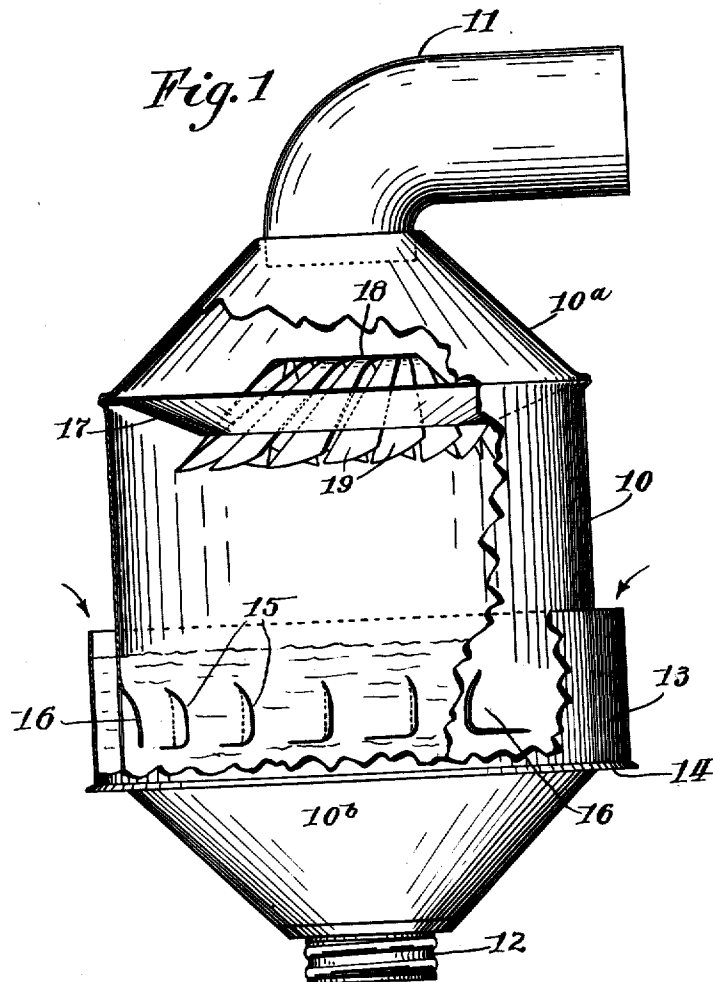
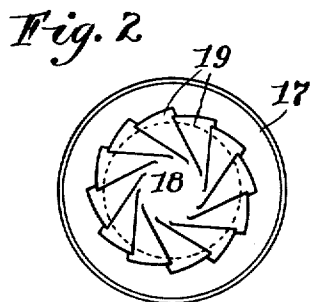


W. H. L. DONALDSON.
AIR WASHER.
APPLICATION FILED NOV. 3, 1919.

Patented Aug. 17, 1920.

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his att'y.

UNITED STATES PATENT OFFICE.

WILLIAM H. L. DONALDSON, OF ST. PAUL, MINNESOTA.

AIR-WASHER.

1,349,608.

Specification of Letters Patent.

Patented Aug. 17, 1920.

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To all whom it may concern:

Be it known that I, WILLIAM H. L. DONALDSON, a citizen of the United States, residing at 988 Cromwell avenue, St. Paul, in the county of Ramsey and State of Minnesota, have invented new and useful Improvements in Air-Washers, of which the following is a specification.

My invention relates to improvements in
10 air washers.

The object of my invention is to provide a device which shall remove the dust from air entering an internal combustion engine by passing the same through a body of
15 water.

A further object of the invention is to provide such washer in simple and compact form and capable of efficiently cleaning the air admitted through the carbureter to such
20 engine.

In the drawings Figure I is an elevation of my air washer, with a part of the casing broken away to show the internal arrangement of parts, and Fig. II is a plan of the
25 baffle used in my washer for removing an excess of free moisture from the air before it passes to the carbureter.

In the drawings the numeral 10 indicates the cylindrical casing of my air washer
30 which is preferably formed with a tapered top 10^a and bottom 10^b, the top 10^a being provided with an elbow 11 adapted to be connected with the carbureter of a gas engine, and the bottom 10^b being supplied with
35 an ordinary screw cap 12, to facilitate draining and cleaning the washer, at the lower end of the conical portion 10^b of the casing, I surround the lower part of the cylindrical portion of the casing with a sleeve 13, which
40 is crimped at its base upon an annular flange 14 extending horizontally from outside the base of the cylindrical portion of the casing 10. The sleeve 13 thus forms an annular water-tight receptacle, open at the top,
45 outside the casing 10 to receive the liquid used in the washer and also to form the intake for the air entering the casing as hereinafter described. The periphery of the casing within the sleeve 13 is provided
50 with a plurality of ports 15 formed by cutting the sheet metal constituting the casing and turning in the flanges thus produced on curved lines to furnish spoon shaped guides 16 directed tangentially into the interior of
55 the casing, said ports 15 being designed to permit the free passage of liquid between

the annular receptacle within the sleeve 13 and the interior of the casing, and also to allow ingress of the air as hereinafter described, the form of the flanges 16 being
60 particularly adapted to give the desired whirling or centrifugal motion to the air as it enters the casing.

At the base of the tapered top 10^a of the casing I attach an inwardly directed and
65 downwardly slanting annular flange 17 which forms a peripheral baffle for ascending air and a dam for liquid or spray which is thrown upward in the operation of the washer. A disk 18 is centrally arranged be-
70 low the intake of the elbow 11 and above the inner edge of the annular flange 17. Surrounding the circumference of this disk, and preferably cut from the same sheet of metal, I form a plurality of downwardly
75 directed peripheral guard blades 19, which are arranged as a whirl of louver boards, and, as viewed from below, overlap each other. The lower ends of these guard
80 blades extend below and beyond the lower edge of the flange 17, a point on the outer edge of each blade being attached to the inner edge of the flange 17 by any suitable means, such as solder. It will thus be ap-
85 parent that the disk 18 with the attached blades 19 present to upwardly moving air and moisture a series of surfaces against which said air must impinge, and upon
90 which the free moisture in the air is deposited so that it will be excluded from the entrance to the elbow 11 and fall by gravity into the lower part of the casing 10, which is filled with liquid such as water or oil to a level near the top of the sleeve 13.

In operation the pulsating suction pro-
95 duced in the carbureter by the movement of the pistons of the gas engine draws air into the receptacle formed by the sleeve 13, as indicated by the arrows in Fig. I, and said air passing into the casing through the
100 liquid by way of the ports 15 in a tangential direction causes the liquid to whirl and absorb the solid impurities in the air, which then tend to settle by gravity into the base
105 10^b of the casing, while the purified air laden with considerable moisture is drawn upwardly and toward the center of the casing against the blades 19, upon the lower surfaces of which the surplus moisture is deposited to drip into the main body of
110 liquid, while the relatively drier air continues its upward course around the disk 18

and between the blades 19 to be drawn into the carbureter through the elbow 11. By these means all objectionable excess of moisture is removed from the air passing into the elbow 11. The body of liquid which is thrown outwardly and upwardly by the movement of the air impinges against the flange 17, and thence falls back into the body of liquid in the base of the casing.

10 I have found that the whirling movement given to the liquid by the rapidly entering tangential currents of air produces an action much like that of a gyroscope, and consequently when the motor driven vehicle to
15 which the washer is attached moves over broken or uneven ground so that the washer is tipped out of plumb the revolution of the liquid is so rapid that it does not spill out of the opening at the top of the sleeve 13.

20 Having described my invention what I claim as new and desire to protect by Letters Patent is:

1. An air washer for internal combustion engines comprising a casing adapted to hold
25 liquid in its base, an annular sleeve sur-

rounding the lower part of the casing and adapted to receive liquid, a series of ports in the casing within said sleeve, a series of curved tangential guides formed in the casing and adapted to direct the liquid in the casing centrifugally and an air conduit opening from the top of the casing to the intake of a carbureter.

2. An air washer for internal combustion engines comprising a casing adapted to hold
35 liquid in its base, an annular receptacle surrounding the lower part of the casing and open at its top for the admission of liquid and air, a series of ports in the casing opening out of said receptacle, a guide adjacent
40 to and extending tangentially within each of said ports to produce a swirling movement of the liquid in said casing, a baffle arranged in the upper part of said casing, and a conduit opening from the top of the
45 casing to the intake of a carbureter.

In testimony whereof, I have hereunto subscribed my name to this specification.

WILLIAM H. L. DONALDSON.