

(No Model.)

T. McSWEENEY.

DIAPHRAGM FOR FLUID PRESSURE REGULATORS.

No. 370,152.

Patented Sept. 20, 1887.

Fig. 1.

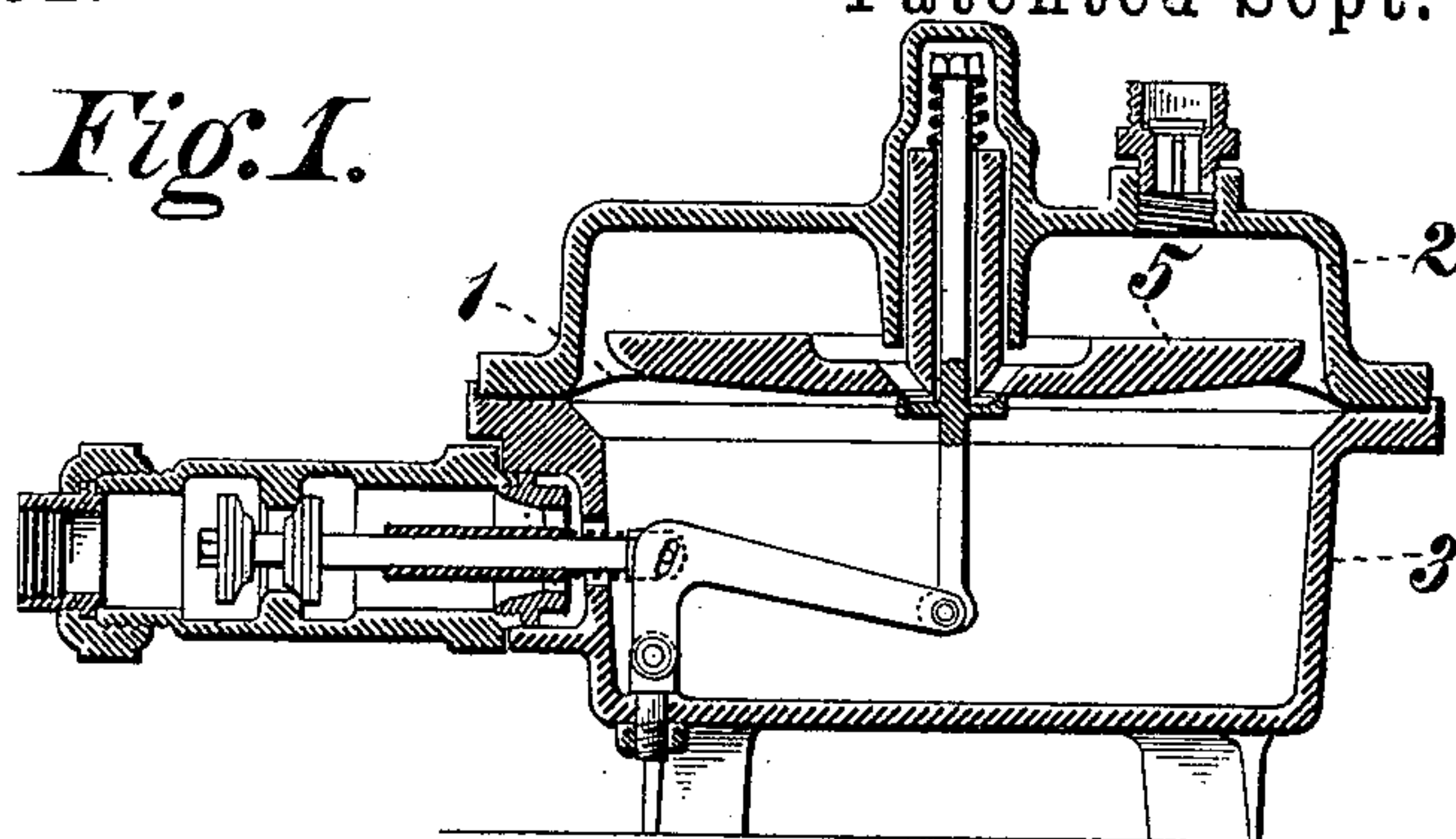


Fig. 2.

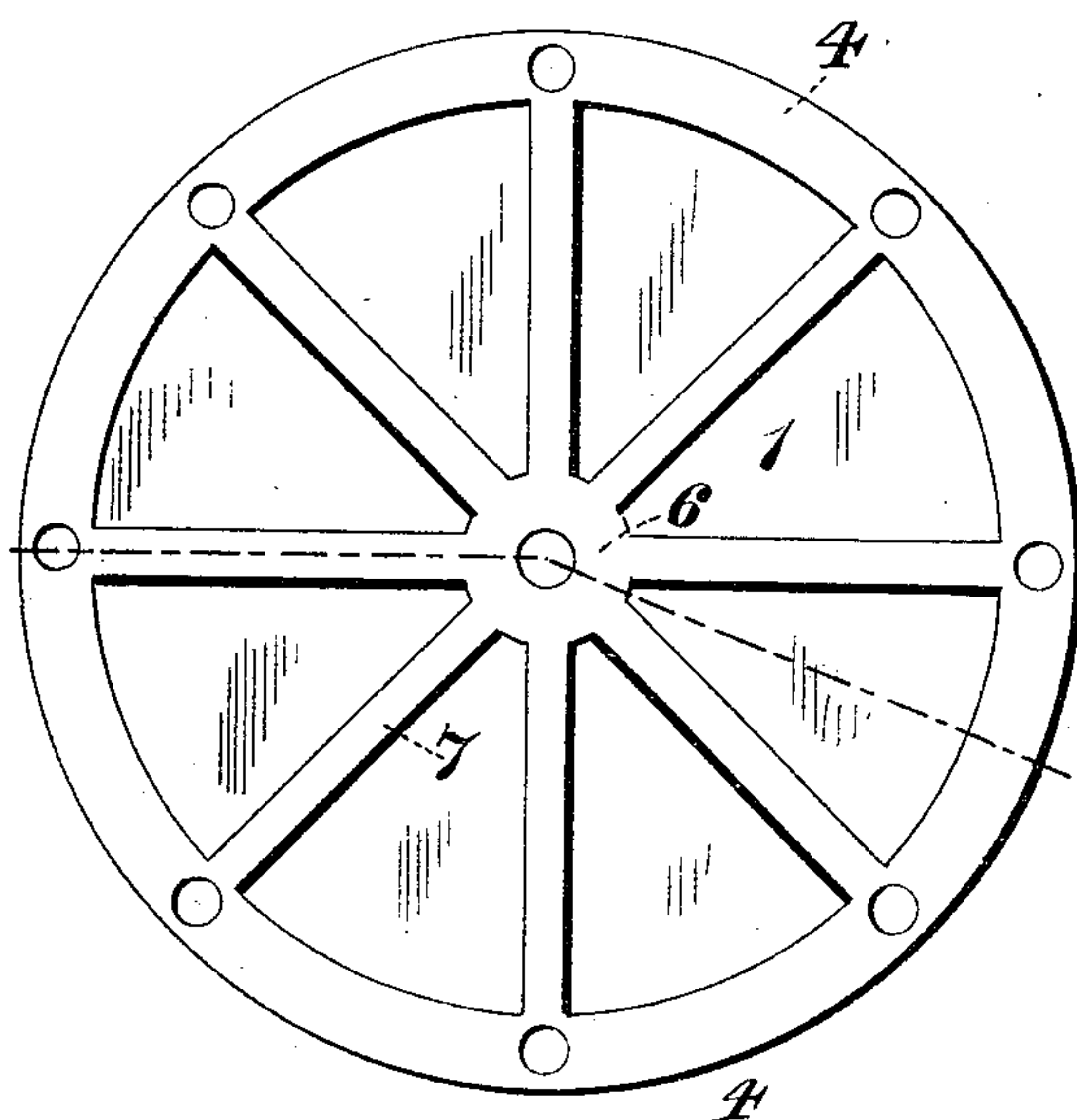


Fig. 3.

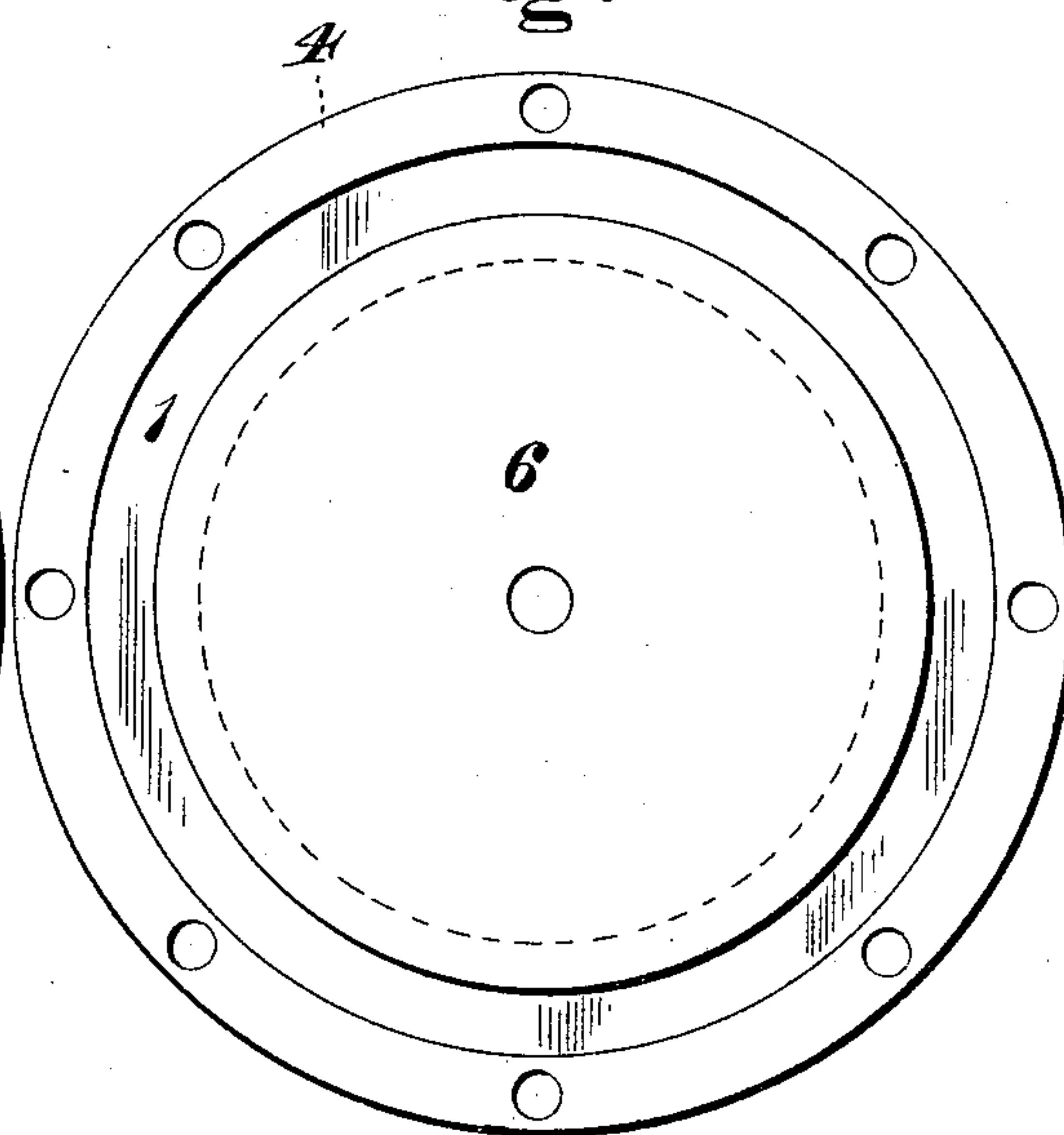
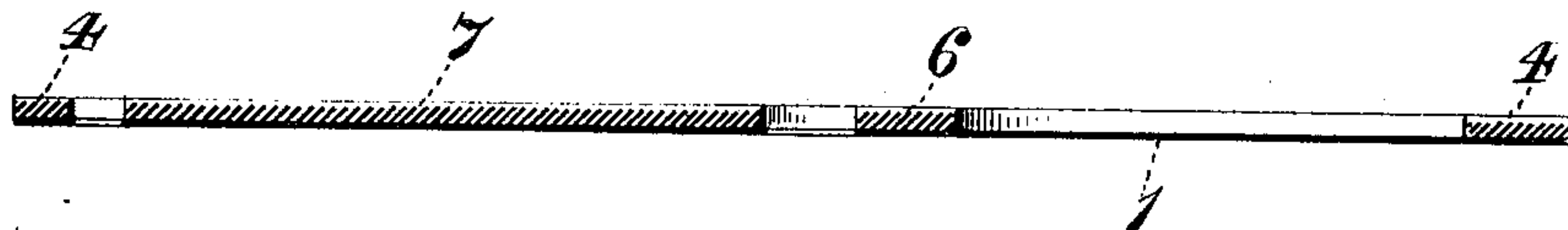


Fig. 4.



WITNESSES:

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TERRENCE MCSWEENEY, OF ALLEGHENY, ASSIGNOR TO THOMAS A. GILLESPIE, OF PITTSBURG, PENNSYLVANIA.

DIAPHRAGM FOR FLUID-PRESSURE REGULATORS.

SPECIFICATION forming part of Letters Patent No. 370,152, dated September 20, 1887.

Application filed February 14, 1887. Serial No. 227,560. (No model.)

To all whom it may concern:

Be it known that I, TERRENCE MCSWEENEY, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, a citizen of the United States, have invented or discovered certain new and useful Improvements in Diaphragms for Fluid-Pressure Regulators, &c., of which improvements the following is a specification.

In the accompanying drawings, which make part of this specification, Figure 1 is a sectional elevation of a fluid-pressure regulator and cut-off having my improved diaphragm arranged therein. Fig. 2 is a top plan view of one form or construction of the diaphragm. Fig. 3 is a similar view of another form of the same. Fig. 4 is a sectional view on the line x , Fig. 2.

The flexible diaphragm used in almost all kinds of fluid-pressure regulators is generally made of rubber, which, however, is objectionable in some instances for the reason that the rubber is hardened or partially vulcanized by the chemical action of some fluids—as, for example, natural and artificial gases—thereby rendering the regulator or cut-off useless. I have discovered, however, that the impervious fabric known in trade as “oil-silk” is not only unaffected by the fluids such as above referred to, but is also much more pliable than the rubber. Prior to placing the oil-silk diaphragms in the regulators or cut-offs I prefer to coat them on both sides with a mixture composed as hereinafter stated, for the purpose of increasing the imperviability of the material and also closing any minute holes which may be formed in the material.

The mixture above referred to consists of a rubber solution, lime-water, oil-varnish, and isinglass, each ingredient being hot at the time of mingling them together. The rubber solution is formed by dissolving water in bisulphide of carbon or other suitable solvent. The lime-water is formed by slaking lime in the usual manner, and as the heat generated in this operation is sufficient for the mixing of the ingredients the lime is usually slaked at the time of forming the mixture. The isinglass is dissolved in water and heated at the time of combining the mixture.

The mixture compounded as above described is applied to the oil-silk by means of

a brush, sponge, or other suitable means. In case the mixture is too thick for easy application, it may be diluted with turpentine or other suitable material. As this fabric is easily torn or frayed by rubbing against hard surfaces or edges, I propose to re-enforce the diaphragm 1 around the edges, where it is secured between the two parts 2 and 3 of the regulator-shell, with a ring, 4, of some stronger and more durable material—as canvas, felt, rubber cloth, or wire-gauze—and at the center, where the diaphragm is secured to the metal disk 5, with a washer, 6, of any of the materials above cited, said washer extending outwardly beyond the edges of the disk, (see Fig. 3,) the edges of the disk being indicated by dotted lines.

In lieu of the ring 4 and large washer 6, as above described, I can use a grid constructed as shown in Figs. 2 and 4, and consisting of an outer ring similar in construction and location to the ring 2 and a small central washer, 6, the washer and ring being connected by a series of radial arms, 7, which serve as bearings for the disk 5 and prevent the diaphragm from coming in contact with the disk. In cases where the diaphragm is subjected to high pressures or to sudden and large changes of pressure the grid form of re-enforce is preferable, as it will relieve the diaphragm of considerable strain.

As no claim is made herein to the construction of the regulator and cut-off shown in the drawings, no description thereof is thought necessary, especially as the diaphragm may be used in connection with other forms of regulator or cut-off.

I claim herein as my invention—

1. In a fluid-pressure regulator or cut-off, the combination of a diaphragm formed of oil-silk and a re-enforcing grid, substantially as set forth.

2. A diaphragm for fluid-pressure regulators or cut-offs, formed of oil-silk coated with a mixture of rubber, lime-water, oil-varnish, and isinglass, substantially as set forth.

In testimony whereof I have hereunto set my hand.

TERRENCE MCSWEENEY.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.

It is hereby certified that in Letters Patent No. 370,152, granted September 20, 1887, upon the application of Terrence McSweeney, of Allegheny, Pennsylvania, for an improvement in "Diaphragms for Fluid Pressure Regulators," an error appears in the printed specification requiring the following correction, viz: In line 42, page 1, the word "water" should be stricken out and the word *rubber* inserted, and that the Letters Patent should be read with this correction therein to make it conform to the record of the case in the Patent Office.

Signed, countersigned, and sealed this 15th day of November, A. D. 1887.

[SEAL.]

D. L. HAWKINS,
Acting Secretary of the Interior.

Countersigned:

R. B. VANCE,
Acting Commissioner of Patents.