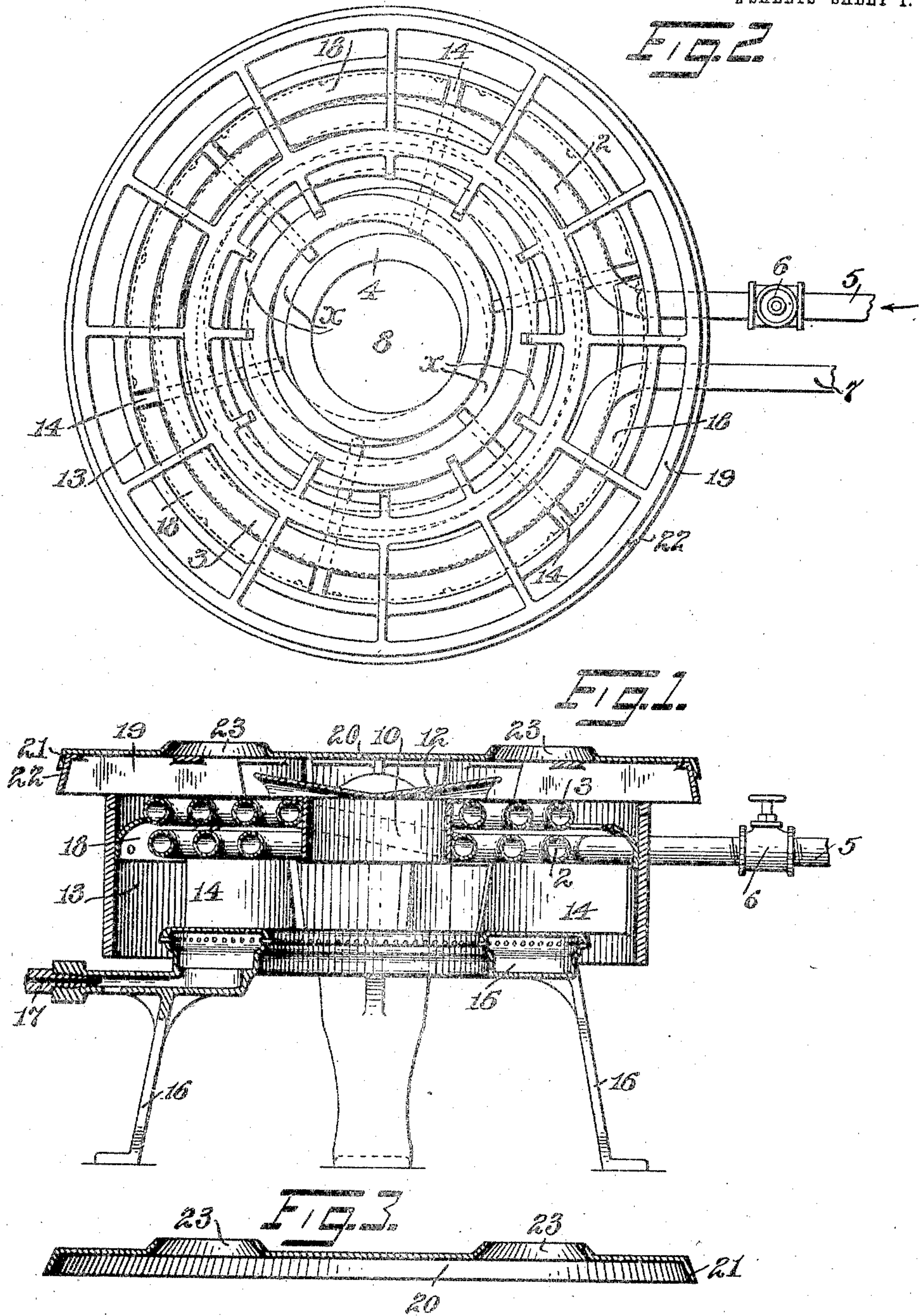


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WATER HEATER.
APPLICATION FILED MAY 5, 1908.

928,261.

Patented July 20, 1909.
2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

FIG. 8

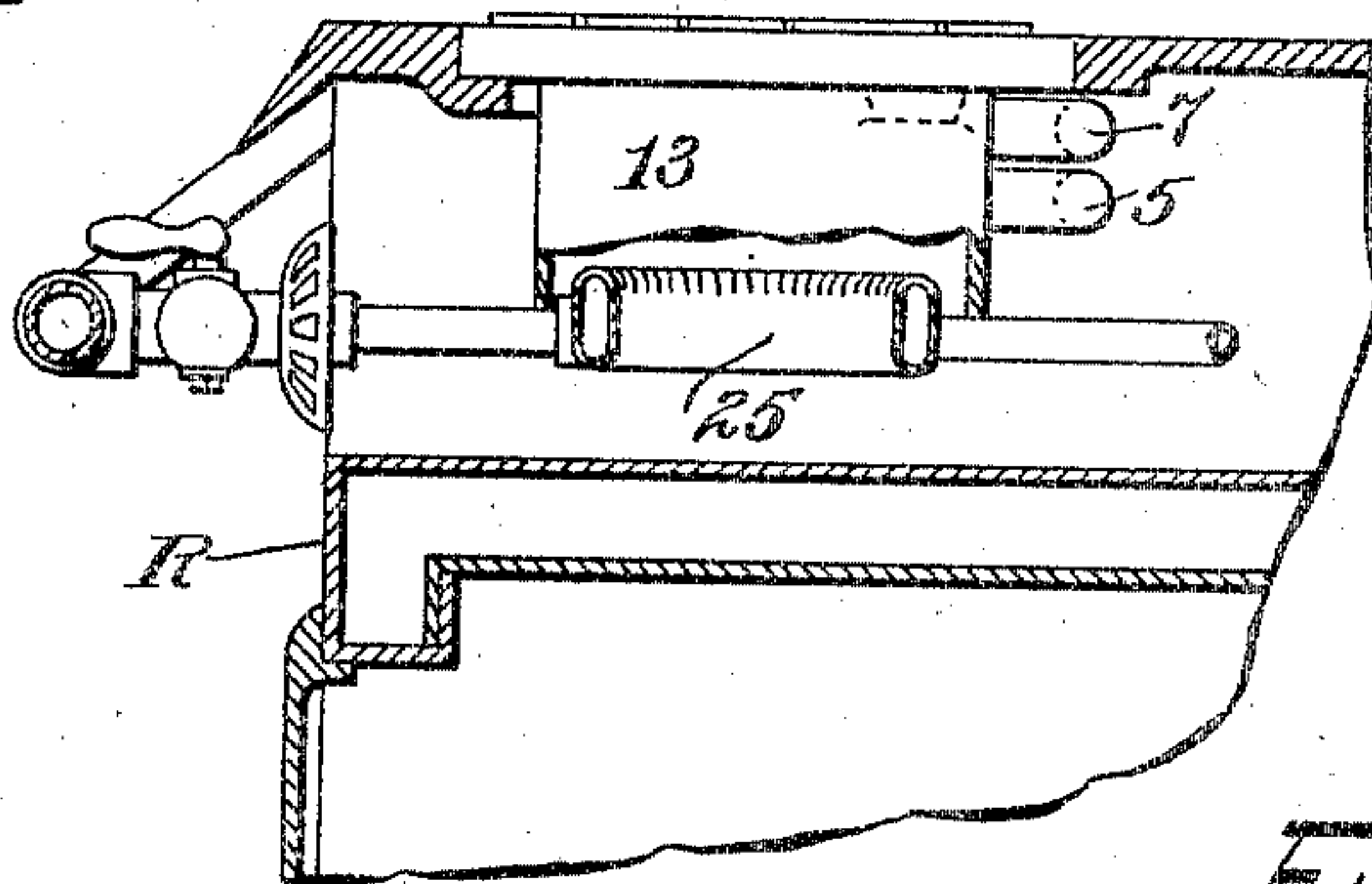


FIG. 7

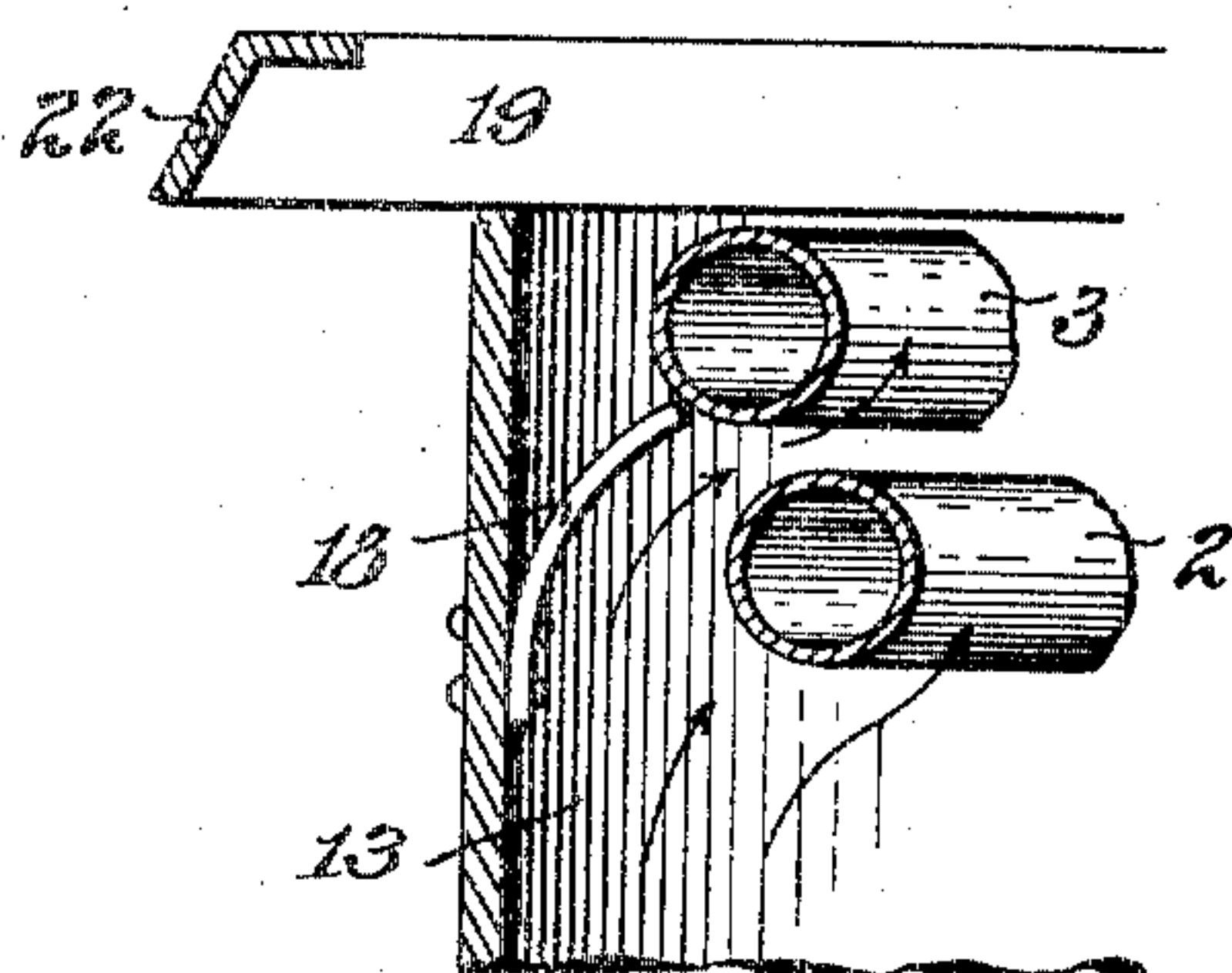


FIG. 5

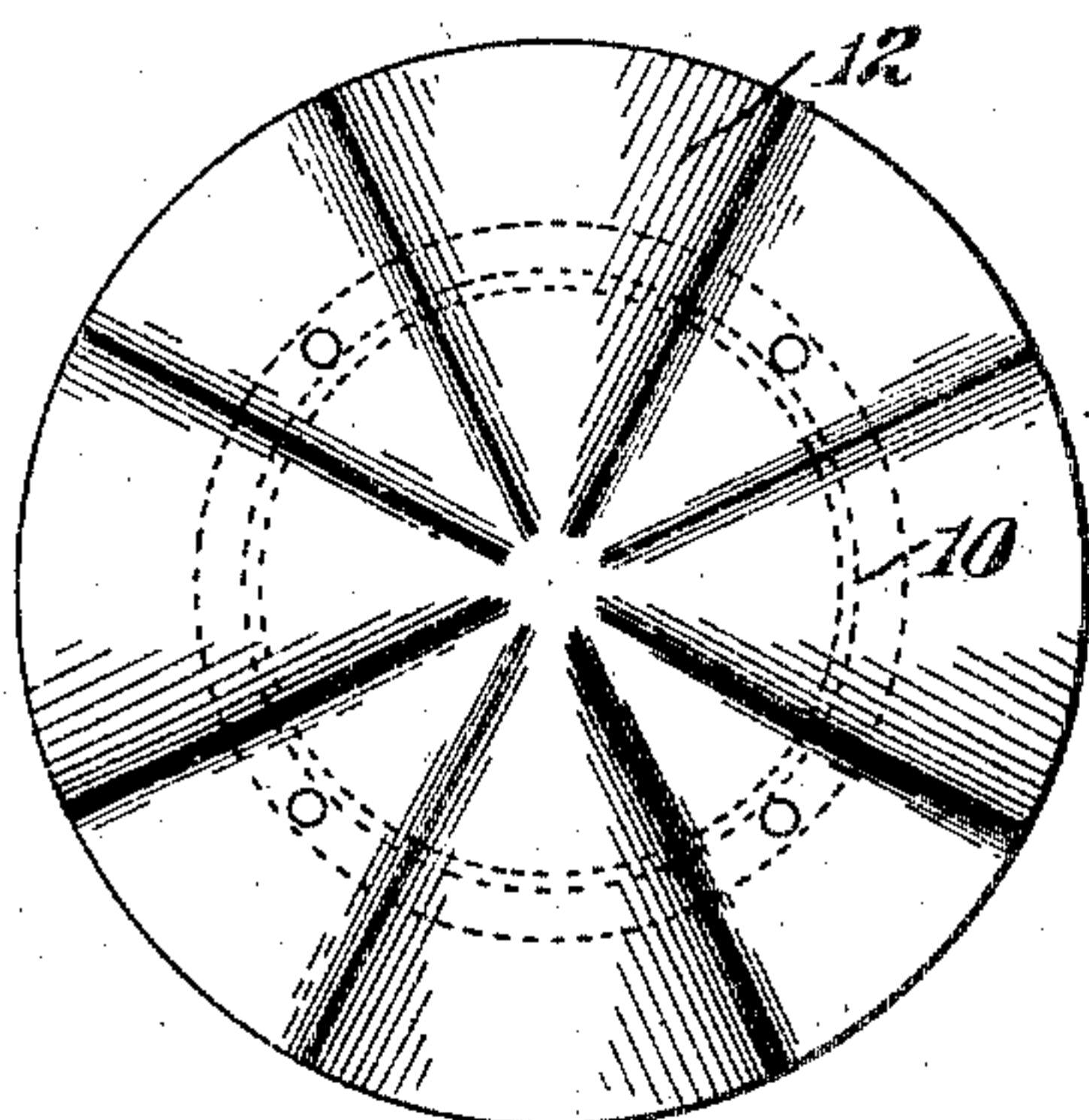


FIG. 4

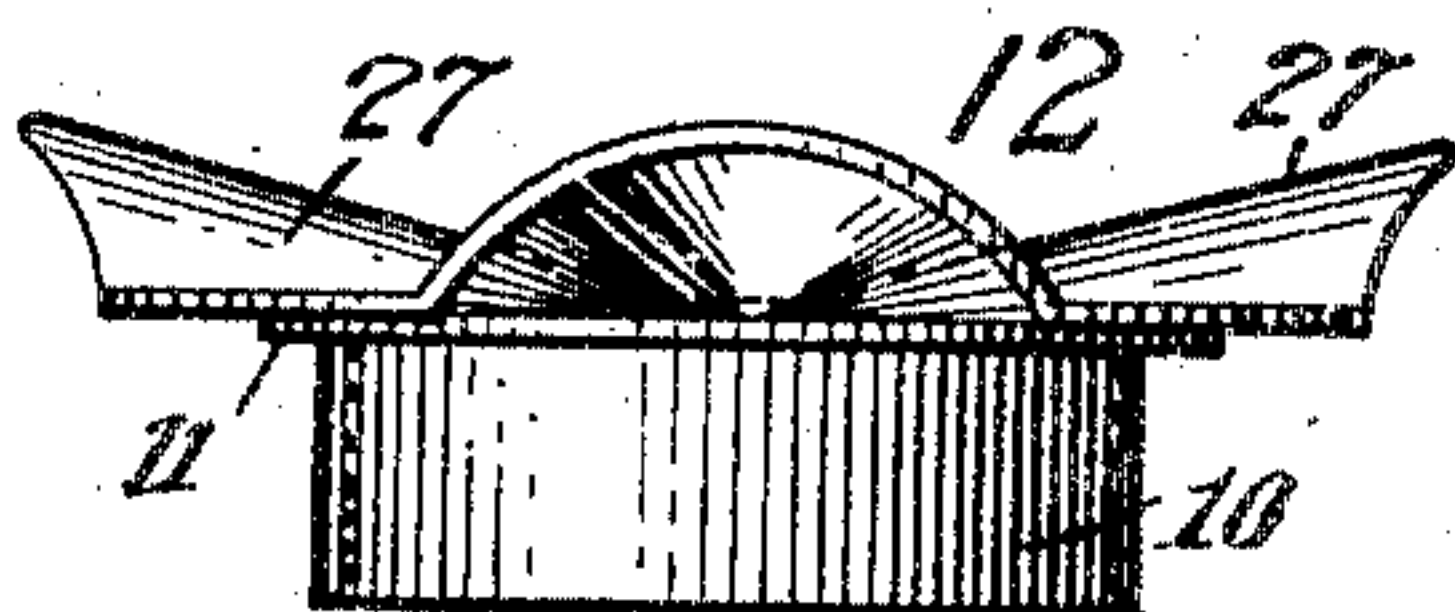
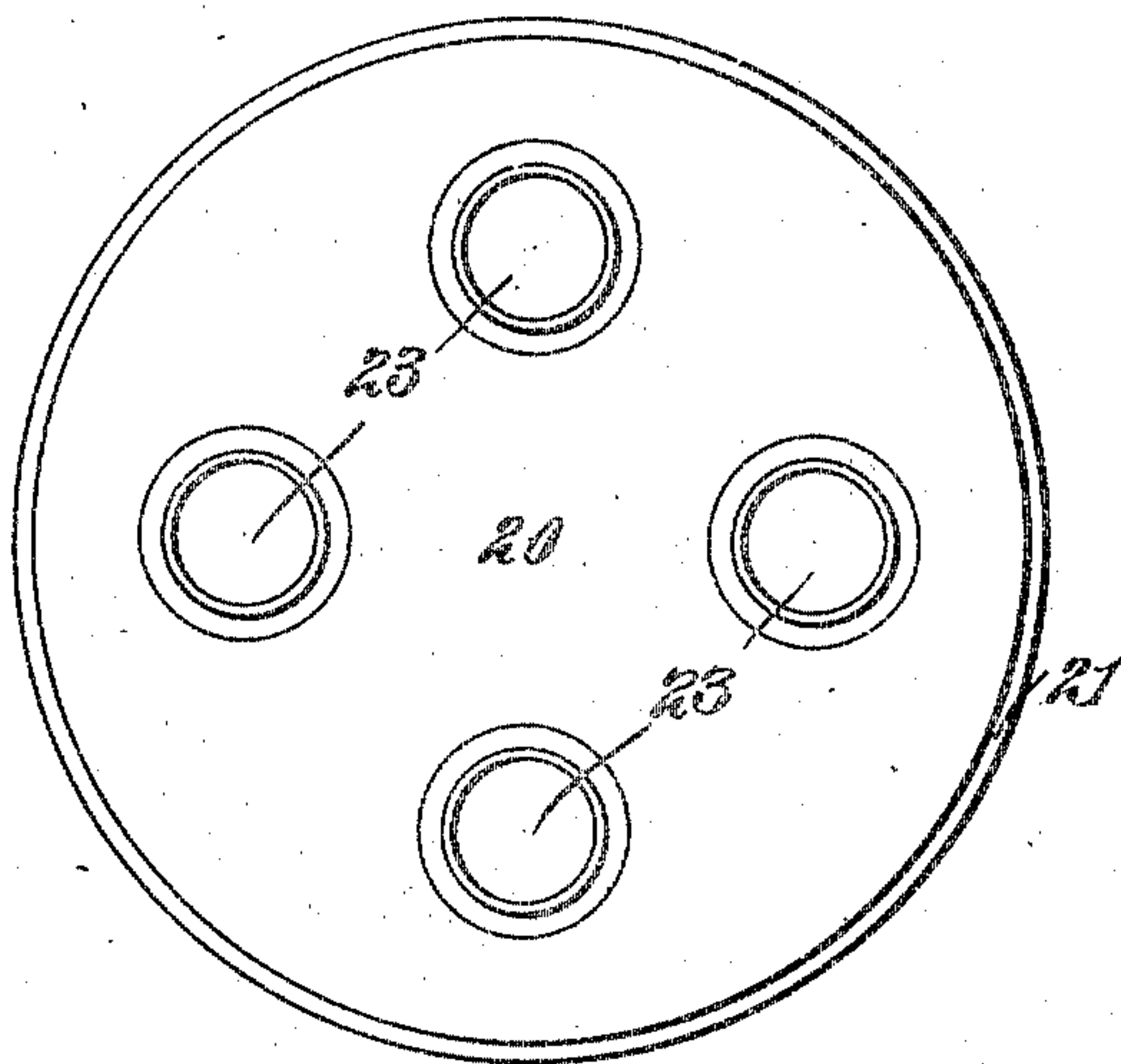


FIG. 6

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UNITED STATES PATENT OFFICE.

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WATER-HEATER.

No. 928,281.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed May 5, 1908. Serial No. 430,934.

To all whom it may concern:

Be it known that I, FRANK A. KNAPP, a citizen of the United States, residing in Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Water-Heaters, of which the following is a specification.

This invention pertains to means for heating water, and is especially adapted for use with gas burners or gas stoves.

One of the objects of the invention is to provide an improved form of such device in which the burning gas or other heating medium will have ready access to a large amount of surface, and can pass around and in engagement with all of the water containing portions.

A further object is to provide such a device in connection with a special form of burner, and which can be removed from the burner and attached to any of the usual forms of gas ranges, being applicable to the usual annular burner, by simply removing the top plate of the gas range, and suitably connecting the outlet and inlet pipes of the heater with the boiler and the water supply.

In the accompanying drawings representing one embodiment of my invention, Figure 1 is a vertical axial section through the device. Fig. 2 is a plan view with the top member and the cap member removed and the burner member omitted. Fig. 3 is a vertical section through the top, and Fig. 4 is a plan view of the same. Fig. 5 is a plan view, and Fig. 6 an elevation of the cap member. Fig. 7 is a fragmentary vertical section enlarged; and Fig. 8 shows on a reduced scale the heater member as applied to a gas range.

The water heater portion itself is shown as comprising two coils of pipes or tubes 2 and 3, each being shown in the form of an evolute with its adjacent convolutions spaced to permit the passage therethrough of the heating medium, from a gas flame or other source. The two coils are shown as having their inner ends integrally connected, as at 4, and are preferably placed in substantially parallel planes, one coil being a short distance above the other coil. The outer ends of the two coils form the inlet and outlet respectively. Preferably, the water enters the lower coil 2 first by the inlet pipe 5 having a valve 6, thence passes around the evolute to the central part and will pass upwardly by the connecting portion 4 to the upper coil 3 around

which it will circulate from the center outward, leaving by the outlet 7. These convolutions are also arranged relatively whereby a number of free vertical spaces between the pipes are provided, indicated by *x* in the drawings. But a large portion of the upper coil is located above the spaces between the convolutions of the lower coil, and so that the gas flame passing between the convolutions of the lower coil will strike the upper coil and have its heat imparted thereto. A central space 8 is provided at the center of both coils, and to prevent waste of the heating medium, a collar 10 is placed at this portion and provided with a cap projecting beyond it to deflect the gas outward on top of the upper coil. This collar may have a flange 11 at the top resting on the upper coil, and is shown provided with a cap 12 having a number of flaring portions 27, somewhat vizor-shaped, that extend outward beyond the sleeve over the upper coil.

The coil member is shown as supported in a drum member 13, having plates 14 extending radially inward upon which the coil member is supported, the inlet and exit members 5 and 7 passing through apertures in the drum. The drum and coil are of a size to be used with the customary form and size of annular burner member 15, the radial plates resting on top of the burner and supporting the drum and coil thereon. The burner member 15 is shown as having legs 16, and a supply pipe 17. The drum extends outward some distance beyond the periphery of the burner member, and to prevent the heating medium passing up between the coil and the drum, an annular deflecting ring 18 is secured to the drum and extends across to the outer convolution of the top coil. This will insure all the heated gases from the burner passing into close engagement with the convolutions of the two coils and imparting heat thereto.

The top of the drum member may have the usual framework 19 for supporting various forms of cooking or heating utensils, similar to a gas range or burner, but where the water heater is used alone without a vessel being placed on top, it is desirable to confine the gases somewhat and prevent their free exit. For this purpose a top plate 20 is provided having a flange 21 adapted to fit on the rim 22 of the supporting member 19. This plate has a few apertures as 23, preferably of the same number as the deflectors 12 and ar-

ranged to alternate between them to still further confine the heated gas before permitting its escape.

The water heater comprising the coil members and the drum and other connected parts, as above described, can be lifted off and removed from the burner member 15 shown in Fig. 1, and inserted on the burner member 25 of a gas range R, by merely removing the top plate or frame of the range. The inlet and outlet pipes of course will be suitably connected with any desired source of water and receptacle or outlet for the heated water. In this position, it can be used either for heating water alone; or by removing the top plate 20 it can be used for cooking purposes at the same time that it serves to furnish a supply of hot water.

Having thus described my invention, I claim:

1. In a water heater, the combination of a drum having a series of radial plates projecting inwardly toward the center, a water-tube member comprising two evolute coils located one over the other and each having its convolutions spaced for passage of the heating medium, the inner ends of the coils being connected and their outer ends forming outlet and inlet parts respectively, the coils being supported on said plates, an annular deflecting member extending from the drum to the outer convolution of the upper coil, a sleeve member having an outward flange at its top and located inside of the coils with the flange engaging the inner convolution of the upper coil, the sleeve having a cap arranged to deflect the heating medium outwardly from the upper coil.

2. In a water heater, the combination of a drum having a series of radial plates projecting inwardly, a water-tube member

comprising two evolute coils located one over the other and each having its convolutions spaced for passage of the heating medium, the inner ends of the coils being connected and their outer ends forming outlet and inlet parts respectively, the coils being supported on said plates, an annular deflecting member extending from the drum to the outer convolution of the upper coil, a sleeve member having an outward flange at its top and located inside of the coils with the flange engaging the inner convolution of the upper coil, the sleeve having a cap arranged to deflect the heating medium outwardly over the upper coil, and a burner member of less diameter than the drum and arranged to support the heater member with the bottom of the plates resting on the burner.

3. In a water heater, the combination of a drum having a series of radial plates projecting inwardly toward the center, a water-tube member comprising coils spaced for passage of the heating medium, the inner ends of the coils being connected and their outer ends forming outlet and inlet parts respectively, said coil being supported on said plates, an annular deflecting member extending from the drum to the outer convolution of the upper collar, a sleeve member having an outward flange at its top and located in the central space of the coils with the flange engaging the inner convolution of the upper coil, the sleeve having a cap arranged to deflect the heating medium outwardly from the upper coil, and a supporting frame at the top of the drum.

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