

E. J. DEEGAN.
 REGULATOR.
 APPLICATION FILED NOV. 22, 1913.

1,108,146.

Patented Aug. 25, 1914.

Fig. 1

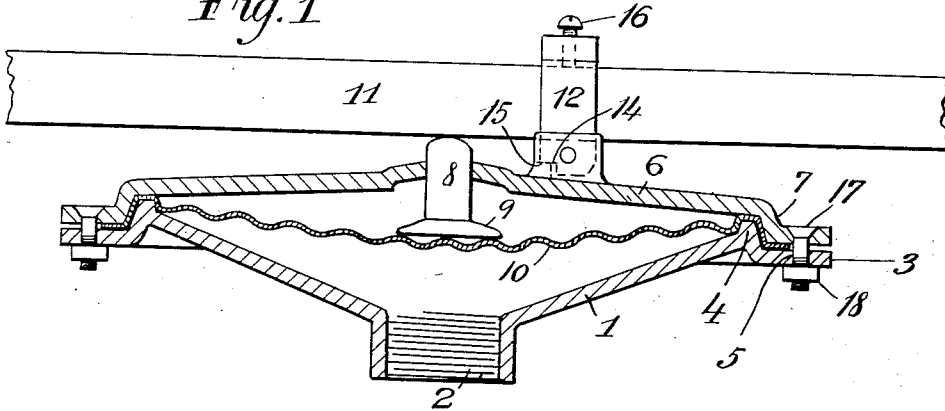


Fig. 2

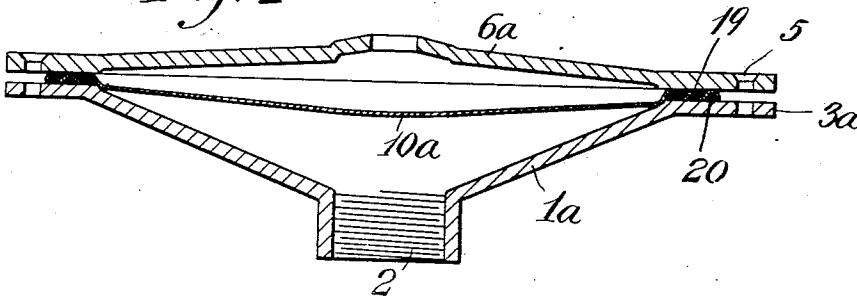


Fig. 3

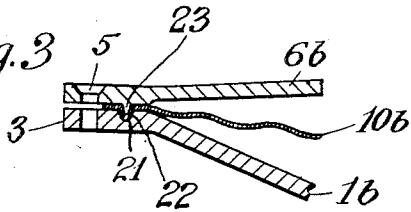


Fig. 6

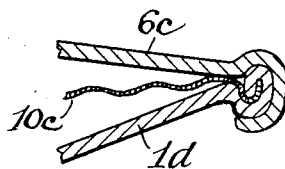


Fig. 4

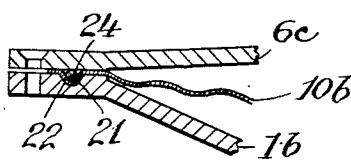


Fig. 7

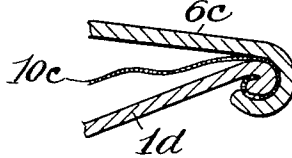


Fig. 5

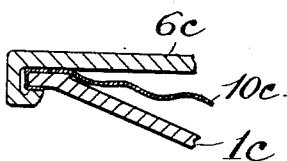
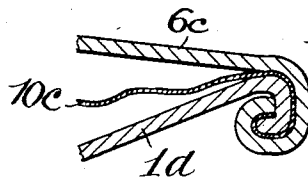


Fig. 8



Witnesses:
 J. P. Owen
 R. G. Mahony

Inventor
 Edward J. Deegan
 By his Attorney
 H. S. M. M. M.

UNITED STATES PATENT OFFICE.

EDWARD J. DEEGAN, OF NEW YORK, N. Y.

REGULATOR.

1,108,146.

Specification of Letters Patent.

Patented Aug. 25, 1914.

Application filed November 22, 1913. Serial No. 802,393.

To all whom it may concern:

Be it known that I, EDWARD J. DEEGAN, a citizen of the United States of America, residing at New York city, in the State of New York, have invented certain new and useful Improvements in Regulators, of which the following is a specification.

My invention relates to regulators, such as are used to regulate steam pressure by closing and opening valves according to the pressure, and for analogous uses and it consists in the joint which I make between the diaphragm, used in such devices, and the base or support for the same, which together with the diaphragm, constitutes an inclosure for the fluid which is to automatically operate the diaphragm and thereby cause the desired movement, which is transmitted to the valve or other controlling device.

Such devices, as is well known, consist of a flexible diaphragm secured to a base, a post or other device resting upon the diaphragm and bearing against or otherwise connected with the regulator lever, and the lever suitably pivoted to be moved, one way by the movement of the diaphragm and the other way, usually, by gravity.

The difficulty has been that rubber diaphragms were not durable nor of sufficient strength and that metal diaphragms could not be economically made tight where they were connected with the base, and to overcome that difficulty, I have devised my improvement which permits the use of a metal diaphragm, thus increasing the durability, strength and efficiency of the regulator and at the same time reducing its cost.

Figure 1 is a vertical, sectional view of a regulator, embodying my invention. Fig. 2 is a similar view of a modified form, some parts of the regulator having been omitted, since they are only a repetition of those shown in Fig. 1. Figs. 3, 4, 5, 6, 7, 8, are sectional views of broken parts of still other modifications.

In the drawings, 1 is a dish shaped base provided with a threaded sleeve 2, which may be screwed on to a steam pipe connected with the system which is to be regulated. It has also a circular rim 3 and, preferably, a flange 4, just within the rim and extending up over the surface of the disk. The outer face of the flange is beveled and the rim is provided with bolt holes 5.

6 is a cover with a rim adapted to fit upon

rim 3, a downwardly extending flange 7, within the rim and beveled to fit the bevel of flange 4. At or near the center it is apertured for the passage of a post 8 with an enlarged base 9, adapted to rest upon the diaphragm 10, and its upper end bears against the operating lever 11, which extends through a slotted guide 12, pivoted in lugs which rise from the cover 6. This guide is notched at the lower inner edge 14, to accommodate a stop 15, also mounted on the cover, and is preferably provided with a set screw 16, to prevent longitudinal creeping of the lever 11.

The diaphragm 10 is a disk of metal with concentric corrugations. Near its edge it is shaped to fit over flange 4 and between that and flange 7. By thus shaping the diaphragm and the adjacent faces of the flanges 4 and 7 I find I can draw the parts together, by means of bolts 17 and nuts 18, so tightly that no steam will escape at the joint and the diaphragm will not crawl inward and thus become ineffective, the bevel form of the flanges aiding materially in attaining that end.

The operation of the device is simple. When it is screwed upon the pipe, the steam or other medium will enter the space between base 1 and diaphragm 10 and as it cannot escape, it will hold said diaphragm at a level related to the degree of pressure. Then the lever is shifted to regulate the valve (not shown) as it is desired it should be regulated at that pressure. If the pressure decreases, the diaphragm will bend farther downward, and the post will follow it, the weight of the lever, (increased by ball weights if need be), will cause it to swing the left end downward and the right end upward and that movement may be utilized to operate the valve, as may be desired. If the pressure increases, it will lift the diaphragm, the post and the left end of the lever and such movement of the lever may be utilized to reverse the movement of the valve, (not shown). This combination thus furnishes an effective, durable and economical regulator.

In the device of Fig. 2 I attain the desired end—a steam tight joint—by the use of rims, clamping a corrugated edge 19 of the diaphragm, (preferably employing cement 20), between the corrugations and the rims. The natural resilience of the corrugated metal at the rim, furnishes a con-

tinuous spring tension for preserving the desired joint, particularly if an elastic cement is interposed.

5 In Fig. 3, one of the two rims is provided with a circular groove 21, the diaphragm has a special corrugation 22, fitting said groove 21 and the other rim has a fin or flange 23, adapted to fit down into the corrugation 22 and force it tightly into groove 21.

10 Fig. 4 shows an independent fin, in the form of a wire 24, arranged to fit the corrugation 22 and be forced down by the pressure of the other rim.

15 In Fig. 5 I have turned the diaphragm over one rim and (using a steel cover), turned the rim of the cover down, about and under the rim of the base, securing a tight joint by the clamping action thereby permitted.

20 In Fig. 6 I turn the base rim around and into the corrugation in the diaphragm and then turn the other rim about the first one.

25 In Fig. 7 I turn one rim over upon the edge of the diaphragm so as to clamp it and then turn the other rim over the combination; and in Fig. 8 I perform the operation specified as to Fig. 7 but before the end of the first turned rim is clamped down, I bring the other rim around the first, over the
30 diaphragm, and between it and the outer face of the body connected with the first rim, and press them together so as to make a tight and very durable joint.

The joint described, in all its phases, I make without necessarily employing any gaskets and with a metal diaphragm and I have, by the means described, secured the absolutely necessary result—a steam tight joint—with a metal diaphragm. 35

What I claim as my invention and desire to secure by Letters-Patent, is:— 40

1. In a regulator, a base with a rim or flange, a metal diaphragm extending over said base and its flange and provided with corrugations in that part which overlays the rim or flange of the base, a clamping piece overlaying the corrugated part of the diaphragm and secured to the base, all substantially as set forth. 45

2. In a regulator, a base with a rim or flange, a metal diaphragm extending over said base and its flange and provided with corrugations in that part which overlays the rim or flange of the base together with a sealing material, located in the corrugations, a clamping piece overlaying the corrugated part of the diaphragm and secured to the base, all substantially as set forth. 50

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses, this 14th day of November, 1913. 60

EDWARD J. DEEGAN.

Witnesses:

WILLIAM HODGSON,
A. G. N. VERMILYA.