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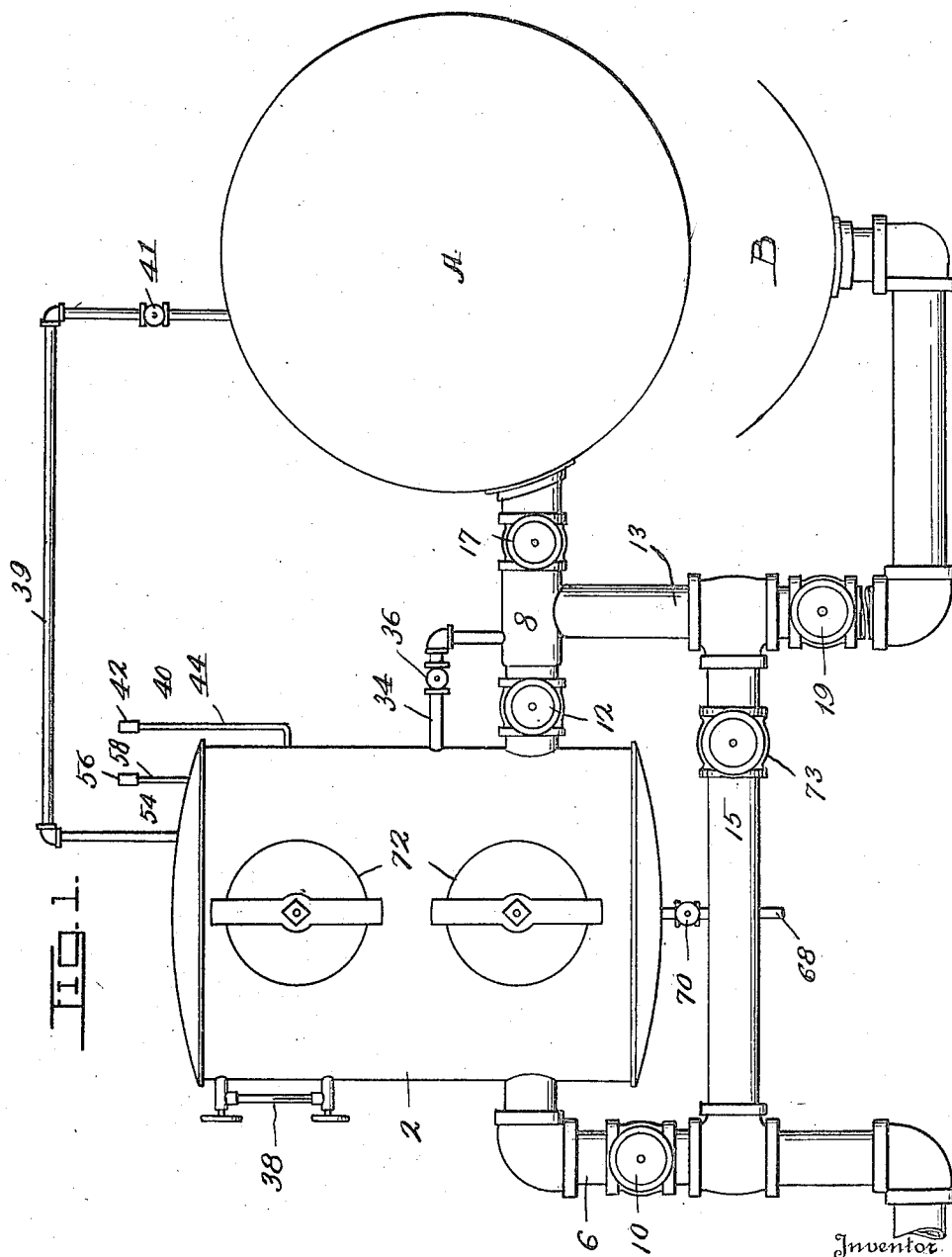
F. E. WEIDNER

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APPARATUS FOR CONTROLLING THE WATER LEVEL IN BOILERS

Filed April 18, 1921

2 Sheets-Sheet 1



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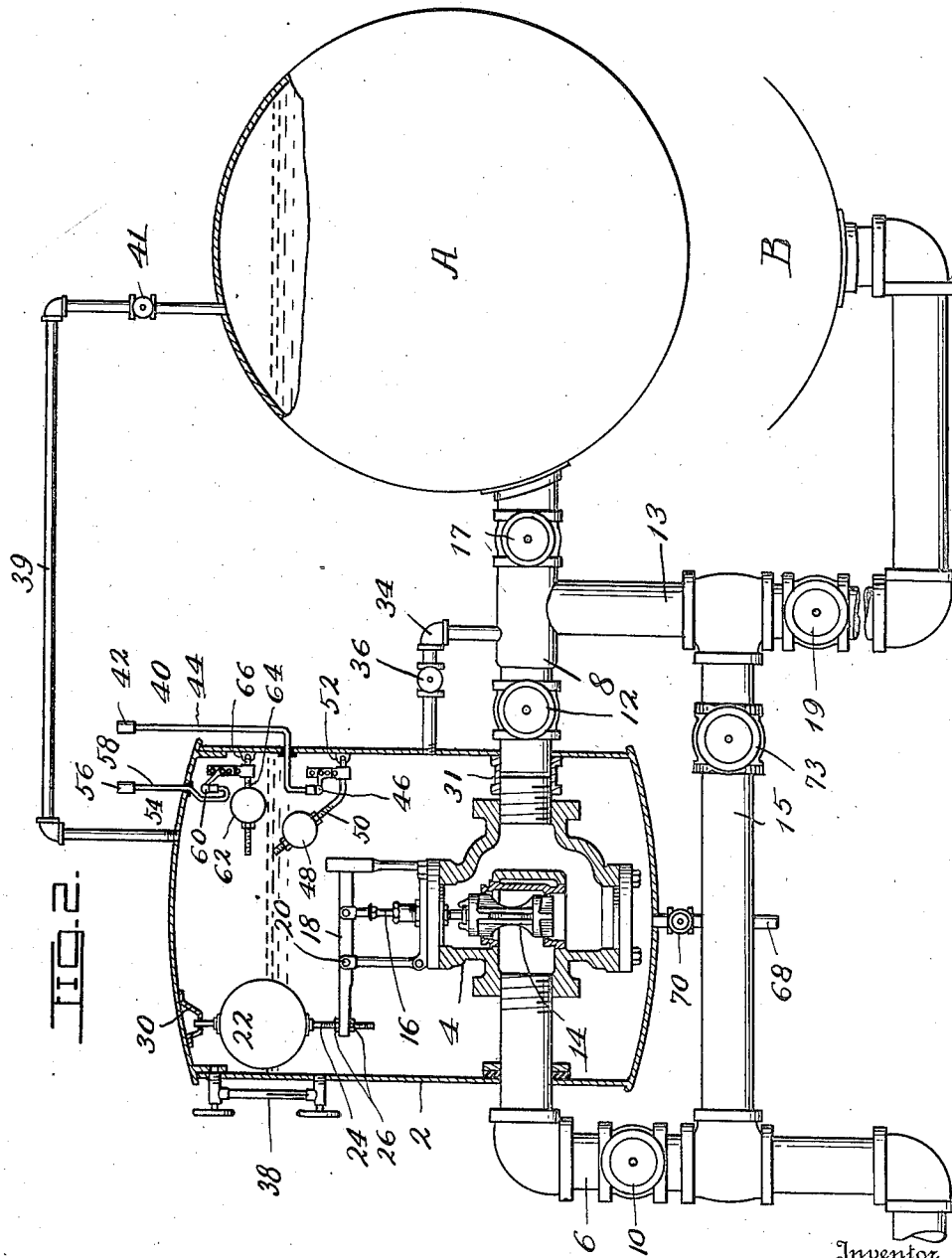
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## UNITED STATES PATENT OFFICE.

FRANK E. WEIDNER, OF MARYVILLE, MISSOURI.

## APPARATUS FOR CONTROLLING THE WATER LEVEL IN BOILERS.

Application filed April 18, 1921. Serial No. 462,196.

*To all whom it may concern:*

Be it known that I, FRANK E. WEIDNER, a citizen of the United States, residing at Maryville, in the county of Nodaway and State of Missouri, have invented certain new and useful Improvements in Apparatus for Controlling the Water Level in Boilers, of which the following is a specification.

My invention relates to improvements in apparatus for automatically maintaining the water level in steam boilers at, substantially, a predetermined point, and in its preferred embodiment includes a reservoir for holding water which controls mechanism for regulating the supply of water to the boiler. The apparatus also embodies signals for indicating when the level of the water rises above or falls below normal working level.

The apparatus is simple in construction and reliable in operation and in order that it may be fully understood, reference will now be had to the accompanying drawings, in which:

Fig. 1 is a side elevation of the apparatus connected to a boiler.

Fig. 2 is a vertical section of the apparatus connected to the boiler.

A and B designate the drums of a boiler of any ordinary or preferred construction. 2 designates a container or reservoir which is located on, or approximately on, the same horizontal plane as the boiler, for holding a supply of water on the same level as that in the upper drum A.

4 designates a balanced valve arranged in the container 2 to control the flow of water from the feed pump (not shown) to the boiler. Said balanced valve 4 is connected at one side to an inlet pipe 6 and at its opposite side to a discharge pipe 8 leading to the drum A, valves 10 and 12 being provided to shut off the water through the pipes 6 and 8, respectively, when desired.

The discharge end of the pipe 8 is enlarged as shown on the drawings to reduce the pressure of the water as it enters the drum A, so that the circulation of the water in the boiler will not be unduly disturbed. A branch pipe 13 leads from the discharge pipe 8 to the drum B, and a by-pass 15 leads from the inlet pipe 6 to said branch pipe 13. A valve 17 is installed on the discharge pipe 8 between the drum A and the branch pipe 13, and a valve 19 is connected to said branch pipe 13 between the drum B and the by-pass 15.

The valve plug 14 is controlled by the level of the water in the container 2 through the intermediacy of a stem 16 connected to said plug 14, a lever 18 fulcrumed at 20 and pivotally connected to the upper end of said stem 16, and a float 22, the rod 24 of which is adjustably connected at its lower end to the lever 18 by nuts 26 and has its upper end extending into a guide 30 depending from the top of the container 2.

The discharge pipe 8 is provided with an expansion joint 31 between the outlet side of the valve 4 and the adjacent wall of the container 2 to allow for differences in the expansion and contraction between said container and the discharge pipe 8.

34 designates a small pipe leading from the discharge pipe 8 into the container 2 in order to supply the same with water to the level of the water in the drum A. Said pipe 34 is provided with a valve 36 for shutting off the water to the container 2 when desired.

The boiler pressure is admitted to the reservoir 2 through a pipe 39 provided with a valve 41, to prevent the water from rising in said reservoir 2 to a higher level than the water in the boiler and also to operate high and low water alarms hereinafter described.

38 designates a visual water gage communicating with the upper portion of the container 2, so that the level of the water may be determined at a glance.

40 designates a low water alarm, which as the name indicates, notifies the attendant when the water in the drum A and the container 2 falls below normal level. Said alarm consists of a whistle 42, a tube 44 leading to the whistle 42 from a point within the container 2 below the normal level of the water, a valve 46 for normally closing the lower end of said tube 44, and a float 48 to which the valve 46 is adjustably secured. The float 48 is mounted upon one end of a stem 50, pivotally connected at its opposite end to a lug 52 fixed to the interior of the container 2.

54 designates a high water alarm for indicating when the water rises above normal level in the container 2 and the drum A. Said high water alarm 54 like the low water alarm 40 consists of a whistle 56, a tube 58 leading to said whistle 56 from a point above the normal water level in the reservoir 2, a valve 60, and a float 62 to which said valve 60 is adjustably connected. The float 62 is mounted upon one end of a stem

64 pivotally connected at its opposite end to a lug 66 secured to the interior of the container 2.

68 designates a drain pipe leading from the bottom of the container 2 through which water and accumulated sediment may be discharged on opening the valve 70 connected to said drain pipe 68. Hand holes 72 are provided so that access may be had to the interior of the container 2 for making repairs and adjustments.

In the normal operation of the apparatus, water is admitted to the drum A through the pipes 6 and 8 and to the drum B through the pipe 13. A portion of the water passing through the discharge pipe 8 enters the container 2 through the pipe 34 and attains the same level as that in the drum A. Should the water rise or fall from normal level the float 22 is actuated accordingly and closes or opens the valve 14 until the water level is again normal. Should the water level rise abnormally from any cause the float 62 will open the valve 60, so that a warning will be sounded on the whistle 56, and should the water fall abnormally below normal level the float 48 will move downwardly and open the valve 46, so that an alarm will be sounded on the whistle 42 by steam passing therethrough from the supply admitted to the upper portion of the reservoir 2 from the drum A, through the equalizing pipe 39. In case of emergency the valves 10 and 12 may be closed and the valve 73 of the by-pass 15, can be opened to allow the water to be fed directly into the drums A and B from the pump through said by-pass 15, the branch pipe 13, and the discharge pipe 8. When it is desired to force mud and other accumulated sediment from the lower drum B the valves 10, 12 and 17 are closed and the valve 73 is opened, so that the water under full pressure of the pump may pass directly into said drum B through the pipes 6, 15 and 13.

From the foregoing description it will be understood, that I have provided an apparatus which is relatively simple in construction and well adapted for the purpose intended, and while I have shown and described the preferred form of the invention I reserve the right to make such changes in the construction, combination, and arrangement of parts as properly fall within the spirit and scope of the claims.

Having thus described my invention, what

I claim and desire to secure by Letters Patent, is:

1. In combination with a boiler, a reservoir positioned to hold water on a level with that in the boiler, a valve located in said reservoir, a pipe leading from a source of water supply to the inlet side of said valve, a discharge pipe leading from the outlet side of the valve directly to the boiler, means for supplying the reservoir with a portion of the water directly from said discharge pipe, and means controlled by the level of the water in the reservoir for actuating the valve, to the end that the water in the boiler and the reservoir may be maintained at, or approximately at, a predetermined level.

2. In combination with a boiler, a reservoir positioned to hold water on a level with that in the boiler, a balanced valve located in said reservoir and having communication at its inlet side with a water supply and at its outlet side with the boiler, a valve controlled by-pass leading around the balanced valve from the water supply to the boiler, valve-controlled means for supplying the reservoir with a portion of the water which passes through the first-mentioned valve, means controlled by the level of the water in the reservoir for actuating said balanced valve, and means for supplying the reservoir with steam from the boiler, so that the pressure in the former will equalize that in the latter.

3. In combination with a boiler, a reservoir positioned to hold water on a level with that in the boiler, a balanced valve located in said reservoir but having no direct communication therewith and communicating at its inlet side with a water supply and at its outlet side with the boiler, means for supplying the reservoir with a portion of the water which passes through the valve, a valve-controlled drain pipe leading from the bottom of the reservoir, and a float controlled by the level of the water in the reservoir for actuating the valve, to the end that the water in the reservoir and the boiler may be maintained at, or approximately at, a predetermined level.

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

FRANK E. WEIDNER.

Witnesses:

MAHLON S. HAMILTON,  
MITCHELL WELLING.