

No. 724,031.

E. A. MOORE.  
GAS COOLER.

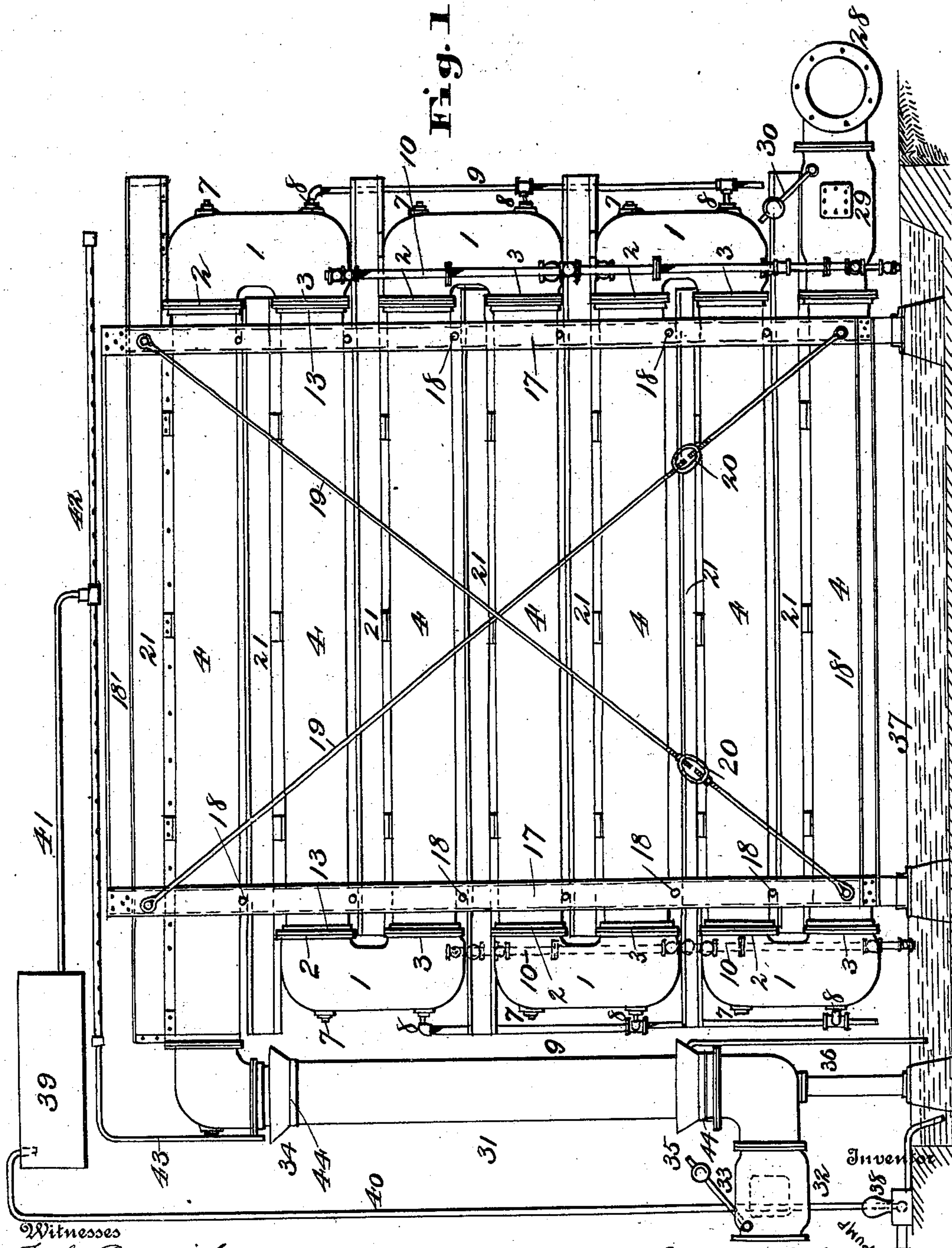
PATENTED MAR. 31, 1903.

APPLICATION FILED JUNE 5, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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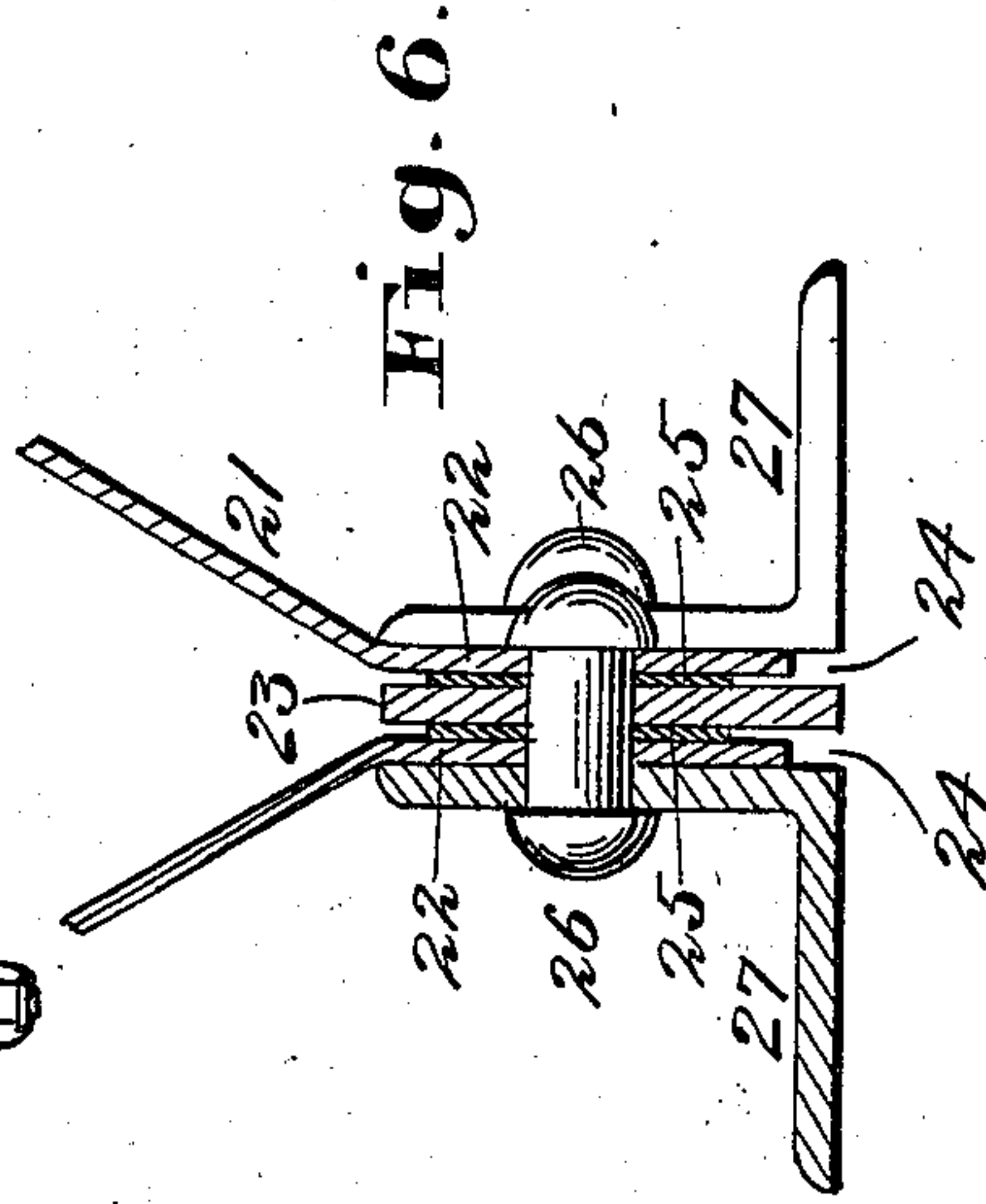
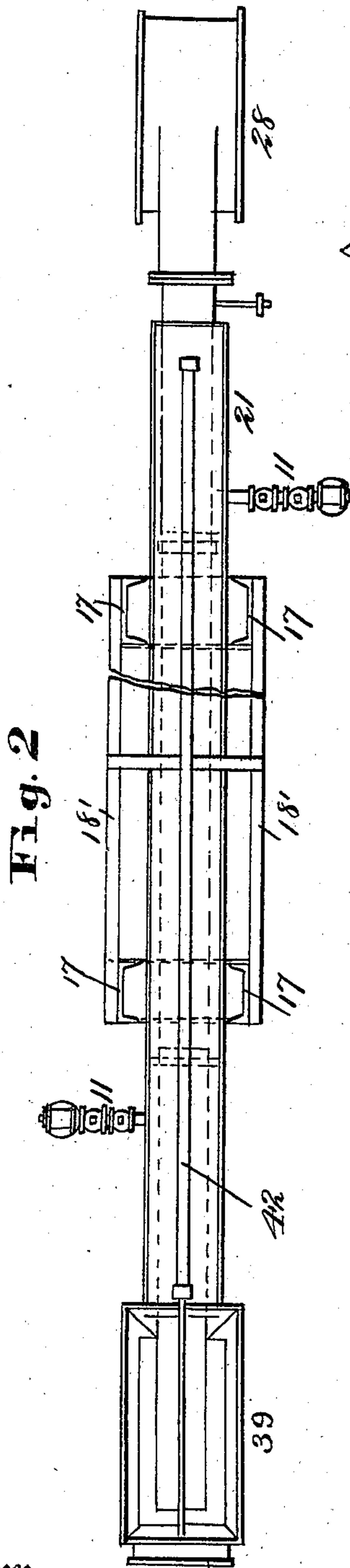


Fig. 5.

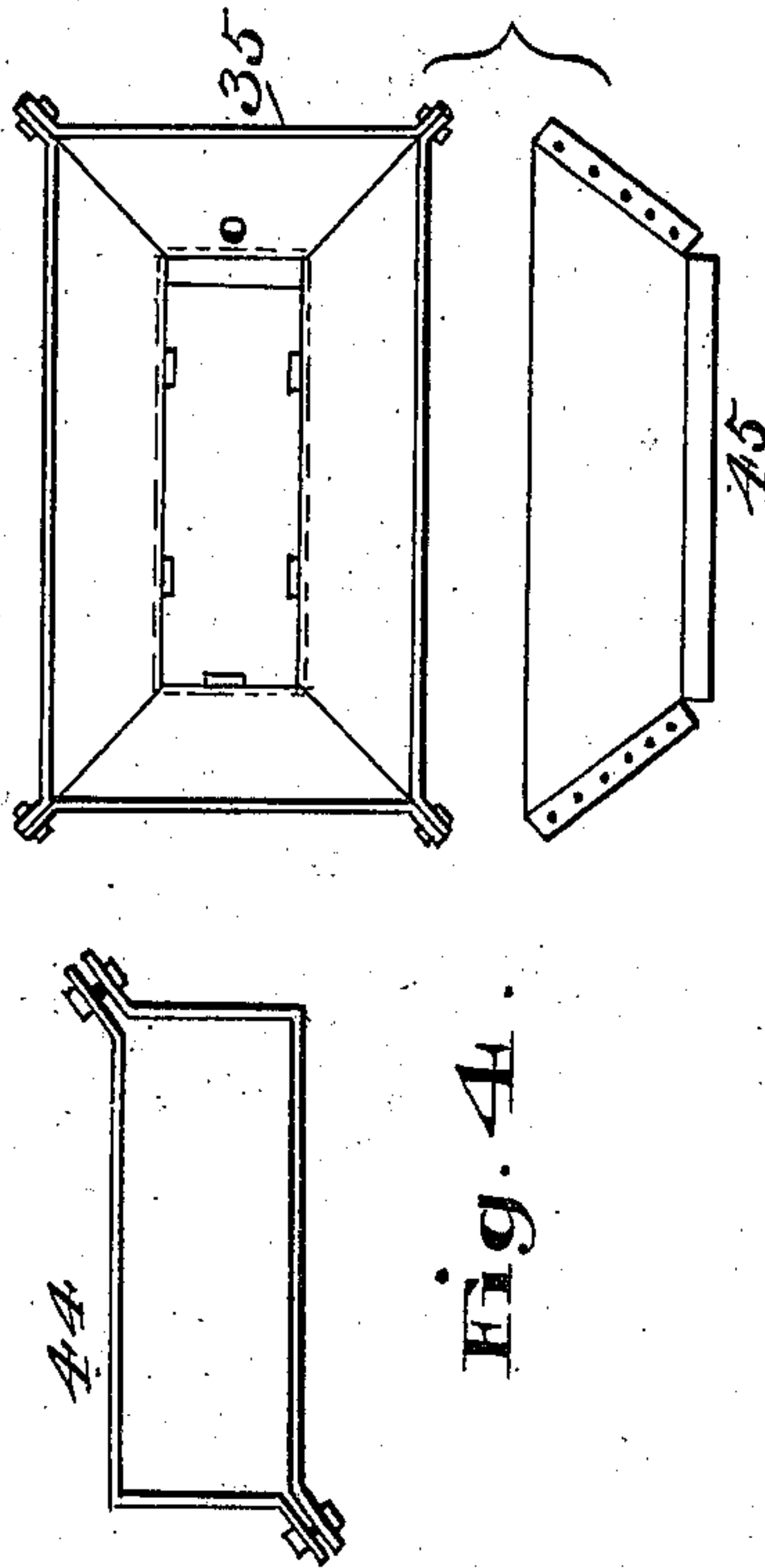


Fig. 4.

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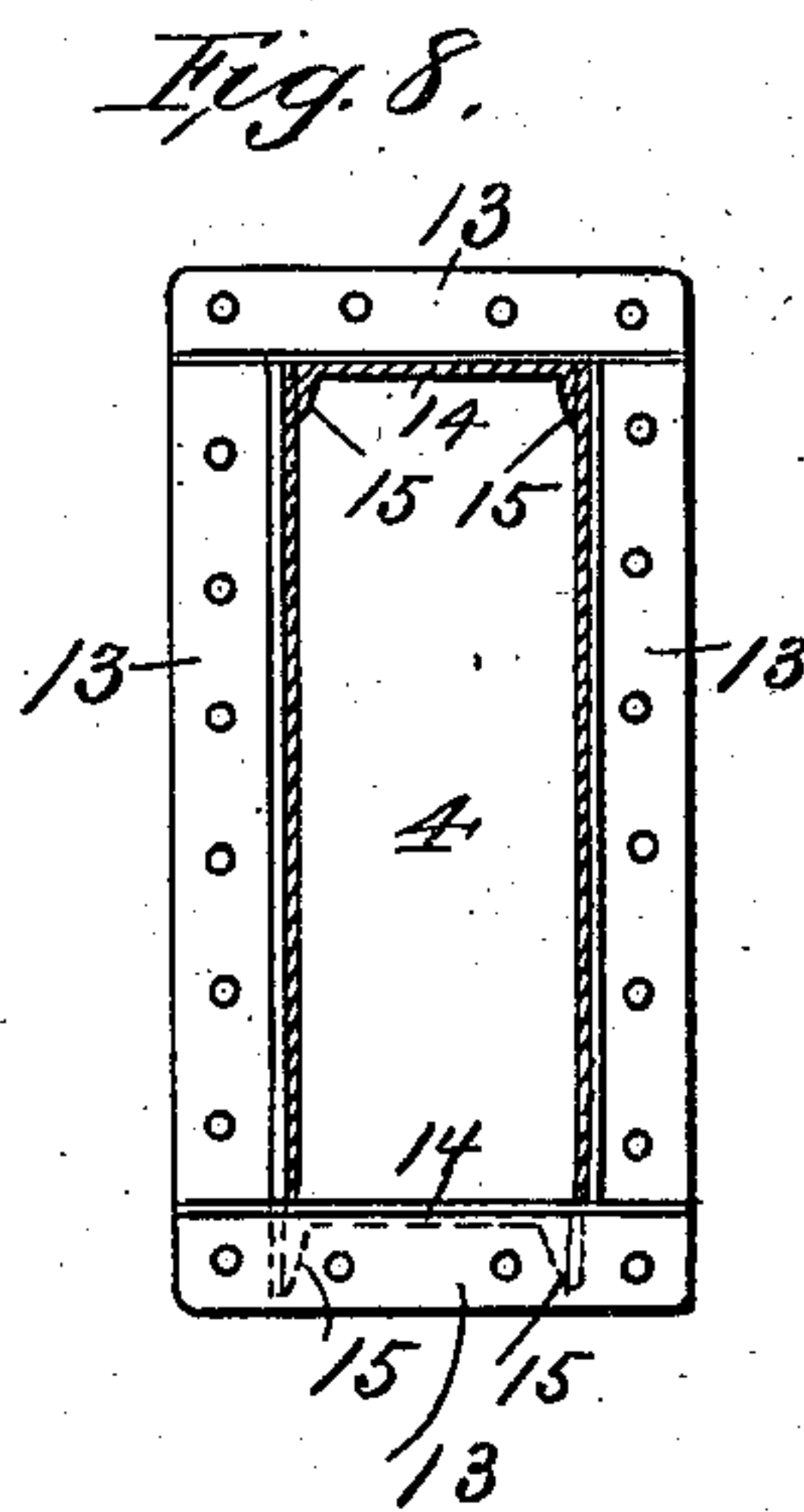
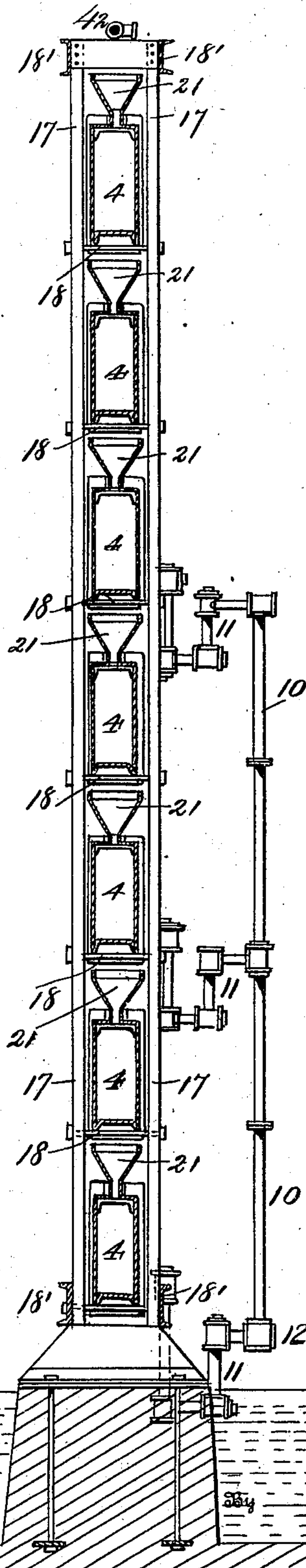
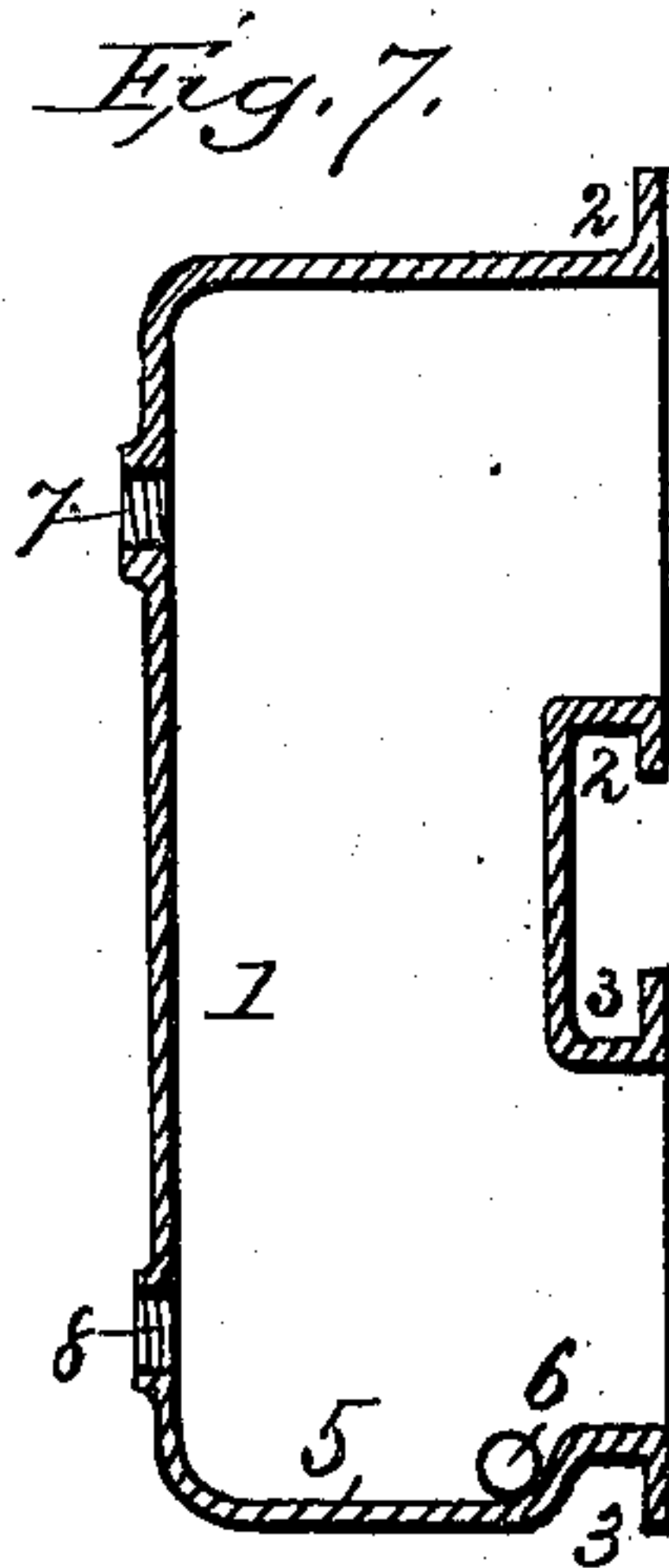
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NO MODEL.

3 SHEETS—SHEET 3.



Witnesses  
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# UNITED STATES PATENT OFFICE.

EDWIN A. MOORE, OF PHILADELPHIA, PENNSYLVANIA.

## GAS-COOLER.

SPECIFICATION forming part of Letters Patent No. 724,031, dated March 31, 1903.

Application filed June 5, 1902. Serial No. 110,378. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN A. MOORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Water and Air Gas-Coolers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates primarily to gas-works, has especial reference to means for cooling gas as it comes from ovens or retorts by the combined effect of water and air applied to the exterior or outer surface of the cooler, and consists in certain improvements in construction, which will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification, Figure 1 represents a side elevation of my improved gas-cooler; Fig. 2, a top plan view of the same; Fig. 3, a vertical transverse section partly in elevation; Fig. 4, a plan view of the trough-clamp on an enlarged scale; Fig. 5, a top plan view of one of the water-troughs for the gas-discharge pipe on an enlarged scale; Fig. 6, a vertical section of one of the main or primary water-troughs; Fig. 7, a vertical longitudinal section of one of the headers or ends on an enlarged scale, and Fig. 8 an end view of one of the horizontal sections or members of the cooler.

Reference being had to the drawings and the designating characters thereon, 1 indicates the headers, ends, or return-bends, preferably made of cast-iron, provided with flanges 2 3 for connecting them to the flanges of the horizontal sections or members 4, which latter are provided with a tar pocket or depression 5, having an outlet 6 and openings 7 and 8 for the attachment of pipes 9 for supplying steam to melt or dissolve the tar and other deposits in the cooler. The tar or other deposits are conducted from the pockets 5 by pipes 10, having traps or seals 11 interposed between the headers and said pipe 10, and are conducted from the lower end of the pipe 10 at 12 to a suitable tar-receptacle. (Not shown.)

The sections 4 are provided with flanges 13

at each end, by which connection is made with the flanges 2 3 of the headers 1, and said sections are preferably made of rolled sheet-iron rectangular in cross-section, as shown in Fig. 8, having upper and lower members 14, of channel-iron, each provided with right-angled bends 15 15, to which the sides 16 16 are secured by rivets in the usual manner of connecting the flanges of structural iron-work.

The several sections of the cooler are supported upon metallic channel-iron columns 17 17, arranged in pairs near each end of the cooler, secured together by transverse bolts or rods 18, upon which the horizontal sections 4 rest, and the columns are braced together by transverse bars 18' and by diagonal tie-rods 19 19, each having a turnbuckle 20 for drawing the rods taut.

Upon each horizontal section 4 rests a trough 21, between whose vertical sides 22 22 a distributor 23 is arranged so as to leave passages 24 24 on each side thereof for the discharge of water, the said passages being formed by interposing washers 25 between the sides 22 and the distributor 23, the washers and distributors being held by rivets 26, which extend through the trough and the brackets 27. Said brackets rest upon the upper surface of the sections 4 of the cooler.

28 indicates the gas-inlet pipe, having a valve 29, controlled by lever 30, and 31 the gas-discharge pipe, also provided with a valve 32, controlled by lever 33, and upon the pipe 31 are water-troughs 34 35 for effecting the final cooling of the gas, the latter trough being provided with a discharge-pipe 36 for returning water to its source of supply, and the troughs are secured to the pipe by clamps 44, which engage the vertical flange 45 of the troughs.

37 indicates a water-basin, above which the gas-cooler is supported and from which water is raised by pump 38 into tank 39 through pipe 40, and from which tank water is conducted through pipe 41 into a perforated supply-pipe 42, which discharges water into the upper trough of the cooler, and from which trough the water is supplied to the outer surface of the upper section 4 and one of its headers 2 in thin sheets enveloping said parts, and the water falls into the next trough and



is again distributed in like manner over the second section 4 and its header at the opposite end of the cooler, and so on consecutively until the water has been applied to the entire cooler and returns to the basin from which it was taken. The trough 34 on pipe 31 is supplied with water from the tank 39 through pipe 43, overflows the trough, envelops the pipe, and is collected in trough 35, from which the water flows through pipe 36 into the basin.

It will be observed that the water flowing over the surfaces of the gas-cooler in thin sheets is subject to the cooling effect of the surrounding atmosphere, which assists materially in neutralizing the heat of the gas in its passage through the cooler, and that the gas after having passed through all the sections or compartments of the cooler is subjected to a final cooling through the medium of cold water in its passage through the discharge-pipe 31.

The sheet-metal sections 4 are readily cooled by exposure to the water and the air, and the entire structure results in great economy in original cost and in its operation.

Having thus fully described my invention, what I claim is—

1. A gas-cooler consisting of a series of horizontal sections connected at their ends by headers or return-bends provided with tar-pockets, means for conducting tar from said headers a gas-discharge pipe surrounded by a trough and provided with a discharge-passage between the pipe and troughs, and means for supplying water to the surface of the cooler and to the troughs on the discharge-pipe.

2. A gas-cooler consisting of a series of horizontal sections connected at their ends by headers or return-bends provided with tar-

pockets, a vertical gas-discharge pipe connected to the upper section, means for conducting tar from said headers, and means for supplying water to the surface of the cooler and to the discharge-pipe in thin sheets exposed to the atmosphere, means for collecting the water, and means for returning the water to the cooler.

3. A gas-cooler consisting of a series of horizontal sections rectangular in cross-section, headers or return-bends connecting said sections and provided with tar-pockets, means for conducting tar from said headers, means for supplying steam to the headers, and means for supplying water to the surface of the cooler.

4. A gas-cooler consisting of series of sheet-metal horizontal sections rectangular in cross-section, headers or return-bends connecting said sections and separate water-troughs interposed between said sections and provided with supporting-brackets resting loosely upon said sections, and having vertical passages for separating the water into thin sheets.

5. A gas-cooler consisting of a series of sheet-metal horizontal sections rectangular in cross-section, and headers or return-bends connecting said sections, a gas-discharge pipe connected to the upper section, opposite supporting-columns, transverse tie-rods connecting said columns and on which said sections rest, and means for supplying water to the surface of the cooler and the gas-discharge pipe in sheets.

In testimony whereof I affix my signature in presence of two witnesses.

EDWIN A. MOORE.

Witnesses:

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C. W. METCALFE.