

No. 822,562.

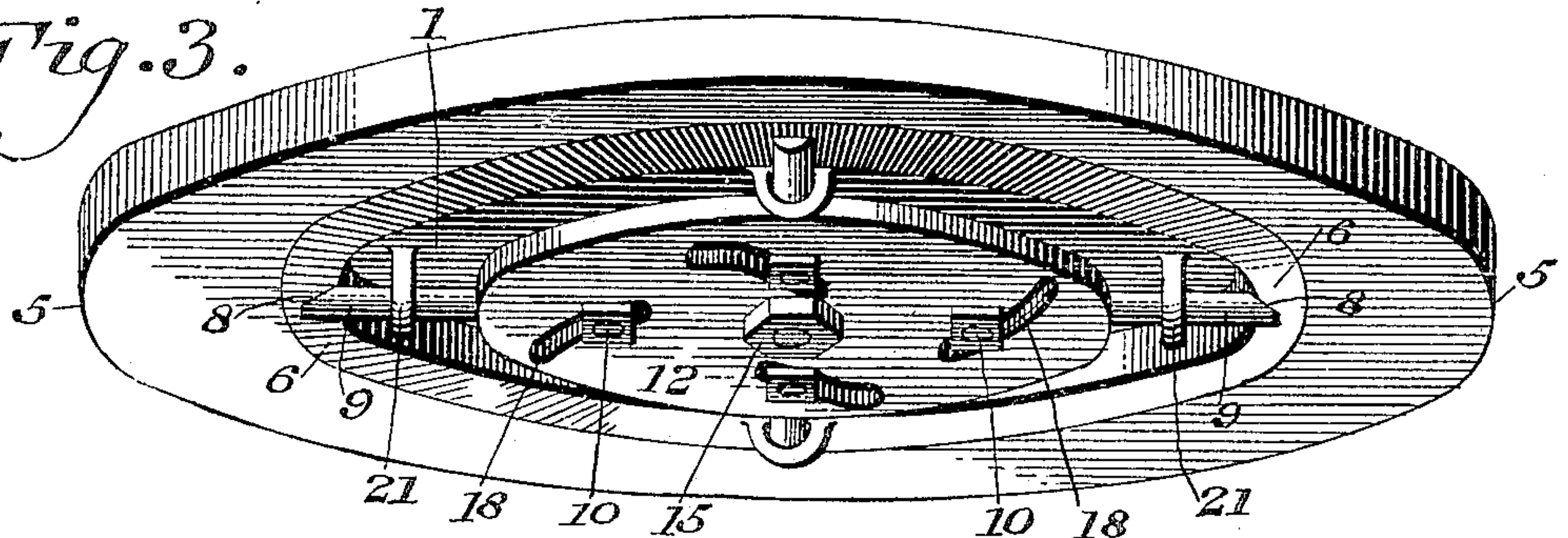
PATENTED JUNE 5, 1906.

F. J. TUCKER.  
FASTENER FOR MANHOLE COVERS.

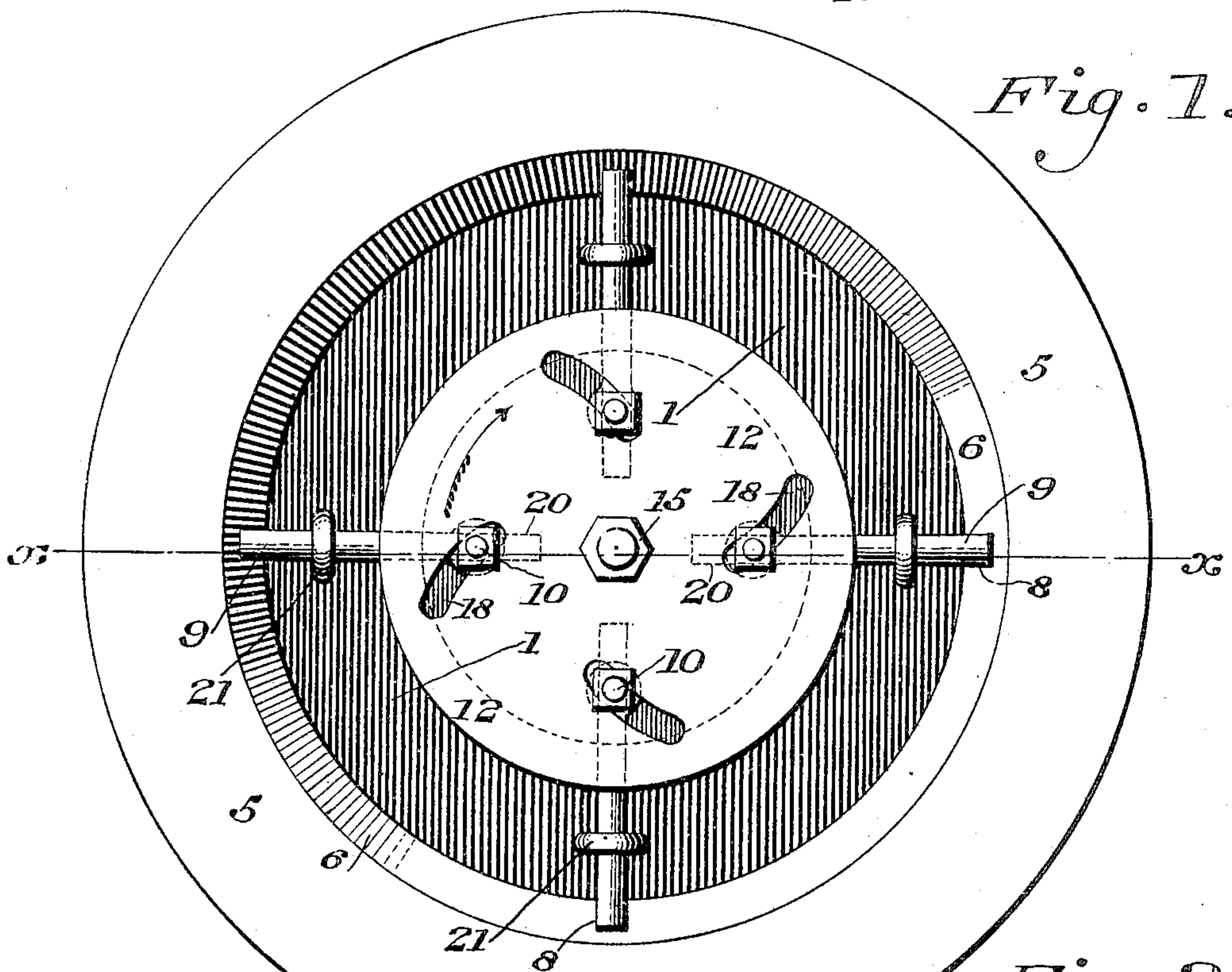
APPLICATION FILED FEB. 2, 1905.

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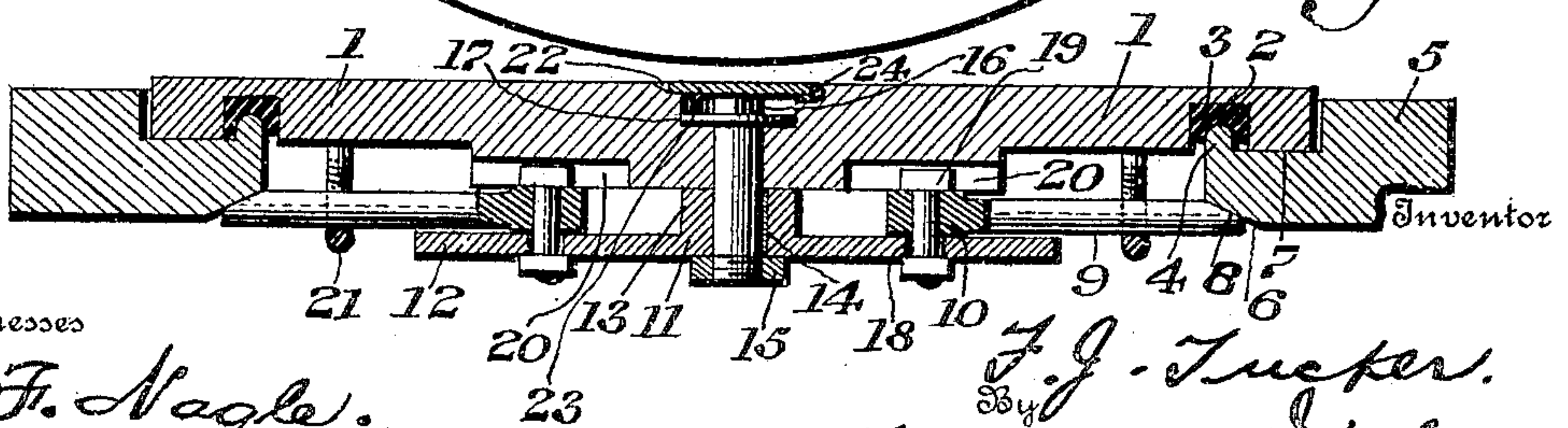
*Fig. 3.*



*Fig. 1.*



*Fig. 2.*



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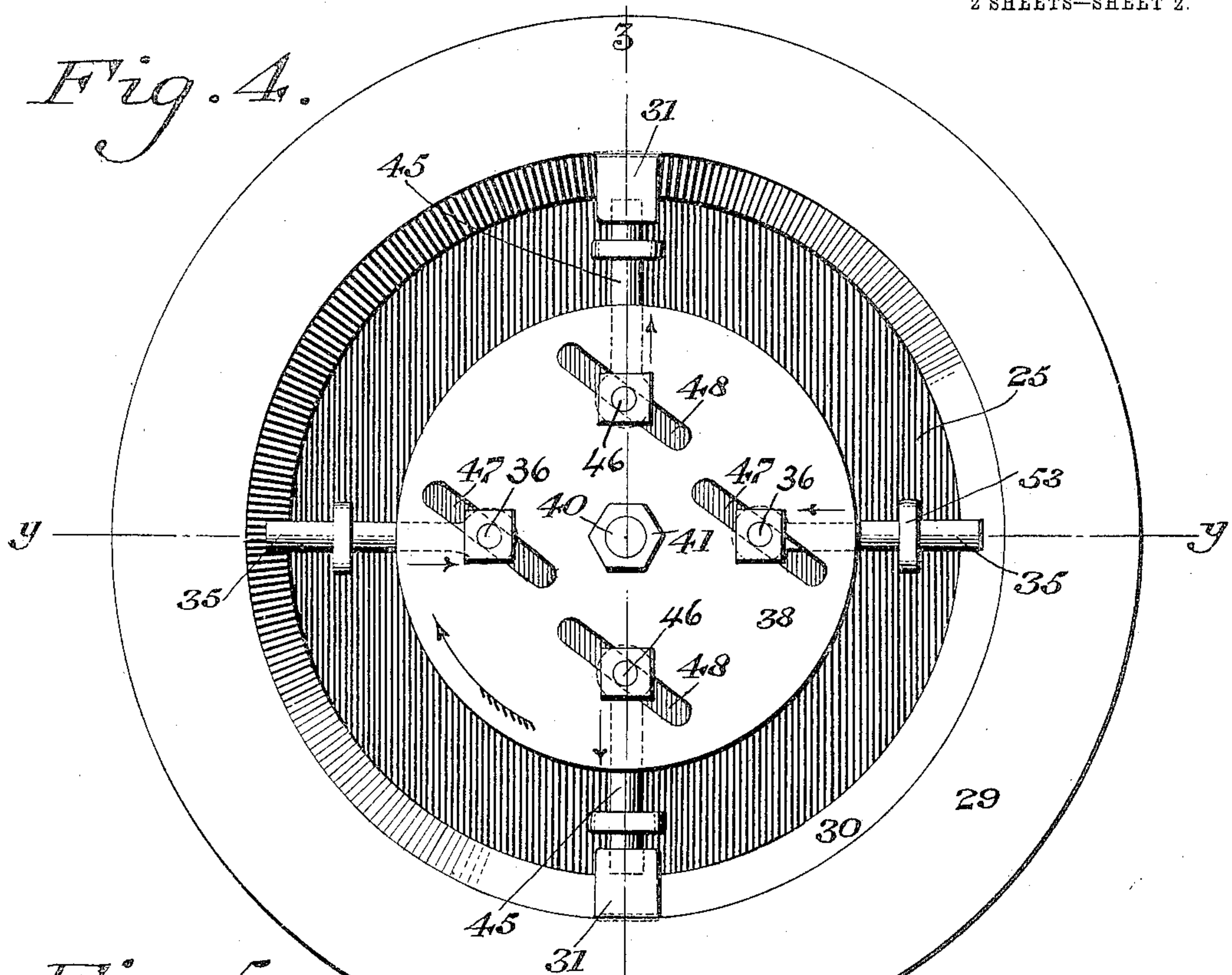
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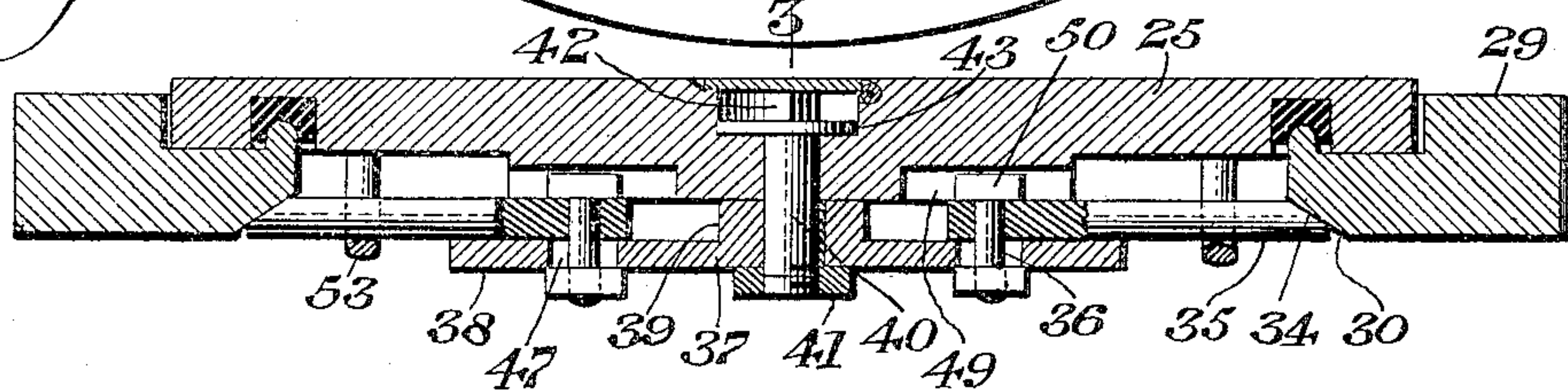
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2 SHEETS—SHEET 2.

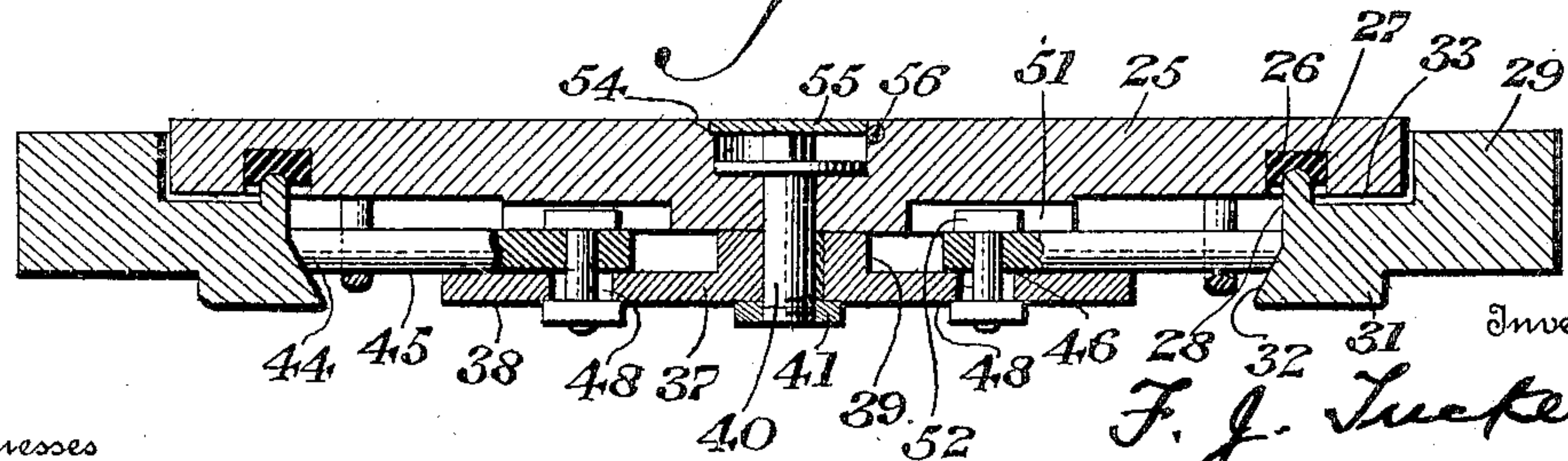
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

FRANCIS J. TUCKER, OF PHILADELPHIA, PENNSYLVANIA.

## FASTENER FOR MANHOLE-COVERS.

No. 822,562.

Specification of Letters Patent.

Patented June 5, 1906.

Application filed February 2, 1905. Serial No. 243,796.

*To all whom it may concern:*

Be it known that I, FRANCIS J. TUCKER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Fastener for Manhole-Covers, of which the following is a specification.

My invention consists of a novel construction of a fluid-tight manhole-cover and in novel means for locking the cover in position and for enabling said cover to be quickly unlocked and removed from its support.

It also consists of a novel construction of actuating and guiding mechanism for the locking-bolts, whereby the latter are moved toward or away from the supporting-frame in an expeditious and effective manner.

It further consists of novel features of construction, all as will be hereinafter fully set forth.

Figure 1 represents a bottom plan view of a manhole-cover and its adjuncts embodying my invention. Fig. 2 represents a section on line *x x*, Fig. 1. Fig. 3 represents a perspective view of the under side of the cover and its adjuncts. Fig. 4 represents a bottom plan view of another embodiment of my invention. Fig. 5 represents a section on line *y y*, Fig. 4. Fig. 6 represents a section on line *z z*, Fig. 4.

Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings, 1 designates a manhole cover or closure having, preferably, an annular groove 2 therein, within which may be contained the packing 3.

4 designates a lip on the base or frame 5, which is adapted to be seated in the groove 2 when the parts are assembled, the under side of the base being beveled, as at 6.

7 designates an annular recess extending outwardly from the lip 4. The beveled ends 8 of the locking-arms 9 contact with the bevel 6 of the frame 5 and are secured by bolts 10 to a carrier 11, which consists of the plate 12, having the enlargement or hub 13, a bolt 14 passing therethrough and through the cover 1, and a nut 15 securing said plate in rigid relation to said bolt. The end 16 of the bolt 14 is squared or otherwise shaped to receive a wrench or other suitable device for turning the same, a flange 17 thereon holding said bolt in proper relation to said cover.

18 designates cam-slots in the plate 12, in which the shanks of the bolts 10 are adapted

to move, the heads 19 of said bolts being adapted to move in substantially radial slots 20 in the cover 1.

21 designates eyes or guides suitably secured to said cover and through which the arms 9 pass. In the present instance I have shown the same as being cast integral with the cover, although they may be secured thereto in any suitable manner.

22 designates a recess in the cover 1, in which the cover 23 is hinged at 24, so that said cover may be lifted and the end 16 of the bolt uncovered and rendered accessible when it is desired to turn the same to lock or unlock the cover 1. The recess 22 permits the bolt-cover 23 to be when closed substantially flush with the surface of the cover 1.

The operation is as follows: It being understood that the parts are shown in the drawings as in assembled position, the cover 23 being lifted exposes the bolt-head 16, and it being desired to remove the manhole the bolt 14 is turned in the desired direction, the plate 12 turning therewith, whereupon the cam-slots 18 therein cause the arms 9 to move inwardly, the heads 19 of the bolts 10 moving in the slots 20, and it being apparent that the length of said slots prevents the arms 9 from moving out of their guides 21. The bevel ends 8 will move inwardly out of contact with the beveled portion 6 of the base or frame 5 and the cover can now be easily removed. It is evident that the packing 3 contained within the groove 2 will be compressed to the desired extent around the lip 4 and will prevent any liquid or gas from entering or escaping around the cover.

It is evident that by the use of the cam-slots 18 a very uniform and accurate movement of the arms 9 is produced and that the manhole-cover can be very quickly locked in position or unlocked therefrom and that the radial movement of the arms 9 is at all times properly guided and easily regulated. It is apparent that to lock the manhole-cover in position the bolt 14 would be turned in the reverse direction to that already described.

It will be apparent that my invention can be very cheaply constructed, since no finishing is required of any of the parts, which can be made of castings or drop-forgings, and in case of injury to any of the parts the same can be readily replaced at slight expense. It will also be apparent that the number of arms or locking devices 9 can be varied as desired, as can also the precise manner of



effecting the locking, without departing from the spirit of my invention. By the use of the cover 23 it will be seen that all the operative parts are prevented from injury by dust or moisture and the life of the device is thereby greatly prolonged. The cover being flush with the surface of the manhole, a neat and attractive appearance is given to the entire device, as is evident.

In the embodiment shown in Figs. 4, 5, and 6 I have shown a novel device for simultaneously effecting the unlocking and unseating of the cover or closure, wherein 25 designates the manhole cover or closure, having, preferably, an annular groove 26 therein, within which may be contained the packing 27. 28 designates a lip on the base or frame 29, which is adapted to be seated in the groove when the parts are assembled, the under side of the base being beveled for a portion of its circumference, as at 30. 31 designates lugs located on the under side of the base, having the beveled portions 32. 33 designates an annular recess extending outwardly from the lip 28. The beveled ends 34 of the locking-arms 35 contact with the bevel 30 of the frame 29, and are secured by bolts 36 to a carrier 37, which consists of the plate 38, having an enlargement or hub 39, a bolt 40 passing therethrough and through the cover 25, and a nut 41, securing said plate in rigid relation to said bolt. The end 42 of the bolt 40 is squared or otherwise shaped to receive a wrench or other suitable device for turning the same, a flange 43 thereon holding said bolt in rigid relation to said cover. 44 designates the beveled ends of the unseating-arms 45, which are adapted to contact with the bevels 32 of the lugs 31, said bevels facing oppositely to the bevel 30, and said arms being secured by bolts 46 to said carrier 37. 47 designates cam-slots in the plate 38, in which the shanks of the bolts 36 are adapted to move, and 48 designates other cam-slots, in which the shanks of the bolts 46 are adapted to move. 49 designates substantially radial slots in the cover 25, in which the heads 50 of the bolts 36 are adapted to move, and 51 designates other slots in said cover in which the heads 52 of the bolts 46 are adapted to move. 53 designates guides suitably secured to said cover and through which the locking and unseating arms pass. 54 designates a recess in the cover 25, in which the cover 55 is hinged at 56, so that said cover may be lifted and the end 42 of the bolt 40 uncovered when it is desired to manipulate the cover 25.

The operation is as follows: Having the cover locked in position, as seen in Fig. 4, and it being desired to remove the same, the bolt 40 would be turned in the direction of the arrow in said figure, the carrier 37 turning therewith, whereupon the cam-slots 47 cause the arms 35 to move inwardly, the

heads 50 of the bolts 36 moving in the slots 49, the length of said slots preventing the arms 35 from moving out of the guides 53, through which they pass. As soon as the beveled ends 34 disengage with the bevel 30 the cam-slots 48 will cause the beveled ends 44 of the unseating-arms 45 to contact with the bevel 32 of the lugs 31. This will cause the cover 25 to be raised or unseated from the frame 29, it being apparent that the height to which the cover is raised may be varied, as desired, by increasing or diminishing said bevels. It is apparent that to lock the manhole in position the bolt 40 would be turned in the reverse direction and that the locking-arms 35 would move outwardly and the unseating-arms would move inwardly. There has always been more or less trouble in unseating covers of manholes and similar places because of their liability to stick to the frame, which renders it necessary sometimes to hammer the cover or employ an iron bar to remove the same. In my present invention this difficulty is entirely overcome, for as soon as the beveled ends of the locking-arms disengage with the body bevel 30 the unseating-arms 45 will raise the cover from the frame. It will be apparent that the number of locking-arms and the number of unseating-arms may be varied, as desired, as can also the precise manner of effecting the locking, without departing from the spirit of my invention. It will also be apparent that both the locking-arms and the unseating-arms are preferably operated substantially simultaneously by a single device, but that it is within the broad scope of my invention to effect the operation by other or equivalent means. It will further be apparent that in practice the unlocking action may take place slightly in advance of the unseating action, all of which can be readily effected by varying the form of the cam-slots.

It will be evident that various changes may be made by those skilled in the art which may come within the scope of my invention, and I do not, therefore, desire to be limited in every instance to the exact construction herein shown and described.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a device of the character described, a cover having radial slots, a bolt passed through said cover, a carrier secured to said bolt, a plurality of locking-arms confined between said cover and carrier, and connections between said arms and carrier guided in said slots whereby the turning of said bolt actuates said arms.

2. In a device of the character described, a cover having radial slots, a bolt having a flange thereon and passing through said cover, a carrier secured to said bolt, a plurality of locking-arms confined between said



cover and carrier, and connections between said arms and carrier guided in said slots whereby the turning of said bolt actuates said arms.

5 3. In a device of the character described, a cover having radial slots, a bolt passed through said cover, a body or frame having a bevel on the under side thereof, a carrier secured to said bolt, a plurality of locking-  
10 arms having beveled ends and confined between said cover and carrier, and connections between said arms and carrier guided in said slots, whereby the turning of said bolt actuates said arms.

15 4. In a device of the character named, a closure having slots in its under side, a slotted carrier supported therefrom with its slots located angularly with respect to said first-mentioned slots, locking-arms located inter-  
20 mediate said closure and carrier, and connections common to said arms and slots with their heads guided in the slots in the under side of the closure.

5 5. In a device of the character described, a  
25 cover, a frame having opposite bevels thereon, and locking and unseating devices independent of the locking devices for said cover coacting with said bevels.

6. In a device of the character described, a  
30 cover, a frame having opposite bevels thereon, locking-arms coacting with one of said bevels, and unseating-arms independent of the locking-arms coacting with the other of said bevels.

35 7. In a device of the character described, a cover, a frame having opposite bevels thereon, locking-arms coacting with one of said bevels, and unseating-arms independent of the locking-arms coacting with the other of  
40 said bevels in combination with a single device for simultaneously operating said arms.

8. In a device of the character described, a cover, a bolt, passing therethrough, a carrier secured to said bolt, a plurality of locking-  
45 arms, a plurality of unseating-arms, and means connecting said arms and carrier, whereby the turning of said bolt actuates said arms.

9. In a device of the character named, a  
50 closure having radial slots in its under face, a

slotted carrier, supported therefrom with its slots located angularly with respect to said first-mentioned slots, locking-arms located intermediate said closure and carrier, and connections common to said arms and slots  
55 with one end guided in said radial slots, in combination with guides in said closure for said locking-arms, and an outer frame, adapted to coact with said arms.

10. In a device of the character described, 60 a cover, an annular groove therein, packing in said groove, a body, a lip projecting therefrom, there being an annular recess extending outwardly from said lip, there being a bevel  
65 on the under side of said body, a bolt having a flange thereon extending through said cover, a carrier secured to said bolt, there being cam-slots in said carrier, there being radial slots in said cover, guides on said cover,  
70 locking-arms disposed between said cover and carrier passing through said guides, there being beveled ends on said arms adapted to contact with the bevel of said body, bolts secured to said arms, heads and shanks on said  
75 bolts, said heads adapted to move in said radial slots, and said shanks being adapted to move in said cam-slots.

11. In a device of the character described, a cover, an annular groove therein, packing  
80 in said groove, a body having a bevel on its under side, a lip projecting therefrom, there being an annular recess extending outwardly from said lip, there being a bolt having a flange thereon extending through said cover, a carrier secured to said bolt, there being cam-slots in  
85 said carrier, there being radial slots in said cover, guides on said cover, locking-arms disposed between the cover and carrier and passing through said guides, said arms having beveled ends adapted to contact with the  
90 bevel of said body, bolts secured to said arms, heads and shanks on said bolts, said heads adapted to move in said radial slots, and said shanks being adapted to move in said cam-slots, and a carrier-bolt cover flush  
95 with said first-mentioned cover.

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