

(No Model.)

T. S. & J. E. STEWART.

DEVICE FOR WATERING COKE IN OVENS.

No. 373,417.

Patented Nov. 15, 1887.

Fig. 1.

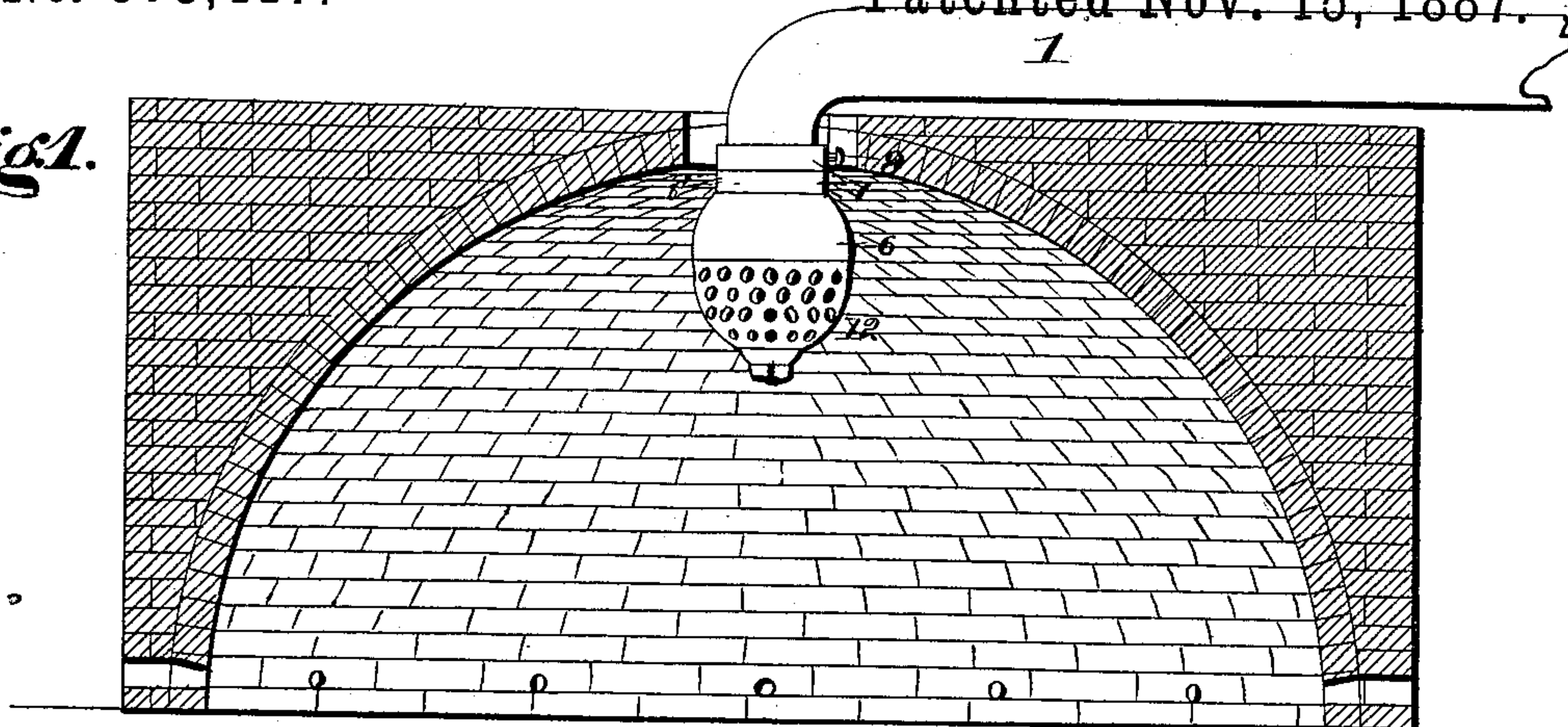


Fig. 2.

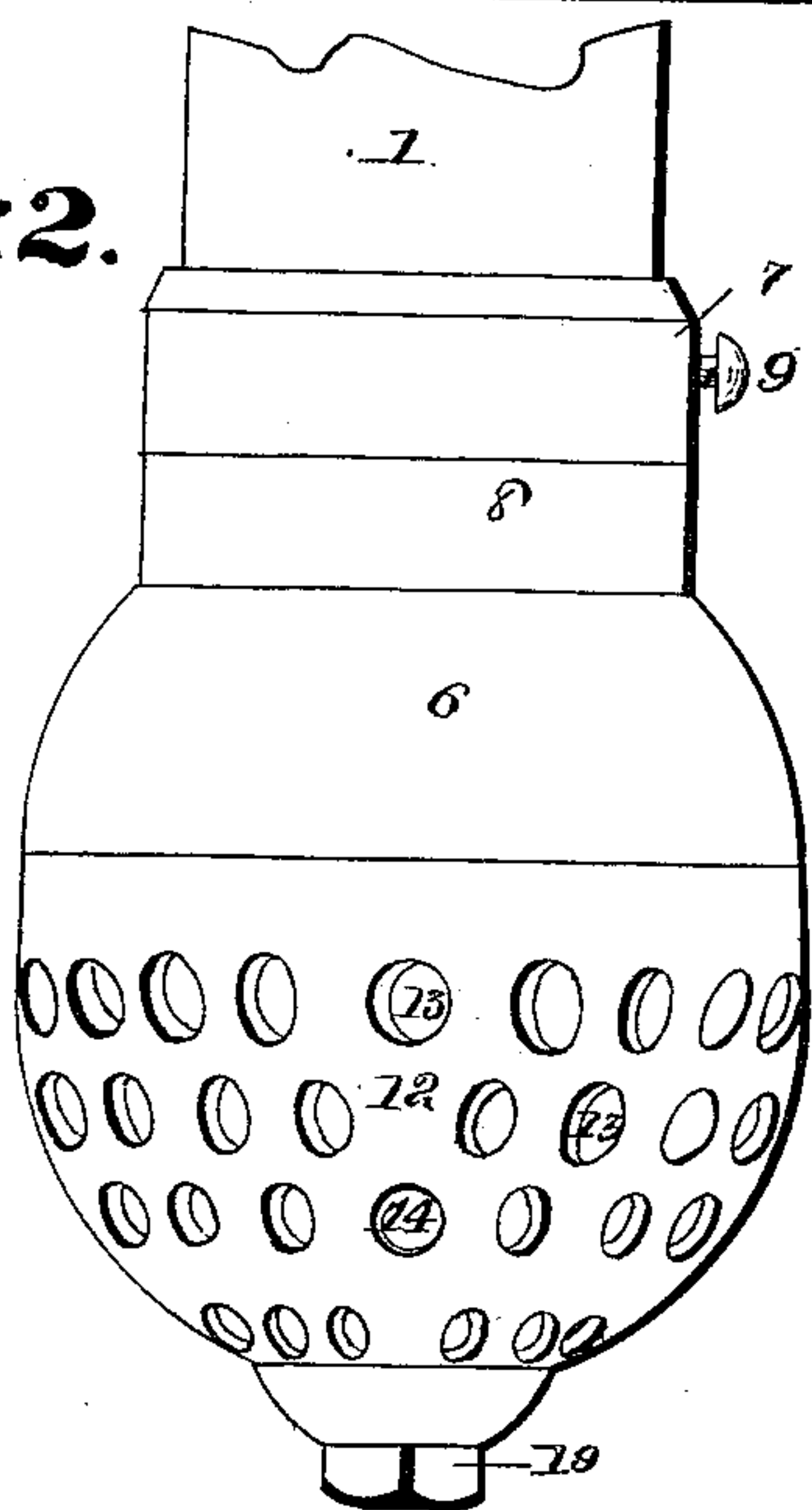


Fig. 3.

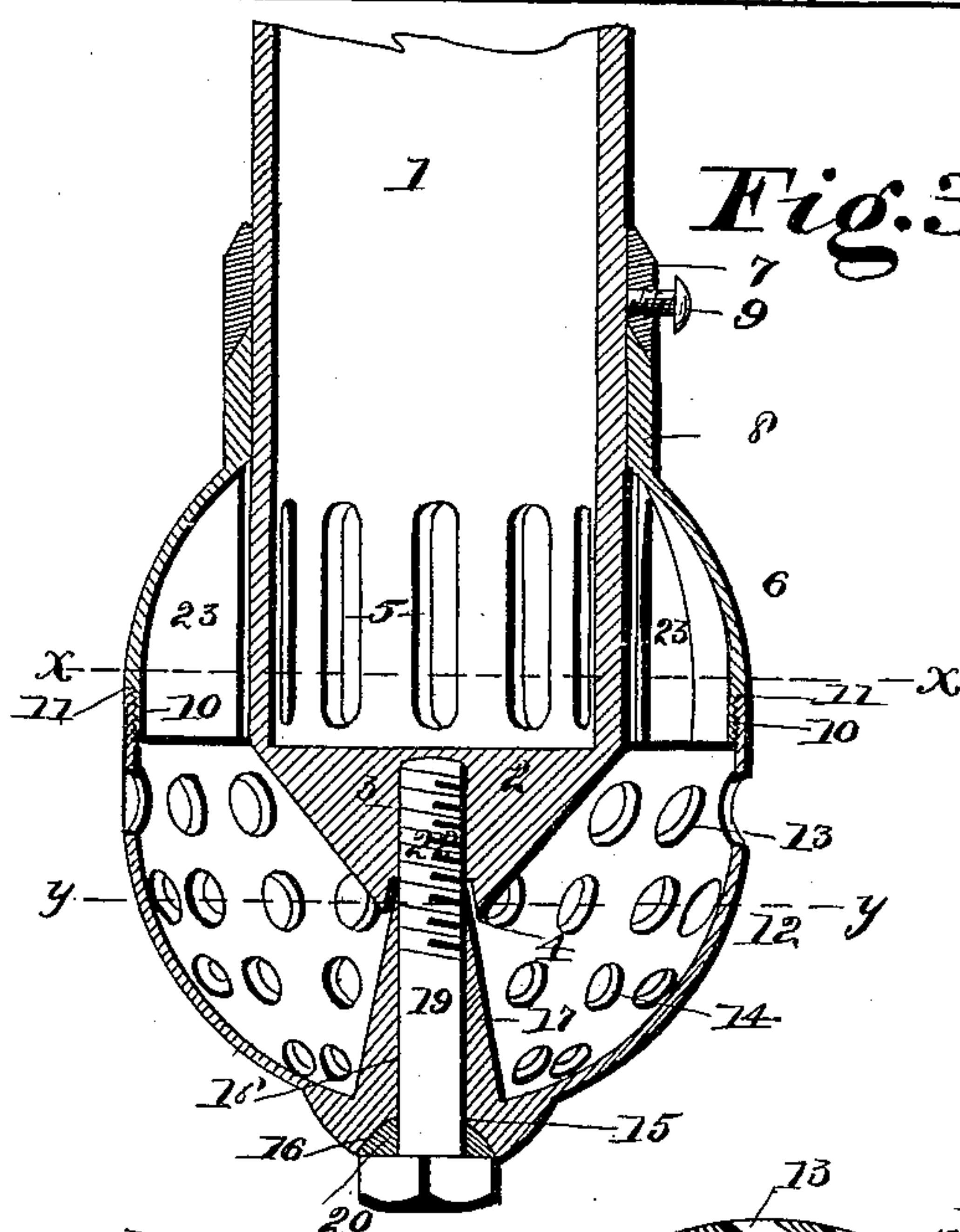


Fig. 4.

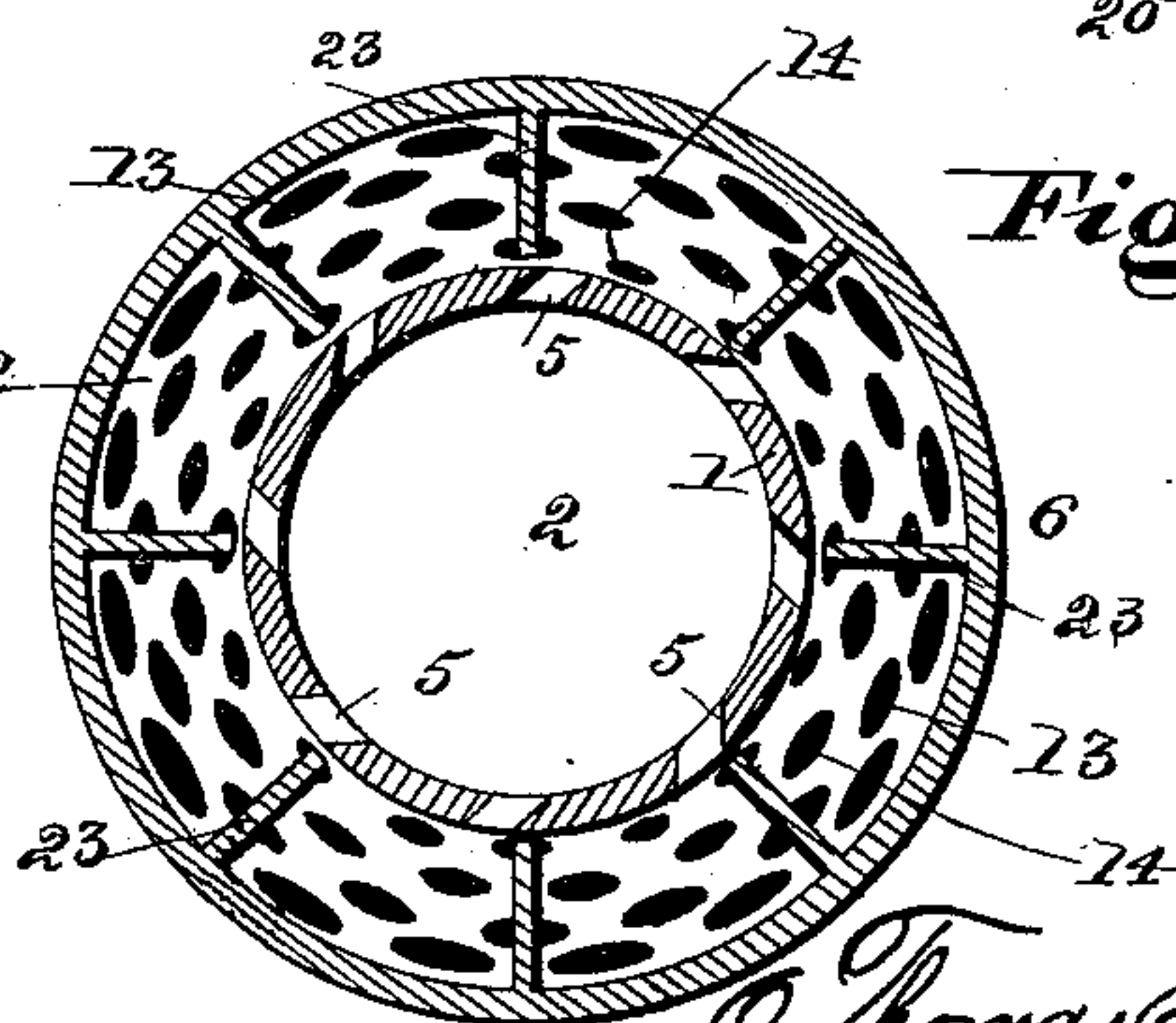
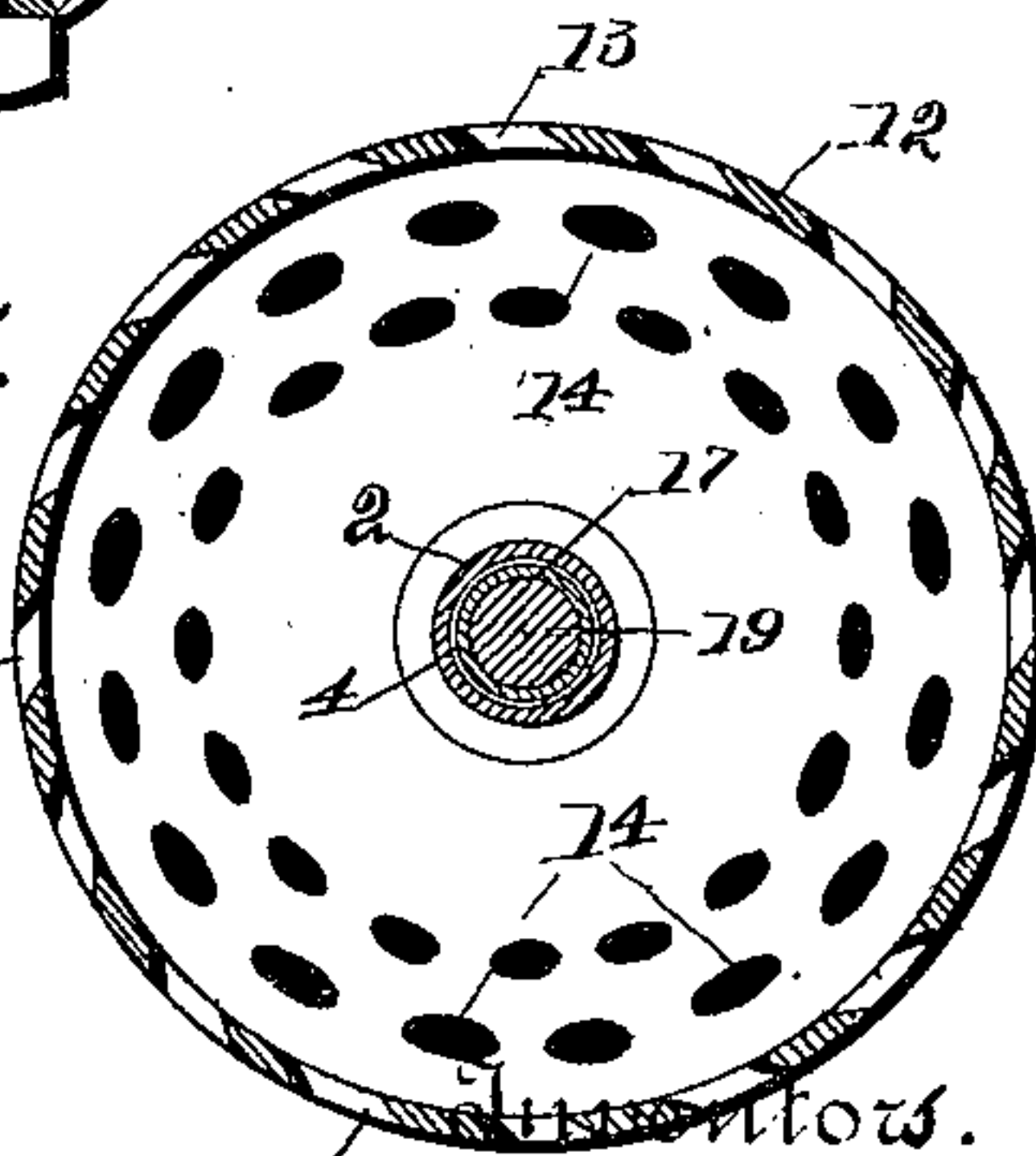


Fig. 5.



Witnesses

F. L. Ourand

B. G. Coof.

Thomas S. Stewart and  
James E. Stewart,  
By their Attorneys  
Louis R. Rager & Co.



# UNITED STATES PATENT OFFICE.

THOMAS SCOTT STEWART AND JAMES ELDER STEWART, OF SALTSBURG,  
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## DEVICE FOR WATERING COKE IN OVENS.

SPECIFICATION forming part of Letters Patent No. 373,417, dated November 15, 1887.

Application filed January 24, 1887. Serial No. 225,313. (No model.)

*To all whom it may concern:*

Be it known that we, THOMAS SCOTT STEWART and JAMES ELDER STEWART, both residents of Saltsburg, in the county of Indiana and State of Pennsylvania, have invented certain new and useful Improvements in Devices for Watering Coke in Ovens; and we do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a sectional view of a coke-oven, showing our improved device for sprinkling water over the coke in operation. Fig. 2 is a view on an enlarged scale of the device. Fig. 3 is a vertical sectional view of the device. Fig. 4 is a horizontal sectional view on line *x x*, Fig. 3; and Fig. 5 is a similar view on line *y y*, Fig. 3.

Similar numerals of reference indicate corresponding parts in all the figures.

Our invention has relation to revolving sprinkling-nozzles, especially to such nozzles employed for the purpose of sprinkling water into coke-ovens for the purpose of putting out the fire in the coal being converted into coke; and it consists in the improved construction and combination of parts of such a device, as hereinafter more fully described and claimed.

In the accompanying drawings, the numeral 1 indicates the supply-pipe, the lower end, 2, of which is conical and solid and formed with a screw-threaded bore, 3, starting from the apex, and formed with a smooth and upwardly-tapering lower portion, 4. The portion of the supply-pipe immediately above the solid end is formed with oblique vertical slots or apertures 5, having their sides at angles to the radii of the pipe and inclined in the same direction, so that water forced through the pipe will pass out through the apertures in oblique streams and in the same direction. A rounded upper bulb portion, 6, is formed with a neck, 8, fitting and turning upon the supply-pipe, and having the upper edge beveled outward and fitting under a correspondingly-beveled collar, 7, secured to the pipe by

means of a set-screw, 9, and the lower edge of the bulb portion is formed with a screw-threaded flange, 10, and an outwardly-projecting downwardly-facing shoulder, 11.

The rounded lower bulb portion, 12, is screwed to the screw-threaded flange of the upper bulb portion, and is formed with a number of perforations, the upper and larger perforations, 13, being preferably oblique and pointing in the opposite direction to the slant of the slots in the supply-pipe, while the lower and smaller perforations, 14, are preferably straight radiating. The lower end of the lower bulb portion is formed with a concave bearing and with a perforation, respectively numbered 15 and 16, and a cone, 17, having an axial bore, 18, projects from the concave bearing and has its upper end fitting into the tapering portion of the bore in the conical solid end of the supply-pipe.

A bolt, 19, has a convex washer, 20, upon its lower headed end, the washer being supported by the head, and the bolt passes up through the bore in the cone of the bulb and fits with its upper screw-threaded end, 22, in the bore of the solid end of the supply-pipe, securing the bulb upon the supply-pipe and allowing it to revolve upon the same.

The upper bulb portion is formed with radiating blades or paddles 23, having their inner edges bearing against the side of the supply-pipe, and as the oblique jets of water passing through the supply-pipe and out through the oblique slots in the same strike the said vanes or paddles the bulb or nozzle will be revolved. The water passing from the oblique slots into the bulb or nozzle will pass out through the apertures in the same; and in passing out through the oblique apertures the jets of water will aid in revolving the bulb or nozzle, so that the jets passing out through the nozzle will be thrown outward and be finely divided, throwing a spray in all directions.

The perforations in the bulb or nozzle diminish in size or may diminish in size and number, or only in number, from the top downward in proportion to the amount of water required for each circle or circular area of glowing and burning coal covered by the spray, the outer jets having larger areas to cover and



having farther to reach, being either thicker in diameter, caused by the increased size of the perforations in the upper portion or by the increased number of the same, so that the surface of glowing or burning coal will receive an even spray at all portions of it.

It will be seen that as the bearing-surfaces of the bulb or nozzle and of the supply-pipe become worn the bolt in the lower end of the bulb or nozzle may be screwed up in the end of the supply-pipe, drawing the cone up into the tapering portion of the bore in the solid end of the supply-pipe, and the beveled upper edge of the neck of the upper bulb portion will be forced against the beveled edge of the collar, so that all portions will continually wear themselves into a seat and all joints will remain tight.

This device is principally intended for the purpose of putting out the fire in coals in coke-retorts, the nozzle being inserted as shown in Fig. 1, the spray formed by the nozzle being so finely divided that it will reach all portions of the glowing coal and perfectly put out the fire in the same; but it is evident that the device may be used for any other sprinkling purposes by simply attaching the nozzle to a suitable supply.

The perforations in the bulb or nozzle may be of different sizes and may be arranged in different patterns, according to the quantity of water desired to be distributed and according to the character of the spray desired.

Having thus described our invention, we claim and desire to secure by Letters Patent of the United States—

1. In a sprinkling or spraying device, the combination of a slotted supply-pipe the lower end of which is solid and conical, said solid portion being provided with a recess, the upper portion of which is screw-threaded and

the lower portion is smooth and tapering, a bulb the lower portion of which is perforated and provided with a cone, the upper end of which engages with the lower portion of said perforation in the end of the pipe, said cone being provided with an axial bore, and a bolt for securing said bulb to said supply-pipe.

2. In a sprinkling or spraying device, the combination of a supply-pipe having a closed conical end formed with an axial screw-threaded bore having a flaring and smooth lower portion, and having oblique slots or apertures in the lower portion, an upper bulb portion having a neck fitting upon the pipe and formed with a beveled upper edge and having vanes or paddles upon the inner sides registering with the slots in the pipe, a collar upon the pipe having a beveled lower edge fitting over the edge of the neck, a lower bulb portion screwed to the upper portion and having upper oblique perforations and lower straight perforations, and having a conical sleeve projecting from its bottom and fitting with its upper end in the flaring bore of the solid end of the supply-pipe, a bolt passing up through the conical sleeve and fitting with its screw-threaded end in the screw-threaded bore in the solid end of the supply-pipe, and a convex washer upon the lower headed end of the bolt and bearing against a concave bearing in the lower end of the bulb or nozzle, as and for the purpose shown and set forth.

In testimony that we claim the foregoing as our own we have hereunto affixed our signatures in presence of two witnesses.

THOMAS SCOTT STEWART.  
JAMES ELDER STEWART.

Witnesses:

J. C. MOORE,  
IRA C. EWING.