

No. 775,682.

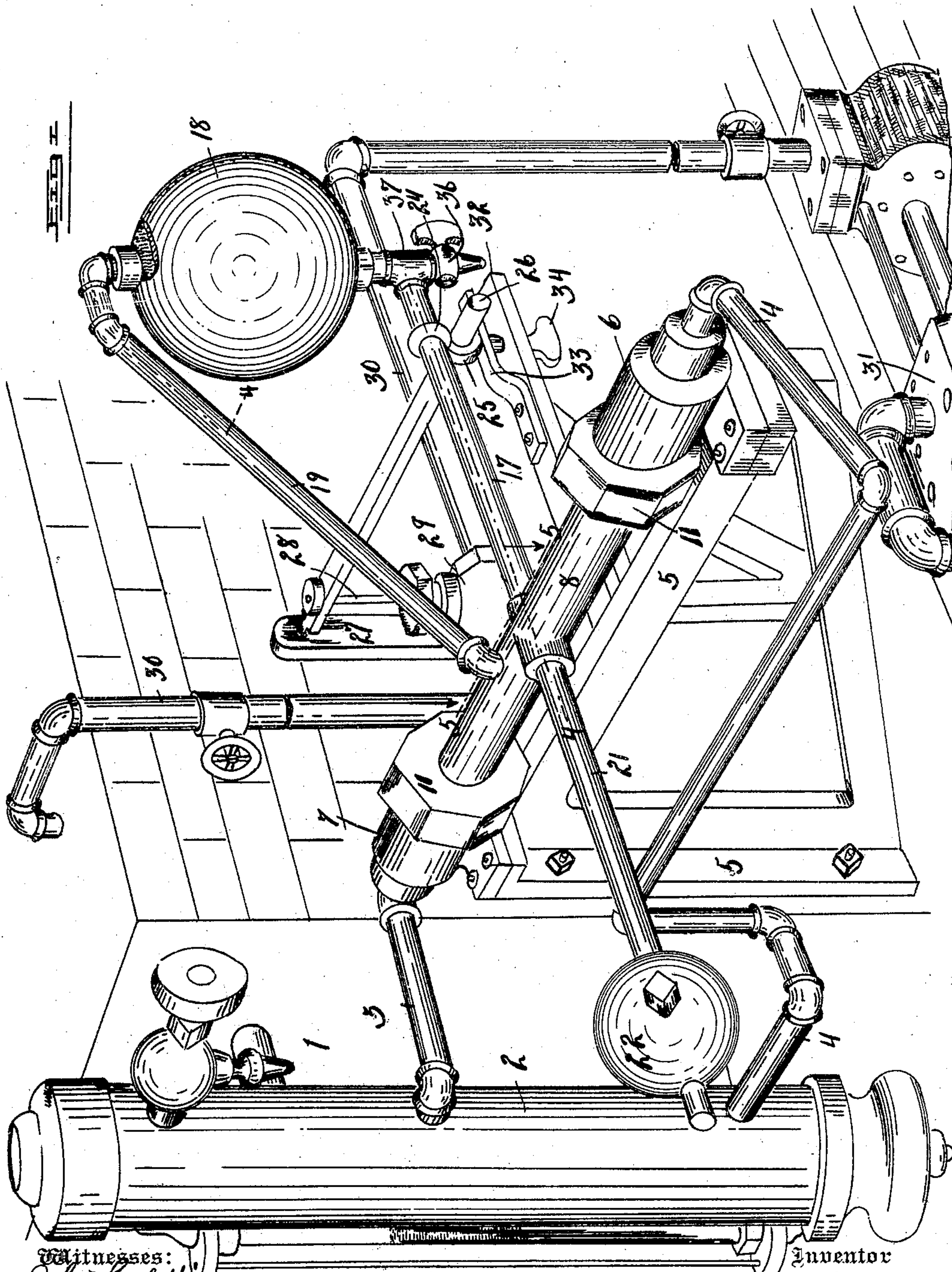
PATENTED NOV. 22, 1904.

N. F. ROADHOUSE.
AUTOMATIC BOILER FEEDER.

APPLICATION FILED DEC. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses:
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Inventor
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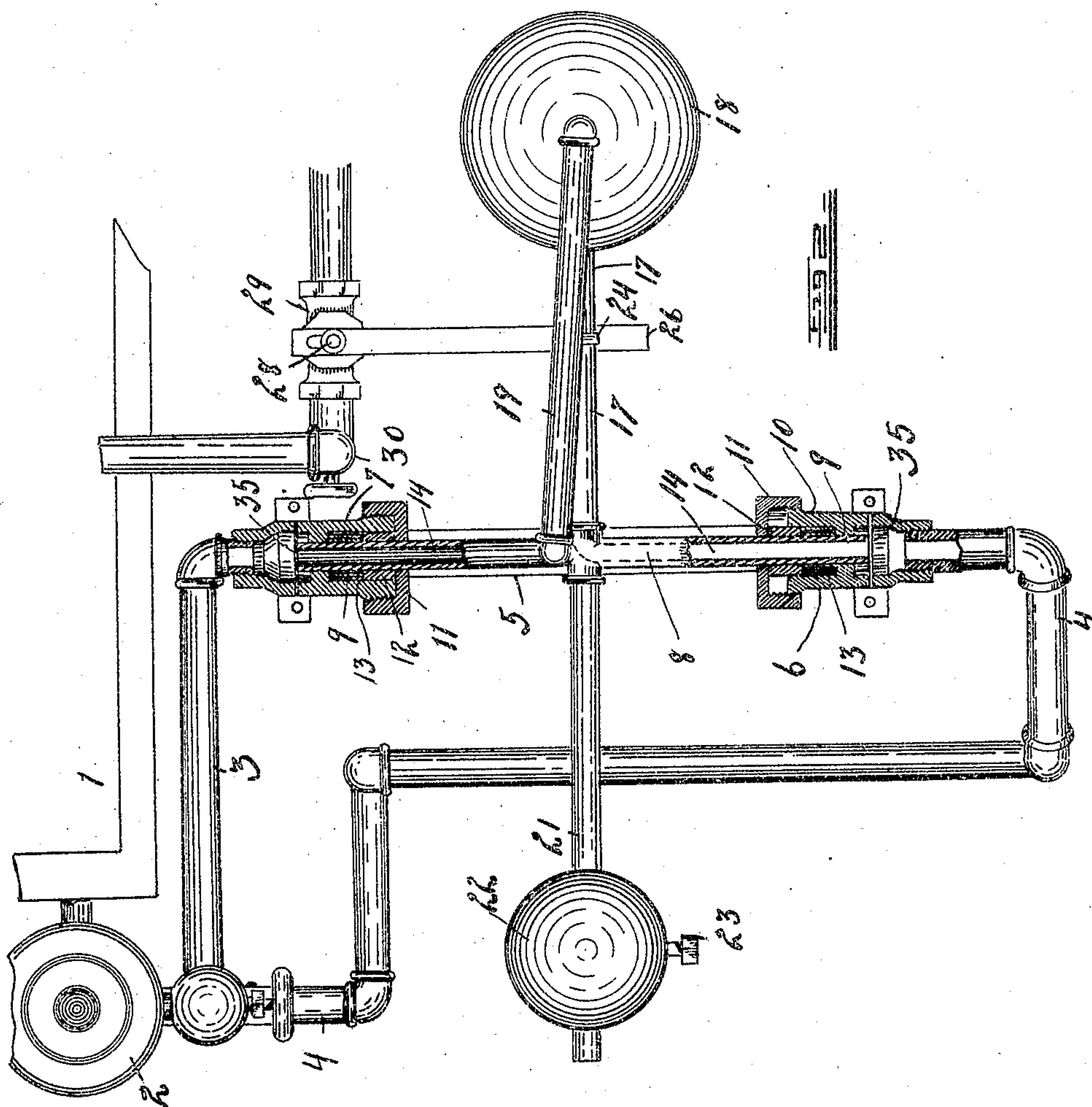
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UNITED STATES PATENT OFFICE.

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McGREGOR AUTOMATIC BOILER FEED COMPANY, OF DETROIT,
MICHIGAN, A CORPORATION.

AUTOMATIC BOILER-FEEDER.

SPECIFICATION forming part of Letters Patent No. 775,682, dated November 22, 1904.

Application filed December 7, 1903. Serial No. 184,109. (No model.)

To all whom it may concern:

Be it known that I, NORMAN F. ROADHOUSE, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Automatic Boiler-Feeders; and I do 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to an automatic boiler-feeder; and it consists in the construction and arrangement of parts hereinafter fully set forth, and pointed out particularly in the claims.

The object of the invention is to provide simple and efficient means for controlling the steam-pump which feeds the water into the boiler, so as to maintain the water practically at a uniform level, the arrangement being such as to cause the device to operate automatically through a slight variation of the water-level, starting the pump when the water falls to a predetermined point and stopping the pump when the water rises to a predetermined level.

The above object is attained by the structure illustrated in the accompanying drawings, in which—

Figure 1 is a general view in perspective, showing the application of my invention to a steam-boiler, the connection of the steam and water pipes being made with the water-column thereof. Fig. 2 is a plan view, partly in section.

Referring to the characters of reference, 1 designates the ordinary steam-boiler provided with the water-column 2. Connected with the water-column at the point where the middle gage-cock is ordinarily attached is a pipe 3, and also connected with said column at the point where the lower gage-cock is ordinarily attached is a pipe 4. Mounted upon one end of a bracket 5, which may be attached to the

boiler-casing or other suitable support, is a socket-coupling 6, into which leads the pipe 4. Upon the opposite end of said bracket is a socket-coupling 7, into which leads the pipe 3.

Interposed between the socket-couplings 6 and 7 is a fitting 8, whose ends extend into the sockets of said couplings and are supported in the annular bearings 9. (See Fig. 2.) Each of said couplings is provided with an exterior thread 10, upon which is adapted to screw a gland 11, and within the socket of said coupling around the fitting 8 is an annular follower 12, which as the gland is screwed into place is adapted to compress the packing 13 between its inner edge and the bearing 9, thereby making a steam-tight joint around the fitting 10, but permitting said fitting to rotate or oscillate in its bearings concentric with its axis. Extending longitudinally of the fitting 8 in opposite directions are the channels 14 and 15, which are separated at the longitudinal center of said fitting by the dividing-partition 16. Communicating with the inner end of channel 14 is a pipe 17, which in turn communicates with the bottom of the globular tank or vessel 18. Communicating with the inner end of channel 15 is a pipe 19, which in turn communicates with the top of said tank. Formed upon the fitting 8 near its longitudinal center is a boss 20, having a threaded bore in which is screwed an arm 21, carrying a weight 22, made adjustable on said arm by means of the set-screw 23. The arm 21 extends from the fitting 8 in a direction opposite to the pipes 17 and 19, whereby the weight is suspended upon the opposite side of the fitting to that occupied by the tank 18. The specific gravity of the weight 22 is sufficient to overcome that of the tank 18 when said tank is empty.

Mounted upon the pipe 17 is a collar 24, having attached thereto a depending ring 25, through which freely passes the outer end of the lever 26, fulcrumed in a suitable support 27. Attached to said lever is the stem 28 of the valve 29, adapted to control the passage of steam through the steam-pipe 30, which communicates with the boiler and with the

steam-pump 31, (shown in Fig. 1,) by means of which the feed-water is pumped into the boiler, as will be well understood.

The pipe 3 communicates with the water-column at about the normal water-level, and the pipe 4 communicates with the water-column at a point always below the water-level, so that in the normal condition of the apparatus the tank 18 is filled with water, which renders it sufficiently heavy to overcome the weight 22 and maintain the parts in the position shown in Fig. 1, wherein the valve 29 is closed and the feed-pump 31 is not in operation. Should the water-level in the boiler fall to a point below the end of the pipe 31, the steam will enter said pipe and tank, causing the water by gravity to pass out of the tank 18 through the pipe 4, when the weight 22 will overbalance said tank, causing the fitting 8 to turn in its bearings and actuating the lever 26 to open the valve in the steam-pipe 30, thereby starting the pump 31, through the operation of which the water in the boiler is replenished until its normal level is restored and it again covers the end of the pipe 3, when the pressure of the steam will force the water through said pipe and again fill the tank 18, causing it to descend and operate the lever 26 to close the valve 29, thereby stopping the pump and cutting off a further supply of water to the boiler until the water-level therein again falls below the end of the pipe 3, when the operation just described will be repeated.

To prevent an excessive jar when the tank 18 descends from its raised position, there is provided a suitable support 32, upon which is mounted a buffer-spring 33, whose free end extends into the path of the ring 25, through which the lever 26 extends, and cushions the descent of the lever and tank, so as to prevent undue jar and vibration. A set-screw 34 is passed through the part 32 to support said spring when unduly depressed by the descent of the tank.

Crossing the socket-couplings 6 and 7 are the transverse pins 35, against which the opposite ends of the fitting 8 are adapted to butt to hold said fitting in place and prevent it from sliding too far into either of said couplings. These pins, while serving to maintain the fitting in place, do not obstruct to any appreciable extent the flow of water through said fitting.

To provide for cleaning out the tank 18, so as to relieve it from accumulated sediment, a blow-off cock 36 is employed, which is connected by a T-coupling with the pipe 17 and the tank 18.

Having thus fully set forth my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In an automatic boiler-feeder, the combination with the water-column of a boiler, of the pipes communicating with said water-column, one pipe being connected thereto through

the middle gage-cock opening at the normal water-level of the boiler and the other pipe being connected thereto through the lower gage-cock opening below said water-level, a rotary fitting connected to said pipes at its opposite ends by rotary joints interposed between said pipes and the ends of said fitting, a weighted arm projecting from said fitting between said rotary joints, a tank upon the opposite side of said rotary fitting in opposed relation to said weighted arm, said tank being supported by two pipes one of which communicates with the bottom thereof and leads to said fitting, wherein is a channel communicating through the rotary joint with one of said first-mentioned pipes, the other of said supporting-pipes communicating with the top of said tank and leading to said fitting, wherein it communicates with a channel leading to the other of said first-mentioned pipes, a steam-pump for feeding water to the boiler, a controlling-valve for said pump, a lever connected with said valve for operating it, the end of said lever having a movable connection with the pipe leading to the bottom of said tank.

2. In an automatic boiler-feeder, the combination with the boiler, the steam-pump, the steam-pipe leading thereto having a valve therein, the pipes communicating with the boiler, one at the normal water-level and the other at a point below said level, an integral rotary fitting having independent apertures extending therein from opposite ends, rotary joints connecting the opposite ends of said fitting with the terminals of said pipes, an arm extending laterally from said fitting centrally between said rotary joints having an adjustable weight thereon, a tank upon the opposite side of said fitting in opposed relation to said weighted arm, a pipe leading from the bottom of said tank and communicating with the channel in said fitting, which in turn communicates with the pipe leading to the boiler below the water-level, a pipe leading from the top of said tank and communicating with the pipe leading to the boiler at the normal water-level, a lever attached to the valve for controlling the steam-supply to the pump, said lever being connected to one of said movable members,

3. In an automatic boiler-feeder, the combination of a rotary fitting having two independent channels therein, a rotary coupling through which one channel communicates with the boiler at the normal boiler-level, a rotary coupling through which the other channel communicates with the boiler below said level, a weighted arm projecting laterally from said fitting between said rotary couplings, a pipe extending horizontally from the opposite side of said fitting, a vessel supported by and communicating with said pipe which in turn communicates with the channel in said fitting that communicates with the boiler below the water-level, a pipe communicating with the top of

said tank and leading to the channel in the fitting that communicates with the boiler at the normal water-level, a steam-pump for feeding water to the boiler, a valve in the steam-pipe
5 leading to said pump, and means connected with one of said movable members for operating said valve.

In testimony whereof I sign this specification in the presence of two witnesses.

NORMAN F. ROADHOUSE.

Witnesses:

E. S. WHEELER,
I. G. HOWLETT.