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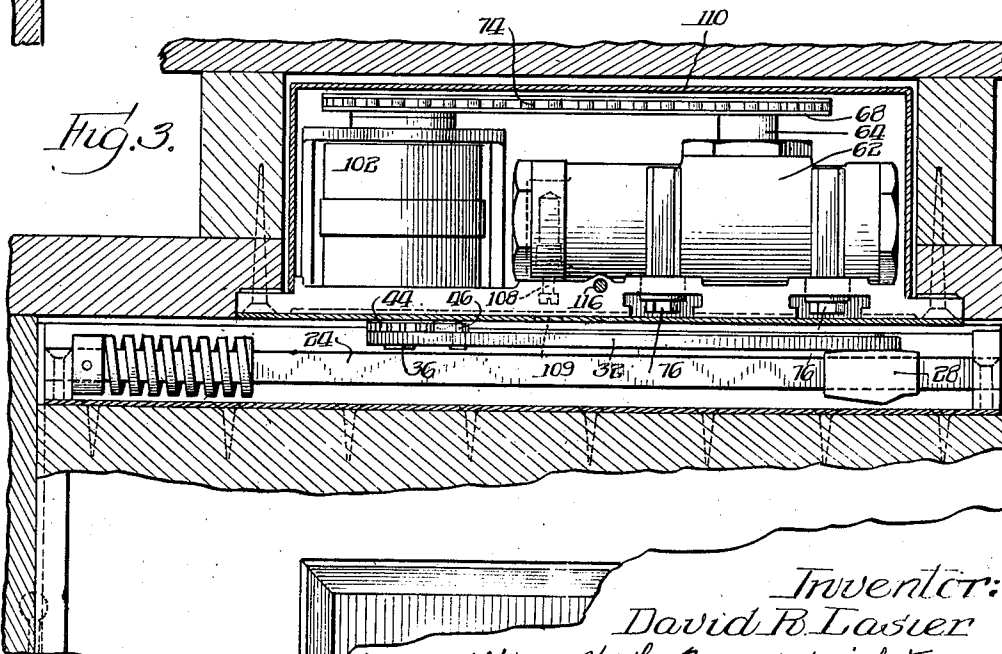
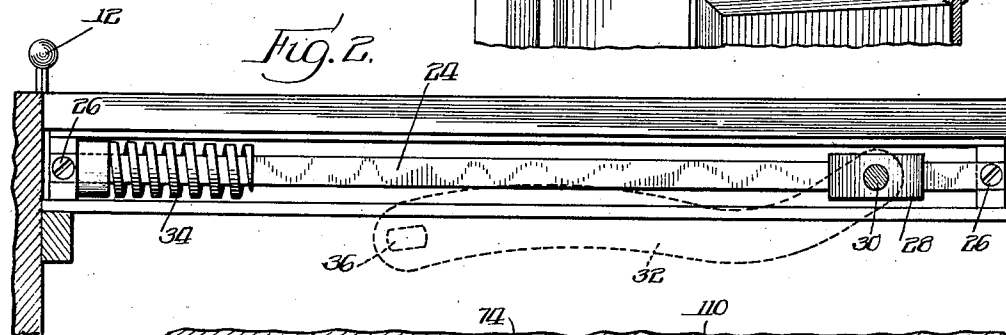
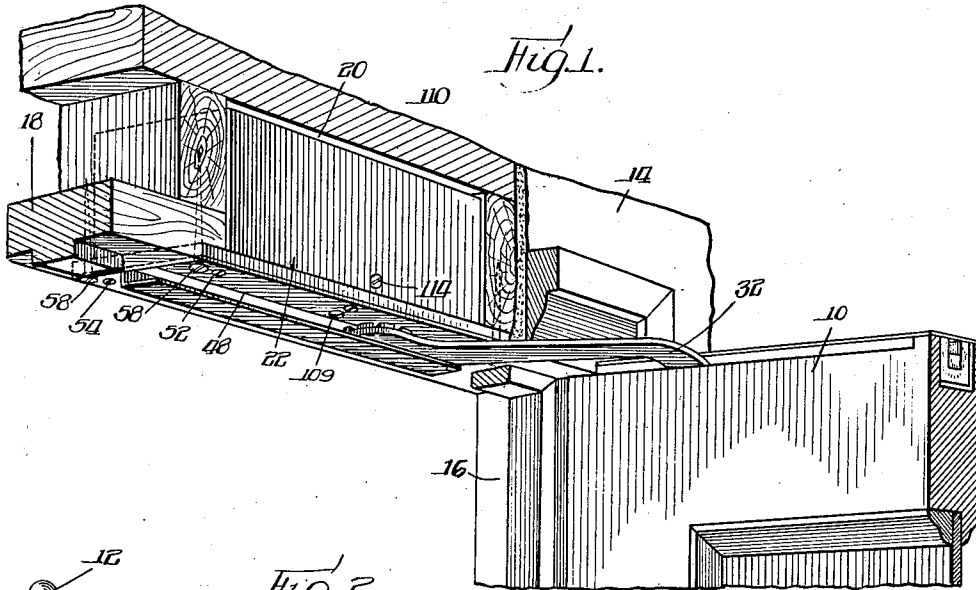
D. R. LASIER

2,082,455

DOOR CLOSING AND CHECKING DEVICE

Filed Feb. 19, 1934

2 Sheets-Sheet 1



Inventor:
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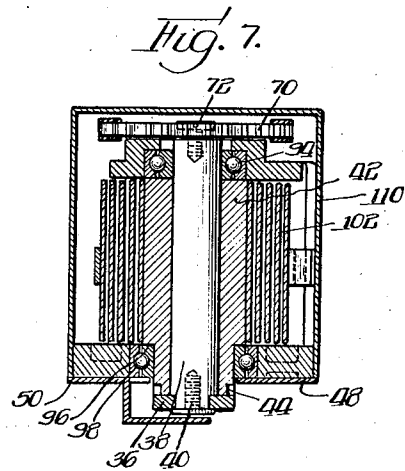
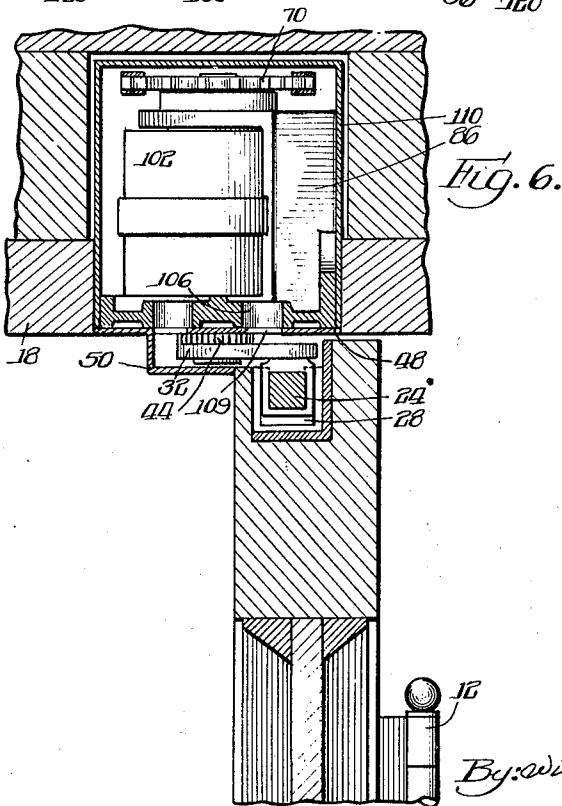
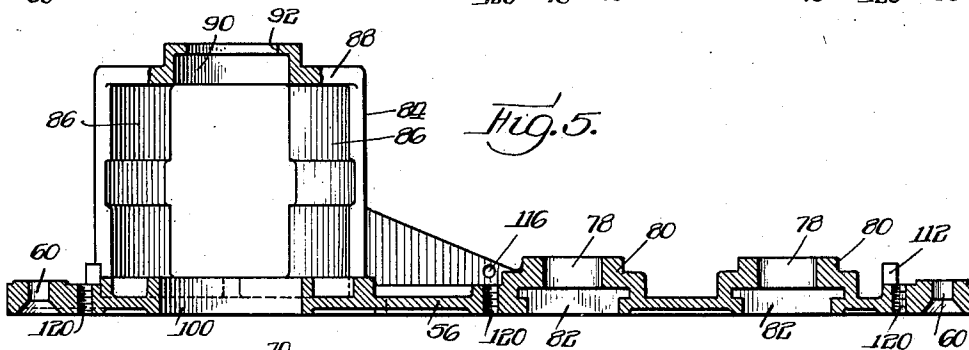
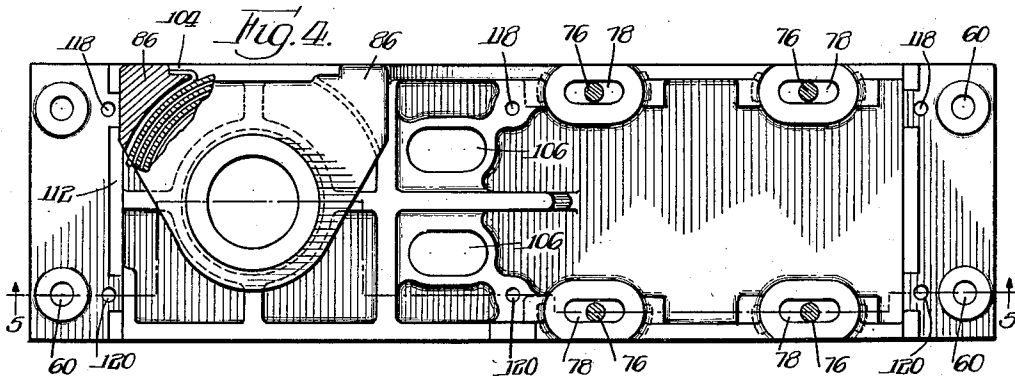
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DOOR CLOSING AND CHECKING DEVICE

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,082,455

DOOR CLOSING AND CHECKING DEVICE

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6 Claims. (Cl. 16—49)

This invention relates to improvements in door closing and checking devices of the concealed type mounted in the head frame of the door casing above the door and the improvements disclosed are particularly applicable to such a device which is single acting for controlling the closing of a door against a door stop or jamb.

It is an object of the present invention to disclose an over-head door closing and checking device, all the mechanism of which is fully concealed when the door is in its closed position.

It is further an object of the present invention to disclose an improved construction in which adjustments may be made from the under side of the door closing and checking device without removing the frame or support therefrom the head frame of the door casing. More particularly the two speed adjustment for the door closing and door latching speed is accessible for adjustment without removal of any parts and the tension of the door closing spring may be adjusted and finally the securing means for holding the checking cylinder in adjusted position is accessible from the underside of the support therefor.

Further improvements relate to the mechanical design of the parts which enables convenient assembly of the parts and a design which will withstand the heavy strains to which the parts of the device may be subjected when in use.

Various other objects and advantages of my improvements will be more readily apparent from the following description taken in connection with the attached drawings, in which—

Figure 1 is a perspective view partially in section showing the connection of the door to the door closing and checking device;

Figure 2 is a plan view of the top edge of the door showing the lever in dotted lines;

Figure 3 is a sectional elevation of the actuating parts for the door closing and checking device with the door in closed position;

Figure 4 is a plan view of the supporting plate for the door closing and checking device partially showing in section a portion of the door closing spring.

Figure 5 is a sectional elevation of the supporting plate on the plane indicated 5—5 in Figure 4;

Figure 6 is a cross sectional view taken through the door, door casing and the door closing and checking device, and

Figure 7 is a detail cross section to show the mounting of the door closing spring.

The door 10 is shown mounted by butt hinges 12 on the door casing 14. The door is permitted

to swing in only one direction and in its closed position seats against the door jamb or stop 16 of the door casing. The head frame 18 of the door casing is recessed as at 20 to receive the door closing and checking device 22. It will be understood that the overhead concealed door closer and checking device, as herein disclosed, is equally adaptable to a metal frame and door as well as a wood frame and door, as herein specifically disclosed. In the upper edge of the door a track 24 is secured by screws 26. A slide 28 is slidably mounted by the track 24. The slide 28 has a pivot 30 for connection with one end of the S-shaped actuating lever 32. It will be understood that the lever 32 is so designed that the door may be swung open to 180° from its closed position. A cushioning spring 34 may be mounted at one end of the track 24, as shown in Figures 2 and 3, for cushioning engagement with the slide 28 at the maximum open position of the door.

The lever 32 is provided with a slot 36 at one end for connection with the lower end of the drive shaft 38 of the door closing and checking device. As shown in Figure 7 the lever 32 is held in position with respect to the spindle shaft 38 by a screw 40. A ratchet sleeve 42 is mounted concentric with the shaft 38 and the protruding lower end of the sleeve 23 has ratchet teeth 44 for engagement with a pawl 46 pivotally carried on the upper side of the lever 32.

In order to conceal the operating parts so far as possible, a pair of plates 48 and 50 are provided. The flat plate 48 is secured by screws 52 to the underside of the door closing and checking device immediately over the door when the door is in closed position. This plate 48 may be cut out to fit around the ratchet sleeve 42. The plate 50 is a Z-shaped plate attached by screws 54 to the underside of the door closing and checking device in place of the door jamb 16 that has been cut away by the provision of the recess 20 in the head frame. As shown by Figure 6 the plate 50 overlaps the lower end of the spindle 38 and extends adjacent to the upper edge of the door when the door is in closed position to fully conceal the actuating lever 32.

The door closing and checking device includes a supporting frame 56 attached to the head frame of the door casing by the screws 58 extending through the openings 60 shown in Figures 4 and 5. Upon the upper side of the plate 56 is mounted a fluid checking device 62 which is of the customary type including a cylinder and a piston actuated by the vertical drive spin-

dle 64, which protrudes upwardly from the checking cylinder. It will be understood that this arrangement is necessary because of difficulty of properly sealing the bearing for the spindle unless it is on the upper side of the checking cylinder. The spindle 64 has mounted thereon a drive sprocket 68.

The spindle 38 previously referred to has mounted at its upper end a sprocket 70 which is held in position by a screw 72. A continuous chain 74 constitutes the driving connection between the sprockets 70 and 68. In order to keep the chain 74 tight, the checking cylinder 62 is adjustably secured by bolts 76 which pass through slotted openings 78 formed in the supporting seats 80 of the supporting plate 56. The heads of the bolt 76 are on the underside of the plate 56 and are received in recesses 82.

At one end of the plate 56 an integral upward extension 84 is provided, including spaced posts 86 and a top plate 88 forming a bearing seat 90, the upper end of which has an annular flange 92. As shown in Figure 7, the bearing seat 90 receives the ball bearing 94 which constitutes the bearing for the upper end of the spindle 38. The sprocket 70 is mounted on the spindle 38 above the flange 92. The ratchet sleeve 42 is shouldered as at 96 for support on a ball bearing 98 which is pressed into the bearing seat 100 formed in the plate 56. A flat coiled spring element 102 surrounds the sleeve 42, the inner end of the spring 102 being attached to the sleeve 42 and the outer end 104 of the spring is bent to anchor on one of the posts 86, depending upon the direction in which the door is mounted to swing, as shown in Figure 4.

From the construction disclosed it will be understood that the movement of the door from its closed position will rotate the sleeve 42 in a direction to tighten the spring 102. The tension of the spring in the closed position of the door may be adjusted by rotation of the sleeve 42 relative to the spindle 38 and the parts may be locked in adjusted position by the pawl 46, whereupon the sleeve 42 will rotate as a unit with the spindle 38.

The frame plate 56 is provided with a pair of spaced openings 106 so disposed that the regulating screw 108 associated with the checking cylinder 62 is accessible for adjustment through one of these openings 106, the particular opening depends upon whether the checking device is assembled for a right or left hand door. When the device is completely installed the regulating screw 108 is accessible for adjustment through the opening 106 in plate 56 and an opening 109 in plate 48. It will be understood that the screw 108 may be adjusted to vary the checking action throughout the closing movement of the door and particularly to obtain an independent adjustment for the latching speed of the door.

After assembly of the mechanism on the supporting plate 56, the parts may be covered by a dust-proof box 110, the position of which is determined by shoulders 112 at the opposite ends of the plate 56 and the box 110 is secured in position by screws 114 extending through the box into openings 116 formed in upward extensions from the plate 56 at the opposite sides thereof. The frame plate 56 is further provided with openings 118 to receive the screws 52 which attach the plate 48 and openings 120 to receive the screws 54 for attaching the plate 50.

I claim:

1. In an overhead door closing and checking

device, a door frame having a door stop thereon, a door hinged to said door frame to swing in one direction away from said door stop, the head frame of said door frame having a recess cut therein through said door stop, a door closing and checking device concealed in said recess and including an operating spindle extending downwardly therefrom, a lever operatively connected with said spindle at one end and slidably connected at the other end with the upper edge of said door and a closing plate applied to the underside of said door closing and checking device in place of the cut-away door stop in position to extend adjacent to the door and to conceal the operating lever when the door is in closed position.

2. In a device of the class described, a door frame, the upper sill of said door frame having a recess therein, a frame plate secured to said upper sill in a position to close the bottom of said recess, door closing and checking mechanism mounted on said plate and concealed within said recess including an operating spindle protruding downwardly from said plate, a plate fixed to the underside of said frame plate in a position to be above the upper edge of the door when the door is in closed position, a second plate fixed to the underside of said frame plate in a position to conceal the lower end of said spindle and to contact the upper side edge of the door when said door is in closed position, said last-mentioned plates being vertically spaced to receive and conceal an operating lever connected at one end to said spindle and slidably connected at the other end to the edge of said door.

3. An overhead door closing and checking device adapted to be concealed in the door casing above the door comprising, a frame member adapted to be secured to said door casing, said frame member including a bottom plate and an upper plate, posts through which said upper plate is supported from said bottom plate, a coiled door closing spring positioned between said plates and anchored at its outer end upon one of said posts, said plates having bearings therein, a drive spindle mounted in said bearings and connected to the inner end of said spring, said spindle extending above and below said spaced plates, a lever through which the lower end of said spindle is adapted to be operatively connected to the door, a fluid checking device mounted on the upper side of said bottom plate at one side of said spring, said fluid checking device including an upwardly extending spindle and flexible means for operatively connecting the upper end of said first spindle to said second spindle.

4. An overhead door closing and checking device adapted to be concealed in a door casing above the door comprising, a frame, said frame including a bottom plate, a pair of upwardly directed posts thereon, an upper plate integrally supported on said posts spaced from said bottom plate, a coiled door closing spring received between said spaced plates and anchored at its outer end upon one of said posts, antifriction bearings mounted in said plates, a ratchet sleeve supported for rotation by the bearing in the bottom plate and connected to the inner end of said spring, said sleeve extending beneath said bottom plate and having ratchet teeth thereon, a spindle shaft rotatably mounted in the bearing carried by said upper plate and extending downwardly through said sleeve, a door operated lever keyed to the lower end of said spindle shaft and adjust-

ably connected to the ratchet teeth on said sleeve, said spindle shaft extending above said upper plate, a sprocket fixed to the upper end of said spindle shaft above said plate, a fluid checking cylinder mounted on said bottom plate at one side of said spring, said cylinder having a rotatable shaft upwardly extending therefrom, a sprocket on said shaft and a flexible chain for connecting said sprockets.

5. An overhead door closing and checking device adapted to be installed in a recess cut into the head frame of the door frame and through a portion of the door stop thereon comprising a supporting plate, door closing and checking means mounted on the upper side of said plate, an operating spindle connected to said door closing and checking means and projecting through and beneath said plate, a door operated lever connected to the projecting end of said spindle and a cover plate secured to the underside of said supporting plate and having a flange parallel to but spaced from said supporting plate extending be-

neath the lower end of said spindle, a portion of said lever being received in the space between said flange and supporting base when the door is in closed position.

6. An overhead door closing and checking device adapted to be installed in a recess cut into the upper sill of a door frame comprising a supporting plate, door closing and checking means mounted on the upper side of said plate, an operating spindle connected to said door closing and checking means and having its lower end projecting through said plate, a door operated lever secured to the lower end of said spindle beneath said plate, a cover plate secured to the under side of said supporting plate in position to serve as a portion of the usual door stop, said cover plate having a portion spaced from said supporting plate and adapted to extend beneath and conceal a portion of the operating lever when the door is in closed position.

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