

No. 672,734.

Patented Apr. 23, 1901.

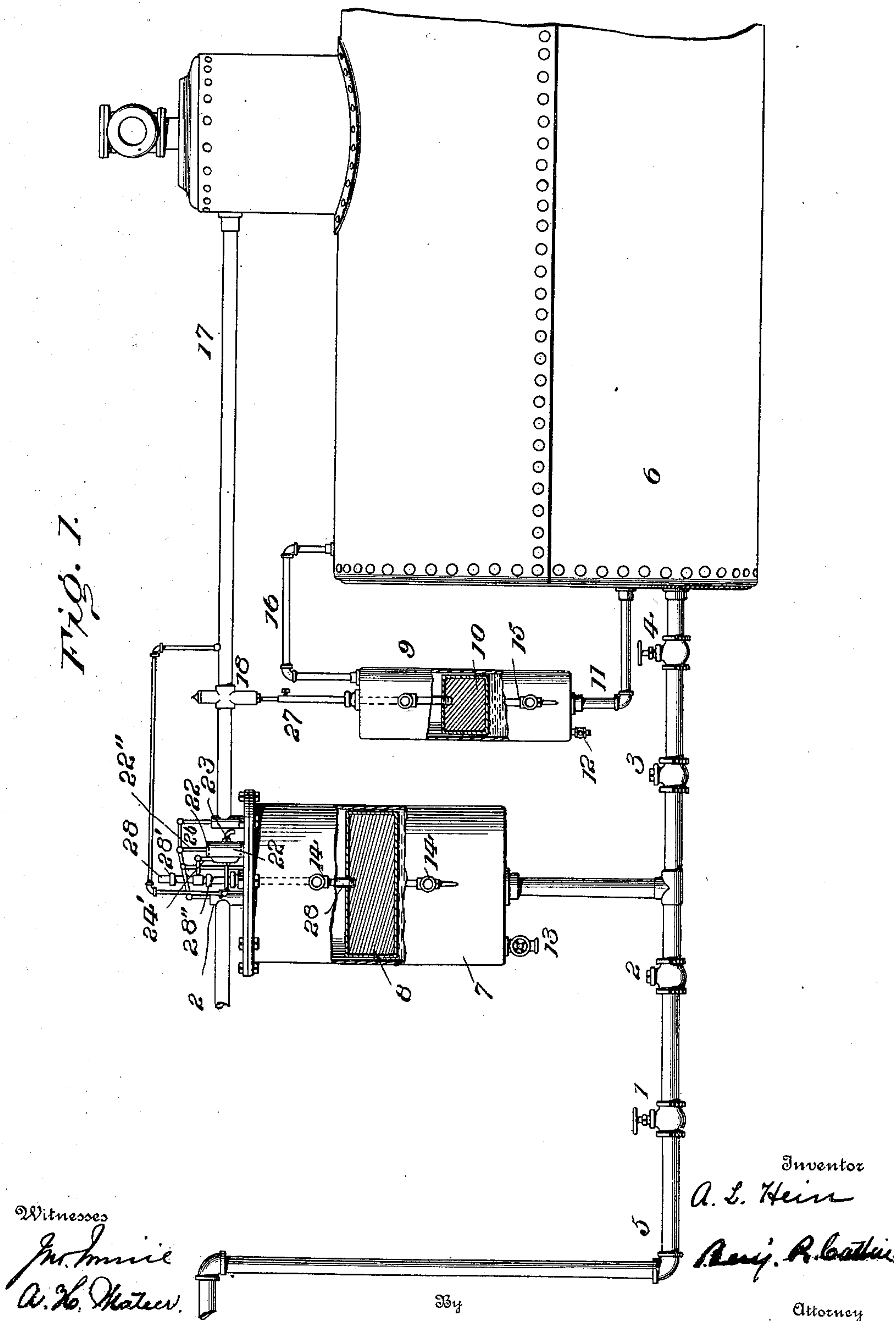
A. L. HEIN.

AUTOMATIC WATER FEEDER FOR STEAM BOILERS.

..(No Model.)

(Application filed Aug. 25, 1900.)

2 Sheets—Sheet 1.



Witnesses

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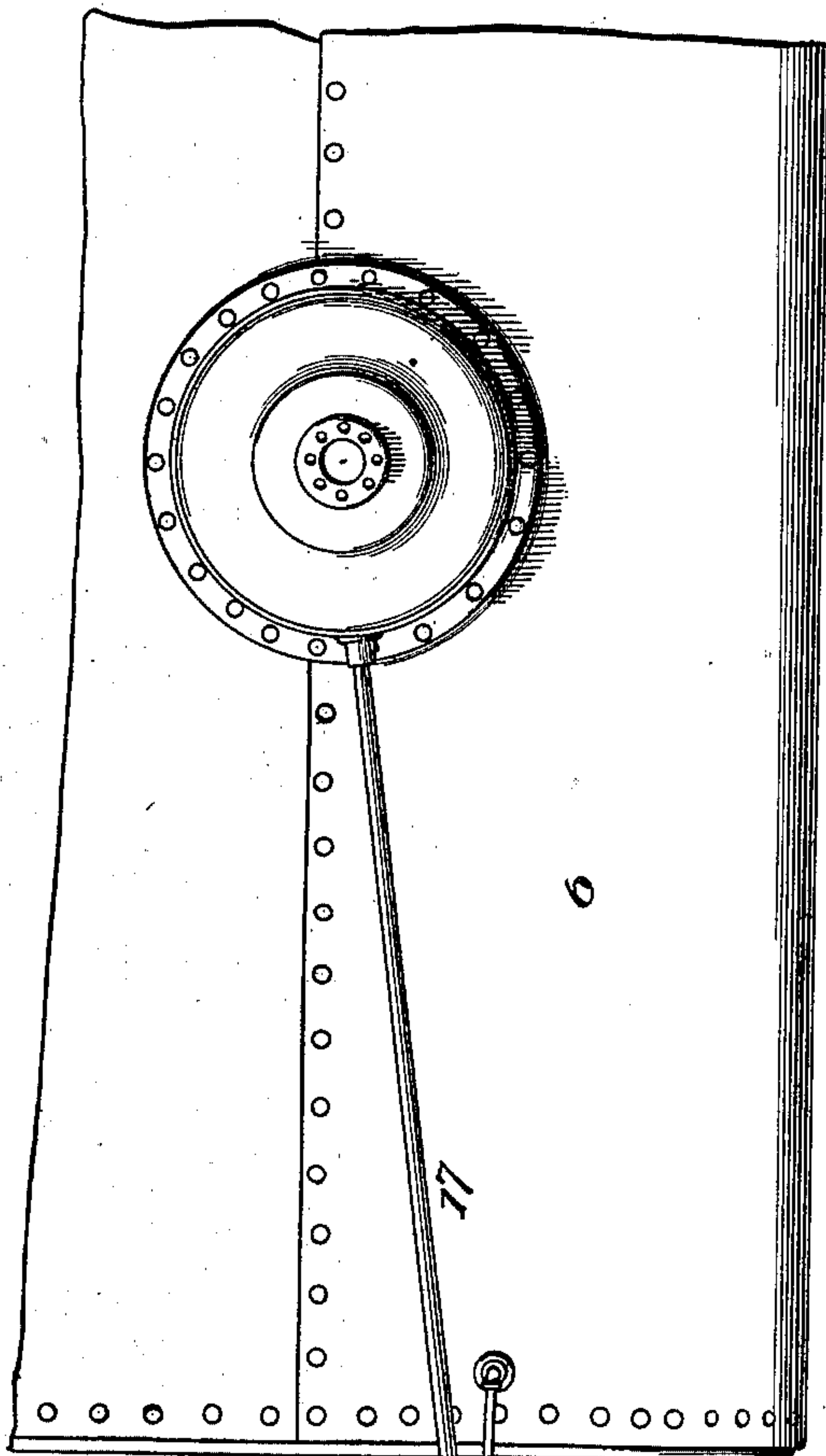


Fig. 2.

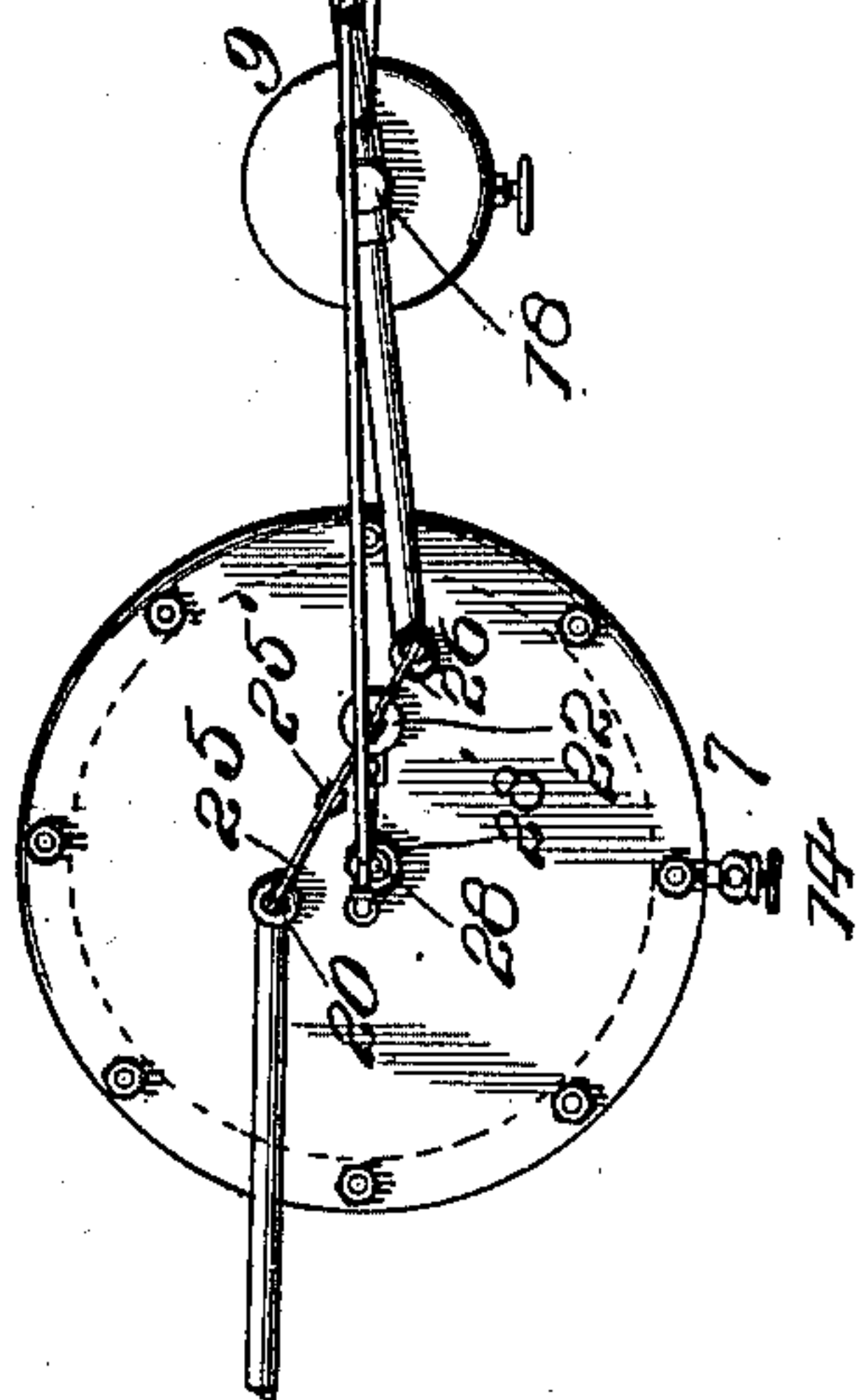
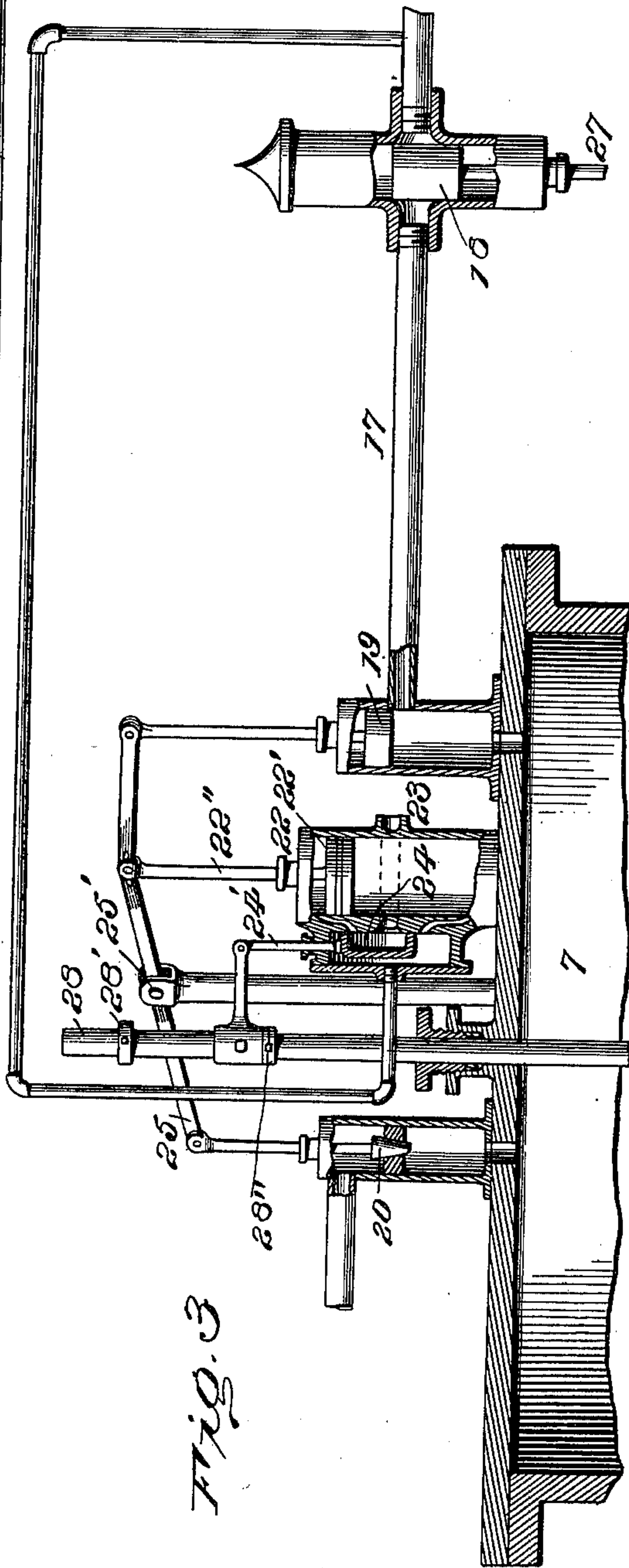


Fig. 3.



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ALMOND L. HEIN, OF SHELBY, OHIO.

AUTOMATIC WATER-FEEDER FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 672,734, dated April 23, 1901.

Application filed August 25, 1900. Serial No. 27,977. (No model.)

To all whom it may concern:

Be it known that I, ALMOND L. HEIN, a resident of Shelby, in the county of Richland and State of Ohio, have invented certain new and useful Improvements in Automatic Water-Feeders for Steam-Boilers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as it pertains to make and use the same.

The invention relates to boiler-feeders, and has for its object to provide for the efficient, safe, and economical feeding of water to steam-boilers.

The invention consists in the construction herein described and pointed out.

In the accompanying drawings, Figure 1 is a side elevation of the improved feeder combined with a boiler, parts being broken away to show interior constructions. Fig. 2 is a plan of the same. Fig. 3 is a partial enlarged section of a feed-water tank, showing connected devices in broken side elevation.

Numerals 6 denotes a boiler of any preferred type, and 5 indicates a feed-water pipe having stop-cocks 1 and 4 and check-valves 2 and 3. The water-pipe may communicate with any suitable source of supply, such as an elevated tank, and be arranged to feed water at any time required. The check-valves 2 and 3 open toward the boiler to prevent the return of the feed-water.

7 denotes a feed-water tank communicating with supply-pipe 5 between the check-valves 2 and 3. It is made of boiler-iron and may be provided with a blow-off cock 13 and glass gage 14.

8 denotes a float having, preferably, a metal shell inclosing wood or an air-chamber. It is connected by a stem or rod 28, which passes through a suitably-packed stuffing-box in the top of the tank and is operatively connected with the valve of a small steam-engine 22, having an admission-valve 24 and an exhaust 23, as will be described.

9 denotes a small tank, having a float 10, a blow-off cock 12, and a gage 15. It communicates freely with the water-space of the boiler by a pipe 11 and with its steam-space by a pipe 16, said pipes opening into the tank below and above the float, respectively.

27 denotes a float-stem connected to a valve

18 in a steam-pipe 17, which pipe, when required, admits steam to the upper part of tank 7, equalizing the pressure in the tank and boiler and permitting water to feed by gravity through pipe 5 to the boiler, check-valve 2 being closed and check-valve 3 opened in the operation. The opening of the valve 18 for this purpose is automatically effected by the float 10 whenever the water-level in the boiler falls below that desired and for which the apparatus may be set by adjusting the extensible part of the stem 27.

As water is fed from tank 7 the float 8 sinks and draws down the rod 28, with the effect to pull down by the medium of its ring 28' the valve-stem 24', which opens the valve 24 and admits steam above the piston 22' in cylinder 22. This, by means of the piston-rod 22'' and bent bar 26, lowers the valve 19 and cuts off steam. It also moves lever 25 about its fulcrum 25' with the effect to open a tank-exhaust valve 20, whereupon water freely enters the tank and raises float 8, closing said exhaust 20 and opening valve 19, thereby putting the charged tank in readiness to receive steam whenever valve 18 is again opened by a fall of water in the boiler and in the communicating governor-vessel 9.

It will be understood that the above-described closing of the exhaust 20 and opening of valve 19 are effected by the ring 28'' engaging and lifting the stem of valve 24 to admit steam below the piston 22', thereby reversing the movements of lever 25 and valve-rod 26.

It will be further understood that tank 7 is kept charged with water by pressure in pipe 5 at all times when valve 19 is closed and that said valve is actuated to close or open by the engine 22, suitably driven by steam, the direction of the movement of the valve and connected engine-piston being determined by the tank - float which controls the engine-valve.

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

1. The combination of a boiler, a water-feeding tank, a steam-admission conduit for said tank, a boiler-controlled valve in said conduit and a tank-controlled valve in the same conduit.

2. The combination of the boiler, the wa-

ter-tank having a float, the valve-actuating engine having its valve connected to the float, the valve actuated by the engine to admit steam under boiler-pressure to the tank, and
 5 a separate float-actuated valve to admit steam to the conduit containing the said engine-actuated valve.

3. In combination, a boiler, a boiler-feeding tank, a second tank in free communication with the water-space and the steam-space of said boiler, a valve-actuating float in said latter tank, the valve, a steam-conduit directly connecting the steam-dome of the boiler and the boiler-feeding tank, a sec-
 10 ond valve in said conduit, a branch steam-conduit connected to the main conduit back of the first-named valve, and an engine to actuate the second valve to control steam admission to the feeding-tank.

20 4. In combination, a boiler, a tank in free communication with the water-space and the steam-space of said boiler, a valve-actuating float in said tank, a steam-conduit controlled by the valve, a boiler-feeding tank receiving
 25 steam from said conduit, and a second valve in the conduit, and a float in the boiler-feeding tank to mediate actuate the latter valve.

5. In combination, a boiler, a tank in free communication with the water-space and the
 30 steam-space of said boiler, a valve-actuating float in said tank, a steam-conduit controlled by the valve, a boiler-feeding tank receiving steam from said conduit, and a second valve in the conduit, a float in the boiler-feeding

tank to mediate actuate the latter valve, 35 and an engine in communication with the boiler, said engine having an admission and exhaust valve actuated by the second float.

6. In combination, a boiler, a tank in free communication with the water-space and the 40 steam-space of said boiler, a valve-actuating float in said tank, a steam-conduit controlled by the valve, a boiler-feeding tank receiving steam from said conduit, and a second valve in the conduit, a float in the boiler-feeding 45 tank to mediate actuate the latter valve, and an engine in communication with the boiler, said engine having an admission and exhaust valve actuated by the second float, and the feeding-tank having an exhaust- 50 valve also actuated by the engine.

7. In combination, a boiler, a water-feeding tank, a float in said tank, an engine receiving steam from the boiler, a lever, and steam admission and exhaust valves pendent 55 from the opposite ends of the lever respectively, said lever being operatively connected to the engine piston-rod, and the tank-float operatively and directly connected to the en- 60 gine-valve.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALMOND L. HEIN.

Witnesses:

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 S. S. BLOOM.