G. DALEN.

MULTIPLE DIAPHRAGM.

APPLICATION FILED NOV. 11, 1914.

1,195,133. Patented Aug. 15, 1916.

Fig. 1.

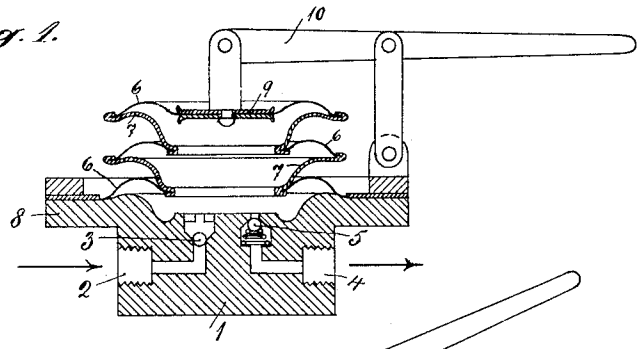
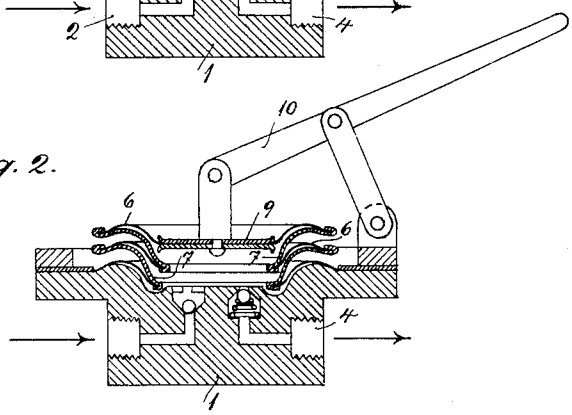


Fig. 2.



WITNESSES

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GUSTAF DALÉN, OF SKÄRSÄTRA, LIDINGÖN, STOCKHOLM, SWEDEN, ASSIGNOR TO SVENSKA AKTIEBOLAGET GASACCUMULATOR, OF STOCKHOLM, SWEDEN.

MULTIPLE DIAPHRAGM.

1,195,133. Specification of Letters Patent. Patented Aug. 15, 1916.

Application filed November 11, 1914. Serial No. 871,448.

To all whom it may concern:

Be it known that I, GUSTAF DALÉN, engineer, residing at Skärsätra, Lidingön, Stockholm, Sweden, have invented certain new and useful Improvements in Multiple Diaphragms, of which the following is a specification.

The present invention refers to certain improvements in multiple diaphragms used in pumps and other apparatus, which are closed by movable diaphragms, consisting of a series of rings, connected with one another at their inner and outer edges, and the invention has for its object to obtain a large variation of volume and a small noxious space with a given length of the stroke of the diaphragm.

The accompanying drawing illustrates a constructional form of the invention, applied to a diaphragm pump. However the invention is also employable in connection with apparatus for mixing air and gas, in which the mixing operation is performed in a diaphragm casing, the volume of which is augmented and diminished periodically, or in connection with automatic gas flash light apparatus, in which gas enters a diaphragm casing and thereby displaces the diaphragm until a certain pressure is obtained in the casing. In apparatus of this kind it sometimes is desirable to obtain a large stroke of the diaphragm without simultaneously augmenting the diameter of the diaphragm and the size of the whole apparatus.

Figures 1 and 2 are vertical sections of a diaphragm pump, showing the diaphragm in two end positions.

1 indicates the pump casing, which is provided with an inlet 2, suction valve 3, and an outlet 4 with pressure valve 5. The diaphragm, closing the pump casing 1, is composed of a series of rings 6 and 7, which are connected with one another at their inner and outer edges. According to the invention every other ring 6 is made of a flexible material, such as leather, whereas every other ring 7 consists of an inflexible or stiff material, such as metal sheet. Said latter rings 7 are formed in such a way, that the flexible rings 6, when the multiple diaphragm is compressed, Fig. 2, apply themselves tightly upon the stiff rings, whereby the noxious space is reduced as much as possible, and the flexible rings 6 are prevented from being bent in opposite directions, whereby they are more sustainable. The bottom ring 6 is fixed between flanges 8 of the apparatus casing 1, and the top ring 6 is provided with a central, stiff piece 9 in a manner before known. At said piece is fixed a device such as a lever 10 for giving the multiple diaphragm a reciprocating motion.

As illustrated on the drawing the edges of the rings 7, made of a stiff material, are bent over the edges of the flexible rings 6, whereby the flexible rings are secured to the stiff rings safely and tightly.

I claim as my invention:

1. A multiple diaphragm, comprising a ring, made of a flexible material, and a ring made of an inflexible material, said rings being connected with one another at one of their edges.

2. A multiple diaphragm, comprising a ring, made of a flexible material, and a ring made of an inflexible material and bent to the form, which the flexible ring occupies when pressure is prevailing in the diaphragm casing.

3. A multiple diaphragm, comprising a ring, made of a flexible material, and a ring, made of an inflexible material and secured to one edge of the flexible ring by bending its edge around the edge of said latter ring.

4. A multiple diaphragm, comprising rings, made of a flexible material, alternating with rings, made of an inflexible material, said rings being connected with one another at their inner and outer edges.

5. A multiple diaphragm, comprising a series of rings, connected with one another at their inner and outer edges, every other ring being made of a flexible material, and every other ring being made of an inflexible material.

In testimony whereof I have affixed my signature in presence of two witnesses.

GUSTAF DALÉN.

Witnesses:
WALDEMAR BOMAN,
GRETA PRICU.