

R. MACLAURIN.
GAS SCRUBBER.
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1,158,066.

Patented Oct. 26, 1915.

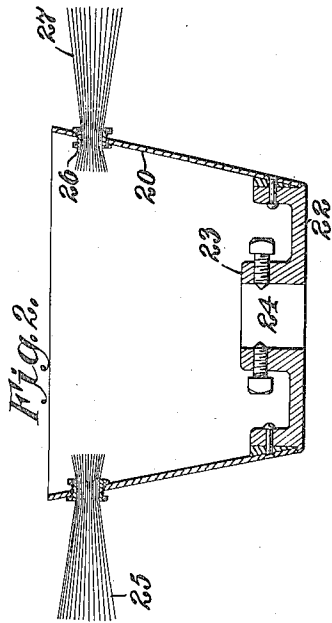


Fig. 2.

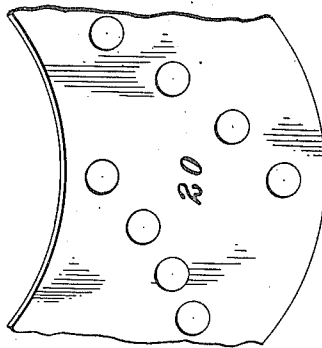
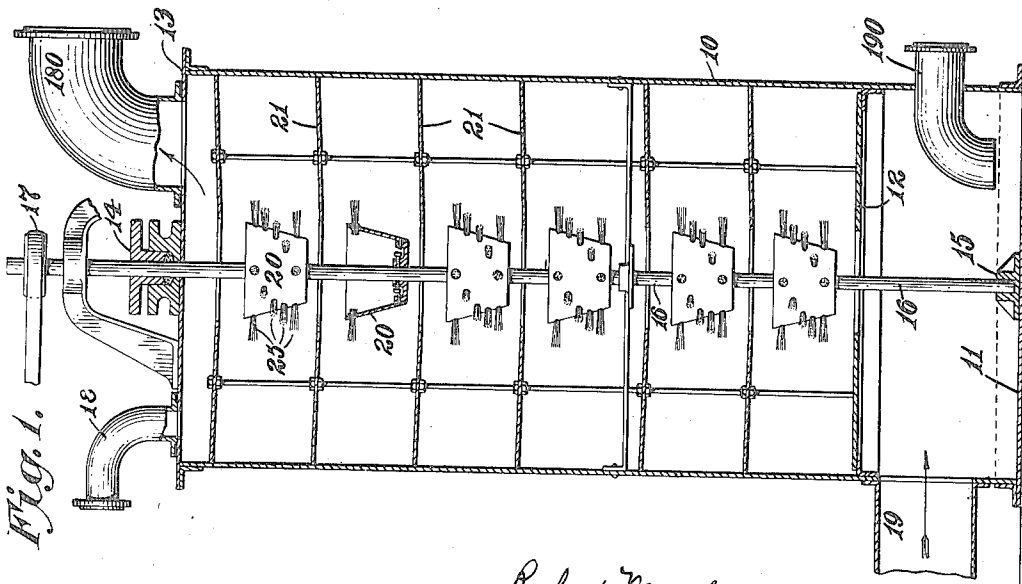


Fig. 1.

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by William R. Bond
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UNITED STATES PATENT OFFICE.

ROBERT MACLAURIN, OF STIRLING, SCOTLAND.

GAS-SCRUBBER.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROBERT MACLAURIN, a subject of the King of Great Britain and Ireland, residing at Stirling, in the county of Stirling, Scotland, have invented certain new and useful Improvements in Gas-Scrubbers, of which the following is a specification.

This invention relates to an apparatus for the scrubbing of gases containing constituents soluble in water or other fluids or condensable or capable of being deposited therein.

As is already well known, the efficiency of such a device depends upon the degree of intimate contact between the gases treated and the scrubbing liquid, and it is also well known that a violent impact of the gases and liquids against proper barriers materially assists in stripping the gases of their undesirable contents. Certain difficulties arise in obtaining a fine spray of liquid impacting at a high velocity, because rapidly moving blades, disks or cones all send off liquids practically in one or two planes or sheets under the influence of the centrifugal forces present, and therefore in order to insure efficiency, a great multiplication of parts is required.

The purpose of my invention is to overcome the difficulties stated by discharging the liquids from central positions outwardly within the vessel in which the operations take place in a peculiar manner and by the peculiar mechanism hereinafter described.

In the drawings, Figure 1 is a vertical central section through an apparatus embodying my invention; Fig. 2 is an enlarged detail of one of the liquid containing vessels, the same being in section; and Fig. 3 is a diagram illustrating the arrangement of the brushes as they appear when the vessel equipped with them is viewed from the outside.

In the drawings, Fig. 1, there is illustrated a casing indicated at 10, provided with a bottom 11, an intermediate false bottom or horizontal partition 12, and a top 13, all made of suitable material, and secured together in any proper manner known to engineering practice. Above the top and the bottom, if desired, are arranged bearings indicated respectively at 14 and 15, in which there is arranged to be rotated a vertical shaft 16, receiving its energy from a pulley indicated at 17 (or by any other suit-

able power transmitting mechanism) from a source of power not shown.

Arranged above the casing is an inlet conduit for the liquid indicated at 18 and an outlet for the gas indicated at 180, and at the bottom of the casing is an inlet conduit for the gas indicated at 19 and an outlet for the liquid indicated at 190.

Arranged in vertical succession along the shaft 16 are vessels indicated at 20, so secured to the shaft that as it is rotated they are each rotated in a horizontal plane. Also arranged in vertical succession within the casing are a series of horizontally disposed annular dish shaped plates indicated at 21 which may be provided with apertures to facilitate the passage of the gases as hereafter described. Each of the vessels 20 is open at the top and provided with a bottom 22 having an upstanding annular flange 23 surrounding a central opening 24 to permit of the passage of the vertical shaft 16. The sides of each of these vessels are provided with a series of brushes 25 the arrangement of which is shown best in Fig. 3. Each brush comprises a socket member 26 with projecting bristles indicated at 27, the bristles as a whole having a flaring or substantially conical shape.

The operation of the apparatus is as follows. The liquid enters at the top through the conduit 18 and flows down upon one of the plates 21, and owing to the shape of such plate flows toward the center thereof and into the uppermost vessel 20 of the series. It will be understood that this vessel is being rapidly revolved by the rotation of the central shaft. Falling into the vessel, the liquid is thrown toward its sides by the centrifugal force of its rotation, and contacting with the inner ends of the brush members, flows along such brush members and is thrown in a fine spray therefrom in every direction, owing to the flaring shape of the brushes and their arrangement around the vessel. The particles or drops of liquid are thus caused violently to impact against the shell or wall of the apparatus, and fall by gravity toward the next plate 21 of the series and flowing toward its center fall into the second vessel. The liquid collected therein is then thrown out and dispersed therefrom and impacted against the walls of the apparatus as before. This operation is repeated with each plate and vessel until the bottom of the apparatus is reached

where the liquid is drawn off by any suitable means in any suitable way, as the outlet 190. In the meantime, the gas to be scrubbed has entered the apparatus at the bottom, and rises up through the apparatus and comes into contact with the first of the revolving vessels at the bottom of the series, and striking the brushes and revolving parts, receives a swirling motion, and is thrown against the sides, thus being brought into most intimate contact with the washing liquid, as it violently impacts upon the sides of the containing vessel. The ascending column of gas meets each vessel and its projecting brushes in turn and is thereby given a long travel through a mist of liquid and by the time it has reached the top of the apparatus has parted with its undesirable constituents.

It is obvious that the number of vessels and the dimensions of the apparatus can be varied to suit the exigencies of the situation, and depend upon the quantity of deleterious materials to be removed from the gas treated, the nature of the scrubbing fluid, and other conditions which are well known to

those skilled in the art. It is also obvious that the particular shape of the vessels employed, their dimensions, the number and size of the collection plates, the material, number and size of the brushes and other elements of the construction of the apparatus may be varied without departing from the principle of the invention.

I claim:

A gas scrubber comprising a vertical casing, with dividing partitions, a series of small vessels disposed in vertical succession therein, and adapted to be rapidly horizontally rotated in unison, each vessel being provided with brushes having short flaring bristles communicating with the interior of the vessels, and means for supplying a scrubbing liquid at the top of the casing, and gas to be scrubbed at the bottom of the casing.

In testimony whereof I affix my signature in presence of two witnesses.

ROBERT MACLAURIN.

Witnesses:

FRED MIDDLETON,
W. WALDO WELLER.