A. F. PRIEST.

DEVICE FOR REGULATING THE DISCHARGE OF EXHAUST GASES.

APPLICATION FILED NOV. 25, 1914.

1,169,734.

Patented Jan. 25, 1916.

Fig. 1.

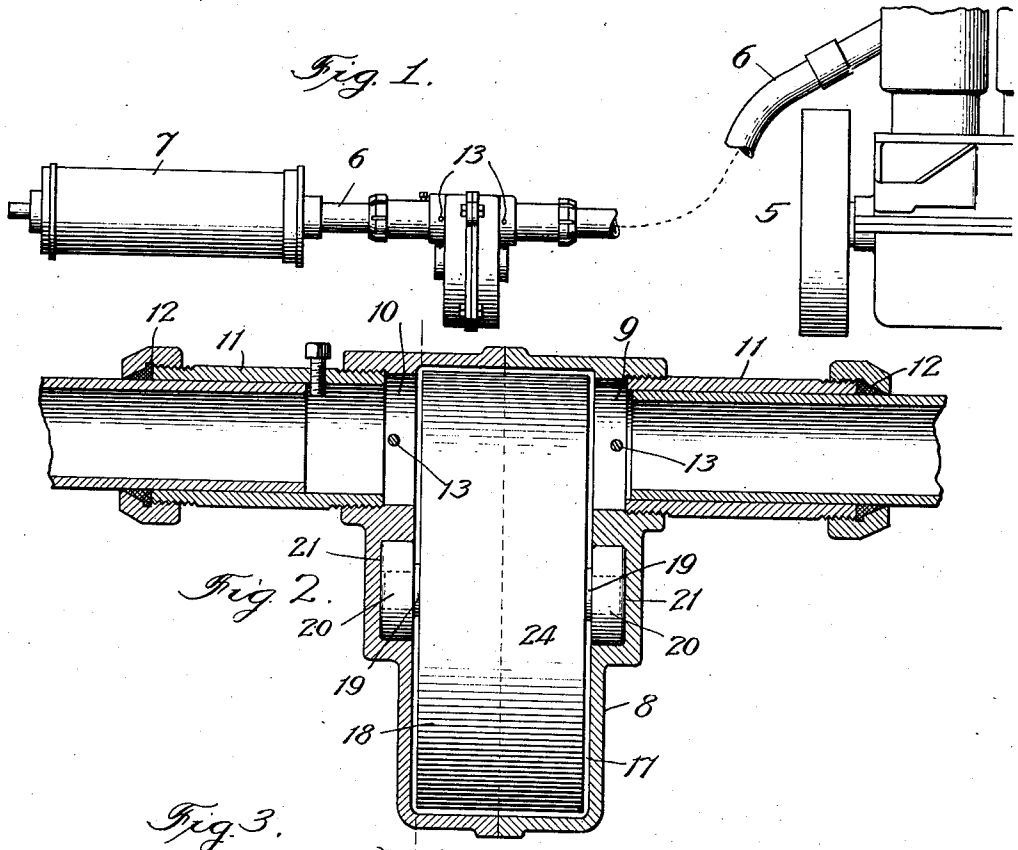


Fig. 2.

Fig. 3.

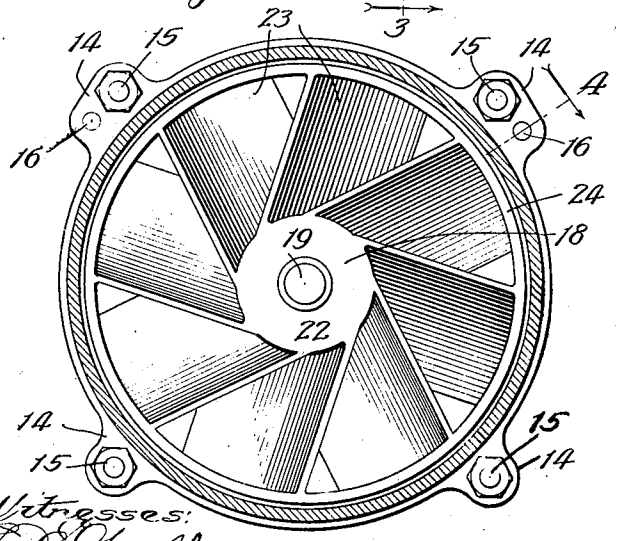
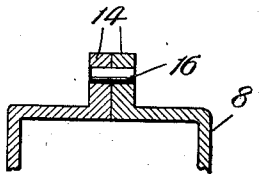


Fig. 4.



Witnesses:
Chas. A. Terbell.
Chas. A. Buell.

Inventor:
Augustus F. Priest.
By Dyrenforth, Lee, Chrittton and Wiles.
Attys.

UNITED STATES PATENT OFFICE.

AUGUSTUS F. PRIEST, OF AKRON, OHIO, ASSIGNOR TO MOTOR-AID COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

DEVICE FOR REGULATING THE DISCHARGE OF EXHAUST-GASES.

1,169,734. Specification of Letters Patent. Patented Jan. 25, 1916.

Application filed November 25, 1914. Serial No. 873,883.

To all whom it may concern:

Be it known that I, AUGUSTUS F. PRIEST, a citizen of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Devices for Regulating the Discharge of Exhaust-Gases, of which the following is a specification.

My invention relates to improvements in devices for regulating the outflow of exhaust gases, discharged intermittently, and more particularly to devices used in connection with the exhausts of engines, for example, internal combustion engines for reducing back pressure on the engine; and my object is to provide a novel and simple construction of device for this purpose.

Referring to the accompanying drawing, Figure 1 is a view in elevation of one end of an internal combustion engine, the exhaust of which is equipped with a muffler and with a device constructed in accordance with my invention, said device being interposed in this preferred embodiment of the invention in the exhaust between the engine and muffler. Fig. 2 is a view in sectional elevation taken through the said device. Fig. 3 is a section taken at the line 3 on Fig. 2 and viewed in the direction of the arrow; and Fig. 4, a broken section taken at the line 4 on Fig. 3 and viewed in the direction of the arrow.

In the arrangement illustrated, an internal combustion engine is represented at 5, the exhaust-pipe 6 of the engine being shown as connected with a muffler 7 of the usual construction.

My improved device is located in the exhaust-pipe 6 between the engine 5 and muffler 7, and in its preferred embodiment comprises a casing 8 of general cylindrical form provided at its upper end with alining inlet and outlet passages 9 and 10, respectively. The exhaust-pipe 6 is formed in sections, one of which connects with the engine and the other with the muffler, these sections opening respectively into the casing 8 through the openings 9 and 10. By preference, the ends of the exhaust-pipe sections 6, communicating with the inlet and outlet 9 and 10, fit into pipe-sections 11 which screw into the openings 9 and 10 and carry at their outer ends packing devices 12 for making tight joints between the pipe-sections 11 and the exhaust-pipe sections 6, the casing 8 preferably containing pins 13 extending through the openings 9 and 10 to prevent the ends of the exhaust-pipe sections 6 from being inserted into the casing 8 a distance sufficient to cause them to strike the fan hereinafter referred to in the casing.

The casing 8 which preferably is formed of similar sections as shown and bolted together at registering lugs 14 as indicated at 15, with dowel pins 16 for insuring the proper positioning of the parts of the casing relative to each other, affords a chamber 17 in which a fan 18 is housed. The shaft of the fan is represented at 19, this shaft projecting beyond the fan at its opposite sides and being mounted in ball-bearings represented at 20 and confined in recesses 21 in the sides of the casing 8. The fan 18 is formed of a hub-portion 22, vanes 23 radiating therefrom and inclined to the axis on which the fan 18 rotates, as illustrated, whereby it will be caused to revolve when gases are discharged from the engine through the exhaust-pipe 6, and a rim 24 connected with the outer ends of the vanes, the hub, vanes and rim of the fan in the particular construction illustrated being cast integral.

As shown in the drawings, the fan 18 practically fills the chamber 17, there being provided between the fan and the walls of the chamber sufficient clearance only to insure unobstructive rotation of the fan, and the inlet 9 and outlet 10, are arranged adjacent the upper end of the fan, whereby as exhaust gases pass from the engine through the exhaust-pipe 6 they will be caused to impinge against the upper end only of the fan.

In the operation of the device, the fan 18 is rotated by the exhaust gases and serves to very greatly reduce back pressure on the engine even when used in connection with a muffler, as represented in the drawings, whereby the efficiency of the engine is greatly increased, the provision of the rim 24 causing the fan to act after the manner of a fly-wheel whereby its speed is maintained practically uniform at all times.

The feature of so proportioning the fan to the casing that the latter is practically completely filled by the fan is of advantage as there is no opportunity for the fan to

produce such a swirling or eddying of gases as to produce back-pressure producing counter-currents in the exhaust-pipe.

The device of my invention might discharge directly to the atmosphere instead of into a muffler. Its operation is, in fact, to muffle the engine to a certain extent, at least.

What I claim as new and desire to secure by Letters Patent is—

1. A device of the character set forth, comprising a casing provided with an inlet and outlet alining with each other and disposed intermediate the center of said casing and its peripheral wall, and a fan adapted to be revolved by impingement of gases thereupon journaled in said casing and provided with obliquely disposed vanes opposing said inlet, the sides of said fan being disposed closely adjacent to the sides of said casing.

2. A device of the character set forth comprising a casing provided with an inlet and outlet alining with each other and disposed intermediate the center of said casing and its peripheral wall, and a fan adapted to be revolved by impingement of gases thereupon journaled in said casing to extend transversely of said inlet and said outlet and formed of radially and obliquely extending vanes opposing said inlet, with a continuous rim connected with the outer ends of said vanes.

3. A device of the character set forth comprising a casing containing an inlet and an outlet alining with each other and disposed intermediate the center of said casing and its peripheral wall, and a fan adapted to be revolved by impingement of gases thereupon journaled in said casing to extend transversely of said inlet and said outlet and formed of radially and obliquely extending vanes opposing said inlet, with a continuous rim connected with the outer ends of said vanes, the sides of said fan being disposed closely adjacent to the sides of said casing.

4. In combination the exhaust pipe of an engine having an intermittent exhaust, a substantially cylindrical casing having a diameter greater than the diameter of the pipe, and a revoluble element within and closely fitting the casing; said casing having an inlet in one side adjacent its outer edge and communicating with said exhaust pipe, and an outlet in the other side in substantial alinement with the inlet, and said revoluble element being provided with vanes disposed so that the gases from said exhaust pipe impinge obliquely thereupon and revolve said element.

AUGUSTUS F. PRIEST.

In presence of—
E. P. Otis,
Anna J. Welling.