This invention relates to door controls especially adapted for double doors, that is, doors that swing in opposite directions from a side of a door frame common to both doors rendering the device especially useful where a screen or storm door is used with a main or ordinary door of a building and may be employed on commercial or domestic buildings.

The primary object of the invention is the provision of a device of the above stated character which may be conveniently installed and will permit independent swinging of either door to closed or open position and to automatically close either door with a gradual movement to prevent slamming thereof when manually freed from a full open position, the device acting to retain the door in a full open position when so positioned manually.

With these and other objects in view, this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a fragmentary side elevation, partly in section, showing a door control constructed in accordance with my invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

Figure 3 is a sectional view taken on the line 3—3 of Figure 1.

Figure 4 is a sectional view taken on the line 4—4 of Figure 1.

Figure 5 is a detail sectional view illustrating a cushioning device.

Figure 6 is a fragmentary plan view, partly in section, illustrating a modified form of my invention.

Referring in detail to the drawings, the numeral 1 indicates a door frame, 2 doors mounted on the frame 1 by hinges 3 so that said doors may swing open in opposite directions to each other. One door may be the main door of a building and the other door a screen or storm door.

Comparatively long pinteles 4 are rotatably supported by brackets 5 and 6. The brackets 5 are secured on the building while the brackets 6 are secured on the door frame and include relatively spaced portions 7 through which extend the pinteles 4. Barrel-like members 8 are mounted on the pinteles between the portions 7 of the brackets 6 and have the doors fastened thereto by straps 9. The barrels are secured on the pinteles 4 and the straps are secured to the barrels so that when the door is swung the pinteles will be rotated. The pinteles 4, brackets 6, and straps 8 are secured to the barrels 8 cooperate in forming additional hinges for the door besides the hinges 3.

Curved arms 10 are secured on the pinteles 4 and are pivotally connected to bars 11 which are arranged to cross each other, as shown in Figures 2 and 3, and are pivotally connected, as shown at 12. One bar is slightly disposed in a plane above the other bar and each bar has a plurality of openings so that any one opening of a bar may be moved to matching relation with an opening of the other bar for the purpose of receiving the pivot 13 and thereby permit an adjustable connection to be had between the bars 11. Coil springs 13 connect the bars to each other, that is, each spring is connected to one end of one bar and to an opposite end of the other bar so that when either of the doors is swung towards an open position the tension of the springs 13 will be increased and act to swing the door to a closed position when freed. When a door, as shown in Figure 3, is swung to a full open position the pivot of the arm of said door passes dead center position permitting the springs to act to retain the door in a full open position. During the opening and closing of the doors the corresponding ends of the bars 11 vary in distances to the other ends of said bars to bring about the varying tension on the springs 13.

Door cushioning devices 15 are connected with the ends of the bars to parallel the springs 13 and each consists of a cylinder 16 to receive a liquid and operating in said cylinder is a piston 17 consisting of a substantially conical shaped hollow piston head 18 and a hollow stem 19. The stem 19 extends through one end of the cylinder. The cylinder is connected to one end of one of the bars and the stem of the piston is connected to an opposite end of the other bars. A comparatively large port 20 is formed in the end of the piston head and a small port 21 is formed in the stem 19. A series of ports 22 is provided in the head between the ports 20 and 21. A spring pressed valve element 23 shaped to fill the piston head operates therein and has a passage 24 of a diameter approximately of the same diameter as the port 21. Normally the valve element closes the ports 22 by the action of the spring 25 so that the flow of liquid from one side of the piston to the other in the cylinder is by way of the ports 20, 21 and passage 24 checking the movement of the piston in the cylinder and consequently checking...

UNITED STATES PATENT OFFICE

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COMBINATION DOOR HINGE AND CONTROL

Henry W. Schwanz, Mart, Tex.

Application August 25, 1937, Serial No. 160,910

3 Claims. (Cl. 16—51)

This invention relates to door controls especially adapted for double doors, that is, doors that swing in opposite directions from a side of a door frame common to both doors rendering the device especially useful where a screen or storm door is used with a main or ordinary door of a building and may be employed on commercial or domestic buildings.

The primary object of the invention is the provision of a device of the above stated character which may be conveniently installed and will permit independent swinging of either door to closed or open position and to automatically close either door with a gradual movement to prevent slamming thereof when manually freed from a full open position, the device acting to retain the door in a full open position when so positioned manually.

With these and other objects in view, this invention consists in certain novel features of construction, combination and arrangement of parts to be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which—

Figure 1 is a fragmentary side elevation, partly in section, showing a door control constructed in accordance with my invention.

Figure 2 is a sectional view taken on the line 2—2 of Figure 1.

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Figure 5 is a detail sectional view illustrating a cushioning device.

Figure 6 is a fragmentary plan view, partly in section, illustrating a modified form of my invention.

Referring in detail to the drawings, the numeral 1 indicates a door frame, 2 doors mounted on the frame 1 by hinges 3 so that said doors may swing open in opposite directions to each other. One door may be the main door of a building and the other door a screen or storm door.

Comparatively long pinteles 4 are rotatably supported by brackets 5 and 6. The brackets 5 are secured on the building while the brackets 6 are secured on the door frame and include relatively spaced portions 7 through which extend the pinteles 4. Barrel-like members 8 are mounted on the pinteles between the portions 7 of the brackets 6 and have the doors fastened thereto by straps 9. The barrels are secured on the pinteles 4 and the straps are secured to the barrels so that when the door is swung the pinteles will be rotated. The pinteles 4, brackets 6, and straps 8 are secured to the barrels 8 cooperate in forming additional hinges for the door besides the hinges 3.

Curved arms 10 are secured on the pinteles 4 and are pivotally connected to bars 11 which are arranged to cross each other, as shown in Figures 2 and 3, and are pivotally connected, as shown at 12. One bar is slightly disposed in a plane above the other bar and each bar has a plurality of openings so that any one opening of a bar may be moved to matching relation with an opening of the other bar for the purpose of receiving the pivot 13 and thereby permit an adjustable connection to be had between the bars 11. Coil springs 13 connect the bars to each other, that is, each spring is connected to one end of one bar and to an opposite end of the other bar so that when either of the doors is swung towards an open position the tension of the springs 13 will be increased and act to swing the door to a closed position when freed. When a door, as shown in Figure 3, is swung to a full open position the pivot of the arm of said door passes dead center position permitting the springs to act to retain the door in a full open position. During the opening and closing of the doors the corresponding ends of the bars 11 vary in distances to the other ends of said bars to bring about the varying tension on the springs 13.

Door cushioning devices 15 are connected with the ends of the bars to parallel the springs 13 and each consists of a cylinder 16 to receive a liquid and operating in said cylinder is a piston 17 consisting of a substantially conical shaped hollow piston head 18 and a hollow stem 19. The stem 19 extends through one end of the cylinder. The cylinder is connected to one end of one of the bars and the stem of the piston is connected to an opposite end of the other bars. A comparatively large port 20 is formed in the end of the piston head and a small port 21 is formed in the stem 19. A series of ports 22 is provided in the head between the ports 20 and 21. A spring pressed valve element 23 shaped to fill the piston head operates therein and has a passage 24 of a diameter approximately of the same diameter as the port 21. Normally the valve element closes the ports 22 by the action of the spring 25 so that the flow of liquid from one side of the piston to the other in the cylinder is by way of the ports 20, 21 and passage 24 checking the movement of the piston in the cylinder and consequently checking...
the movement of the door towards closed position, permitting the door to close gradually without a slam. However, the movement of the piston in an opposite direction by the door swinging open, the flow of fluid will then be through the ports 22 unseating the valve element and port 20 allowing a more rapid flow of fluid from one side of the piston to the other.

Instead of employing a pair of cushioning devices 15 as shown in Figures 2 and 3, a single cushioning device 27 constructed similar to one of the cushioning devices 15 may have the cylinder thereof pivoted to rods 23 while the stem is pivoted to rods 28. The rods 23 and 28 are pivotally connected to links 30. The links 30 are pivotally connected to ends of the rods 11. With this arrangement the single cushioning device 27 performs the same function as the pair of cushioning devices 15.

The stem 19 of the piston 17 has slidable therein a plunger 31 and the latter has a stem 32 extending outwardly of the hollow stem of the piston and having threaded a connection therewith and equipped at its free end with a finger piece 34. By rotating the finger piece 34 in opposite directions the plunger 31 may be adjusted relative to the port 21 for the purpose of varying the size of the port and consequently the amount of liquid which may flow through said port.

What is claimed is:

1. Door controls comprising pintles, means connecting said pintles to hinged edges of doors and to a door frame, arms secured on said pintles, pivotally connected bars crossing each other and pivotally connected to said arms, and tension springs connecting said bars.

2. Door controls comprising pintles, means connecting said pintles to hinged edges of doors and to a door frame, arms secured on said pintles, pivotally connected bars crossing each other and pivotally connected to said arms, tension springs connecting said bars, and door cushioning means connecting said bars.

3. Door controls comprising pintles, means connecting said pintles to hinged edges of doors and to a door frame, arms secured on said pintles, pivotally connected bars crossing each other and pivotally connected to said arms, tension springs connecting said bars, links pivotally connected to said bars, pairs of rods pivoted to said links, and a cushioning device having one end connected to one pair of rods and its other end connected to the other pair of rods.

HENRY W. SCHWARZ,