May 22, 1951 E. OLYOTT 2,553,934

MANHOLE COVER CONSTRUCTION

Filed July 24, 1948

Fig. 1

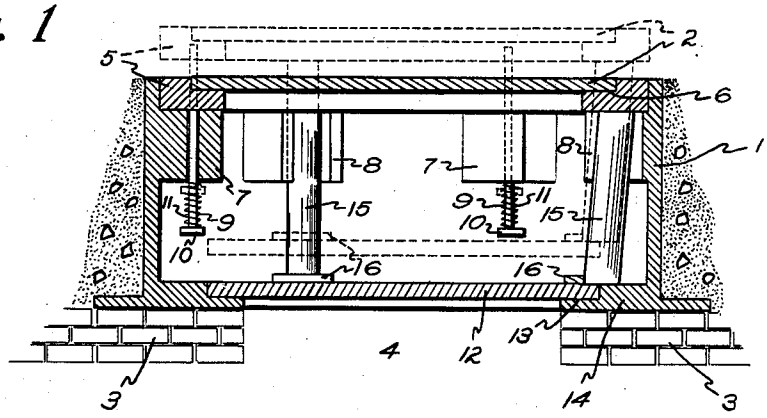


Fig. 2

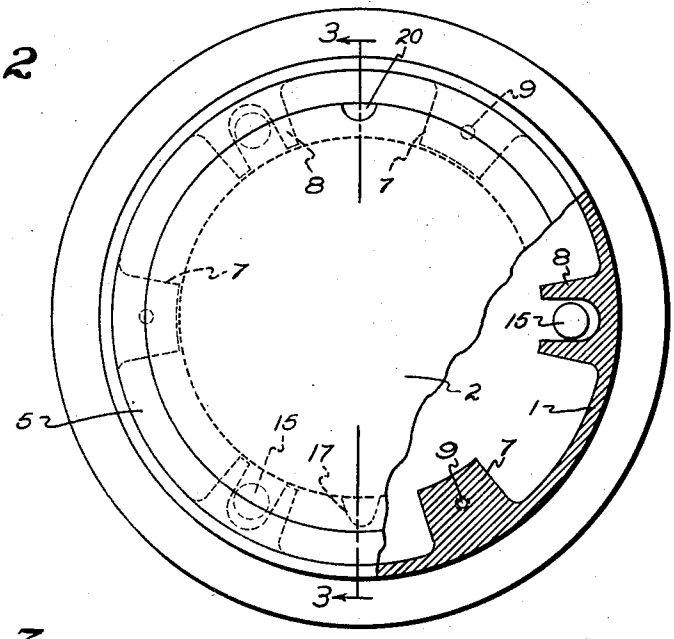
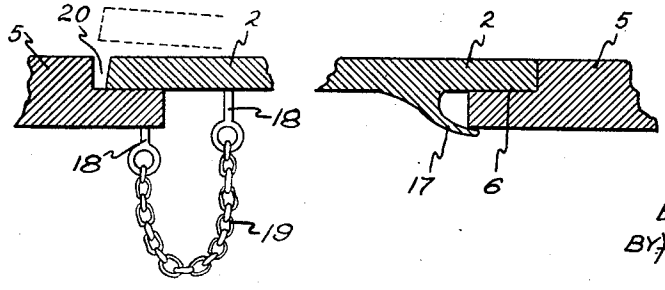


Fig. 3



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MANHOLE COVER CONSTRUCTION

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5 Claims. (Cl. 94—34)

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This invention relates to manhole cover constructions and particularly to devices of this sort which are sometimes referred to as "safety manholes," in that the cover element is so mounted that it can have only a limited upward movement when it is lifted from its seat by an explosion in the manhole, or from any other causes, and cannot be blown free and clear from the body member.

One object of my present invention is to provide a so-called "safety manhole construction" in which the seat portion, on which the cover element rests, is made as a separate element from the housing or body member, and in which said seat element is so supported on the body member that it can have a limited upward movement only, and in which means is provided whereby whenever an abnormal pressure develops within the manhole the seat member with the cover resting thereon will be raised sufficiently to vent the manhole.

In order to give an understanding of my invention I have illustrated herein a selected embodiment thereof which will now be described after which the novel features will be pointed out in the claims.

In the drawings:

Fig. 1 is a vertical sectional view through a manhole construction embodying my invention;

Fig. 2 is a plan view with a part broken out; and,

Fig. 3 is a fragmentary section on the line 3—3 Fig. 2.

My improved manhole cover construction comprises a body member or hatch 1 on which the cover 2 is supported, said body member or hatch being supported on a suitable foundation 3 as usual in manhole cover constructions, said foundation 3 surrounding the manhole proper 4.

In my present invention the cover 2 is supported by a seat element or cover-supporting member 5 which is separate from the housing or hatch 1. The seat member 5 is an annular member and is provided with a seat portion 6 on which the cover 2 rests. The seat element 5 is normally supported by inwardly projecting lugs or projections 7 and 8 with which the hatch 1 is provided.

The seat element 5, which as stated above is separate from the hatch or body 1, is permanently secured to the body 1 in such a way that it can have a limited vertical movement relative thereto during which the seat element will be carried above the upper end of the body, as shown by dotted lines in Fig. 1. For this purpose the seat element 5 is shown as provided with a plurality of pins 9 each provided at its lower end with a head 10, said pins extending loosely through the lugs or projections 7. Situated between the head 10 of each pin and the corresponding projection 7 is a spring 11 which encircles the pin, said springs yieldingly holding the seat 5 in its operative lower position shown in full lines in Fig. 1.

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Any desired number of these pins 9 and springs 11 may be employed and as herein illustrated there are three of them.

As stated above, means are provided whereby whenever an abnormal pressure is developed within the manhole 4, such as would be caused by an explosion, the seat element 5 with the cover 2 mounted thereon will be raised above the housing or hatch 1 into the dotted line position Fig. 1, thereby venting the manhole. The upward movement of the seat element is limited by the heads 10 on the pins 9 cooperating with the lugs or projections 7.

When the abnormal pressure subsides the springs will return the seat element 5 with the cover 2 thereon to normal position shown in full line Fig. 1.

The means I have provided for thus raising the seat element 5 with the cover 2 loosely resting thereon includes a lifting member in the form of a disk situated within the body member and subject to any upward pressure resulting from the development of abnormal pressure within the manhole, such as would be occasioned by an explosion, and means for transmitting such upward pressure to the seat element.

In the construction hereinafter shown the lifting member is in the form of a disk 12 which is normally supported on a seat 13 with which the housing or hatch 1 is provided. Said housing or hatch is shown as having the inwardly extending flange 14 at its lower end and the annular seat 13 for the disk 12 is formed on the inner edge of said flange 14.

Situated between the disk 12 and the seat element 5 are a plurality of thrust pins 15. Said thrust pins rest at their lower ends in seats 16 with which the disk 12 is provided near its periphery and their upper ends engage the under side of the seat element 5. The lugs or projections 8 function as guides for the thrust pins, each lug or projection having a groove or slot in its inner face in which the corresponding thrust pin is received.

Whenever any abnormal pressure develops within the manhole 4 such pressure will act

against the disk 12 and lift the latter and the disk 12 acts through the thrust pins 15 to lift the seat member 5 with the cover 2 resting thereon against the action of the springs 11, as shown in dotted lines in Fig. 1. The raising of the disk 12 will establish an annular opening between the periphery of the disk and the flange 14, and the raising of the seat member 5 will also establish an annular vent opening between said seat member and the top of the housing member. The disk 12 is slightly smaller in diameter than the seat member 5 and as a result the annular vent opening which is established between the disk 12 and the flange 14 when said disk is raised will have a less area than the vent opening established between the seat element 5 and the housing or hatch 1. As a result it will not be possible for any pressure to be built up in the space within the hatch between the disk 12 and the cover 2 which would tend to lift the cover 2 from its seat member. Hence, even when an explosion occurs in the manhole the cover will remain seated on the seat element 5 as the latter is raised to vent the manhole.

The cover 2 is constructed so that it can be manually removed from the seat element whenever it is necessary to inspect the manhole or for a person to enter it. In the construction herein shown the cover 2 is provided with a lip 17 adapted to engage the under side of the seat element, as shown in Fig. 3, and at a point opposite said lip 17 the cover is loosely attached to the seat element. This may conveniently be done by providing the cover with an eye bolt 18 and providing the seat element 15 with a similar eye bolt and then tying the two eye bolts together with a loose chain or other flexible connection, as indicated at 19.

The cover element is provided with a notch 20 opposite the lip 17 to receive a crow bar or other element for prying the edge of the cover upwardly into a position slightly above the seat element, as shown in dotted lines in Fig. 3. When one edge of the cover has been thus lifted then said cover may be moved laterally to withdraw the lip 17 from its engagement with the seat member. When this has been done the cover may be swung into an entirely open position thereby completely opening the manhole.

The chain element 19 is sufficiently long to permit this to be done.

It will be observed that with my invention the manhole cover cannot be blown free from the manhole when an explosion occurs, but instead it, and the seat element on which it rests, will simply be lifted sufficiently to vent the manhole and when the excess or abnormal pressure subsides the seat and the cover will be returned to normal position.

The cover 2 is shown as non-perforated. The advantage of this is that it makes the manhole both waterproof and dustproof.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is:

1. A manhole cover construction comprising an annular body member, a seat element at the top of the body member, means mounting said seat element on the body member for limited upward movement relative thereto, a cover loosely resting on the seat element, a seat-lifting element separate from the cover and normally closing the lower end of the annular body member and subjected to any abnormal pressure that may develop within the manhole, means interposed between the seat-lifting element and the seat element whereby upward movement of the seat-lifting element caused by the development of an abnormal pressure in the manhole will raise the seat element and the cover which is loosely resting thereon above the body member thereby venting the manhole, and yielding means to return the seat element, the cover and the seat-lifting element to normal closed position when the abnormal pressure in the manhole subsides.

2. A manhole cover construction comprising an annular body member, an annular seat element at the top of the body member, means mounting said seat element on the body member for limited upward movement relative thereto, a cover loosely resting on the seat element, a seat-lifting element normally closing the lower end of the body member and subjected to any abnormal pressure existing within the manhole, thrust pins situated between the seat-lifting element and the seat element, whereby when the seat-lifting element is raised by such abnormal pressure, the rising movement thereof is communicated to the seat element through the thrust pins and means to limit the upward movement of the seat-lifting element and seat element.

3. A manhole cover construction comprising an annular body member, an annular seat element at the top of the body member, means mounting said seat element on the body member for limited upward movement relative thereto, a cover loosely resting on the seat element, a seat-lifting element normally closing the lower end of the body member and subjected to any abnormal pressure existing within the manhole, thrust pins situated between the seat-lifting element and the seat element, whereby when the seat-lifting element is raised by such abnormal pressure, the rising movement thereof is communicated to the seat element through the thrust pins, and guiding lugs on the body member for positioning and guiding the thrust pins.

4. A manhole cover construction comprising an annular body or hatch, an annular seat element separate from and located at the top of said body member and movable vertically relative thereto, a permanent connection between the seat element and the body member, said permanent connection comprising spring means for yieldingly holding the seat element in operative position and means to limit the upward movement of the seat element relative to the body member against the action of the spring means, a cover separate from the seat element and loosely resting thereon and removable therefrom, and means responsive to the presence of an abnormal pressure in the manhole to raise the seat element with the cover loosely resting thereon above the top of the body member, thereby venting said manhole.

5. Manhole cover construction comprising an annular body member, an annular cover-supporting member separate from and located at the top of the body member, said cover-supporting member being movable vertically relative to the body member and having a central opening, means permanently connecting said cover-supporting member to the body member, said means including springs acting to hold the cover-supporting member yieldingly in operative position and also including means to limit the upward movement of the cover-supporting member relative to the body member against the action of

said springs, a cover separate from and supported loosely by the cover-supporting member and normally covering the opening therein, a lifting member within the body member which is subject to any upward pressure resulting from the development of abnormal pressure within the manhole, and means transmitting such upward pressure to the cover-supporting member, whereby said cover-supporting member with the cover loosely resting thereon will be raised for a limited distance from the body member by any destructive abnormal pressure developed within the manhole thus venting said manhole.

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