

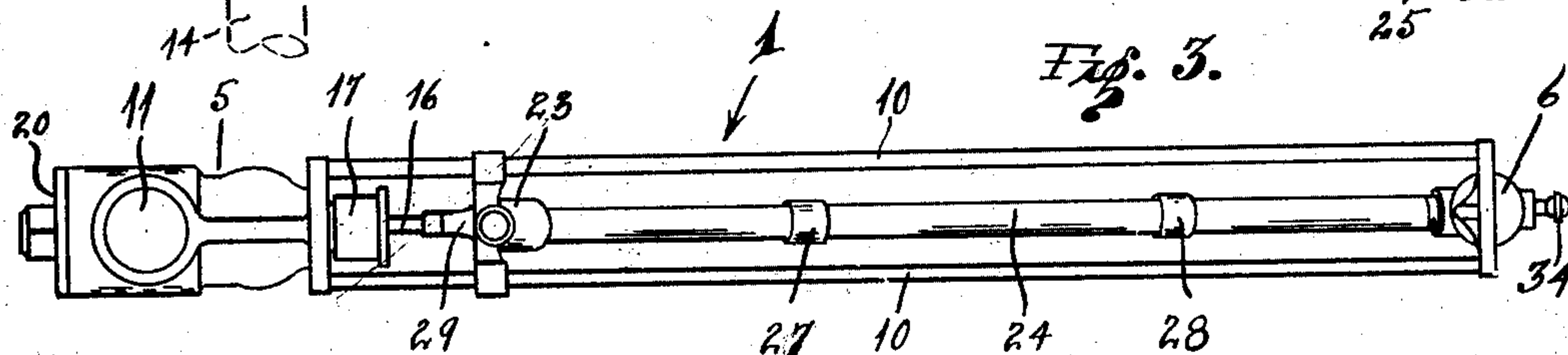
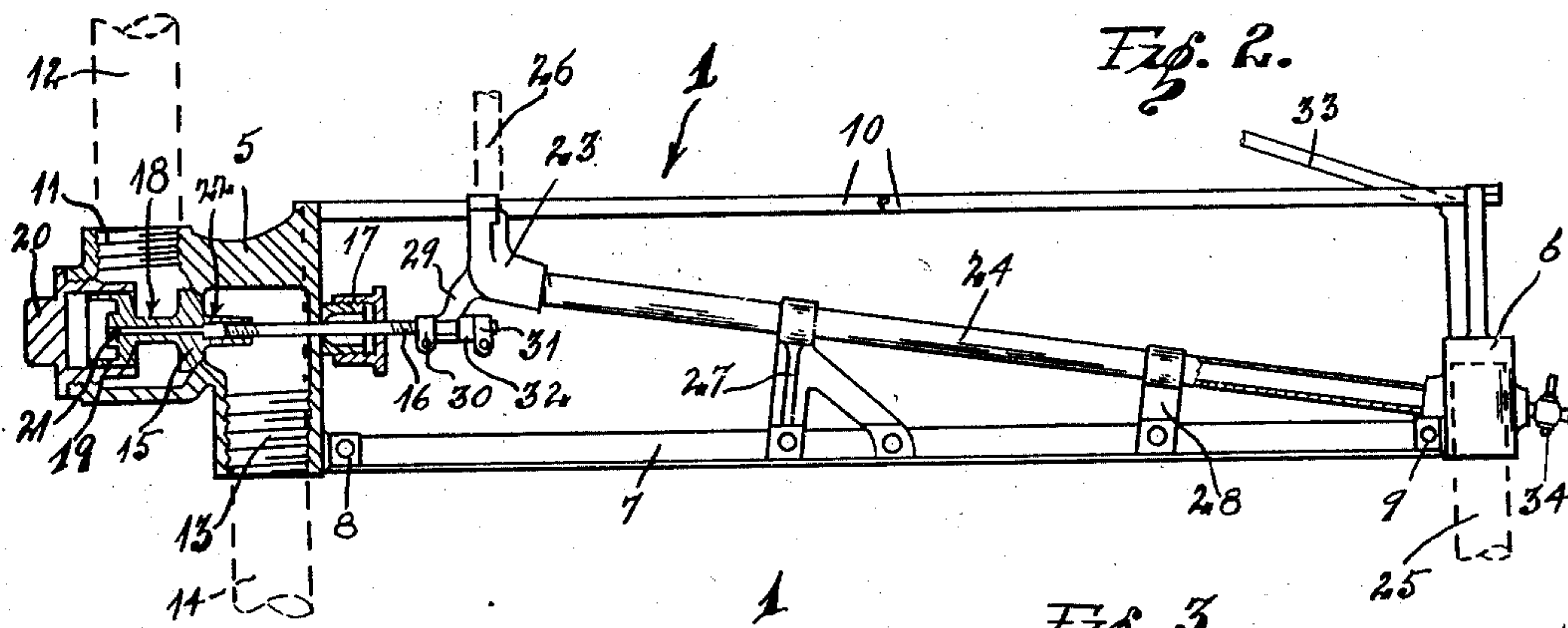
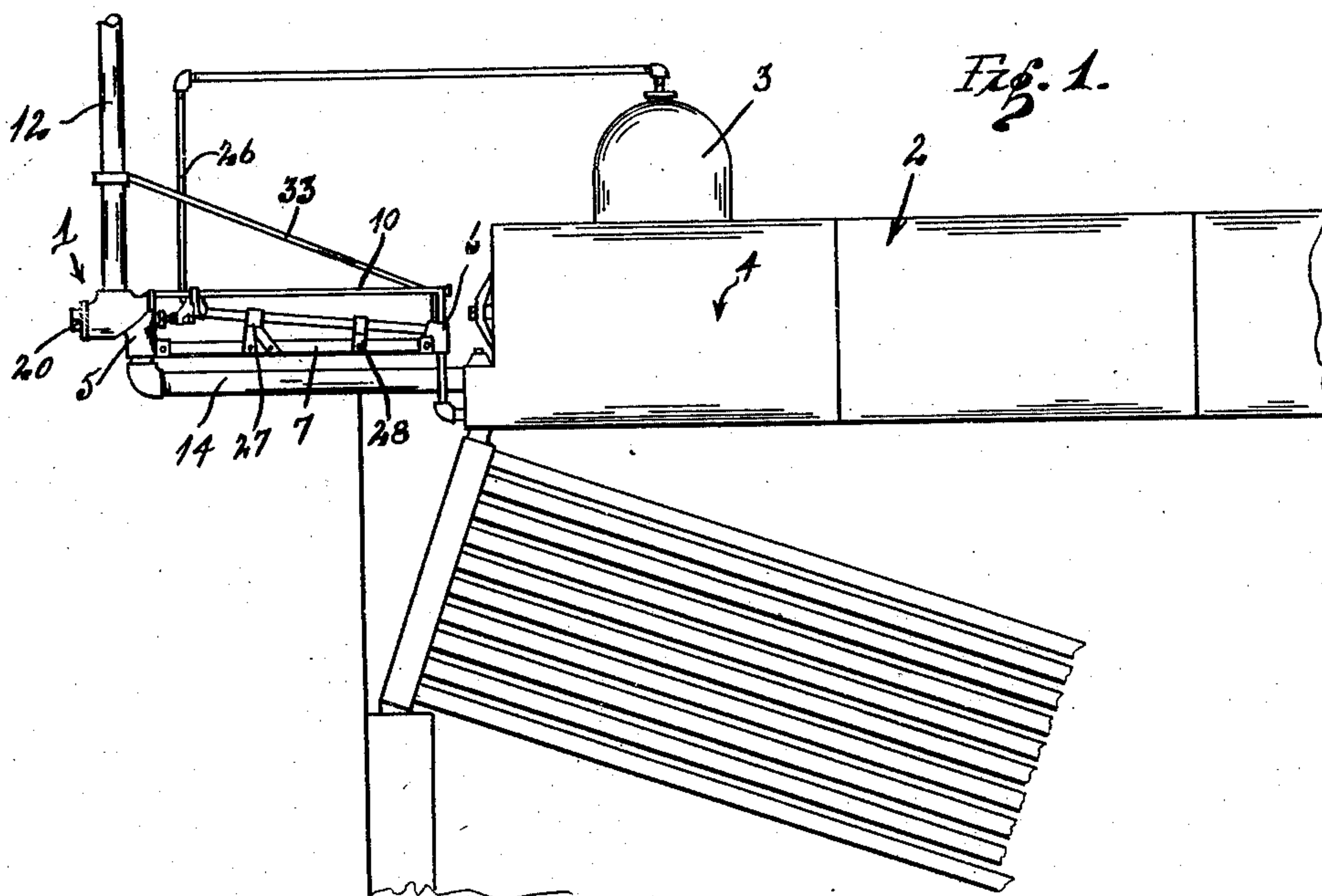
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BOILER FEED WATER CONTROL

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BOILER-FEED-WATER CONTROL

Application filed December 13, 1926. Serial No. 154,413.

An object of my invention is to provide an automatic feed water control for boilers operating on the thermostatic principle and in which the expansible element is not directly connected to the control valve.

Another object is to provide a feed water control of the character stated which will accurately maintain a water level in the boiler.

A feature of my invention consists in the inclined expansible tube, the inclination serving to make a more sensitive control.

A further object is to provide a balanced valve feed water intake.

A still further object is to provide a feed water control in which the expansible element is accurately guided and prevented from buckling or warping.

Still another object is to provide a feed water control which is simple in construction and effective in operation.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description, and the appended claims.

In the drawing—

Fig. 1 is a fragmentary side elevation of a boiler with my control mounted thereon.

Fig. 2 is a side elevation partly in section of my control.

Fig. 3 is a plan view of my control.

Referring more particularly to the drawing:

My control 1 is mounted on a boiler 2 which boiler comprises a steam dome 3 and the normal water level in which boiler is indicated at 4. My feed water control 1 includes a valve cage 5 and a water intake fitting 6. The cage 5 and fitting 6 are connected adjacent the lower end thereof by an angle bar 7 which bar is suitably secured to ears 8, 9 on the cage 5 and fitting 6, respectively. A pair of rods 10, 10 are secured to and extend between the cage 5 and fitting 6 adjacent the upper end thereof. The cage 5 is provided with a feed water intake opening 11 into which the feed water pipe 12 is threaded. A feed water outlet opening 13 is also provided in the cage 5 and a pipe 14 extends therefrom to the boiler 2.

A valve 15 is seated in the cage 5 and normally closes the passage between the openings 11, 13. A horizontally extending valve stem 16 is secured to the valve 15 and projects from the cage 5 through a packing gland 17. A reduced neck portion 18 extends rearwardly from the valve 15 and connects said valve and a piston 19, said piston being adapted to reciprocate in a nut 20 threaded into the rear of the cage 5. The piston 19 serves to guide the valve 15 and insure its accurate seating at all times.

The valve 15 is balanced in the following manner: The reduced section 18 causes an equal pressure on the rear of the valve 15 and the front face of the piston 19. If any water should leak past the piston 19, I have provided a port 21 which port extends from the rear of the piston 19 through the valve 15 and bleed holes extend into said port and open into the passage 13, thus any excess pressure back of the piston 19 will be transmitted through the port 21 and holes 22 to the passage 13 which is open to the boiler. Thus it will be seen that my valve is securely balanced and consequently can be easily and quickly opened or closed and will not be affected by the boiler pressure or the feed water pressure.

A rider 23 is slidably mounted on the rods 10, 10 and a tube 24 is secured in said rider and in the fitting 6; said tube is inclined upwardly at an angle the purpose of which will be further described. A pipe 25 is secured in the fitting 6 and extends to the boiler 2 below the water level therein, thus permitting water to be transmitted from the boiler to the tube 24. That is, the water in the tube will be at the same level as that in the boiler.

A pipe 26 is secured in the rider 23, said pipe extending to the steam dome 3, thus transmitting steam from the dome to the upper end of the tube 24. In mounting my control I prefer to so position the inclined tube 24 that the normal water level 4 in the boiler will be at about a central point in the tube. It will be apparent that as the water level in the boiler lowers, the steam from the pipe 26 will fill a greater portion of the tube, thus tending to raise the temperature thereof, and

causing its expansion for a purpose to be further described.

Raising of the water level in the boiler will cause the converse to occur. By reason of the inclination of the tube 24, a relatively small rise or fall of the water in the boiler 2 will cause the fluid level in the tube to move a considerable distance. This large movement of the water in the tube will cause said tube to rapidly heat or cool as the case may be, and will maintain a practically constant water level in the boiler. To prevent buckling or warping of the tube 24 during its contraction and expansion, I provide guides 27, 28 which are secured to the bars 7 and said tube being slidably mounted therein.

A finger 29 depends from the rider 23, and the stem 16 extends therethrough, an adjusting nut 30 screws on the stem 16 against the front of the finger 29 and a second adjusting nut 31 screws against a rubber packing 32 which packing bears against the rear of the finger. Thus it will be seen that as the tube 24 expands and contracts the rider 23 will be moved along the rods 10, 10, which movement is transmitted through the finger 29 directly to the stem 16 to open or close the valve 15, and thus permit the feed water from the pipe 12 to pass into the boiler, or closing said pipe and stopping the flow of water as the case may be.

A brace rod 33 is secured at one end to the fitting 6 and at the other end to the pipe 12, thus the fitting is prevented from moving, due to the expansion and contraction of the tube 24. A drain cock 34 is provided in the fitting 6 by means of which the tube 24 may be cleaned. The adjusting nuts 30, 31 permit the adjustment of the valve 15 relative to the rider 23 so that movement of said rider will properly open and close the valve.

The rubber packing 32 permits further contraction of the tube 24 and movement of the rider 23 as the valve is closed without damaging said valve. The direct connection of the tube 24 to the valve stem 16 permits a more accurate opening and closing of the valve and also prevents the surge of the feed water into the boiler. The arrangement of connecting bars 7 and rods 10, 10 rigidly braces the fitting 6 so that any longitudinal movement of the tube 24 will be transmitted in its entirety to the rider 23.

Having described my invention, I claim:

1. An automatic feed water control for boilers comprising a cage, a balanced valve in said cage, a feed water intake pipe extending into said cage, an outlet pipe extending from said cage and adapted to be connected to a boiler, a fitting, a pipe adapted to extend from the fitting to the water space of the boiler, a rider, means slidably mounting the rider, a steam pipe extending to the rider, an inclined tube connected to the fitting and the rider, and means connecting the rider and

the valve whereby longitudinal movement of the tube will act to open and close the valve, said balanced valve comprising a valve-head, a piston, a constricted portion connecting the valve-head and piston, said valve having a passage therethrough and ports extending into the passage, said ports being adjacent the valve head, whereby pressure is equalized on both ends of the valve.

2. A feed water control for boilers comprising a valve cage, a feed water intake pipe for said cage, a feed water outlet pipe from said cage adapted to extend to a boiler, a valve in said cage controlling the feed water intake, said valve comprising a valve head, a piston, a constricted portion connecting the valve head and piston, said valve having an opening extending therethrough and ports adjacent said valve head extending into the opening whereby pressure is equalized on both ends of the valve, a fitting, a pipe adapted to extend from the fitting to the water space of the boiler, an inclined tube, means adapted to connect said tube to the steam in the boiler, and means connecting said tube and the valve whereby longitudinal movement of the tube will act to open and close the valve.

In testimony whereof, I affix my signature.
OTTO B. KIBELE.