Oct. 1, 1935. E. BOMMER 2,015,988

DOOR CHECK AND CLOSER

Filed Jan. 4, 1933 3 Sheets-Sheet 1

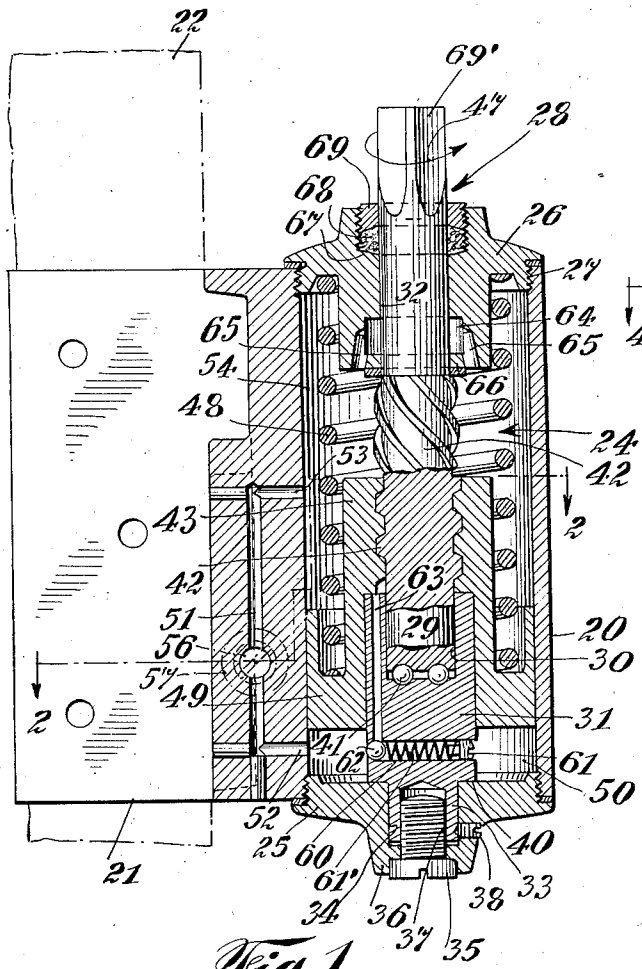


Fig. 1.

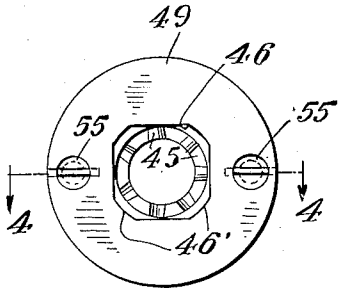


Fig. 3.

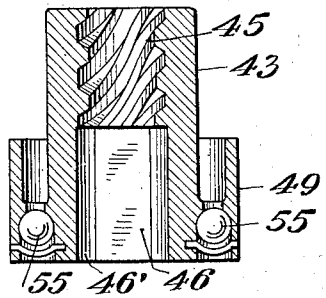


Fig. 4.

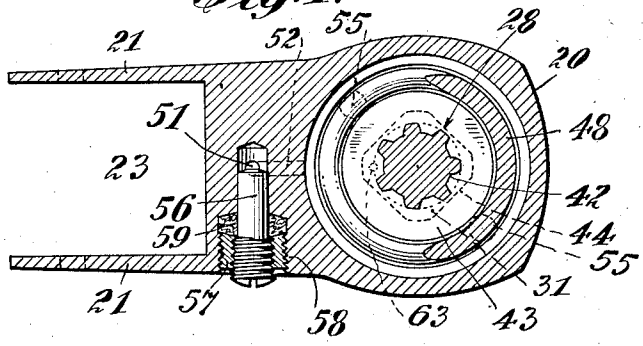


Fig. 2.

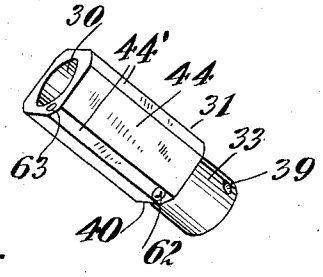


Fig. 5.

INVENTOR-
Emil Bommer
BY C. L. Bogel
his ATTORNEY-

Oct. 1, 1935. E. BOMMER 2,015,988

DOOR CHECK AND CLOSER

Filed Jan. 4, 1933 3 Sheets-Sheet 2

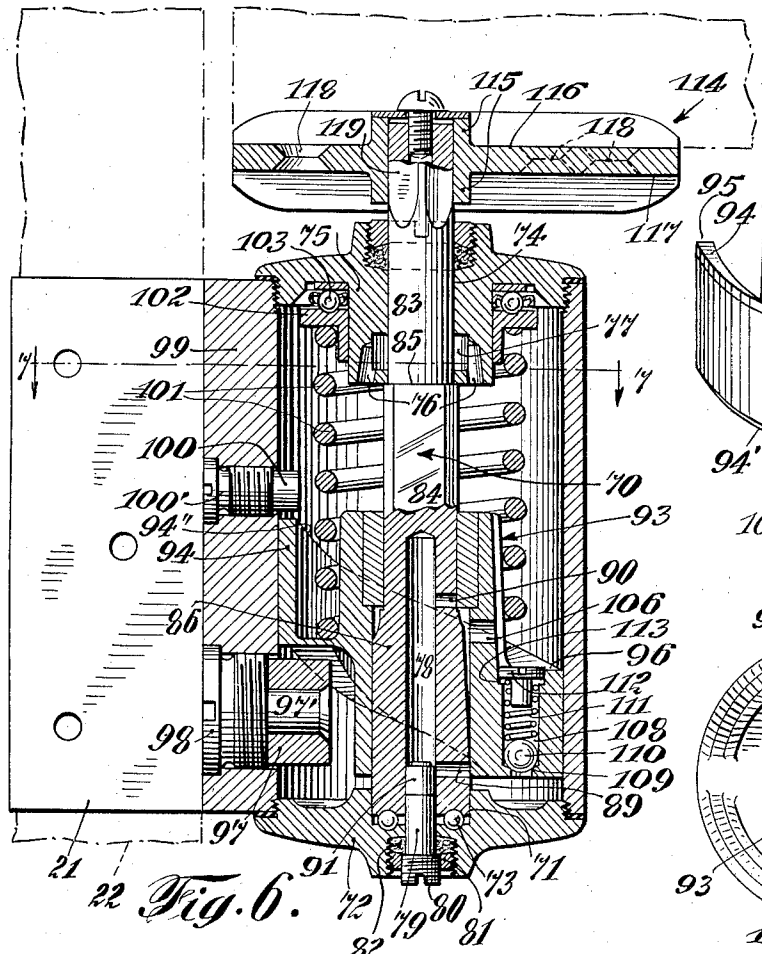


Fig. 6.

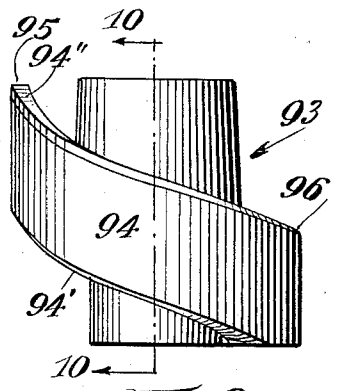


Fig. 8.

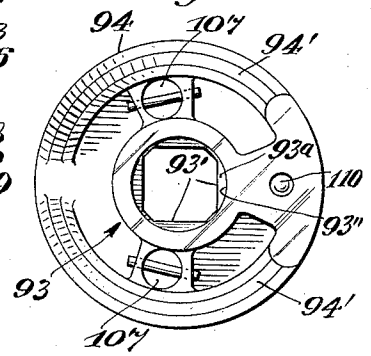


Fig. 9.

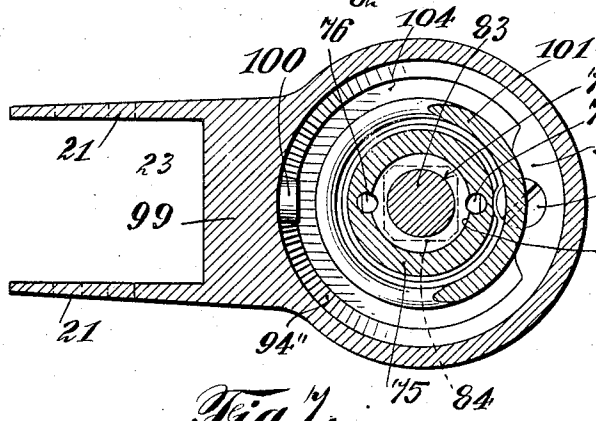


Fig. 7.

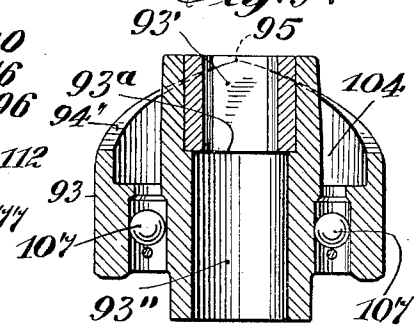


Fig. 10.

INVENTOR-
Emil Bommer
BY C. F. Boepel
his ATTORNEY-

Oct. 1, 1935. E. BOMMER 2,015,988

DOOR CHECK AND CLOSER

Filed Jan. 4, 1933 3 Sheets-Sheet 3

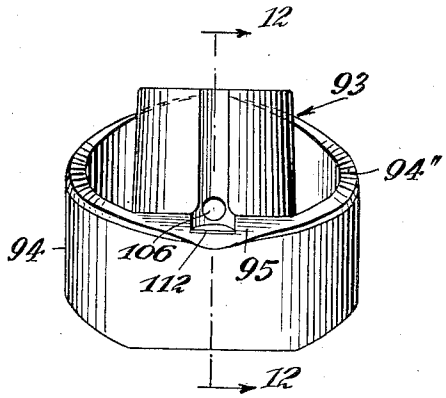


Fig. 11.

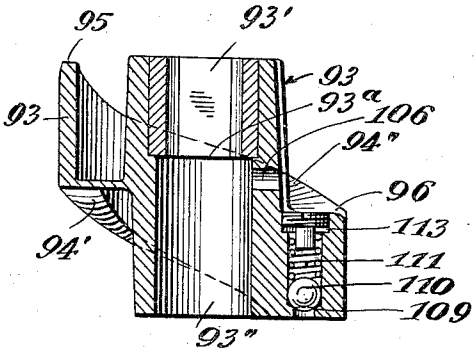


Fig. 12.

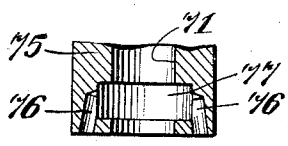
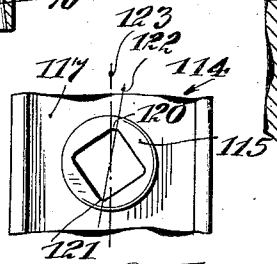


Fig. 13.



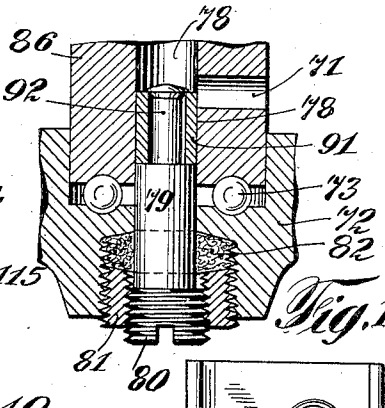


Fig. 14.

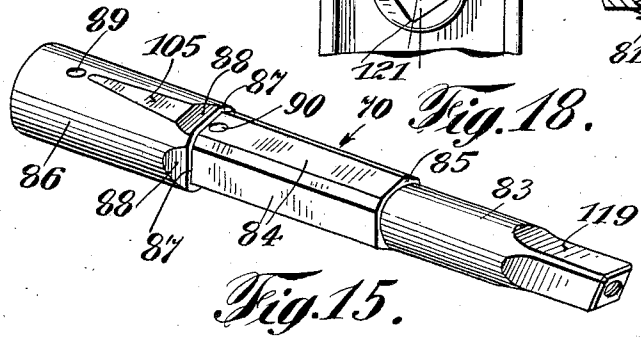


Fig. 15.

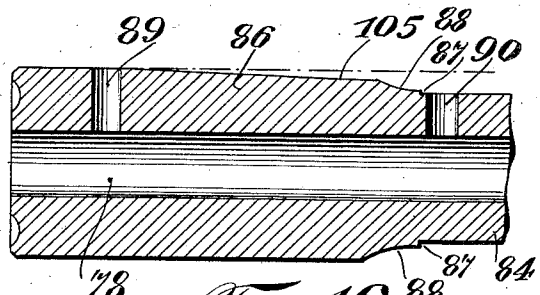


Fig. 16.

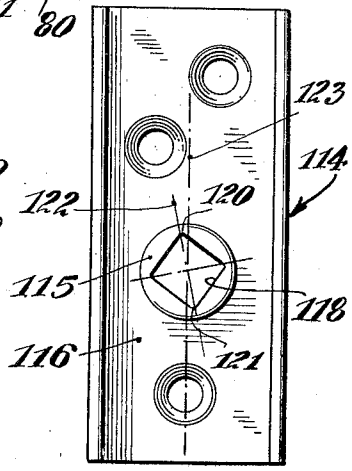


Fig. 17.

INVENTOR-
Emil Bommer
BY C. P. Boepel
his ATTORNEY-

Patented Oct. 1, 1935 2,015,988

UNITED STATES PATENT OFFICE

2,015,988

DOOR CHECK AND CLOSER

Emil Bommer, Brooklyn, N. Y.; Gustav Bommer, John F. Voelkel, and Charles F. Gehrmann, executors of Emil Bommer, deceased

Application January 4, 1933, Serial No. 650,091

10 Claims. (Cl. 16—54)

This invention relates to door checks and closers of the type embodied in hinges for the doors, and the object of the invention is to improve generally in the construction and operation of devices of this character.

The door check and closer hinge of my present invention is intended more particularly for use in connection with lavatory and similar doors which are supported from stiles, although the invention is not confined to this class of doors.

An object of the invention is to provide improved automatically operated mechanisms for closing and checking the closing movement of lavatory and similar doors. My improved mechanisms are of the type employing expansile door closing springs, the expanding actions of which are opposed by suitable checking medium such as oil.

Another object of my invention is to provide a novel spindle and plunger arrangement, with means whereby as the spindle rotates with the door which it supports, the plunger will be caused to move axially along the spindle; and further to provide in connection with this arrangement a valve regulated relief port by means of which to effect a quiet and substantially silent stop of the door at its terminal of closing movement, with the relief port and its regulating valve so located that this valve is accessible for regulation from the outside of the casing. This type of construction is regulatable so as to provide for effectually relieving shocks and strains and hence for eliminating the breaking of parts upon the plunger meeting resistance due to attempts to force the closing of the door.

A further object of the invention is the provision of means for preventing the escape around the spindle of checking oil to the outside of the casing while at the same time providing for the lubrication of the spindle in its bearing.

The subject matter of the present invention is also described in and certain novel features of the invention herein described, but not herein claimed, are claimed in my companion application for patent, filed May 21, 1934, Serial No. 726,752, which companion application is a division of the present application.

A further object of the invention is to provide in association with the door and the door closer and check spindle for supporting the same, an edge attaching plate or fitting so constructed and connected with said parts that the door will normally be forced to assume a properly aligned position with respect to its stile.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts as hereinafter more specifically described, and illustrated in the accompanying drawings, wherein I have shown two more or less variant examples of the invention.

In the drawings:—

Figure 1 represents a vertical sectional view through a door check and closer hinge made in accordance with one embodiment of my invention;

Fig. 2 is a cross sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is an underneath plan view of the plunger or piston;

Fig. 4 is a central vertical sectional view taken on the line 4—4 of Fig. 3;

Fig. 5 is a perspective view of the center post which supports the spindle and on which the plunger has sliding movement;

Fig. 6 is a vertical sectional view showing another embodiment of my door check and closer hinge, and showing also in connection therewith the edge plate for connecting the upper portion of the hinge spindle with the door;

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

Fig. 8 is an elevational view of the plunger cam;

Fig. 9 is an underneath plan view of the plunger cam;

Fig. 10 is a vertical sectional view taken on the line 10—10 of Fig. 8;

Fig. 11 represents another elevational view of the plunger cam, showing the same turned to a position in which the observer can see the port which leads to the tapered flat portion of the spindle;

Fig. 12 is a vertical sectional view taken on the line 12—12 of Fig. 11;

Fig. 13 is a sectional detail of the inner portion of the top screw cap closure;

Fig. 14 is an enlarged sectional detail showing the screw valve and sleeve for regulating the flow of oil through the port in the lower portion of the spindle;

Fig. 15 is a perspective view of the spindle;

Fig. 16 is an enlarged fragmentary sectional view of the spindle showing the tapering flattened region provided on the cylindrical portion thereof;

Fig. 17 is a plan view of the edge attaching plate for the door; and

Fig. 18 is a fragmentary view showing the opposite face of the edge attaching plate.

Referring now in detail to the accompanying

drawings, and first to the example illustrated in Figs. 1 to 5, inclusive, 20 indicates an elongated casing which is provided longitudinally along one side with two integral leaves or plates 21 adapted to engage the opposite sides of a stile 22 entered in a bight 23 between the two plates. On being attached to the stile, this casing occupies a vertical position for the support of a swinging door of the lavatory type. This casing is made with a cylindrical interior space 24 the lower end of which is closed by a bottom closure or end piece 25 which is secured in any suitable manner liquid-tight to the casing. A top cap 26 closes the hollow interior at the upper end thereof, this cap for assembly and disassembly purposes being suitably screw-threaded at 27 to the casing.

28 denotes in general a vertically disposed spindle, the lower portion 29 of which has turning fit in a socket 30 provided in the top end of a vertically disposed center post 31, while the upper end of the spindle is journaled for rotation in a bearing 32 provided in the top screw cap closure 26. Said vertical center post 31 has a reduced lower portion 33 which fits in an opening 34 provided for the purpose in the bottom closure 25. This center post is a stationary element and is made fast with the bottom closure 25 by means of a screw 35 fitted in the downwardly extending nose 36 of said bottom closure and threadably engaged at 37 in an axial recess provided in the reduced portion 33. A pinch screw 38 threaded laterally through the nose 36 so as to engage a recess 39 in the reduced portion 33 may be employed as additional means whereby rigidly to secure the vertical center post with the bottom closure. Because of the provision of the reduced portion 33 on the center post, there results thereon an annular shoulder 40 which is drawn tightly against the inner face of the bottom closure when the screw 35 is tightened, this tightening operation, being effected prior to turning the pinch screw 38 into engagement with its seat 39. It is in place to point out here that the screw 35 should be provided with a right-hand thread when it is to be used with a door operated from the right-hand side and with a left-hand thread if the door is to be operated from the left-hand side. If the screw is threaded in this manner to suit the operation of the door, its tendency is to tighten under the opening thrust of the door and no pinch screw or equivalent device is necessary in order to keep it from working loose.

As will be evident to those familiar with the art, a function of the spindle 28 is to support the door and to turn therewith, and in view of this function suitable ball bearings or anti-friction devices 41 are provided between the lower end of the spindle portion 29 and the socket bottom in the vertical center post 31, whereby to facilitate turning of the spindle within the socket. Just above the top end of the center post, the spindle is furnished with a spirally threaded portion 42, and having threaded engagement with the threads of this portion is a plunger element 43 the lower portion of which has vertically-reciprocatory movement upon the center post 31. The center post serves as guiding means for the vertically-reciprocatory operation of the plunger, and to this end it will be seen from an inspection of Fig. 5 that the exterior 44 of said post is substantially of square formation, and that the interior of the plunger below its screw-threaded region 45 is of a corresponding square formation at 46, as shown in Figs. 3 and 4. The substantially square formations of the post and plunger may include respectively flattened corners 44' and 46'. By this arrangement, when the spindle is turned by the opening movement of the door, for instance, in the direction of the arrow 47, the plunger will be moved vertically in a straight line, and upon the reverse turning of the spindle, which reverse movement takes place upon the closing movement of the door, the plunger will move downwardly in a straight line.

A coiled expansile spring 48 is imprisoned between the head 49 of the plunger and the top screw cap 26. As the plunger moves upwardly during the opening of the door, this spring is compressed, so that upon the release of the door for closing movement, the spring in expanding will force the plunger downwardly, thereby effecting reverse movement of the spindle and hence the closing movement of the door.

As is usual with door checks and closers of this character, the downward movement of the plunger is opposed by liquid pressure, for instance, oil occupying the chamber 50 below the plunger head, the liquid pressure resisting or opposing the expanding action of the spring and thereby checking the closing movement of the door. For the relief of the oil pressure to permit the downward movement of the plunger, there is provided an oil passage 51 having an intake port 52 in communication with the lower portion of the chamber 50 and an outlet port 53 in communication with the chamber 54 at the upper side of the plunger head. To permit the oil to pass from the chamber 54 at the upper side of the plunger head to the chamber 50 at the lower side thereof during the upward movement of the plunger, suitable one-way escape valves 55, the same being ball valves of a well-known type, are provided in the plunger as illustrated in Fig. 4. The flow of oil through the passage 51 is controlled by a regulator screw valve 56 which is arranged so as to be accessible from the outside of the casing for its manipulation. This regulator valve has screw-threaded engagement with a gland nut 57 which is threaded into a cavity 58 so as to retain therein around the valve stem, suitable packing 59 for preventing the escape of oil.

According to an important feature of this arrangement, there is provided a further relief passage 60 which extends transversely through the squared portion 44 of the center post adjacent the shoulder 40. One open end of this passage is closed by a screw 61 while the opposite end thereof is normally closed by a ball valve 62, there being a coiled compression spring 61' imprisoned between the screw 61 and ball valve 62. In communication with the passage 60 is a vertically extending channel 63 which feeds to the interstices of the cooperating screw-threads between the spindle and plunger, and it will be noted that this passage at its lower end is normally closed by the ball valve 62. Said passages 60 and 63 are so arranged that the ball valve 62 is seated in a position in which it is exposed directly to fluid pressure and so as to be moved from its seat inwardly into the passage 60 when the fluid pressure exerts force sufficient to overcome the resistance of the compression spring 61'. On being moved inwardly of the passage 60, the ball valve 62 opens the way for oil to pass around it into the passage 63 and thence to the spiral threads between the plunger and spindle. As the plunger moves downwardly into its lower terminal of movement, or door closing position, it crosses the intake port

52 and the ball valve 62, exposed in part somewhat lower than the port 52, provides such relief for the oil pressure as will permit the door to have a quiet and substantially silent stop. The provision of the ball valve 62 also serves another purpose in that if it be attempted by manual operation to effect sudden closing movement of the door, the resulting sudden resistance of the liquid pressure force will overcome the opposition of the spring 61' so as to permit unseating of the valve 62 for the escape of oil in the passage 63.

According to another important feature of my invention, the top screw cap closure 26 is constructed at its inner end so as to parry the force of the oil pressure and prevent leakage to the outside of the casing. The means for this purpose consists in providing an annular channel 64 in the bearing surrounding the spindle, and further in providing a plurality of spaced ducts 65 which lead from the inner end 66 of the bearing to said annular channel 64. The top or outer end of the cap closure 26 is provided around the spindle with a recess 67 in which is disposed suitable packing 68 held in place by an outer seal or gland nut 69 which is screw-threaded into the recess. Under this arrangement, the ducts 65 in connection with the annular channel 64 serve as means for parrying and thereby destroying the force of liquid pressure exerted against the bearing, so that although sufficient oil will seep into the crevice between the bearing and spindle for keeping the spindle oiled, yet there will not be liquid pressure sufficient to force a leakage of oil through the stuffing box sealed by the gland nut.

While I have herein shown and described cooperating substantially square portions between the center post and plunger whereby to cause the plunger, when operated by the screw spindle to have vertical or axial movement, it will be recognized that in the practice of the invention, angular guiding forms or devices other than the square forms illustrated may be employed to obtain the same result. It may be remarked at this point that the screw threads between the spindle and plunger may be spiralled so as to adapt the hinge for a right-hand door, and that, on the contrary, they may be made to adapt the hinge for use with a left-hand door. In this embodiment it will be observed that the coiled expansile spring 48, imprisoned between the top cap closure and the vertically-reciprocatory plunger does not have a bodily rotary movement, but on the opening movement of the door is simply compressed by the upward travel of the plunger, and, when the opened or partially opened door is released, has a downwardly acting tension for moving the plunger downwardly against the opposing oil pressure for effecting the closing of the door.

The bottom closure 25, if a separate member as herein shown, should be made rigid with the casing, and the vertical central post should be secured rigidly to said bottom closure. Manifestly, the purpose of so securing the bottom closure and center post is to prevent any movement of these parts relatively to the casing. The protruding end 69' of the screw spindle is preferably made in substantially square form for cooperation with the door edge attaching plate of novel construction and utility, as will be explained in connection with the second example of my invention now to be described.

Referring in detail to the embodiment of my invention illustrated in Figs. 6 to 16, inclusive, it will be seen that the vertical spindle, indicated generally by the reference character 70, has its lower end rotatably fitting in a socket 71 provided in the bottom closure 72, suitable ball bearing devices 73 being interposed between the lower end of the spindle and the bottom of said socket. The opposite end of the spindle extends through the bearing 74 provided in the top screw cap closure 75, the said bearing 74 at its inner end being provided with ducts 76 leading to an inner annular channel 77 whereby for the purpose of preventing leakage, to parry the force of oil pressure as in the form of the invention hereinbefore described. Provided in the lower portion of this spindle is an axial bore or passage 78 in which is received the stem 79 of a regulator valve, the head 80 of which is threaded into a gland nut 81, which in turn is threaded in the bottom closure against packing 82 surrounding the stem 79.

Below its cylindrical portion 83 which is journaled in the bearing 74, the spindle 70 is made with an elongated portion 84 of angular form in cross section, this portion in the present instance being four-sided, and at the juncture of the portions 83 and 84 there is a shoulder 85 which turns against the inner face of the bearing 74. Below the angular portion 84, said spindle has an enlarged cylindrical portion 86, and at the juncture of the portions 84 and 86 there is a shoulder 87. Adjoining the shoulder 87, the cylindrical portion 86 is made with tapered faces 88 of which there is one for each flat face of the angular portion 84. In communication with the passage 78 are lower and upper lateral ports 89 and 90, the first-named being located adjacent the inner face of the bottom closure 72 so as to be covered and uncovered by a sleeve 91 rotatably carried on the reduced inner end portion 92 of the screw stem 79. This arrangement is such that the sleeve 91 turns freely upon the screw stem with the turning of the spindle and by adjusting the screw 80, the sleeve may be used as an instrumentality for controlling the flow of liquid from the port 89 to the passage 78.

Arranged to cooperate with the spindle 70 for actuation thereby is a plunger cam 93 the upper interior 93' of which is made in a four-sided configuration in agreement with the four-sided spindle portion 84, while the lower interior portion 93'' has a cylindrical form which fits on the cylindrical portion 86 of the spindle. As shown in Fig. 10, the upper and lower interior portions 93' and 93'' are separated by a shoulder 93a adapted to cooperate with the shoulder 87 of the spindle whereby to limit the downward movement of the plunger cam upon the spindle. By this arrangement, when the spindle is turned the plunger cam turns with it while at the same time the latter can be moved longitudinally of the spindle. This plunger cam is made with a spiral portion 94 forming lower and upper cam tracks 94' and 94'' both curving spirally from a high point 95 to a low point 96. Arranged to turn on the lower spiral track 94' is a roller 97 carried by a stem 97' on plug 98 screw-threaded into the casing wall 99. A stud 100 engages the upper spiral cam track 94'', said stud being formed on a screw 100' threaded into said wall 99. A coiled expansile spring 101 is imprisoned between the plunger cam 93 and a collar 102 rotatably fitting around the cylindrically formed bearing 74. A suitable ball bearing or anti-friction device 103 is disposed between the collar 102 and inner face of the top screw cap closure, as shown in Fig. 6. The lower end of the coiled spring fits in a seat 104 provided for the purpose between the spiral portion 94 and plunger

cam body. With the parts arranged in this manner, when the spindle turns with the opening movement of the door, the plunger cam turns with it and is elevated by reason of the engagement of the roller 97 with the lower spiral track 94'. Because of the provision of the rotatable collar 102, the coiled spring rotates with the plunger cam while being compressed under the elevating movement of the same.

As best shown in Figs. 6, 15 and 16, the cylindrical portion 86 of the spindle is provided with a tapered flat 105 between the outer ends of the ports 89 and 90, the tapering of this flat being inwardly of the cylindrical portion toward the port 90 and terminating in one of the cut-away portions 88 adjacent the shoulder 87. The plunger cam has a port 106 which provides communication between the space resulting from the provision of the tapered flat and the oil pressure chamber above the plunger. The upper port 90 in the spindle provides communication between the passage 78 and the space of the tapered flat when the plunger cam is moved upwardly from its lower terminal of movement, and the lower port 89 provides communication between the passage 78 and the oil pressure chamber below the plunger cam when the latter moves from its lower terminal of movement. As the spindle is turned at the opening movement of the door the oil or checking medium flows from the chamber above the plunger cam to the chamber therebelow through one-way escape valves 107 of well known construction. When by the downwardly acting tension of the coiled spring 101, the plunger cam is forced downwardly against the resistance of oil pressure in the chamber below the plunger cam, the checking oil escapes through the port 89, passage 78, port 90, the space afforded by the tapered flat, and thence out through the port 106. Owing to the provision of the tapered flat, as the plunger cam descends, the escape of the checking oil is gradually restricted until as shown in Fig. 1, the ports 89 and 90 are substantially covered at the lower terminal of movement of the plunger cam, the purpose and advantage of this entire arrangement being to provide a quiet, silent stop for the door. By the adjustment of the regulator screw 80 the relief of the pressure fluid can be regulated so as to make effective either relatively fast or relatively slow closing movement of the door; and it will be noted in this connection that the arrangement of parts is such that the regulator screw can be manipulated from the outside of the casing. In order, in addition to the quiet, silent stop action accomplished by this arrangement, to provide for full closure of the door, the plunger cam is furnished with a vertical bore 108 having a ball seat and port 109 in communication with the lower chamber. A ball valve 110 is normally forced to this seat by a coiled spring 111 which is imprisoned in the bore 108 between the ball valve 110 and a screw pin 112 threaded into the top end of the bore. As the plunger cam reaches or is about to reach its lower terminal of movement, any excessive checking fluid pressure in the lower chamber will unseat the ball valve 110 and permit escape of oil into the bore 108 and thence through a very shallow port 113 which passes by the head of the screw pin 112. Another advantage results from the provision of the ball valve 110 in this, that if the attempt be made to close the door forcibly and with a sudden jerk, this ball valve will be unseated permitting pressure relief.

In the use of door checks and closers, much difficulty is experienced in closing the door to a position in which it will be properly aligned with the stile upon which the door is mounted for swinging movement. In order automatically to effect alignment of the door with its stile, I provide a novel door edge attaching plate or fixture 114. As shown in Fig. 6, this plate extends longitudinally of the door underneath the lower edge thereof and it is provided with a boss 115 which extends equal distances from the opposite faces 116 and 117 of the plate. In this boss is provided a square opening 118 of a size to snugly receive the squared upper end portion 119 of the spindle. The novel feature of this arrangement is that the square opening 118 is so made in the boss that at one side of the plate, for instance the side 116, the diametrically opposite angular corners 120 and 121 will lie at opposite sides of a vertical plane paralleling the length of the plate to give an engaged spindle a door closing lead in the direction tending to align the door with its stile. In Fig. 17, the diametrically opposite corners 120 and 121 are illustrated as lying in a plane 122 intersecting at an acute angle the vertical plane 123 which is parallel with the longitudinal sides of the plate. With this side-centering of diametrically opposite corners, the door instead of standing slightly ajar, is forced ahead for alignment with its stile a distance substantially equal to that of the lead corner from the line 123. This door edge plate 114 may be used with equal efficiency for either right-hand doors or left-hand doors, since, as will be evident from a comparison of Figs. 17 and 18, by inverting the plate, the positions of the diametrically opposite corners will be reversed, bringing the trailing corner from the line 123 into the lead from said line.

In the form of my device having the plunger cam 93 with spiral tracks from a high point 95 to a low point 96, a movement of the spindle through a full circle of 360 degrees may be had without any possible injury to the actuating parts. This form of the device, therefore, may be used either in connection with single or double acting doors.

While I have illustrated and described my invention as taking certain selected forms, it will be understood that changes and alterations may be made in the particular forms of construction without departing from the spirit of the invention, and hence I do not limit myself to the particular details set forth or to the particular forms of construction, but consider myself at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

I claim:

1. In a door check and closer, the combination with a checking fluid chamber, of a stationary member, a door supporting spindle associated with the stationary member for relative turning, a spring urged plunger slidable on the member and engaged with the spindle to cause turning movement of the latter, a valved passage in the member the valve of which is below the spindle, forming an outlet for checking fluid from the chamber, the valve in said passage being arranged to resist a certain amount of pressure exerted by the checking fluid and to be unseated when such pressure becomes excessive.

2. In a door check and closer, the combination with a socketed stationary member having angular form in exterior outline, of a door supporting spindle having its lower end rotatively bearing in the socket of said member and having at its upper end spiral threads, a plunger having

an interior angular outline at its lower portion shaped to fit said stationary member so as to slide axially thereon, and having spiral threads at its upper portion interengaging the threads of said spindle, thereby adapting the plunger to be moved axially by the rotation of the spindle, and, conversely, adapting the spindle to be rotated by the axial movement of the plunger.

3. In a door check and closer, the combination of adjoining coaxial members, comprising a stationary member and a spindle turning with respect thereto, said first member having angular form in exterior outline and said spindle having exterior spiral threads, and a plunger engaging said member and spindle, adapted to actuate said spindle and to be actuated thereby, said plunger having part of its interior outline shaped to fit and slide on said first member and having a spirally threaded portion interengaging with the spiral threads of said spindle.

4. In a door check and closer including a vertically disposed door supporting spindle, the combination of a vertical post in the top of which the spindle is supported for rotation, a plunger surrounding the spindle and post, spiral screw threads between the spindle and plunger, and means between the plunger and post preventing rotation of the plunger while permitting free axial movement thereof.

5. In a door check and closer including a vertically disposed door supporting spindle, the combination of a vertical post in the top of which the spindle is supported for rotation, a plunger surrounding the spindle and post, spiral screw threads between the spindle and plunger, means between the plunger and post preventing rotation of the plunger while permitting free axial movement thereof, a door closing spring acting upon the plunger, and a valve body in the post arranged to be actuated by the force of pressure fluid exerted thereon during the movement of the plunger under the door closing action of the spring.

6. A door check and closer comprising, in combination, a casing, a door supporting spindle and a stationary post supporting the same in vertical position within the casing, a plunger mounted upon the post and spindle, having spiral threaded engagement with the spindle and non-rotary axially sliding movement on the post, a top closure having a bearing for the upper portion of the spindle and formed at its inner end to carry the force of checking liquid, a door closing spring having downwardly acting tension on the plunger, a passage for checking liquid extending in the casing from the lower side of the plunger to the upper side thereof, a relief passage for checking fluid extending in the post from the lower side of the piston to the cooperating threads between the spindle and plunger, and means comprising a spring urged valve controlling the entrance of checking fluid to said relief passage.

7. A door check and closer having, in combination, a casing, a vertical door supporting spindle, a lower bearing in the casing in which the lower end of the spindle is supported and including anti-friction means on which such lower end rests for rotation, a screw top for the casing having an upper bearing for the spindle, said upper bearing having its inner end formed to carry the force of checking fluid around the spindle, a plunger dividing the casing into lower and upper chambers and having an axial portion surrounding the spindle, means engaging the plunger to cause it to rise toward said fluid-parrying end when the spindle is given a door-opening rotation, and a relief passage for checking fluid having its inception at the lower chamber and extending to a point within the area at which such axial portion surrounds the spindle.

8. In a door check and closer of the class having a door supporting spindle and a plunger which is moved against checking fluid in a chamber during the door-closing rotation of the spindle, an axial portion on the plunger surrounding the spindle for an axial distance at a point remote from said chamber, said axial portion and spindle having interengaging contact for forcing the proper actuation of either of these parts by the actuation of the other, and means between said chamber and axial portion forming a passageway for checking fluid, said passageway having its inception at said chamber and discharging at a point between said spindle and surrounding axial portion.

9. In a door check and closer of the class having a door supporting spindle and a plunger which is moved against checking fluid in a chamber during the door-closing rotation of the spindle, an axial portion on the plunger surrounding the spindle for an axial distance at a point remote from said chamber, said axial portion and spindle having interengaging contact for forcing the proper actuation of either of these parts by the actuation of the other, means between said chamber and axial portion forming a passageway for checking fluid, said passageway having its inception at said chamber and discharging at a point between said spindle and surrounding axial portion, and a valve in said passageway for controlling the flow of checking fluid therein, said valve being disposed adjacent said chamber.

10. A door check and closer having, in combination, a vertical casing, a door supporting spindle vertically disposed therein, bearings for the spindle, comprising a lower bearing disposed within the lower portion of the casing and an upper bearing formed in the top cover thereof, the latter being formed at its inner end and around the spindle with means for parrying checking fluid, a plunger providing lower and uppper chambers within the casing and formed adjacent the upper chamber with an axial portion having interengaging contact with the spindle for forcing proper actuation of either of these parts by the actuation of the other, a door closing spring disposed in the upper chamber and acting on the plunger, means between the lower chamber and said axial portion forming a relief passageway for checking fluid from said chamber, said passageway discharging at a point of the interengaging contact between said axial portion and spindle, and a valve in said passageway controlling the flow of checking fluid therein, said valve being disposed adjacent the lower chamber.

EMIL BOMMER.