

No. 673,170.

Patented Apr. 30, 1901.

F. J. MAYER.

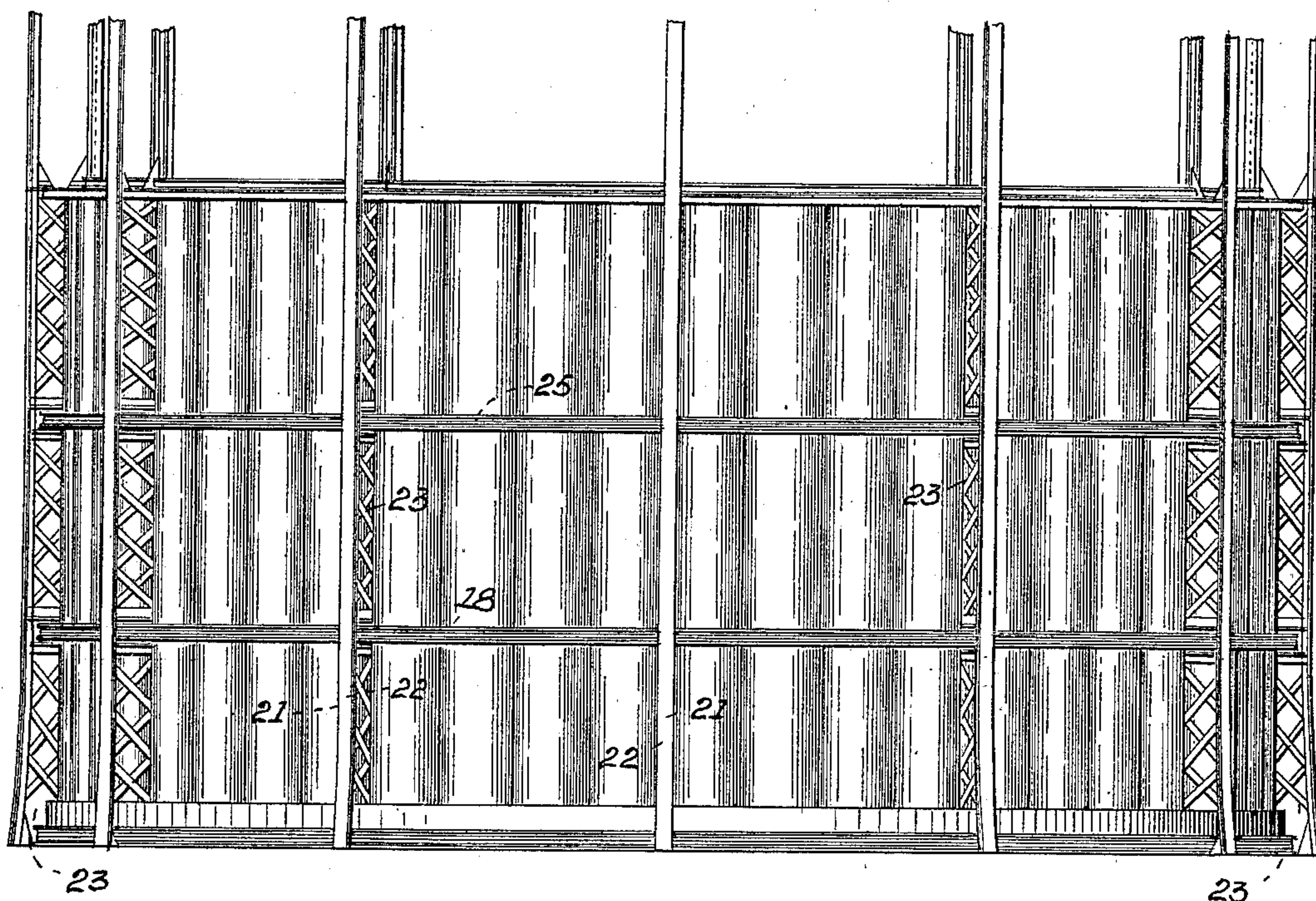
GAS HOLDER.

(Application filed Dec. 7, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



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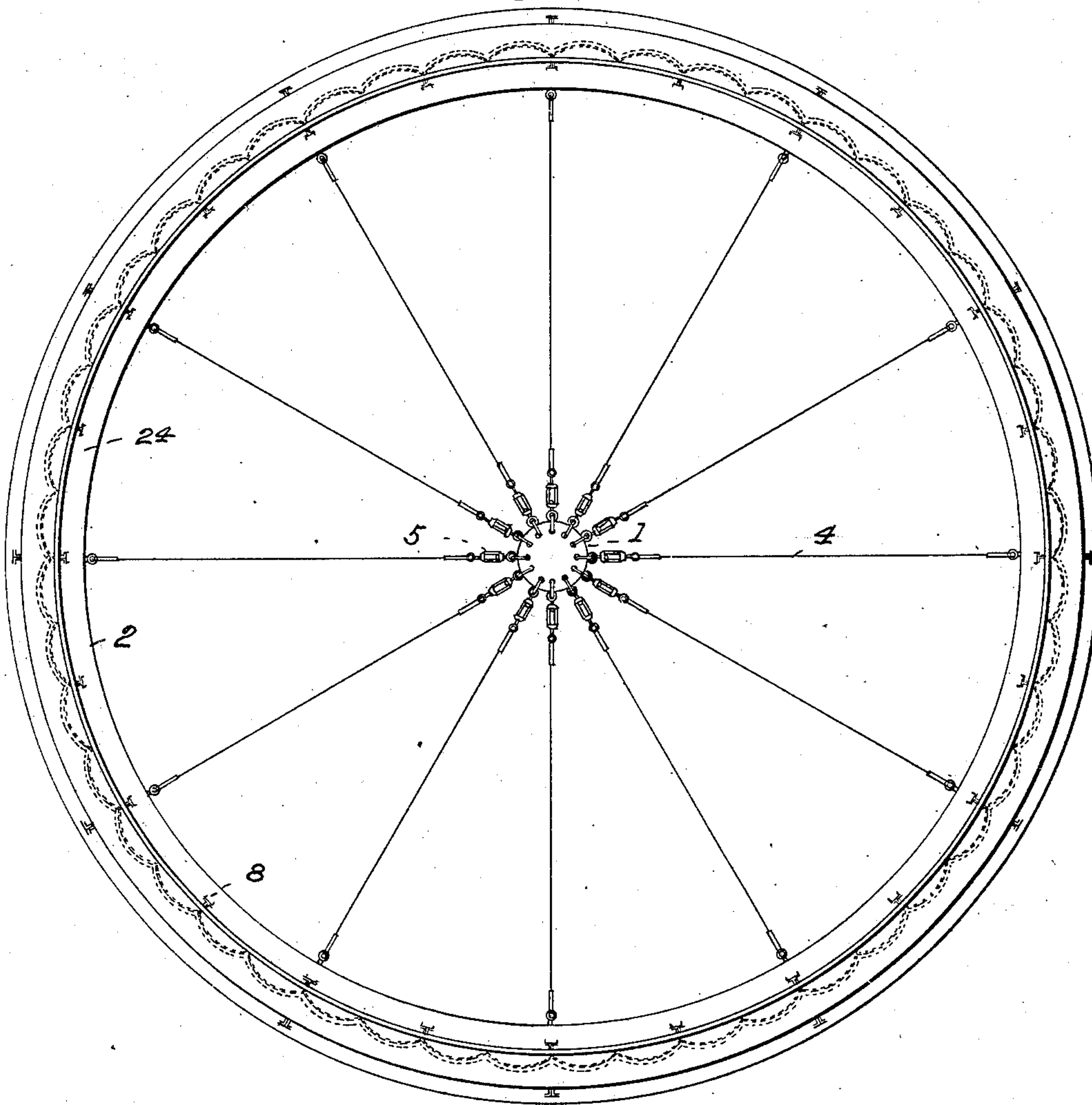
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Fig. 2.



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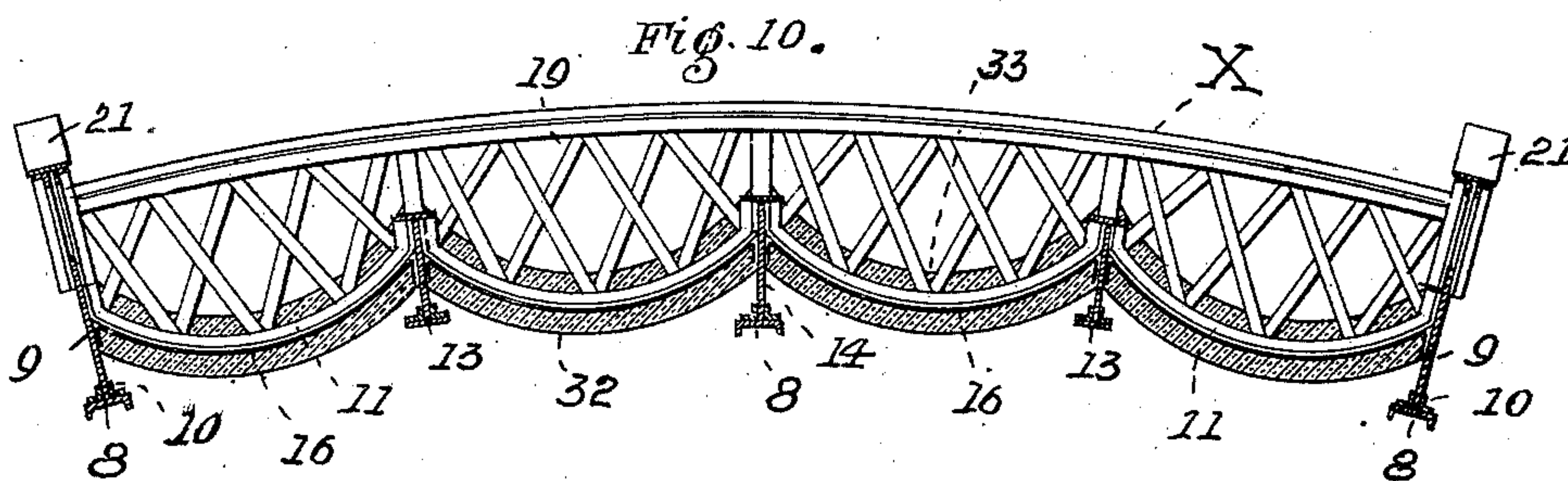
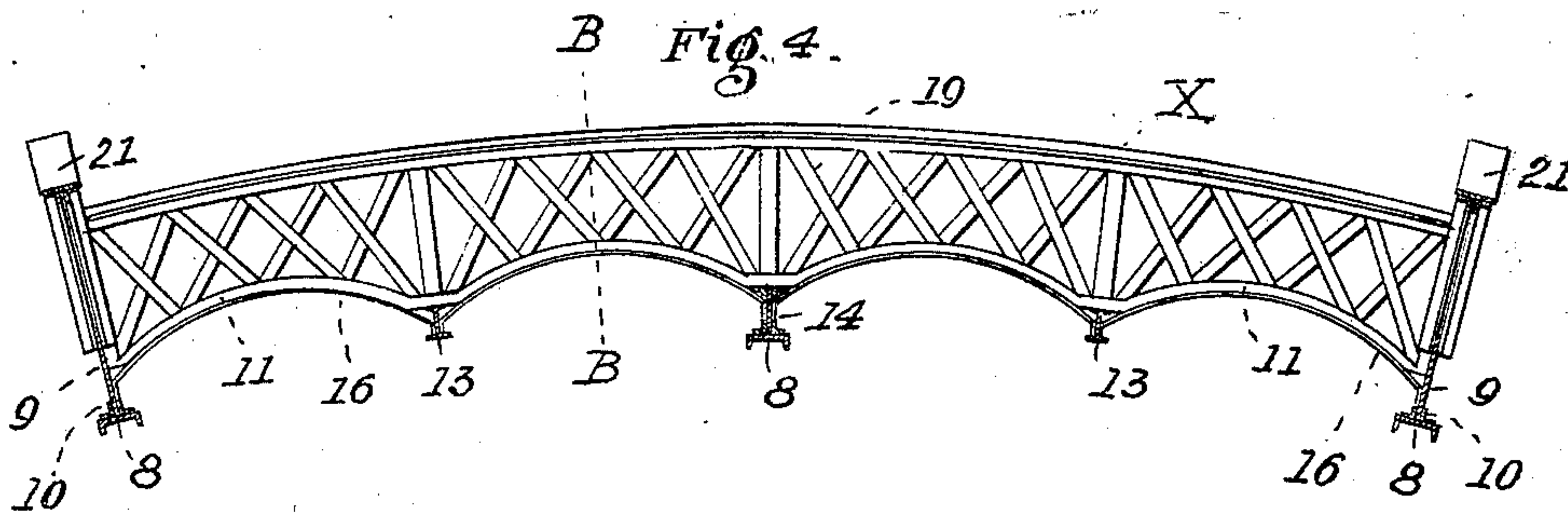
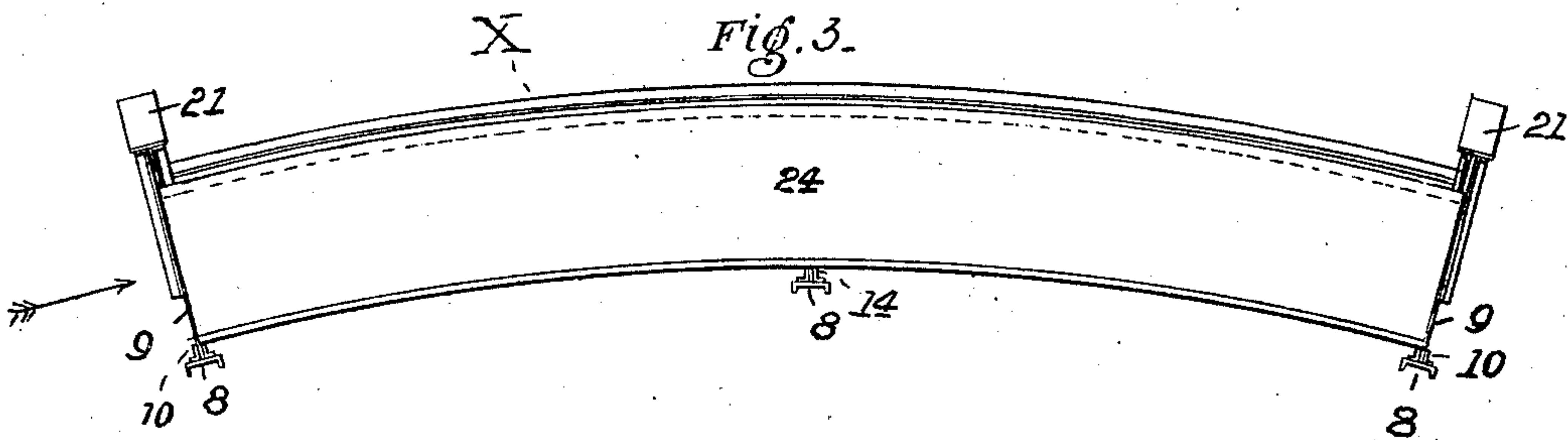
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4 Sheets—Sheet 3.



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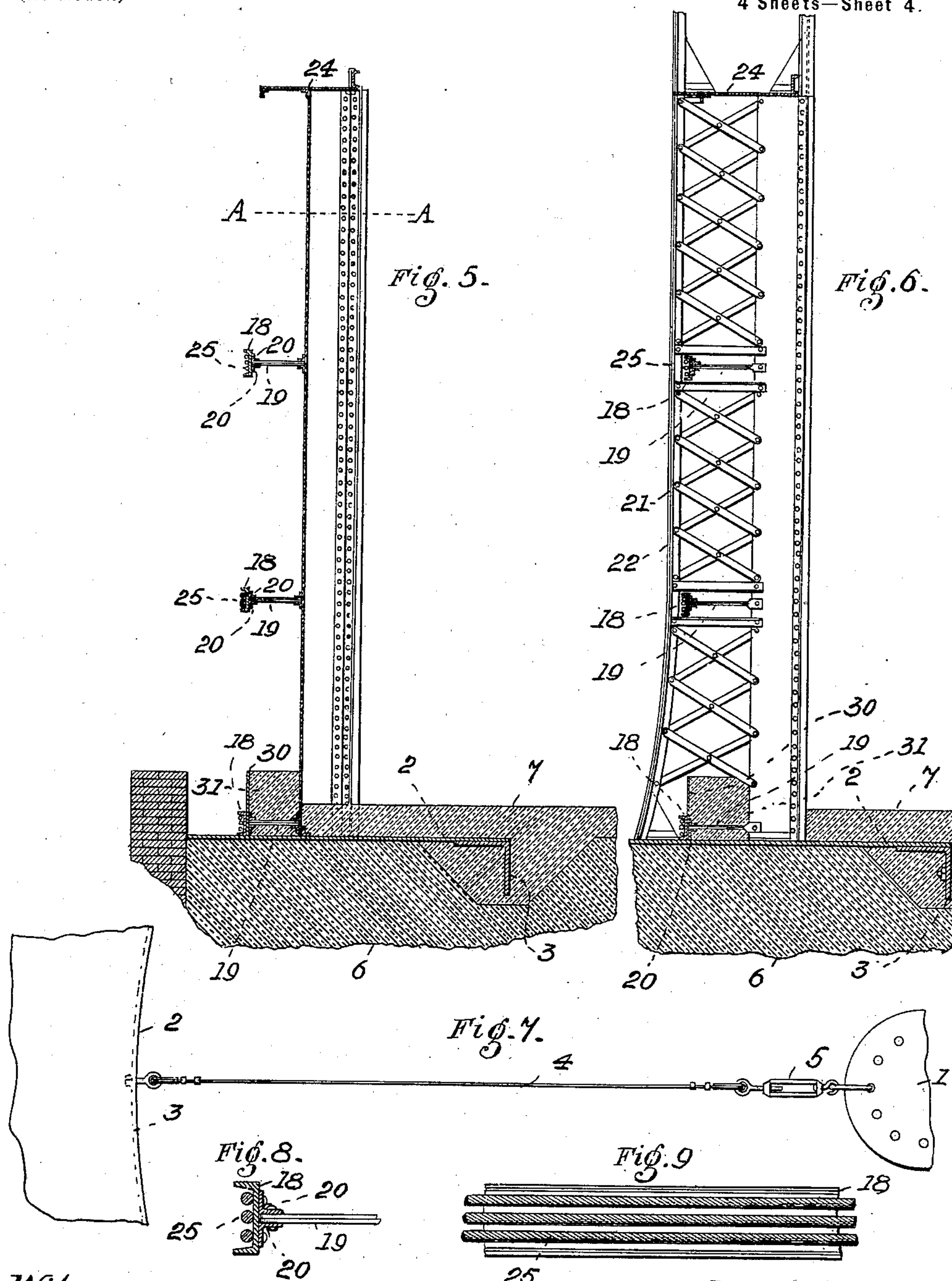
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4 Sheets—Sheet 4.



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UNITED STATES PATENT OFFICE.

FREDERICK J. MAYER, OF BALTIMORE, MARYLAND.

GAS-HOLDER.

SPECIFICATION forming part of Letters Patent No. 673,170, dated April 30, 1901.

Application filed December 7, 1900. Serial No. 38,996. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK J. MAYER, of the city of Baltimore, in the State of Maryland, have invented certain Improvements in Gas-Holder Tanks, of which the following is a specification.

This invention relates, first, to a peculiar construction of a gas-holder tank whereby the necessary tensile strength to resist internal pressure is obtained by reinforcing a comparatively thin shell rather than depending on the shell alone, thus avoiding the handling and manipulation of heavy plates.

The said invention relates, secondly, to the formation of the tank proper in independent segmental sections, which are built, shipped, and erected as entireties and only require to be connected to form a circular body, as will hereinafter fully appear.

In the further description of the said invention which follows reference is made to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is an exterior elevation of the improved gas-holder tank. Fig. 2 is a plan of the same. Fig. 3 is an enlarged exterior top view of one of the segmental sections of the tank. Fig. 4 is a section of Fig. 5, taken on the dotted line A A. Fig. 5 is an enlarged vertical section of Fig. 4, taken on the dotted line B B. Fig. 6 is an end view of Fig. 3 looking in the direction indicated by the arrow. Figs. 7, 8, and 9 are enlarged details of the tank, Figs. 8 and 9 being on a still further enlarged scale. Fig. 10 is a view similar to Fig. 4, illustrating a modification in the construction of the tank.

Referring now to Figs. 1 to 9, inclusive, 1 (see Figs. 2 and 7) is a circular plate situated at the center of the foundation of the tank, and 2 an annular plate forming a part of the wall of the same. The annular plate 2 has a downwardly-extending flange 3, which is connected to the plate 1 by the tie-bolts 4, having the turnbuckles 5. The plates 1 and 2 are seated on the concrete foundation 6, and over them is poured the grouting 7, which forms the floor of the tank.

The wall of the tank is formed of segmental sections X, each one of which is constructed as an entirety. In the erection of the tank the sections are placed together and their ad-

joining ends united by rivets, after which the whole is strengthened by a system of wire ropes wound around the structure in a manner hereinafter described. At each end of a section X is a vertical channel-iron 8, secured to a vertical plate 9 by means of the angle-irons 10 and the necessary rivets. (See particularly Fig. 4.) The channel-irons 8 serve as guides for the rollers of the gas-holder. (Not shown.)

11 11 are angle-irons (see Figs. 4 and 10 particularly) which are bent so as to form a series of segments having a small radius. (See particularly Fig. 4.) At the junction of the small segments are secured the I-beams 13, which extend from the top to the bottom of the tank. Instead of an I-beam at the center of the segmental section X is a plate 14, similar to the ones 9 before referred to, and this plate 14 is provided with a channel-iron 8 similar to the others represented by the same numeral. The segmental angle-irons 11 support the steel plates or sheets 16, which extend the entire height of the tank, and the lateral edges of these plates are flanged inward and riveted to the plates 9 and 14 and the I-beams 13.

18 18 (see Figs. 5 and 8) are horizontally-placed segmental channel-irons situated exteriorly of and at some distance from the inner wall of segmental sheets and secured to the angle-irons 11 by the lattice-work 19, consisting of crossed flat bars. The said lattice-bars are secured to the horizontally-placed segmental channel-irons 18 by the angle-irons 20.

21 21 are standards (see Fig. 6) situated where the segmental sections X adjoin, and they consist each of a flat plate 22, flared out at the bottom, as shown in the figure, and secured to the plates 9 by means of the lattice-work 23 and angle-irons.

The whole structure thus far described is covered by the head-plate 24. (Shown in Figs. 3, 5, and 6.)

Around the annuli formed by the segmental channel-irons 18 are tightly wound the steel cables 25, (see particularly Figs. 5, 6, 8, and 9,) which bind the whole tank circumferentially, thus reinforcing it and adding to its inherent strength. These cables may be separate and independent of each other, or a

single cable may be wound around each annulus and secured, as their office is to increase the tensile strength of the remaining portion of the structure. Within the lower channel-iron annulus 18 is placed a circular plate 30, and between this plate and the segmental plates 16 is a body of grouting 31 to render the tank water-tight at the bottom.

Referring now to Fig. 10, it will be seen that the segmental plates 16 are reversed in position and present to the interior of the tank convex instead of concave surfaces. In this alternative construction the plates are subjected to a compressing instead of a tensile strain, and they are reinforced by interior and exterior coverings of concrete, respectively represented by 32 and 33. In other respects the construction of the tank is the same as that before described.

I claim as my invention—

1. In a gas-holder tank, the wall thereof constructed in segmental sections embodying a system of smaller segmental plates, backed by angle-irons, a series of annuli situated exteriorly of the said segmental plates, lattice-work which unites the annuli with the angle-iron backing and cables wound around the said annuli and fastened, substantially as specified.

2. In a gas-holder tank the inner wall thereof formed of segmental plates of a smaller radius than the wall proper, combined with a backing of angle-irons and lattice-work, a series of annuli, and cables wound around the said annuli and secured thereat, substantially as specified.

3. In a gas-holder tank, the wall thereof constructed of a shell, a series of annuli placed one above another exteriorly of the shell, means to connect said annuli to the exterior surface of the shell, and cables wound around the said annuli and secured thereat, substantially as specified.

4. In a gas-holder tank, the wall thereof embodying a series of segmental plates of a smaller radius than the tank proper, and means applied to the tank exteriorly of the said segments to prevent their circumferential distortion, substantially as specified.

5. In a gas-holder tank, the wall thereof embodying a series of segmental plates of a smaller radius than the tank proper, and a series of annuli situated exteriorly of the segmental plates, combined with means to unite the said annuli with the segmental plates, and cables wound around the said annuli and secured, substantially as specified.

6. In a gas-holder tank, the wall thereof formed of a series of segmental plates of a radius which is less than that of the tank proper, provided with a vertical angle-iron at each end or edge whereby the said segmental plates are secured together, combined with a series of annuli, lattice-work which connect the said annuli with the angle-iron segments, and a cable wound around and secured to each annuli, substantially as specified.

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Witnesses:

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