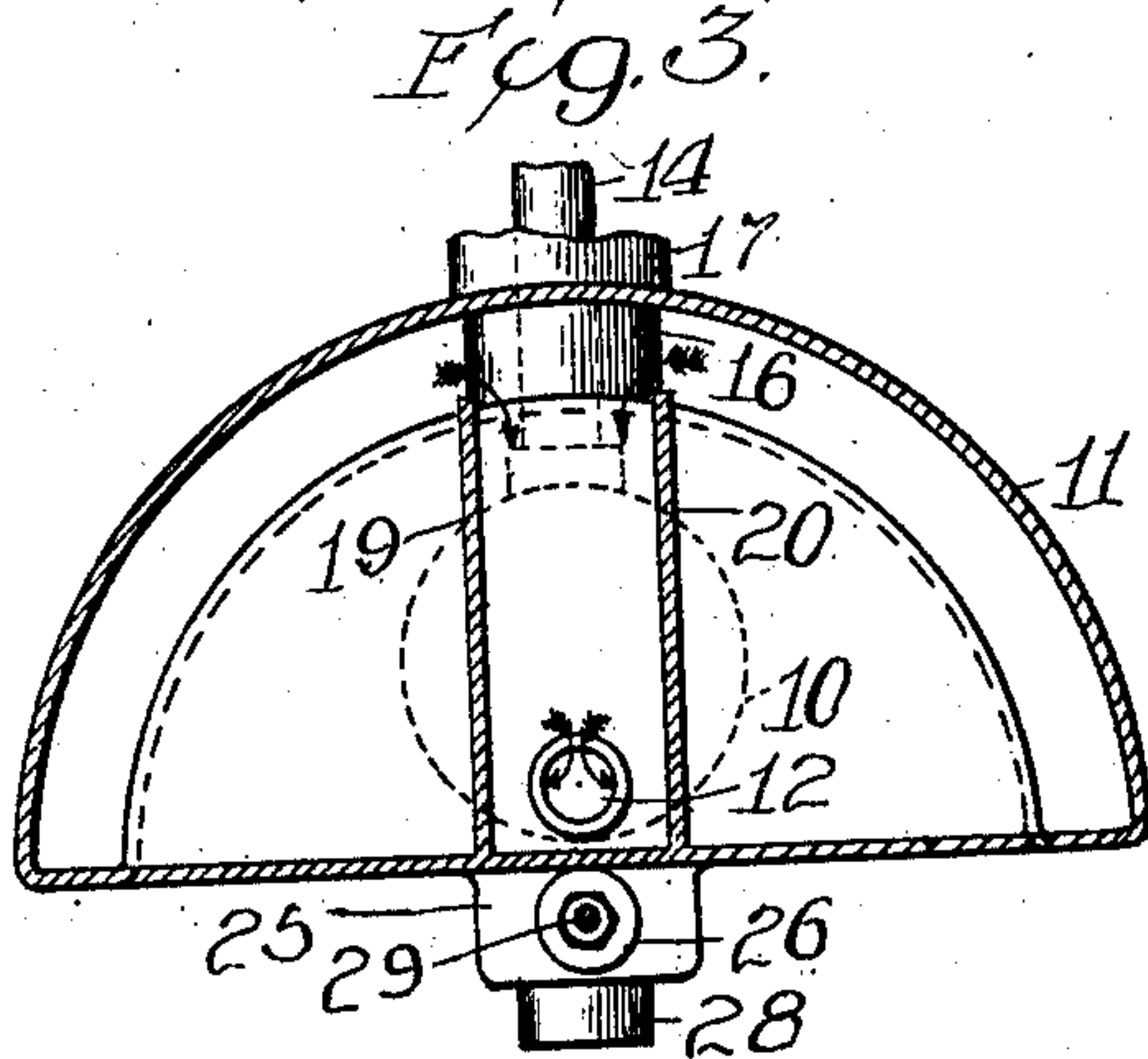
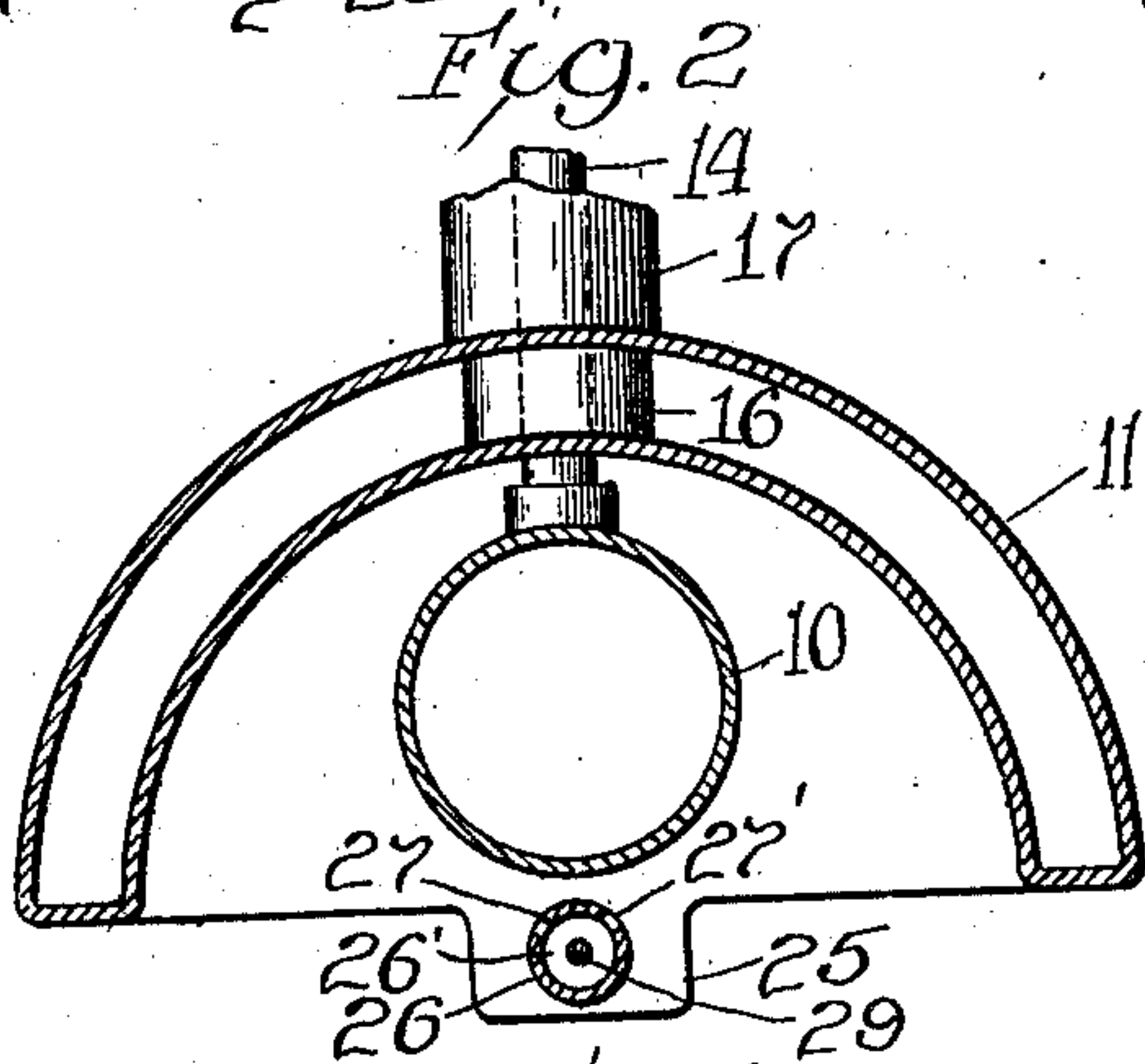
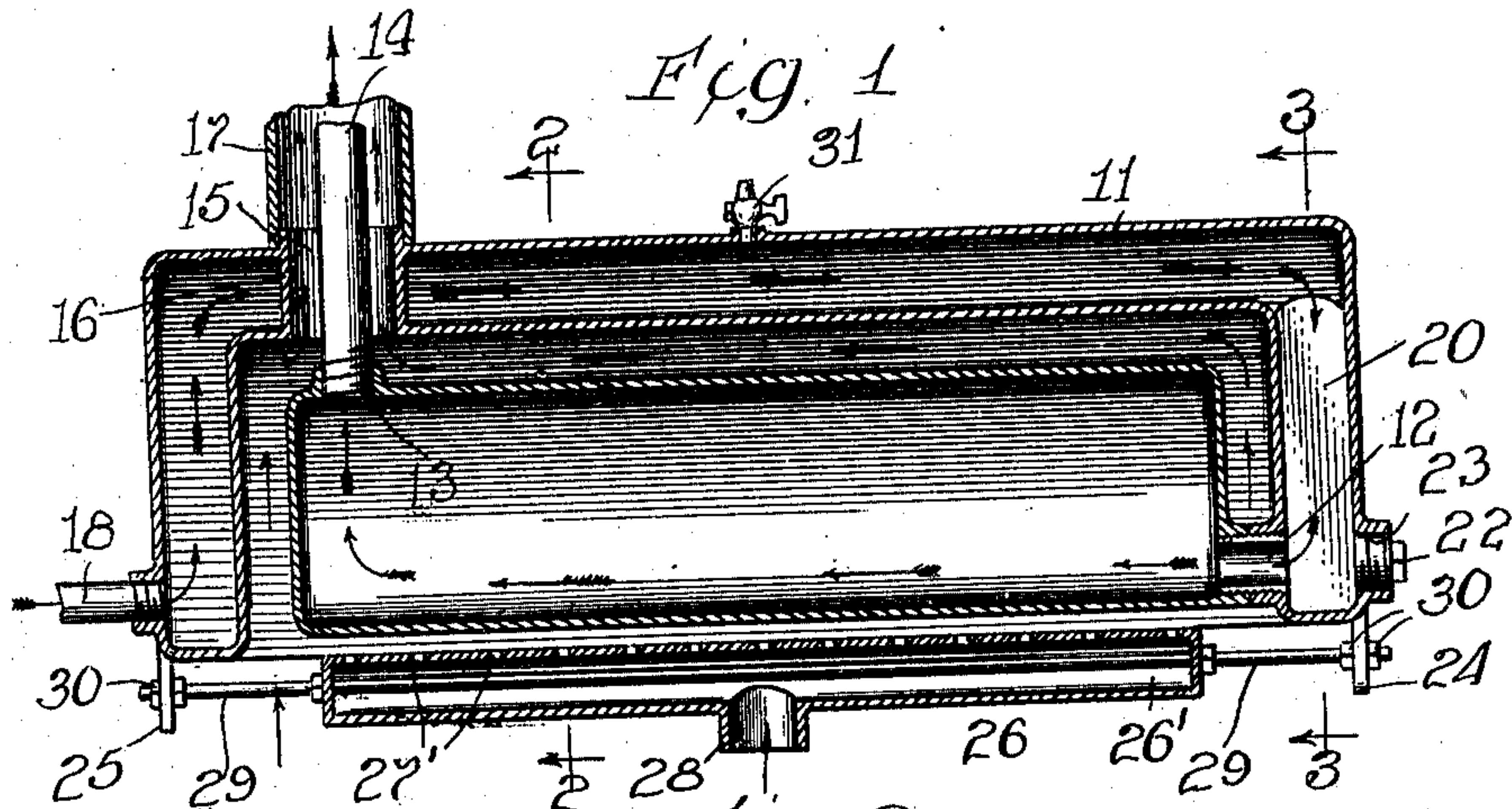


H. W. DONALDSON.
WATER HEATER.
APPLICATION FILED OCT. 1, 1909.

Patented July 5, 1910.

963,424.



Witnesses
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UNITED STATES PATENT OFFICE.

HENRY W. DONALDSON, OF CHICAGO, ILLINOIS.

WATER-HEATER.

963,424.

Specification of Letters Patent.

Patented July 5, 1910.

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To all whom it may concern:

Be it known that I, HENRY W. DONALDSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

My invention relates to improvements in water heaters and has special reference to that class of heaters which are usually used for furnishing hot water for domestic purposes, for the kitchen, bath, laundry, etc.

One of the objects of my invention is to provide a highly efficient, economical, and simple device for the purpose for which it is to be used.

Another object is to provide a heater that can be easily and conveniently cleaned of all internal deposit, and still another object is to provide in a heater of the class described a circulating path for the water so arranged that there is substantially no abrupt differences in temperature between heating gases and the water, so heated, throughout its entire extent. The gases of the highest temperature being applied to water of the highest temperature, and gases of lower temperature being applied to water of lower temperature.

In the drawing, Figure 1 is a central vertical longitudinal section of the heater; Fig. 2 is a cross sectional view taken on line 2—2 of Fig. 1; Fig. 3 is a cross sectional view taken on line 3—3 of Fig. 1.

In all of the views, like reference numerals apply to corresponding parts.

In the embodiment exemplified by the drawing, there are two main water receptacles. The inner, cylindrical, receptacle 10 is partially surrounded by the exterior crescent-shaped receptacle, 11. The two receptacles are connected together, as by a screw-threaded nipple, 12, through which the water enters the cylinder 10. In the upper wall of the cylinder, preferably at the opposite end thereof, a screw-threaded opening, 13, is provided for the hot-water delivery pipe, 14. The hot-water delivery pipe 14 passes through an opening, 15, made through the receptacle, 11, and surrounded by a wall, 16. A pipe, 17, is provided for carrying away the burned products of combustion. This smoke pipe surrounds the delivery pipe 14 and as the gases pass there-through at a much hotter temperature than the surrounding atmosphere, the water is

to some extent prevented from cooling by radiation while within the smoke flue. An intake pipe, 18, is screw-threaded into one end of the crescent-shaped receptacle. Baffle plates, 19 and 20, extend from the interior bottom of the receptacle 11 on each side of the open nipple 12 to a point near the top of said receptacle to provide a path for circulation of water. A screw-threaded plug, 22, is inserted in the opening, 23, which is in line with the opening containing the nipple 12. Through these openings the inner receptacle 10 may be readily cleaned of all deposits and other objectionable matter. Integral lugs, 24 and 25, extend down below the lower portion of the receptacle 11, one at each end, and afford convenient means for attaching the gas burner. A gas burner 26 may conveniently be a pipe, 26', provided with a series of perforations, 27—27', preferably made in two longitudinal rows, one on each side of the vertical central plane. The air and gas may enter the part 26' at the opening, 28, made preferably near the middle of the pipe, 26'. A convenient means for securing the gas burner, 26, in place consists of a rod, 29, which passes longitudinally through the pipe 26 and is secured, as by nuts 30, to the respective lugs, 24 and 25. A cock, 31, is a convenient means for permitting the entrapped air to escape when filling the heater.

The path of circulation of the hot gases is shown by a series of tailless arrows. The water circulation is indicated by a series of feathered arrows. Cold water is admitted into the heater by the intake pipe 18 near the bottom of the exterior receptacle. As the water becomes heated it rises to the top and when water is drawn off by pipe 14 from the interior receptacle, water from the top of the outside receptacle will descend between the baffle plates 19 and 20, and pass into the interior receptacle through the nipple 12, and circulation through the boiler will continue as long as the device is in operation. The baffle plates are employed to prevent relatively cold water from entering the receptacle 10 from below. By the present arrangement, water cannot enter the receptacle 10 from the exterior receptacle until it has been heated sufficiently first to rise to the top of said receptacle when it may then pass between the baffle plates into the interior receptacle. The hotter gases from the burner 26 are immediately applied

to the chamber 10, wherein is contained the hottest water; while the cooler gases from the burner come in contact with the inner surfaces of the crescent-shaped chamber, wherein is contained the coolest water, thus providing a highly efficient and economical means for heating water.

While I have herein described in some detail a particular embodiment of my invention, it will be apparent that such particular embodiment is only one of many which may advantageously be used to suit varying requirements, and I do not desire to be understood as limiting my invention to the details of construction herein illustratively shown further than is defined in the appended claims.

What I claim is:

1. A water heater comprising an interior cylindrical water receptacle immediately over the source of heat, and an exterior crescent-shaped water receptacle partially encompassing the first and communicating therewith by a passageway from a point near the top of the exterior receptacle to a point near the bottom of the interior receptacle to provide a path therethrough for water to be heated, said receptacles being spaced apart for the passage of hot gases therebetween, and a hot water outlet from the inner receptacle.

2. A water heater comprising an interior longitudinally extended water receptacle horizontally disposed, and an exterior water receptacle longitudinally parallel with and partially encompassing the first, and communicating with the first by a passageway near the bottom thereof to provide a joint path through said two receptacles for water circulation from the top of the exterior receptacle to the bottom of the interior receptacle, and said receptacles being spaced apart to provide between them a path for the circulation of hot gases.

3. A water heater comprising an interior horizontally disposed cylindrical receptacle, an exterior crescent-shaped receptacle open substantially throughout its bottom and hollow throughout its sides, top, and end, said exterior receptacle being parallel to the interior receptacle and encompassing the latter except at its bottom, a connection for com-

munication between the bottom of the interior receptacle and an end of the exterior receptacle, a connection for water supply in the opposite end of the exterior receptacle, and baffle plates in the hollow end of said exterior receptacle, extending from the bottom thereof to a point near the top, on each side of said connection opening, whereby water must pass from the bottom to the top of the exterior receptacle before entering the bottom of the interior receptacle.

4. A water heater comprising an interior cylindrical receptacle, horizontally disposed, an exterior water receptacle parallel with and encompassing the sides, top, and ends of the interior receptacle, and spaced apart therefrom, a connection for passage of water between the end of the interior receptacle and an end of the exterior receptacle adjacent the bottoms thereof, and a closable opening in the outer end wall of the exterior receptacle registering with said connection to permit access to the interior receptacle.

5. A water heater comprising an interior cylindrical water receptacle with a horizontal axis, an exterior water chamber crescent-shaped in cross section partially encompassing said interior receptacle, an open connection between said receptacles, the exterior receptacle having a water inlet thereto, and baffle means for causing the water to travel from the bottom of the exterior receptacle to the top thereof before entering the bottom of the interior receptacle and the interior receptacle having a water outlet therefrom for the passage of water through said heater from the exterior receptacle to the interior receptacle, said receptacles being spaced apart to provide for the circulation therebetween of hot gases, and the outer receptacle having an opening therethrough for the escape of said gases, and a source of heat adapted and arranged to direct its hottest gases to the interior receptacle.

In testimony whereof I hereunto set my hand in the presence of two witnesses.

HENRY W. DONALDSON.

In the presence of—
W. LINN ALLEN,
MARY F. ALLEN.