

No. 731,072.

PATENTED JUNE 16, 1903.

T. REGAN.
BALANCED WATER HEATER.

APPLICATION FILED FEB. 11, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

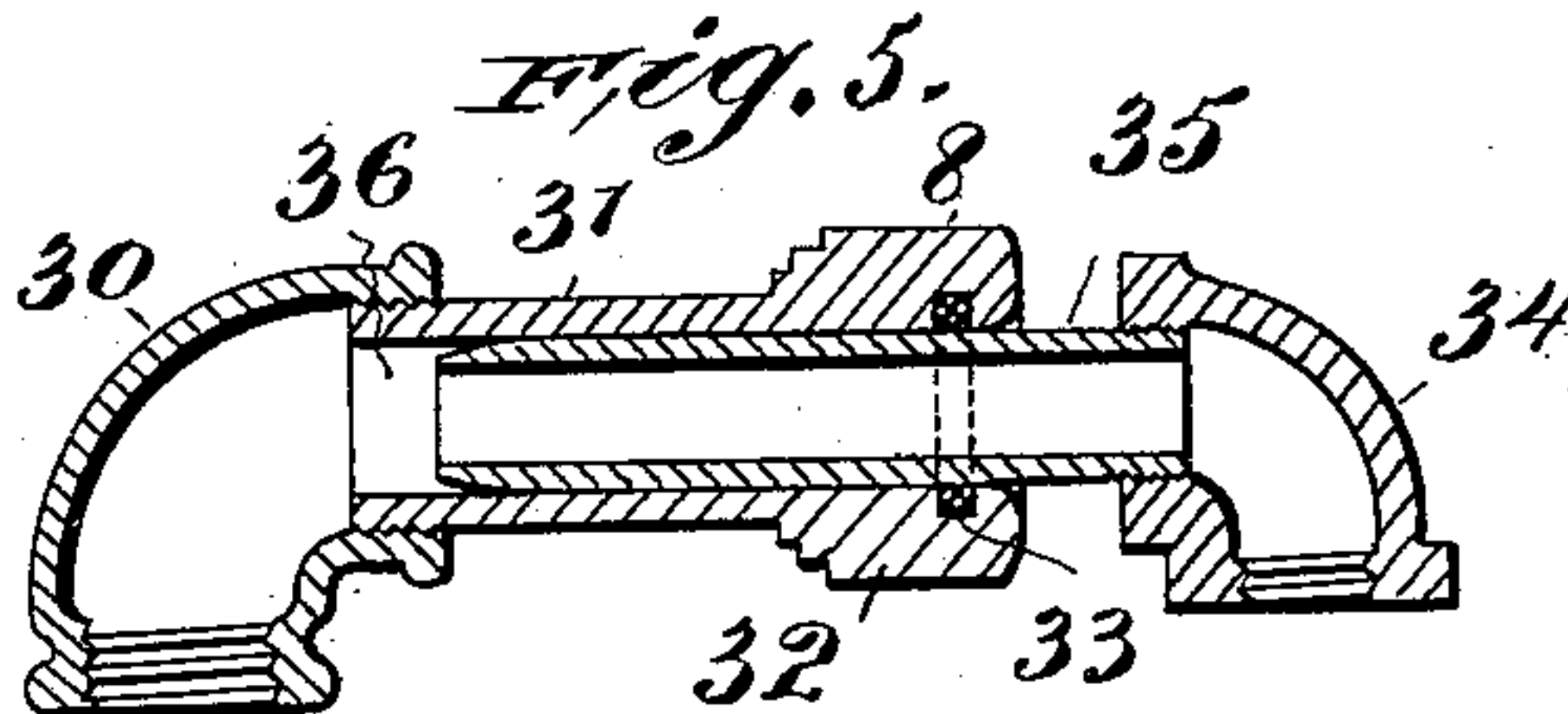
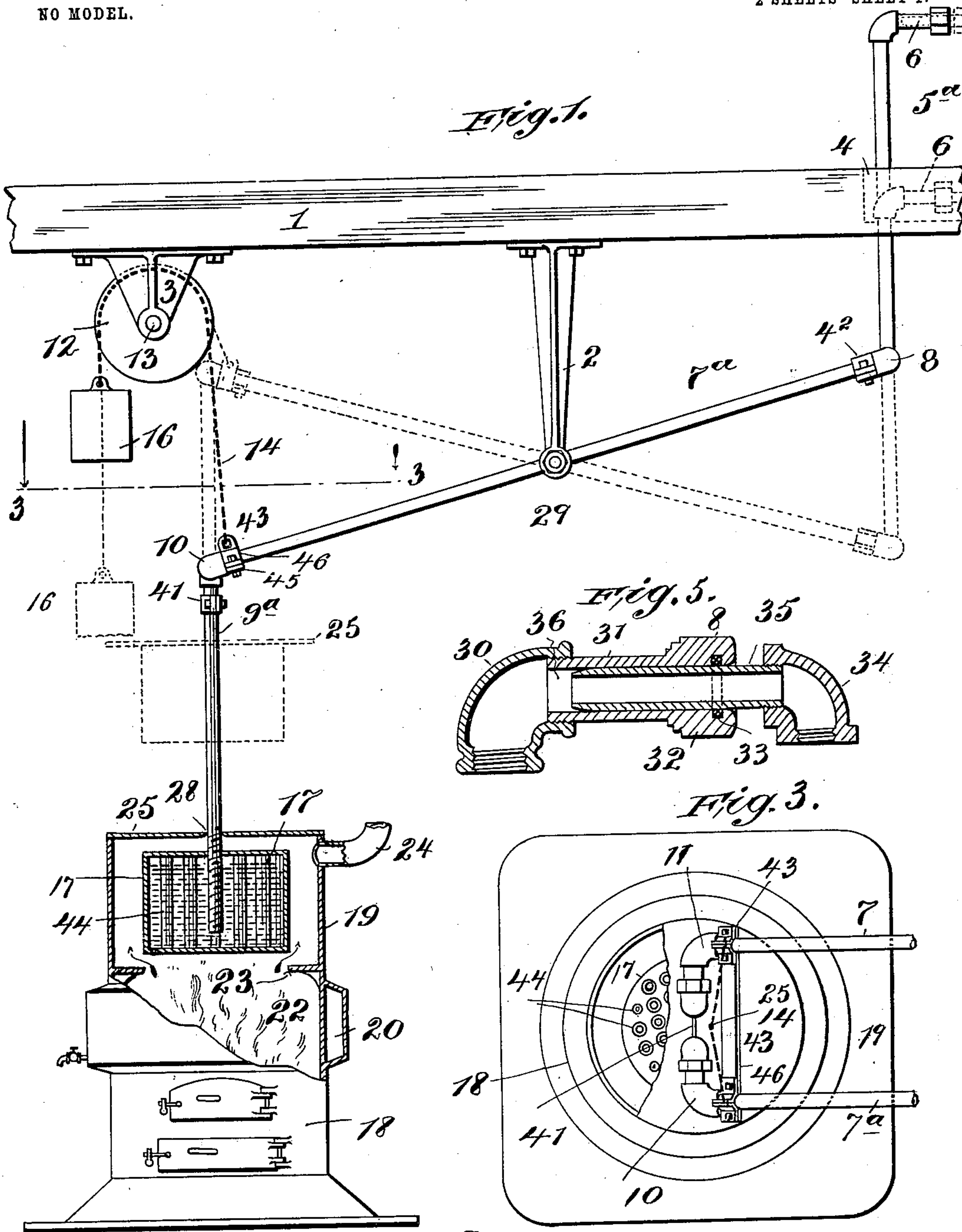
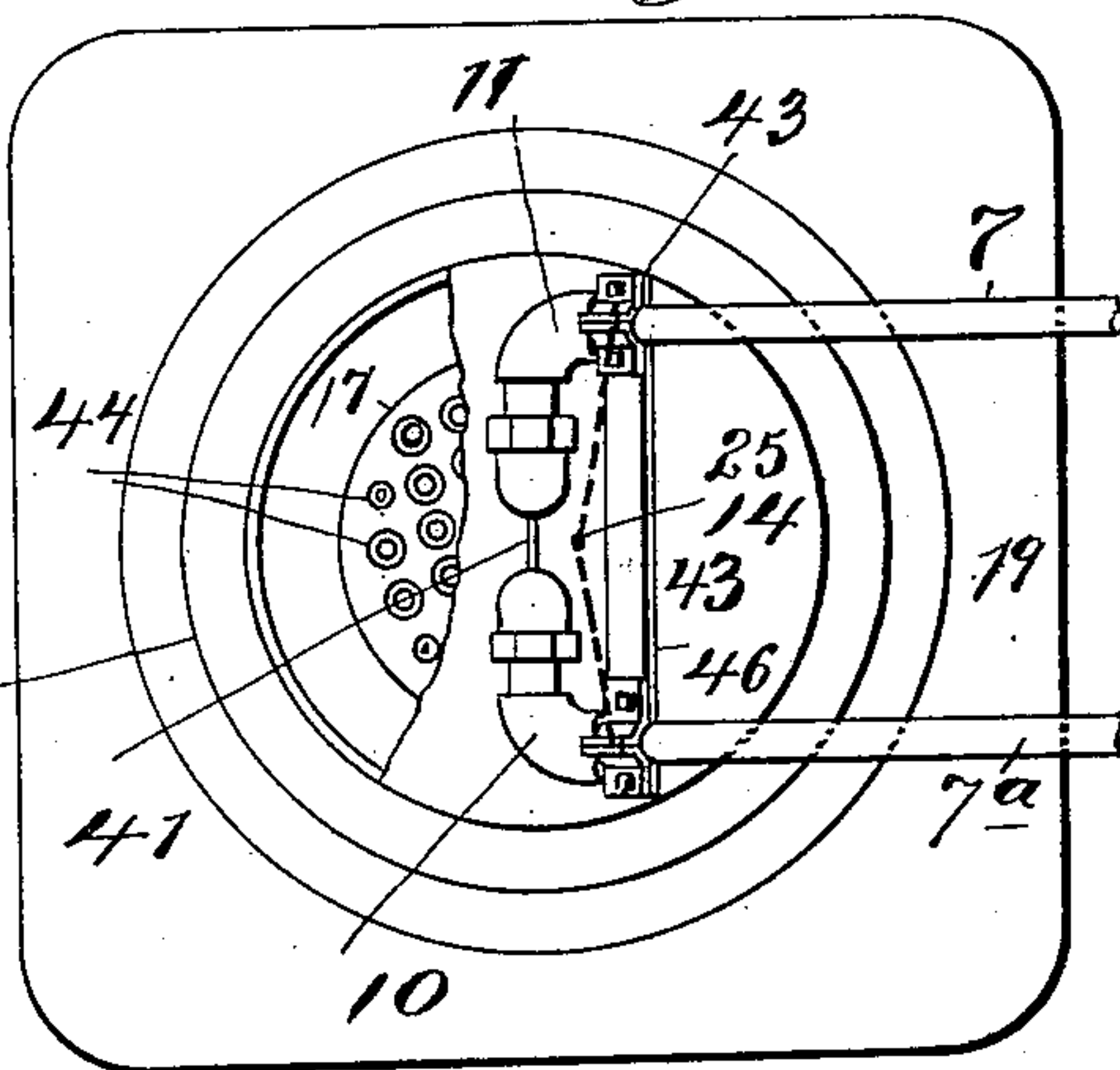


Fig. 3.



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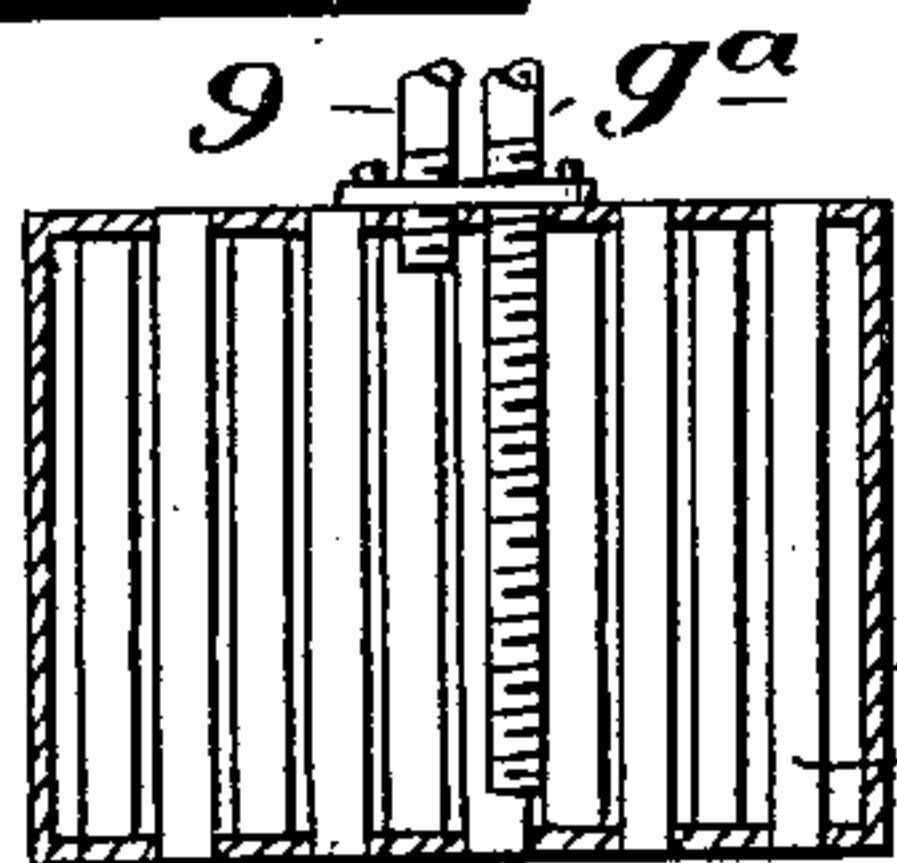


Fig. 8.

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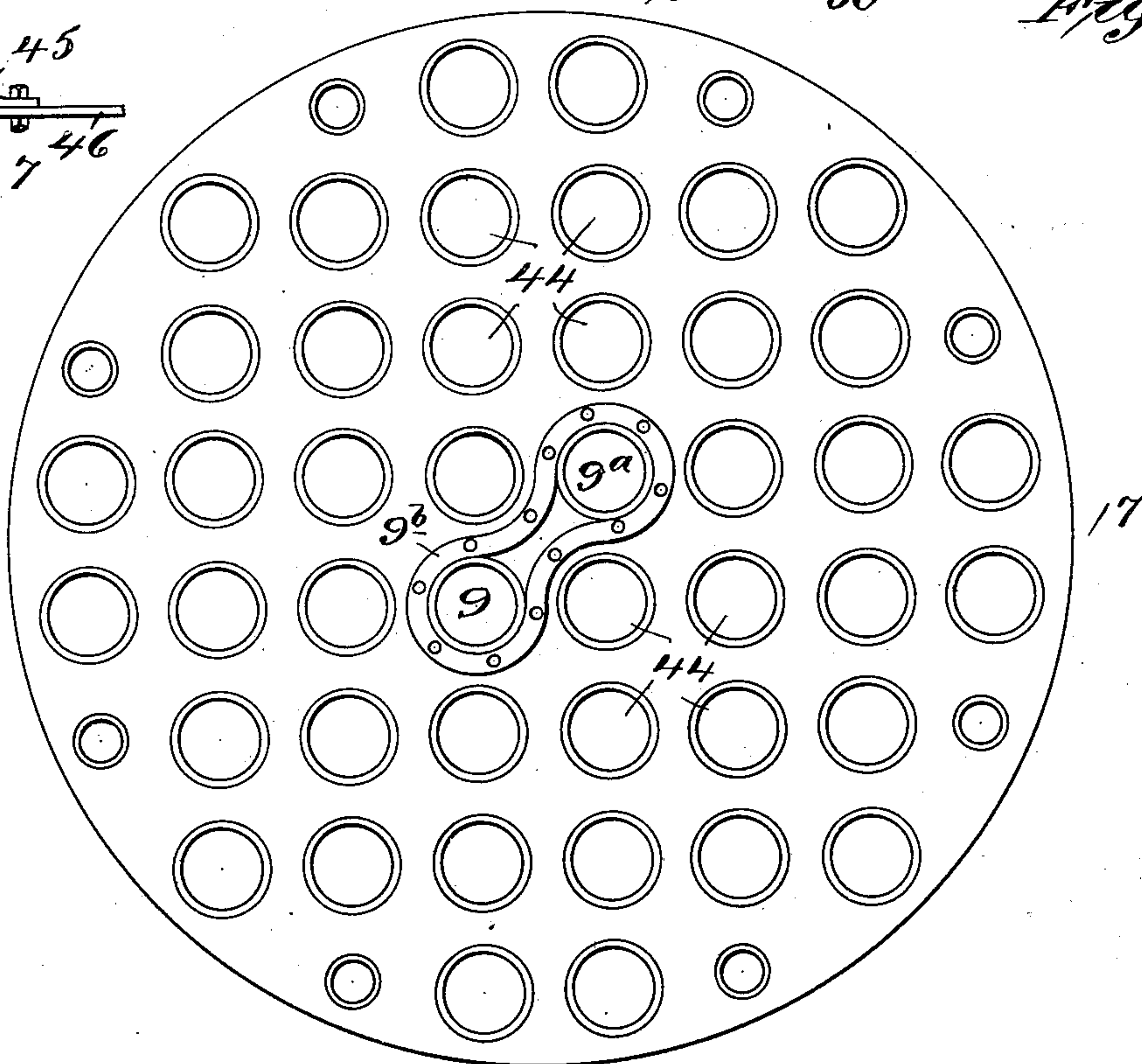
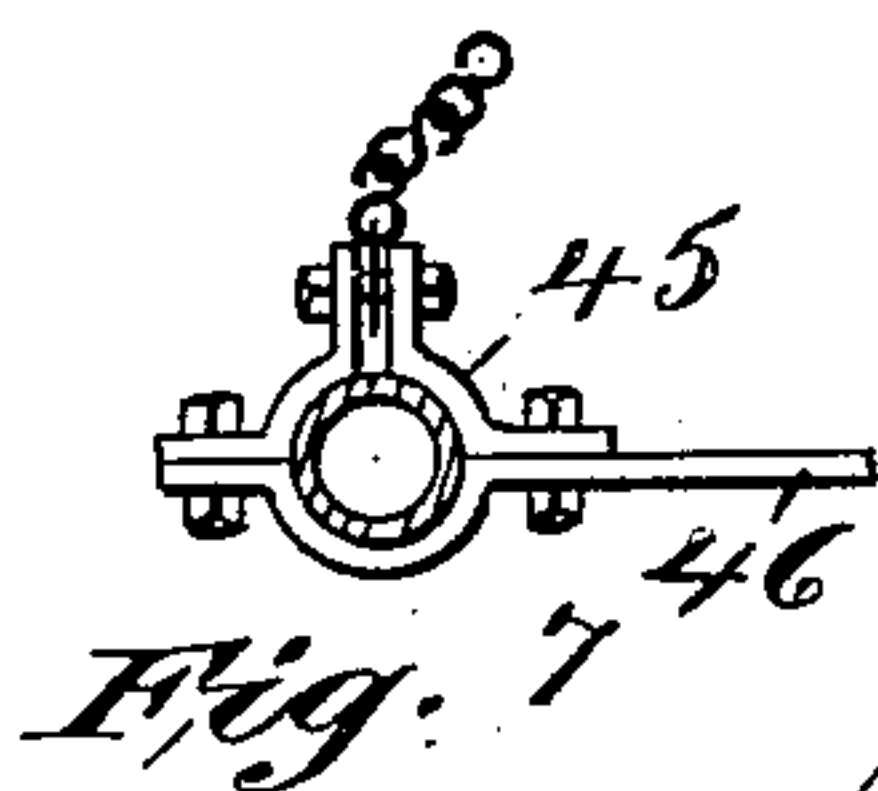
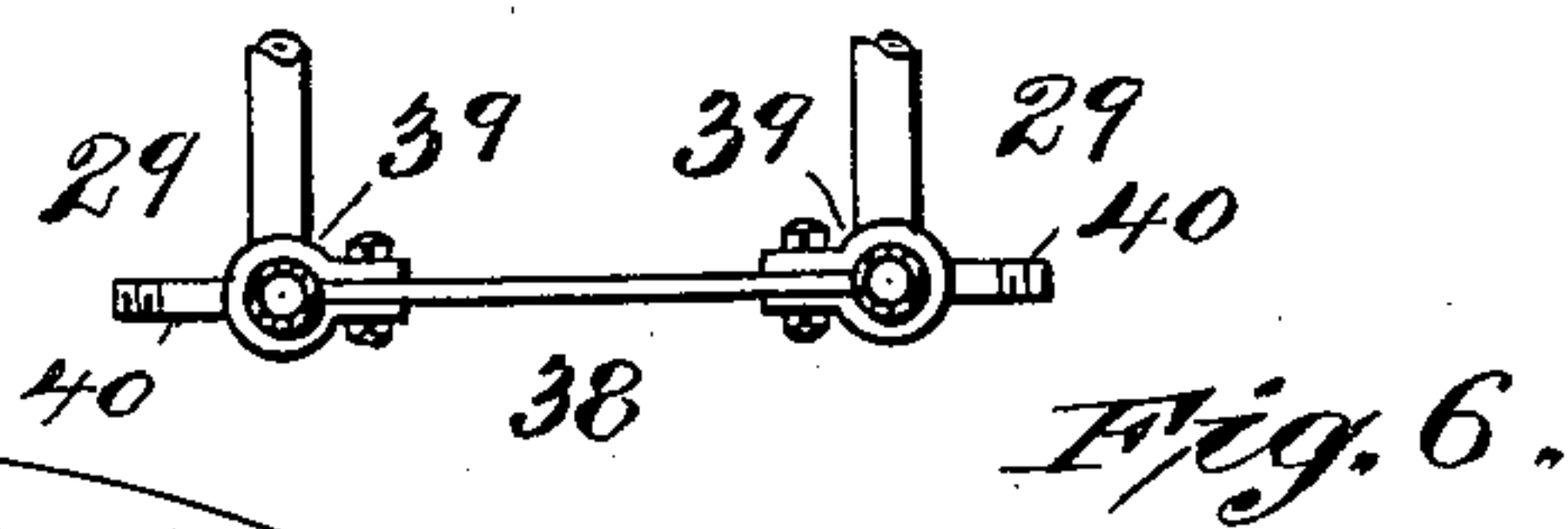
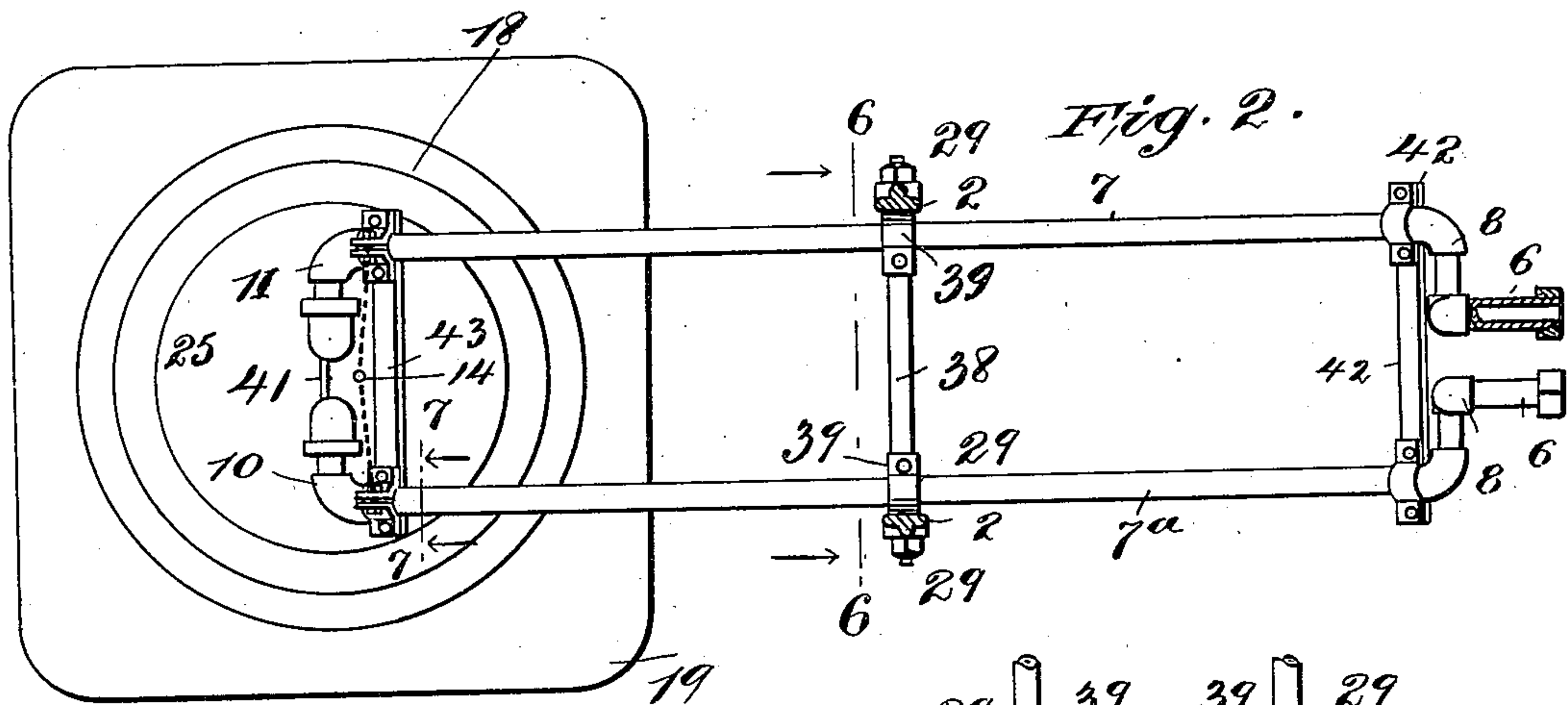


Fig. 4.

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UNITED STATES PATENT OFFICE.

TIMOTHY REGAN, OF NEW YORK, N. Y.

BALANCED WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 731,072, dated June 16, 1903.

Application filed February 11, 1903. Serial No. 142,827. (No model.)

To all whom it may concern:

Be it known that I, TIMOTHY REGAN, a citizen of the United States, and a resident of the city of New York, borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Balanced Water-Heaters for Fire-Engines, of which the following is a specification.

My invention relates to a device for maintaining a continual supply of steam in a fire-engine while the same is inactive and awaiting the call to a fire.

It is customary in fire-houses to keep a continuous supply of steam in the fire-engine—say about twenty pounds pressure—in order that when the engine is called to a fire there will be a partial supply of steam in the boiler, and by immediately building a fire in the engine a necessary quantity of steam is quickly generated, so that by the time the fire-engine reaches its destination it will have generated sufficient steam to enable it to be used for the desired purposes. Formerly it has been customary to connect a fire-engine while the same is in the fire-house by pipes running through the floor and connected with a coil which is situated in the heater or furnace in the cellar. There is also in such devices a reservoir independent of both the engine and the steam-coil. Thus when the engine is called out it is necessary to reach down through the floor, sometimes with a long pole, to turn off a three-way cock which connects the pipes from the engine with that of the coil and to connect the pipe from the coil with that of the reservoir in order that when the fire-engine is cut off from the coil the latter will not burn out, owing to the supply of water from the reservoir. It will be readily seen that this operation, though seemingly simple, consumes considerable time in a most critical moment, and in such cases where the firemen are obliged to be away from a fire-house for, say, ten hours or more at a time by reason of inattention the reservoir becomes empty and the steam-coil becomes burned out. In fact, such cases are well known to applicant.

It is my object, therefore, to produce a simple and effective device whereby the fire-engine automatically disconnects itself from the heating device and the latter assumes such a position as will raise the generator away from

the heat of the furnace, thereby causing the generator to become inactive when disconnected from the fire-engine and not only save the time of the engineer in disconnecting the fire-engine from the steam-generator, but also provide means whereby the generator is not liable to become burned out. In order to carry out these results, I have constructed the balanced heater which will be more fully described, and further pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of the balanced heater, the full lines indicating the heater in the position which it occupies when in use—viz., when connected to the fire-engine—the dotted lines showing the generator when disconnected from the fire-engine. Fig. 2 is a plan view of the generator and the pipes attached thereto. Fig. 3 is a plan view on the line 3 3, Fig. 1. Fig. 4 is an elevation of the generator. Fig. 5 is a cross-section of one of the swivel-joints. Fig. 6 is a section on the line 6 6 of Fig. 2. Fig. 7 is a sectional view of the end of one of the spreaders with the chain connection, and Fig. 8 is a cross-section of the generator.

In the accompanying drawings, 1 represents the floor of the fire-house, to which are attached the arms 2 and 3. A recess is cut part way through the floor to receive the pipe connection at the end of the pipes.

5 represents two similar parallel pipes having slip-joints 6 at their ends. At 7 are also two parallel pipes arranged in substantially horizontal position below the floor and suspended by the hangers 2. The pipes 5 5^a and 7 7^a are connected by swivel-joints 8 at their ends. The pipes 7 7^a at their opposite ends are connected by the pipes 9 9^a by means of the swivel-joints 10 and 11.

To the arms 3 is attached a pulley 12 by means of the journals 13. About the periphery of the pulley is suspended a chain 14, which is connected at one end to a buckle 15 on the pipes 7 and 7^a and a counterbalance-weight 16 at the other end. The parallel pipes 9 are in substantially vertical position and connected with the generator 17.

The stove or furnace 18, resting on the floor in the basement, may be of any desired form. The one herein shown consists of sides 19,

having a water-leg 20. The purpose of the the latter is to have a continual supply of warm water for incidental use by the firemen for washing hands, &c. The furnace or stove
 5 is provided with the necessary ash-pans and fire-box 22. Above the fire-box and projecting inwardly from the sides of the furnace I provide a circular flange 23 for the purpose of diverting the heat about the generator. At
 10 24 is a smoke-stack for carrying off smoke, gas, &c., from the furnace.

25 comprises a lid or cover resting on top of the furnace and adapted to be raised when the generator moves upwardly. The cover is
 15 provided with two circular openings 28 to allow for the reception of the pipes 9.

At 29 are pivot-joints connected to the pipes 7 7^a and arms 2. It consists of a spreader 38, bound at each end by bands 39 to the pipes
 20 7 7^a. The bands are provided with laterally-projecting pins which rest in the bearings 29 of the arms.

In Fig. 5, 8 represents a swivel-joint which I have used to connect the pipe-sections, in
 25 which 30 is an elbow threaded on the body 31, the latter having a pack-box 32, in which packing 33 is placed. The latter is adapted to be inserted in the core 36 of the body portion 31, the packing 33 making it a substantially tight joint. In this form of joint the
 30 pipe-sections are adapted to have a swivel motion at the joints. In order to keep the pipe-sections parallel and to keep the slip-joint from going apart, I have provided tie-rods 41, 42, and 43, which are joined at both of their
 35 ends to the pipes near the slip-joints.

The generator consists of a circular tank or boiler, in which are the vertical tubes 44, running from bottom to the top of the generator
 40 similar to an ordinary steam-boiler. Through these tubes pass the smoke and heat of the furnace to heat the water in the generator. The pipes 9 9^a are connected with the top of the generator by means of screw-threads or
 45 in any desired way and are adapted to sustain the generator.

The counterbalancing weight is connected to the pipes 7 and 7^a by means of the chain 14, secured to the combined eyelet and spreader
 50 43. This spreader is similar to the ones already described, with the exception that it is provided with the eyelets or tongues 38^a, to which the chain is fastened.

The pipes 7 and 7^a are so hung from the
 55 arms 2 that their ends may move up and down in a teetering motion. It will be seen from this construction that when the fire-engine is placed in the fire-house on the floor 1 plugs are inserted in the slip-joints 6, one of
 60 the plugs being connected with the water-supply of the fire-engine, the other to the top of the boiler in the steam-chamber. In order to do this, the slip-valve 6 is lifted from the recess 4 to the necessary height, and by backing the engine or otherwise the plugs are
 65 slipped into the joint 6 and the valves on the end of the pipes of the fire-engine are opened.

When the slip-joints are thus raised, the pipes 5 5^a and 7 7^a pivot on the joints 29, throwing their opposite ends downward until the
 70 generator at the end of the pipes assumes a position in the stove or furnace directly over the heating-chamber. Likewise the cover assumes the position shown in full lines in Fig. 1. The action of the chain and counterbal-
 75 ance-weight is to counteract the weight of both the pipes, generator, and normal supply of water, the counterbalance-weight being somewhat heavier in order to exert an additional upward pull at the point 15. Thus
 80 it will be seen that as the cut-offs at the end of the pipes on the fire-engine are cut off and as soon as the plugs are released from the slip-joint 6 the pipes, by reason of the counterbalancing-weight 16, are teetered until the
 85 slip-joints 6 assume a position in the recess 4 beneath the floor-surface. The fire-engine will then be free to pass over the floor-surface without any obstruction. The firemen have nothing further to attend to in the generator
 90 before leaving.

While I have shown a particular kind of slip-joint to connect the pipe system, I do not limit myself to the specific construction, as
 95 any desired form of joint may be used as long as the pipes may move freely, as shown in the drawings. The slip-joint which I have shown is composed of two elbows, intermediate of which is the body portion adapted to receive the plug of the opposite elbow. To each of
 100 the elbows are connected the pipes in the usual manner, the connection thus forming a continuous by-pass, allowing of a swivel connection between the various pipe-sections.

In Figs. 2, 3, and 6 are shown the means of
 105 keeping the pipe and sections at a predetermined parallel position and keep the slip-joints in their proper position, in which a spreader 37 is attached at its ends to the parallel pipe-sections.

The cover or lid at the top of the furnace is automatically opened by the generator 17
 110 when the latter is raised to its uppermost position. While the generator is in this position, (upper,) it is sufficiently far away from the influence of the heat to be unaffected by it. Thus when the engine is unexpectedly
 115 called out the pipe-sections being disconnected assume the position shown in dotted lines, Fig. 1. The generator being substantially free
 120 from all influences of the heater, it requires no attention, and if left in this position, even though there may not be any water in it, there is no danger of any damage, such as would be caused by the heat of the furnace.

Fig. 8 shows the heater 17 in cross-section. From this view it will be seen that the pipe
 125 10 enters in and is connected to the upper part of the generator and the pipe 9 enters the upper portion of the generator and passes
 130 down nearly to the bottom of the generator. About the pipe I provide a collar 9^b, which is bolted against the top of the heater.

I prefer that the pipes 5, 7, and 9 be con-

nected to the water-supply from the boiler of the engine and the pipes 9^a, 7^a, and 5^a be connected to the steam-chamber of the engine.

Having described my invention, I claim—

5 1. In a steam-generator for fire-engines, a generator, means for heating said generator, means for connecting the generator with a fire-engine, and means whereby said generator may be automatically separated from said
10 heater upon the separation of the connection with the engine.

2. In a steam-generator for fire-engines, a generator, a heater for said generator, pipes leading from said generator adapted to be
15 connected with the fire-engine, and means whereby said generator may be automatically raised above said heater.

3. In a steam-generator for fire-engines, a furnace, a generator, adapted to be sustained
20 within said furnace, pipes connecting the generator to a fire-engine, and means whereby when said fire-engine is disconnected from the pipes, the generator will be moved bodily out of said furnace.

25 4. In a generator for fire-engines, a furnace, a generator adapted to be suspended within said furnace, pipes connecting the generator to a fire-engine, and automatic means whereby when said fire-engine is disconnected from
30 the said pipes, the generator will be moved bodily out of said furnace.

5. In an apparatus of the class described, a furnace, a generator adapted to be heated by said furnace, means for connecting the
35 generator to the fire-engine, and means whereby when the said engine is disconnected from the pipes, the connections will automatically assume a position below the floor-surface.

40 6. In an apparatus of the class described, a heating-furnace, a generator adapted to be heated thereby, pipes leading to and connected with the fire-engine, counterbalancing-weights to sustain the generator and
45 adapted to raise the generator out of the furnace when the said pipes are disconnected from the fire-engine.

7. In a generating apparatus, a heating-furnace provided with a cover, a generator
50 within said furnace, means connecting said generator with a fire-engine, the generator being adapted to be raised out of said furnace.

8. In a steam-generating apparatus for fire-houses, a furnace, a generator lying within
55 the said furnace, two sets of pipes connecting the said generator with a fire-engine, one section of said pipes pivoting at a point between their ends, means for raising the generator and part of the pipe system to a point above
60 and free from the furnace.

9. In a steam apparatus of the class described, a furnace, a generator within said furnace, pipes leading to and adapted to be connected with the fire-engine, and means
65 whereby when the said pipes are disconnected from the fire-engine, the generator will be raised out of and away from said furnace.

10. In a heating apparatus for fire-engines, provided below the floor-surface, means for heating water, said means being retained
70 within the furnace, pipes to connect the said heating means with a fire-engine, and means for removing the said heating means from the said furnace.

11. In a steam-generator for fire-engines, a
75 furnace, a generator adapted to lie within the said furnace, two pipes running vertically, swivel-joints connecting the latter pipes with two substantially longitudinally disposed pipes, said latter pipes connected at
80 their opposite ends with two further vertical pipes, the latter being connected at their opposite ends with a fire-engine, and means for automatically raising the generator out of
85 and away from said heating apparatus.

12. In a steam-generator for fire-engines, a heating apparatus, a steam-generator within
said heating apparatus, pipes running vertically from said generator, horizontal pipes connected with said vertical pipes, the hori-
90 zontal pipes being adapted to pivot at a point between their ends.

13. In a generator for fire-engines, heating apparatus, a steam-generator within said
heating apparatus, pipes running vertically
95 therefrom, and horizontal pipes connected with said vertical pipes, and means for pivotally suspending said horizontal pipes, and swivel-joints connecting the said horizontal
100 and vertical pipes.

14. In a generating apparatus, a heating-furnace, a generator adapted to lie within the
furnace, a pulley provided with a counterbalancing-weight, and means for raising said
105 generator out of and away from the furnace, through the action of said counterbalancing-weight.

15. In a fire-engine, a furnace, a generator therein, pipes leading from the said generator
for connecting the fire-engine, and a counter-
110 balancing-weight adapted to raise said generator when said pipes are disconnected from the fire-engine.

16. In a generator apparatus, arms hung below the floor, pipes pivotally connected to said
115 arms, a furnace, a steam-generator lying within said furnace, pipes connecting said generator with said first-mentioned pipes, and means for raising the generator and pipes out of said
120 furnace.

17. In a generating apparatus, a heating-furnace, a generator lying within the furnace,
pipes leading from the generator, another set of pipes adapted to be pivotally hung from
125 above the furnace, another set of pipes, all three sets of pipes being connected respectively, a counterbalancing-weight adapted to sustain the weight of the generator and pipe-
sections.

18. In a generating apparatus, a heating-
130 furnace, a generator lying within the furnace, pipes leading from the generator, another set of pipes adapted to be hung from above, another set of pipes, all three sets of pipes be-

ing connected respectively, a counterbalancing-weight to sustain the generator, and pipes, and of sufficient weight to raise the said generator and pipes out of said furnace, when
5 the apparatus is disconnected from the fire-engine.

19. In a generating apparatus, a furnace, a generator adapted to be suspended within said furnace, pipes leading from the said generator, a second set of pipes above the latter,
10 swivel-joints connecting the said first and second sets of pipes, means for connecting the said second set of pipes to a fire-engine, a counterbalancing-weight connected with the
15 first set of pipes and adapted to raise the generator and pipes when the said second set of pipes are disconnected from the fire-engine.

20. In a generating apparatus, a furnace, a generator, having tubes passing therethrough,
20 the generator adapted to be sustained within said furnace, connections between the generator and a fire-engine, and automatic means for removing said generator from said furnace when the generator is disconnected from the
25 fire-engine.

21. In a balance-generator, a furnace in the basement, a generator adapted to lie within the furnace, two pipes running upwardly from said generator, two horizontal pipes connected to said first-mentioned pipes by means
30 of swivel-joints, an arm secured to the building above the furnace to which the said horizontal pipes are pivotally connected, two vertical pipes connected to said horizontal pipes
35 by swivel-joints, said vertical pipes passing through the floor overhead, and provided with connections for a fire-engine, a counterbalancing-weight secured to a chain, said chain passing over a pulley and connected to the
40 said longitudinal pipes whereby said generator may be moved out of said furnace, and spreaders, to maintain the various pipes in parallelism.

Signed in the city, county, and State of New York this 10th day of February, 1903.

TIMOTHY REGAN.

Witnesses:

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SOPHIE SEKOSKY.