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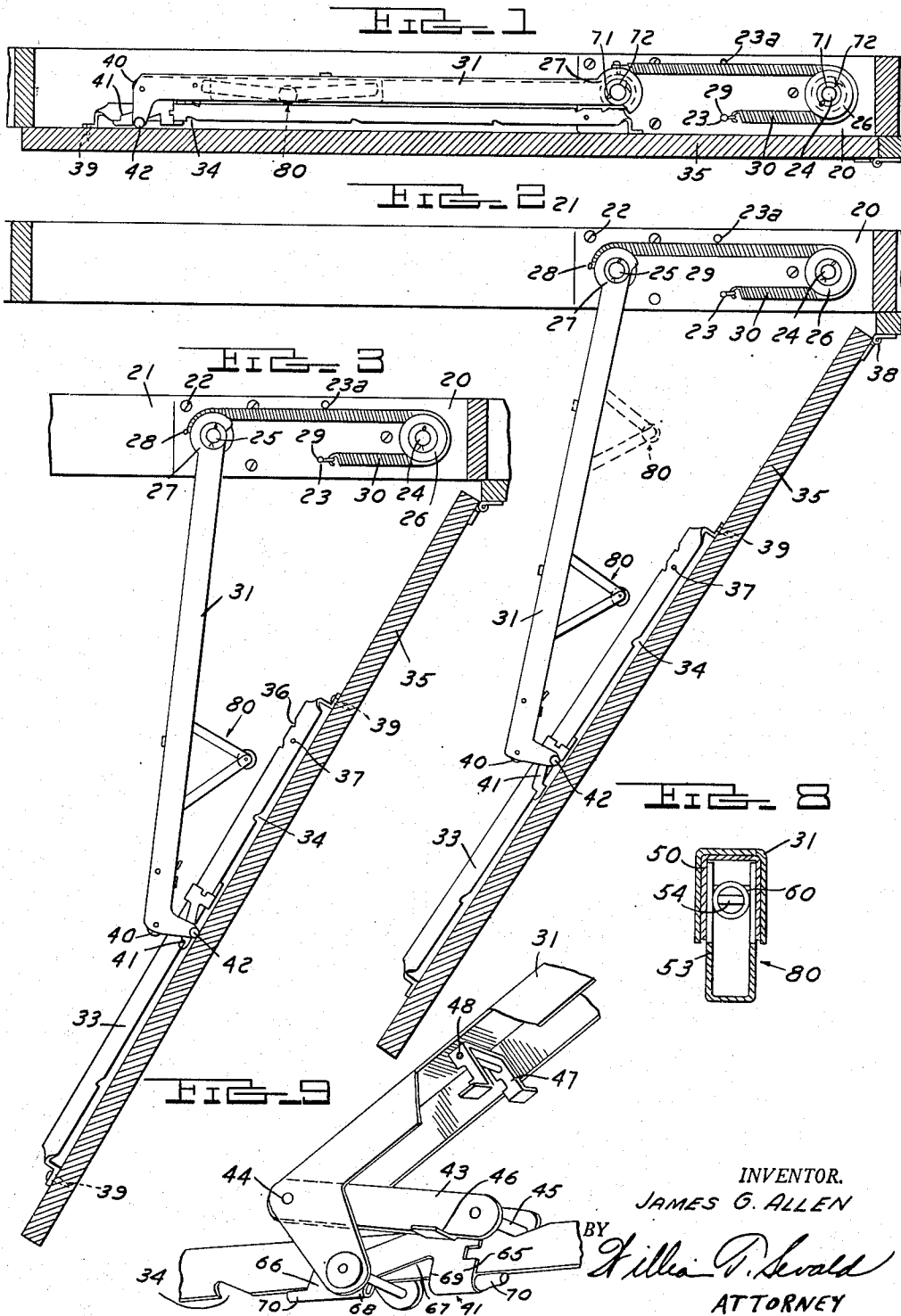
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2,664,590

DOOR HOLDER AND BUFFER

Filed June 10, 1950

2 Sheets-Sheet 1



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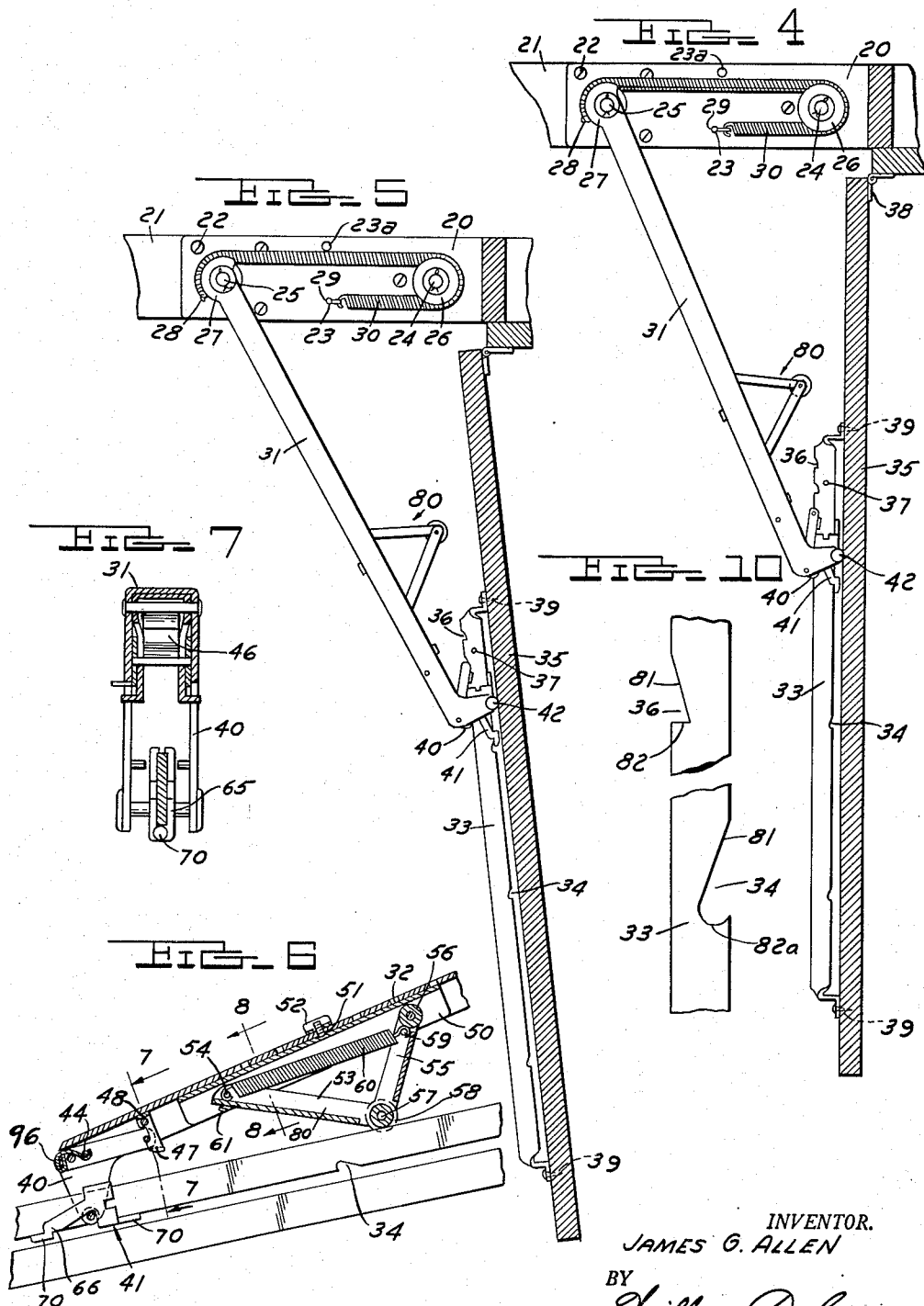
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UNITED STATES PATENT OFFICE

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DOOR HOLDER AND BUFFER

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10 Claims. (Cl. 16—65)

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This invention relates to door checks and in particular to improvements in a mechanically operated door closing device, an anti-slamming or buffing device, an automatic latching and delatching device, and locking device for positioning the door open.

Mechanical means have heretofore been employed to close and prevent slamming of doors and to secure doors in the open position; however, the several devices of the prior art have not proven entirely satisfactory in that usually the anti-slamming element interferes with the closing element, and the securing element for holding the door in the open position does not work positively nor automatically and generally interferes with the closing and anti-slamming elements.

With the foregoing in view, the primary object of the invention is to provide an integrated door closing element, anti-slamming or buffer element, and open-position door holding element including an automatic latching and delatching element.

An object of the invention is to provide an integrated device which is easily reversible and adaptable to either right or left-hand doors.

An object of the invention is to provide a device which is easily and quickly mounted.

An object of the invention is to provide a device which is inexpensive to manufacture as compared to other devices now on the market capable of comparable utility and function.

An object of the invention is to provide a device which does not require intricate adjustment.

An object of the invention is to provide an anti-slamming element which is substantially deactivated at a point adjacent the door's closed position so as not to interfere with the door closing element.

An object of the invention is to provide a positive locking element for positioning the door open which does not burden the closing element or buffing element.

An object of the invention is to provide a buffer element operable at peak resistance when the door is approximately 45 degrees open which will diminish in resistance as the door closes to practically no resistance when the door is approximately 5 or 10 degrees open.

These and other objects of the invention will become apparent by reference to the following description of a door-check embodying the invention taken in connection with the accompanying drawings in which:

Fig. 1 is a plan view of the device secured to

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the top of a door-way and attached to a door showing the door and part of the jamb in cross-section with the door in the closed position.

Fig. 2 is a view similar to Fig. 1 with the door in a partially opened secured position.

Fig. 3 is a view similar to Fig. 1 with the door in an open position in the act of closing.

Fig. 4 is a view similar to Fig. 1 with the door in a full open, secured position.

Fig. 5 is a view similar to Fig. 1 with the door in a full open, secured and locked position.

Fig. 6 is a partial plan view of a door check and closer embodying my invention, partly in cross-section showing the buffing, securing, and locking elements in greater detail with the check or buffing element and the holder element activated in mutual coaction.

Fig. 7 is a cross-sectional view of Fig. 6 taken on the line 7—7 thereof.

Fig. 8 is a cross-sectional view of Fig. 6 taken on the line 8—8 thereof.

Fig. 9 is a perspective view of a portion of the device in the open, secured and locked condition with a portion of the arm broken away to show internal parts.

Fig. 10 is an enlarged fragmentary plan view of the slide bar.

Referring now to the drawings wherein like numerals refer to like and corresponding parts throughout the several views, the door-check disclosed therein to illustrate the invention comprises a door jamb plate, a free pulley on the plate adjacent the jamb, a torsion arm pivotally mounted on the plate remote from the jamb, a tension spring anchored at one end remote from the jamb, reversely turned about the free pulley and attached at its other end on the arm so as to torsion the arm away from a door, a notched door slide, a pin on the arm positioned adjacent the notched inner side of the slide, a cam traveler on the slide adapted to follow the arm-pin in either direction and to normally prevent the arm pin from entering the slide notches in either direction of travel except when the swinging of a door is reversed at a notch to permit the arm pin to enter a notch when the swinging of a door is reversed at a notch, and a toggle-type buffer on the arm adapted to contact the slide when the door is closing and adapted to exert greatest resistance to the torsion arm closing a door during the initial stages of closing to prevent slamming and to offer practically no resistance to the torsion arm adjacent the door's closed position to insure the torsion arm completely closing the door.

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Referring in more detail to the component parts of the embodiment of the door-check as shown in the drawings, a plate 20 is attached to the top of a doorway or on doorway bracket 21 by means of screws or bolts 22 and is equipped with dual, threaded spring anchor apertures 23 and 23a on either side thereof intermediate its length, a stub shaft 24 mounted on the plate 20 at one end thereof, a stub shaft 25 mounted on the plate 20 adjacent the other end thereof, a free pulley 26 mounted on the stub shaft 24, a torsion arm sector 27 pivotally mounted on the stub shaft 25, a spring anchor 28 on the sector 27, a spring anchor 29 threaded in one spring anchor aperture 23 of the plate 20, a spring 30 anchored on the plate 20 via spring anchor 29 and reversely turned about the pulley 26 and secured to the sector spring anchor 28 under tension so as to torsionally bias the sector 27 in a direction away from an adjacent door, a channeled torsion arm 31 U-shaped in cross-section and welded to the sector 27 for movement therewith and having spaced apertures 32 pierced in its back portion, door slide rail 33 having catch notches 34 in the edge thereof disposed toward a door 35 and lock notches 36 disposed in the side thereof remote from a door 35, and a stop pin 37 on the slide rail 33 on the end of the slide rail adjacent the hinges 38 of the door 35. The door slide rail 33 is attachable to door 35 via screws or bolts 39. Lateral projections or tips 40 on one end of the torsion arm 31 are adapted to overlap either side of the door slide rail 33, and a door slide cam traveler 41 slidably mounted on the door slide rail 33 engaging pin 42 disposed between the ends of the projections 40 and adapted to lie between the slide rail 33 and the door 35. Locking fingers 43 are pivotally mounted adjacent the end of the torsion arm via the pin 44, a slide lock notch engaging pin 45 being disposed between the ends of the lock fingers 43, manual actuating tabs 46 being provided on the fingers 43, a spring 48 being disposed between the torsion arm 31 and the lock fingers 43, and a catch 47 being pivotally mounted on the torsion arm 31 via the pin 48 adapted to engage the pin 45 to secure the pin 45 out of engaging relation with the lock notches 36 of the slide rail 33. A torsion arm channel sleeve 50 is adapted to lie within the torsion arm 31, a threaded stud 51 adapted to lie in one of the apertures 32 of the torsion arm 31 for adjustably positioning the sleeve 50 at selected points between the ends of the torsion arm 31, a nut 52 threaded on the stud 51 securing the sleeve 50 to the torsion arm 31, a toggle leg 53 pivotally mounted on the sleeve 50 via the pin 54; a floating toggle leg 55 engaging the sleeve 50 via the roller or wheel 56 pivotally connected to the toggle leg 53 via the pin 57, a wheel or roller 58 on the pin 57 for engaging the door slide rail 33, a spring anchor pin 59 on the toggle leg 55 adjacent the roller 56, a tension spring 60 anchored relative to the toggle leg 53 via the pin 54 and secured to the toggle leg 55 via the spring anchor pin 59, and toggle stops 61 on the sleeve 50 adapted to prevent the spring 60 from pulling the roller 56 to a dead-center position behind the roller 58.

The cam traveler 41, Figs. 6 and 9, comprises a guide loop skate 55 slidably surrounding the slide rail 33, a skate 66 slidably engaging the rail 33, a cam portion 67 for engaging the pin 42, a pin stop 68 adjacent one end of the cam portion 67, and a pin stop 69 adjacent the other end of the cam portion 66.

The pulley 26 and the sector 27 are attached to

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the stub shafts 24 and 25 respectively by means of cotter pins 71 and washers 72 permitting reversing of the sector 27 and the torsion arm 31 in relation to the plate 20; in other words, to reverse the device to facilitate operating with the door 35 swinging from the side opposite that shown in the drawings, the cotter pin 71 and the washer 72 are removed from the stub shaft 25 and the sector 27 taken therefrom and turned over thereby reversing the sector in relation to the remaining mechanism; the washer 72 and the cotter pin 71 are then replaced, the plate spring anchor 29 removed from the position shown in the drawings and screwed into the plate spring anchor threaded aperture 23a, Fig. 4; the spring 30 is then secured to the anchor 23a and looped in the opposite direction around the pulley 26 from that shown in the drawings, and connected to the sector spring anchor 28. The device is then in position for operating with the door oppositely hung from the position indicated in the drawings.

In installing the device on a door, the plate 20 is screwed via the screws 22 to the top of the doorway 21 or to a bracket projecting from the side of the doorway and the door slide rail 33 is screwed to the door 35 by means of the screws 39.

In operation, considering the door closing elements of the device, the sector 27 is torsioned by the spring 30 in a direction away from the door, or in a direction the same as the closing direction of the door. Due to the length of the spring 30, its tension is not materially increased or decreased when the door is in the open or closed position due to the fact that the rotation of the sector 27 does not substantially elongate the spring 30. In other words, substantially constant tension is applied to the torsion arm 31 whether the door is open or closed thus providing the door with a substantially constant urge towards closing. The pin 42 slidably engages the slide rail 33 between the rail 33 and the door 35 thereby communicating the torsion of the arm 31 to the door 35 with the pin 42.

Considering the slide rail 33 being deleted of its notches 34 the action of the device so far described in the description of the operation is as follows: The spring tensions the torsion arm 31 which torsion is applied to the door 35 via the pin 42 slidably engaging the slide rail 33 so that when the door is manually opened against the tension of the spring 30 and then released, the tension of the spring 30 tensions the arm 31 via the sector 27 so that the pin 42 engages the slide rail 33 and pulls the door closed with the pin 42 sliding along the slide rail 33. It will be noted in this connection that the door would slam due to the fact that no buffing element against its slamming has yet been described.

To prevent the door slamming the toggle type buffer or anti-slamming element 80 is longitudinally adjustably positioned as indicated in dotted lines in Fig. 2, within the channel of the torsion arm 31 via the spaced apertures 32 and the torsion arm 31 and the stud 51 on the toggle sleeve 50. It will be noted that in Figs. 2 to 5 the toggle buffer is disposed in its position and condition of strongest resistance in that the legs 53 and 55 of the toggle approach a position closer to right angles to the sleeve 50 so that pressure applied to the roller 58 is strongly resisted by the mechanical angulation of the legs 53 and 55 and the tension of the spring 60. In other words, in this position the spring 60 is capable of exerting its maximum of mechanical resistance in con-

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junction with the legs 53 and 55. Fig. 1 illustrates in dotted lines the position of the toggle in its weakest condition to oppose mechanical resistance to pressure on the roller 58. It will be noted therefore, that the toggle buffer 80 provides its maximum resistance when the door is closing at a position spaced from its actual closed position of approximately 30 to 45 degrees and that the toggle buffer 80 is at its weakest mechanical condition for resisting pressure at the roller 58 when the door is closely adjacent to its closed condition. In this way the toggle buffer is operative to contact the slide rail 33 as the door is closing at a point when the door is removed from its closed position to absorb the momentum of the closing door under the torsion arm 31 to substantially reduce the velocity of the closing door at a point 30 to 45 degrees away from its closed position. It is to be further noted that, after the toggle has absorbed the momentum of the closing door and reduced its swinging velocity, the toggle approaches its weakest condition of resistance at the point when the door is slightly spaced from closing thereby eliminating resistance of the toggle buffer 80 to the torsion of the arm 31 so that the toggle buffer 80 furnishes practically no resistance against the torsion arm 31 to close the door 35 in the last 5 or 10 degrees of the door swing or arc.

Considering now the latching and locking mechanism of the invention, it will be noted that the slide rail 33 is provided with latching or catch notches 34 and locking notches 36. It will be further noted that both the catch notches 34 and the locking notches 36 are equipped with a sloping wall 81 disposed toward the door hinge 32 and an abrupt or hooked wall 82 or 82a disposed towards the non-hinged edge of the door 35 for operation in conjunction with the pin 42 disposed on the tips 40 of the torsion arm 31. It can be thus seen in opening the door the pin 42 will ride over the notches 34 due to the sloping wall 81 therein and will catch in the notches 34 when the door is closing due to the abrupt or hooked wall 82a therein to allow the door to be freely opened and for latching the door in an open position when the door is closing. The function of the device so far described in its operation would be such that upon closing of the door the torsion of the arm 31 would cause the pin 42 to travel against the edge of the slide rail 33 having the notches 34 therein so that the pin 42 would engage each notch 34 in its closing and necessitate manually disengaging the pin 42 from the notch 34 to allow the door to close. To obviate this condition, the cam traveler 41 is slidably disposed on the slide rail 33 with the cam portion 67 positioned in a direction opposite to the sloping wall 81 of the notch 34. In opening and closing the door the pin 42 contacts the pin stops 68 and 69 on the traveler 41 so that the traveler slides with the pin 42 and tips 40 relative to the slide rail 33. In opening the door from its closed position the pin 42 contacts the pin stop 69 on the traveler 41 adjacent the low portion on the cam surface 67 and as the door is progressively further opened the pin causes the traveler 41 to slide on the rail 33 from the position indicated in Fig. 1 to the position indicated in Fig. 4. It will be noted that in opening the door the pin 42 is abutting the stop 69 adjacent the low part of the cam portion 67, allowing the pin 42 to drop into the notches 34, and that the sloping wall 81 of the notches 34 allows the pin 42 to travel out of the notches 34 in opening the door.

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To latch the door open the door is opened until the pin 42 drops into a notch 34 at the low end of the cam 67; the door is then released and the pin 42 contacts the abrupt or hooked wall 82a of the notches 34, positioning the door in the selected open position. This action is identical in any one of the notches 34 along the slide rail 33. To close the door 35 from a latched position as immediately previously described, the door is opened to a point where the pin 42 is disposed intermediate a pair of the notches 34 of the slide rail 33 and the door is then allowed to close under the torsion of the arm 31 so that the pin 42 slides from a position adjacent the pin stop 69 on the traveler 41 to a position abutting the pin stop 68 on the traveler 41 so that the pin 42 is also engaged by the high end of the cam portion 67. In this position the pin and traveler slide relative to the bar 33 with the high end of the cam portion 67 preventing the pin 42 from entering the notches 34 so that the pin 42 by-passes the notches 34 allowing the torsion arm 31 to completely close the door.

To open and close the door without latching same in the opened position, the door is opened to a point where the pin 42 is intermediate a pair of the notches 34 and then released so that the pin 42 travels relative to the traveler 41 to a point adjacent the high end of the cam portion 67 and abutting the pin stop 68, and from that point on the traveler 41 and pin 42 move together relative to the slide rail 33 with the high end of the cam portion 67 preventing the pin 42 from entering the notches 34 and allowing the door to close under the torsion of the arm 31.

To lock the door in the open position the latch 47 is released, allowing the fingers 43 to position the lock pin 45 under the pressure of the spring 96 against the side of the slide rail 33 having the lock notches 36 therein so that when the door is opened to approximately right angles to the door jamb the lock pin 45 drops into a lock notch 36 in the slide rail 33 so that when the door is released the torsion arm 31 slides the lock pin 45 into a notch 36, abutting the abrupt wall 82 of the notch 36 and thereby locking the door in the open position. The pin 37 on the slide rail 33 is adapted to stop relative movement between the slide rail 33 and the arm 31 at a point in which the lock pin 45 is positioned in a lock notch 36. In order to release the door from its locked position it is necessary to manually extract the lock pin 45 from the lock notch 36 via the tabs 46 on the lock arms 43 and if it is desired to render the locking element inactive, the pin 45 is latched in inoperative position by means of the catch 47 on the torsion arm 31; the lock fingers 43 and locking pin 45 may be optionally completely deactivated or allowed to actively operate.

It will be noted from the above description of the operation of the inventive device that the closing, buffing, latching and locking mechanisms are completely coordinated permitting the user to latch or lock the door in an open position or a partially opened position and that the elements of the device are so coordinated that the operation of one element does not interfere with the operation of another element and that the peak efficiency of the toggle buffer is used to dissipate the peak momentum of the door by the torsion of the arm 31, and that the minimum resistance of the toggle buffer 80 is at a point closely adjacent to the closed position of the door thereby deactivating the toggle buffer

to furnish resistance to the torsion arm in completely closing the door insuring that the torsion arm will completely close the door.

The general proportions and relationship of the slide rail, torsion arm, traveler and locking element indicated in the drawings and described herein are desirable and preferable for the proper functioning of the invention. Although but a single embodiment of the invention has been shown and described in detail, it is obvious that many changes may be made in the size, shape, detail and arrangements of the elements of the invention within the scope of the appended claims.

I claim:

1. A door closing device comprising a mounting plate, a pulley freely rotatably mounted on said plate adjacent the door jamb end thereof, a sector freely rotatably mounted on said plate adjacent the doorway end thereof, a spring anchor on the arcuate portion of said sector, a spring anchor on said plate intermediate said pulley and said sector, a tension spring secured to said spring plate anchor, reversely turned about said pulley adjacent the door jamb end of said plate and secured to the spring anchor on said sector so as to torsion said sector in a direction away from the door to which said plate is mounted adjacent, a torsion arm on said sector, a door slide rail mountable on a door adjacent said plate, tips on said arm overlying said rail, and a pin disposed between said tips adjacent the inside edge of said rail in sliding engagement with the inside edge of said rail; said spring being capable of torsioning said sector and said attached arm to close a door to which the slide rail is attached via the sliding engagement of said pin on said slide rail from any open position of the door.

2. A buffer to prevent a door from slamming upon closing having a torsion arm adapted to close a door; a first toggle leg pivotally disposed adjacent one end thereof on the arm, a second toggle leg slidably disposed adjacent one end thereof on the arm and pivotally connected adjacent its other end to the other end of said first toggle leg, and a spring disposed between the arm pivoted end of said first toggle leg and the arm sliding end of said second toggle leg adapted to jackknife said toggle legs relative to one another so as to form a triangle with the arm when a door to which the arm is slidably attached is in the open position to slidably contact a member on the door upon closing to resist the closing of the door via the jackknifed mechanical position of the legs and the tension of said spring by contacting the member on the door at the mutually connected ends of said legs so that further closing of the door collapses the legs from a jackknife resisting position to a straight position substantially devoid of mechanical resistance to the closing of the door.

3. A door catch device having a torsion arm attachable to a door-way and a slide rail attachable to a door having catch notches therein defined by a sloping wall toward the hinged side of a door and an abrupt wall toward the non-hinged side of a door; a traveler slidably mounted on said rail; a cam on said traveler having a high portion toward the hinged side of a door and a low portion toward the non-hinged side of a door; stops on said traveler adjacent either end of said cam; a pin on the arm slidably engaging the notched side of the slide disposed between said stops adjacent said cam,

the notches being adapted to allow said pin to drop into and move out of the notches in opening a door; said cam being adapted to permit said pin to engage the abrupt wall of said notch to secure a door in open position when the opening action of a door is immediately reversed upon said pin entering a notch; and said cam being adapted to prevent said pin entering a notch when the opening action of a door is not immediately reversed.

4. A door closer and buffer comprising a mounting plate, a pulley freely rotatably mounted on said plate adjacent the door jamb end thereof, a sector freely rotatably mounted on said plate adjacent the doorway end thereof, a spring anchor on the arcuate portion of said sector, a spring anchor on said plate intermediate said pulley and said sector, a tension spring secured to said spring plate anchor reversely turned about said pulley adjacent the door jamb end of said plate and secured to the spring anchor on said sector so as to torsion said sector in a direction away from the door to which said plate is mounted adjacent, a torsion arm on said sector, a door slide rail mountable on a door adjacent said plate, tips on said arm overlying said rail, a pin disposed between said tips adjacent the inside edge of said rail in sliding engagement with the inside edge of said rail; said spring being capable of torsioning said sector and said attached arm to close a door to which slide rail is attached via the sliding engagement of said pin on said slide rail; a toggle leg pivotally disposed at one end thereof on said arm, a second toggle leg slidably disposed at one end thereof on said arm and pivotally connected at its other end to the other end of said first leg, and a spring disposed between the pivoted end of said first leg and the sliding end of said second leg adapted to urge the sliding end of said second leg towards the pivoted end of said first leg to jackknife said legs relative to one another to a position approaching right angles relative to said arm; the mutually connected ends of said legs being adapted to engage said slide rail upon the closing of a door to which said slide rail is attached to provide resistance to said arm closing a door and to collapse from a jackknife position relative to said arm to a position substantially parallel with said arm by extending said last named spring connecting the pivoted end of said first arm and the sliding end of said second arm to permit said arm to close a door.

5. A door closer and buffer comprising a mounting plate, a pulley freely rotatably mounted on said plate adjacent the door jamb end thereof, a sector freely rotatably mounted on said plate adjacent the doorway end thereof, a spring anchor on the arcuate portion of said sector, a spring anchor on said plate intermediate said pulley and said sector, a tension spring secured to said spring plate anchor reversely turned about said pulley adjacent the door jamb end of said plate and secured to the spring anchor on said sector so as to torsion said sector in a direction away from the door to which said plate is mounted adjacent, a torsion arm on said sector, a door slide rail mountable on a door adjacent said plate, tips on said arm overlying said rail, a pin disposed between said tips adjacent the inside edge of said rail in sliding engagement with the inside edge of said rail; said spring being capable of torsioning said sector and said attached arm to close a door to which the slide rail is attached via the sliding engage-

ment of said pin on said slide rail; a toggle leg pivotally disposed at one end thereof on said arm, a second toggle leg slidably disposed at one end thereof on said arm and pivotally connected at its other end to the other end of said first leg, a spring disposed between the pivoted end of said first leg and the sliding end of said second leg adapted to urge the sliding end of said second leg towards the pivoted end of said first leg to jackknife said legs relative to one another to a position approaching right angles relative to said arm; the mutually connected ends of said legs being adapted to engage said slide rail upon the closing of a door to which said slide rail is attached to provide resistance to said arm closing a door and to collapse from a jackknife position relative to said arm to a position substantially parallel with said arm by extending said last named spring connecting the pivoted end of said first arm and the sliding end of said second arm to permit said arm to close a door; said slide rail having catch notches therein defined by an abrupt wall on the side remote from said plate and a sloping wall on the side adjacent said plate, a traveler slidably mounted on said slide rail, a cam portion on said traveler having a low end adjacent said plate and a high end remote from said plate, and pin stops on said traveler adjacent said cam portion; said cam portion on said traveler being adapted to allow said arm pin to drop into the notches of said slide rail at the low end of said cam portion and to prevent said arm pin from dropping into the notches of said slide rail adjacent the high end of said cam portion; said cam portion being further adapted to allow said pin to drop into said notches upon opening a door and to prevent said pin from dropping into said notches upon the closing of a door.

6. A door operating mechanism comprising mounting plate, a pulley freely rotatably mounted on said plate adjacent the door jamb end thereof, a sector freely rotatably mounted on said plate adjacent the door-way end thereof, a spring anchor on the arcuate portion of said sector, a spring anchor on said plate intermediate said pulley and said sector, a tension spring secured to said spring plate anchor reversely turned about said pulley adjacent the door jamb end of said plate and secured to the spring anchor on said sector so as to torsion said sector in a direction away from the door to which said plate is mounted adjacent, a torsion arm on said sector, a door slide rail mountable on a door adjacent said plate, tips on said arm overlying said rail, a pin disposed between said tips adjacent the inside edge of said rail in sliding engagement with the inside edge of said rail; said spring being capable of torsioning said sector and said attached arm to close a door to which the slide rail is attached via the sliding engagement of said pin on said slide rail; a toggle leg pivotally disposed at one end thereof on said arm, a second toggle leg slidably disposed at one end thereof on said arm and pivotally connected at its other end to the other end of said first leg, a spring disposed between the pivoted end of said first leg and the sliding end of said second leg adapted to urge the sliding end of said second leg towards the pivoted end of said first leg to jackknife said legs relative to one another to a position approaching right angles relative to said arm; the mutually connected ends of said legs being adapted to engage said slide rail upon the closing of a door to which said slide rail is attached to provide resistance to said arm closing

a door and to collapse from a jackknife position relative to said arm to a position substantially parallel with said arm by extending said last named spring connecting the pivoted end of said first arm and the sliding end of said second arm to permit said arm to close a door; said slide rail having catch notches therein defined by an abrupt wall on the side remote from said plate and a sloping wall on the side adjacent said plate, a traveler slidably mounted on said slide rail, a cam portion on said traveler having a low end adjacent said plate and a high end remote from said plate, and pin stops on said traveler adjacent said cam portion; said cam portion on said traveler being adapted to allow said arm pin to drop into the notches of said slide rail at the low end of said cam portion and to prevent said arm pin from dropping into the notches of said slide rail adjacent the high end of said cam portion; said cam portion being further adapted to allow said pin to drop into said notches upon opening a door and to prevent said pin from dropping into said notches upon the closing of a door; said rail having lock notches formed thereon on the edge thereof remote from a door to which said rail is attached, lock fingers on said arm, a lock pin disposed between said fingers, a spring urging said lock pin via said fingers into engagement with said slide rail so that upon opening a door said pin will slide relative to said slide rail to a point adjacent the lock notches therein and enter one of the notches under the pressure of said spring to lock a door in an open position.

7. A door closing device comprising a pulley positionable adjacent to the hinged side of a door, a pivoted arm positionable remote from the hinged side of a door, a spring anchor on said arm adapted to exert torsion thereon to pivot said arm, a stationary spring anchor positionable between said pulley and said arm pivot point, and a tension spring secured to said stationary spring anchor leading around said pulley to said spring anchor; said arm being adapted to engage a member on the door to close said door from any open position under the power of said spring.

8. A door buffer adapted to prevent a door from slamming upon closing comprising a toggle leg pivotally mounted adjacent one end thereof, a toggle leg movably mounted adjacent one end thereof, a pin pivotally inter-connecting the unmounted ends of said toggle legs, and a spring connected to said toggle legs intermediate their ends adapted to urge the mounted ends of said toggle legs together to jackknife said legs relative to one another to provide mechanical advantage in the device against a door closing at a point spaced from the door's closed position and to collapse as the door approaches its closed position so that the device's mechanical advantage is diminished and is finally completely lost when the door is closely adjacent its closed position thereby eliminating buffer resistance to the complete closing of the door.

9. A door closing device for closing a door relative to a jamb and for securing a door open relative to a jamb comprising slide rail mountable on one member having a notch therein defined by an abrupt wall on the side of the notch remote from the hinged edge of the door and a wall sloping toward the other side of said notch, a torsion arm mounted on the other member slidably engaging said rail to close a door and to permit a door to be opened, a pin on said arm slidably engaging the inside of said rail so that

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the torsion of said arm urges said pin into contact with said rail; said pin being receivable in said rail notch to prevent said arm from closing the door; a traveler on said rail, spaced stops on said traveler for contacting said pin so that said traveler rides said rail with said pin, and a cam on said traveler between said stops oppositely disposed to said rail notch so that in opening a door said pin is permitted by said cam to drop into said rail notch; said cam being adapted to prevent said pin from entering said rail notch when a door is closing if the pin is not positioned in said rail notch upon initiating closing of a door.

10. In combination, a door-closing, automatically-variably checking, and positive-securing and automatically-releasing-holder device comprising a slide-rail positionable on a door, a torsion-arm positionable on a jamb, a pin on said arm slidably engaging the inside of said rail to permit opening and to effect closing of a door; said rail having pin engaging notches in the inside thereof by-passable by said pin in door opening and normally pin receivable in door closing to engage said pin to hold the door in selectable open conditions; a cam-traveler slidably disposed on said rail adapted to be bidirectionally moved by said pin and itself adapted to selectively permit said pin to engage a notch on said rail in door closing, and a toggle-check carried by said

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arm adapted to engage said rail to automatically variably check a door as the door moves from an open to a full-closed position and to urge said pin into engagement with said rail notch when said checking and holding elements are both activated.

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