A. Tufts.

Gas-Meter Bellows.

No. 83,113, Patented Oct. 13, 1868.

Fig. 1.

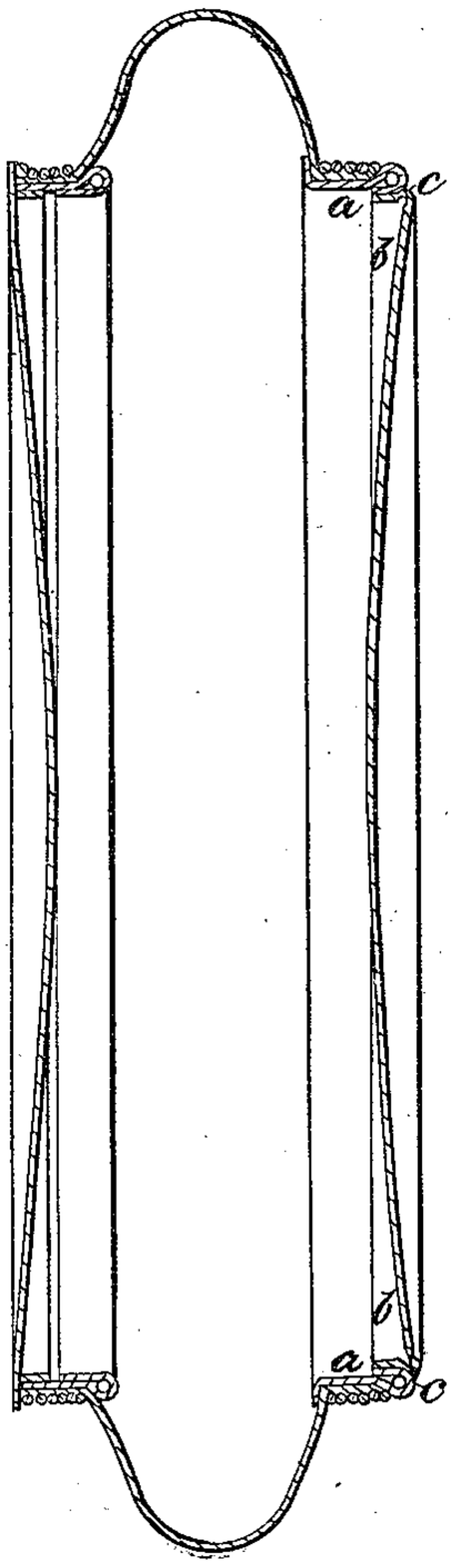
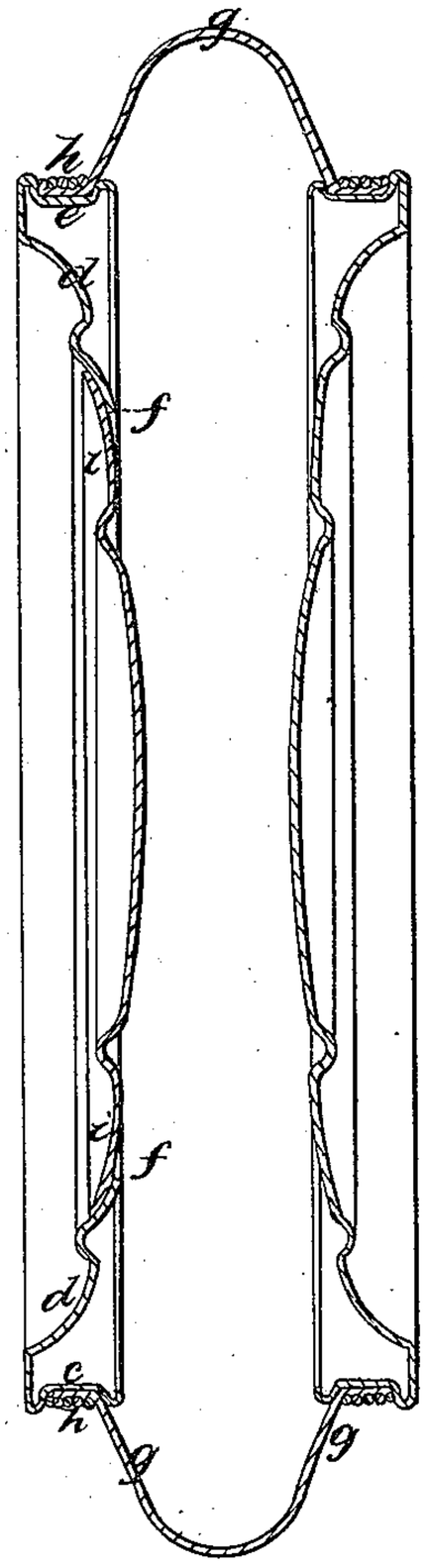



Fig. 2




Witnesses

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# United States Patent Office.

AUGUSTUS TUFTS, OF MALDEN, MASSACHUSETTS.

*Letters Patent No.* 83,113, *dated October* 13, 1868; *antedated October* 3, 1868.

## IMPROVEMENT IN DIAPHRAGM-BELLOWS FOR DRY GAS METERS.

The Schedule referred to in these Letters Patent and making part of the same.

*To all whom it may concern:*

Be it known that I, AUGUSTUS TUFTS, of Malden, in the county of Middlesex, and State of Massachusetts, have invented an Improvement in the Details of the Construction of Diaphragm-Bellows for Use in Gas-Meters; and I do hereby declare that the following, taken in connection with the drawings, which accompany and form part of this specification, is a description of my invention sufficient to enable those skilled in the art to practise it.

This invention is an improvement upon that relating to the same general subject-matter, patented under the number 29,639, and date of August 14, 1860, to my brother Nathaniel.

The bellows, as constructed under said patent No. 29,639, is shown in the drawings by Figure 1, which is a central cross-section.

This bellows, which is composed of two flanged heads or diaphragms, and a belt, of leather or other suitable flexible substance, is made up on a blocking-former or mould, which gives convexity to the flexible material uniting the two diaphragms, which former is made in pieces, so as to be capable of removal from the interior of the bellows.

The flanged head on the right of fig. 1 is made with the flange or ring separate from the head, and these parts are not united till the sectional former is removed from within the bellows.

The flexible material is united to the flanges of the bellows by winding a cord over said material where located on the flanges, the cord being saturated or covered with greasy or resinous matter, or with a compound of such matter. Now, the difficulty with this old construction is, that when the flange marked *a* and the diaphragm marked *b* are soldered together at the joint *c*, the heat communicated from the soldering-iron is apt to burn or scorch the leather, and to melt the matter upon the winding-cord, and the cord itself is often weakened by the heat, so that it soon breaks, any of which occurrences impairs the integrity of the bellows.

Figure 2 of the drawings shows, in cross-central section, a bellows similar to the one before referred to, but differing in detail of construction in so far as to avoid the troubles caused by the soldering in the old construction, and it is in this modification of detail, by which the soldered joint is removed from proximity to the leather and its winding, that my present invention consists.

On the right of fig. 2, the flange and diaphragm-head are made of one piece of metal, this being accomplished mostly in dies under a drop-press, though the groove-like formation of the flange is obtained by the process known as "spinning."

On the left of said figure, the flange and a part of the diaphragm are made of one piece, similarly to the flanged diaphragm-head on the right, but the part *d* of the head which is integral with the flange *e*, terminates at *f*, some considerable distance from the place on the flange where the leather, *g*, is secured to the flange *e*, by winding the cord *h* over the leather on said flange.

The circular opening bounded by *f f* is smaller in area than the opening in the old construction through which the sectional former is removed; hence, in making use of my invention, the former has to be cut into more and smaller pieces than has heretofore been the practice, but this is attended with no delay or inconvenience.

The piece *i* is a mere disk, of diameter sufficient to lap beyond *f f*, so as to give a good joint-surface, on which solder and the soldering-iron can be freely used. The diameter of this joint being less than the diameter of the joint in the old construction, less time is required to make the joint, both on account of the lessened size and amount of care required, there being no danger from heat, in the new construction, either to the leather or the winding-cord.

The hollow screw by which the bellows is attached to the gas-meter is not shown in the drawings, as that is a matter well understood by those skilled in the art, and has nothing to do with the subject of my present invention.

I claim a gas-meter-bellows in which one head is annular, with an attached flange, to which the flexible material of the bellows is secured, and in which head the opening through which the "former" is extracted in parts is closed by soldering the disk *i* at its edge which is remote from the cord *h*, which secures the flexible material *g* to the flange *e*, substantially as described.

AUGUSTUS TUFTS.

Witnesses:

FRANCIS GOULD,

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