Hand-lift Lid

Manufactured & installed by Concrete Doors & Vaults (Pty) Ltd.
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SA Patent 2012/08045 (lid) & SA Pat application 2015/07179 (lock & key assembly)

A lockable concrete lid that provides extreme protection against vandalism of valve chambers.

The lid fits into a 3CR12 steel frame that is cast into the concrete roof-slab, see fig1. (The frame is supplied by CD&V to the contractor who positions it at the time of fixing the reinforcing). At the centre of the lid is an 'access tube' that goes all the way through the lid and which provides passage to the locking mechanisms underneath. The tube is closed on top by a plug - see inset in fig 1.

Fig 2 shows the plug being lifted out of the access tube using a magnet that is attached to the back end of the 'key assembly'. Now a 'lock' comes into view a little further down the access tube (see fig 3).

Fig 4 through 6 show the sequence used to remove the lock, rendering the access tube open – see RH inset in fig 6. (The LH inset shows the lock). The 'opening tool' is now inserted into the access tube (see fig 7 and 8), and its gear-shaped pinion (see inset in fig 7) passes through a matching 'key-hole' plate at the bottom of the access tube (see RH inset in fig 6) and then a little further on engages the teeth of the two locking levers (see fig 9).

Fig 10 shows the locking levers in their extended (locked) position, where the levers are extended into respective sockets in the steel frame. Now if the opening tool's handle is turned anti-clockwise, the levers will retract out of the sockets, allowing the lid to be lifted by means of the handle of the opening tool (see fig 11), out of the steel frame (see fig 12). In fig 13 the lid has been removed rendering the manhole open.

The lid shown is 500 x 500 mm in plan, but should preferably be 500 x 400 (= 640 mm from corner to corner) for easier lifting. It is made from 60MPa concrete and has multi-layers of reinforcing bars that are so closely spaced so as to render it effectively chisel proof. The various components and locking mechanisms in fig 1 through 13 are made from stainless steel.

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