

R. HOFFMAN.  
AUTOMATIC SHUT-OFF FOR WATER HEATERS.  
APPLICATION FILED AUG. 8, 1904.

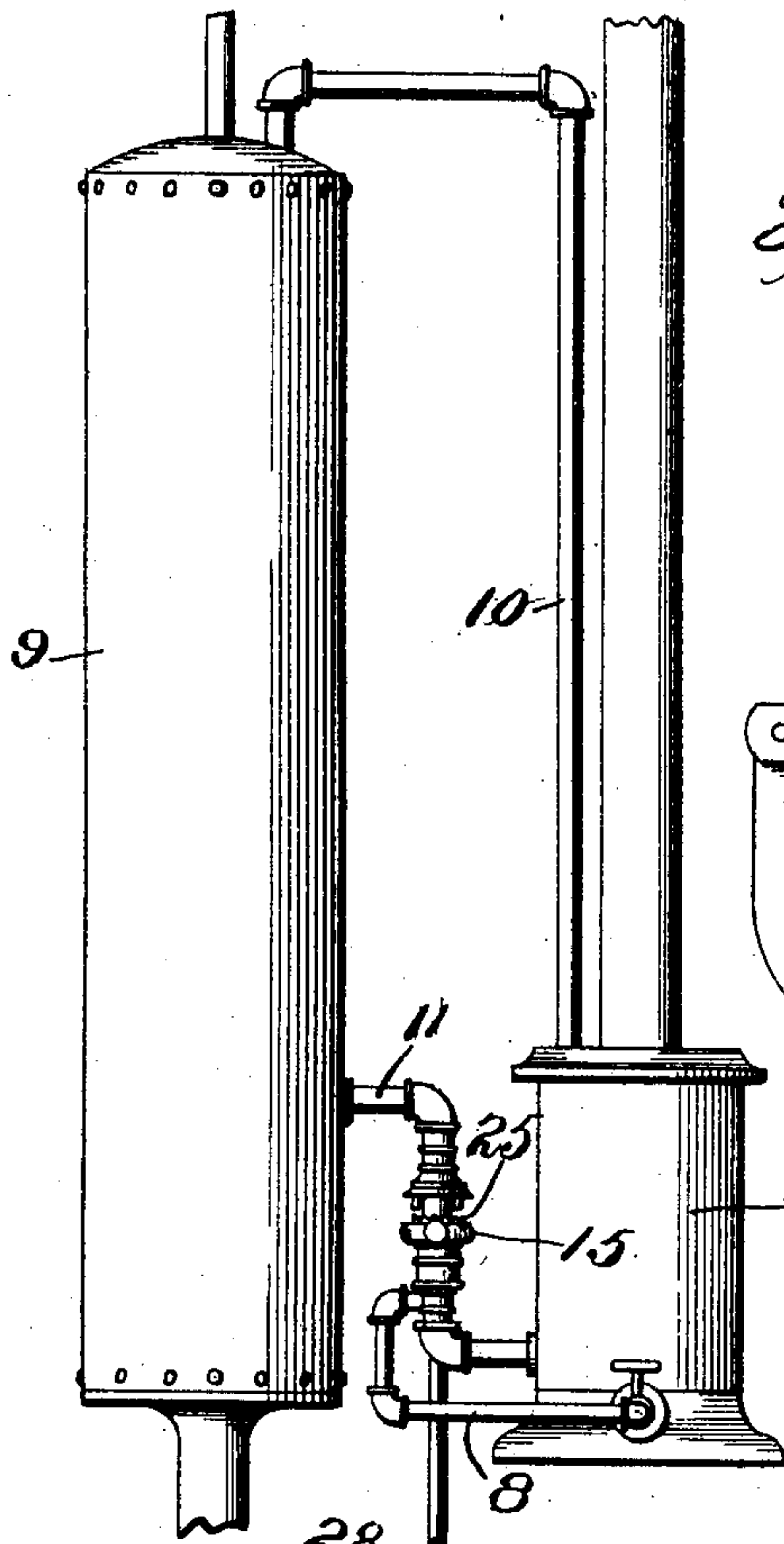


Fig. 1.

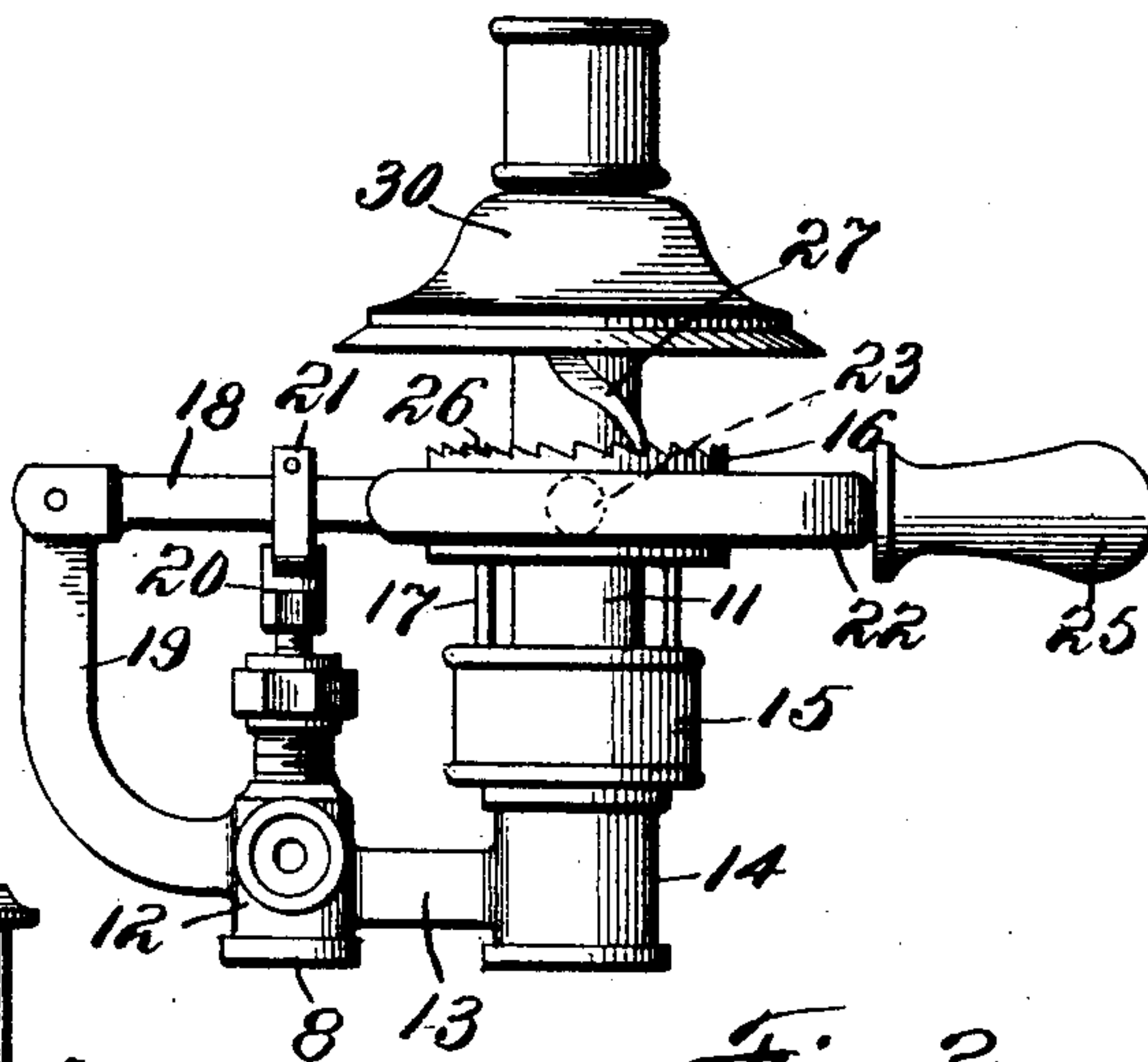


Fig. 2.

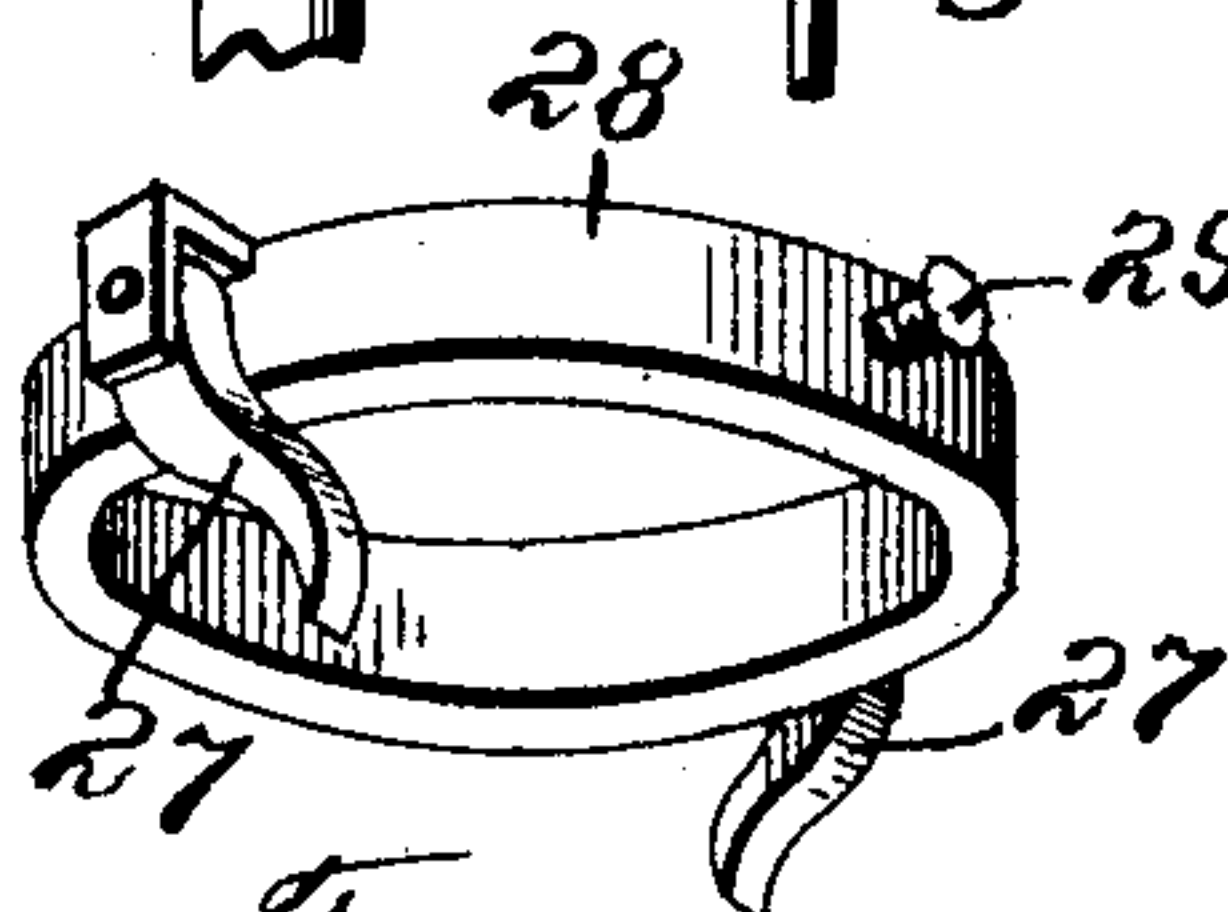


Fig. 4.

Fig. 5.

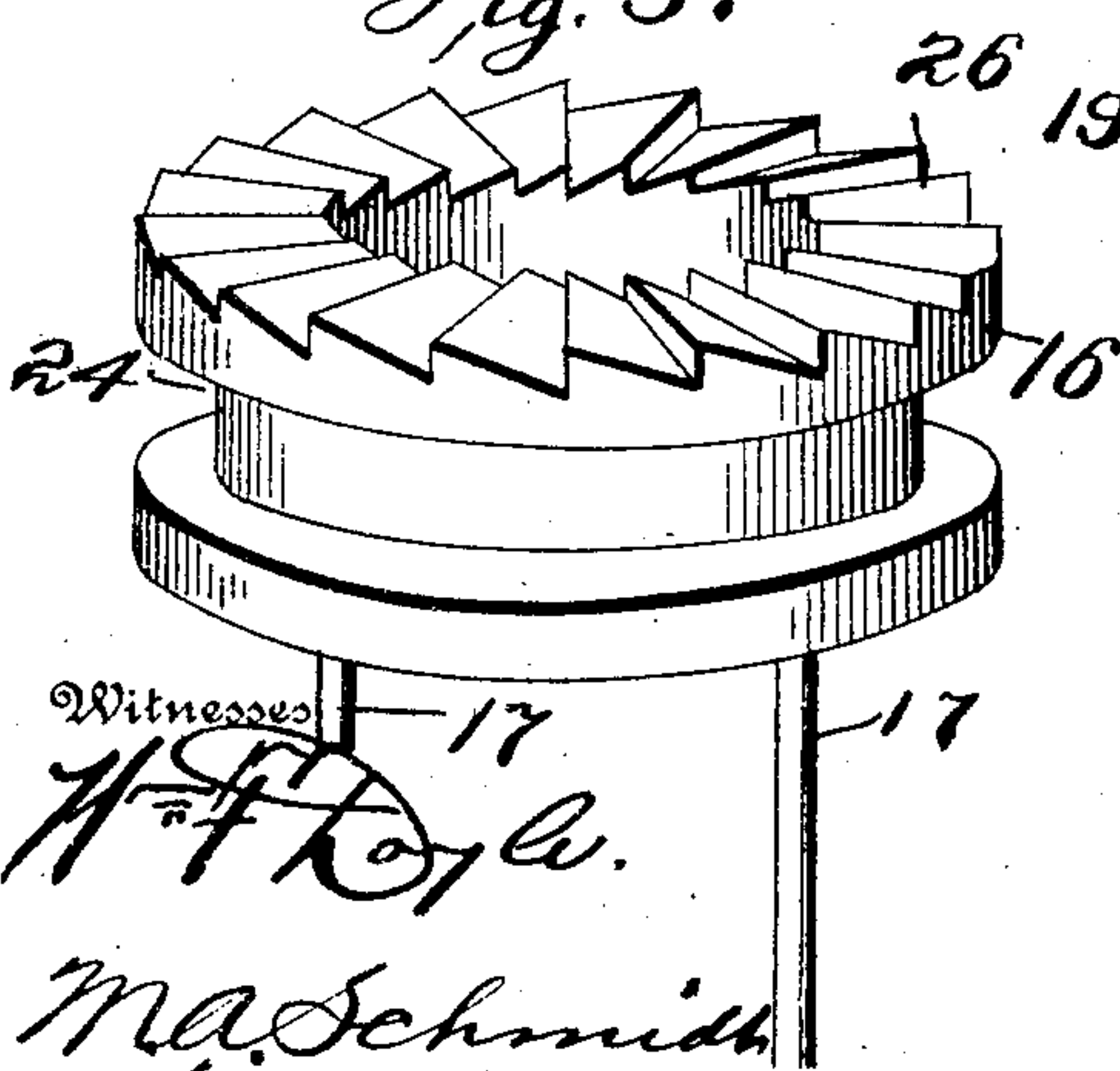
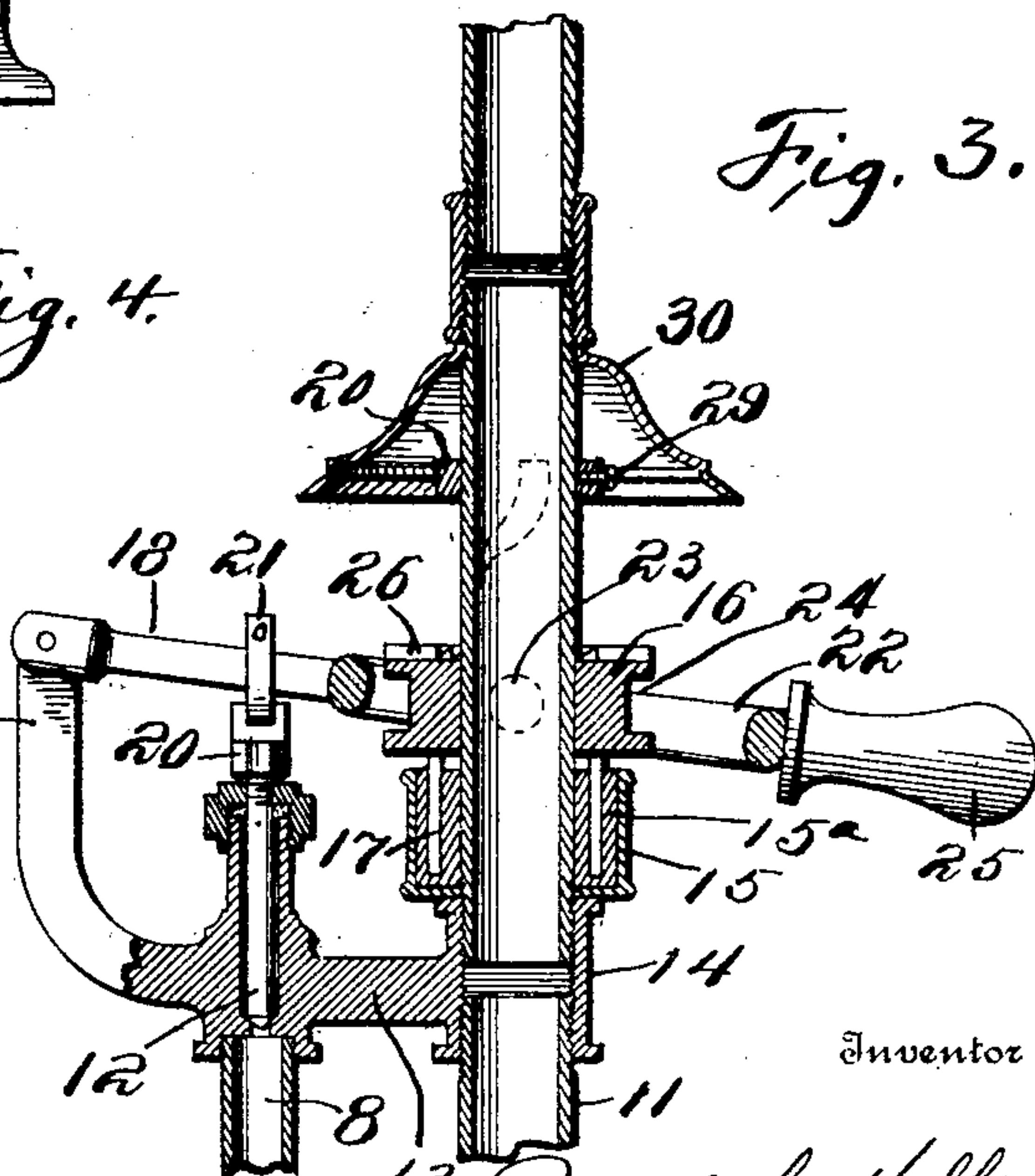


Fig. 3.



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# UNITED STATES PATENT OFFICE.

RUDOLPH HOFFMAN, OF LORAIN, OHIO.

## AUTOMATIC SHUT-OFF FOR WATER-HEATERS.

SPECIFICATION forming part of Letters Patent No. 779,711, dated January 10, 1905.

Application filed August 8, 1904. Serial No. 219,965.

*To all whom it may concern:*

Be it known that I, RUDOLPH HOFFMAN, a citizen of the United States, residing at Lorain, in the county of Lorain and State of Ohio, have invented new and useful Improvements in Automatic Shut-Offs for Water-Heaters, of which the following is a specification.

My invention relates to an automatic valve for controlling the supply of gas to the burner of a water-heater, more particularly that class of heaters in which the water is heated in a set of coils heated by a gas or similar burner.

The object of the invention is to provide simple and effective means for shutting off the gas when the water has become heated; and it consists in certain novel features of construction hereinafter described and claimed.

In the accompanying drawings, Figure 1 is an elevation of a water-heater, showing the invention applied thereto. Fig. 2 is an elevation of the gas-valve and the means for operating the same, the valve being shown open. Fig. 3 is a vertical section thereof, showing the valve closed. Figs. 4 and 5 are details in perspective.

Referring specifically to the drawings, 7 denotes the heater, which contains the coils and the burner. The gas-supply pipe to the burner is indicated at 8. The heater is connected to the tank 9 by pipes 10 and 11, respectively. The first-mentioned pipe enters the tank at the top and the latter near the bottom thereof. The circuit of the water is from the coils through the pipe 10 into the tank and through the pipe 11 back to the coils. The valve for controlling the flow of gas to the heater is indicated at 12, and its casing has an arm 13, at the end of which is a union 14, into which the pipe 11 is screwed. The pipe 11 passes through a cup 15, which is supported on the top of the union 14, and said cup contains wax 15<sup>a</sup> or other similar substance, which is substantially solid at ordinary temperatures, but which will fuse or melt readily at higher temperatures. Above the cup a collar 16 is loosely mounted on the pipe 11, and said collar has on its under side

a number of depending pins 17, which rest on the top of the wax in the cup when it is hard, and thus holds the sleeve in elevated position.

At 18 is indicated a lever which is fulcrumed at one end on an arm 19, extending from the casing of the gas-valve 12. This lever is connected to the valve-stem 20 of the valve 12, as at 21, and is forked, as at 22, and extends around the collar 16, having pins 23, which extend into a circular groove 24 in the collar. The end of the lever 18 has a weighted handle 25. The top side of the collar is formed with ratchet-teeth 26, which are adapted to be engaged by dogs 27, which are pivoted to and hang below a collar 28, fastened to the pipe 11 by a set-screw 29 or otherwise.

The operation of the invention is as follows: When the water is cold, the wax in the cup is hard and supports the pins 17, which then hold the sleeve 16 in elevated position, as shown in Fig. 2. In this position the gas-valve will be held open by the lever 18. The water circulates through the pipe 11, as already described, and when it becomes heated the pipe will also become hot, so that the wax in the cup will melt or soften until it no longer can support the pins 17, which then drop into the wax, as shown in Fig. 3, this movement being aided by the weighted handle 25 of the lever. The sleeve as it drops carries the lever with it by reason of the connection above described, and the downward movement of the lever forces the valve to its seat and shuts off the gas to the burner. This economizes fuel, as the gas will be shut off as soon as the water is heated. When it is desired to heat more water and after the wax has hardened again sufficiently to support the pins, the lever is lifted and the pins again placed on top of the wax as before, whereby the gas-valve will be opened again. To prevent the pins from entering the same holes in the wax upon being so lifted, the collar is turned to shift the pins to a new location on the wax by means of the pawl or ratchet described. When the lever and collar are lifted, the pawls engage the ratchet on the latter and turn the same a notch or two,



thereby throwing the pins to a new position on the wax.

At 30 is indicated a shield on the pipe, which protects the wax-cup and prevents water from dripping therein in case of leaking joints. The wax-cup is placed on the return-pipe 11 to the heater, because the flow-pipe 10 from the heater becomes heated much faster and would therefore cause the gas-valve to close too soon.

Many changes and alterations in the details of construction can be readily made without departing from the nature and spirit of the invention.

What I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a valve controlling fuel-supply, of a body of fusible substance a part of which supports said valve in open position when said substance is hard, a pipe for fluid heated by said fuel, extending adjacent said fusible substance in position to melt the same and allow the valve to close when the pipe becomes heated, and means to support the said valve on a different part of the fusible substance, each time the valve is opened.

2. The combination with a valve controlling fuel-supply, of a pipe for fluid heated by said fuel, a cup on the pipe, containing a fusible substance, an operating-lever connected to the valve, and a pin carried by the lever and supported on the fusible substance when the same is hard, and arranged to drop therein and close the valve when the said substance melts.

3. The combination with a valve controlling fuel-supply, of a pipe for fluid heated by said fuel, a cup on the pipe, a fusible substance in the cup, a loose collar on the pipe above the cup and supported on the fusible substance therein and arranged to drop when said sub-

stance melts, and an operating-lever for the valve, connected to the collar.

4. The combination with a valve controlling fuel-supply, of a vessel containing a fusible substance, a pipe for fluid heated by said fuel, extending through said vessel, a collar slidable on the pipe and having depending pins resting on the said substance to hold the sleeve in elevated position when the substance is hard and a lever attached to the valve-stem and movable with the sleeve to open and close the valve.

5. In a water-heater the combination with a valve controlling fuel-supply, of a vessel containing a fusible substance, a hot-water pipe extending therethrough, a sleeve slidable and rotatable on the pipe and having on its under side depending pins resting on the fusible substance to hold the sleeve in elevated position when said substance is hard, and a lever attached to the valve-stem movable with the sleeve to open and close the valve.

6. In a water-heater, the combination with a valve controlling fuel-supply, and a pipe for fluid heated by said fuel, of a cup on the pipe, a fusible substance in the cup, a loose rotatable collar on the pipe above the cup, having depending pins which rest upon the top of the said substance when it is hard and drop therein when it is soft, an operating-lever for the valve, connected to the collar, and means to turn the collar when it is lifted.

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

RUDOLPH HOFFMAN.

Witnesses:

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A. H. BABCOCK, Jr.