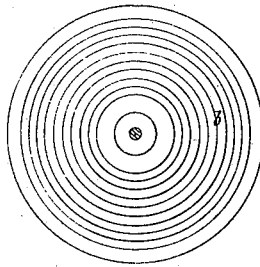


G. W. GILBERT & M. G. WILDER.  
Diaphragm.

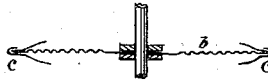
No. 219,458.

Patented Sept. 9, 1879.

*Fig. 1.*



*Fig. 2.*



*Witnesses:*  
*Chauncy S. Truax*  
*James A. Donohue*

*Inventors:*  
*George W. Gilbert*  
*Moses G. Wilder*  
*By their Attorney,*  
*Wm. S. Thornton*

# UNITED STATES PATENT OFFICE.

GEORGE W. GILBERT AND MOSES G. WILDER, OF BROOKLYN, NEW YORK,  
ASSIGNORS TO THE NEW YORK GAS CONTROLLER COMPANY.

## IMPROVEMENT IN DIAPHRAGMS.

Specification forming part of Letters Patent No. 219,458, dated September 9, 1879; application filed August 2, 1879.

*To all whom it may concern:*

Be it known that we, GEORGE W. GILBERT and MOSES G. WILDER, both of the city of Brooklyn, in the county of Kings and State of New York, have jointly invented a new and useful Improvement in Diaphragms; and we hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification.

This invention relates to an improvement in the manufacture of diaphragms to be used in gas-regulators and similar apparatus for regulating the pressure and supply of gases or fluids under pressure. It is more especially applicable to diaphragms for small regulators, such as are used for regulating one burner or a small number of burners; but it may also be applied to larger gas-regulators, and also to various kinds of pressure-regulators.

The object of the invention is to provide a diaphragm which shall be of uniform thickness and strength throughout its entire body, and shall also be impervious both to gas and to moisture, and shall remain unaffected by changes of temperature.

The invention consists in the improved process by which the diaphragm is prepared or produced, as hereinafter particularly set forth, and also in a diaphragm, as a new or improved article of manufacture, made from paper or fibrous material of linen or similar substance, coated with collodion, and treated in the manner hereinafter described.

In the accompanying drawings, Figure 1 represents a plan view of our improved diaphragm, and Fig. 2 a transverse section of the same.

Similar letters of reference indicate the same parts in both the figures.

The material from which the diaphragm is made is paper or fabric of linen or similar material of suitable thickness, the thickness thereof being proportioned to its size or diameter, and the process by which we prepare it for the purposes above indicated is as follows, namely: We take a sheet or sheets of the linen (or other) paper or fabric, and either immerse the same in collodion or apply collodion thereto, on both sides thereof, by means of a brush or similar means, so that the collodion shall be evenly spread over the entire surface thereof and permeate the entire substance of the pa-

per or fiber. What is known to the trade as "flexible collodion" is preferred for this purpose. When the collodion is nearly dry we form concentric corrugations *b* on the diaphragm by pressing it between suitable dies, for the purpose of increasing its flexibility and elasticity, and securing a suitable degree of fullness and of inflection under pressure, after which, in order that the body of the diaphragm shall be evenly and uniformly stretched, we fix it in position in the case (represented by *c*) in which it is to be used, so that when the collodion has dried the diaphragm will be stretched evenly and uniformly. We then place the diaphragm and the case in which it is secured in an oven of any suitable kind, and gradually increase the heat therein until it reaches about 220° Fahrenheit, allowing them to remain therein about thirty minutes, (more or less,) and by this means the diaphragm is rendered permanently water-proof and gas-proof, and will remain unaffected either by moisture, or by the gas, or by changes of temperature.

A diaphragm made and applied in the manner above described is more sensitive and more uniform in its action than is one made of metal or any other material, and will remain unaffected for an indefinite length of time, either by the gas brought in contact therewith, or by moisture or changes of temperature, and its operation will be uniform and equal under all conditions; and in addition to these advantages it is comparatively inexpensive and is easily handled.

We may state that we do not confine ourselves exclusively to paper or fiber made from linen, as a paper or fibrous material made from silk or cotton or other substances, when treated as before described, may be employed; but linen is the preferred substance. Neither do we confine ourselves to the exact means shown in the drawings for securing the diaphragm in its case, as these may be modified or changed without changing or altering the principle of our invention, the object being to secure a uniform and equal tension throughout the body of the diaphragm by placing the same in position in its case before the collodion is dried or seasoned.

What we claim as our invention is—

1. The process hereinbefore described for producing a diaphragm from paper or fiber made

from linen or similar material, the said process consisting in coating both sides thereof with collodion, then corrugating it with concentric corrugations, and afterward baking or seasoning it while placed in position in its case, all as herein described and set forth.

2. As a new article of manufacture, a diaphragm of paper or fiber made from linen or

similar material, coated with collodion, and treated as hereinbefore set forth.

GEORGE W. GILBERT.  
MOSES G. WILDER.

Witnesses:

JOHN S. THORNTON,  
WALTER NICHOLS.