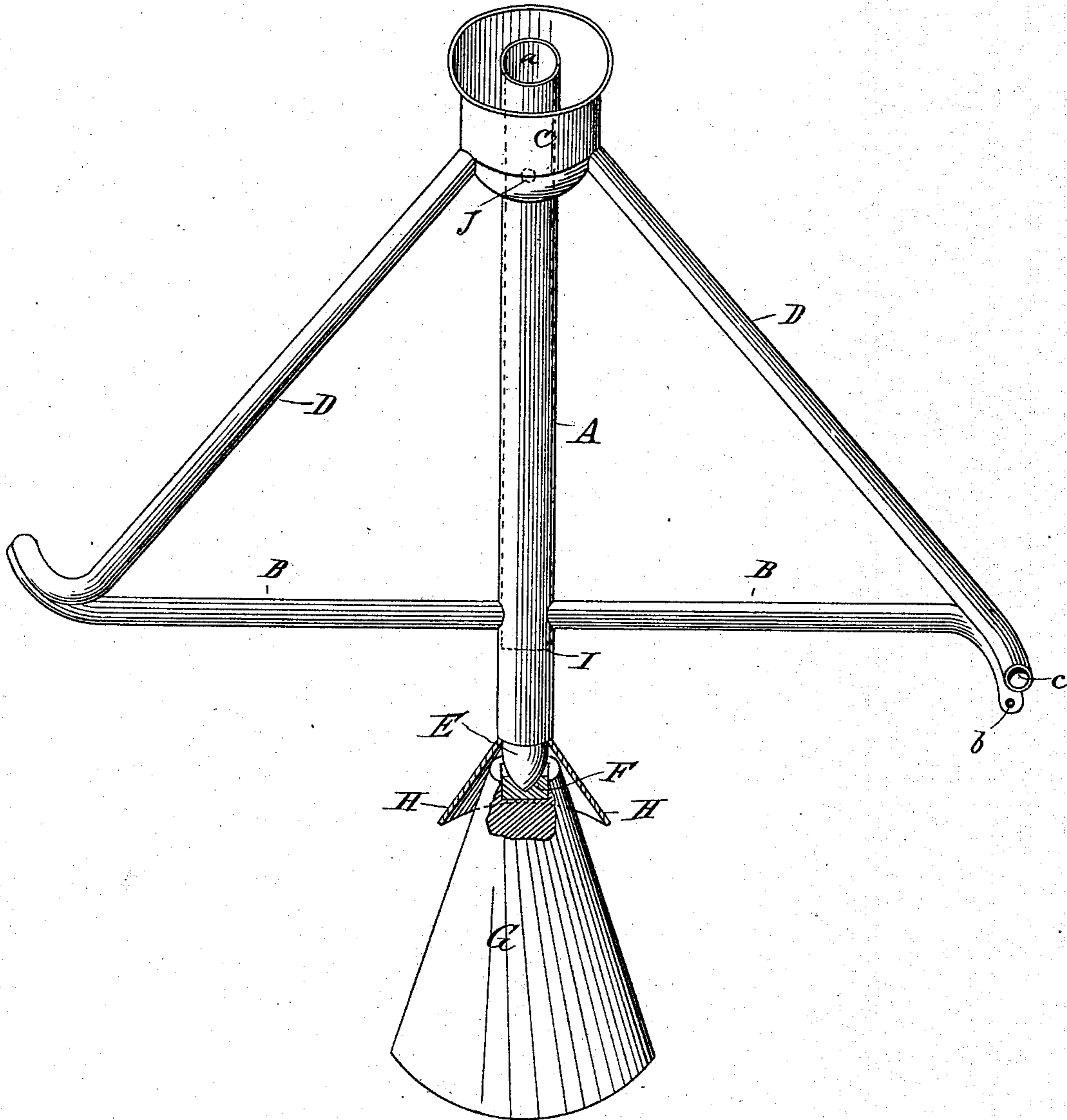


(No Model.)

S. FRAZIER.
SULPHURIC ACID DISTRIBUTER.

No. 388,406.

Patented Aug. 28, 1888.



WITNESSES:

W. Benjamin,
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BY
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UNITED STATES PATENT OFFICE.

SCHUYLER FRAZIER, OF NATRONA, PENNSYLVANIA.

SULPHURIC-ACID DISTRIBUTER.

SPECIFICATION forming part of Letters Patent No. 388,406, dated August 28, 1888.

Application filed February 10, 1887. Serial No. 227,138. (No model.)

To all whom it may concern:

Be it known that I, SCHUYLER FRAZIER, a citizen of the United States, residing at Natrona, in the State of Pennsylvania, have invented a new and useful Improvement in Sulphuric-Acid Distributers, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to that device used in the manufacture of sulphuric acid for the purpose of distributing the acid uniformly over a perforated plate forming the top of denitrating and concentrating towers, and known to the trade as a "distributer" or "yankee."

Distributers have heretofore been usually made of glass, in the form and acting on the principle of that device described in the treatises on natural philosophy as "Barker's Mill."

Aside from liability to breakage and impossibility of repair, they present many practical disadvantages. The distributer must be adapted to the quantity of acid supply, a different distributer being required with each material variance of the quantity of the acid at the time supplied to the tower. Otherwise the distributer will either fail to revolve or it will overflow. In either case it fails to serve its purpose. Again, a deposit of sulphate of lead and iron soon clogs the glass distributer and renders it useless, which deposit cannot practically be removed; also, the lower bearing of such distributers is not so protected from the acid as to admit of lubrication. Consequently the longer the distributer is used the greater becomes the friction at that point from wear and the more imperfectly it performs its duty.

My invention is intended to meet and overcome these objections.

The drawing forming part of the specification shows an elevation of my distributer, partly in section.

It consists of a perpendicular tube, A, provided with two horizontal tubular arms, B, bent at their free extremities in reverse directions in a horizontal plane, each of which free ends is provided with a small opening, *b*, for the discharge of the acid. The upper portion of the perpendicular tube A is provided with a surrounding basin, C, from which lead two tubes, D, bent at their free ends and provided

with discharge apertures *c*, as already described in reference to the free ends of the horizontal tubes B.

The apertures *b* in the free ends of the horizontal tubes B should be of such size as to discharge the minimum quantity of acid which will properly rotate the distributer. The apertures *c* should be larger and of sufficient size to discharge the maximum supply which the distributer may be called on to dispose of.

With the upright tube A twelve inches long and one and one-eighth inch bore, and the arms B and D of half an inch bore, I have found an aperture of three-sixteenths of an inch for the openings *b* and of one-half inch for the openings *c* to answer well in practice. The lower extremity of the perpendicular tube A terminates in a hard-metal pivot, E, which rests in a suitable hard-metal bearing, F, embedded in and supported by a standard, G, composed of lead or any other non-corrosive material. An acid-proof diaphragm, I, above the pivot E protects the latter from the acid within the tube A. A shield, H, (shown in section,) of non-corrosive material protects the bearings from any acid which may slop over from above. By raising the distributer the bearings may readily be lubricated, while the lubricant is protected from the acid by the shield H.

I prefer to make my distributer of lead, since it can then be repaired by any plumber, and can readily be freed from any interior deposit likely to occur by forcing steam through it without danger of breakage, as is not the case when glass is used.

It is well to perforate the upper part of the tube A within and near the bottom of the basin C, as at J, so that when the supply of acid exceeds the discharge-capacity of the smaller openings *b* the surplus may find its way into the basin C without necessarily overflowing the top of the perpendicular tube A.

The upper portion of the tube A may be supported in the usual or in any other convenient manner.

My invention operates as follows: The bearings of my distributer having been properly lubricated, the acid is introduced into the upright tube A at its top *a*, filling the body of that tube and the arms B and escaping at the apertures *b*. This causes the distributer to

revolve on the pivot E, thus scattering the acid uniformly over the perforated plate forming the top of the tower, upon which the distributor stands. Should the supply of acid exceed the discharge power of the openings *b* the surplus will overflow into the basin C or escape into it through suitable openings in that part of the tube A which is within the basin, if such openings have been provided. The surplus then flows from the basin C through the arms D and finds exit at the openings *c*. It is obvious the discharge capacity of the tubes D can be increased to any extent by enlarging the bore of those tubes or by increasing their number. Thus as long as the distributor receives acid enough to make it revolve properly the manufacturer need give it no further care.

It is also clear that my distributor may be used wherever in the arts any analogous distribution of liquids may be required, and that the upright tube A may be provided with two or more basins like C provided with discharge-tubes should liquids of two or more different kinds require to be distributed or mixed together at the same time.

Having thus described my invention, what I claim as new, and desire to patent, is—

1. The combination of a supply-tube, outlet-pipes from said supply-tube, and having a reduced opening, and overflow-pipes connected with the supply-tube and having a different-sized opening from the opening in said outlet-pipes, substantially as described.

2. The combination of a supply-tube having an overflow reservoir or basin, outlet-tubes connected with the supply-tube, and overflow-tubes connected with the reservoir, substantially as described.

3. The combination of a standard, G, a supply-pipe having a bearing in the standard G, acid-throwing arms in said supply-pipe, and a shield interposed between the arms and the step, substantially as described.

In testimony that I claim the foregoing improvement in sulphuric-acid distributors, as above described, I have hereunto set my hand this 31st day of December, 1886.

SCHUYLER FRAZIER.

Witnesses:

HUBERT R. JOHNSON,
G. W. MEEK.