March 25, 1941. L. L. WESTCAMP 2,236,026

DOOR CLOSURE CONTROL ASSEMBLY

Filed March 13, 1939

Fig. 1

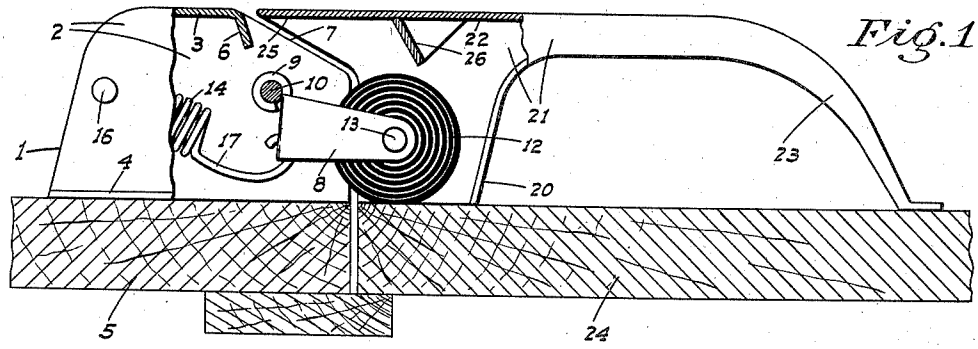


Fig. 2

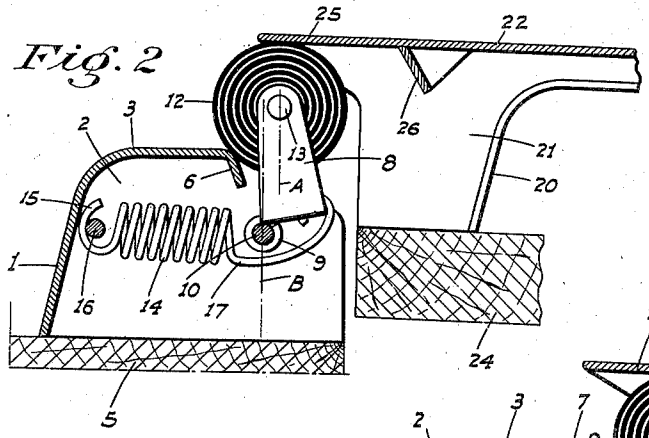


Fig. 3

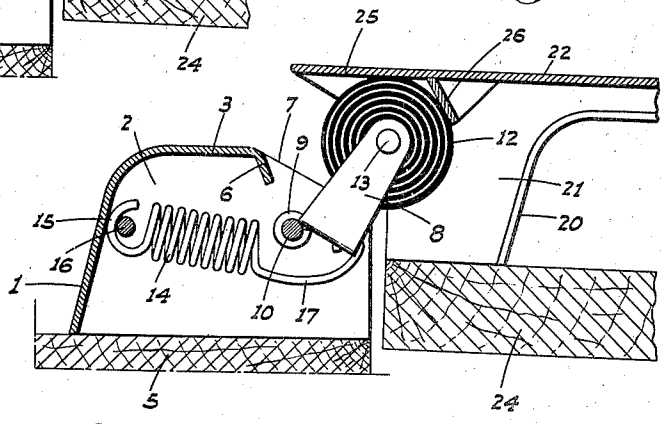
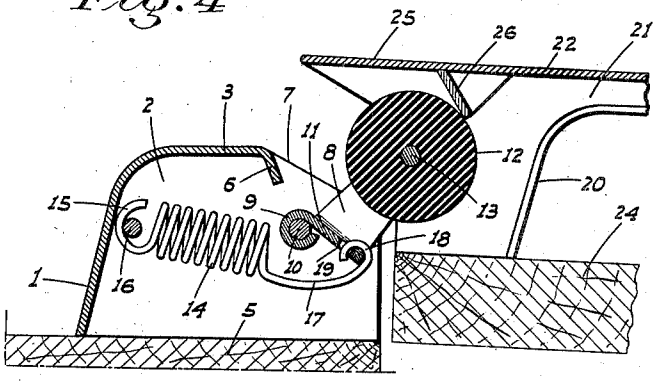


Fig. 4



INVENTOR

L. L. Westcamp

ATTORNEY

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DOOR CLOSURE CONTROL ASSEMBLY

Leslie L. Westcamp, Elk Creek, Calif.

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2 Claims. (Cl. 292—79)

This invention relates in general to a mechanical asembly for checking and closing doors, and in particular the invention is directed to a spring actuated mechanism for silencing the slam of, and thereafter holding tightly closed, doors which are urged in a closing direction by spring hinges, separate coil springs or the like.

The known types of devices for checking and closing doors include those which make use of a hydraulic unit having a piston and cylinder therein and arranged to control the closing velocity of the door. While the hydraulic type is best known due to its smoothness of operation, it is subject to the objection that the door closing velocity is relatively low permitting insects such as flies to pass through the door opening before the door is finally closed. A further objection is the relatively high cost due to the nature of the structure.

The principal object of this invention is to provide a door closure assembly including unique spring actuated mechanism to check a closing door to prevent slamming thereof and thereafter to allow the door to close quietly, and then yieldably hold the door in closed position; the assembly being arranged so that the closing door may swing with maximum velocity to a point adjacent but clear of a closed position before the spring actuated mechanism becomes operative and as is desirable to prevent entry of insects.

A further object of the invention is to provide a door closure control assembly which is easy to install, inconspicuous in appearance, and includes—with the door checking and closing mechanism—an accessible door handle.

Additional objects of the invention are to provide a door closure control assembly which functions smoothly, is simple and inexpensive in structure, and yet is sufficiently rugged and durable to accomplish the purposes for which it is designed.

In the drawing similar characters of reference indicate corresponding parts in the several views:

Figure 1 is a top plan view, partly in section, of the assembly as attached to a door and its frame; the assembly being shown in normal position and yieldably holding the door closed.

Figure 2 is a sectional plan view of the assembly with the bumper mechanism in cocked position and showing the strike plate at the moment of engagement therewith.

Figure 3 is a sectional plan view of the assembly with the bumper mechanism tripped and engaging the roller bumper abutment flange.

Figure 4 is a sectional plan view of the assembly with the roller bumper unit escaping the roller bumper abutment flange and just prior to engagement thereof with the door.

Referring now more particularly to the characters of reference on the drawing, the assembly comprises an open ended housing or frame 1 including spaced sides 2 and a top 3; the sides at the lower edges being formed with out-turned mounting flanges 4. This housing 1 is mounted on the door frame 5 adjacent the edge thereof and with the open end of the housing facing the door; the housing being secured in place by wood or machine screws which pass through flanges 4. The top 3 is cut back some distance from the open end of the housing and turned down to form a transverse stop flange 6; the sides 2 tapering inward, as at 7, from said flange toward the open end of the housing.

A yoke having its arms 8 parallel to sides 2 is pivoted therebetween by means of an integral, and offset bearing sleeve 9 turnable on a transverse pin 10; the bearing being of full width and a continuation of the base 11 of the yoke as shown in Fig. 4. A relatively large diameter roller bumper 12 of resilient material, such as rubber or the like, is carried between the outer ends of yoke arms 8 on a cross pin 13. The above yoke and roller bumper mechanism will hereinafter be termed the roller bumper unit.

A heavy duty tension spring 14 is disposed in the housing and mounted with the roller bumper unit as a snap action spring in the following manner: At one end the spring is formed with a hook 15 which engages over a transverse pin 16 mounted adjacent the back of said housing. At the other end the spring is formed with a curved finger 17 which has its inception on the side of the spring 14 most remote from pin 10, and which is formed at its free end with a hook 18 which engages in an eye 19 formed in the yoke base 11 adjacent the side opposite bearing sleeve 9.

The pin 10 is positioned between sides 2 and the finger is curved so that when the yoke swings in a counter-clockwise direction until roller 12 rests against stop flange 6, the end of the spring formed with hook 18 has moved outward beyond dead center relative to pin 10. The tension of spring 14 then urges the roller into engagement with the stop flange 6 and holds the yoke and roller in what may be termed a cocked position and as shown in Fig. 2. When the yoke and roller are in such cocked position the roller pin 13 is disposed in a plane offset laterally toward the door relative to the plane of bearing sleeve

supporting pin 10 and for the reason hereinafter set forth; such planes being indicated by broken lines A and B in Fig. 2.

The remainder of the assembly comprises another open ended housing 20 which includes side plates 21, a top plate 22, mounting flanges, and an extension 23 which forms an effective door handle; this housing being mounted on the door 25 at its free edge and in end-to-end alinement with the frame mounted housing 1 for the roller bumper unit. The top plate 22 is extended as a strike plate 25 which overlies the cut back portion of the top 3 of housing 1; this strike plate terminating at a point adjacent but spaced from stop flange 6. A roller bumper abutment flange 26 extends between side plates 21 of housing 20 and immediately below top plate 22 some distance back of the strike plate 25, this flange 26 sloping away from the open end of the housing 20 and with its exposed face at an obtuse angle to the inner surface of the top plate.

Operation

As mounted on a door 25 and door frame 5, the assembly above described is normally in the position shown in Fig. 1 and wherein the roller bumper 12, under the tension of spring 14, rests against the door and holds the same tightly but yieldably in closed position.

When the door 25 is swung open, the roller bumper 12 is forced outward which swings the roller bumper unit in a counterclockwise direction until the same is set in cocked and projecting position as shown in Fig. 2; the door then swinging therebeyond. Thereafter, when released, the door swings toward a closed position with maximum velocity until the strike plate 25 strikes the roller bumper 12 of the previously cocked unit. The reaction of the strike plate 26 upon striking the roller bumper 12 of said previously cocked unit exerts a force on the roller bumper and supporting yoke along the line A in Fig. 2. As the plane of roller pin 13 is offset toward the door relative to the plane of pin 10, there results a force moment tending to produce clockwise rotation which trips the roller bumper unit past dead center position and the same rotates in a clockwise direction until this resultant throw of the unit is arrested by the roller bumper 12 engaging roller bumper abutment flange 26 in housing 20, as shown in Fig. 3. The closing motion of the door is now checked with a minimum of jar and sound, the resilient roller bumper 12 being compressed and deformed between the strike plate 25 and roller bumper abutment flange 26 and the roller bumper pin 13. At this moment, the strike plate rebounds from the roller bumper freeing the latter from flange 26 and whereupon said roller bumper snaps against the adjacent surface of the door closing the same with a minimum of jar and sound. The door is then held tightly closed preventing rattling thereof, reducing draughts, and excluding insects.

From the foregoing description it will be readily seen that I have produced such a device as substantially fulfills the objects of the invention as set forth herein.

While this specification sets forth in detail the present and preferred construction of the device, still in practice such deviations from such detail may be resorted to as do not form a departure from the spirit of the invention, as defined by the appended claims.

Having thus described my invention, what I claim as new and useful and desire to secure by Letters Patent is:

1. In a door check including the combination of a support having spaced sides, an arm projecting from between said sides, a bumper mounted on the projecting end of said arm, and means mounting said arm at the other end between said sides in pivotal snap action relation to said support for alternate movement from a cocked position clear of a door member to a door member engaging position; said means comprising a pivot pin arranged with said other end of the arm and connected between the sides of the support, a coil tension spring disposed between the sides of the support, one end of the spring being anchored on the support at a point beyond the pivot pin and the spring extending from said point toward but the coil portion thereof terminating short of said other end of the arm, a member on the arm at said other end and when the arm is in cocked position projecting laterally of the pivot pin in a direction away from said spring, and an element formed with the end of the spring adjacent said other end of the arm and connected with said projecting member beyond the pivot pin, said element being formed to clear said pivot pin when the arm is in either of said alternate positions.

2. In a door check including the combination of a support having spaced sides, an arm projecting from between said sides, a bumper mounted on the projecting end of said arm, and means mounting said arm at the other end between said sides in pivotal snap action relation to said support for alternate movement from a cocked position clear of a door member to a door member engaging position; said means comprising a base of substantial width on said arm and extending transversely between said sides of the support, a transverse bearing sleeve formed on and extending substantially the full width of said base, a pivot pin connected between the sides of the support and extending through said bearing sleeve, a coil tension spring disposed between the sides of the support, one end of said spring being anchored on the support at a point beyond the pivot pin and the spring extending from said point toward but the coil portion thereof terminating short of the base of the arm, one side of the base when the arm is in cocked position projecting laterally of the pivot pin in a direction away from said spring, and an element formed with the end of the spring adjacent said base and connected with the outer edge of said projecting side of the base, said element being formed to clear the base and bearing sleeve when the arm is in either of said alternate positions.

LESLIE L. WESTCAMP.