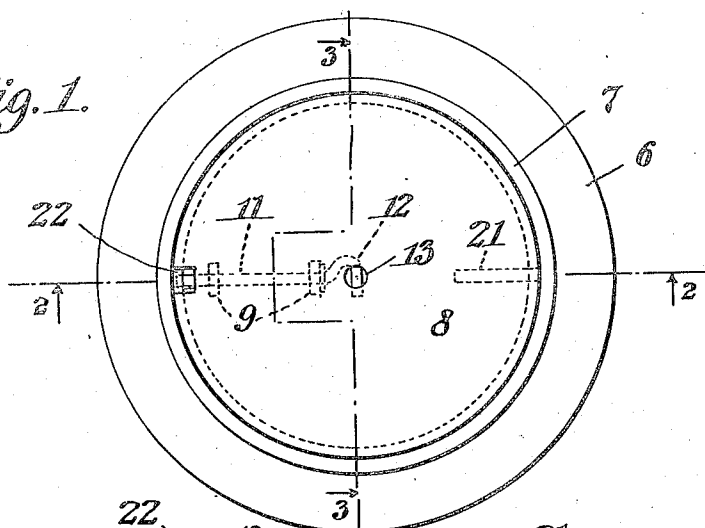


Jan. 15, 1935.

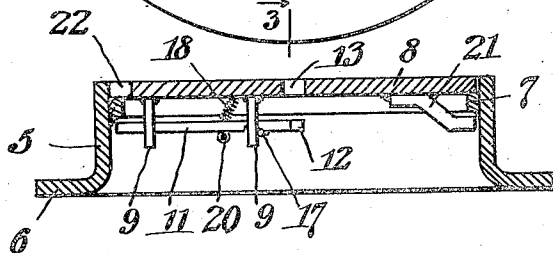
C. H. MOORE  
MANHOLE FRAME COVER  
Filed Oct. 28, 1932

1,988,360

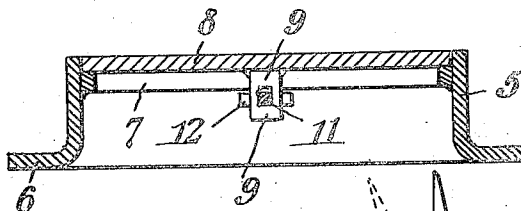
*Fig. 1.*



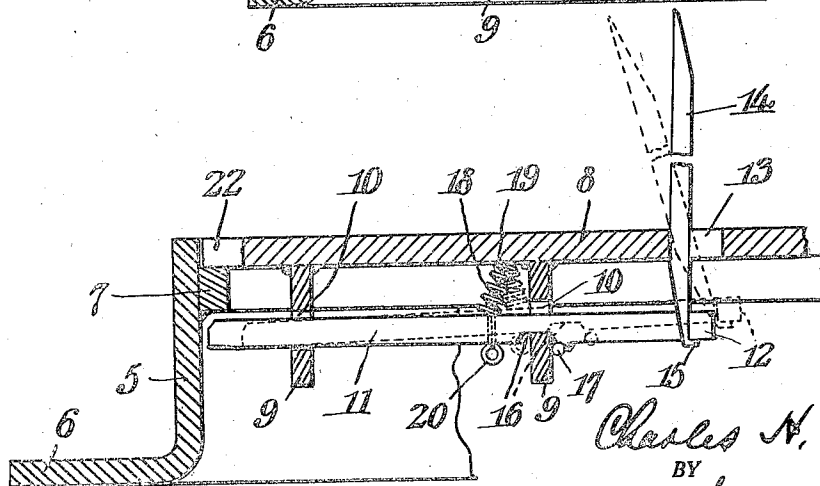
*Fig. 2.*



*Fig. 3.*



*Fig. 4.*



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## UNITED STATES PATENT OFFICE

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## MANHOLE FRAME COVER

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Application October 28, 1932, Serial No. 640,061

## 1 Claim. (Cl. 94—35)

This invention relates generally to street manhole frames and covers, and particularly to structures of this kind formed of pressed steel and involving a locking means to prevent accidental or unauthorized removal of the cover from the opening.

The primary object of the invention is to provide a frame and cover constructed in such manner as to at all times insure a proper seating of the lid or cover in the frame and to obviate the possibility of rattling.

A further object of the invention is to provide improved means for locking the cover in position within the frame.

With these objects in view, together with others which will appear as the description proceeds, the invention consists in the novel construction, combination and arrangement of parts, all as will be more fully disclosed hereinafter, illustrated in the drawing, and particularly pointed out in the claim:—

In the drawing:—

Fig. 1 is a top plan view of the improved manhole frame and cover constructed in accordance with the invention,

Fig. 2 is a transverse sectional view taken substantially upon the line 2—2 of Fig. 1 and disclosing the locking means in elevation,

Fig. 3 is a similar view taken upon the line 3—3 of Fig. 1, and

Fig. 4 is an enlarged fragmentary sectional view taken through the frame and cover and disclosing the construction and method of operation of the improved locking means.

It has heretofore been the practice to construct manhole frames and covers of cast metal, but an objection arises in that irregularities often occur either in the cover seat or in the cover itself causing an improper fit of the cover and resulting in an objectionable rattling of the cover when encountered by vehicular traffic. In instances where it is required that the cover be locked within the frame, it has been the practice to apply and lock the cover with a rotary movement of the cover. In removing the cover it has been necessary to release the locking means and then apply retrograde rotary motion to the cover in order to fully disengage the locking means. A serious objection to this method of locking is that after a time tar, grease, dirt and other foreign matter become packed in the groove between the cover and frame so tightly as to make it most difficult, if not impossible, for a single operator to give to the cover the rotary

movement, however slight, necessary to disengage the cover from the frame.

It is an object of the present invention to provide a manhole frame and cover of such character and construction as to obviate the above mentioned serious objections, as well as to provide a simplified and improved locking means which is assembled within the structure in such manner as to be proof against breakage, corrosion or derangement, which is at all times operable by those possessed of a knowledge of its construction and operation, which rigidly maintains the cover in locked position and which can not be readily operated except with the use of a special tool or implement.

Referring now more particularly to the drawing, the frame per se comprises a cylinder 5 of proper depth having an outwardly projecting annular flange 6 at its lower end. This frame is preferably formed of pressed steel. Upon the interior of this frame and near the upper end thereof there is arranged an annular shoulder 7 also formed of steel. This shoulder may be formed integral with the frame if desired, but is preferably a steel ring of a diameter to snugly fit within the frame and is welded thereto. The upper edge of the shoulder will be disposed a distance below the upper edge of the frame corresponding to the thickness of the cover plate 8. The upper face of the shoulder 7 and that portion of the cover 8 which engages the same will be machined so as to insure a proper seating of the cover upon the shoulder throughout the circumference of the plate. It will be understood, of course, that the upper face of the cover plate may be provided with grooves, projections or recesses to promote traction to the wheels of vehicular traffic passing thereover.

The locking means for the cover includes a pair of spaced parallel stirrups or lugs 9 depending from the lower surface of the plate 8. These lugs are apertured as at 10 to slidably receive a lock bolt 11. This lock bolt is preferably rectangular in cross section while the openings 10 are similarly formed to prevent rotation of the bolt within the stirrups. The innermost lug has its opening elongated vertically to permit a limited degree of play or movement of the bolt therein. The rear end of the bolt is provided with a hook portion 12 disposed beneath an aperture 13 near the central portion of the cover plate 8, the said hook portion affording means whereby the bolt may be retracted or projected by the insertion of a tool or instrument 14 through the said aperture. The lower end of this

tool is provided with a projection 15 to enable the said instrument to be engaged beneath the hook 12 in order that the said bolt may be lifted within the lug recess.

5 The underface of the bolt 11 is notched or recessed at 16 at such point that the recess will receive the adjacent portion of the innermost stirrup or lug when the bolt is in projected or locking position. If desired, a stop 17 may  
10 be secured to the underface of the bolt to engage with the said lug and to limit the projecting movement of the said bolt. It is obvious, therefore, that in order to retract the bolt it is necessary that the inner or rear end thereof  
15 be lifted so that the recess 16 will clear the adjacent portion of the lug 9.

Interposed between the underface of the cover 8 and the bolt 11 is an expansion spring 18. The upper end of this spring is engaged over a stud 19, secured to the cover while its lower end encloses the upper end of a cotter pin or key extending upwardly through a suitable opening in the bolt 11. The spring is so positioned relative to the bolt 11 that it becomes  
20 cocked in opposite directions as the bolt is projected or retracted. In other words, when the bolt is projected, the spring exerts a pressure tending to force the bolt into such position at the same time it forces the said bolt down firmly  
30 in contact with the retaining stirrups or lugs. In retracting the bolt it is necessary that the same be lifted against the tension of the spring 18 until the recess 16 clears the adjacent portion of the lug, whereupon retraction of the bolt  
35 causes the spring 18 to cock in such position as to tend to hold the bolt in retracted position. This withdrawing movement of the bolt is limited by the protruding end of the cotter pin 20 as well as the lower end of the spring itself.

40 All parts of the frame and cover are of forged steel, and the stirrups or lugs 9 are welded to the underface of the said cover. The latter is provided with a hook 21 at a point diametrically opposite to the bolt 11 to engage  
45 beneath the shoulder 7. It will be understood that in applying the cover to the frame, the same is tilted in such position that the hook 21 will engage beneath the shoulder 7. With

the bolt 11 retracted the cover will be lowered, this action causing the hook 21 to engage beneath the shoulder. When properly in place, the tool 14 is inserted through the opening 13 and the hook end 12 of the bolt is engaged  
5 thereby and moved outwardly, whereupon the recess 16 receives the adjacent portion of the lug 9 and the bolt is thus held in locked or projected position. The reverse of these operations is performed in removing the cover, and  
10 should it be required, the tool 14 may be engaged in a peripheral opening 22 in the cover to pry the same loose.

From the foregoing it is apparent that I have provided a manhole frame and cover fully capable of overcoming the objections set forth as well as obtaining the objects outlined, and while the present is a disclosure of the invention in its preferred embodiment, it is nevertheless to be understood that variations in the details of  
20 construction, assemblage and arrangement of parts may be resorted to if desired without departing from the spirit of the invention as set forth in the claim.

Having thus described my invention, I  
25 claim:—

In a manhole construction, a frame provided with a shoulder, a removable cover for said frame, bolt supporting means depending from the cover, a bolt slidably mounted in said supporting means and so positioned as to cooperate with said shoulder, said bolt having a notch engageable with a complemental fixed portion of said supporting means, and a spring interposed between the cover and the bolt and normally acting to apply downward pressure upon the bolt, said spring being so connected with the bolt as to be cocked to different positions by locking and unlocking movement of the bolt, said spring being so constructed and arranged  
40 as to also apply yieldable tension to the bolt in either rectilinear direction of said bolt in accordance with the different cocked positions, said bolt having means so arranged that it may be engaged and operated by a tool inserted through  
45 an opening in the cover.

CHARLES H. MOORE.