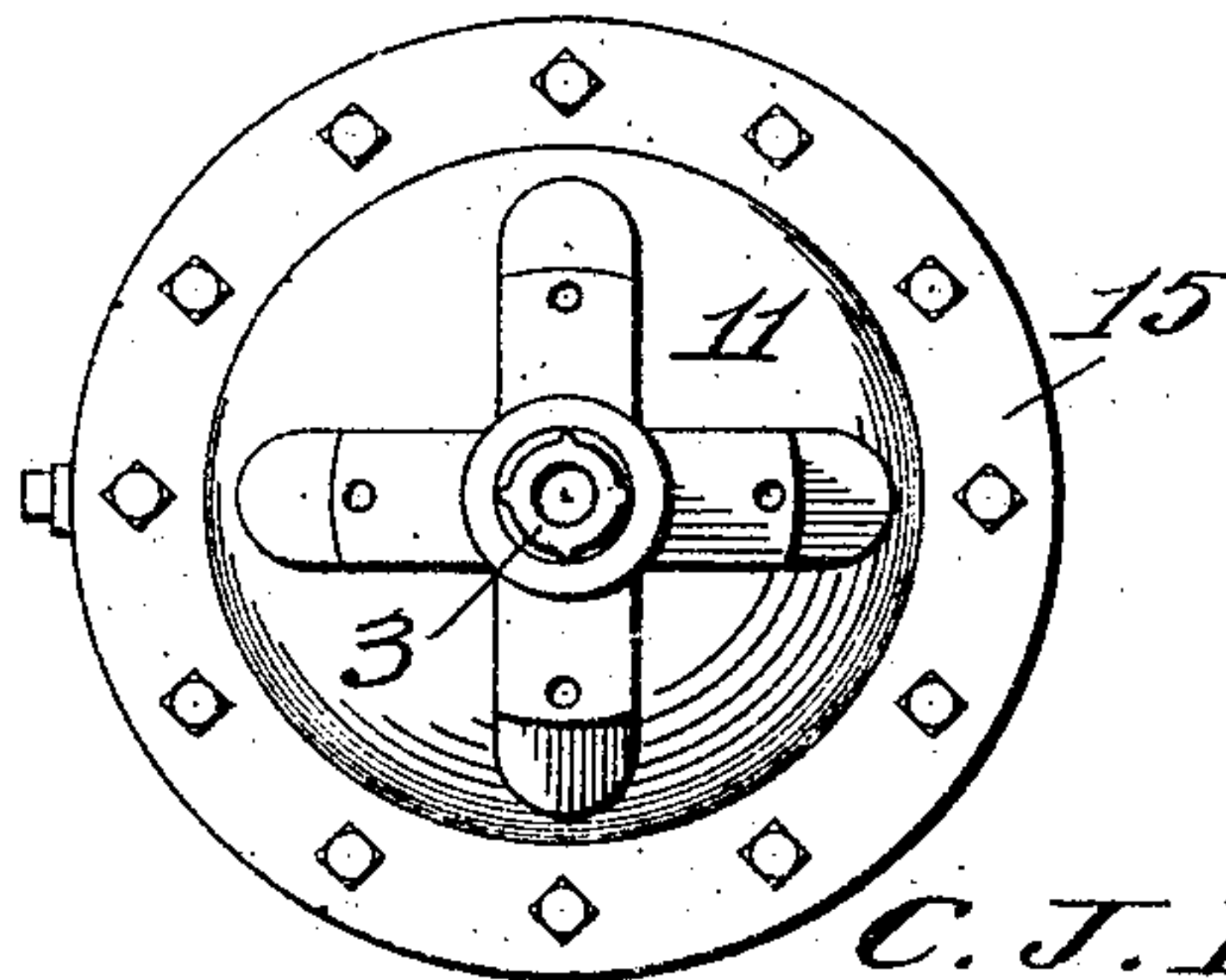
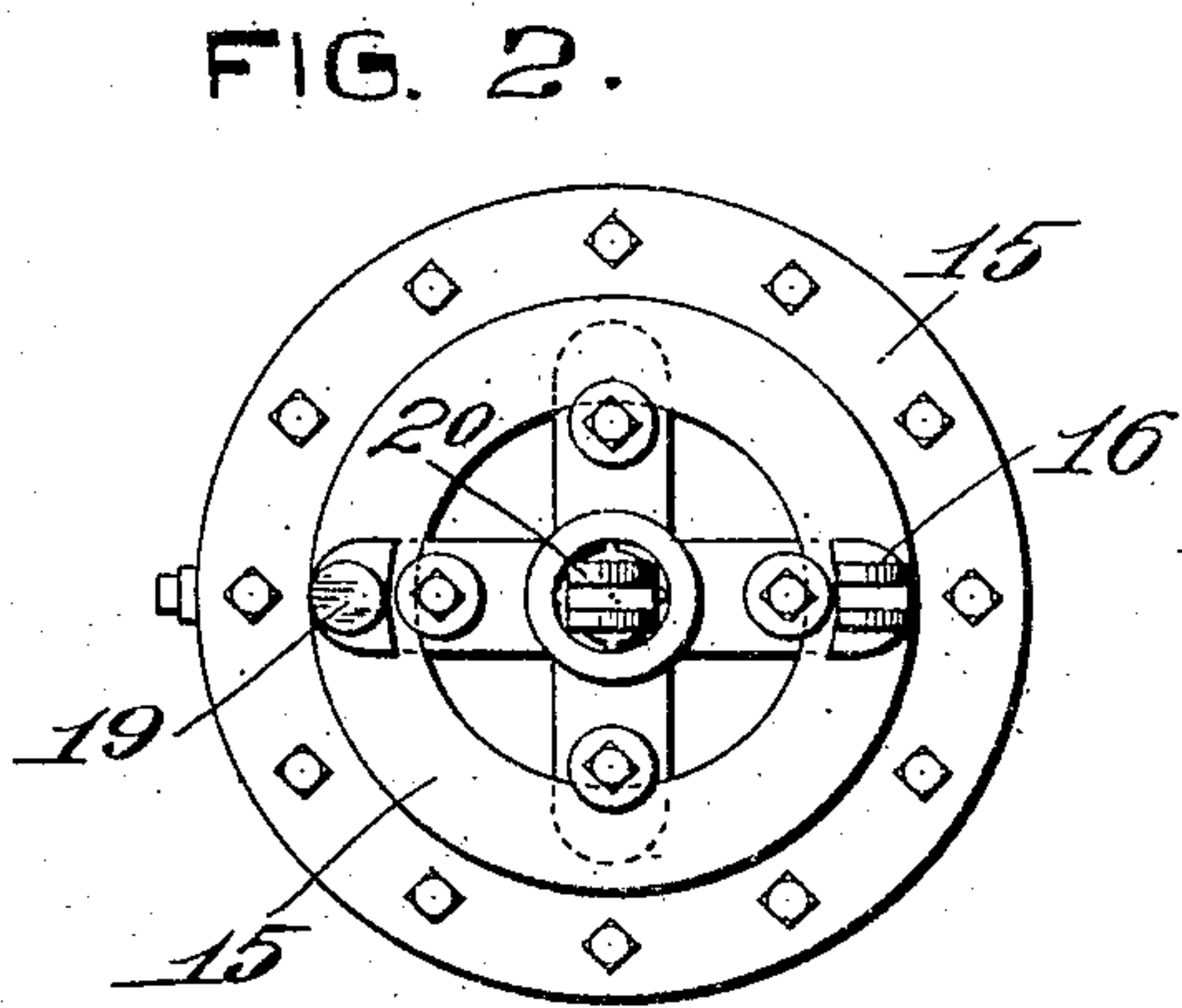
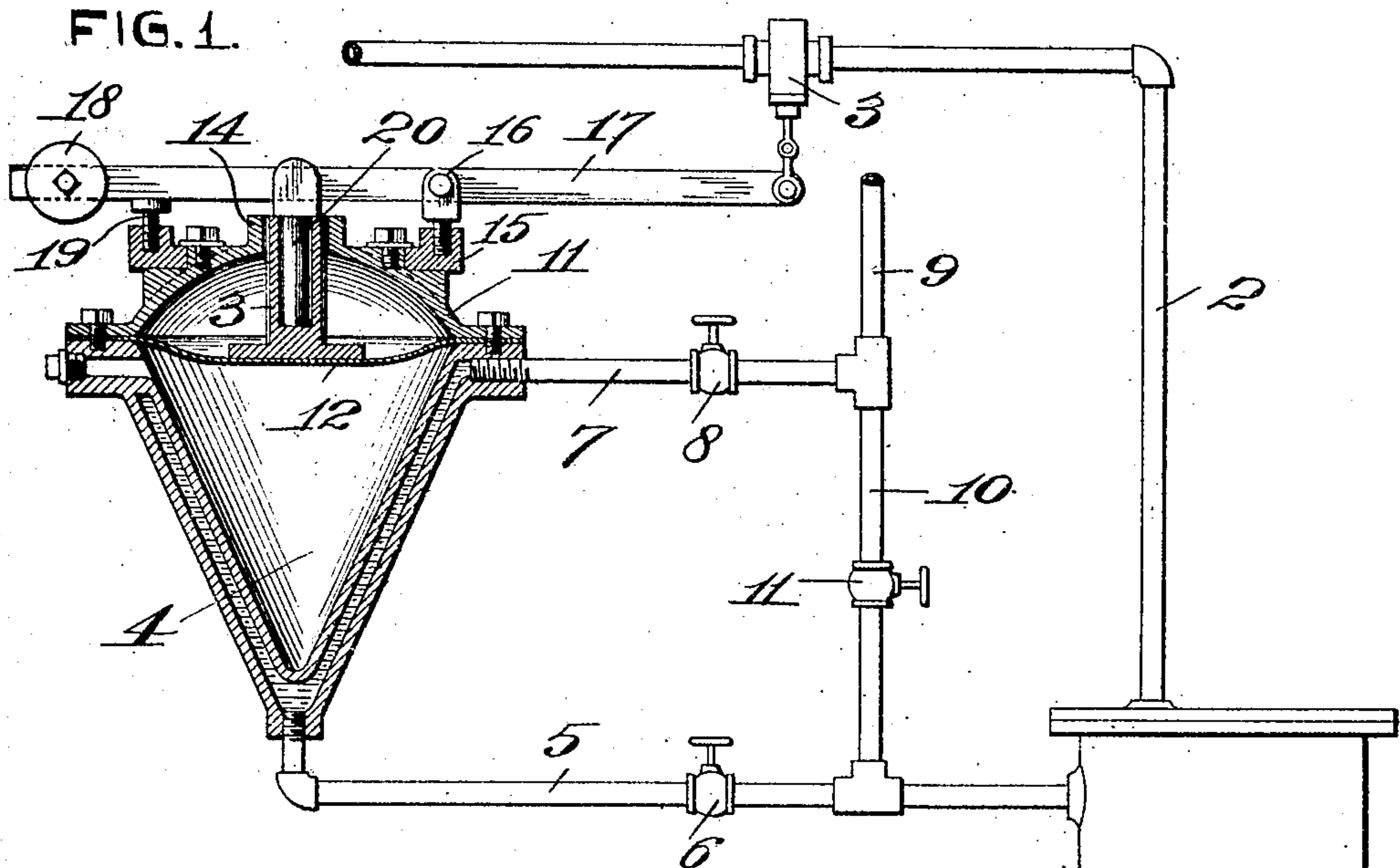


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THERMOSTATIC REGULATOR.
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Patented Apr. 27, 1909.



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CURT J. BALTHASAR, OF ST. LOUIS, MISSOURI.

THERMOSTATIC REGULATOR.

No. 919,522.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CURT J. BALTHASAR, a citizen of the United States, and resident of St. Louis, Missouri, have invented certain new and useful Improvements in Thermostatic Regulators, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to a thermostatic regulator, and consists of means which operate automatically to maintain water or other fluid at a uniform temperature by controlling the supply of heat to said water or fluid.

My invention further consists in a double walled air chamber, in one end of which is arranged a diaphragm which is elevated and lowered as a result of the expansion and contraction of the air in the chamber due to the changes in temperature of the fluid passing through the double walls of said chamber, and said diaphragm operating a suitable mechanical device, such as a damper or valve, in the heating mechanism.

To the above purposes, my invention consists in certain novel features of construction and arrangement of parts, which will be hereinafter more fully set forth, pointed out in the claims, and illustrated in the accompanying drawings, in which:—

Figure 1 is a side elevation of a hot water tank with my improved thermostatic regulator attached thereto, and being shown in vertical section; Fig. 2 is a plan view of the regulator; Fig. 3 is a plan view of the regulator, with the adjustable ring which carries an operating lever removed therefrom.

Referring by numerals to the accompanying drawings:—1 designates a hot water tank, 2 the steam pipe leading thereinto, which provides means for heating the water in said tank, and in which steam pipe is located a balanced valve 3.

4 designates a double walled conical chamber, and leading into the lower end thereof from the upper end of the tank 1 is a pipe 5, in which is located a valve 6. Leading from the upper end of the chamber 4 is a pipe 7, in which is located a valve 8, and said pipe 7 connects with a service pipe 9. Connecting the pipe 5 with the service pipe 9 is a pipe 10, in which is located a valve 11, which pipe 10 performs the function of a by-pass when

the thermostatic regulator is out of use, and the valves 6 and 8 are closed.

Rigidly fixed in any suitable manner on top of the chamber 4 is a cap 11, and held between the edge thereof and the top of the conical chamber 4 is a flexible diaphragm 12, of rubber, or analogous material, and located on top of said diaphragm is a sleeve 13, which operates through an opening 14 formed in the center of the cap 11. The arrangement of the diaphragm 12 on top of the chamber 4 creates an air-tight compartment within said chamber below said diaphragm.

Arranged for rotation on top of the cap 11 is a ring 15, and fixed in one side thereof is a bracket 16, in which is fulcrumed a horizontally disposed lever 17. This lever extends across the top of the cap 11, and its outer end is provided with an adjustable weight 18. A pin 19 is adjustably seated in the ring 15 opposite the bracket 16 and serves as a rest for the outer end of the lever 17 when the same occupies a horizontal position, and located in the sleeve 13 is a pin 20, the upper end of which is bifurcated and engages the lever 17 between the fulcrum point and the weighted end thereof. The end of the lever 16 opposite the weighted end is connected in any suitable manner to the stem of the balanced valve 2.

When my improved regulator is in use, the steam discharging from the pipe 2 heats water in the tank 1, and the water thus heated passes through the pipe 5, between the double walls of the chamber 4, through the pipe 7, and out through the service pipe 9. When the temperature of the water rises above the normal degree, the air on the interior of the air tight chamber 4 will be expanded by said heat, and, as a result, the diaphragm 12 will be elevated. This action elevates the sleeve 13 and pin 20, in turn elevating the weighted end of the lever 17, swinging the same upon its fulcrum, and thus operating the balanced valve 3 to cut off, or partially cut off, the passage of steam through the pipe 2, which heats the water. As the steam to the tank 1 is thus cut off or reduced, the temperature in said tank will naturally fall, until the proper degree of temperature is reached, and thus a practically stationary temperature is maintained as long as the regulator is in use. Should the regulator get out of order or become

inoperative for any reason, or should it be desired to dispense with the use thereof, the valves 6 and 8 are closed, and the hot water will discharge from the pipe 5 through the by-pass pipe 10 direct to the service pipe 9.

The lever 17 can readily be shifted to any horizontal angle on top of the cap 11 by rotating the ring 15, thus enabling said lever to be connected to a valve, damper, or analogous device at any point within the radius in which said lever swings. It will be readily understood that the lever 17 may be attached to a damper, ventilator, or any mechanical contrivance which controls the passage of fluid which is utilized for heating or cooling purposes, and any fluid capable of being heated can be utilized in circulating between the double walls of the chamber 4 for causing the air to expand on the interior of said chamber to actuate the diaphragm.

A thermostatic regulator of my improved construction is simple, inexpensive, comprises a minimum number of parts, is easily assembled or taken apart, and can be readily utilized wherever an accurate and sensitive regulator is needed.

A particular advantage of my improved regulator consists in locating the flexible diaphragm at one end of the air tight chamber so that the pressure of the expanded air acts direct upon said diaphragm to operate the mechanical devices.

I claim:—

1. A thermostatic regulator, comprising a funnel shaped double walled chamber constructed in a single piece, a diaphragm inclosing the upper end of the chamber to form a compartment, a cap arranged over the diaphragm and the edges of which are fixed to the edge of the chamber, a member

arranged on top of the diaphragm and operative through the cap, a pin loosely seated in said member, the upper end of which pin is bifurcated, a ring arranged for rotation on the cap, a vertically adjustable bearing on said ring, a lever fulcrumed in the bearing, and which lever is engaged by the bifurcated upper end of the pin, and an adjustable stop arranged on the ring for limiting the downward movement of the free end of the lever.

2. A thermostatic regulator, comprising a funnel shaped double walled chamber constructed in a single piece, a diaphragm inclosing the upper end of the chamber to form a compartment, a cap arranged over the diaphragm and the edges of which are fixed to the edge of the chamber, a member arranged on top of the diaphragm and operating through the cap, a pin loosely seated in said member, the upper end of which pin is bifurcated, a ring arranged for rotation on the cap, a vertically adjustable bearing on said ring, a lever fulcrumed in the bearing, and which lever is engaged by the bifurcated upper end of the pin, an adjustable stop arranged on the ring for limiting the downward movement of the free end of the lever, and means whereby fluid is delivered to and discharged from the space between the double walls of the funnel shaped member.

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

CURT J. BALTHASAR.

Witnesses:

M. P. SMITH,
E. L. WALLACE.