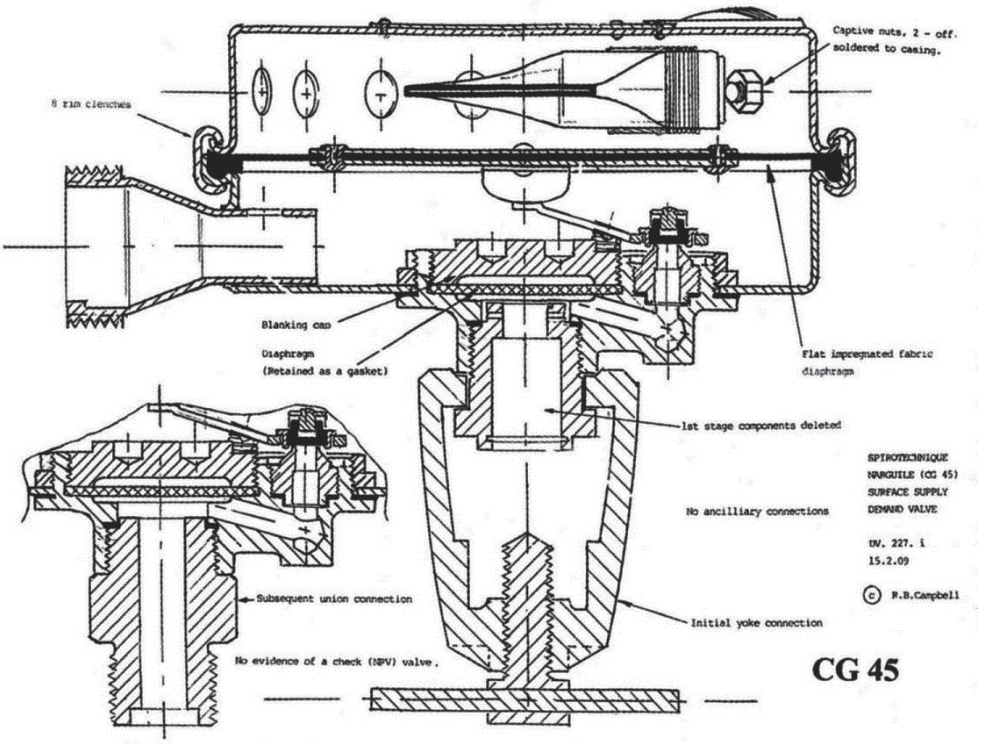
Spirotechnique Narguiles Twin Hose Surface Regulators

Der nachfolgende Beitrag soll die fundierten Beiträge von Lothar Seveke in der Tauchhistorie 4 und 5 über die Entwicklung der berühmten französischen Lungenautomaten CG 45 und Mistral ergänzen. Der Tauchhistoriker Bob Campbell berichtet hier über die ersten Variationen des CG 45 als oberflächenversorgter Atemregler für Berufstaucher.



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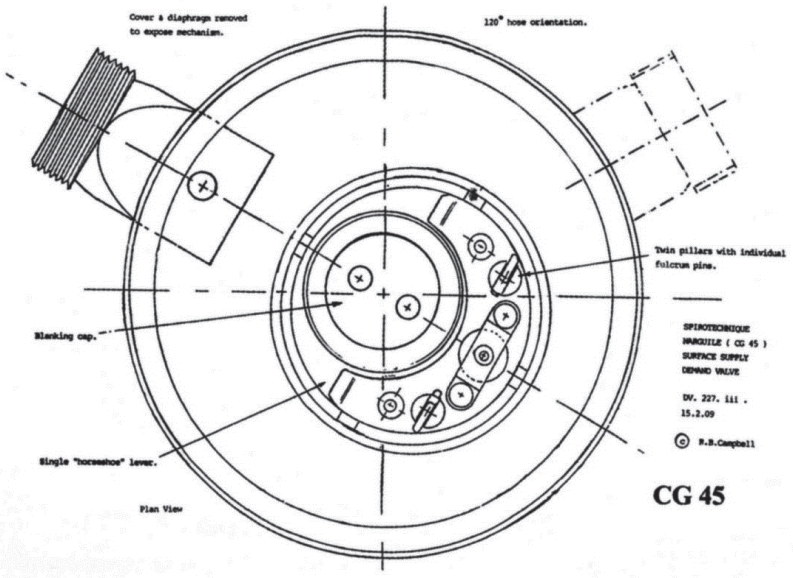

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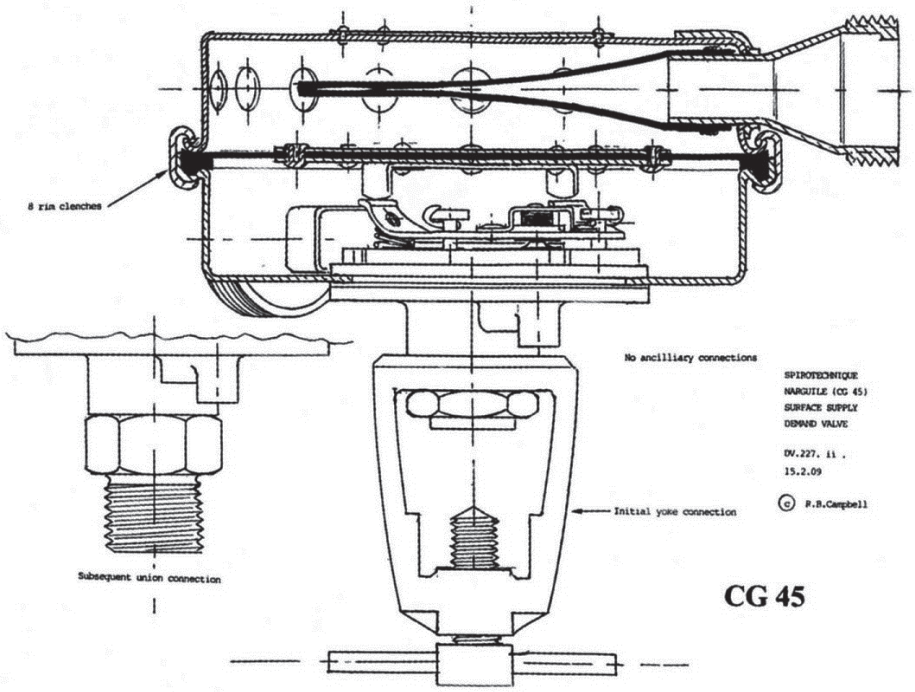
Spirotechnique Narguiles Twin Hose Surface Demand Regulators

'Narguile' (Narghile) French translation 'A Turkish water pipe, a hookah'

A surface demand regulator is essentially the 2nd (demand) stage of a two stage system. The demand stage is worn by the diver attached by the air hose to the first stage reducing valve on the surface. The air supply may be a bank of high pressure cylinders or a medium pressure compressor with a receiver tank.

Virtually any two stage SCUBA regulator can be adapted to serve as a 2nd stage demand valve by removing, or bypassing, the 1st stage sub-assembly and then connecting it directly to the surface supply. Strictly speaking it should not now be described as a SCUBA system, as it is no longer self-contained. However, its SCUBA parentage is obvious and it has little resemblance to standard diving dress.

Spirotechnique chose the name Narguile (sometimes spelt Narghile) for their adaptation of die Cousteau Gagnan CG 45 twin hose regulator into a surface demand mode and the translation into Hookah passed into general use for all such SCUBA based surface demand systems.



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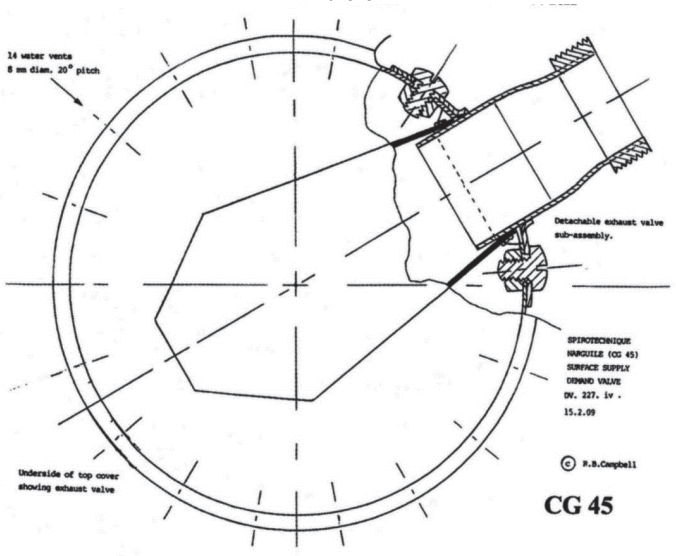

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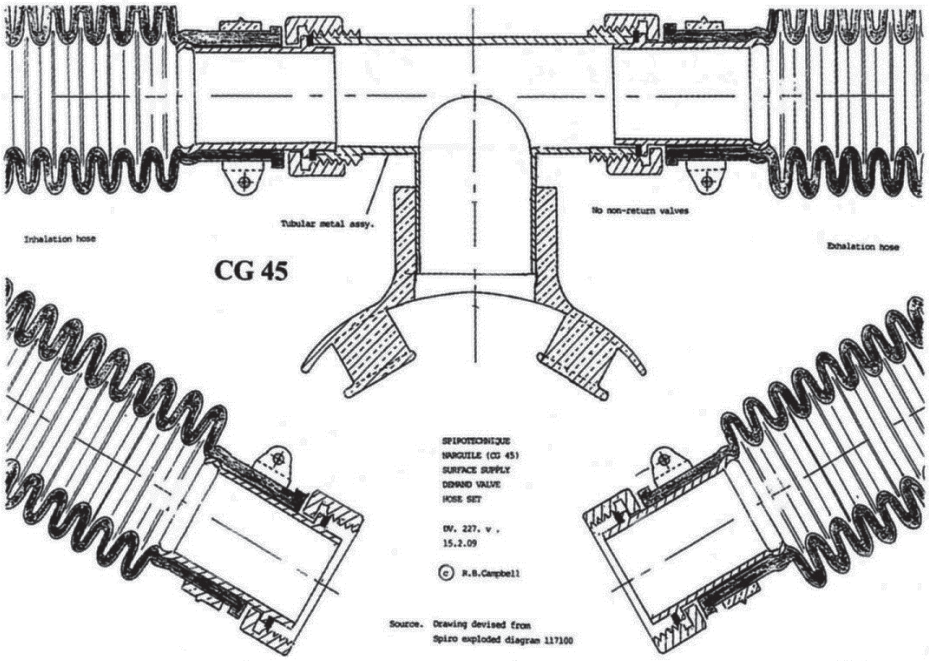

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CG45 Adaption

The first NARGUILE was simply a CG 45 demand valve with the 1st stage components removed and the interstage chamber sealed, using the 1st stage diaphragm as a gasket. The external yoke connection was retained and the whole regulator body strapped to the diver's back in a webbing harness.

This system was first depicted in one of the early Cousteau films, which showed a diver being kitted out on the surface with an attendant approaching bearing the air hose. The hose appears to be of large diameter, akin to that used by standard divers, with a pillar valve secured in the end and this could be seen being clamped into the regulator yoke in an otherwise normal fashion. The hose then needs to be passed to the front of the diver across his chest.

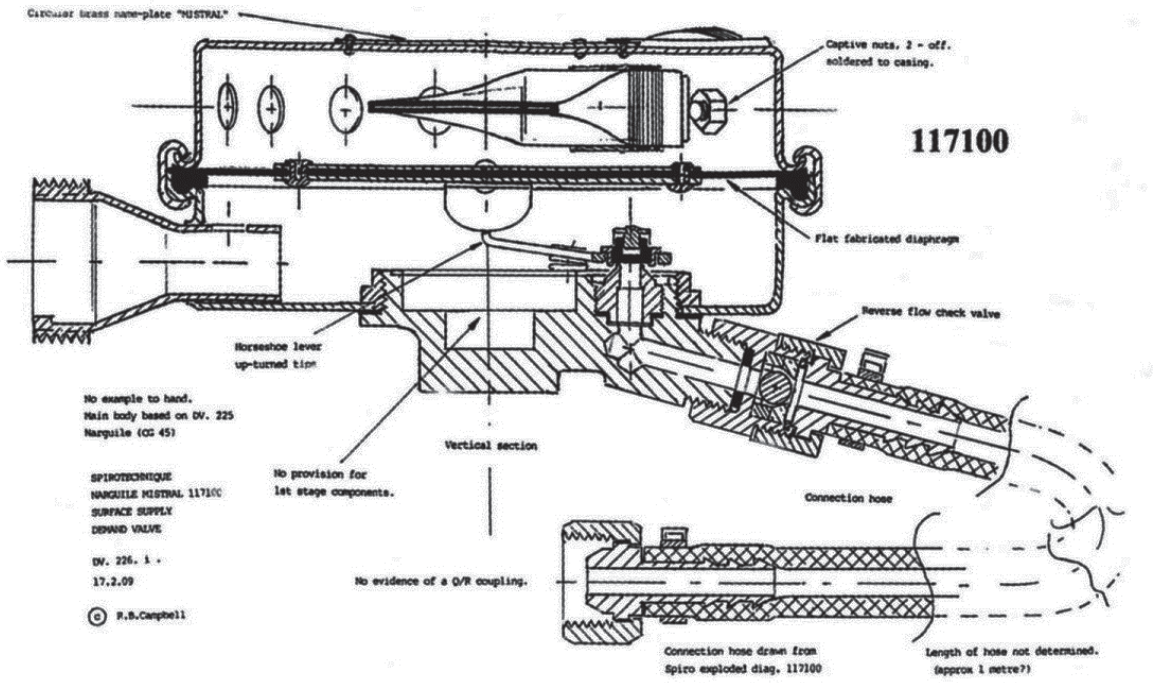
Perhaps they did not do this at first, but the diver would have very quickly discovered that a hose only attached at his back would afford him little directional control being more like a fish caught an a line. With the hose to the front he can lean against the drag of the hose to make progress. With a heavy hose the use of fins would probably be ineffective, necessitating the diver to walk across the seabed rather than swim. In most cases, given that the limited radius of action of the diver was governed by the length and flexibility of the hose, this was probably adequate.

The ad-hoc experiment with the adapted CC 45 regulator showed promise, and Spirotechnique went on to produce a dedicated surface demand regulator which they named the NARGUILE.

Narguile. First production version

The first production version of the NARGUILE was not far removed from the initial experimental version. The internal 1st stage components were removed, with the exception of the 1st stage diaphragm, and the restrictive 1st stage seat was bored out to improve the air flow. The pressure setting spring, complete with its housing and pressure plate, were replaced by a blanking cap, bearing down on what was the 1st stage diaphragm but which now only served as a gasket above the inter-stage chamber.

The external yoke connection was also retained. There was however, no evidence that a check valve was incorporated at the air supply hose connection which was still in the form of a pillar valve at the hose end. The 2nd stage remained unaltered from the CC 45 configuration. A spring loaded, horseshoe shaped lever was mounted on two spigots and, at its apex, carried a rubber pad that bore down on the inlet seat. The open ends of this lever contacted with two extended lugs from the 2nd stage diaphragm pressure plate. Originally this diaphragm was of a laminated construction, later to be replaced by a moulded version.



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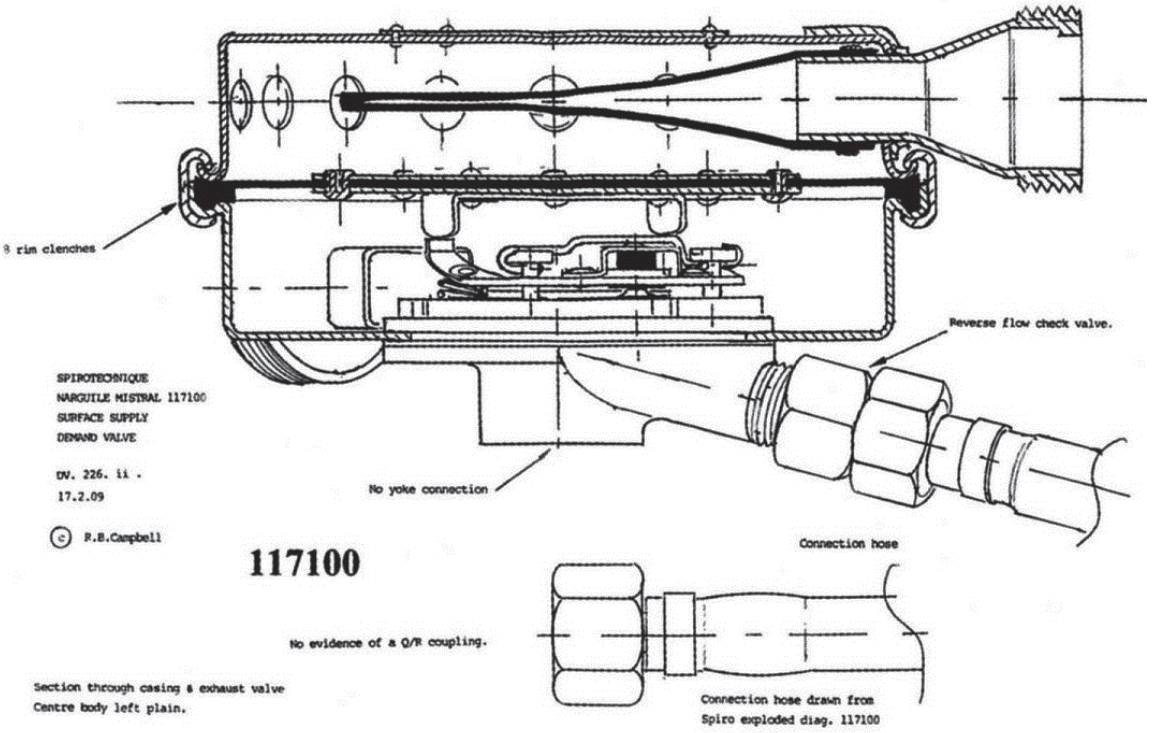

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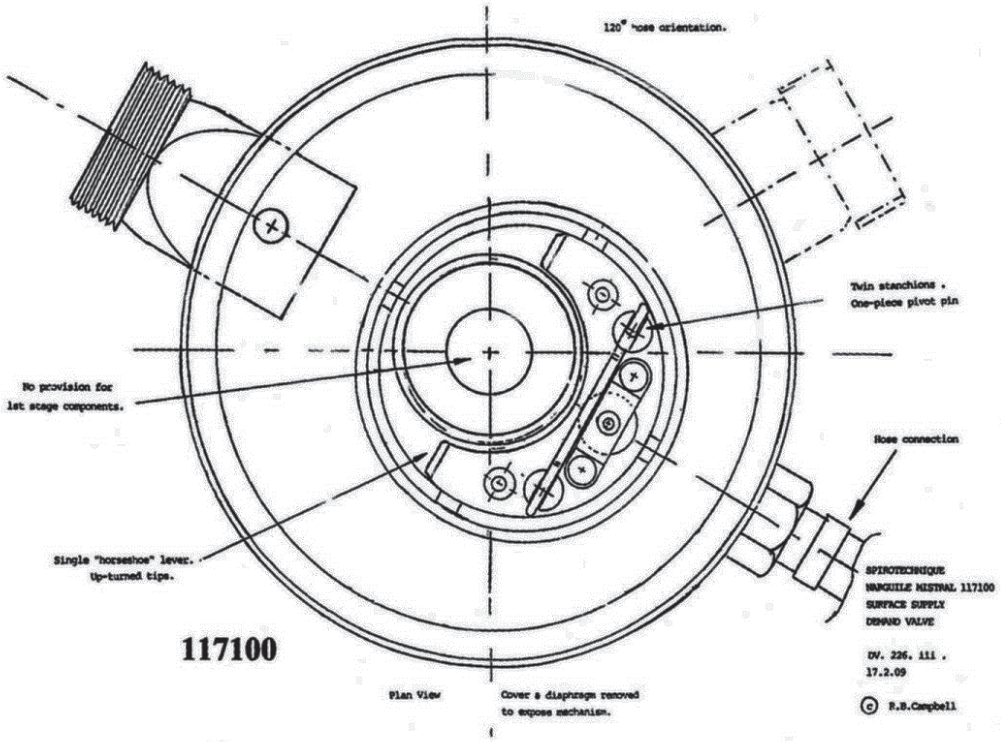
It was essential that the open ends of the lever were correctly aligned and in contact with the lugs, so that an adjustment of the mounting spigots would allow the lever height to be correctly set. In use, depression of the diaphragm then imparted a rocking motion to the lever, which opened and closed the air inlet orifice according to the diver's demand.



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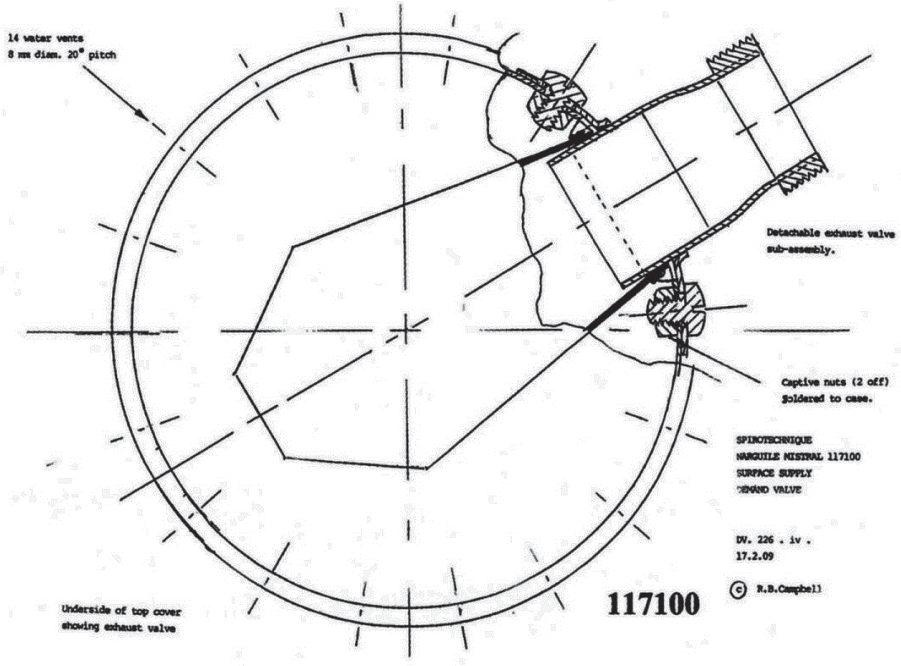
Above the diaphragm was the water chamber, containing the exhaust valve. This was in the form of rubber 'duck's beak' or spear valve, a pattern typical of many twin hose regulators. A clamp ring replaced the screwed clenches previously used to hold the two halves of the casing together, while the top casing carried a circular metal name plate giving the name NARGUILE. The hose set was attached to the regulator with screwed couplings, and was similarly attached to the tubular metal mouthpiece. There were no non-return valves in the mouthpiece.

My own example of this regulator has had the yoke replaced by a straight screwed union. In truth a banjo coupling would have been more useful.



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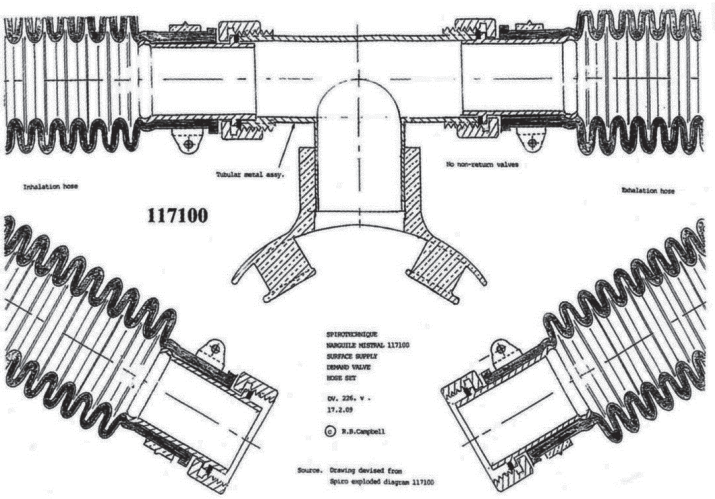
Narguile 117100

Still using the CG 45 regulator as the basis of the design, Spirotechnique then refined the assembly. The external yoke was eliminated, creating a shallower main body, with the delivery hose connection moved to a more convenient position at the side of the body. This was a screwed connection, now incorporating a check valve, with a short length of hose leading under the diver's arm to the front of his harness, where it connected to the main supply hose with a screwed coupling. The hose was now of small diameter and more flexible.



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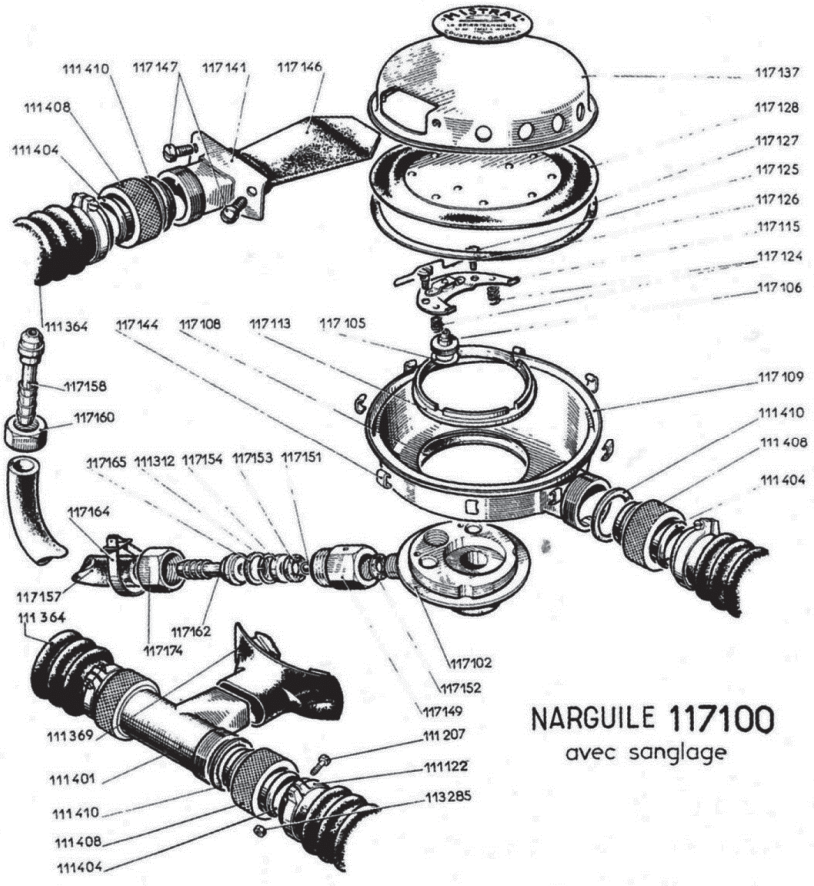
The check valve incorporated in the hose connection to the demand valve was necessary, to prevent any reverse flow should there be a rupture of the delivery hose. The great risk in a surface demand system being, that if the supply hose became disconnected, particularly at the surface, the diver would suffer a severe reversal of pressure in his lungs unless this situation was immediately checked. The check valve must be located at the demand valve. Whilst the Spirotechnique diagram only shows a simple screwed connection joining the demand valve hose to the surface supply hose, a quick release coupling at this point would be more desirable.



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Spirotechnique confused the identification of this version of the NARGUILE, by fixing a circular name plate with the title MISTRAL, although the mechanism does not bear any resemblance to the better known Mistral single stage, twin hose, demand valve. The Maker's manual, however, gives the identity as a NARGUILE 117100.

In common with their other twin hose regulators the mouthpiece was of a tubular metal construction, with screwed connections for the hoses and did not incorporate non-return valves.

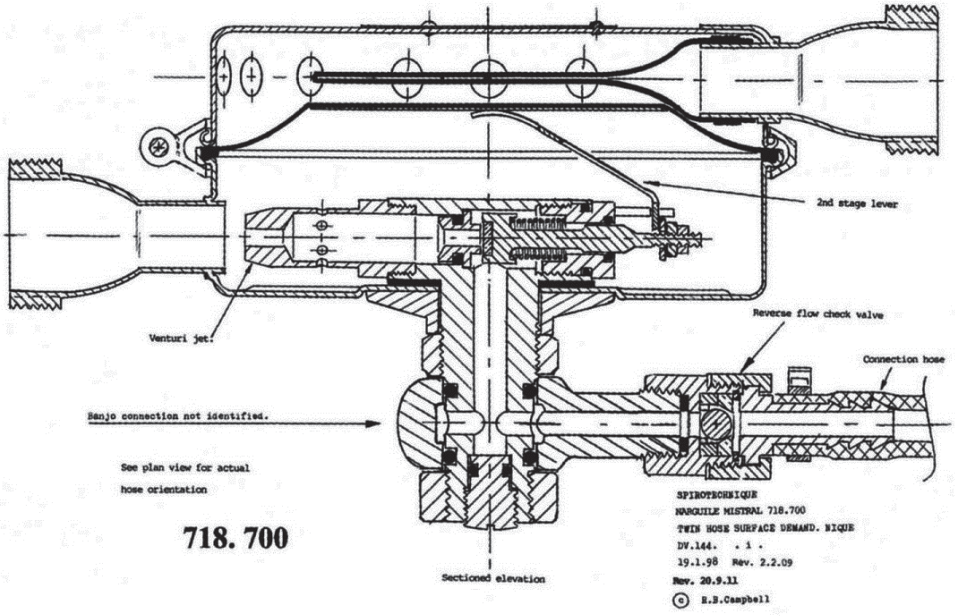
Narguile Mistral 718.700

In 1968 the NARGUILE was redesigned, losing its derivation from die CG 45. The external casing retained the typical configuration for a twin hose demand valve, i.e. basi-

cally cylindrical 4½-in. diameter by 2¼-in deep (115mm x 55mm). A circular rim clamp provided for easy access to the internal mechanism, replacing the previously used rim clenches. A moulded diaphragm was now used in place of the previously laminated version, while the pressure plate no longer had protruding lugs. The exhaust valve remained as the ubiquitous spear valve, common to many designs.

Internally, an entirely new 2nd stage mechanism was fitted. A square section central body supported an 'H' shaped lever and a large diameter Venturi jet discharging directly into the Inhalation port. The lever transferred the movement of the diaphragm to the controlling poppet valve, whilst two nuts on the end of the poppet provided for adjustment of the lever height. The poppet valve itself was similar to, but larger than, that used in Spirotechnique's single hose AQUILON demand valve. The spring loaded poppet sat on a separate valve seat sealed by an O-ring.

Externally, a banjo coupling carried a short supply hose around to the front of the diver's harness, where it attached to the supply hose from the surface with a quick-release coupling. The main supply hose was 30 metres long and attached to the 1st stage reducing valve, which was mounted on a bank of high pressure cylinders.



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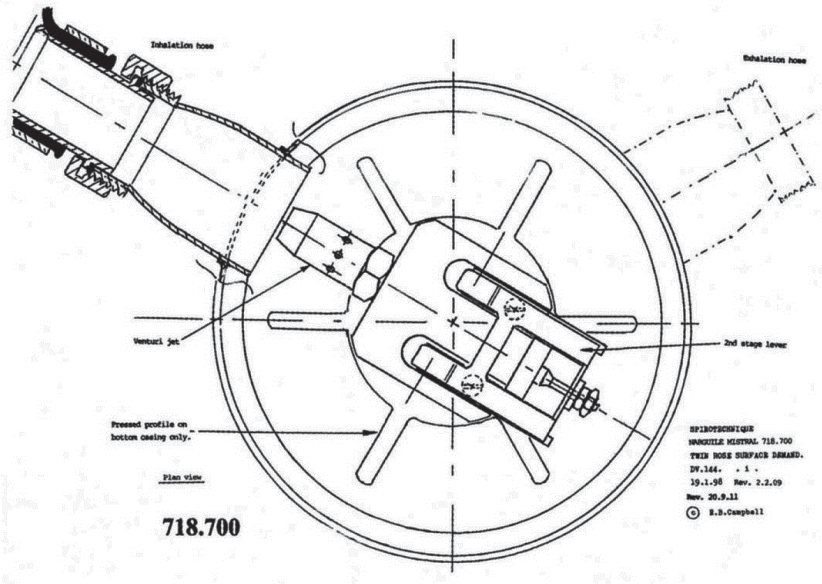

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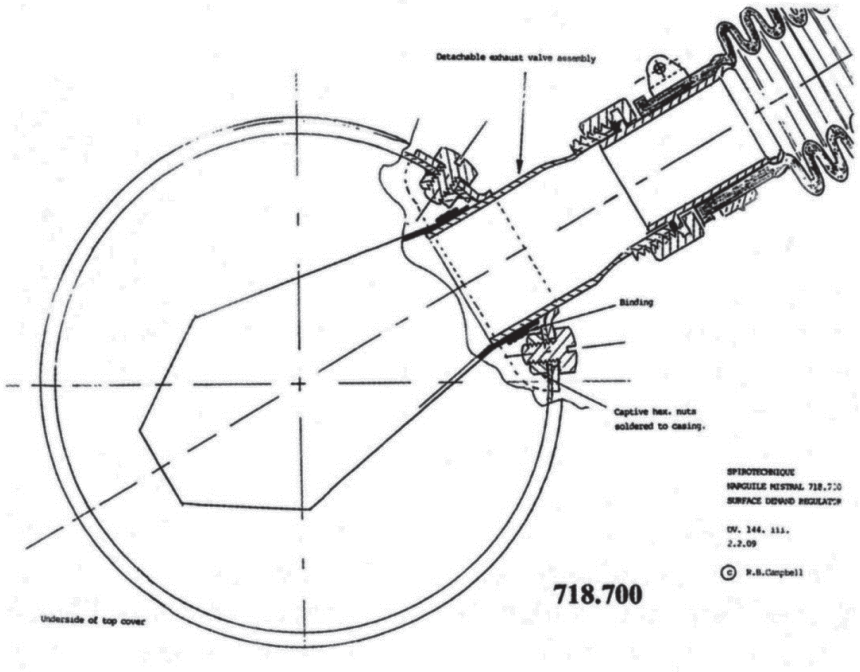

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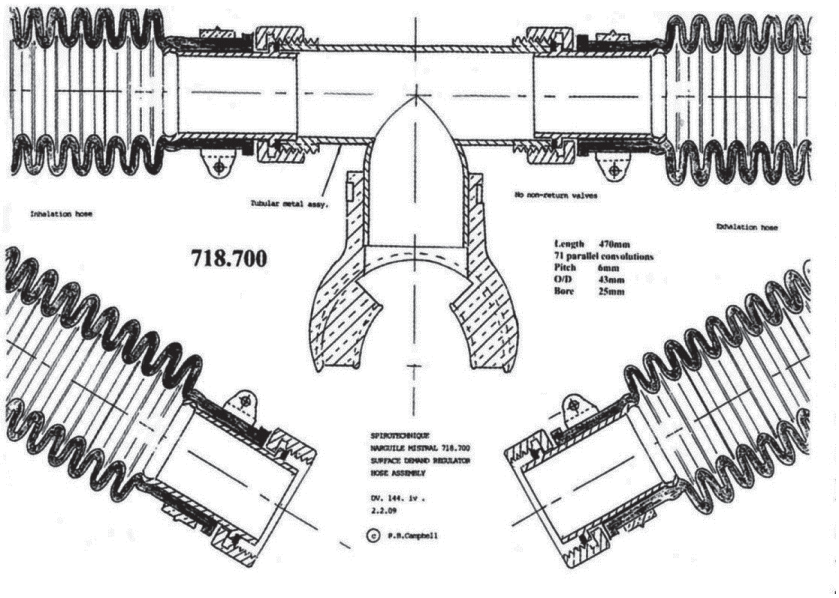

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Hookah Diving

With the introduction of the NARGUILE regulators, Spiro also introduced a new term into the lexicon of Scuba diving, namely HOOKAH. This became the accepted term for Scuba derived surface demand systems and was extensively used in America and Australia. Neither the term nor the practice held much sway in the UK and although surface demand systems were produced by both Heinke and Siebe Gorman, these were generally used by commercial diving operators rather than for recreational diving.

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[1] Erstmals abgedruckt in Historical Diving Times 2012, Nr. 53, S. 14-17.