



Fig 1



Fig 2



Fig 3



Fig 4



Fig 5

Roll-open Lid

SA Patent 2012/03959

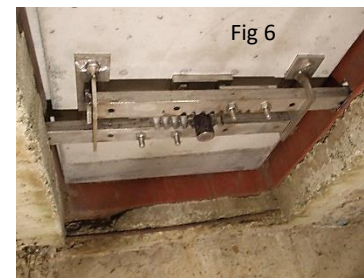


Fig 6



Fig 7



Fig 8



Fig 9

Owing to attacks on the pressure reducing valve at the Deduza reservoir the council placed an upside down culvert over the valve chamber's manhole (see [fig 1](#)). However this meant that a front end loader was required to remove the culvert anytime access into the valve chamber was required. The culvert system is also vulnerable to a truck pulling the culvert off with a chain, or it can easily be removed with a crow bar and rollers.

To solve this problem a roll-open lid was installed – see [fig 2](#), where the lid is shown in its closed and locked position. The first step to opening the lid is to remove the plug in the 'access tube' using an 'opening tool' – see [fig 3](#). More specifically the plug is lifted out by the magnet attached to the front of the opening tool – see [fig 4](#). With the plug removed, the opening tool is inserted through the access tube (see [fig 5](#)), whereupon its pinion engages the rack-levers underneath the lid – see [fig 6](#). The opening tool is now turned from above, and the levers move out of the slots in the manhole (see [fig 7](#)).

The lid may now be rolled open, and these sequences are shown in [fig 8](#) through [fig 10](#). The radius (about which the lid turns) and upright panel (counterbalance panel) are designed such that rolling the lid open/closed requires minimal effort – it can be done with just one hand – even though lids typically weigh in the region of 500kg/1000kg. The lid is stable throughout the rolling process and will stop and stay in any position if let go.

[Fig 11](#) is a view of the open lid from above. It is evident that the underside of the lid has a protrusion that is made to go some way into the manhole. This prevents the lid from being pulled or pushed off the valve chamber (when in the closed position).

[Fig 12](#) is a close up of the locking mechanism, with the pinion of the opening tool engaging the teeth of the rack-levers. It may be observed that there is a key-hole plate behind the rack-levers, through which the opening tool's pinion (gear) must pass en-route to the rack-levers. It is evident that the pinion & key-hole plate may have more or fewer teeth, and that the teeth may be longer or shorter, or thinner or fatter. The pinion and key-hole plate may therefore be customised – where literally hundreds of combinations are possible.

[Fig 13](#) is a view of a roll-open lid in its fully closed and locked configuration installed at Badfontien for the Limpopo Department of Agriculture.

Advantages include (a) simple retrofitting to any size manhole, (b) safe operation, (c) extreme protection, (d) fast unlocking and (e) easy operation.

Manufactured & installed by Concrete Doors and Vaults (Pty) Ltd. Contact details: nicholas@damsforafrica.com mobile 082 416 8958, tel 011 472 1520/8

Other models for lids are possible and include a screw-lid, a hand-lift lid, a 'seat & lid', and a slide-lid. Further products in our range include various sliding concrete doors (for pump stations & sub-stations), various vaults for housing boreholes, transformers & stand alone control panels, see www.concretedoorsandvaults.com. All products have robust locking mechanisms, and are made from 60MPa concrete with heavy reinforcing for extreme protection.



Fig 13

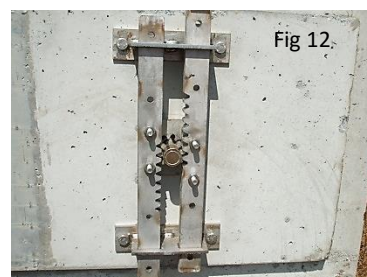


Fig 12



Fig 11



Fig 10