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DOOR STOP

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FIG. 1

FIG. 2

FIG. 3

FIG. 4

FIG. 5

FIG. 6

FIG. 7

FIG. 8

FIG. 9

FIG. 10

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DOOR STOP

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This invention relates to a door stop and more particularly to a hinge stop attachment therefor, although certain features thereof may be employed with equal advantage for other purposes.

It contemplates more especially the provision of a simple, inexpensive and improved hinge stop attachment that can be utilized in conjunction with standard building door hinges serving as mounts for doors that open both parallel as well as angularly to a wall.

Numerous types of door stops have heretofore been proposed in conjunction with hinge mounts therefor, but these are expensive and require special hinge constructions that preclude their use with doors of standard construction now available and commonly used in building structures. Then, too, the hinge stops of known construction are not adaptable for use on present door constructions which are in use and cannot be advantageously changed to provide an adjustable stop therefor of known construction. It is often that doors cannot be permitted to swing to the limit of their open position against an adjacent wall because there may be numerous obstructions such as the requirement to place furniture in the path thereof.

As a result, injury is occasioned to the door as well as the furniture unless a positive stop is provided. This usually takes the form of a floor mounted stop which is undesirable for numerous well known reasons such as impairment to the floor as well as the obstruction occasioned thereby when the door is not in its extreme open position. Floor mounted stops as well as the customary door stops on the base-board of the wall are not entirely advantageous or desirable in that they serve as obstructions causing damage to the person as well as appliances such as vacuum cleaners, buggies and other movable objects that are often displaced in the path thereof. All of these shortcomings render it undesirable to utilize the customary base-board and floor mounted door stops as well as the specially constructed hinges that have been provided for an equivalent purpose, the latter being too expensive as a substitute for standard hinges and for that reason have not been adopted to any extent.

Numerous types of door stop hinge attachments have heretofore been proposed, but these for the most part require special hinges and an attachment is so designed that they must be anchored in both the door and wall frames or either. The anchored attachment of door stops in the wall or door or both usually is beyond the ability of the average untrained individual in the home and, further, these necessitate permanent holes and cause unsightly damage to the finish, so that the door stop cannot be removed

should the occasion arise therefor or in the event the further use thereof becomes unnecessary. With the teachings of the present invention, these undesirable features of door stops have been overcome and an improved structure has been provided that enables the ready association thereof to a standard hinge without any required anchorage in the wall or door frame.

One object of the present invention is to simplify the construction and improve the operation of devices of the character mentioned.

Another object is to provide a durable, inexpensive and effective hinge stop attachment that is operable in a variety of positions by attachment to a standard floor hinge.

Still another object is to provide an adjustable door stop that serves as a complement of a standard door hinge without any required auxiliary attachment to the wall or door frame.

A further object is to provide a door stop consisting of a plurality of interconnected links capable of relative pivotal displacement to arrest the opening of a door in a variety of positions by merely serving as a complement to a standard door hinge.

A still further object is to provide a plurality of interconnected links having means for varying the relative positions thereof to constitute an adjustable obstruction in the path of a door.

Still a further object is to provide door stop attachments capable of application to standard building door hinges to predetermine the positions of the door without resort to the usual wall or door anchored elements.

An additional object is to provide a plurality of interconnected links together with adjustable means to render such relatively collapsible and expandable to define adjustable obstructions in the path of a swinging door and its frame.

Other objects and advantages will appear from the following description of an illustrative embodiment of the present invention.

In the drawing:

Figure 1 is a sectional plan view of a wall and door frame showing a plan view of a hinge attached door stop embodying features of the present invention and illustrated in its operative relation to a wall and door frame.

Figure 2 is a front view in elevation of an adjustable hinge attached door stop embodying features of the present invention.

Figure 3 is a side view in elevation of the device shown in Figures 1 and 2, parts thereof being in section to clarify the showing.

Figure 4 is a sectional view taken substantially along line IV—IV of Figure 2.

Figure 5 is a side view in elevation of a modified door stop of a type similar to that shown in Figure 2.

Figure 6 is a side view in elevation of a still further modified embodiment of a hinge attached

door stop embodying features of the present invention.

Figure 7 is a front view in elevation of a modified embodiment of the invention shown in Figure 6.

Figure 8 is a fragmentary sectional view in elevation taken substantially along line VIII—VIII of Figure 6.

Figure 9 is a sectional view taken substantially along line IX—IX of Figure 7.

Figure 10 is a sectional view taken substantially along line X—X of Figure 7.

The structure selected for illustration comprises a substantially elongated rectangular bracket member 10 stamped or otherwise shaped from steel or other suitable material to provide normally offset arms 11 and 12 constituting in this instance integral portions of the bracket member 10 to define horizontally spaced and vertically aligned extensions thereof. The top and bottom bracket arms 11—12 are spaced to correspond with the width of the complemental hinge loops 13, 14, 15, and 16—17 comprising parts of the standard hinge plates 18 and 19.

The hinge plates 18—19 are maintained in assembled relation for pivotal swinging movement relative to each other by an interconnected pintle 20 that terminates at its upper end in a peripheral flange 21 constituting a part of an ornamental head 22. The pintle 20 extends through the complemental loops 13—14—15 and 16—17 of the hinge plates 18—19, respectively, and the bottom ornamental head 23 has a pin 24 extending into the lower hinge loop 15 to provide symmetrical and ornamental hinge pin extensions 22—23.

As shown, the bracket arms 11—12 receive the aligned complemental loops 13—14—15 and 16—17 therebetween, the bracket arms 11—12 being provided with aligned bores to receive the pintle 20 and the lower head pin 24 therethrough so that the bracket member 10 is detachably connected thereto. It is to be noted that the interconnected hinge plates 18—19 serve to swingingly mount the door 25 to a door frame 26 of a building structure. To this end, the door 25 has its hinge plate 18 mounted in a countersunk end portion 21.

Similarly the door frame 26 has its hinge plate 19 mounted in a countersunk end portion 28, since the countersunk end portions 27—28 are provided in the adjacent surface of the door 25 and frame 26 as an expedient of common practice. Threaded screws or other suitable fasteners secure the movable hinge plates 18—19 to the door 25 and door frame 26 in the customary manner. This constitutes a standard hinge mount for doors 25 to maintain them relative to a fixed door frame 26 and usually two or more hinges 18—19—20 are utilized to swingingly support a door 25 depending upon the size and weight thereof.

The number of hinges 18—19—20 that are utilized to swingingly support the door 25 is immaterial, since it is preferable though not essential that the top hinges 18—19—20 of any door 25 be utilized for attachment of the stop member bracket 10 thereto. To this end, the stop member bracket 10 is detachably connected to the top hinge pintle 20 and an adjustable stop is mounted thereon for positioning in the path between the relatively swinging door 25 and its frame 26.

In the present embodiment, the adjustable stop member comprises a plurality of links 29,

30, 31 and 32, in this instance four, which are interconnected at their extremity by means of pivot pins 33, 34, 35 and 36. The pins 34 and 36 constitute, in this instance, short rivets that loosely interconnect the links 29—30 and 31—32 at their laterally projecting extremities. The top pivot pin 33 not only interconnects the upper extremities of the links 29—31, but also projects through the bracket member 10 proximate to the top thereof to serve as an attaching expedient thereof.

The lower pin 35 interconnects the lower extremities of the links 30—32 and, further, has an inwardly projecting lug 37 constituting an integral portion thereof to threadedly receive a screw adjusting bolt 38 therethrough. To this end, the lug 37 is provided with an internally threaded bore corresponding with the external threads on the screw adjusting bolt 38 which is journaled at its extremities in the vertically aligned bores provided in the bracket arms 11—12. To this end, the screw adjusting bolt 38 is provided with an enlarged upper head 39 and a lower thumb knob 40 which permits the rotation of the screw adjusting bolt 38 to raise or lower the lug 37 which is pivotally connected to the lower extremities of the links 30—32.

It will be observed that with the rotation of the screw adjusting bolt 38 in one direction, the lug 37 will be elevated to spread the pivoted extremities 34—36 of the interconnected links 29—30—31 and 32. By reversing the direction of rotation of the screw adjusting bolt 38, the lateral movement of the link extremities 34—36 will be effected to contract the interconnected links 29, 30, 31 and 32, thereby providing a variable spread thereto so that the link extremities 41 and 42 proximate to the pins 34—36, will be disposed in the path of the swinging door 25 and its frame 26 (Figure 1).

As a result, the door 25 will be limited in its swinging movement relative to the frame 26 depending upon the relative position of the interconnected links 29—30—31—32 that is controlled by the screw adjusting bolt 38. So that the extremities 41—42 of the interconnected links 31—32 and 29—30 will not mar the finish of the door 25 and frame 26, metallic impact sustaining plates 43 and 44 are attached by means of fasteners 45 and 46 to the confronting surfaces of the door 25 and frame 26 over the area thereof that confronts the link extremities 41—42. These plates 43—44 serve as a protecting shield for the door 25 and frame 26 which, for the most part, are constructed from wood that otherwise would be injured by the impact of the link extremities 41—42 thereagainst.

In the modified embodiment shown in Figure 5 the position of the stop link actuating member is reversed from that shown in the preceding embodiment. In this embodiment, the elongated rectangular bracket member 10' has relatively shorter top and bottom bracket arms 11'—12' spaced to correspond with the width of the complemental hinge loops 13', 14', 15', and 16'—17' comprising parts of the standard hinge 18' and 19' (Figure 5). As shown, the bracket arms 11'—12' receive the aligned complemental loops 13'—14'—15' and 16'—17' therebetween and the bracket arms 11'—12' are provided with aligned bores to receive the pintle 20' and the lower head pin 24' therethrough so that the bracket member 10' is detachably connected thereto. The bracket member 10' extends parallel to aligned hinge loops 13'—14'—15' and 16'—17' and in closer

association therewith in that the interconnected links 29', 30', 31' and 32' are next adjacent thereto with the top link pin 33' extending therethrough to provide an outwardly projecting lug 33^a.

The top pivot pin 33' not only interconnects the upper extremities of the links 29'—31', but also projects through the bracket member 10' proximate to the top thereof to serve as an attaching expedient therefor. In this embodiment, the top pin 33' also carries the lug 33^a as will appear more fully hereinafter. The lower pin 35' interconnects the lower extremities of the links 30'—32' and, further, has an outwardly projecting lug 37' constituting an integral portion thereof to threadedly receive a screw adjusting bolt 38' therethrough.

To this end, the lug 37' confronts the upper pin lug 33^a and a lower lug 33^b anchored to the lower extremity of the bracket member 10', the lugs 33^a, 33^b, and 37' being provided with internally threaded aligned bores corresponding with the external threads on the screw adjusting bolt 38' journaled at its extremities in the vertically aligned bores provided in the bracket arms 11'—12'. To this end, the screw adjusting bolt 38' is provided with an enlarged upper head 39' and a lower thumb knob 40' which permits the rotation of the screw adjusting bolt 38' to raise or lower the lug 37' which is pivotally connected to the lower extremities of the links 30'—32'.

It will be observed that with the rotation of the screw adjusting bolt 38' in one direction, the lug 37' will be elevated to spread the pivoted extremities 41', 42' of the interconnected links 29'—30'—31'—32'. By reversing the direction of rotation of the screw adjusting bolt 38', the lateral movement of the link extremities 34'—36' will be effected to contract the interconnected links 29', 30', 31' and 32', thereby providing a variable spread thereto so that the link extremities 41' and 42' proximate to the pins 34'—36', will be disposed in the path of the swinging door 25 and its frame 26 (Figure 1). As a result, the door 25 will be limited in its swinging movement relative to the frame 26 depending upon the relative position of the interconnected links 29'—30'—31'—32' that is controlled by the screw adjusting bolt 38'.

In the still further modified embodiment shown in Figures 6 to 9, the screw adjusting bolt 38' in the preceding embodiment, is dispensed with in lieu of a more simple and inexpensive expedient. In this embodiment, the elongated rectangular bracket member 10' has relatively longer top and bottom bracket arms 11'—12' spaced to correspond with the width of the complemental hinge loops 13'', 14'', 15'', and 16''—17'' comprising parts of the standard hinge 18'' and 19'' (Figure 9). As shown, the bracket arms 11'—12' receive the aligned complemental loops 13''—14''—15'' and 16''—17'' therebetween and the bracket arms 11'—12'' are provided with aligned bores to receive the pintle 20'' and the lower head pin 24'' therethrough so that the bracket member 10' is detachably connected thereto.

The bracket member 10'' extends parallel to the aligned hinge loops 13''—14''—15'' and 16''—17'' in closer association therewith in that interconnected links 29'', 30'', 31' and 32'' are next adjacent thereto with the top link pin 33'' extending therethrough to provide a direct pivotal mount therefor with the links 29'', 30'', 31'', 32'' disposed between the bracket 10'' and the

hinge loops 13'', 14'', 15'' and 16''—17''. In this embodiment, the adjustable stop member comprising a plurality of links 29'', 30'', 31'' and 32'', in this instance four, which are interconnected at their extremity by means of pivot pins 33'', 34'', 35'' and 36''.

The pins 34'' and 36'' constitute, in this instance, short rivets that loosely interconnect the links 29''—30'' and 31''—32'' at their laterally projecting extremities. The top pivot pin 33'' not only interconnects the upper extremities of the links 29''—31'', but also projects through the bracket member 10'' proximate to the top thereof to serve as an attaching expedient thereof. The lower pin 35'' interconnects the lower extremities of the links 30''—32'' and, further, has an outwardly projecting threaded shank 37'' constituting an integral portion thereof. The threaded shank 37'' extends from a shoulder 38'' on the pin 35'' which rides in an elongated slot 39'' provided in the bracket member 10''.

To this end, the shoulder 38'' rides in the slot 39'' within the limits thereof to elevate the pin 35'' to spread the pivoted extremities 34''—36'' of the interconnected links 29''—30''—31'' and 32''. By lowering the pin 35'', the lateral movement of the link extremities 34''—36'' will be effected to contract the interconnected links 29'', 30'', 31'' and 32'', thereby providing a variable spread thereto so that rubber feet 41'' and 42'' anchored to the pins 34''—36'', will be disposed in the path of the swinging door 25 and its frame 26 (Figure 1).

As a result, the door 25 will be limited in its swinging movement relative to the frame 26 depending upon the relative position of the lower pin 35'' which determines the lateral spread of the interconnected links 29''—30''—31''—32'' that is controlled and retained in adjusted position within the slot 39'' by a screw fastener 40''. It will be observed that the rubber extremities 41''—42'' of the interconnected links 31''—32'' and 29''—30'' will not mar the finish of the door 25 and frame 26, and that such a resilient bumper expedient may be desirable to protect the confronting surfaces of the door 25 and frame 26 over the area thereof that confronts the link extremities 41''—42''. It will be observed that in the last described modified embodiment, the elongated screw adjusting member 38'' shown in the previous embodiments, is dispensed with and that a much simpler and less expensive construction serving the same or equivalent purpose is available.

Various changes may be made in the embodiment of the invention herein specifically described without departing from or sacrificing any of the advantages of the invention or any features thereof, and nothing herein shall be construed as a limitation of the invention, its concept or structural embodiment as to the whole or any part thereof except as defined in the appended claims.

I claim:

1. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complemental connected association by a pintle extending therethrough, of a rigid bracket member provided with integral arms having aligned spaced openings to receive the hinge pintle therethrough for detachable connection above and below the hinge plates responsive to inserting the pintle therethrough, and adjustable door stop means mounted on said member for support by said hinge pintle between a door and

frame. swingingly connected by said plates and pintle for regulating the limit of maximum swinging door movement.

2. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of a substantially U-shaped bracket having aligned spaced openings to receive the hinge pintle therethrough for detachable connection above and below the hinge plates responsive to inserting the pintle therethrough, and laterally adjustable door stop means mounted on said bracket for support by said hinge pintle between a door and frame swingingly connected by said plates and pintle for regulating the limit of maximum swinging door movement.

3. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, and link actuator means to laterally spread and contract said links to provide an adjustable stop for a door mounted on the hinge.

4. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, and threaded link actuator means to laterally spread and contract said links to provide an adjustable stop for a door mounted on the hinge.

5. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, and adjustable means to laterally spread and contract said links to provide an adjustable stop for a door mounted on the hinge, and means for retaining said adjustable means in any predetermined position of link adjustment.

6. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, and adjustable means comprising an elongated threaded bolt operatively connected to said interconnected links.

7. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, a threaded bolt journaled in said spaced bracket arms, and a threaded lug on said links in mesh with said threaded bolt to laterally spread and contract said links to provide an adjustable stop for a door mounted on the hinge.

8. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, a member projecting from an interconnecting link pivot to cooperate with said bracket member, and means for frictionally holding said projecting member in any adjusted position along said bracket member.

9. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, a pin projecting from said interconnected links, there being a slot in said bracket member to receive said last named threaded pin, and threaded fastening means on said threaded pin to retain the latter with said interconnected links in any adjusted position within the limits of said slot in said bracket member.

10. In a door stop hinge attachment, the combination with standard door swinging hinge plates in complementary connected association by a pintle extending therethrough, of an elongated bracket member having confronting arms extending therefrom, there being aligned bores in said bracket arms to receive said hinge pintle therethrough for detachable connection of said bracket member to the hinge, a plurality of pivotally interconnected links on said bracket member, said interconnected links being joined by pivotal pin connectors, one of said pivotal pins serving to mount said interconnected links to said bracket member, another pin projecting from said interconnected links, there being a slot in said bracket member to receive said last named threaded pin, and threaded fastening means on said threaded pin to retain the latter with said interconnected links in any adjusted position within the limits of said slot in said bracket member.

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