

A. W. SCHRAMM.
DIAPHRAGM.
APPLICATION FILED MAY 9, 1912.

1,055,812.

Patented Mar. 11, 1913

Fig. 1.

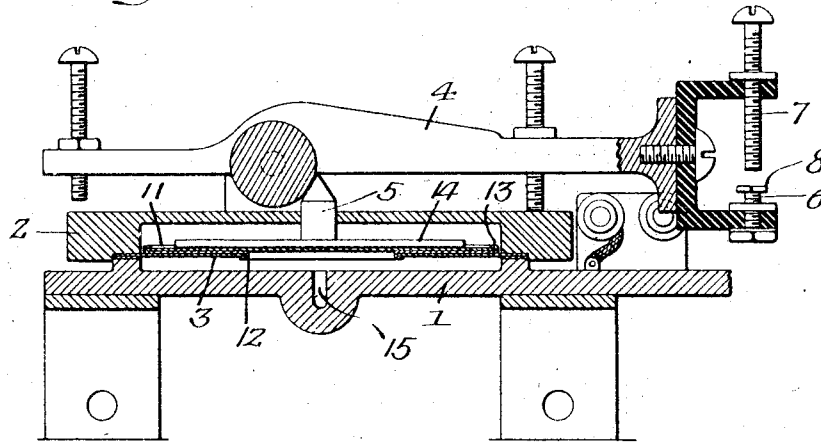


Fig. 3.

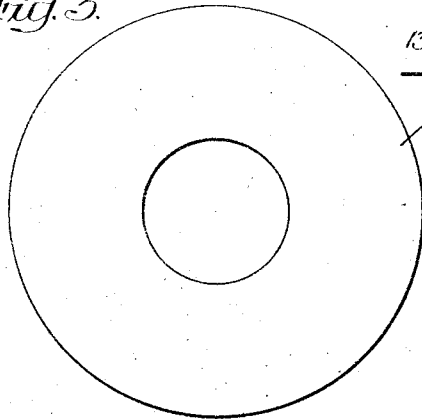


Fig. 5.

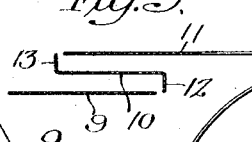


Fig. 4.

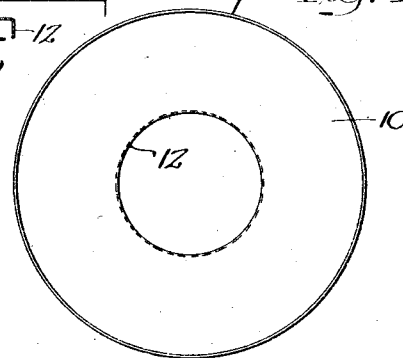


Fig. 2.

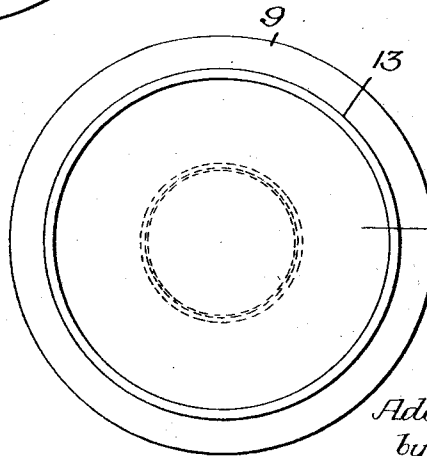


Fig. 6.

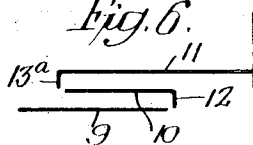
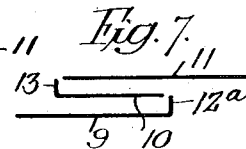


Fig. 7.



Witnesses—
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UNITED STATES PATENT OFFICE.

ADOLPH W. SCHRAMM, OF RIVERTON, NEW JERSEY, ASSIGNOR TO ELECTRO DENTAL MANUFACTURING COMPANY, OF PHILADELPHIA, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

DIAPHRAGM.

1,055,812.

Specification of Letters Patent.

Patented Mar. 11, 1913.

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To all whom it may concern:

Be it known that I, ADOLPH W. SCHRAMM, a citizen of the United States, residing in Riverton, New Jersey, have invented certain
5 Improvements in Diaphragms, of which the following is a specification.

One object of my invention is to provide a novel form of diaphragm, particularly adapted for use in pressure actuated switches or other instruments whose movable members are similarly operated, which for a given pressure will give a relatively large movement to the member or structure attached to it, and shall be compact as well as
15 substantial in construction.

I further desire to provide a composite or built up diaphragm having the above noted characteristics which shall be relatively inexpensive in construction and not
20 likely to break or become injuriously strained by prolonged or severe use.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in
25 which,

Figure 1 is a vertical section illustrating my invention as applied to a pressure actuated switch and showing its detailed construction; Fig. 2 is a plan of the diaphragm shown in Fig. 1; Figs. 3 and 4 are plans of
30 two of the parts used in constructing the diaphragm, and Figs. 5 to 7 are fragmentary detached sections illustrating the preferred form and two modifications of my invention.

In Fig. 1 of the above drawings, 1 represents a recessed base structure having a cover 2, between which and said structure is clamped the diaphragm 3 for actuating the switch lever 4. This latter is pivoted or otherwise movably mounted and is moved by power transmitted to it through a pin or strut 5 acted on by the diaphragm 3, to bring one or the other of its contacts 6 and
45 7 into engagement with another contact 8. According to my invention, the diaphragm 3 is built up of a perforated disk 9 of thin sheet material, a second and smaller perforated disk 10 and an unperforated disk 11. The perforation of the disk 10 is provided with an outwardly projecting flange 12 while it is peripherally provided with a flange 13 extending in a direction opposite to that of the flange 12.
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In assembling the parts of the diaphragm.

the flange 12, which is of suitable diameter, is passed through the perforation of the disk 9 and its edges are turned over as shown in Fig. 1, being afterward soldered to provide a fluid tight joint. The unperforated disk 11, which is likewise of suitable diameter, is placed within the flange 13 of the disk 10 and said flange is turned over by any suitable means, it being likewise soldered to the disk 11 to provide a fluid tight
60 65 joint.

Under conditions of use the peripheral edges of the disk 9 are clamped between the two structures 1 and 2 and a plate 14 to which the pin or strut 5 is fixed, rests on the disk 11. Fluid under pressure may be admitted to the container formed by the base structure 1 and the composite diaphragm through an opening 15 and it is obvious that such fluid will deflect each of the three disks, 9, 10, and 11 to a small extent, and the sum of said deflections will constitute the amount through which the plate 14 and consequently the strut 5 is moved. The switch lever or any other operating or
80 indicating member actuated by said strut would thus be deflected in a predetermined manner. With such an arrangement of parts, in order to obtain definite movement of the switch lever 4, there is necessarily but a relatively small movement of each of the diaphragm elements which consequently are subjected to less strain than would be the case if but a single diaphragm element were employed. It is moreover to be noted that in the manufacture of the device the diaphragm parts may be assembled with the greatest ease and with little expense.

While the disk 10 is the one preferably having the flanges whereby connection is made with the disks 9 and 11 as shown in Fig. 5, I may, as in Fig. 6, provide a flange 13^a on the disk 11 in place of the flange 13 on the disk 10, or I may employ a flange 12^a on the disk 9, as in Fig. 7, instead of the flange 12 on said disk 10.
95 100

I claim—

1. A diaphragm consisting of an unperforated disk and a plurality of perforated disks all connected together; the joints between adjacent disks being fluid tight and formed by turning the edge of one of them over the other.
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2. A diaphragm consisting of an unperforated disk and a plurality of perforated
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disks all connected together; the joints between adjacent disks being formed by turning the edge of one of them over the other and soldering the same; the perforated disk at the end of the series being of larger diameter than the others.

3. The combination in a diaphragm of a disk having a perforation; a second disk of smaller diameter having a flanged and soldered connection with said first disk; and an unperforated disk having a flanged and fluid tight connection with said second disk.

4. The combination of a supporting structure and a diaphragm constituting a container having a connection to a source of fluid under pressure; mechanism actuated by said diaphragm; and means for holding the diaphragm in place; said diaphragm including a perforated disk engaged by said holding means; with a plurality of other disks connected to said first disk adjacent its perforation, in position to be acted on by the fluid under pressure.

5. The combination of a supporting structure; a diaphragm; a second structure clamping the diaphragm to its supporting structure; and mechanism actuated by

movement of said diaphragm; the diaphragm and one of said structures forming a container connected to a source of fluid under pressure; the diaphragm consisting of a perforated disk held between the supporting and the clamping structures; a second perforated disk having a flanged and fluid tight connection with the edge of the perforation of the first disk; and a third disk having a peripheral flange and a fluid tight connection with the second disk.

6. The combination in a diaphragm of one unperforated and two perforated disks; one of the perforated disks having flanges respectively adjacent its periphery and adjacent its perforation; said flanges being turned over and connected by fluid tight joints to the other perforated disk and to the unperforated disk respectively.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ADOLPH W. SCHRAMM.

Witnesses:

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WM. A. BARR.