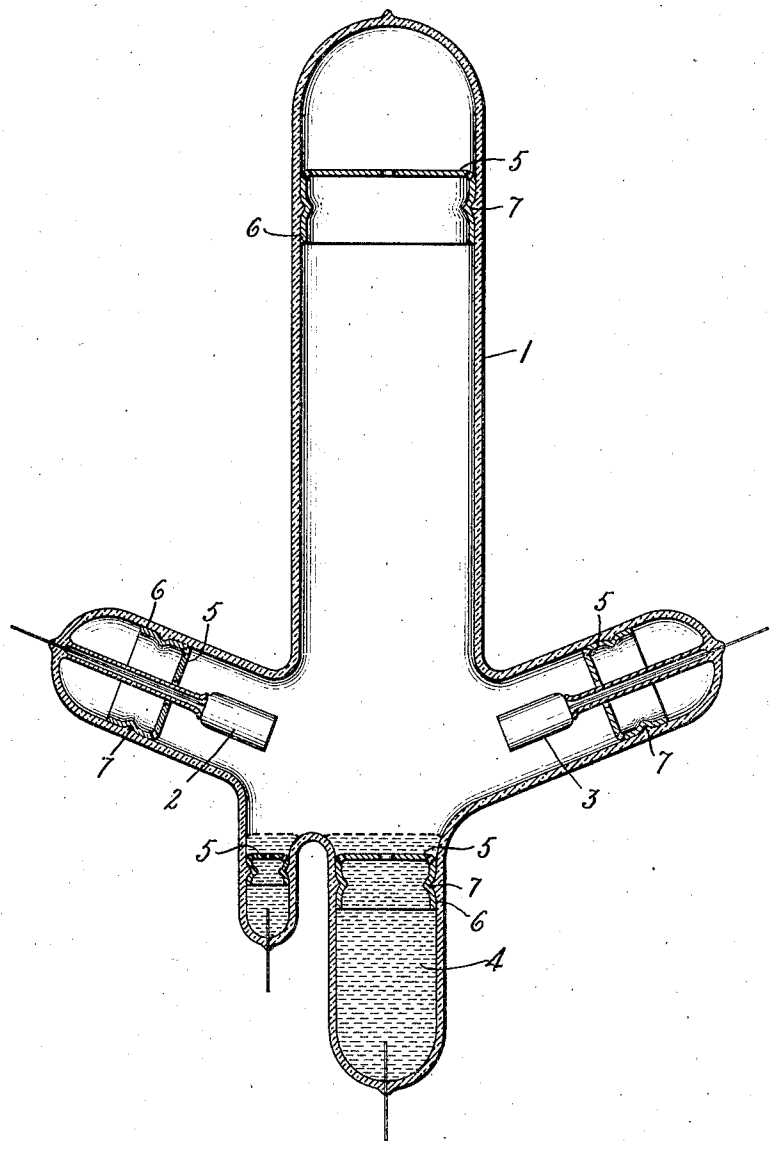
No. 850,633. PATENTED APR. 16, 1907.

S. FERGUSON.

PROTECTIVE DEVICE FOR FRAGILE VESSELS.

APPLICATION FILED NOV. 7, 1904.



Witnesses:
George H. Tilden.
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UNITED STATES PATENT OFFICE.

SAMUEL FERGUSON, OF SCHENECTADY, NEW YORK, ASSIGNOR TO GENERAL ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

PROTECTIVE DEVICE FOR FRAGILE VESSELS.

No. 850,633. Specification of Letters Patent. Patented April 16, 1907.

Application filed November 7, 1904. Serial No. 231,658.

To all whom it may concern:

Be it known that I, SAMUEL FERGUSON, a citizen of the United States, residing at Schenectady, county of Schenectady, State of New York, have invented certain new and useful Improvements in Protective Devices for Fragile Vessels, of which the following is a specification.

Mercury-vapor lamps, mercury-rectifiers, and other electrical apparatus in which a body of mercury or other heavy liquid is contained in an evacuated chamber are subject to considerable danger from breakage when the apparatus is inverted or suddenly changed in position. This destruction of the apparatus is produced by the sudden rush of mercury or other liquid from one part of the evacuated chamber to the other and the consequent sudden impact against the wall of the chamber. The fact that the atmosphere within the chamber is in a very rarefied condition greatly increases this danger of breakage, as there is practically no cushioning effect to protect the wall. This phenomenom is quite analogous to the so-called "water-hammer" often experienced with steam-heating systems and may prove more or less destructive to mercury-rectifiers and other apparatus during shipment.

It is the object of this invention to provide a means whereby the sudden impact of the mercury against the fragile parts of such apparatus may be prevented, and this means consists of a suitable diaphragm or baffle-plate in the path of the moving mercury. This diaphragm is perforated to permit the slow passage of mercury, but nevertheless offers sufficient resistance to the flow of liquid to prevent a sudden and destructive impact against the chamber-wall.

In the drawing is shown a mercury-rectifier 1 of ordinary form, comprising the anodes 2 and 3 and a mercury cathode 4. The peculiar shape of the rectifier makes it desirable to protect the end walls of the various cylindrical chambers which radiate from the center of the apparatus. To effect this protection, I have inserted the perforate diaphragms 5 near these end walls, but separated therefrom by a considerable space. These diaphragms are adapted to break up a sudden rush of mercury, but at the same time to permit the slow passage of mercury from one side to the other. The diaphragms may be made of glass or other vitreous material, but are preferably made of metal stamped or spun to the desired form and provided with an annular flange 6, having an annular groove 7, into which fits a portion of the side wall of the chamber, so that the diaphragm is held firmly in place. By securing the diaphragm to the side walls at some distance from the end of the chamber a very strong support is obtained for the diaphragm, and an efficient protection against the impact of mercury is obtained without interfering in any way with the normal operation of the rectifier.

While I have shown my invention as applied to a mercury-rectifier, I contemplate using it in a great variety of ways for protecting fragile vessels from the sudden impact of a heavy liquid.

What I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination of a chamber having a fragile wall, a body of mercury in said chamber, a perforated diaphragm rigidly mounted in the path of movement of said mercury whereby sudden impact of said mercury against the fragile wall is prevented.

2. The combination with a mercury-vapor apparatus having a fragile containing-wall, a body of mercury, and a perforated metallic diaphragm rigidly mounted in the path of movement of said mercury.

3. The combination, with a mercury-vapor apparatus having a tubular chamber and containing a body of mercury, of a perforate diaphragm rigidly secured in proximity to the end wall of said tubular chamber to prevent the sudden impact of mercury against said wall.

4. The combination, with a mercury-vapor apparatus having a tubular chamber and containing a body of mercury, of a submerged perforate diaphragm in proximity to the end wall of said tubular chamber to prevent sudden impact against said wall.

In witness whereof I have hereunto set my hand this 5th day of November, 1904.

SAMUEL FERGUSON.

Witnesses:
BENJAMIN B. HULL,
HELEN ORFORD.