

Improvement in Steam Boilers.

No. 123,414.

Patented Feb. 6, 1872.

Fig. 1.

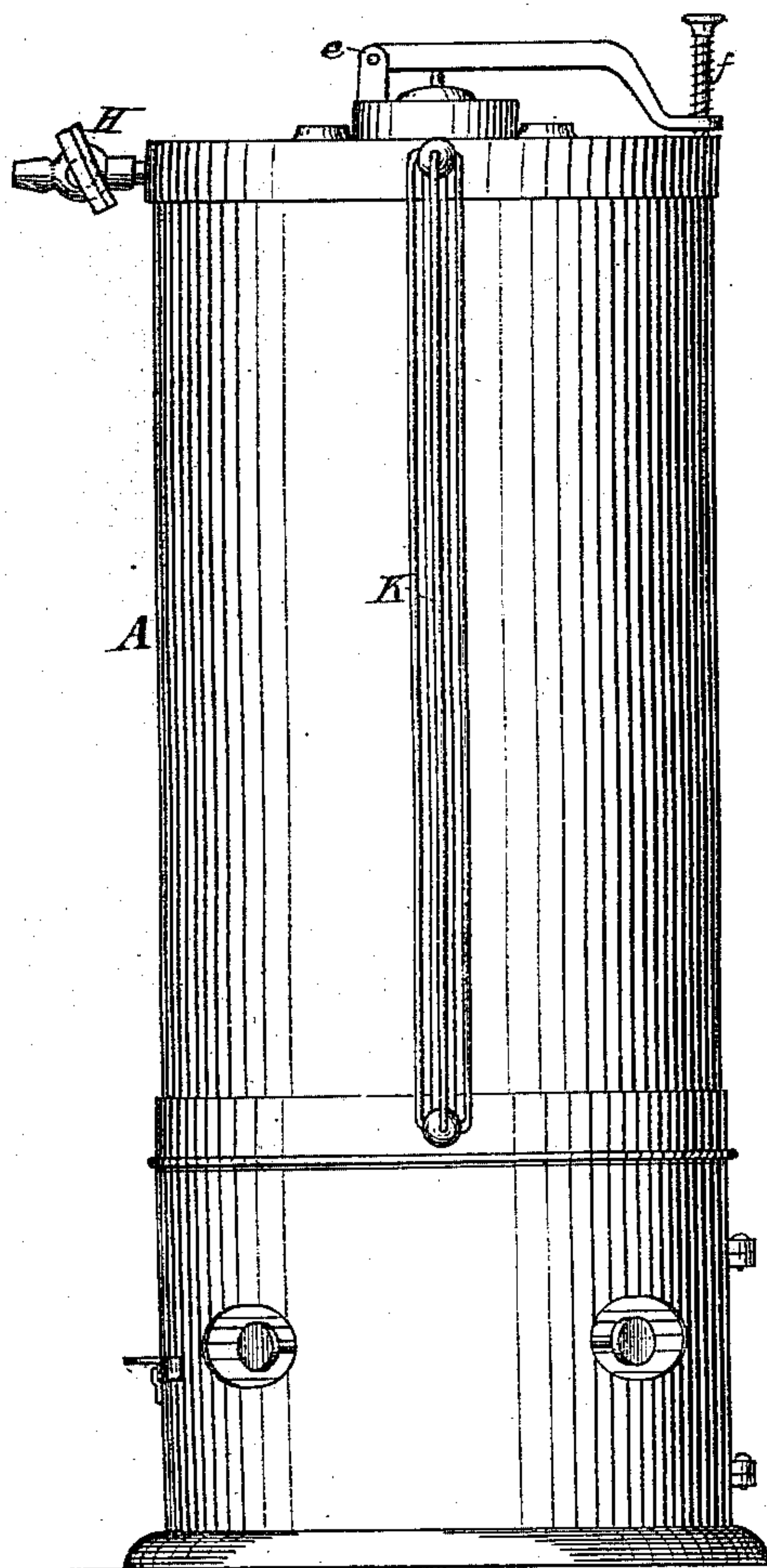
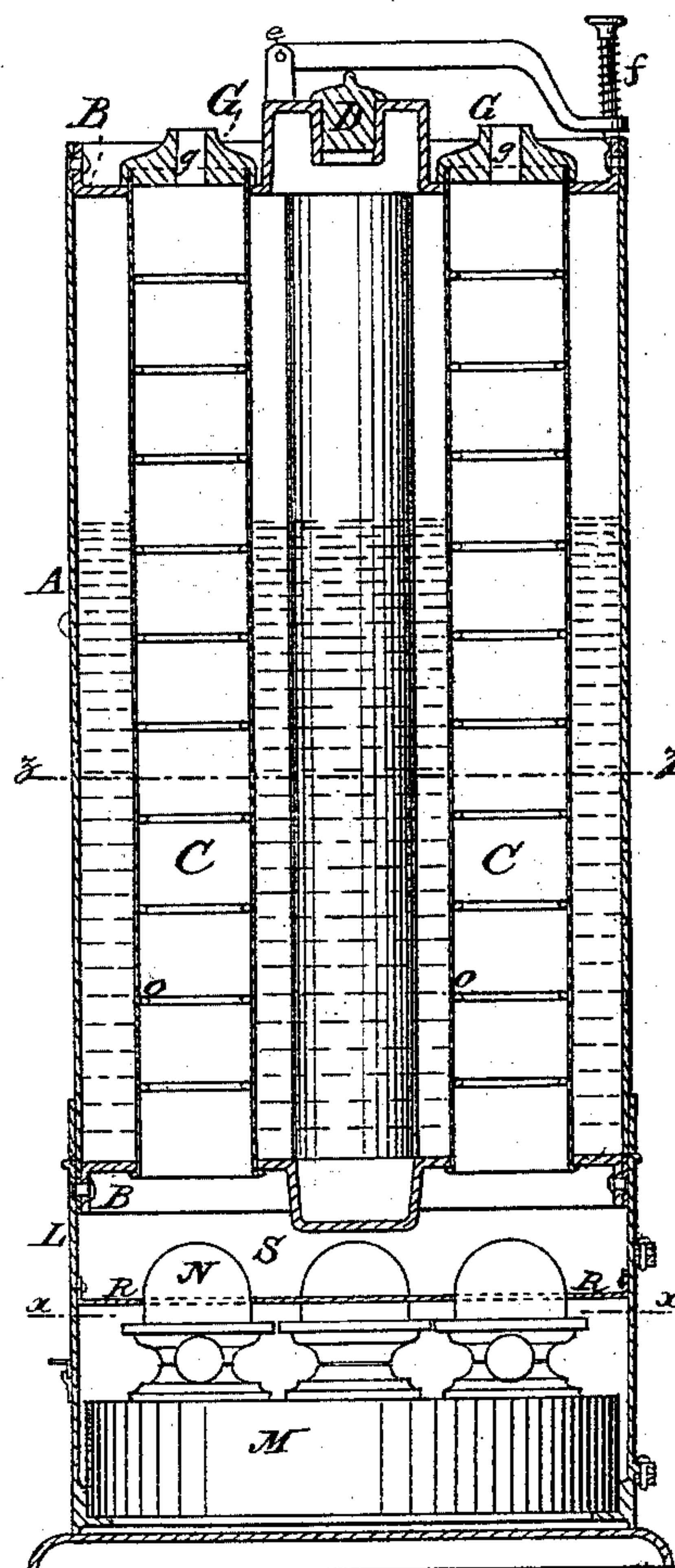


Fig. 2.



UNITED STATES PATENT OFFICE

EZRA NICHOLSON, OF CLEVELAND, OHIO, ASSIGNOR OF TWO-THIRDS OF HIS RIGHT TO CHAS. B. STILWELL AND JOHN J. CLAUSE, OF SAME PLACE.

IMPROVEMENT IN STEAM-BOILERS.

Specification forming part of Letters Patent No. 123,414, dated February 6, 1872.

SPECIFICATION.

Specification describing certain Improvements in Steam-Boilers, invented by EZRA NICHOLSON, of Cleveland, in the county of Cuyahoga and State of Ohio.

The first part of my invention relates to the combination of the flues of the boiler, the heads, and the shell in such a manner that the flues may be used as chimneys to ordinary coal-oil lamps; the object of this part of my invention being to use a cheap fuel for generating steam that requires no replenishing during running hours. The second part of my invention relates to the combination of the lamp, the boiler, and the fire-box or stand, upon which the boiler rests, so as to bring the heat from the flame of the lamps in contact with the flues and heating surface of the boiler in such manner as to utilize the greatest amount of heat and have perfect combustion in burning the oil.

Figure 1 is an exterior view of the boiler. Fig. 2 is a vertical section of the same. Fig. 3 is a top view of the same. Fig. 4 is a horizontal section through the line *z z* in Fig. 2. Fig. 5 is a view of the lower part or fire-box through the line *x x* in Fig. 2, showing the position of the lamps when the door is swung open.

A is the shell of the boiler, which may be made of any sheet metal strong enough to resist the required pressure. B B are the heads or flue sheets, made of any suitable metal—I prefer cast malleable iron—which are fastened in the ends of the shell by rivets, or in any suitable manner. C C C C are the flues, placed vertically inside the shell passing through and fastened to the heads. D is the safety-valve, which is similar to the safety-valves on ordinary steam-boilers, except that the valve-lever is so arranged as to be readily removed from the valve by withdrawing a small pin at *e* and swinging it to one side without disturbing the spring *f*. G G are small caps with openings *g* in them, placed at or near the top of the flues to decrease the size of the top opening of the flues. H is the steam-cock or throttle, by which is regulated the supply of steam to the engine. K is the water-gauge, which is a glass-tube so connected with the boiler as to show the height of the water in the boiler by

water in the tube. L is the fire-box or stand upon which the boiler rests, and may be made of any suitable material, and is so arranged that one side of it forms a door. M is the lamp, having one or more burners, N, as the case may require, and is so arranged in connection with the fire-box as to be swung from under the boiler by opening wide the door of the stand. I adapt my boiler to the use of coal-oil for fuel, burned in the ordinary lamp using the flues of the boiler as chimneys to the lamps. I construct the flues in such manner that when gas or a more expensive oil is used, as well as with the coal-oil, the heat is utilized to that extent that only a small quantity of the burning material need be used to generate sufficient steam for the purposes designed. I introduce a sufficient quantity of water into the boiler at one time to furnish steam to run the machinery, to which the power is applied, one-half of the usual working day or more, thus doing away with the ordinary pumping apparatus used to keep up the necessary supply of water, and, therefore, relieving the operator from that attention which such apparatus necessarily requires. By the use of coal-oil burned in the ordinary lamp I obtain a constant and uniform heat, and I am enabled to furnish fuel enough at one time to last eleven hours or more; and, therefore, my heating apparatus needs no attention during running hours. To utilize the greatest amount of heat the flues are made of thin sheet metal and are stayed or braced upon the inside by rings O O, as shown in Fig. 2, or their equivalents to resist the required pressure; but they may be made of sufficient thickness or rigidity to be used without the supporting rings. The boiler is raised somewhat above the burners of the lamp, and the burners are incased by a diaphragm, R, Fig. 2, in such manner as to form a hot-air chamber under the bottom of the boiler, thus obtaining more heating surface without interfering with the perfect combustion of the oil, and serving to protect the lamp from the heat; or, it may be placed lower down so that the flues rest upon the burners, similar to the glass-chimneys ordinarily used with the burners. To further aid the combustion of the oil the caps G G are placed at or near the top of the flues, but the flues may

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Lamp.

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Fig. 1.

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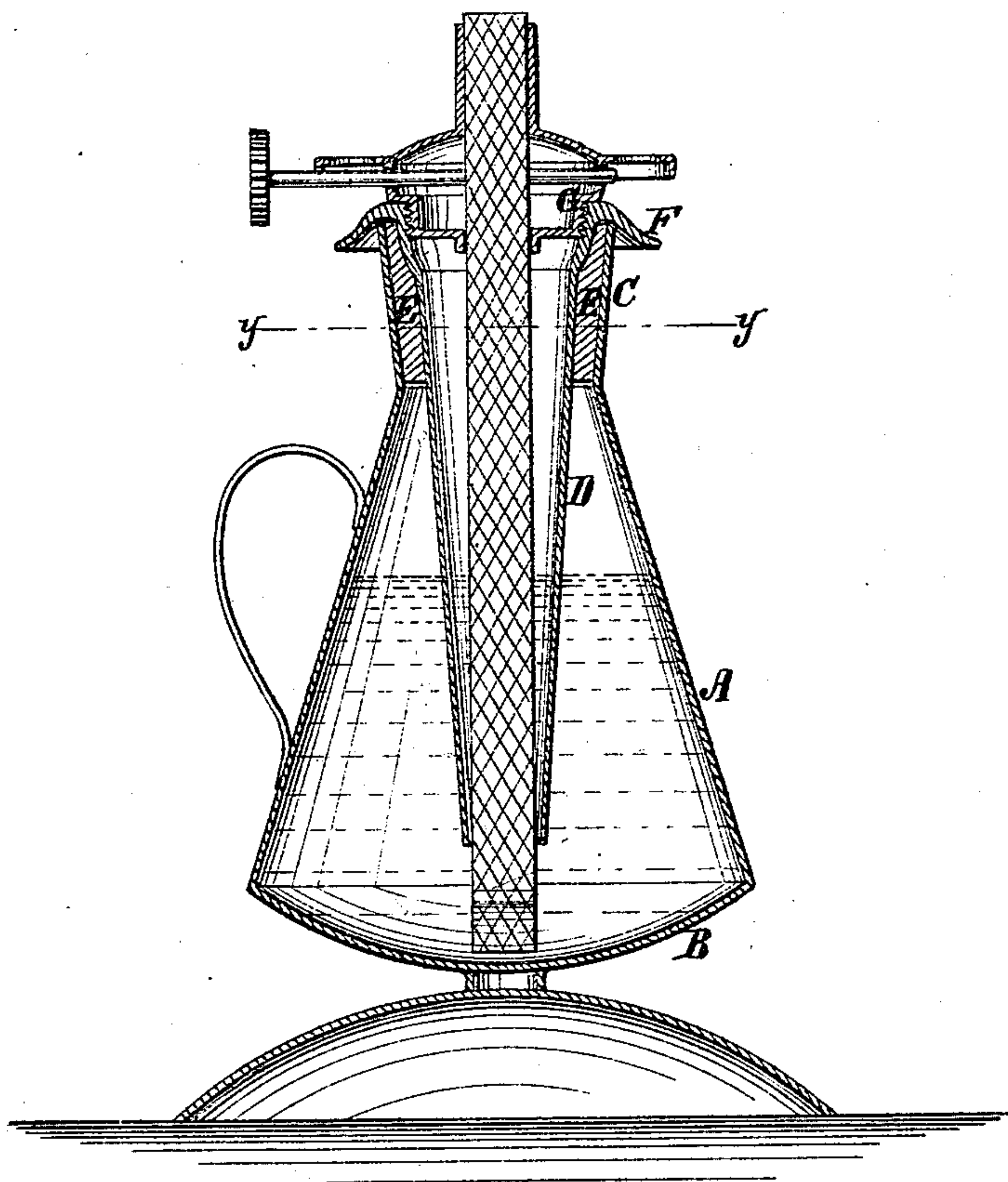
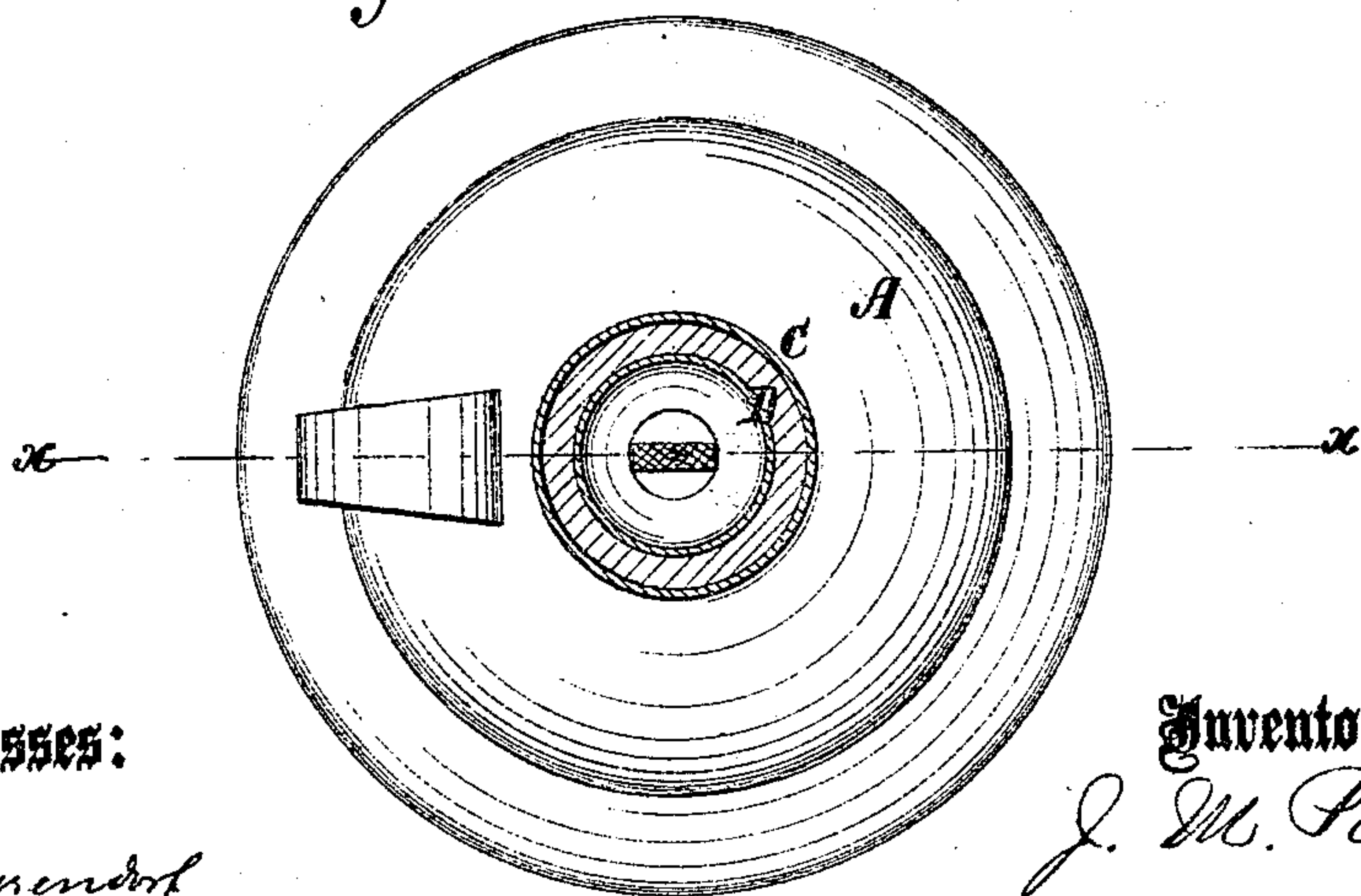


Fig. 2.



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