door body and said member.

5. A device of the character described comprising a door member, having a rear edge portion of arcuate convex cross-section, a frame having a side portion of arcuate concave cross-section, said convex and concave portions being concentric, means to pivot said convex portion about its longitudinal axis whereby a clearance between said portions remains constant, a door body, means to secure and adjust said door body to and with respect to said door member, and yieldable weather stripping means associated with one of said convex and concave portions to provide a seal between said door member and said frame.

6. A device of the character described comprising a door member, a rear edge portion for said door member of arcuate convex cross-section, a frame for said door having a side portion of arcuate concave cross-section, said convex and concave portions being concentric, means to pivot said convex portion about its longitudinal axis whereby the clearance between said portions remains constant, a door body associated with said door member, a vertical and a horizontal slot defined by said body adjacent said door member, and camming means mounted on said door member and engageable with said slots to adjust said door body in horizontal and vertical position with respect to said door member.

7. A device of the character described comprising a door member, a rear edge portion for said door member of arcuate convex cross-section, a door frame having a side portion of arcuate concave cross-section, said convex and concave portions being concentric, pins mounted in the extremities of said convex portion in alignment with the longitudinal axis thereof and slidable into and out of said convex portion, for pivoting the said convex portion about its longitudinal axis whereby the clearance between said portions remains constant, a door body associated with said door member, a vertical and a horizontal slot defined in said door body adjacent said door member, and camming means mounted on said door member and engageable with said slots to adjust said door in horizontal and vertical position with respect to said door member.

8. A device of the character described compris-

ing a door member, a rear edge portion for said door member of arcuate convex cross-section, a door frame having a side portion of arcuate concave cross-section, said convex and concave portions being concentric, blocks disposed at the extremities of said convex portion, oppositely facing bores in said block in alignment with the longitudinal axis of said convex portion, pins slidable into and out of said bores, openings in said blocks intersecting said bores and projecting transversely thereof, means in said openings to limit the inward movement of said pins, openings in said frame for receiving said pins, said pins being for mounting said member for pivotal movement with respect to said frame whereby the clearance between said portions remains constant, a door body associated with said door member, a vertical and horizontal slot defined in said door body adjacent said door member, and camming means mounted on said member and engageable with said slots to adjust said door body in horizontal and vertical position with respect to said door member.

9. A pin for pivotally supporting a door or the like comprising a cylindrical body, a cup defined in one end of said body, and an annular groove defined adjacent the other end of said body.

10. A device of the character described comprising a door, a frame, pins at the top and bottom of said door for pivotally supporting the same in said frame, said pins being mounted in recesses at the top and bottom of said frame and recesses at the top and bottom of said door, and a pin projecting through said door at at least one of said recesses opposite the inner end of the pin therein for limiting inward movement of the pin in said last named recess.

11. A device of the character described comprising a door, a frame, pins at the top and bottom of said door for pivotally supporting the same in said frame, said pins being mounted in recesses at the top and bottom of said frame and recesses at the top and bottom of said door, a pin projecting through said door and at least one of said recesses opposite the inner end of the pin therein for limiting inward movement of the pin in said last named recess, and a metal ball at the bottom of the recess in said bottom of said frame, said pin having a cup at the bottom thereof for engagement with said ball, whereby the weight of said door is borne by said ball.

12. In combination with two members for securing them together, one of said members having an opening therein and the other of said members having a sheet metal portion, means to clamp said sheet metal portion to said member having said opening, said clamping means being effective over said opening and bulging said sheet metal into said opening for preventing relative movement between said members.

13. A device of the character described comprising a door member, a door body supported by said door member, said door member having a pivotal mounting, said door member comprising two spaced sheet metal portions receiving said door body therebetween, and means pivotally supported from each of said sheet metal portions and projecting through in operative and

supporting engagement with the portions of said door body between said sheet metal portions, the portion of said last named means between said sheet metal portions being eccentric to the portion thereof pivoted in said portions whereby rotative movement of said last named means adjusts the position of said door body relatively to said door member.

14. A device of the character described comprising a door member, a door body supported by said door member, said door member having a pivotal mounting, said door member comprising two spaced sheet metal portions receiving said door body therebetween, means pivotally supported from each of said sheet metal portions and projecting through in operative and supporting engagement with the portions of said door body between said sheet metal portions, the portion of said last named means between said sheet metal portions being eccentric to the portion thereof pivoted in said portions whereby rotative movement of said last named means adjusts the position of said door body relatively to said door member, and means to lock said door body in adjusted position with respect to said door member.

15. A device of the character described comprising a door member, a door body supported by said door member, said door member having a pivotal mounting, said door member comprising two spaced sheet metal portions receiving said door body therebetween, and camming means pivotally supported from each of said sheet metal portions operatively engageable with said door body for adjusting the same with respect to said door member.

16. A device of the character described comprising a door member, a door body supported by said door member, said door member having a pivotal mounting, said door member comprising two spaced sheet metal portions receiving said door body therebetween, camming means pivotally supported from each of said sheet metal portions operatively engageable with said door body for adjusting the same with respect to said door member, and means to lock said door body in adjusted position with respect to said door member.

17. In combination with two members for securing them together, one of said members having a recess therein and the other of said members having a sheet portion, means to clamp said sheet portion to said member having the recess, said clamping means being effective over said recess and deflecting said sheet portion inwardly of said recess for preventing relative movement between said members.

18. A device of the character described comprising a door, a frame, means at the top and bottom of said door for pivotally supporting the same in said frame, at least one of said means comprising a pin, said frame and door having opposed recesses for receiving said pin, and a second pin projecting into said recess in said door opposite the inner end of the pin therein for limiting movement of the pin inwardly of the door.

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