A. BELER.

INSTANTANEOUS GAS HOT WATER HEATER.

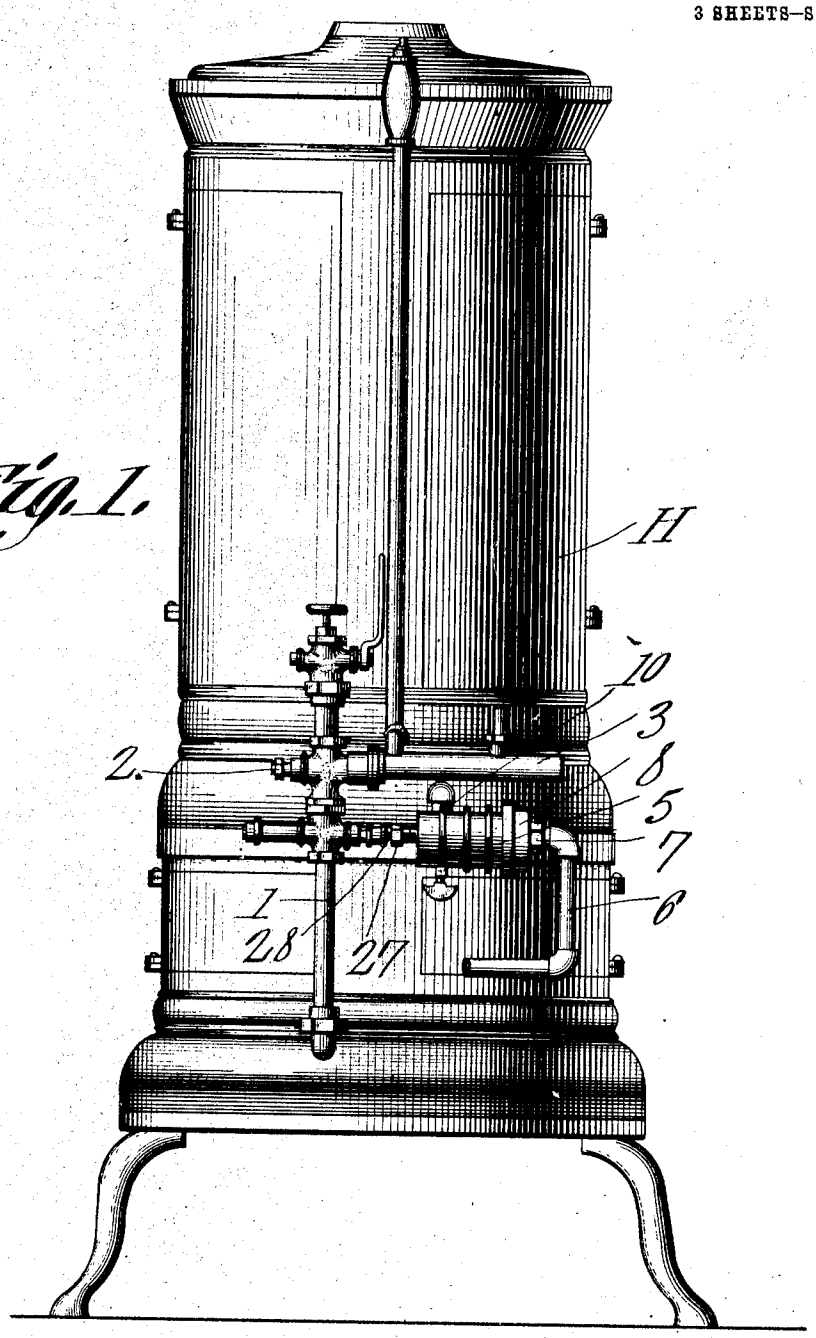
APPLICATION FILED SEPT. 11, 1911.

1,025,777.

Patented May 7, 1912.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses

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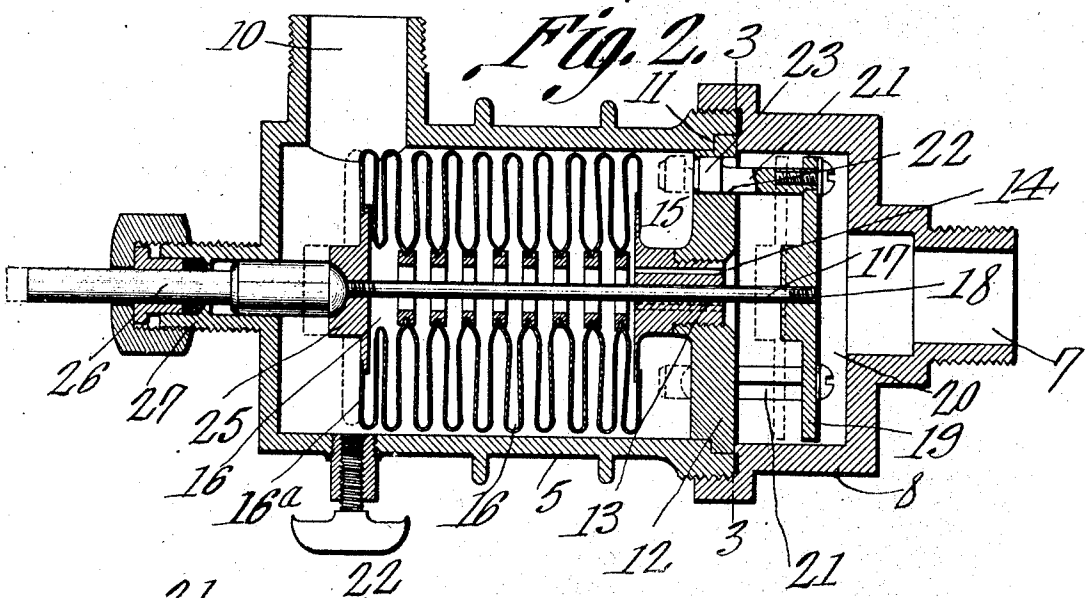
3 SHEETS—SHEET 2.

Fig. 2.



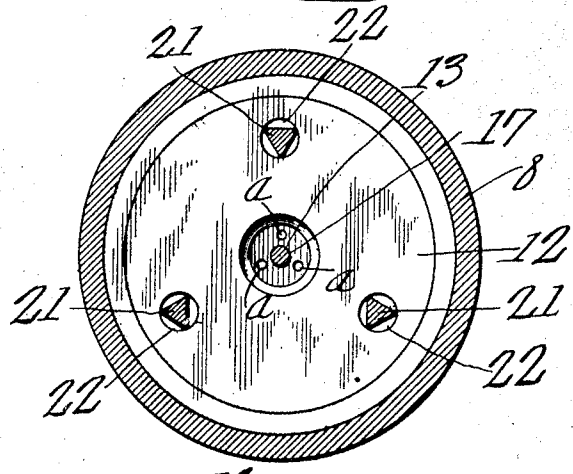


Fig. 3.

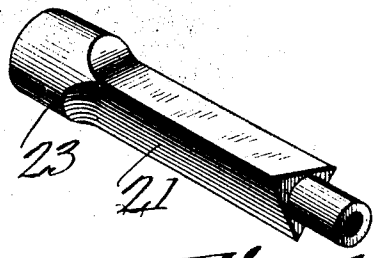


Fig. 4.

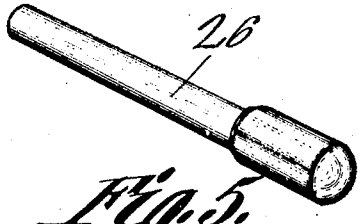


Fig. 5.

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3 SHEETS—SHEET 3.

Fig. 6.

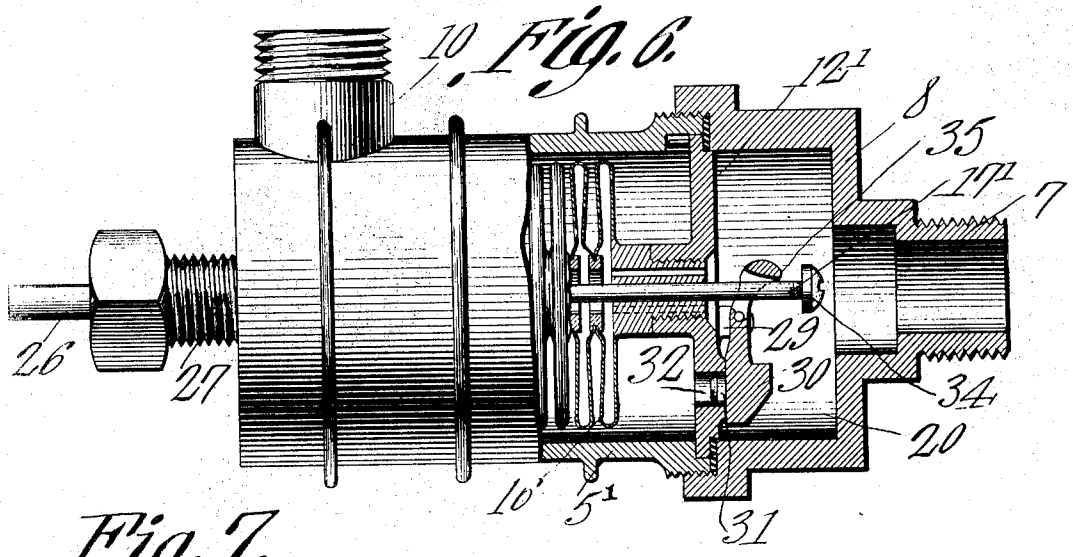


Fig. 7.

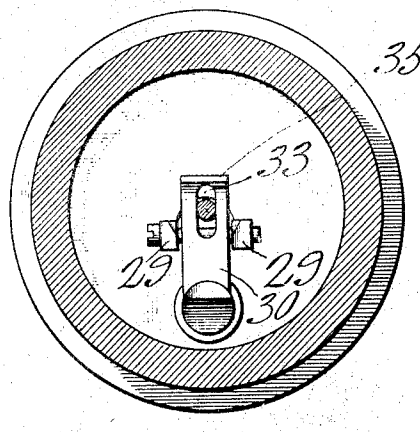


Fig. 9.

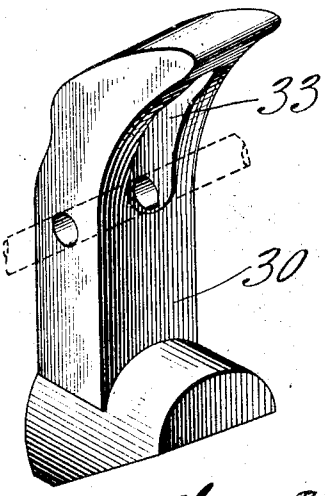
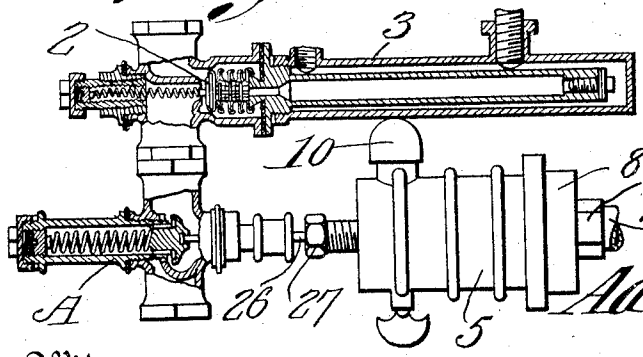


Fig. 8.



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UNITED STATES PATENT OFFICE.

ADOLF BELER, OF PITTSBURGH, PENNSYLVANIA, ASSIGNOR TO BELER WATER HEATER CO., OF PITTSBURGH, PENNSYLVANIA.

INSTANTANEOUS GAS HOT-WATER HEATER.

1,025,777. Specification of Letters Patent. Patented May 7, 1912.

Application filed September 11, 1911. Serial No. 648,724.

To all whom it may concern:

Be it known that I, ADOLF BELER, a citizen of the United States, residing at Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Instantaneous Gas Hot-Water Heater, of which the following is a specification.

The present invention relates to improvements in instantaneous gas hot water heaters, the primary object of the invention being the provision of a novel form of water pressure actuated mechanism to automatically and simultaneously control the gas flow with the turning on and off of the water supply, in combination with a thermostatically controlled device for automatically cutting off or decreasing the flow of gas, due to the too high temperature of the water within the heater.

A further object of the present invention is the provision of a pressure actuated device operably connected with a water supply, whereby the water is permitted to gradually expand a plurality of sealed diaphragms or expansible disk chambers to finally actuate a main valve or valves, to permit the water to flow at the full pressure to the heater, and to simultaneously actuate a gas flow control valve, thereby producing an instantaneous heater of an efficient and practical character.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:—Figure 1 is a front elevation of a heater with the combined water actuated and thermostatically controlled devices in elevation and operable relation to the water and gas pipes. Fig. 2 is an enlarged section through the water actuated mechanism and its casing, dotted lines illustrating the position of the parts when expanded. Figs. 3, 4 and 5 are detail views of parts of said water actuated mechanism. Fig. 6 is a longitudinal section of a modified form of water actuated mechanism. Fig. 7 is a end view thereof. Fig. 8 is a perspective view of the valve shown therein. Fig. 9 is a section through both of the gas controlled valves and the thermostat.

Referring to the drawings, the numeral 1 designates the vertically disposed gas conduit or pipe, having connected therein the thermostatically controlled gas valve 2, which is normally opened, and is controlled by the thermostatic regulator device 3, the detail construction of which is shown in applicant's Patent No. 917,704, dated April 6th, 1909, and will therefore not be described in detail herein. The casing 3 is properly connected to receive the hot water from the coil (not shown) of the heater H, while the water controlled casing 5, is disposed between the cold water supply pipe 6, which enters the nipple 7, of the removable cap 8, of the casing 5, and the pipe 9, which is connected to the nipple 10, of the casing 5 to the coil (not shown) of the heater. Disposed to seal the annularly shouldered end 11, of the casing 5, is a disk 12, which is normally held tightly in the end 11 by the cap 8, said disk having concentrically therethrough an aperture 13, while upon the inner face is an interiorly threaded boss 14, to which is connected the nipple 15, of a series of expansible diaphragms or disk chambers 16. Connected concentrically to the wall 16^a, of the extreme inner chamber 16, and extending concentrically through all of the chambers 16 and the aperture 13 of the disk 12, is a stem 17, whose outer threaded end 18, is connected concentrically to the disk or plate 19, which is normally held outwardly within the chamber 20, of the cap 8, by the compressible action of the chambers 16, due to the equilibrium, or the static condition of the water within said chambers 16. This plate 19, has attached thereto and projecting toward and through the valve ports 22 of the disk 12, a plurality of valve stems 21, which are tri-angular in cross-section for a greater portion of their length, terminating in the cylindrical valves 23, which are of sufficient size to fit snugly within to close or seal the respective ports 22. This is the normal position of the said valves.

In operation, when it is desired to instantly heat the water in the heater H, and also supply water thereto concurrently with such heating, the cock or faucet (not shown) is operated to permit water to flow into the chamber 20, of the cap 8. The water will then slowly pass through the apertures or

bores *a*, about the aperture 13 in the disk 12, into the chambers 16. Such action gradually expands the chambers 16, and pull inwardly upon the stem 17, which in turn pulls inwardly the disk 19 and all of its valves 23, which after their cylindrical portions have passed through the ports 22, and the tri-angular portions are disposed within the ports, will permit the water to flow into the chamber of the casing 5, about the chambers 16, and finally to the coil (not shown) of the heater H. The bores or apertures *a* form the means of communication between the chamber 20 and the expansible chambers 16. Simultaneously with this action, the socketed boss 25, disposed exteriorly and concentrically of the wall 16ª, of the extreme inner chamber 16, will be moved into contact with the inner end of the glass non-corrodible stem or rod 26, which is mounted in the concentric stuffing box 27, of the casing 5. The stem or rod 26, is thus moved outwardly and engages the stem 28, of the gas supply control valve A, the detail structure of which forms no part of this application, but is the subject matter of an application filed June 25, 1910, Serial No. 568,876; and by this means automatically and simultaneously with the turning on or of the flow or feed of water to the heater, gradually increases the gas flow and the flame at the burner (not shown).

In the modified form of water actuated mechanism, as shown in Figs. 6 and 7, the disk 19, is dispensed with, the plate 12′, being provided with a pair of lugs 29, which have journaled therein the lever 30, which is provided with a valve 31, which normally hangs to close the valve port 32, of the disk or plate 12′. This lever is provided with an aperture 33, through which the stem 17′, passes, and is provided with an adjustable circular head 34, which as the chambers 16′, are expanded in a similar manner to the chambers 16, pulls the stem or rod 17′, to cause the head 34 to engage the shoulder 35 of the upper end of the lever 30, tilting said lever to remove the valve 31 from over the port 32, and permit the water to enter the casing 5′, and finally the coil (not shown) of the heater. The expansible chambers 16′ are in communication with the chamber 20′, through the apertures or bores *a*′, similarly to that shown in Fig. 2.

What is claimed is:—

1. The combination with a spring closed gas control valve, a water actuated mechanism for actuating said valve, comprising a casing, a disk disposed in the open end thereof and provided with a concentric aperture therethrough, an expansible water actuated means carried by said disk within the casing and in communication through the aperture of said disk, a stem controlled thereby and projecting through the aperture of the disk, a cap for the casing providing a chamber at that end of the casing beyond the sealing disk and into which said stem projects, the water supply being connected to the casing through said cap, means for controlling the gas valve mounted concentrically at the opposite end of the casing and in operable relation to said expansible means, and means actuated by the stem within the cap for controlling the flow of water through the sealing disk into the casing.

2. The combination with a spring closed gas controlled valve, of a water actuated mechanism for actuating said valve, comprising a casing, a sealing disk disposed in the open end thereof and provided with an aperture therein, a water expanded medium carried by said disk within the casing and in communication through the aperture of said disk, a stem connected to the inner end of said medium and projecting through the aperture of the disk, a cap for the casing providing a chamber at that end of the casing beyond the sealing disk and into which said stem projects, the water supply being connected to the casing through said cap, means for controlling the gas valve operably connected to the opposite end of said casing and in operable relation to the expansible medium within the casing, and means actuated by the stem within the cap for controlling the flow of water through the sealing disk into the casing.

3. The combination with a spring closed gas control valve, of a water actuated mechanism for actuating said valve, comprising a casing, a disk disposed in the open end thereof and provided with a concentric aperture therein, a plurality of expansible disk chambers carried by said disk within the casing and in communication through the aperture of said disk, a stem connected to the inner disk chamber and projecting through the aperture of the disk, a cap for the casing providing a chamber at that end of the casing beyond the sealing disk and into which said stem projects, the water supply being connected to the casing through said cap, means for controlling the gas valve mounted concentrically at the opposite end of the casing and in operable relation to the expansible disk chambers within the casing, and means actuated by the stem within the cap for controlling the flow of water through the sealing disk into the casing.

4. In a water actuated valve control mechanism, a casing open at one end, a sealing disk therefor provided with a concentric aperture, and a plurality of valve ports therethrough, a cap fitting over the open end of the casing and locking the sealing disk therein, a stem projecting through the concentric aperture of the disk, a plurality

of communicating expansible disk chambers connected to the inner face of the sealing disk and in communication at all times with the chamber of the cap through the concentric aperture of the sealing disk, another disk mounted in the chamber of the cap and connected to the outer end of the stem for movement therewith, a plurality of valves carried thereby and disposed to control the valve ports of the sealing disk, and a slidingly mounted stem disposed concentrically of the closed end of the casing and in operable relation with the inner chamber of the expansible chambers.

5. In a water actuated valve control mechanism, a casing open at one end, a sealing disk therefor provided with an aperture therethrough and a plurality of valve ports therethrough, a cap fitting over the open end of the casing and locking the sealing disk therein, and providing a chamber beyond the sealing disk, a stem projecting through the aperture of the disk, a water expanded medium connected to the inner face of the sealing disk and in communication at all times with the chamber of the cap through the aperture of the sealing disk, another disk mounted in the chamber of the cap and connected to the outer end of the stem for movement therewith, a plurality of valves carried thereby and disposed to control the valve ports of the sealing disk, and means for actuating the main valve disposed in the closed end of the casing and in operable relation with the inner end of the expanding medium.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

ADOLF BELER.

Witnesses:
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A. C. BURKE.