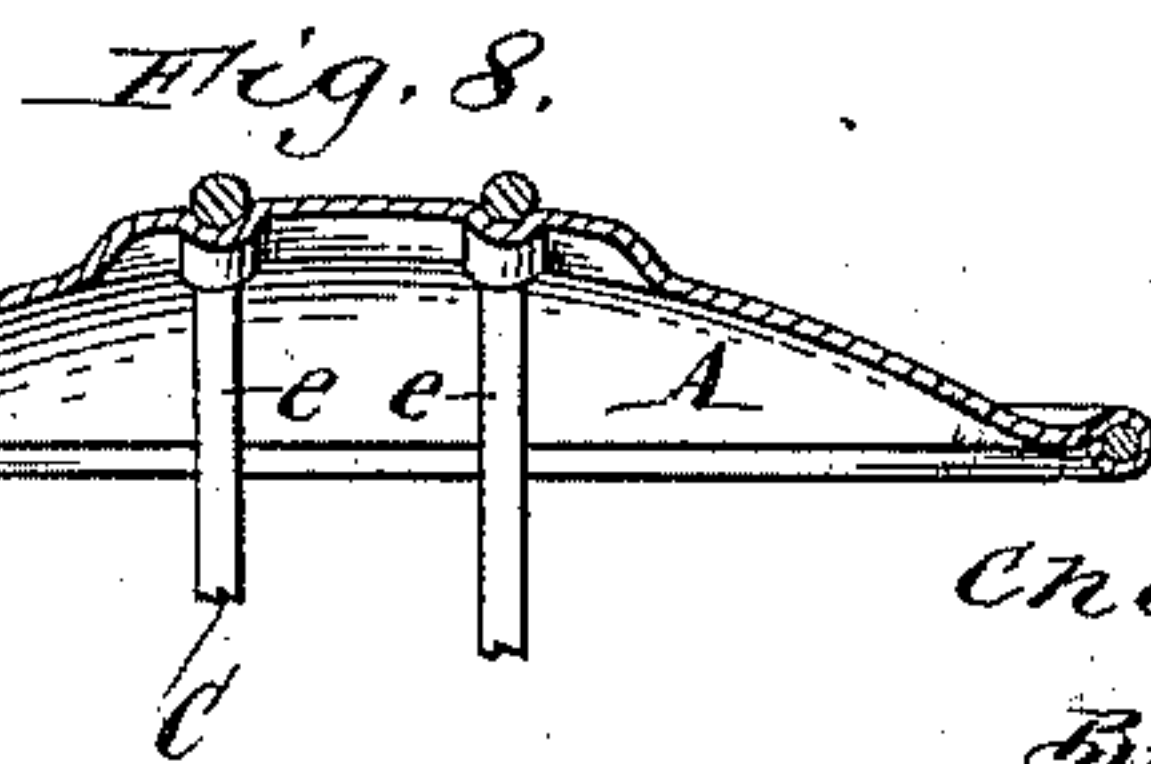
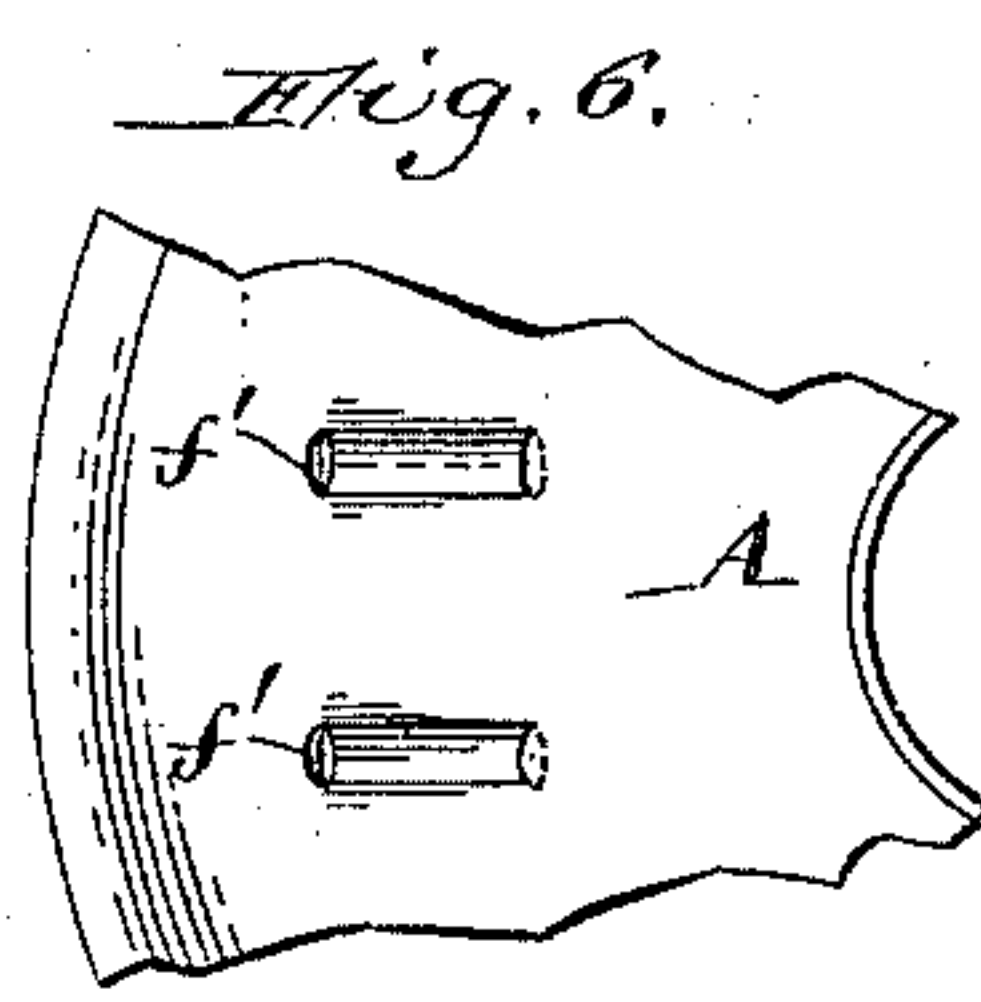
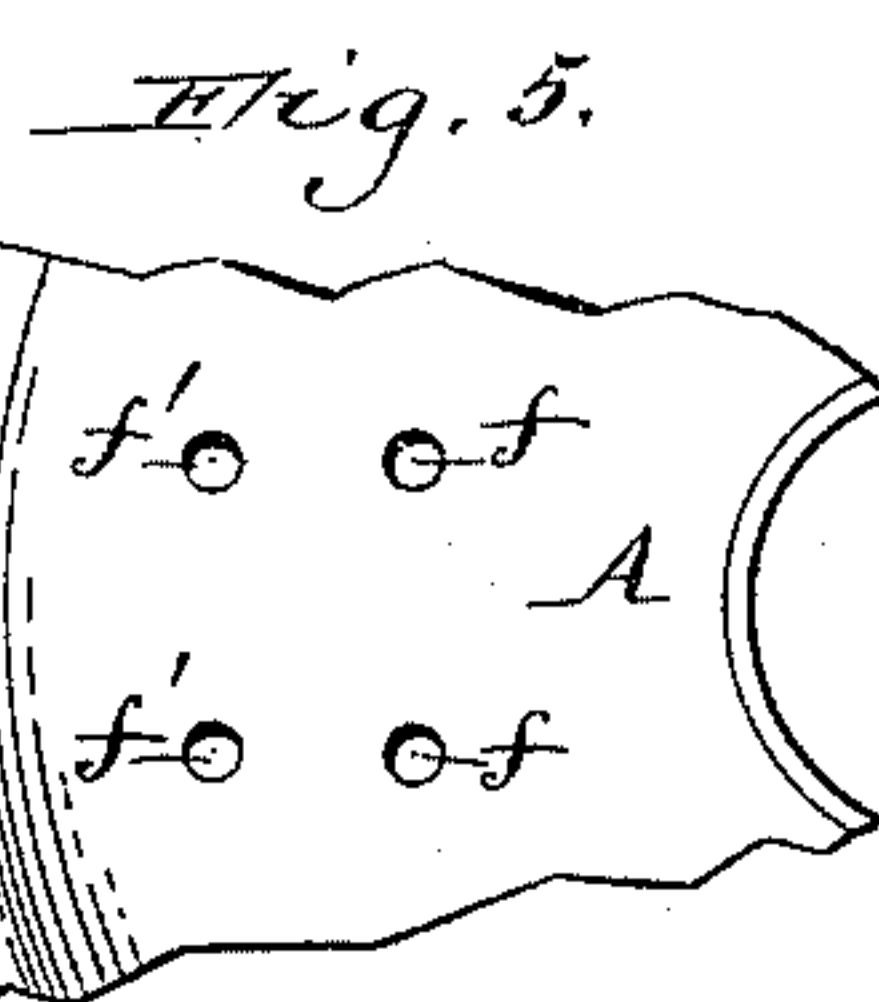
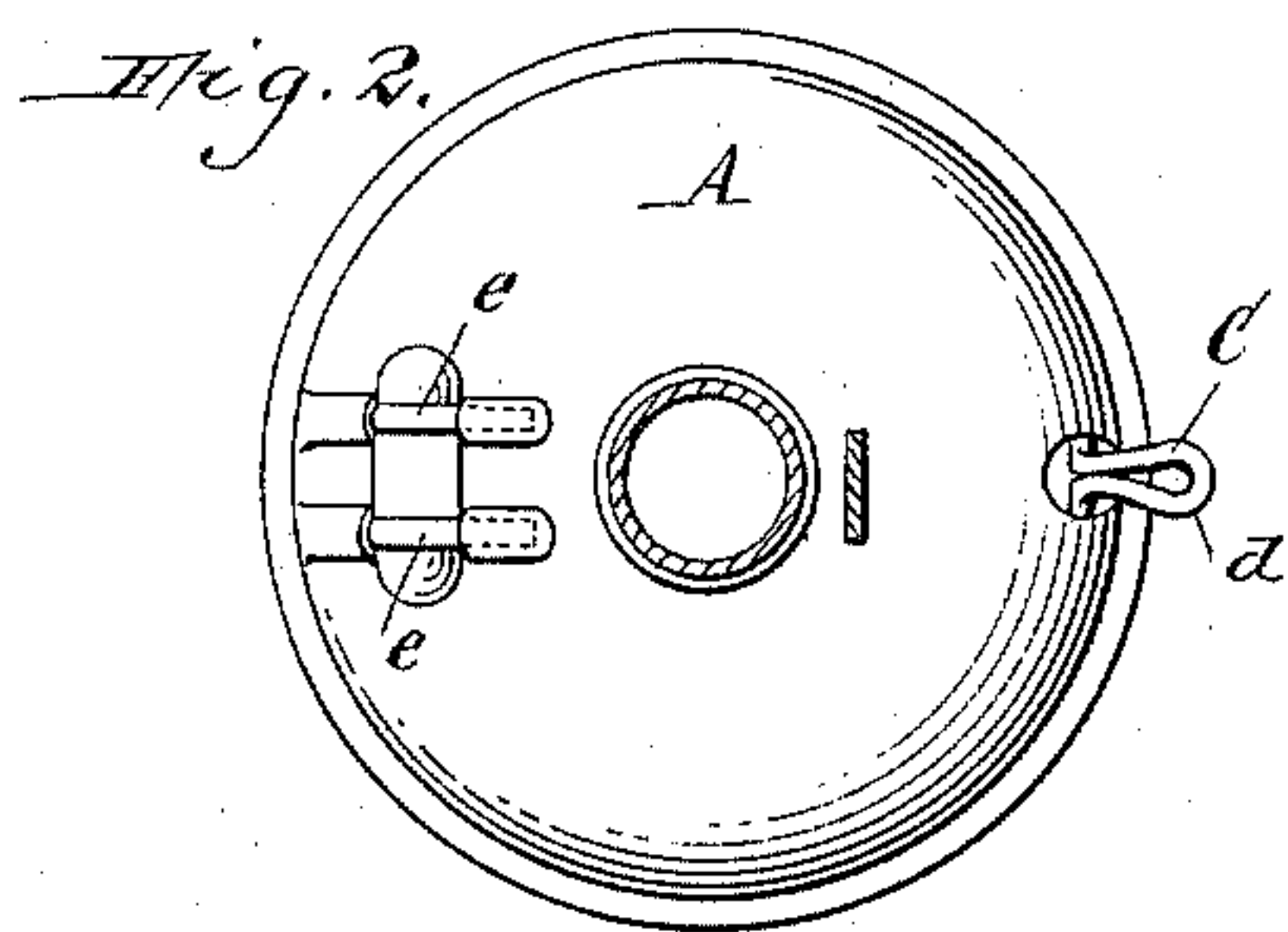
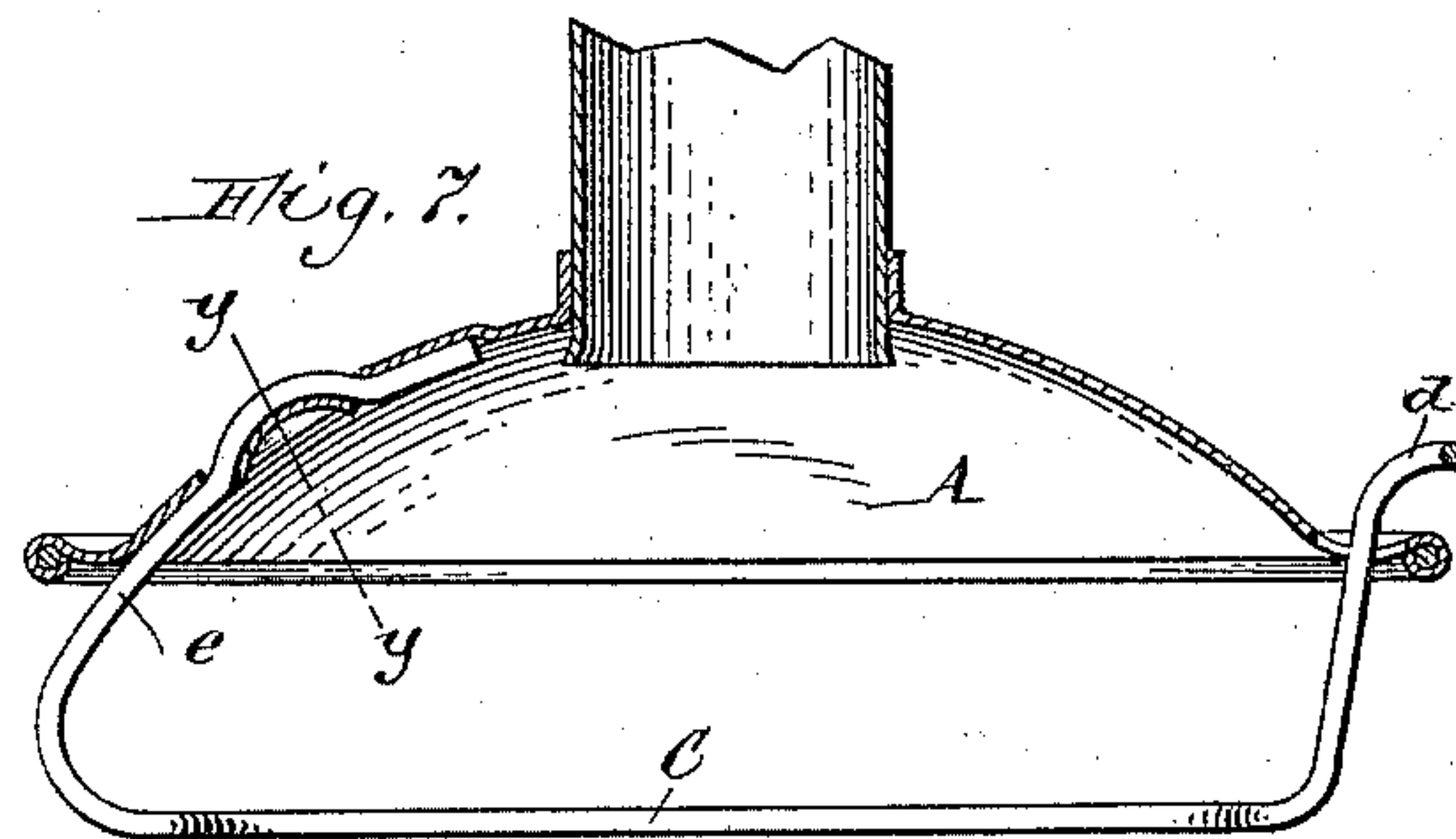
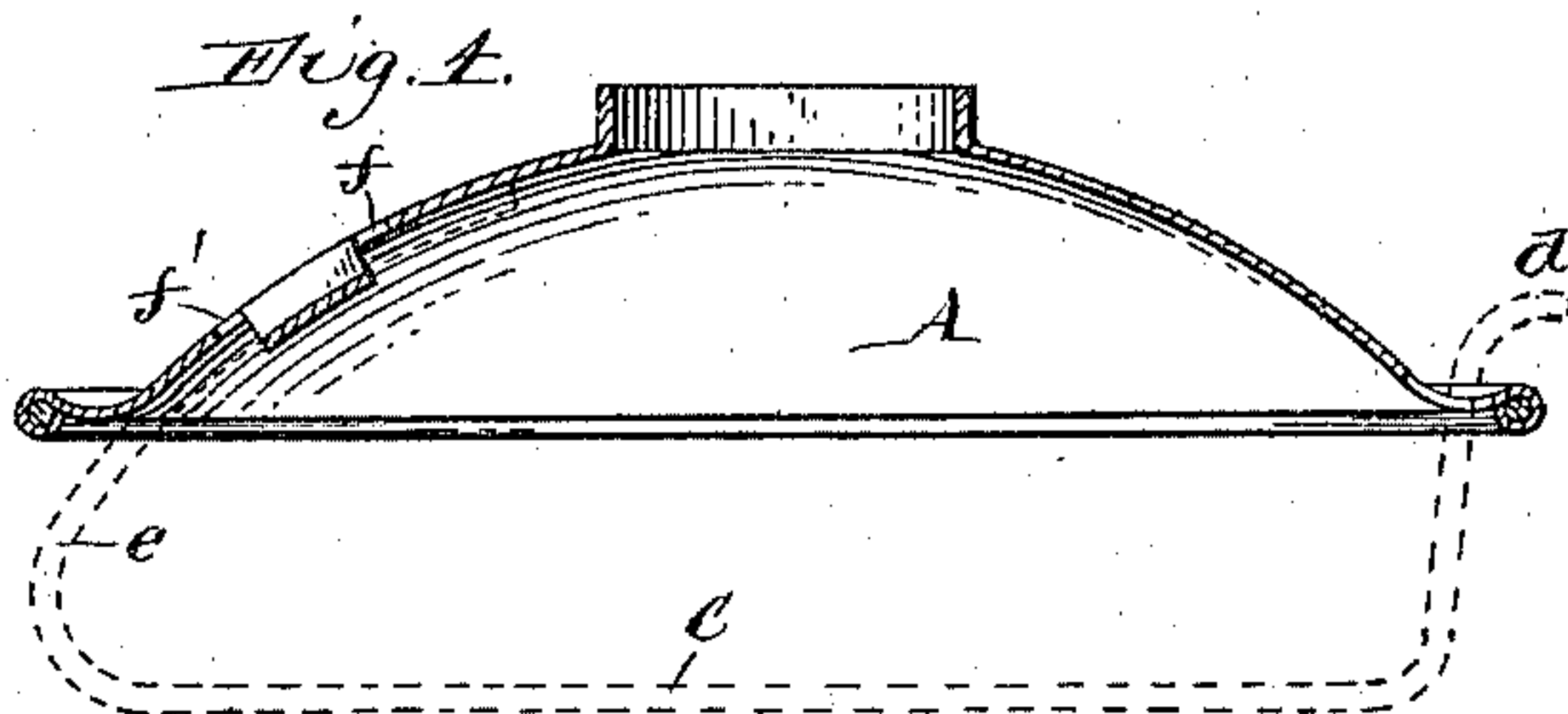
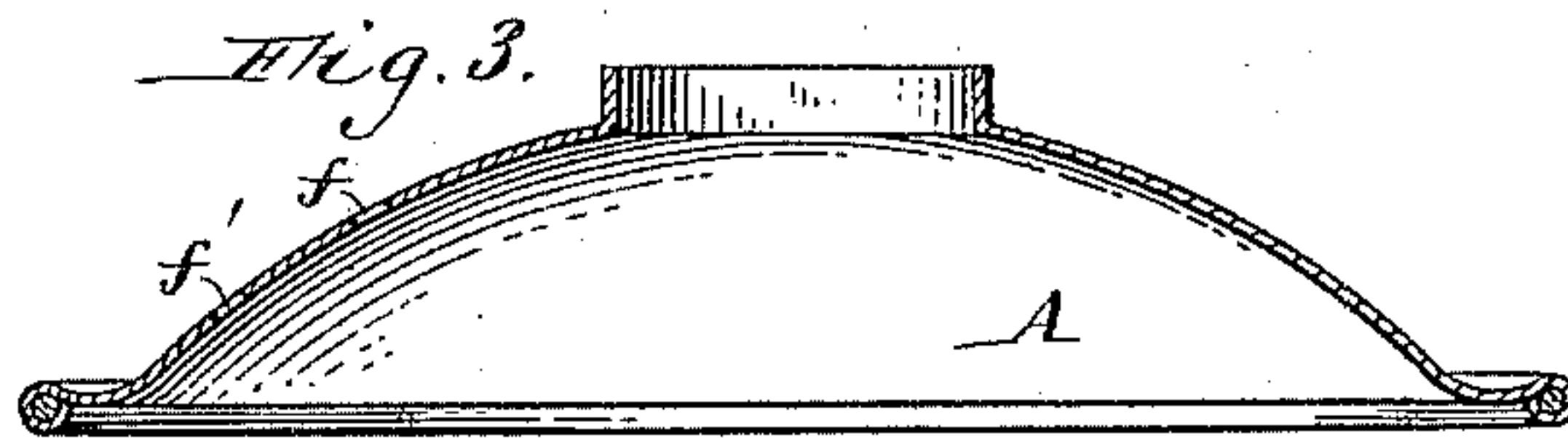
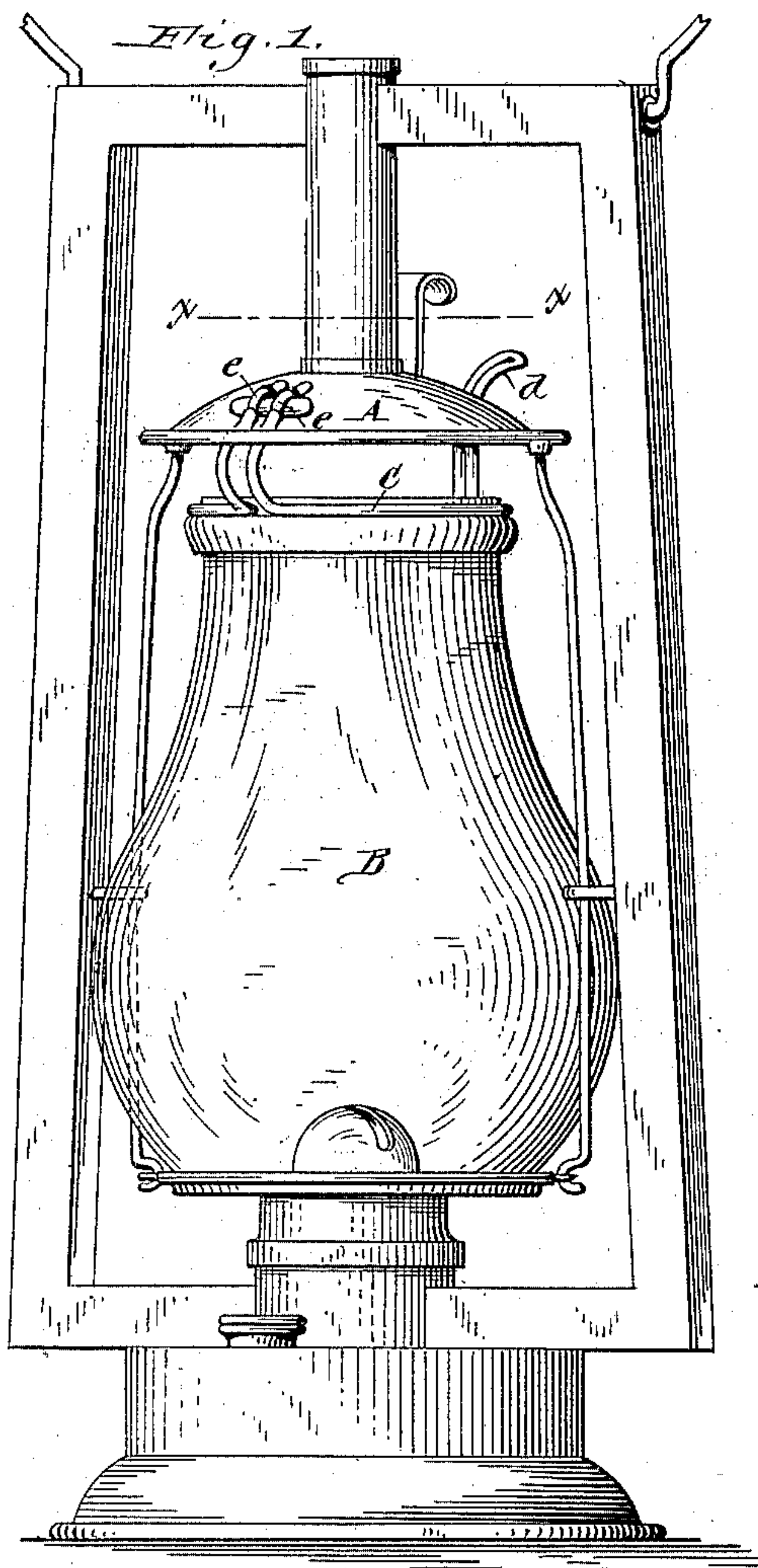


(No Model.)

C. F. ERB.
WIRE FASTENING.

No. 493,916.

Patented Mar. 21, 1893.



Witnesses:
Theo. L. Popp.
Chester D. Howe.

Inventor,
Charles F. Erb.
By Edward Wilhelm,
Attorney.

UNITED STATES PATENT OFFICE.

CHARLES F. ERB, OF NEW YORK, N. Y., ASSIGNOR TO THE R. E. DIETZ COMPANY, OF SAME PLACE, AND THE STEAM GAUGE AND LANTERN COMPANY, OF SYRACUSE, NEW YORK.

WIRE-FASTENING.

SPECIFICATION forming part of Letters Patent No. 493,916, dated March 21, 1893.

Application filed August 22, 1890. Serial No. 362,722. (No model.)

To all whom it may concern:

Be it known that I, CHARLES FREDERICK ERB, a citizen of the United States, residing at New York, in the county and State of New York, have invented a new and useful Improvement in Wire-Fastenings, of which the following is a specification.

This invention relates to the means of fastening wires to plates of tin or other sheet metal and has the object to dispense with solder as a means of fastening.

My invention is particularly designed to be used in lanterns in which solder joints which are exposed to heat, are liable to become unfastened, and is particularly desirable for fastening the globe spring to the air gathering plate or bell of a tubular lantern. These globe springs have been usually secured to the bell by providing the bell for each wire with a pair of perforations, bending the perforated portions out of the plane of the bell, inserting the end portion of the wire in both perforations and then securing it in position by soldering, as for instance in the patent to Betts, No. 397,624, dated February 12, 1889. The security of this fastening depends entirely upon the solder and that is liable to give way under the heat to which it is exposed.

In the accompanying drawings:—Figure 1. is an elevation of a tubular lantern in which my improved fastening is used for connecting the globe spring to the bell or air gathering plate above the globe. Fig. 2 is a horizontal section in line $x-x$, Fig. 1. Figs. 3 and 4 are vertical sections of the bell on an enlarged scale, showing it in successive stages of preparation for the reception of the globe spring. Figs. 5 and 6 are fragmentary plan views corresponding respectively with Figs. 3 and 4. Fig. 7 is a vertical section of the bell and globe spring showing the fastening completed. Fig. 8 is a vertical cross section in line $y-y$, Fig. 7.

Like letters of reference refer to like parts in the several figures.

A represents the bell or air gathering plate of a tubular lantern. This bell surmounts the globe B in the usual way and carries the globe spring C which bears against the top of the

globe. The globe spring is bent to the usual circular form of a single piece of spring wire with an upwardly projecting thumb piece d at one side and two upwardly turned ends $e e$ diametrically opposite. These ends are fastened to the bell A but instead of being secured by soldering, as has been done heretofore, they are secured as follows:—The bell is first provided with two holes $f f'$ for each end of the wire, the hole f being nearer the center of the bell than the hole f' , as represented in Figs. 3 and 5. The metal between the two holes $f f'$ is next depressed by means of suitable dies, as represented in Figs. 4 and 6, so as to form a depressed channel or trough on the underside of the bell, which channel or trough is open at its inner and outer ends. The two ends $e e$ of the globe spring are next inserted into these channels, as represented by dotted lines in Fig. 4, in which position each wire is held between the depressed metal of the channel on one side and the bell on the other side. The wires are finally secured in this position by upsetting, indenting or bending the depressed channel portion of the tin and the wire resting thereon by suitable dies outwardly, or into the open space between the two perforations through which the wire passes, as represented in Figs. 1, 2, 7 and 8. This converts the depressed channel portion of the metal into a convex bearing surface which projects outwardly into the concavity of the bent portion of the wire, so that both the convex bearing surface between the two perforations and the bent portion of the wire project outwardly into the recess or open space between the two perforations. By this means the inner concave side of the wire is interlocked with the outer convex bearing surface between the two perforations and the outer convex side of the wire is interlocked between the two perforations, whereby the wire is firmly secured in position on the plate.

The final upsetting dies are preferably so constructed that both wires and channels are upset or bent at the same time. This method of fastening the wire to the tin plate is very simple and inexpensive and does away with the use of solder, whereby the cost of the fastening is reduced and the latter is rendered

more durable as it is not affected by heat. It also enables the globe springs to be secured to the bell to a gage so that each spring stands in the proper position to engage with the globe, 5 while the soldered springs are liable to be pushed in too far or not far enough which results in variations in the position of the globe spring in different lanterns.

It is obvious that this fastening can be employed for various purposes, for instance the 10 attachment of the lift wires to the bell.

I do not broadly claim a wire secured to a plate of sheet metal by bending the metal and the wire, because that is shown in Patent No. 15 218,758, dated August 19, 1879.

I claim as my invention—

The combination with the sheet metal plate having a pair of openings and the metal between these openings depressed below the

plane of the plate to form a recess between 20 said openings, of a wire arranged against the under side of the plate and passing through said openings and above the depressed portion of the plate, the metal between the openings and the portion of the wire resting on 25 said metal, being bent upwardly into said recess, whereby a bulge is formed in the metal between said openings having an upper convex side against which the concave underside of the bent portion of the wire rests, substan- 30 tially as set forth.

Witness my hand this 19th day of August, 1890.

CHAS. F. ERB.

Witnesses:

I. J. ALLEN,
J. F. HEANEY.