

No. 755,530.

PATENTED MAR. 22, 1904.

A. PARFITT.
STEAM BOILER.

APPLICATION FILED APR. 28, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.

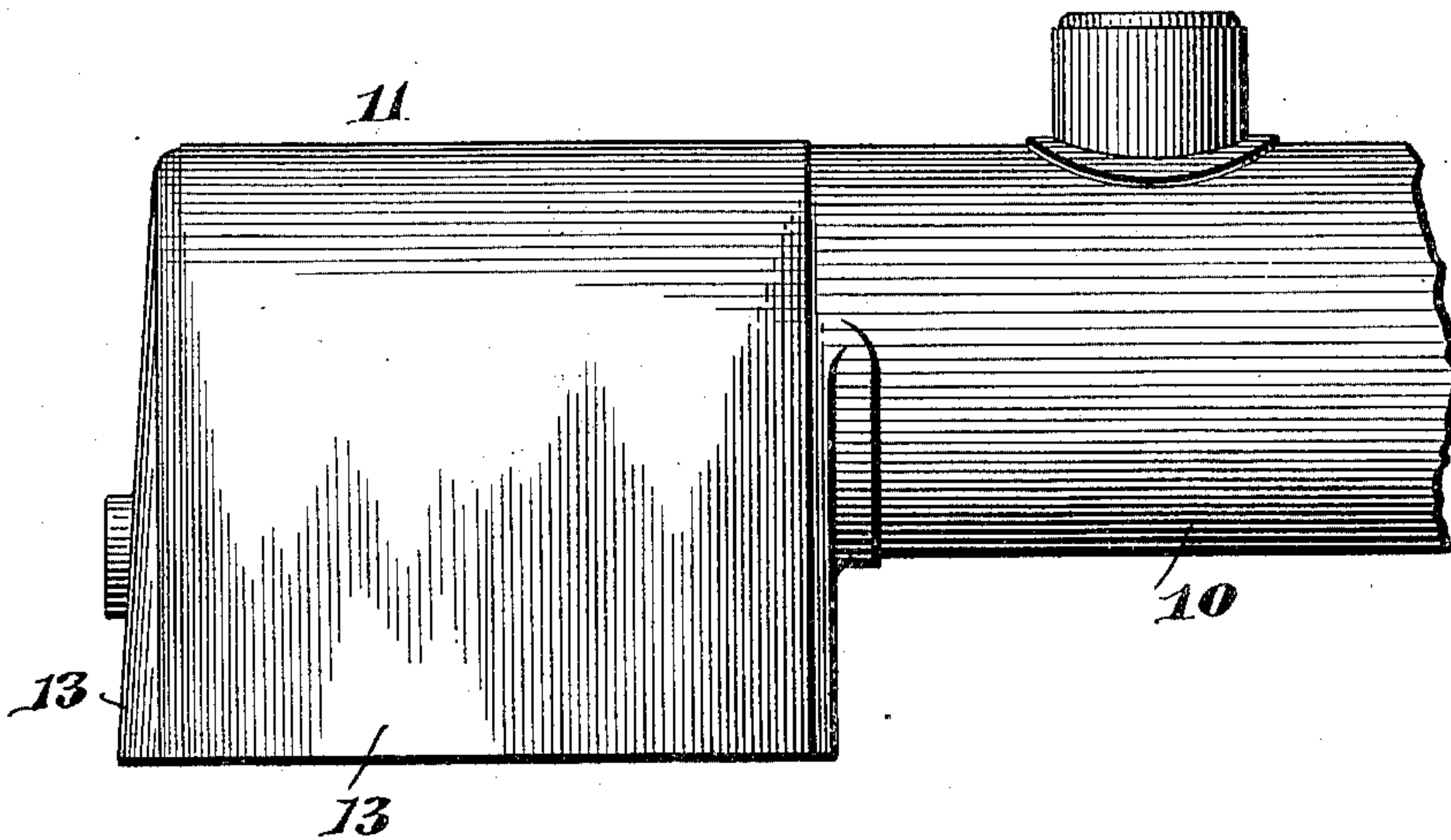
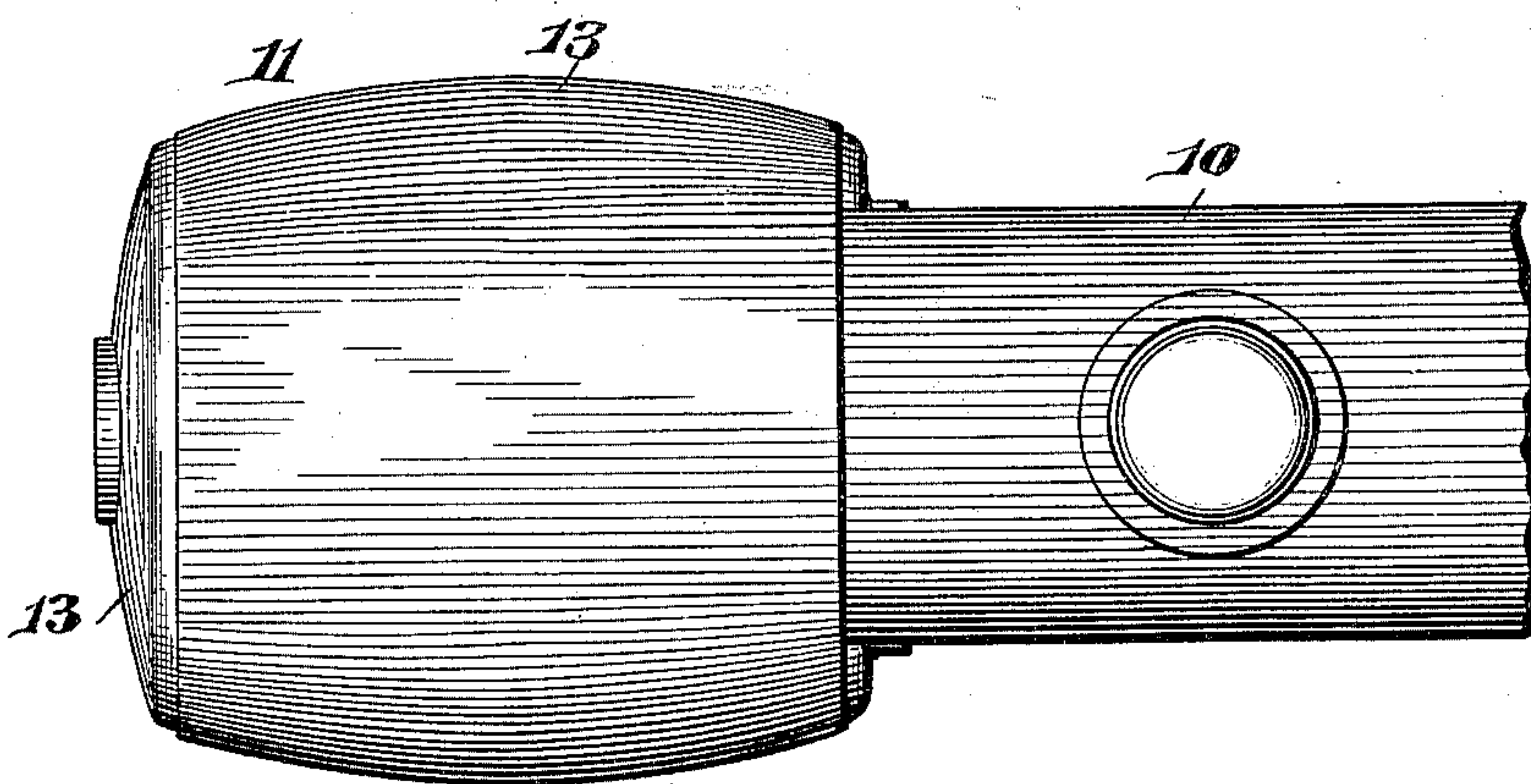


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

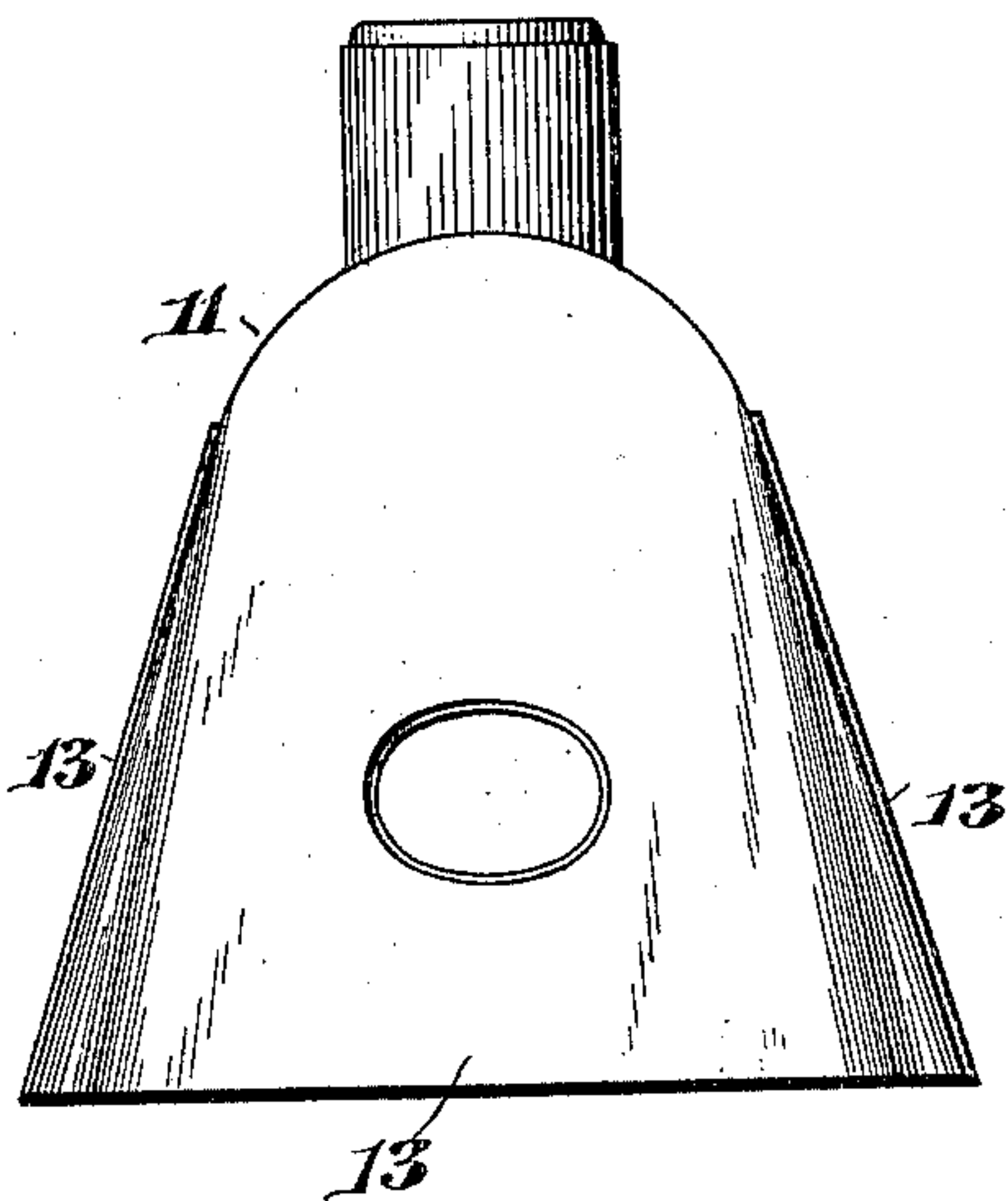


Fig. 4.

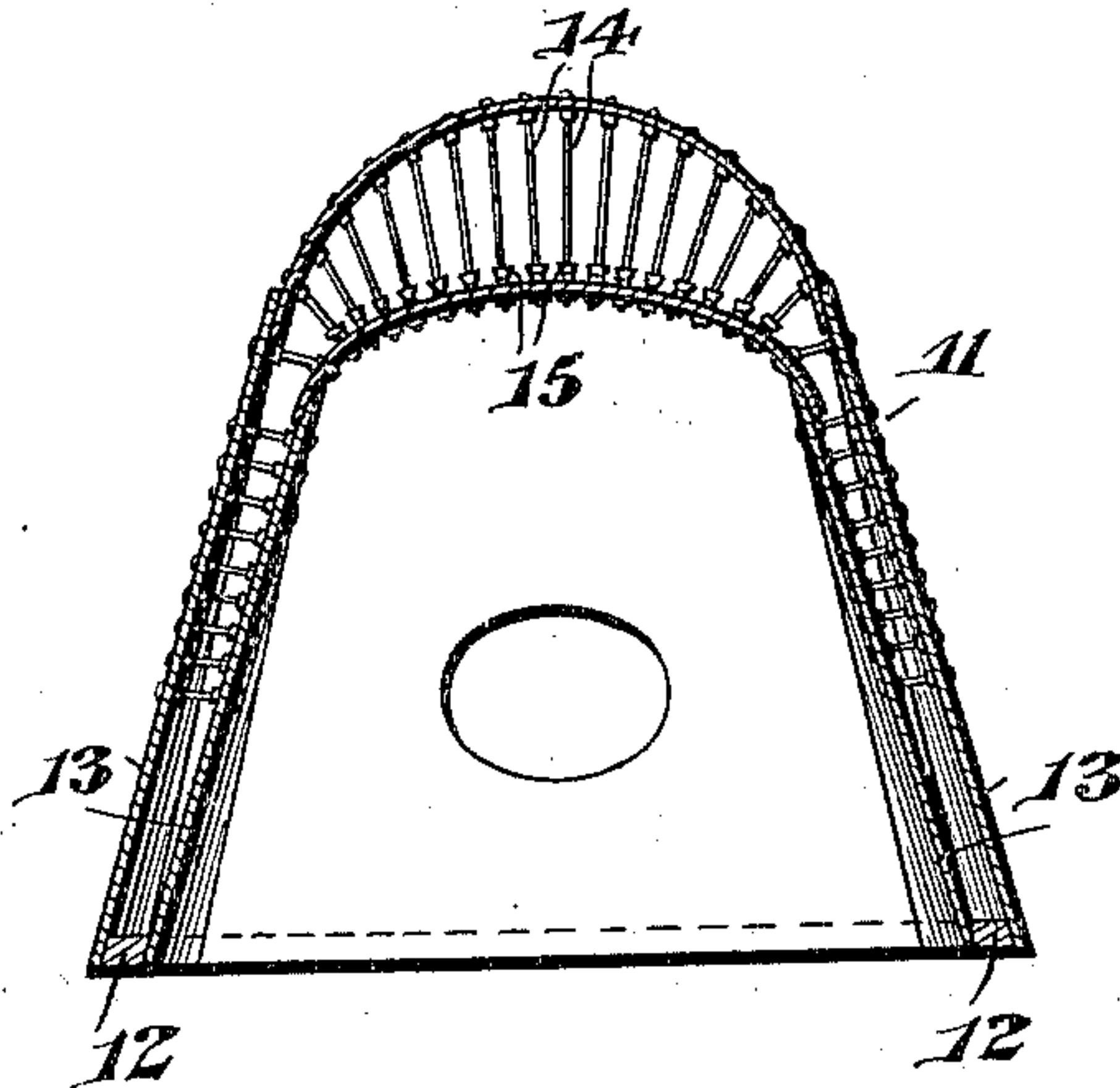


Fig. 5.

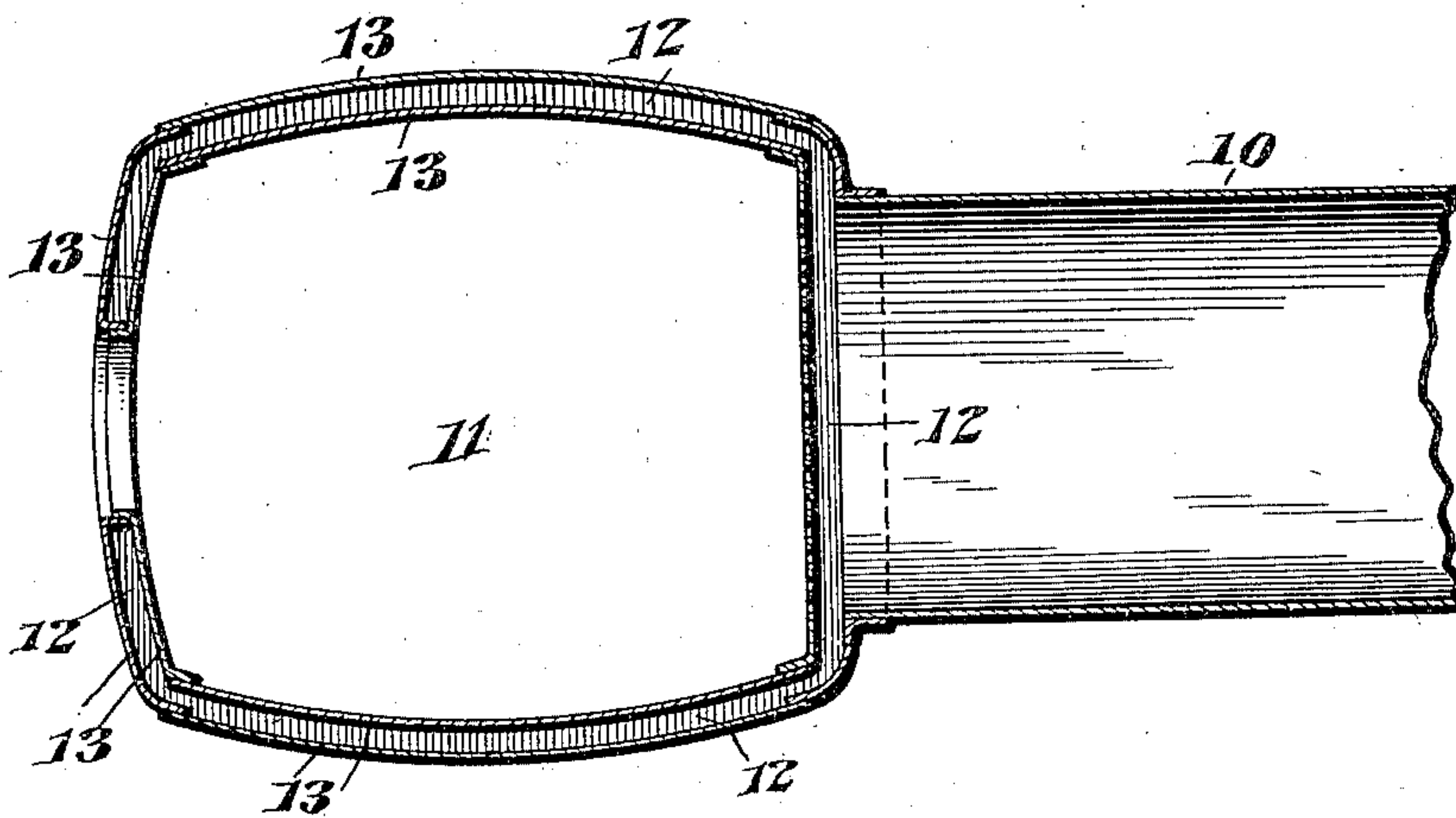
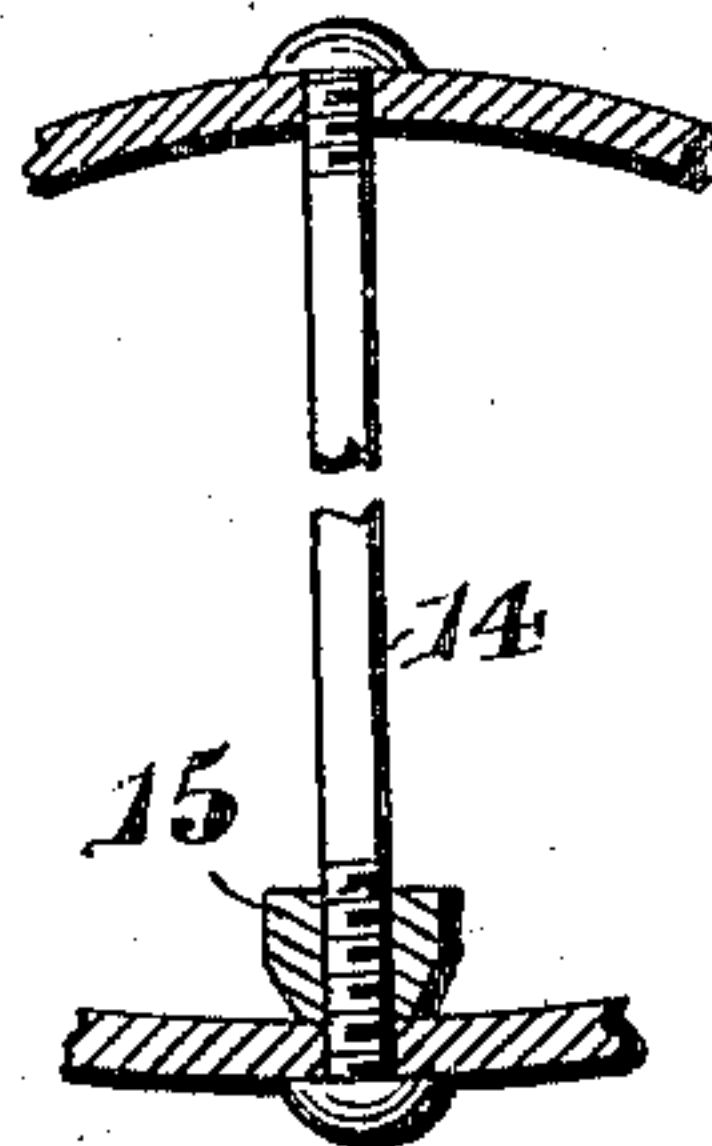


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALFRED PARFITT, OF TOPEKA, KANSAS.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 755,530, dated March 22, 1904.

Application filed April 28, 1903. Serial No. 154,664. (No model.)

To all whom it may concern:

Be it known that I, ALFRED PARFITT, a citizen of the United States, residing at Topeka, in the county of Shawnee and State of Kansas, have invented a new and useful Steam-Boiler, of which the following is a specification.

The object of the invention is to overcome the excessive strains that are customary on the side, door, and flue sheets, also upon the outer sheets of boilers built on the locomotive pattern. These strains cause the side and other sheets to bulge and crack in expanding and contracting, occasioned by the intense heat in the fire-box. The heat from the fire causes the sheets to expand, and as they are put in in straight lines and held that way by the mud or foundation ring (which is generally colder than the fire-box) great strains are thrown on the sheets, thereby causing them to crack vertically from the mud-ring up toward the crown of the box, said cracks varying from one to four feet in length and making it either necessary to patch the box or put in a new one. This trouble is especially great with boilers carrying high pressures and with long and wide fire-boxes of that character now being built. The trouble is augmented in "bad-water districts." Boilers of the stationary type are also troubled in this way.

The present invention aims to provide a novel structure which will overcome the above objections, at the same time preserving the practical shape of the boiler.

The preferred embodiment of the invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a side elevation of a portion of a boiler constructed in accordance with the present invention. Fig. 2 is a top plan view of the same. Fig. 3 is an end elevation of the boiler. Fig. 4 is a vertical transverse sectional view through the same. Fig. 5 is a horizontal sectional view; and Fig. 6 is a detail section, on an enlarged scale, more clearly showing the arrangement of the stay-bolts.

Similar reference-numerals indicate corresponding parts in all the figures of the drawings.

In the embodiment herewith illustrated the usual horizontal cylindrical shell is employed,

which is designated by the reference-numeral 10. Arranged at one end of the shell is the fire-box, (designated as a whole by the reference-numeral 11.) The invention relates particularly to this feature of the boiler. As will be seen by reference to the drawings, the lower end of the box is preferably larger than the upper end, said lower end being provided with a foundation or mud ring 12, the two sides and rear end of which are outwardly curved. The rear and side walls are formed of spaced sheets 13, which are also outwardly curved and are arranged in convergent relation toward their upper ends, said curvature gradually decreasing toward the upper end of the fire-box.

As a result of this construction a box is provided that tapers toward its upper end, the walls thereof being outwardly curved and said curvature decreasing toward the upper end of the box, so that it finally merges into the upper convexity of the boiler-shell proper. This arrangement permits the expansion and contraction of the sheets and obviates to a very great extent the danger of cracking and leakage. At the same time the practical shape of the boiler is maintained—a very important feature, especially in locomotives. In view of the fact that the expansion and contraction of the upper sheets tend to strip the threads of the radial stay-bolts (designated 14) said bolts are preferably provided with nuts 15, threaded thereon and bearing against the inner face of the fire-box sheets. It is a well-known fact that the strains upon the radial bolts are different from those on the stay-bolts, those on the former being directly longitudinal and both tension and compression in their nature. The latter strains upon the radial stays cause the crown-sheet to strip the threads, and the water eats said threads, causing breaking at the joints. The nuts serve to prevent this undesirable action and also serve as solid foundations should it become necessary to calk the joints. Moreover, the end of the nut that bears against the sheet is tapered, so that an extremely small portion of the sheet is covered thereby. This is an important feature.

From the foregoing it is thought that the

construction, operation, and many advantages of the herein-described invention will be apparent to those skilled in the art without further description, and it will be understood
5 that various changes in the size, shape, proportion, and minor details of construction may be resorted to without departing from the spirit or sacrificing any of the advantages of the invention.

10 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a steam-boiler, a fire-box having outwardly-curved walls, said walls decreasing in
15 curvature toward the upper portion of the box.

2. In a steam-boiler, the combination with a horizontal shell, of a fire-box depending from the shell and having its lower end projecting beyond the sides of the shell, the side
20 walls of said box being outwardly curved and said curvature decreasing toward the upper end of the box.

3. In a steam-boiler, the combination with a horizontal shell, of a fire-box depending
25 from one end of the shell and having its lower end projecting beyond the sides of the shell,

said fire-box comprising a convexedly-curved foundation-ring located at the lower end of the fire-box, and outwardly-curved wall-sheets secured to the ring and decreasing in curva- 30
ture toward their upper ends.

4. In a steam-boiler, a fire-box having curved side walls, said walls decreasing in curvature toward one end of the box.

5. In a steam-boiler, a shell and a fire-box 35 depending from one end thereof, said fire-box having outwardly-curved side walls that are arranged in convergent relation.

6. In a steam-boiler, the combination with a horizontal shell, of a fire-box located at one 40
end thereof, said box having convergently-disposed side walls, each wall comprising spaced parallel outwardly-curved sheets, the curvature of which gradually decreases toward the convergent ends of the walls. 45

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ALFRED PARFITT.

Witnesses:

W. H. CHAMBERLIN,
GUS. FOGEL.