

(No Model.)

3 Sheets—Sheet 1.

A. LONG & C. McCUMBER.  
WATER HEATER.

No. 505,529.

Patented Sept. 26, 1893.

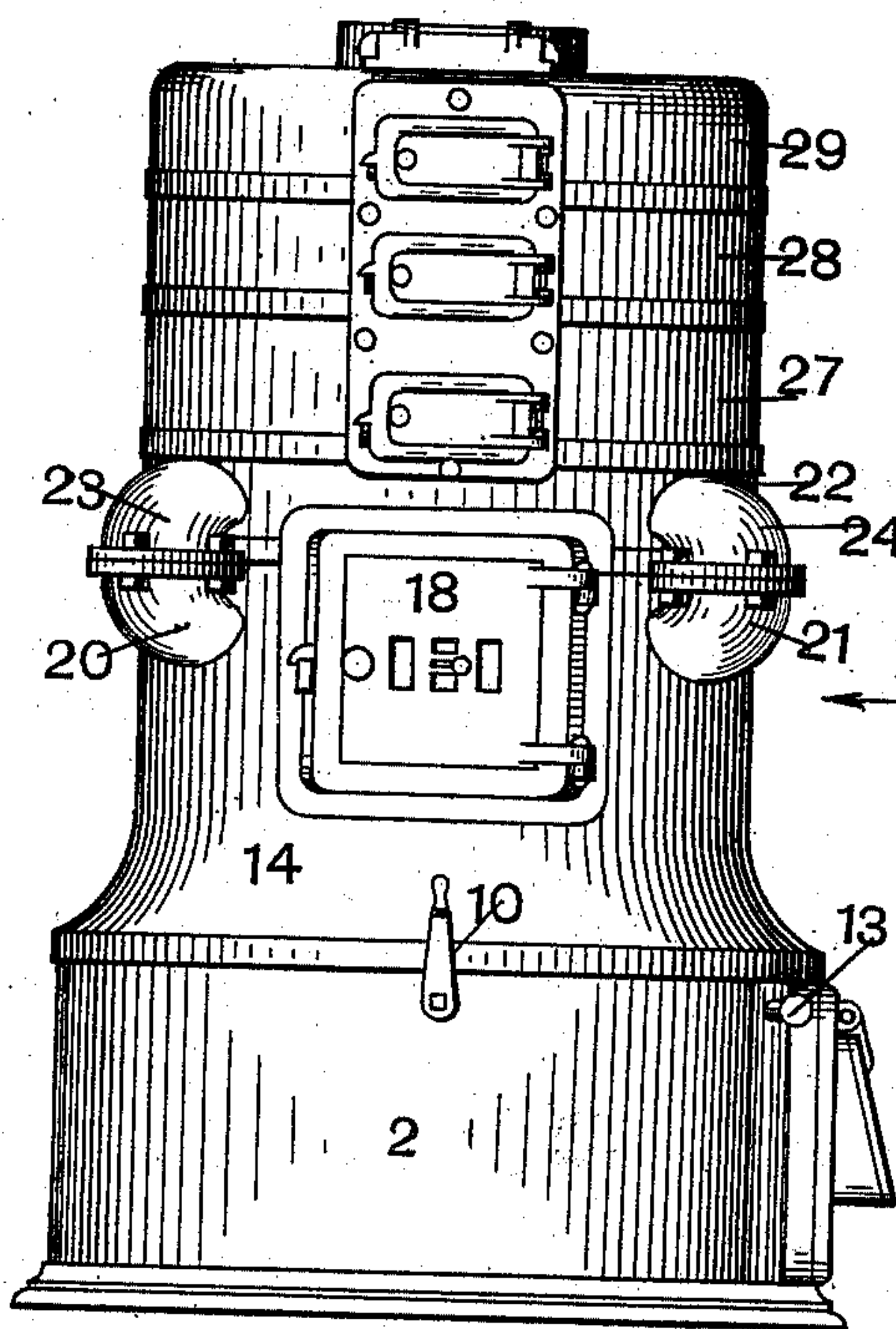


Fig. 1.

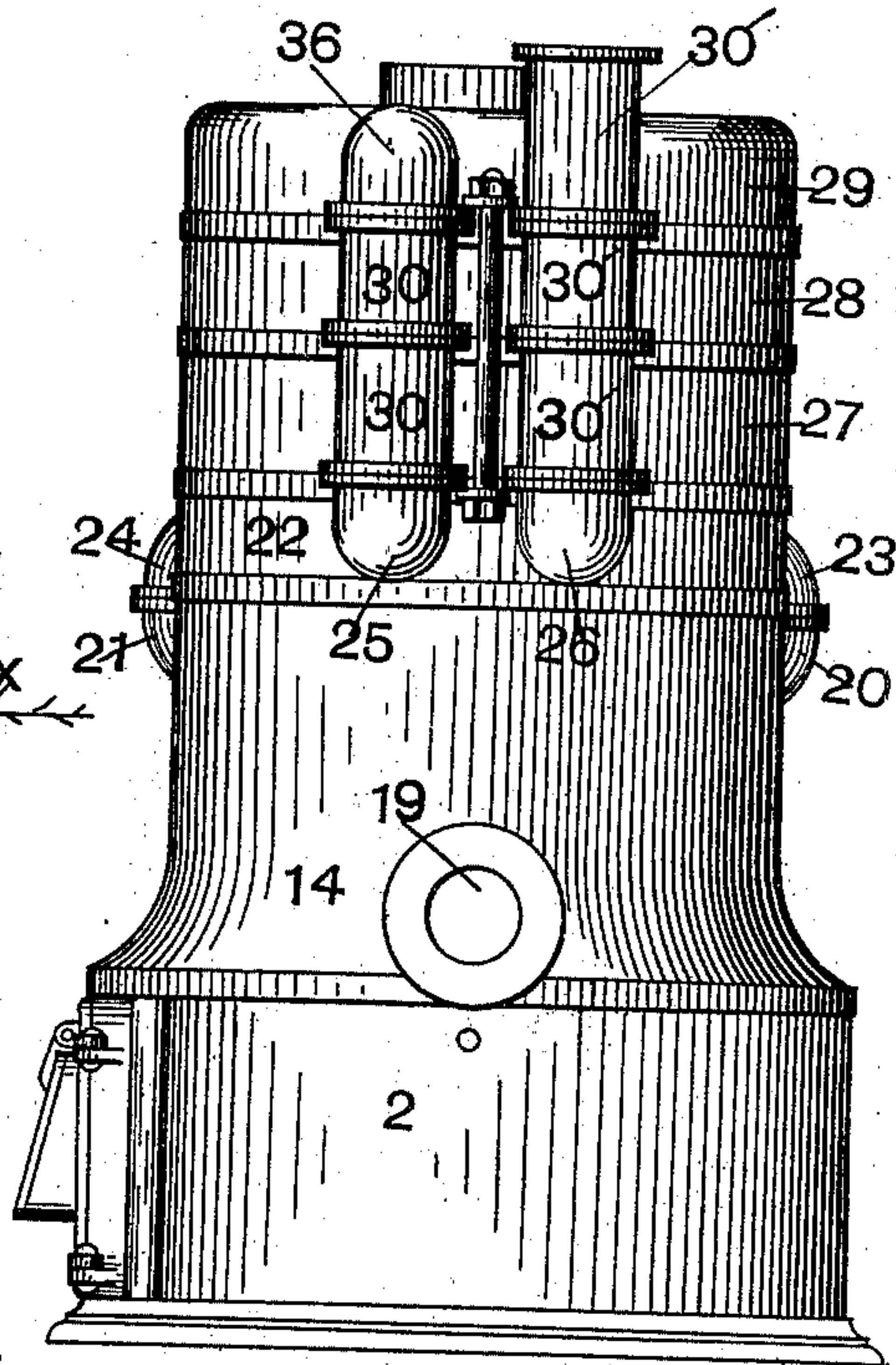


Fig. 2.

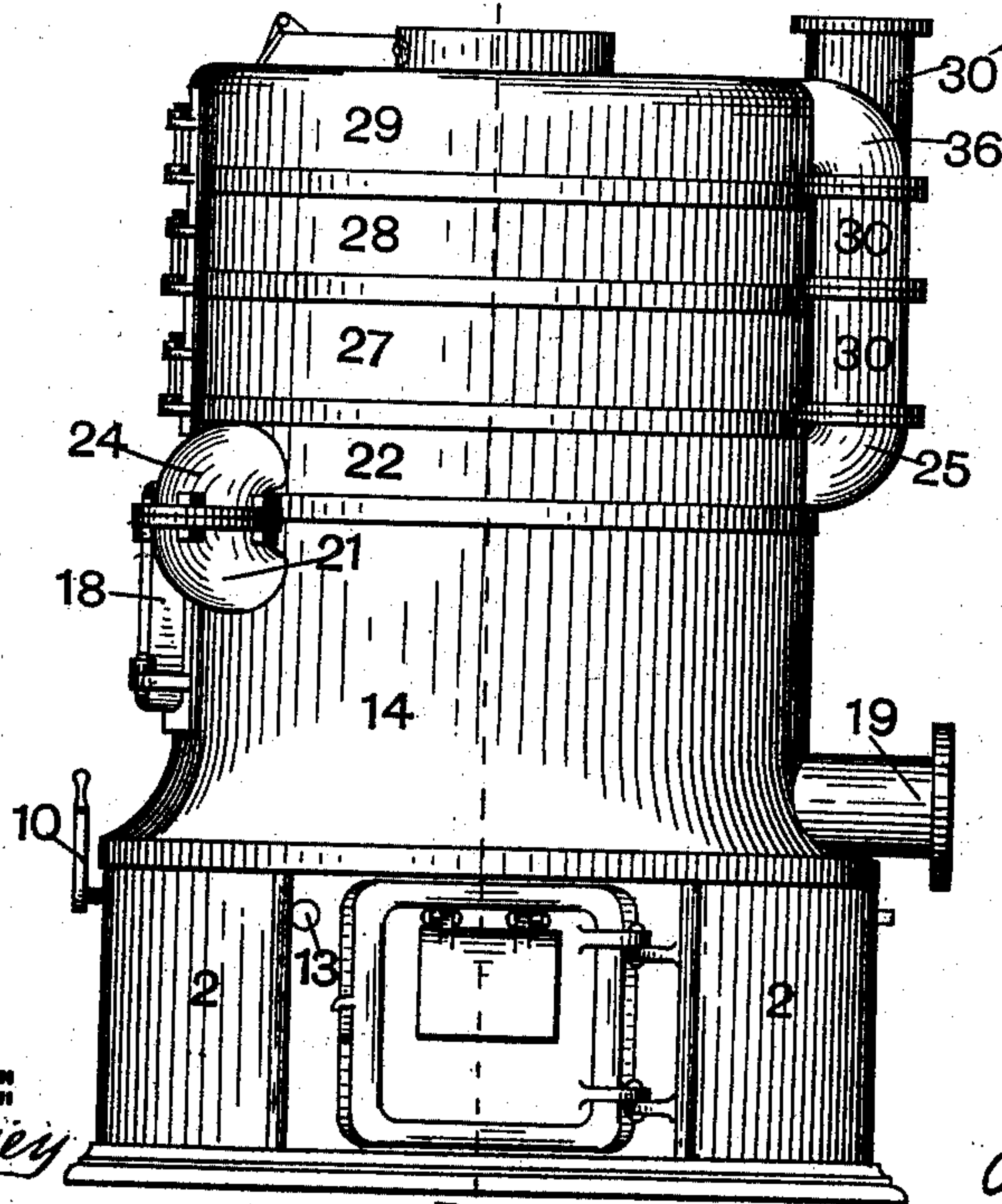


Fig. 3.

WITNESSES:  
*Fred W. Hersey*  
*L. L. White.*

INVENTORS  
*Albert Long.*  
*Charles McCumber*  
By their atty. *Oscar Snell*

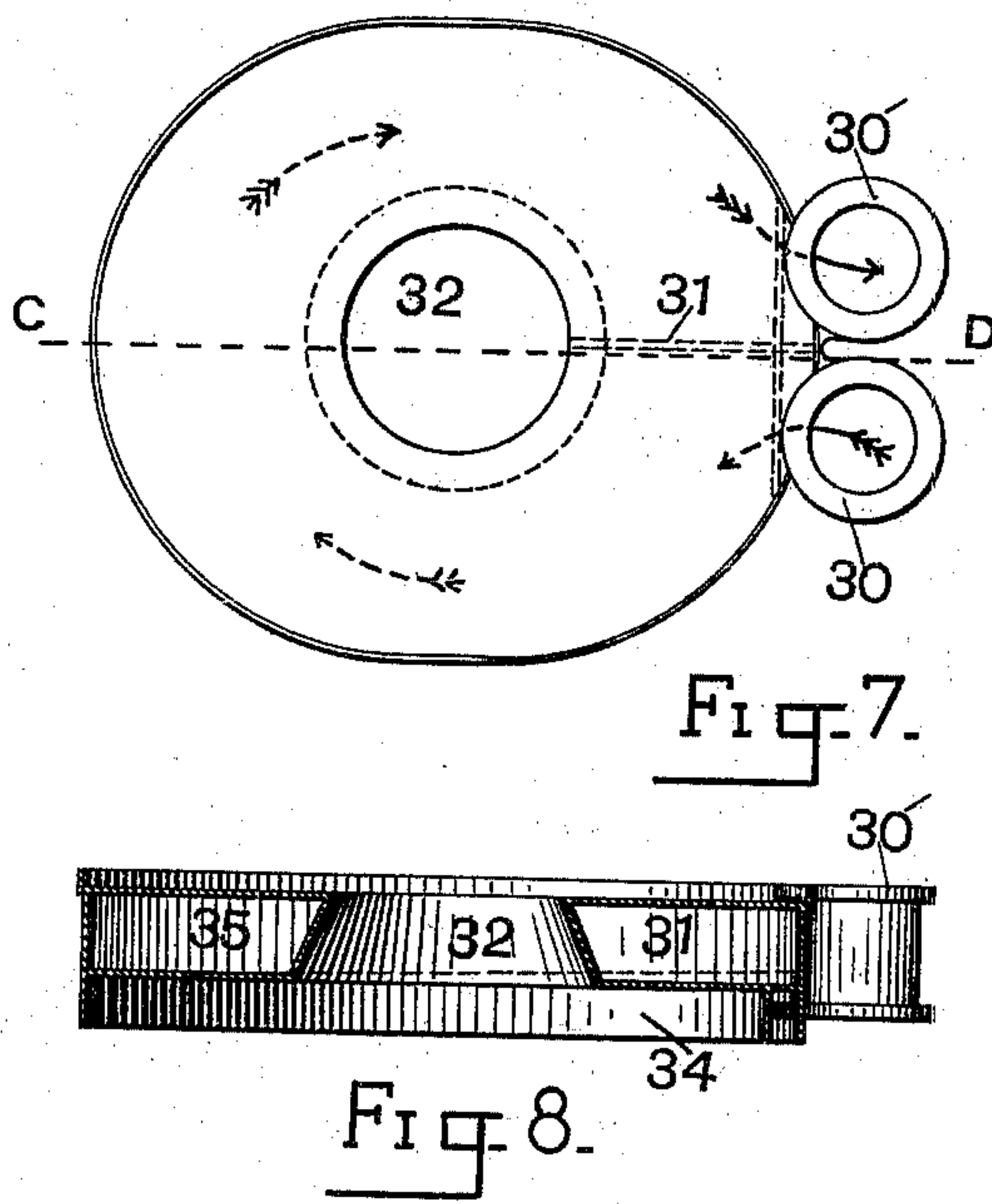
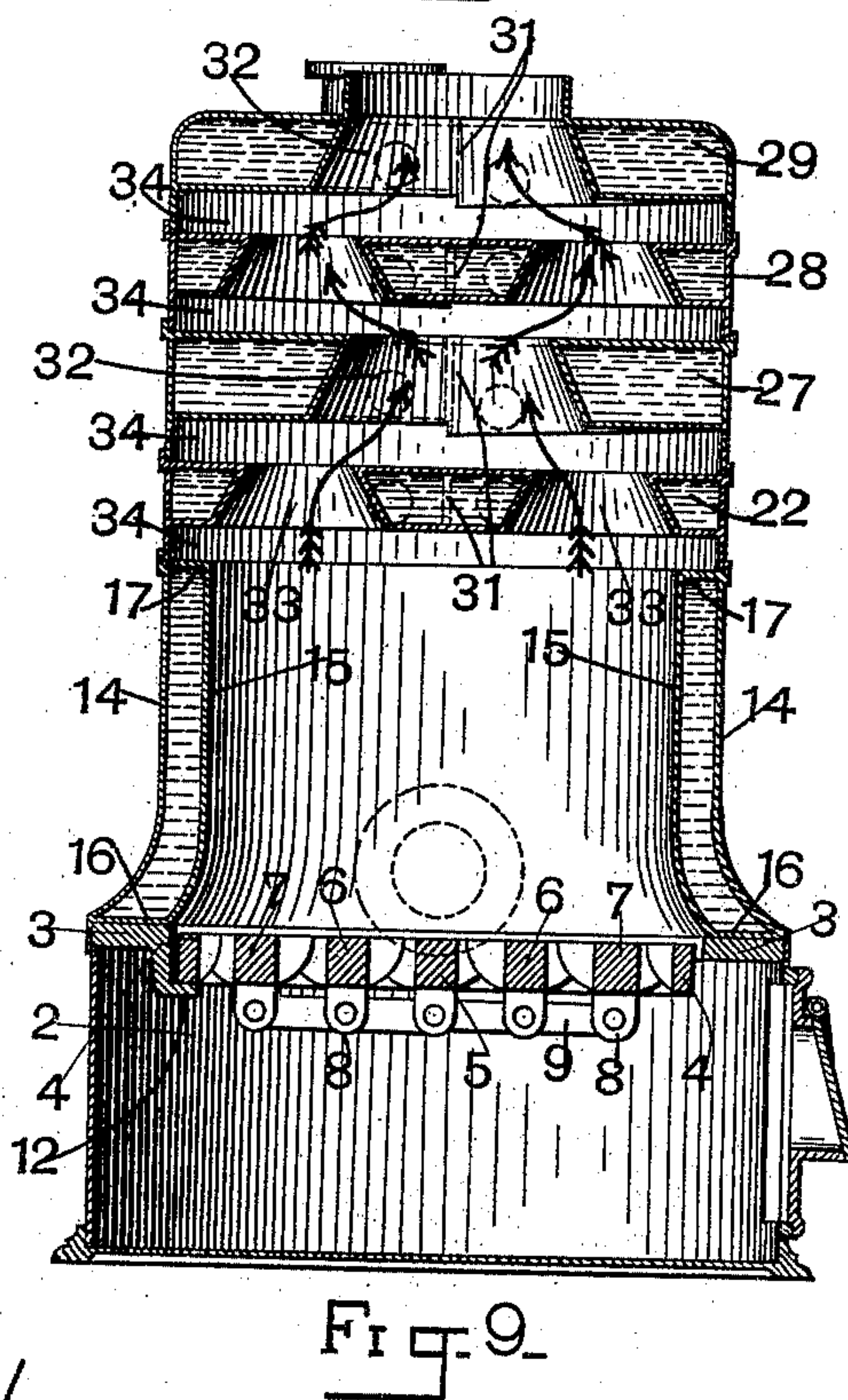
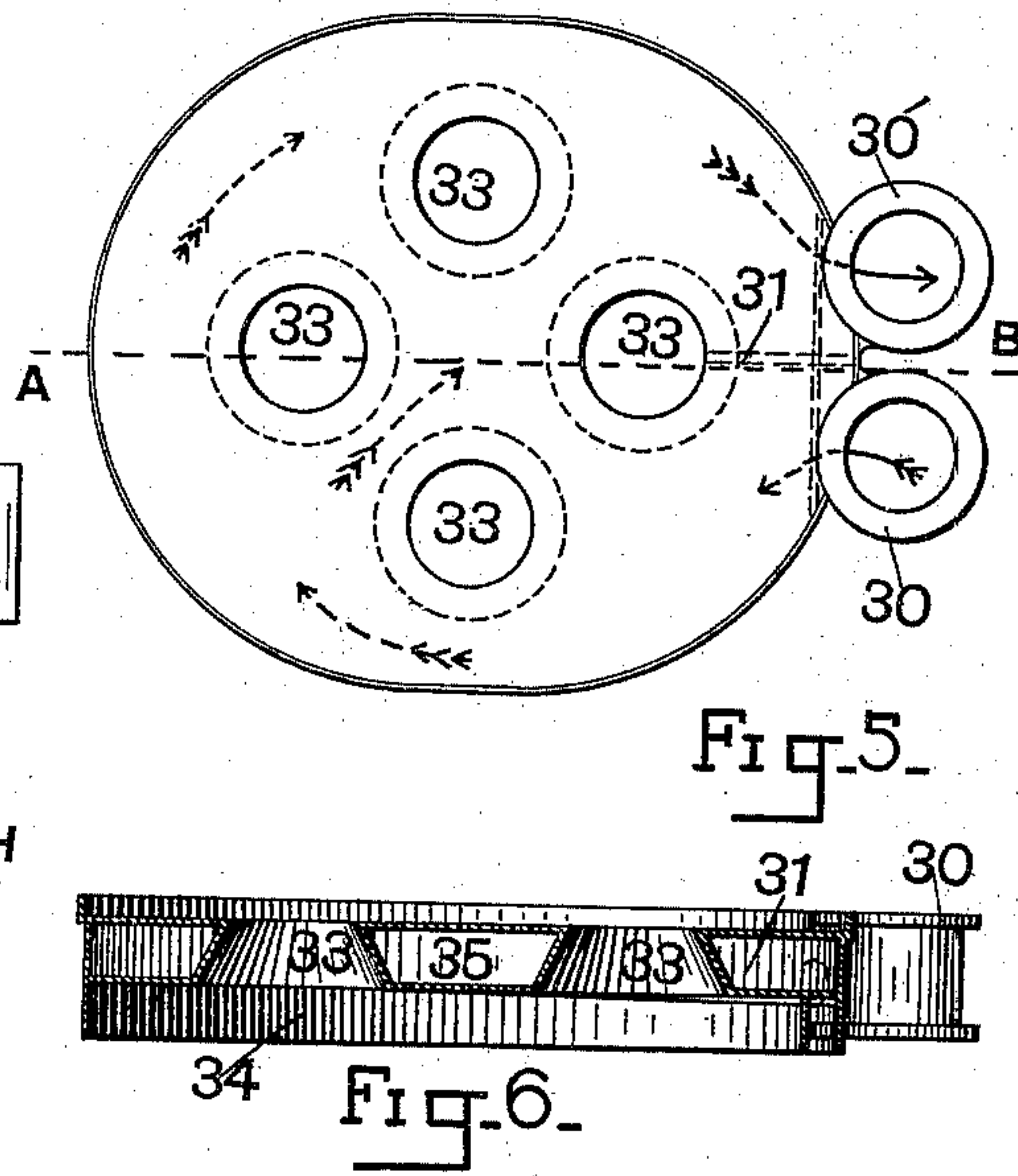
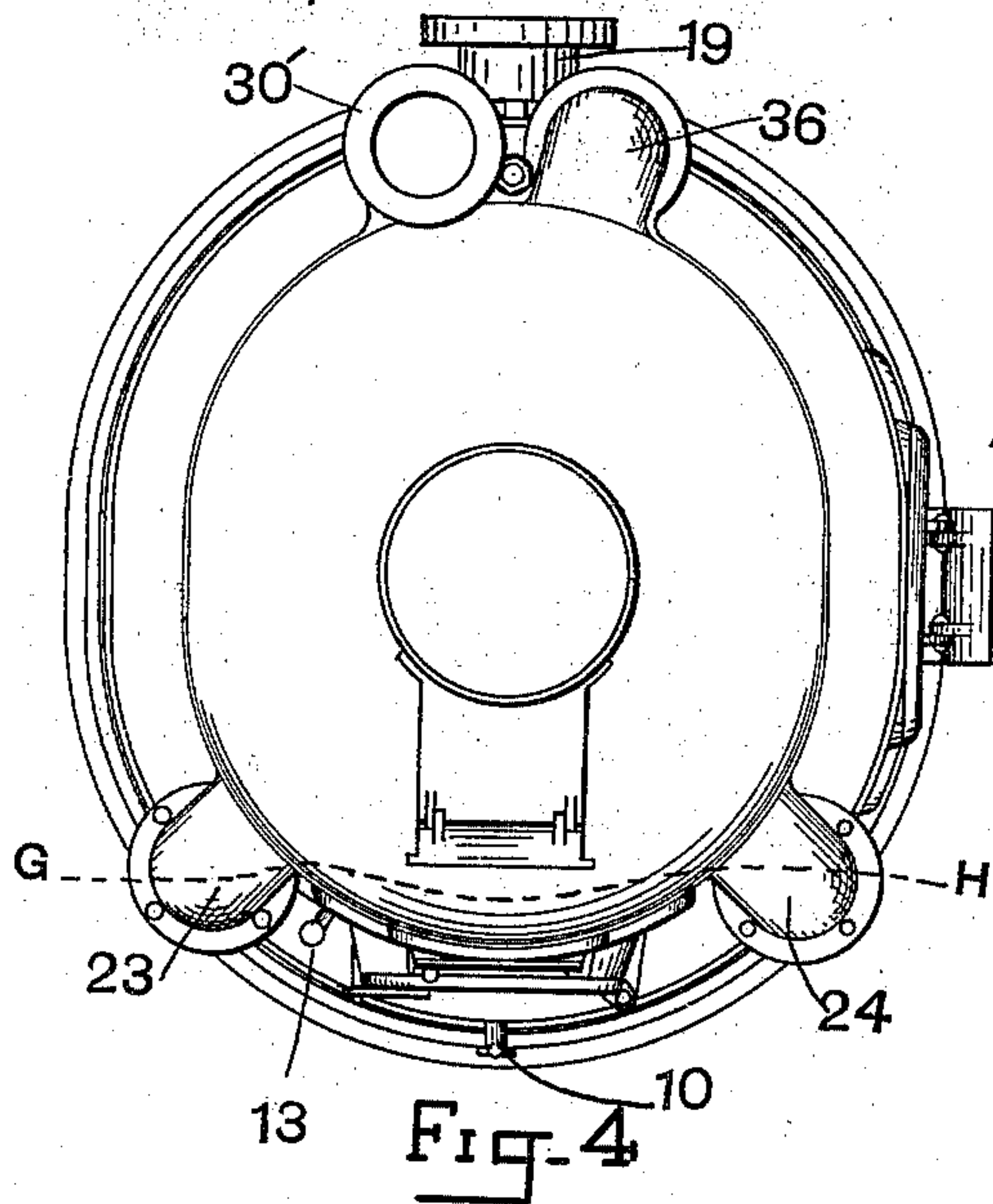
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3 Sheets—Sheet 3.

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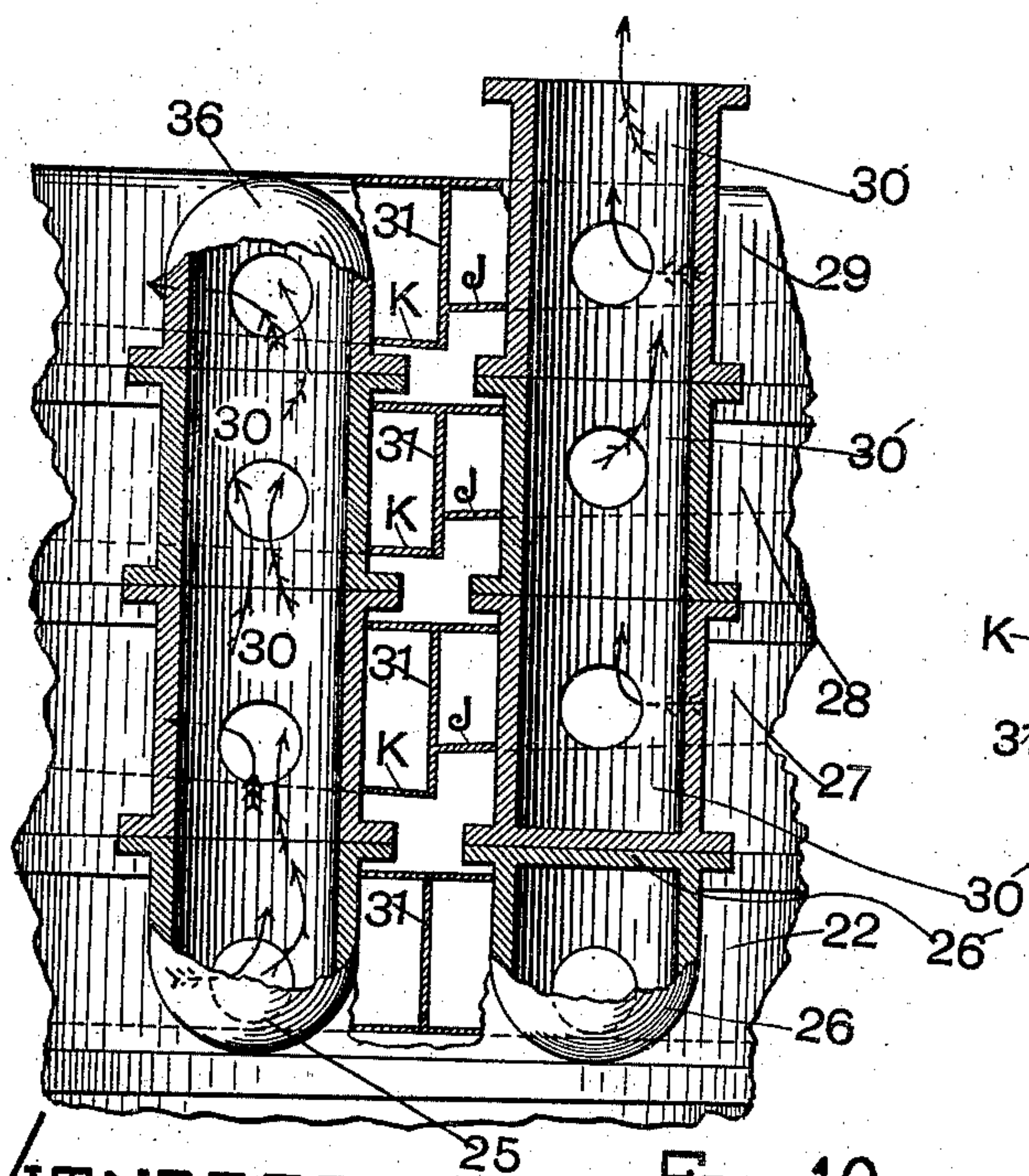


Fig. 10.

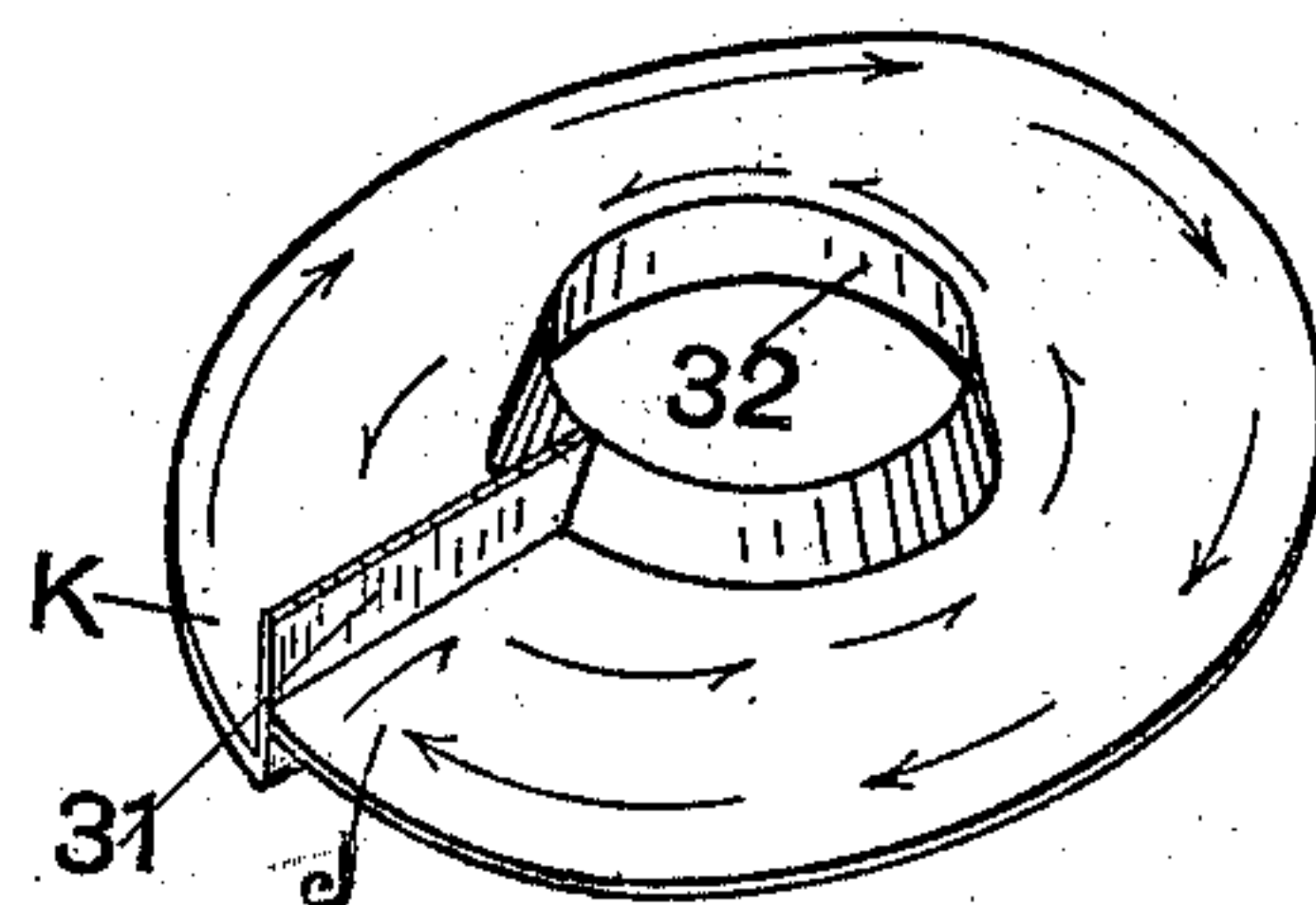


Fig. 11.

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INVENTORS

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*Charles McCumber*

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# UNITED STATES PATENT OFFICE.

ALBERT LONG, OF CHICAGO, ILLINOIS, AND CHARLES McCUMBER, OF FOND DU LAC, WISCONSIN.

## WATER-HEATER.

SPECIFICATION forming part of Letters Patent No. 505,529, dated September 26, 1893.

Application filed December 12, 1892. Serial No. 454,828. (No model.)

*To all whom it may concern:*

Be it known that we, ALBERT LONG, residing at Chicago, in the county of Cook and State of Illinois, and CHARLES McCUMBER, residing at Fond du Lac, in the county of Fond du Lac and State of Wisconsin, citizens of the United States, have invented a new and useful Water-Heater, of which the following is a specification.

Our invention relates to means for imparting heat to water for the purpose of heating buildings, &c., and our object is to provide an apparatus for the purpose which has numerous advantages hereinafter named and whose construction is shown by the accompanying drawings, in which—

Figure 1 is a front elevation of the heater as it appears when ready for attaching the chimney and water connections. Fig. 2 is a rear elevation of Fig. 1. Fig. 3 is a side elevation of Fig. 1, looking in the direction of arrow X. Fig. 4 is a plan view of Fig. 1, showing the oblong shape of the heater, and the general conformity of the top section thereof. Fig. 5 is a plan view of the second or third section from the top, showing the arrangement of the flues for the products of combustion. Fig. 6 is a vertical section on line A B of Fig. 5, showing water chamber, flues and chamber for heated gases of combustion between the sections; these chambers being formed when the several sections are in position for use, as will be explained hereinafter. Fig. 7 is a plan view of the third section from the top, detached from the heater similar to Fig. 5, and Fig. 8 is a vertical section on line C, D, of Fig. 7, to show water chamber and means for forming chamber between the sections, similar to Fig. 6. Fig. 9 is a vertical section of the heater on line E F, Fig. 3. Fig. 10 is a vertical section of the several sections on line G H, Fig. 4. Fig. 10 is for the purpose of showing the course taken by the currents of water when passing upward from one section to another, and also shows the inclined bottom of the three top sections. Fig. 11 is a perspective view of the bottom plate of the third section from the top, to illustrate the downward inclination of the surface of the bottom of sections one, two and three from the top, the purpose of this

inclination of the bottom of the sections being explained hereinafter.

Similar numerals indicate like parts throughout the several views.

Resting upon the top of the top base ring 3 is the furnace portion of the heater, which consists of an outside wall 14, an inside wall 15 which, with the bottom 16 and top 17, inclose an annular space which is filled with water and surrounds the fire on the grates on all sides, except at the door 18 where fuel is introduced. At the rear of this annular water receptacle is a projecting pipe 19, which has communication therewith, this pipe being connected to the return water pipes when the apparatus is used for house heating purposes. At 20 and 21 are elbows which connect this annular receptacle with the first section 22 above, through elbows 23 and 24, the elbows being bolted together with gaskets in the joints to prevent leakage of water.

There are two elbows 25 and 26 shown at the rear view of the heater, Figs. 2 and 10, but water is permitted to pass up into the water column composed of short flanged connections 30, elbow 26 being closed by a cap 26' as shown in Fig. 10 elbow 26 serving as a base to support and close the lower end of water column composed of short flanged connections 30'. Connections 30 have communication with one side of each of the sections, and form an intercommunication between them for the passage of water in either an upward or downward direction. Connections 30' serve for the same general purpose as 30, being in communication with the several sections. The top of connections 30' is connected directly with the pipes which carry hot water outward to heat the house, while the lower ends of connections 30 receive water from the lower section and are successively connected with each of the superimposed sections, ending at the top section with an elbow 36, as shown in Fig. 10. Each of the sections 22, 27, 28 and 29 have side walls 35, Figs. 6 and 8 and a bottom and top with conical smoke flues passing up through their central portions as shown at 32 and 33, Figs. 6 and 8. The top of each of these sections is horizontal but the bottoms of sections 27, 28 and 29 are made of a plate, which is shown



in Fig. 11, and which has the form of a spiral so that water poured on the portion of the bottom at J would run around the inside of the section and run off at K, the division plate 31 forming a closed portion between the top and bottom and the flue 32 and the front of the section, compelling the water to pass clear around the circle of the section, around flue 32 in the direction of the one-barbed arrows. Water connections 30 connect with the sections near the bottom at K and connections 30' near J, as shown in Fig. 10, the orifice for the entrance of the hot water in circulation, in each section having the spiral bottom, being lower than the exit orifice of each section. Each of the sections is held apart by the downwardly projecting skirting 34 which forms a space between the sections for the gases of combustion to pass and contact with the entire bottom of each section.

In the construction of this water heater we have endeavored to so construct and combine the several parts that an easy circulation of the water is attained, and a large fire surface provided, so as to reduce the temperature of the waste gases of combustion to a very low degree.

In the description of the several parts of this heater given hereinbefore it is obvious that the water by the action of the heat from the furnace will readily pass into and out of the several sections as indicated and that the

several parts can be manufactured at a comparatively low cost and be assembled and placed in position for duty by mechanics of ordinary skill.

It will be noticed that, in case a drainage valve is placed at the lowest part of this heater all the water will flow out of the sections on account of the inclination of the bottoms thereof so that should the heater be placed somewhat out of level no water would be left in the sections to cause damage by freezing.

We claim as our invention—

A water heater constructed with sections having vertical flues and a partition plate between one of the flues and the side and bottom and top of said sections, as described, the bottom of each of said sections lower at one side of said partition than at the other side thereof, and orifices for the admission and exit of water into and out of said sections, said orifices disposed relative to said bottom and said partition in each of said sections substantially as shown and described.

In testimony that we claim the foregoing we have hereunto set our hands this 5th day of November, 1892, in the presence of witnesses.

ALBERT LONG.

CHARLES McCUMBER.

Witnesses:

J. H. McCrory,

F. F. Duffy.