March 18, 1952 H. H. GARY 2,589,795

QUICK-OPENING MANHOLE

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Fig. 1.

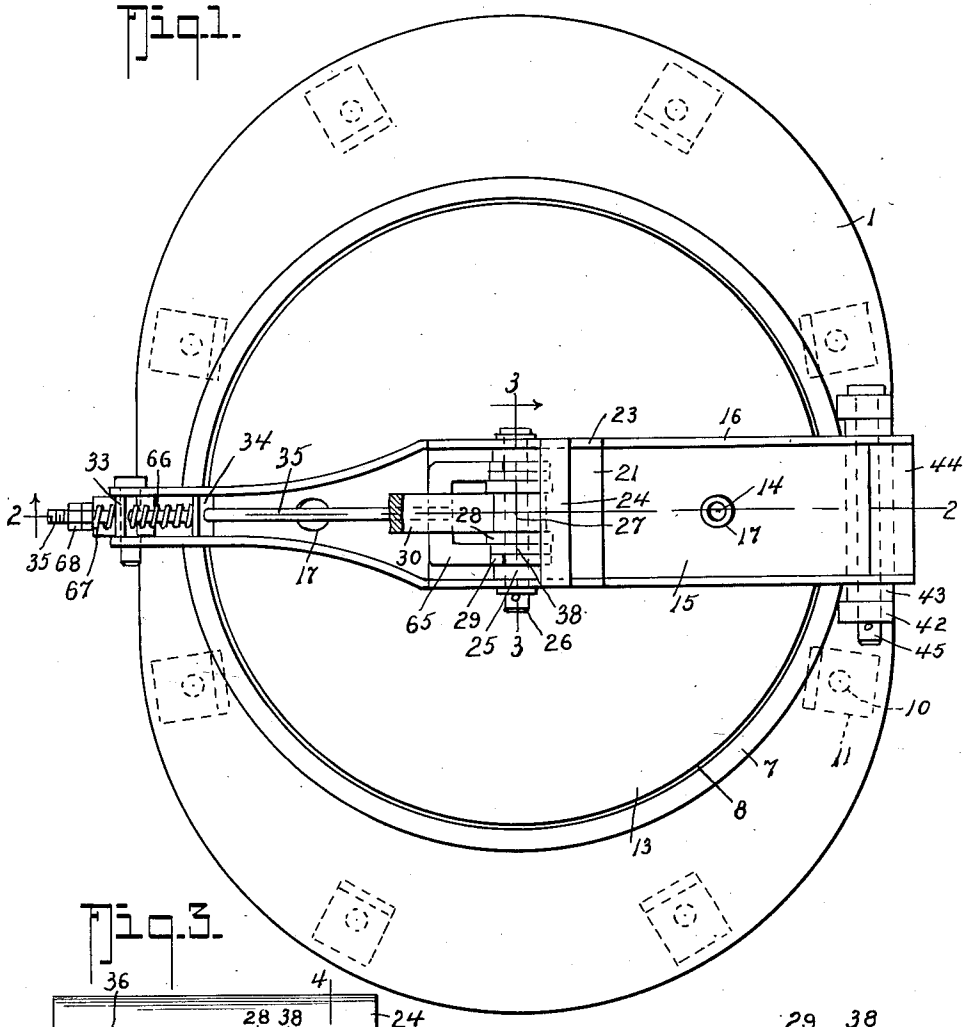


Fig. 3.

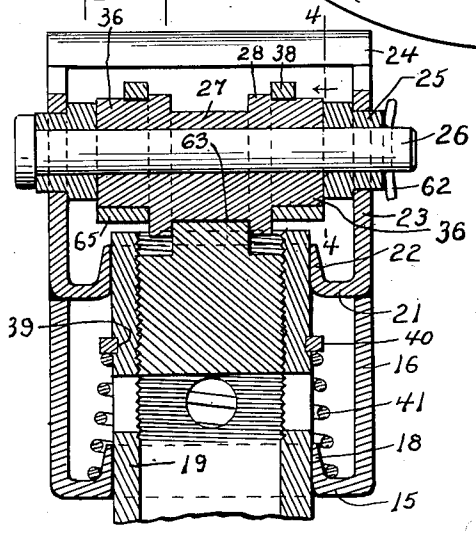
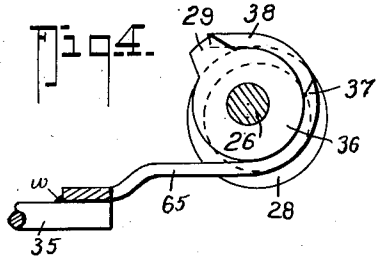


Fig. 4.



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Fig. 2.

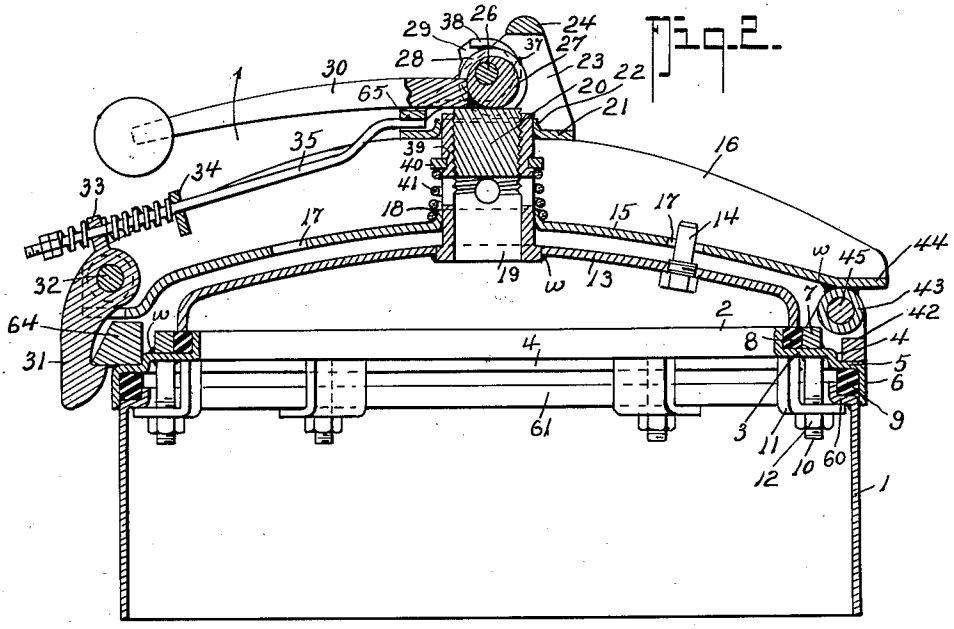
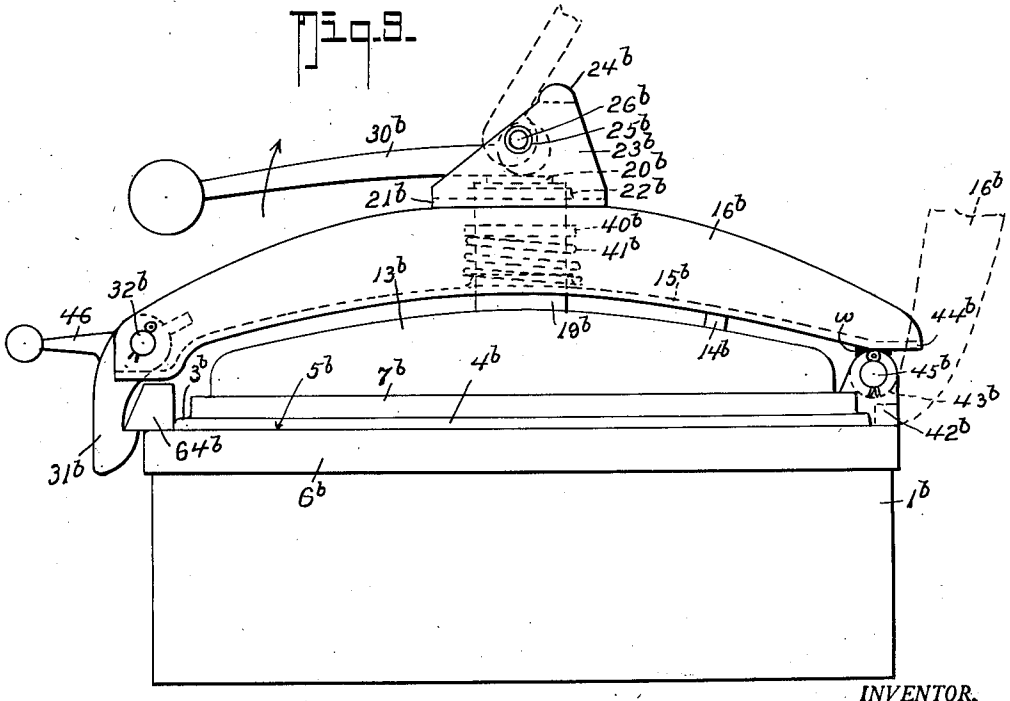


Fig. 3.



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Fig. 5.

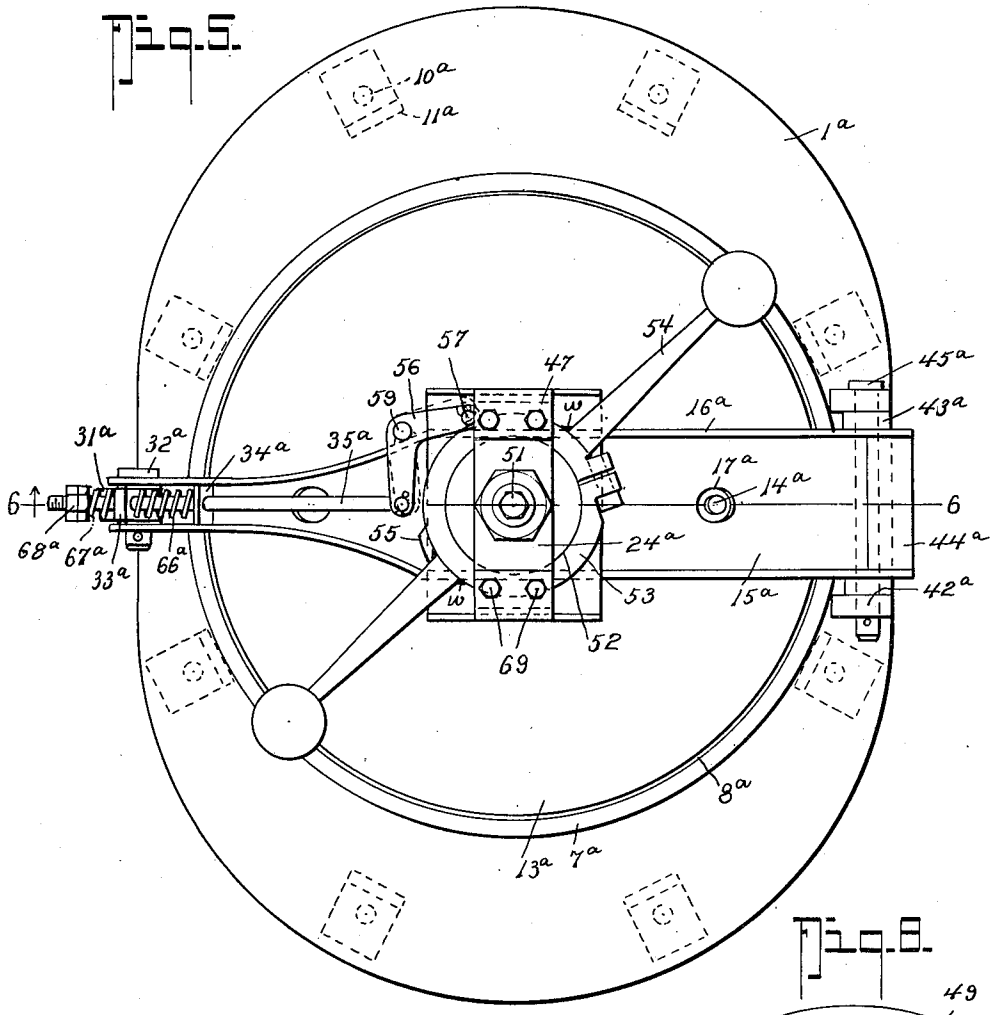


Fig. 8.

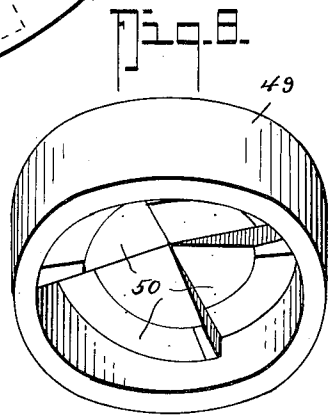
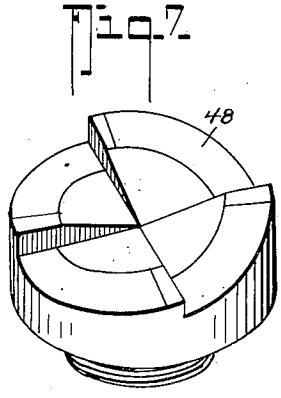


Fig. 7.



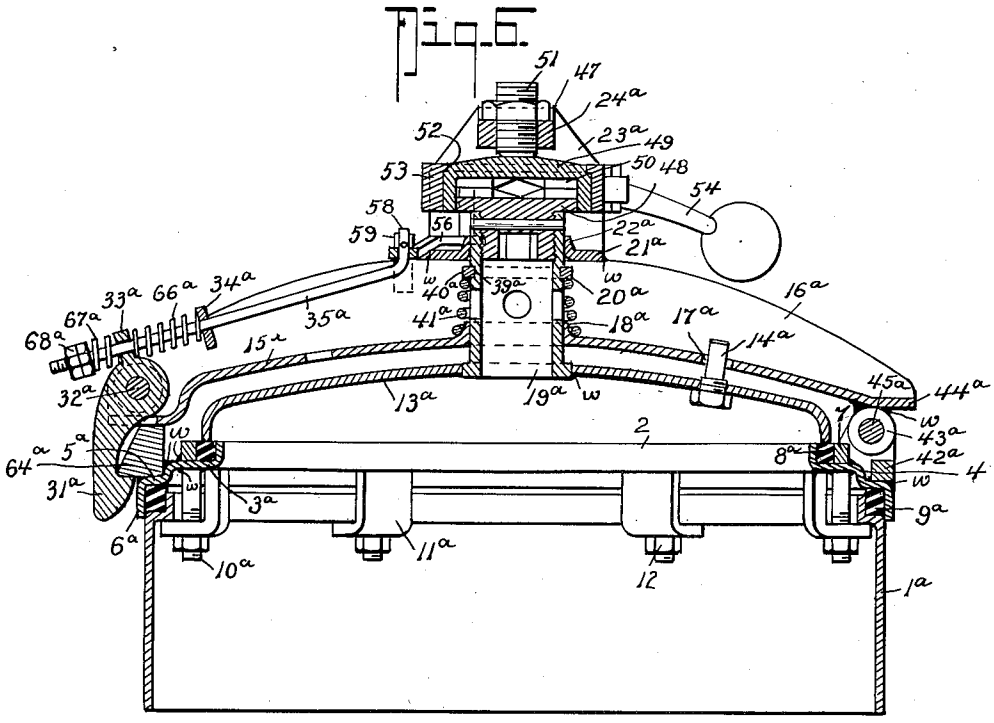
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Fig. 6.



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QUICK-OPENING MANHOLE

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Application December 6, 1946, Serial No. 714,488

2 Claims. (Cl. 220—57)

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My present invention relates to quick-opening manholes, handholes and the like, and consists of new and useful improvements to apparatus of the general type on which Letters Patent No. 2,318151 were granted to me on May 4, 1943, and has for its objects to provide additional and improved means of axially moving the cap into and out of engagement with its gasket prior to any angular movement of the yoke on its hinge; to provide additional and improved means for latching and unlatching the yoke; and to provide a manhole and cover which is adapted to be manufactured largely from thin metal stampings in contrast to the thick metal castings contemplated in my previous invention, thus greatly decreasing the weight, which is highly desirable especially when the apparatus is used in connection with truck tanks and the like to the end that "pay load" may be substituted for dead load. (This latter object of my invention relates especially to the novel means provided for gasketing the structure.)

Other objects will in part be obvious and in part be pointed out hereinafter.

To the attainment of the aforesaid objects and ends invention still further resides in the novel details of construction, combination and arrangement of parts, all of which will be first fully described in the following detailed description, and then be particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which:

Fig. 1 is a top plan view of one embodiment of my invention.

Fig. 2 is a vertical section on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged detail section on the line 3—3 of Fig. 1.

Fig. 4 is a detail section on the line 4—4 of Fig. 3.

Fig. 5 is a top plan view of another embodiment of the invention.

Fig. 6 is a vertical section on the line 6—6 of Fig. 5.

Fig. 7 is an enlarged detail perspective view of the male cam member.

Fig. 8 is an enlarged detail perspective view of the female cam member.

Fig. 9 is side elevation of a modification of the embodiment shown in Figs. 1 and 2.

In the drawings in which like numerals and letters of reference indicate like parts in all the figures, 1 represents a manhole ring having an inwardly directed portion 60 at right angles to the ring proper, and an internal upwardly extended annular flange 61, forming a seat for a gasket 9.

A frame for attachment to the ring 1 is formed principally of sheet metal and is composed of an outer rim 6, a lower annular seat portion 5, at

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right angles to the rim 6, an intermediate rim 4, an upper annular flat portion 3, and an inner upstanding rim 2. A ring 7 is welded, at *w*, to the portion 3 at a suitable distance from the rim 2 to provide a pocket for the gasket 8. Threaded studs 10 are welded to the under face of the frame portion 3 and cooperate with L-shaped clamps 11 and nuts 12 to secure the frame to the ring 1.

The cap 13 is of the same general form as that, 32, of my patent aforesaid. It has a keeper 14 that passes through a hole 17 in the yoke 15 and has welded to it, the hub 19. In said hub 19 is provided a groove 39 in which is set a split ring 40. A coiled spring 41 lies between the split ring 40 and the yoke 15 and continuously tends to move the cap 13 axially toward the yoke. The yoke 15 is of thin metal stamped with flanges 16 to the top of which the base of a guide and cam-shaft-suporting member 21 is welded. The member 21 has a guide boss through which the hub 19 projects. It also has sides 23 joined by a bridge bar 24 and provided with bearings 25 for the cam shaft 26, the latter being held in place by a cotter pin 62, as best shown in Fig. 3. The yoke is also provided with a guide boss 18 through which the hub 19 projects and the hub 19 is threaded to receive the threaded plug 20.

Suitably mounted on the shaft 26 is a main cam member between the flanges 28 of which the projection 63 of the plug 20 lies. The cam member has a cam 27 to engage the projection 63 and cams 29 to engage the fingers 37 of the latch-releasing fork 65. The fork 65 has extensions 38 constituting guide members to overlie the circular ends 36 of the main cam member, as best shown in Figs. 3 and 4. A handle 30 is welded to the cam 27 (see Fig. 1). A latch keeper 64 is welded to the frame and cooperates with a latch 31 that is pivoted to one end of the yoke 15 by a pivot pin 32 mounted in the flanges 16. This latch keeper 64 also serves as a stop for the yoke 15. The latch has an apertured lug 33 through which and through an apertured rib 34 welded to and between the flanges 16, a latch releasing rod 35 passes, and to which the fork 65 is welded.

The yoke 15 is welded to one member 43 of a hinge joint another member 42 of which is welded to the frame, the two members 42 and 43 being connected by a hinge pin 45. The yoke 15 is extended beyond the hinge as at 44 to comprise a stop.

A coil spring 66 lies between the lug 33 and the rib 34 and continuously tends to move the latch 31 to latching position and overcome the tension of a buffer spring 67 which lies about the rod 35 between the lug 33 and the adjusting nuts 68.

The foregoing completes a description of the

structure of the first embodiment of my invention.

By reference to Figs. 1 and 2 it will be seen the parts are in the "closed" position. Upon lifting the lever **30**, the cam **27** will first release the plug **20** (whereupon spring **41** will lift cap **13**) and upon further movement the cams **29** will engage the fingers **37** and push the fork **65** from left to right in Figs. 2 and 4, thereby releasing latch **31**. Further lifting of lever **30** will bring it against bridge bar **24** as a stop and thereafter further moving of the lever in the direction of the arrow (Fig. 2) will raise the yoke and cap to slightly beyond vertical position where it will remain of its own weight.

By arranging the position of the apparatus so that the yoke **15** lies in the longitudinal direction of the vehicle and with the hinge joint forward, when the vehicle starts forward, the "jerk" thereof will automatically cause the yoke to fall and the latch to engage its keeper to again latch the cover or cap closed.

If desired, the automatic latching devices may be omitted and in that event the latch **31b** is provided with a handle **46** for releasing the latch (see Fig. 9).

In Figs. 5 to 8 inclusive I have shown another embodiment of my invention. In these figures those parts which are of substantially the same construction as like parts in the preceding figures bear the same reference numbers plus the index letter *a* and need not be further described here.

In this embodiment the plug **20a** has a male cam **48** which cooperates with a female cam consisting of a cup **49** containing the cam element **50** (see Figs. 6, 7 and 8). The member **21a**, instead of having an integral bridge bar, has flanges **47** to which a bridge bar **24a** is bolted or secured by cap screws **69** (see Figs. 5 and 6). An adjusting screw **51** is mounted in the bar **24a** and holds the cams **48** and **50** in constant engagement, with the assistance of the spring **41a**.

The cup member **49** has a groove **52** to receive a flanged clamp **53** which carries radial arms **54** by means of which the female cam member may be turned about the axis of the plug **20a**, to tighten or release the cap **13** on its seat accordingly as the cup member **49** is turned in one direction or the other.

The clamp ring **52** has a cam **55** to engage a stud **57** on a bell crank lever **56** that is pivoted at **59** to the yoke and to the other arm of which the latch-releasing rod **35a** is connected as at **58**. The cam **55** is so positioned that the first part of the turning of arms **54** from the position shown serves to release the cap and further movement causes cam **55** to engage the stud **57** and rock the bell crank to release the latch.

Reverse movement of arms **54** first releases the latch and after latching takes place, further movement of the arms in the same direction forces the cap to closed position. The screw connection between plug **20** and hub **19** (Figs. 2 and 3) and the adjusting screw **51** (Fig. 6) provide means for adjusting the cap axially with respect to its gasket.

From the foregoing description taken in connection with the accompanying drawings it is thought the construction, operation and advantages of my invention will be clear to those skilled in the art.

What I claim is:

1. In a quick-opening manhole, a manhole ring and a frame sealed thereto, said frame carrying a gasket, a cap adapted to seat against said gasket, a yoke pivoted at one end to said frame and extending diametrically across said frame, a latch carried by said yoke at its other end and a latch keeper on said frame for said latch, a hollow hub secured to said cap and projecting upwardly through said yoke in sliding relation therewith, a ring secured to said hub superjacent said yoke, a spring interposed between said ring and yoke for urging said cap towards said yoke, a shaft rotatably mounted in said yoke, a cam on said shaft, a plug secured in the upper end of said hub and having its upper end terminating in sliding engagement with the lower face of said cam, and means for actuating said cam for compressing said spring and axially moving said cap into engagement with said gasket subsequent to the latching of said yoke.

2. In a quick-opening manhole, a manhole ring and a frame sealed thereto, said frame carrying a gasket, a cap adapted to seat against said gasket, a yoke pivoted at one end to said frame and extending diametrically across said frame, a latch carried by said yoke at its other end and a latch keeper on said frame for said latch, a hollow hub secured to said cap and projecting upwardly through said yoke in sliding relation therewith, a ring secured to said hub superjacent said yoke, a spring interposed between said ring and yoke for urging said cap towards said yoke, a shaft rotatably mounted in said yoke, a cam on said shaft, a plug secured in the upper end of said hub and having its upper end terminating in sliding engagement with the lower face of said cam, a fork supported on said shaft, cam members mounted on said shaft and engageable with the ends of said fork, a rod having one end secured to said fork with the other end secured to a lug on said latch and a handle secured to said cam for rotating said shaft and cam members for moving said fork and rod to latch said yoke prior to the engagement of said cam with said plug for compressing said spring and axially moving said cap into engagement with said gasket.

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