

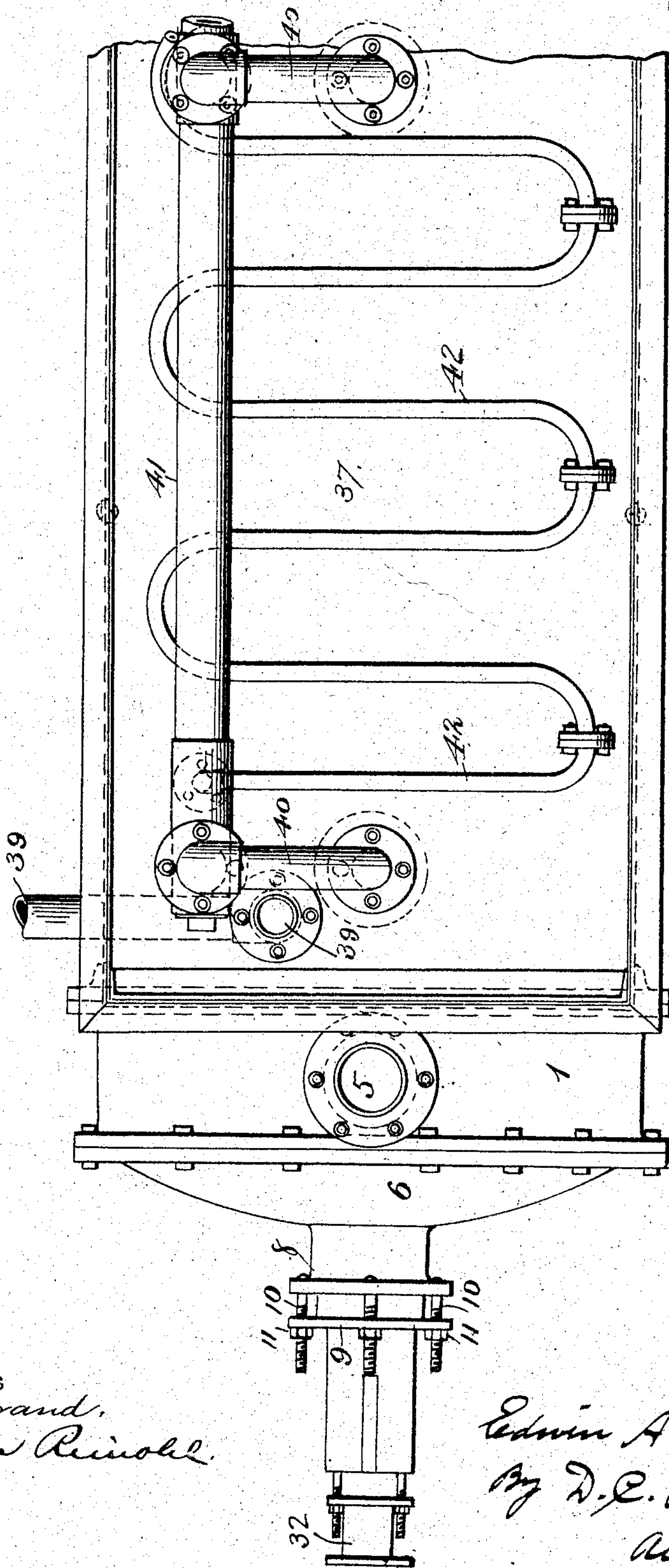
No. 786,828.

PATENTED APR. 11, 1905.

E. A. MOORE.
TAR DEHYDRATER.
APPLICATION FILED MAY 5, 1903.

5 SHEETS—SHEET 1.

Fig. 1.



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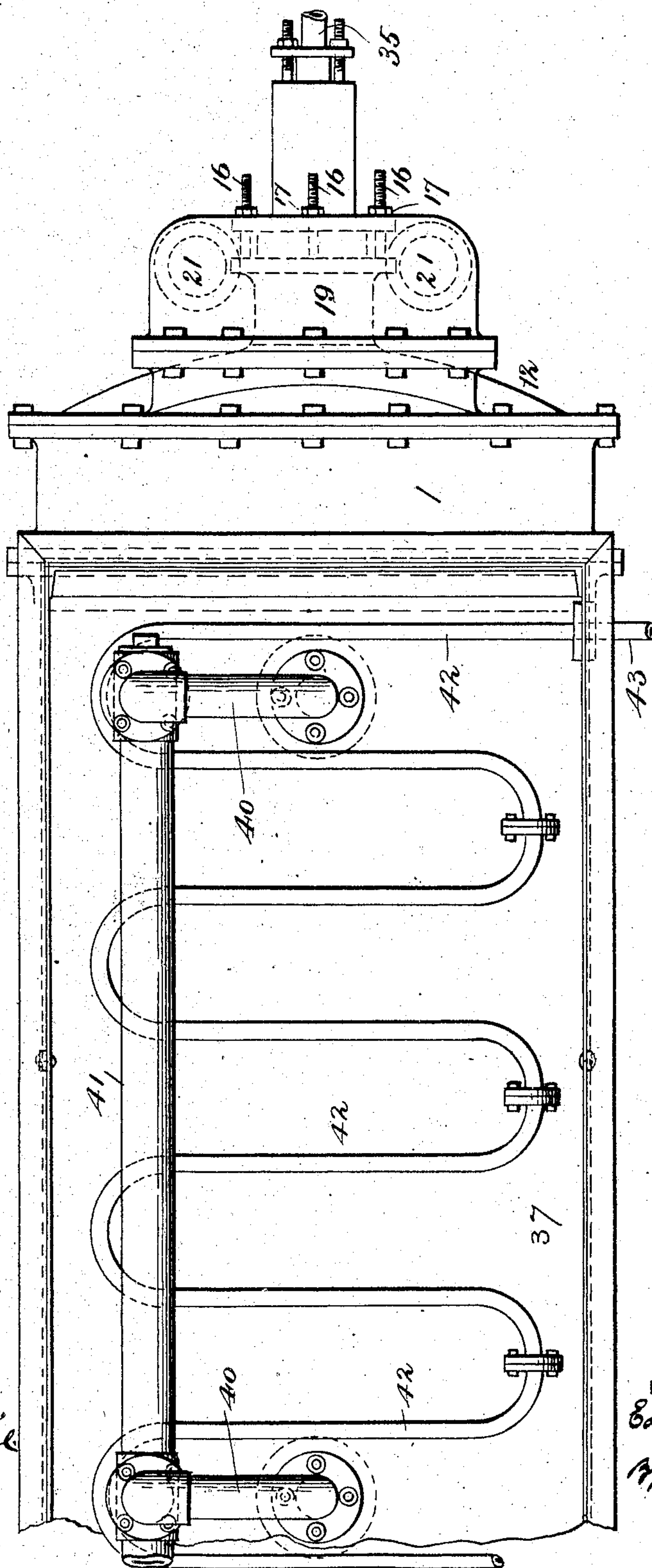
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Fig. 1a



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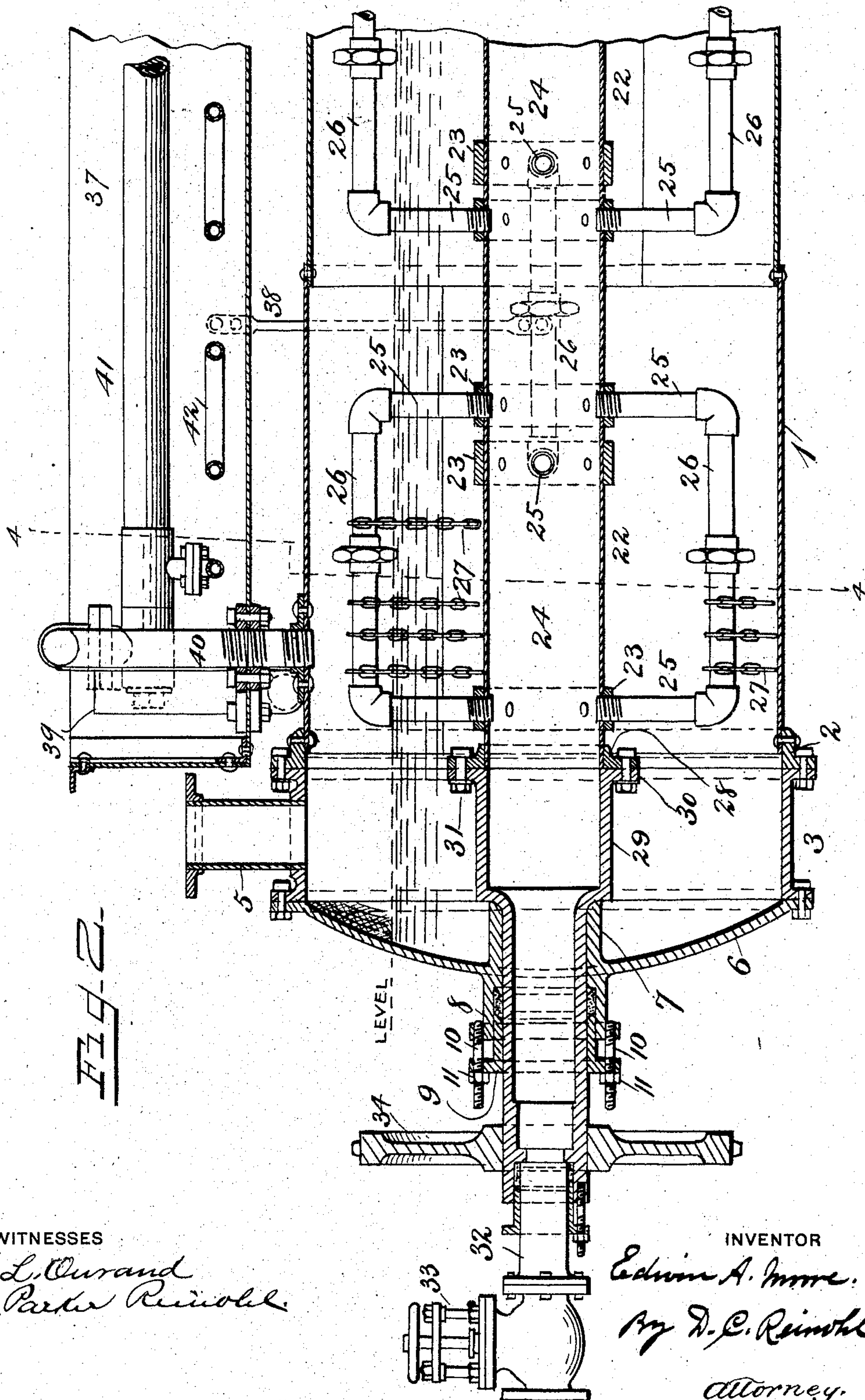
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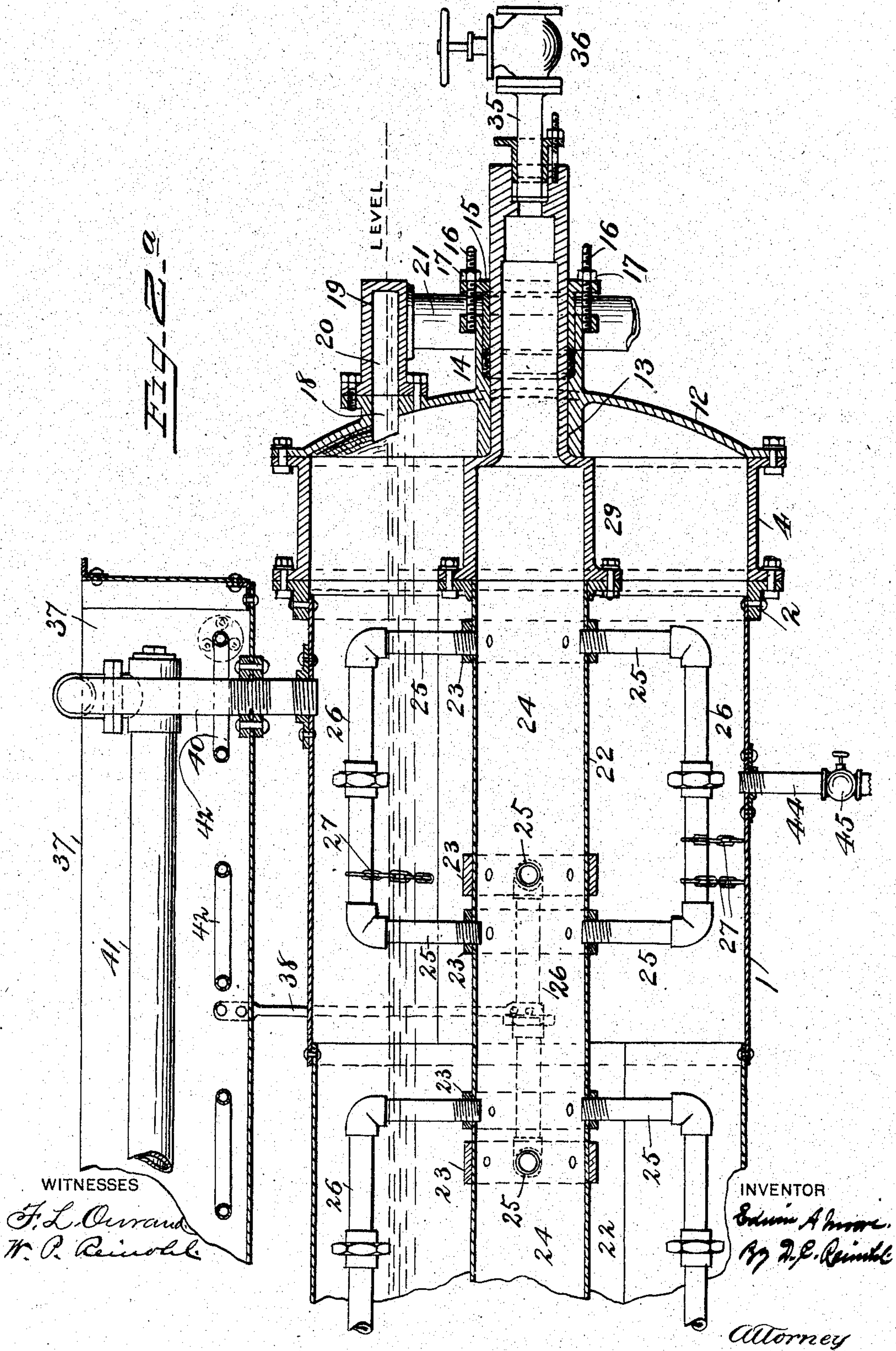
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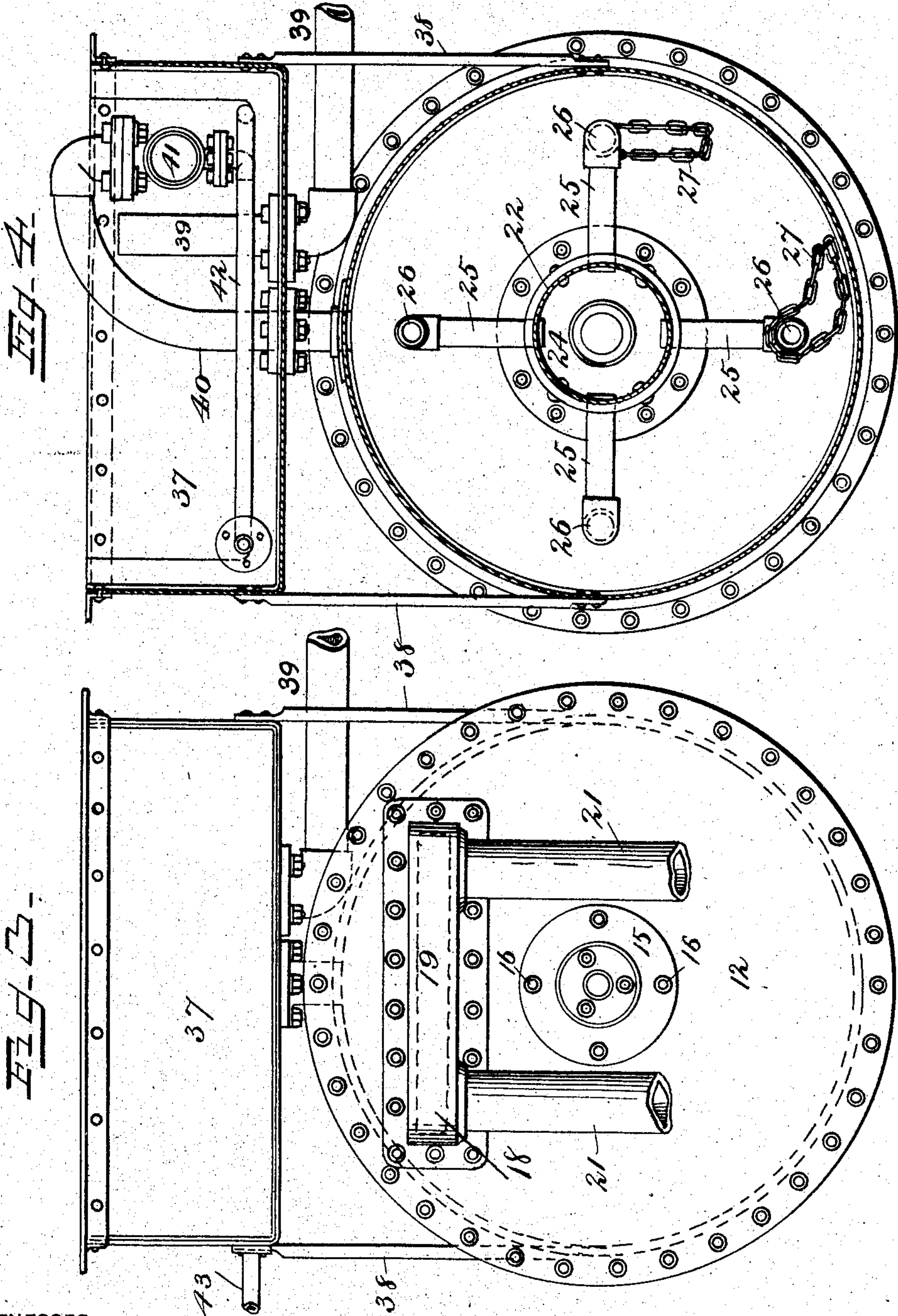


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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

EDWIN A. MOORE, OF PHILADELPHIA, PENNSYLVANIA.

TAR-DEHYDRATER.

SPECIFICATION forming part of Letters Patent No. 786,828, dated April 11, 1905.

Application filed May 5, 1903. Serial No. 155,721.

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 Tar-Dehydraters; 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 to the dehydration of tar derived from gas evolved from the distillation of coal, and has for its object the separation of the water from tar and the arresting of the distillates liberated in the treatment of the tar; and the invention consists in certain improvements, which will be fully disclosed in the following specification and claim.

In the accompanying drawings, which form part of this specification, Figures 1 and 1^a represent a top plan view of my improved tar-dehydrater with a section removed from the center; Figs. 2 and 2^a, a vertical longitudinal section of the same, the supply and discharge valves, the tubular arms, and the pipe 40 being shown in side elevation; Fig. 3, an elevation of the discharge end of the device, and Fig. 4 a vertical transverse section on line 4-4, Fig. 2.

Reference being had to the drawings and the designating characters thereon, the numeral 1 indicates the tar-receptacle of the device, preferably made of boiler-iron, at each end of which is a right-angled flanged ring 2, to one of which flanges is secured an extension 3 and to the other an extension 4, both of which are of cast-iron, the extension 3 being provided with a tar-supply pipe 5. To the extension 3 is secured a head 6, provided with an inwardly-extending bearing 7, a stuffing-box 8 on the outside of the head, and a gland 9 for the adjustment of the packing by means of the bolts 10 and nuts 11, which engage the flanges on the stuffing-box and on the gland. To the extension 4 is secured a head 12, provided with a like inwardly-extending bearing 13, a stuffing-box 14, a gland 15, bolts 16, and nuts 17, and in the head and above the hori-

zontal center thereof is an elongated opening 18, crossing the head transversely, and secured to the head is an elongated extension or pocket 19, having a tar-collecting chamber 20, having exit-pipes 21 connected therewith for conducting tar from the dehydrater.

Within the receptacle is an agitator composed of a tubular shaft 22, on which are bands or collars 23, preferably shrunk on the shaft and to which shaft and in communication with whose chamber 24 are secured radial tubular arms 25, arranged in groups, and on the horizontal members 26 of the arms short sections of chain 27 may be secured to more effectively agitate the tar during the revolution of the agitator. The radial arms and their horizontal members are arranged in pairs and at a right angle to each other, the courses of the horizontal members overlapping the adjacent ends of adjoining members. To each end of the shaft 22 is secured a right-angled flanged ring 28, to which is secured a tubular trunnion 29 by bolts 30, extending through one of the flanges of the ring 28 and through the flange 31 on the inner end of the trunnion, and the trunnion extends through the bearing 7 and the stuffing-box 8, being provided with a steam-supply pipe 32 and a valve 33 for regulating the supply of steam to the dehydrater, and on the outer end of said trunnion is a sprocket-wheel 34, by which the agitator is revolved by a belt (not shown) connected with a suitable motor or source of power.

The trunnion 29 at the opposite or discharge end of the device extends through the bearing 13 and the stuffing-box 14 and is provided with a steam-discharge pipe 35 and a valve 36, both of which are of less capacity than the steam-supply pipe and its valve at the opposite end of the device.

Above the receptacle 1 is a water-tank 37, supported on rods 38, secured to the wall of the receptacle, and is supplied with water by a suitable pipe, (not shown,) and the water is conducted from the tank by pipe 39, which extends nearly to the top of the tank, as shown in Figs. 2 and 4. From the top of the receptacle 1 extend pipes 40, which connect with a header or pipe 41 for conducting the vapors

from the tar being dehydrated and condens-
ing them in the tank by surface condensation,
the pipes 40 and the header 41 constituting
the primary condenser. To the lower side of
5 the header 41 and near one end thereof is con-
nected a serpentine pipe 42 or secondary con-
denser of less diameter than the pipes 40 and
header 41, which crosses the tank 37 repeat-
edly and draws off or conducts from the pri-
10 mary condenser the resultant liquid or distil-
lation and all the emanations from the coal-
tar evolved and liberated by the heated and
agitated tar in the dehydrater, which are dis-
charged at the opposite end of the tank through
15 pipe 43 and collected in a suitable receptacle
for the separation of the chemical properties
therefrom.

To the lower side of the receptacle 1 is at-
tached a pipe 44, provided with a valve 45 for
20 the withdrawal of the contents of the recep-
tacle at any time that it becomes necessary.

In the operation of dehydrating tar the re-
ceptacle 1 is supplied with tar through pipe 5,
and steam is admitted to the interior of the
25 agitator through valve 33 and pipe 32. The
agitator is revolved, tar heated, the water in
the tar vaporized, and the vapor conducted
through the primary and secondary condens-
ers in the tank 37. The ammonia and other
30 distillates of the tar carried with the water
into the condensers by the vapors are arrested
and conducted to a suitable receptacle for the
recovery of the by-products which it contains.
The tar is discharged from the surface of the
35 body in the receptacle, deprived of water,
ammonia, and other constituents which will
volatilize at the temperature to which the tar

is subjected, and flows off through passage 18,
chamber 20, and pipes 21.

The tar in the receptacle 1 is maintained at 40
about the line indicated on Figs. 2 and 2^a and
the tar heated to a point or degree to vapo-
rize the water and the volatile distillates con-
tained in the tar while the agitator is revolved 45
slowly, the supply of the tar being regulated
to produce a constant overflow of the tar from
the opening 18 and the pipes 21. The level
of the tar varies slightly, according to its fluid-
ity. The thin tar moving more rapidly toward 50
the discharge end of the receptacle than thick
tar causes it to rise higher; but under all con-
ditions the tar flows off or is discharged at the
end of the receptacle opposite that at which
it is received, and the flow of the tar is con-
stant while the apparatus is in operation. 55

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

A tar-dehydrater consisting of a receptacle
provided with a supply-pipe, an agitator hav-
ing a tubular body and tubular arms, trun- 60
nions detachably connected to the body of the
agitator and provided respectively with steam
supply and discharge pipes, a detachable head
at each end of the receptacle provided with
tubular bearings and stuffing-boxes for said 65
trunnions, a tar-discharge opening in one of
the heads of the receptacle and in the plane of
the level of the tar, and a condenser.

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

EDWIN A. MOORE.

Witnesses:

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C. W. METCALFE.