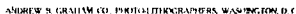


H. J. WEISS.
SLIDING DOOR HANGER.
APPLICATION FILED JUNE 30, 1904.



UNITED STATES PATENT OFFICE.

HENRY J. WEISS, OF BIRMINGHAM, ALABAMA, ASSIGNOR OF ONE-THIRD
TO HENRY U. SIMS, OF BIRMINGHAM, ALABAMA.

SLIDING-DOOR HANGER.

SPECIFICATION forming part of Letters Patent No. 795,241, dated July 18, 1905.

Application filed June 30, 1904. Serial No. 214,830.

To all whom it may concern:

Be it known that I, HENRY J. WEISS, a citizen of the United States, residing at Birmingham, in the county of Jefferson and State of Alabama, have invented new and useful Improvements in Sliding-Door Hangers, of which the following is a specification.

My invention has relation to new and useful improvements in hangers for sliding doors, and especially to hangers of the general character or type embodying in their structure means providing for the vertical adjustment of the door in order to establish the proper clearance-space between the bottom of the door and the floor over which it moves or for other purposes.

The primary object of the invention is to provide a hanger of the character mentioned which is extremely simple in construction, of few parts, and which may be manufactured at small cost.

Further objects are to construct the hanger in such a manner that the door may be readily and quickly adjusted vertically with relation thereto and to provide a novel means for connecting the door to the hanger which will not require the usual bolts or other fastening devices and which will permit the door to be easily and quickly disconnected from the hanger when occasion requires.

A further object is to provide a hanger which may be constructed largely of sheet metal and which will at the same time have the requisite degree of strength.

The invention consists in the construction and arrangement of the various elements, as will be fully described hereinafter and the novelty of which will be particularly pointed out and distinctly claimed.

I have fully and clearly illustrated my invention in the accompanying drawings, to be taken as a part of this specification, and wherein—

Figure 1 is a view in side elevation of a complete structure embodying my invention. Fig. 2 is a top plan view. Fig. 3 is a vertical transverse section on the line 3 3 of Fig. 1. Fig. 4 is a detail perspective of one end of the attaching-plate for the door. Fig. 5 is a

sectional view taken on the line 5 5 of Fig. 1. Fig. 6 is a plan view in detail of one end of the hanger, and Fig. 7 is a detail bottom plan view of the hanger-bar.

Referring to the drawings, 1 designates the attaching-plate, adapted to be secured on the upper edge face of the sliding door and by means of which, in connection with other instrumentalities to be set forth hereinafter, the door is connected to the hanger. This attaching-plate comprises two flat metallic plates 2 2, laid parallel to each other with the flat faces in the same horizontal plane, the combined width of said blanks being preferably such as to permit the outer longitudinal edges of the blanks to be flush with the front and rear faces of the door to which the attaching-plate is secured. At one end the attaching-plate is provided with a vertical post having suitable keepers, the construction of which will now be described. Adjacent one of the ends thereof and at their inner edges each of the plates 2 is struck up to provide vertically-projecting parallel members or webs 3 3, which are arranged with their inner faces in contact with each other, so that the two webs may cooperate to brace and support themselves, the said members constituting a post rising vertically from the attaching-plate. Each of the said members on the inner vertical edge thereof is provided with an outwardly-directed wing portion or projection 4, the body of which is bent backwardly upon the member, but spaced apart therefrom, as at 5, all substantially as shown in Figs. 1 and 2 of the drawings, the said wing portions, as will be seen particularly from Fig. 2, being opposite to each other. The lower edges of the wings 4 are formed at their lower edges with downwardly-projected outwardly-flaring portions 6, which serve a purpose to be made more clearly apparent hereinafter. For the purpose of securing the webs or members 3 3 in contact with each other and also for rigidly uniting the plates 2 2 one of said webs is provided with a locking means, which is shown as consisting of a tongue 7, which is bent to embrace the opposite web 3 and closely engage the same, whereby the webs are main-

tained in the desired relation. In order that any vertical movement of the plates 2 and webs 3 with relation to each other may be prevented, the web which is engaged by the locking or securing tongue 7 is formed in its outer vertical edge with a recess or cut-out portion 8, into which the tongue portion 7 is received when bent to lock the members together, the upper and lower edges of the tongue coöperatively engaging with the upper and lower boundaries of the recess to prevent relative vertical movement of the parts, as above stated. It will thus be seen that by the structure just described the attaching-plate is provided at one end with a post, which post has formed thereon keepers or retainers formed by the wings 4, the function and purpose of which will be described presently. At the opposite end of the attaching-plate from the one just described said plate is provided with a recess or housing, the construction of which will now be described.

Each of the plates 2 has struck up therefrom on a line longitudinally thereof a triangular portion 9, which portion is bent to lie in a vertical plane, the said portion being shown in form a right triangle, the sides of which are constituted by the line upon which said portion is bent and the vertical edge, as shown, the hypotenuse standing obliquely to the plane of the top plate 1 and inclining upwardly from the body of said plate toward the vertical side of said triangle. As just stated, each plate 2 is formed with one of these triangular vertical portions, and it will be seen from the drawings that the line upon which they are struck up from the plates is at a distance from the inner edges of the plates, so that when the plates are secured in position on the door a space 10 will be left between the said vertical triangular portions to form a housing, of which the triangular portions constitute the side walls. Along the line of its inclined edge each vertical wall 9 is provided with an inwardly-directed flange 11, the flanges on said walls being brought into contact with each other at their outer edges and by such engagement constitute the upper wall of the housing, the parts of the housing and ends of the plates 2 upon which they are mounted being secured together by a tongue 12, integral with one of the flanges 11 and passed through an opening 13 in the opposite vertical wall and at its free end bent back upon itself down into positive engagement with the outer surface of the flange 11. The flanges 11 are formed on their inner edges at one end with recesses 14, which when the parts are assembled in proper relation register with each other to provide an opening 15 in the upper wall of the housing, the purpose of which will appear presently.

16 designates a hanger-bar to which the attaching-plate is hung, as hereinafter described,

and to which is secured the bearing member 65 in which the bearing-rollers upon which the door travels are journaled. This hanger-bar 16 is constructed from a blank of sheet metal bent upon itself along its longitudinal center, so that, as shown in the drawings, said bar consists of two wings 17, arranged in parallel vertical planes, said bar being approximately the same length as the top plate of the door and when in operative position is arranged with its fold-line lowermost toward the top of the door. At one end—that toward the end of the attaching-plate carrying the post and keepers, as heretofore described—the bar 16 is slit along the fold for a short distance, as at 18, and the ends of the wings 17 are spread apart, as shown in Fig. 2, so that a space is formed between the ends of said wings, each of which is cut out at a point adjacent its end on its upper longitudinal edge, as at 19, to form parallel alining hooks 20, (clearly shown in Figs. 1, 2, and 6.) said hooks being spaced apart from each other greater than the width of the post formed by the members 3 3 on the top plate. The hanger-bar at the end opposite to that carrying the hooks is also cut for a short distance along the fold-line, as at 21, and the wings constituting the bar are spaced apart vertically along an oblique line entirely across the said bar, thus forming a passage-way 22, the longitudinal axis of which is substantially at right angles to the inclined upper wall of the housing on the top plate for the door. Within this passage-way, at a point intermediate its ends, is mounted, to be held against rotation, an interiorly-threaded block 23. This block may be secured in position and held against rotation in a number of ways; but as an efficient and simple means of accomplishing the objects in view I cut in the opposite wings of the bar 16 a pair of parallel slits 24, the pair in one wing alining with the pair in the other and both pairs in substantial parallelism with the inclined upper wall of the housing on the top plate. The metal confined between these slits is then cut transversely to form oppositely-disposed tongues 25 25, the ends of which are bent slightly outward, as shown in Figs. 2 and 7, to provide alining openings 26 26 in the wings 17. The block 23, above referred to, which is preferably angular in shape, is seated in the pocket formed by the tongues 25 and the openings 26, with the tongues engaging the straight edges of the block, the angular portions of the block projecting through the said openings, as shown in Fig. 2.

The hanger-bar, as above described, is connected to the attaching-plate in the following manner: The bar is manipulated so as to place the hooks 20, heretofore described, on either side of the post carried by the attaching-plate, said post being received in the space between

the hooks, which are then raised until the hooks engage the keepers 4, as shown in Fig. 1, in which position the parts cooperate during the sliding movements of the door and when it is stationary.

Arranged with the head 27 within the housing on the top plate and having its shank and stem extending upwardly through the slot 15 in the top wall of said housing is an adjusting-screw 28, the shank of which is projected upwardly through the passage-way 22 in the hanger-bar 16 and threaded into the block 23, heretofore described. It will be seen that by operating the screw 28 the distance between the hanger-bar and the door will be regulated, the said bar being swung away from the top plate, the connection between the hooks and the keepers on the post serving as a hinge or fulcrum for said bar.

Pivotaly mounted on the hanger, but at a point intermediate the ends thereof, is a vertical member 29, formed from a sheet-metal blank, which is bent transversely and folded down upon itself to provide two legs 30 30, which are arranged straddle of the hanger-bar and are pivoted thereto by a bolt 31, extending through said legs and the bar. This vertical member 29 carries the carriage, upon which are mounted the rollers upon which the hanger travels during the movement of the door. This carriage and the manner of mounting the rollers thereon may be described as follows: Within the vertical member 29, at a point adjacent its upper extremity and above the hanger-bar, is provided a circular opening 32, closed on opposite sides by concave circular disks or plates 33, the concave faces of said disks being directed inwardly, thus forming an annular chamber substantially as shown in the drawings. Centrally of each of the plates 33 are formed alining bearing-apertures 34, through which is arranged a horizontally-disposed shaft 35, said shaft extending through the annular chamber above referred to and projecting on opposite sides of said plates for a short distance, and on the opposite ends of the shaft are arranged bearing-rollers 36, the structure and form of which is immaterial. Located upon the shaft 35, between the rollers 36 and the plates 33, are concave spring-washers 37, the edges of which are arranged in engagement with the inner faces of the rollers and the backs or rear faces of which are in engagement with the disks 33, said washers serving to effectually maintain said disks in positive engagement with the side faces of the vertical member 29. Within the chamber formed by the member 29 and the disks 33 and about the shaft 35 are arranged a plurality of bearing-balls 38, which contribute to the easy running of the hanger during the sliding movement of the door.

The hanger, as above described, is adapted

to travel upon parallel tracks 39, between which the vertical member 29 depends when the hanger is in operative position, the construction of said tracks being immaterial to the structure of the hanger, which is adapted to be used in connection with tracks or guides of any of the well-known forms. However, I have shown these tracks as being of an inverted-V shape, as shown in the drawings in Fig. 3, and the treads of the rollers are so formed as to leave a space between their extreme outer edges and the bottom of the tracks, so that dust and other gritty substance which may from time to time accumulate in the bottoms of the tracks will not interfere with the easy passage of the rollers.

It will be seen from the drawings, taken in connection with the description, that when the hanger and door are arranged in operative relation the door is supported from the roller-carriage and hanger-bar by means of the post carried by the top plate and the screw 28 adjustably connecting said top plate and the hanger-bar. When in this position, the height of the door from the floor may be regulated either to increase or diminish the same by rotating the screw 28 in one direction or the other, which rotation will either permit the door to be lowered or drawn up, according to the direction of rotation, the door having a pivotal connection to the hanger-bar by virtue of the engagement of the hooks 19 with the keepers 4.

The hanger, as above described, also provides for the easy and rapid detachment of the door from connection therewith, which is accomplished by tilting the end of the door so as to move the keepers 4 out of engagement with the hooks 20, after which the door is swung to the right until the screw is permitted to pass out of the housing through the slot 15, when the door is released and may be removed from its casing.

I prefer to reduce the shaft 35 near its end portions and to mount the bearing-rollers 36 on these reduced portions to prevent any lateral movement of the rollers on the shaft, which would increase the friction against the washers 37.

It will also be noted in Figs. 2 and 6 that the outer ends of the hooks 20 are spaced apart or spread, so that they serve as guides to assist in causing the hooks to properly engage the post and to provide for a more ready assembling of parts, which is a particular advantage of my improved door-hanger.

Though I prefer to construct the hanger parts of stamped metal, it is evident that the advantages of construction and operation will be of equal value when the parts are formed in any other equally available manner, as where the parts are cast or machined. I do not, therefore, desire to limit myself to this particular detail of my preferred construction.

It will be noted in Figs. 1 and 4 that the plates 11 have overhanging downwardly-inclined lugs or projections 40, the purpose of which is to prevent the head 27 of the supporting-bolt from slipping out of engagement with the hanger when in operation. To disengage the parts, it is therefore necessary to unscrew the bolt until its head 27 can be passed under these flanges.

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

1. In a door-hanger, a hanger member, a door-attaching means associated with said hanger, a supporting member pivotally connected to said hanger member, and a roller-supporting shaft pivotally journaled upon antifriction-bearings carried by said supporting member.

2. In a door-hanger, an attaching means adapted to be secured to the door and provided at one end with a post having oppositely-disposed lateral projections, a hanger member provided at one end with spaced hooks adapted to straddle said post and engage the projections thereon, and means to adjust the hanger member with relation to the attaching means.

3. In a door-hanger, an attaching means comprising two plates, each provided at one end with a vertical member, said members co-acting to constitute a vertical post, having projections thereon, a hanger member provided with spaced hooks straddling the post and engaging said projections, and means to adjust said member with relation to the attaching means.

4. In a door-hanger, an attaching means comprising two plates, each provided at one end with a vertical member, said members co-acting to constitute a vertical post provided with a projecting portion, one of said members having a tongue in engagement with the other to secure the members together, a hanger member provided with spaced hooks straddling the post and engaging said projecting portion, and means to adjust said member with relation to the attaching means.

5. In a door-hanger, an attaching means comprising two plates, each provided at one end with a vertical member having projections, said members combining to constitute a vertical post, one of said members having a recess, and the other a tongue engaging said recess, a hanger member provided with spaced hooks straddling the post and engaging the projections on said vertical members and means to adjust the hanger member with relation to the attaching means.

6. In a door-hanger, an attaching means provided with a post at one end, said post having lateral projections, and also with a housing at the opposite end having an inclined upper wall, a hanger member provided with spaced hooks at one end straddling said post

and engaging the projections thereon, a pocket in the other end of said member, an interiorly-threaded block in said pocket and an adjusting-screw in said housing and engaging the block.

7. In a door-hanger, an attaching means comprising two plates, and having a post at one end of said means and a housing at the other end formed by portions of said plates, a hanger member provided with a hook engaging said post, and means located partly within the housing and engaging the hanger for adjusting said hanger and attaching means with relation to each other.

8. In a door-hanger, an attaching means, comprising two plates formed at one end with vertical members combining to form a vertical post, each vertical member being provided with a lateral projection, each of the opposite ends of said plates being provided with a vertical wall having a flange which unite to form a housing, a hanger member provided with spaced hooks to straddle the said vertical members and engage the projections thereon, and an adjusting-screw located in said housing and engaging the hanger member.

9. In a door-hanger, an attaching means provided with a post at one end having lateral projections, a hanger member comprising two plates separated from each other at one end, and each plate provided at said end with a hook, the said hooks being constructed to straddle the post and engage the projections thereon, the plates being spaced apart at the opposite end portion to provide a passage-way, an interiorly-threaded block located therein, and an adjusting-screw carried by the attaching means extending through the passage-way and engaging the threaded block therein.

10. In a door-hanger, a hanger member, a door-attaching means associated with said hanger, a supporting member pivotally connected to said hanger member, rollers mounted on a shaft which passes through an opening in said supporting member, a set of balls carried by said hanger member and constituting an antifriction-bearing for said shaft, and means to permit said shaft angular movement relative to said supporting member.

11. In a door-hanger, a hanger member, a door-attaching means associated with said hanger, a supporting member pivotally connected to said hanger member, rollers mounted on a shaft which passes through an enlarged opening in said supporting member, dish-shaped washers mounted on said shaft and forming with the periphery of said opening a ball-race, and antifriction-balls in said race on which said shaft runs.

12. In a door-hanger, the combination of a hanger member, and a door-attaching means

associated with said hanger, with a support-
ing member formed of a plate folded on itself
and having its ends spread to straddle said
hanger member, means to pivotally connect
5 said plate and member, and rollers carried by
said plate and running on a track.

In testimony whereof I have signed my name

to this specification in the presence of two sub-
scribing witnesses.

HENRY J. WEISS.

Witnesses:

HENRY UPSON SIMS,
HENRY R. HOIZE.