

No. 625,406.

Patented May 23, 1899.

P. MEEHAN.
BOILER.

(Application filed June 3, 1898.)

(No Model.)

2 Sheets—Sheet 1.

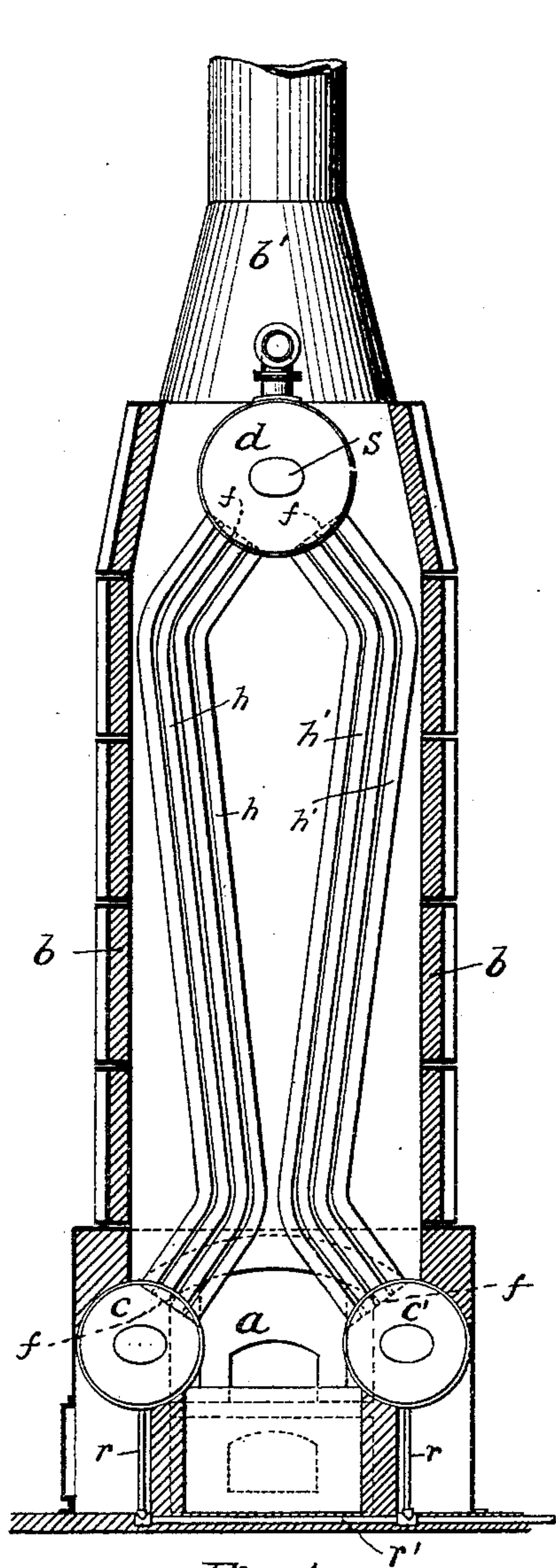


Fig. 1.

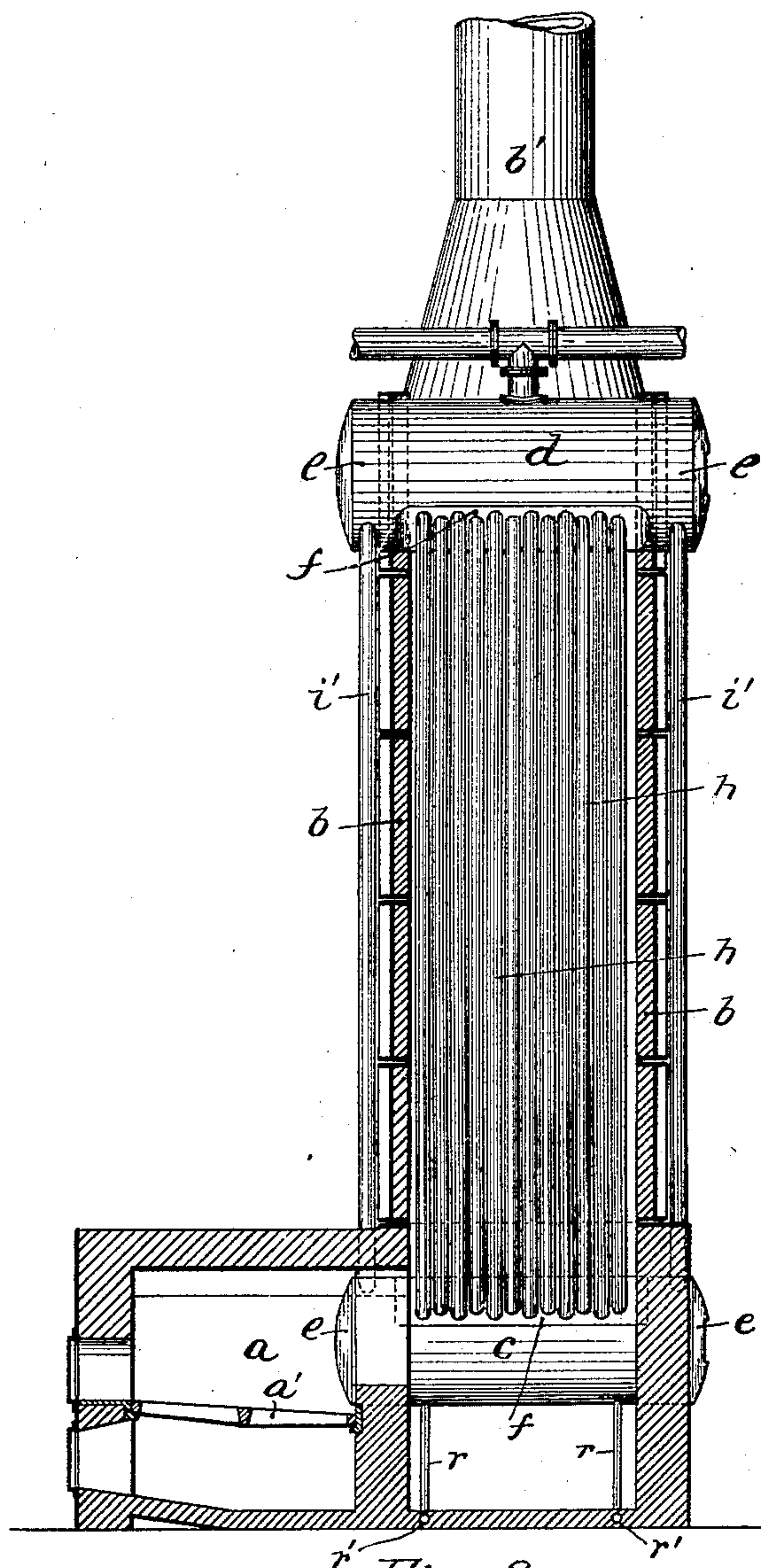


Fig. 2.

Witnesses:

Walter Samaras

Charters,

Inventor:

Patrick Meehan

By Kay & Wether

Attorneys.

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Fig. 3.

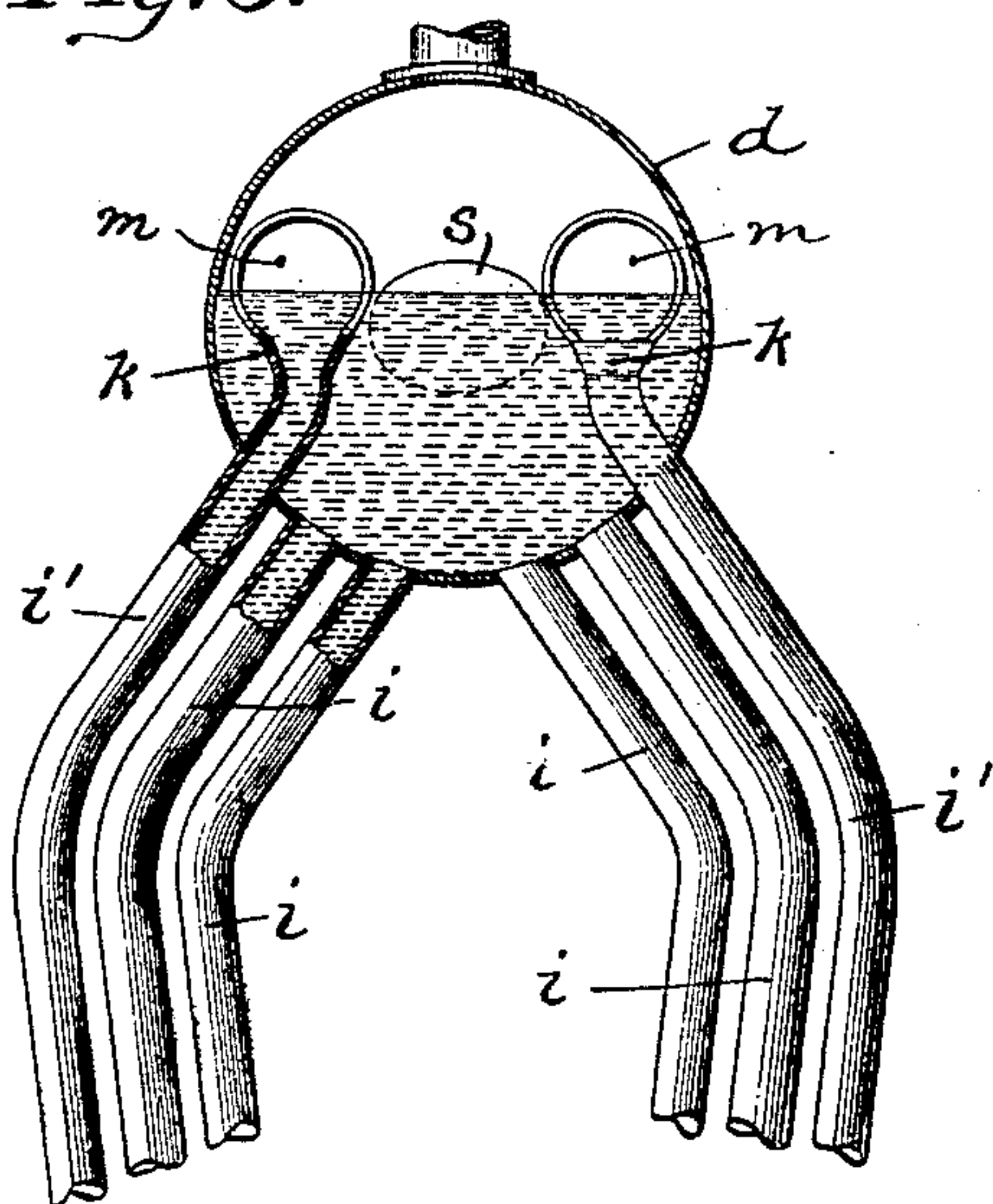


Fig. 5.

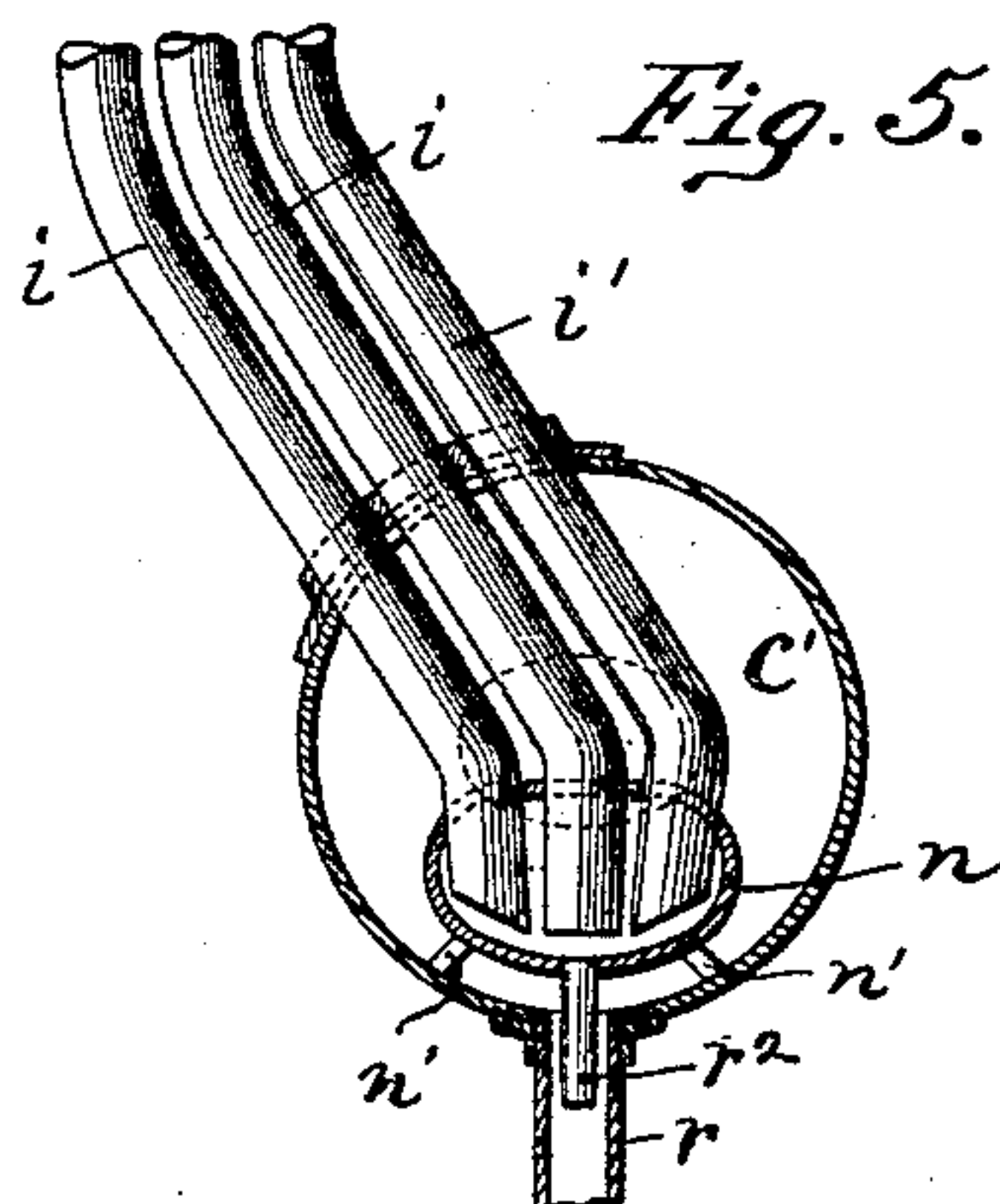


Fig. 4.

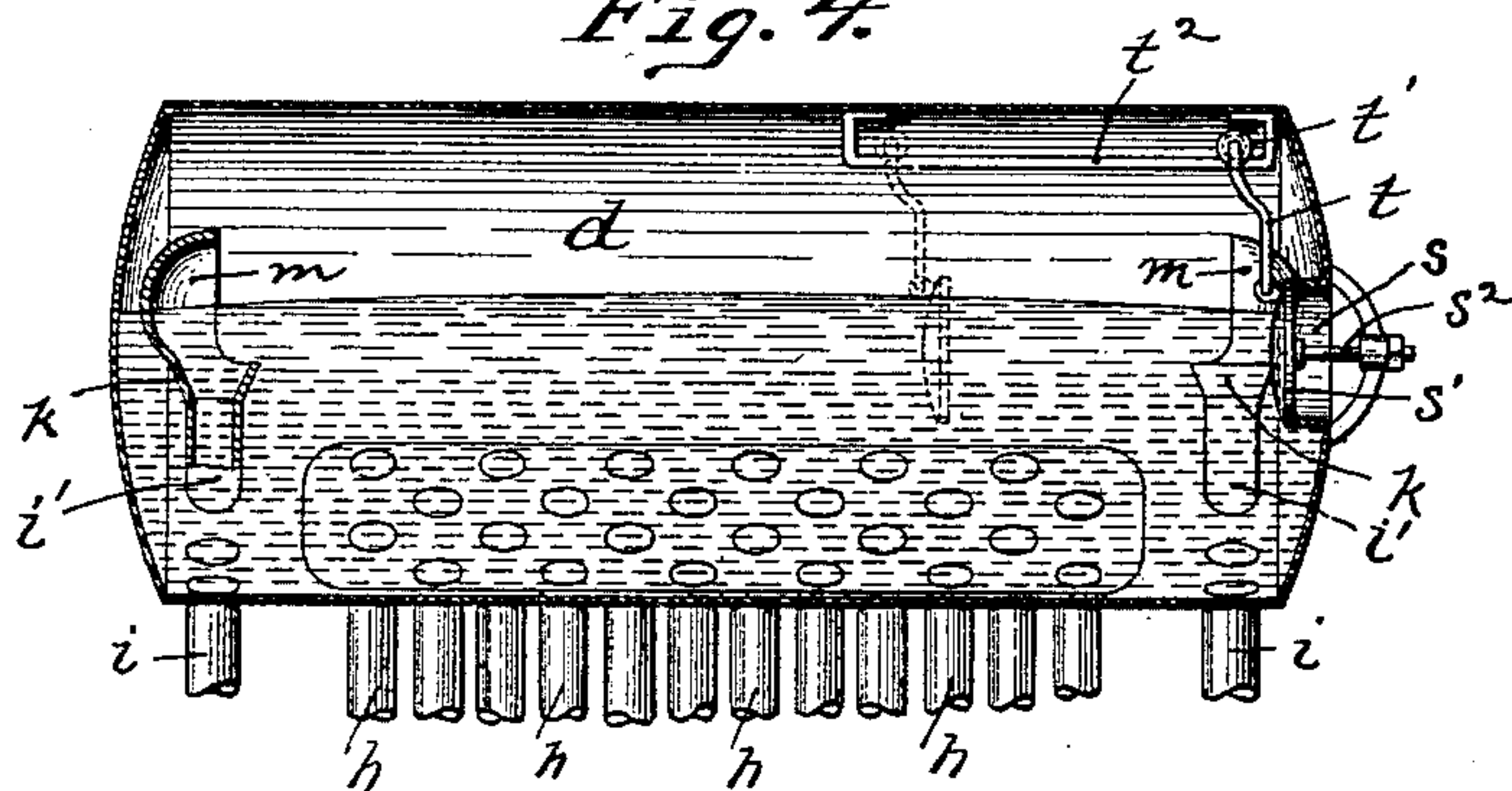
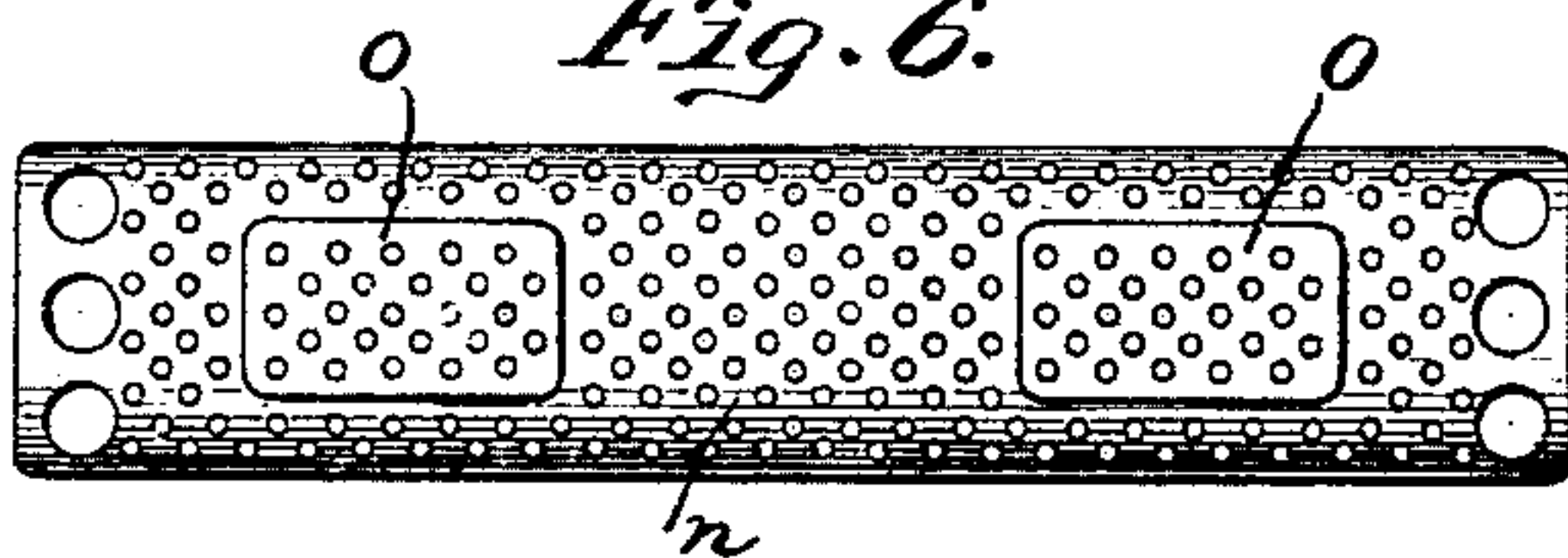


Fig. 6.



Witnesses:

Water Samanias
Chas. H. B.

Inventor:

Patrick Meehan
By Ray, Kays, & Mott
Attorneys.

UNITED STATES PATENT OFFICE.

PATRICK MEEHAN, OF LOWELLVILLE, OHIO, ASSIGNOR TO THE MEEHAN
BOILER AND CONSTRUCTION COMPANY, OF SAME PLACE.

BOILER.

SPECIFICATION forming part of Letters Patent No. 625,406, dated May 23, 1899.

Application filed June 3, 1898. Serial No. 682,427. (No model.)

To all whom it may concern:

Be it known that I, PATRICK MEEHAN, a resident of Lowellville, in the county of Mahoning and State of Ohio, have invented a new and useful Improvement in Boilers; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to steam-boilers.

One of the main objects of my invention is to provide a vertical water-tube boiler so constructed that the bent tubes which connect the upper and lower drums may be uniform in length, which does away with the necessity of tubes of different lengths and bends.

My invention comprises the new and novel features set forth and claimed hereinafter.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved boiler. Fig. 2 is a like view from the side. Figs. 3 and 4 are views showing the interior of the upper drum and the construction of the downflow-tubes. Fig. 5 is a cross-section of lower drum, and Fig. 6 is a plan view of mud-drum.

Like letters indicate like parts in each of the figures.

The letter *a* designates a suitable furnace having the grate-bars *a'* and suitable openings for the introduction of fuel and the removal of ashes. The furnace, however, forms no part of my invention and any other suitable construction may be used.

Extending up from the furnace *a* is the shell or casing *b*, which surrounds my improved boiler, said casing having the smoke-stack *b'* at the upper end thereof.

Fitted in the furnace *a* are the drums *c c'*, while at the upper end of the casing *b* is the drum *d*. These drums *c, c'*, and *d* have the round ends *e*, but intermediate of said ends are the flat portions *f*. The lower drums *c c'* each have one such flat portion *f*, while the upper drum *d* has one on each side. These flat portions *f* have the openings formed therein to receive the ends of the tubes *h h'*. The

tubes *h* enter the openings in the drum *c* and the tubes *h'* those in the drum *c'*. The upper ends of the tubes enter the flat portions on opposite sides of the upper drum *d*. With the tubes bent in substantially the manner shown it is apparent that by the use of the flat portions *f* all the tubes *h h'* are of the same length and have the same bends. Furthermore, by having the tubes all of the same length there is no unequal expansion, and consequently there are no unequal strains. The flat portions *f* do not, however, interfere with the strength of the drums, as they do not extend the entire length of said drums; but said drums have the regular round ends, which give strength and rigidity.

The downflow-tubes *i i'* are preferably outside the casing *b* and enter the round ends *e* of the drums. The downflow-tubes *i'* extend up within the upper drum *d* to about the water-line, and the upper ends of said tubes are flared outwardly, as at *k*. For the reasons more fully hereinafter set forth the upper ends of the tubes *i'* have the shields *m*.

Within the lower drums *c c'* are the mud-drums *n*. These mud-drums are supported within the drums *c c'* by the supports *n'*. The tops of the drums *n* are perforated, and at each end thereof are the lids *o*, by means of which access may be had to said drums for purposes of cleaning. The lower ends of the downflow-tubes *i i'* enter the mud-drums *n*.

Leading from the drums *c c'* are the blow-off pipes *r*, said pipes connecting with the main blow-off pipe *r'*. Blow-off pipes *r²* lead from the mud-drums *n* into the blow-off pipes *r* of larger diameter, both of said pipes communicating with the main blow-off *r'*. By this construction the drums *c c'* and mud-drums *n* may all be blown off at one time by simply turning a valve in the main pipe *r'*.

The letter *s* represents the ordinary man-hole, provided with the cover *s'*, which is held in place in the ordinary manner by the bolt *s²*. Secured to the cover *s'* is the arm *t*, which has the roller *t'* journaled in its upper end. This roller *t'* runs on the track *t²*, secured to the interior of the drum. By this construc-

tion when it is desired to gain access to the drum the cover is released from the bolt s^2 and is then pushed back to the position shown in dotted lines, Fig. 4, the roller traveling on the track t^2 . In this manner all necessity for the handling and lifting of the cover is avoided, and as they weigh considerable and it is difficult and awkward to remove them the advantage is at once apparent. To adjust the cover in place again, it is only necessary to draw it back and apply the bolt, as before.

When my improved boiler is in use, the water and steam pass up through the tubes $h h'$ as said tubes are exposed to the direct action of the heated products of combustion coming from the furnace. As the tubes $h h'$ enter the upper drum d intermediate of its ends, the water in the upper drum will be raised when said tubes enter and will fall off toward the ends, as illustrated by the dotted lines in Fig. 4. The water then descends by way of the downflow-tubes $i i'$. As the tubes $i i'$ extend up within the drum d to about the water-line and adjacent to the ends of the drum said tubes being unobstructed carry down the scum and other matter which floats on the surface of the water. The shields m , together with the flaring ends of the tubes i , assist in the admission of a greater quantity of water to said tubes. The water passing down the tubes i' enters the mud-drums n , and the sediment is deposited in said drums, the water passing out through the perforations into the drums $c c'$. In this manner the drums $c c'$ are freed from a great deal of sediment. The sediment once deposited in the mud-drums n cannot well escape, and the consequence is that the water circulating through the tubes is cleaner, and said tubes will not clog up so readily. When it is desired to blow off the drums and mud-drums, it can all be done through the one main pipe.

All the tubes $h h'$, or the upflow-tubes, can be made of the same length and bend, so that in constructing the boiler tubes of different lengths and bends do not have to be employed. This is a great advantage, as the tubes can be made and bent in large quantities and in less time, while at the same time if a tube is to be replaced it can be readily obtained. The flat portions for the insertion of the tubes being intermediate of the ends permits of the regular round ends on the drums, so that

said drums are not weakened by said flat portions, but the ends are rigid and firm.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a boiler, drums having flat portions intermediate of their ends and round ends, and tubes connecting said drums, substantially as set forth.

2. In a boiler, drums having flat portions intermediate of their ends and round ends, and bent tubes connecting said drums, substantially as set forth.

3. In a boiler, upper and lower drums, tubes connecting same, a mud-drum in the lower drum having perforations therein, the downflow-tubes entering said mud-drum, substantially as set forth.

4. In a boiler, upper and lower drums, tubes connecting same, a mud-drum in the lower drum and communicating with the lower drum, the downflow-tubes entering said mud-drums, a blow-off pipe leading from said lower drum, and a blow-off pipe leading from said mud-drum into said first-mentioned blow-off pipe, said blow-off pipes communicating with a main blow-off pipe, substantially as set forth.

5. In a boiler, upper and lower drums, tubes connecting same, the downflow-tubes having unobstructed openings and extending up within the upper drum, substantially as set forth.

6. In a boiler, upper and lower drums, tubes connecting same, the downflow-tubes having unobstructed openings and extending up within the upper drum to the water-line, substantially as set forth.

7. In a boiler, upper and lower drums, tubes connecting same, the downflow-tubes extending up within the upper drum, said downflow-tubes having outwardly-flaring ends, substantially as set forth.

8. In a boiler, upper and lower drums, tubes connecting same, the downflow-tubes extending up within the upper drum, and shields at the upper ends of said downflow-tubes, substantially as set forth.

In testimony whereof I, the said PATRICK MEEHAN, have hereunto set my hand.

PATRICK MEEHAN.

Witnesses:

ROBT. D. TOTTEN,
JAMES I. KAY.