EL DORADO JONES & R. P. UPTON.

EXHAUST ATTACHMENT FOR GAS ENGINES.

APPLICATION FILED AUG. 3, 1914. RENEWED SEPT. 27, 1916.

**1,229,471.**

Patented June 12, 1917.

Fig. 4.

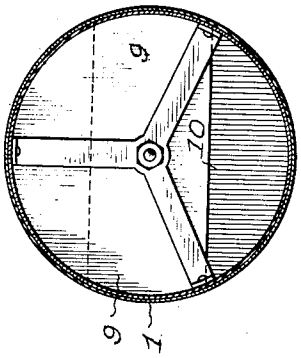



Fig. 3.

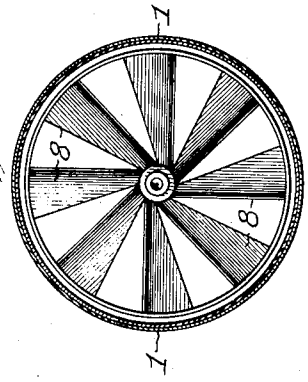



Fig. 2.

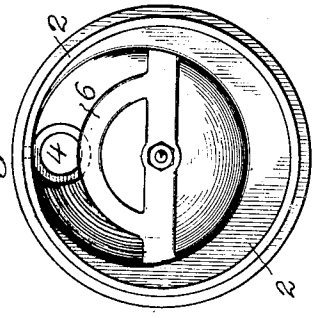
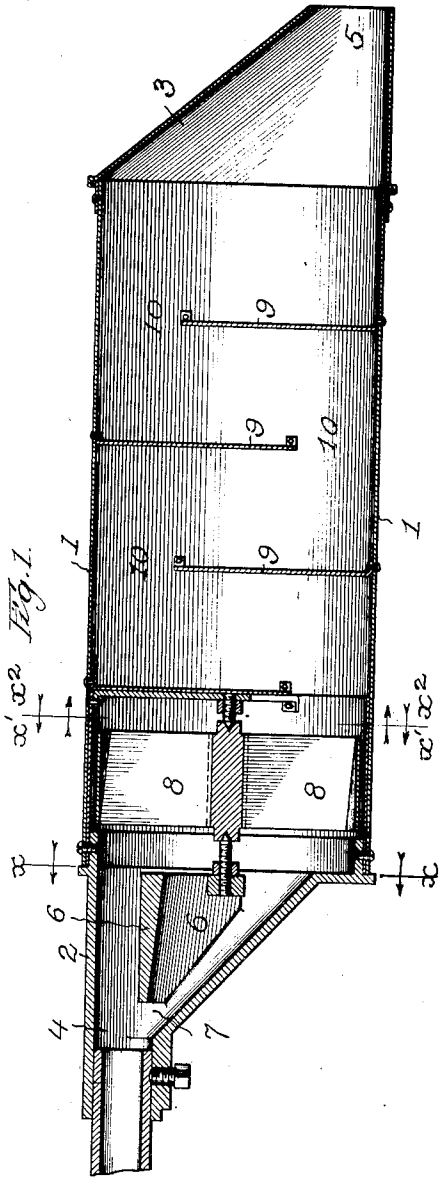



Fig. 1.




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# UNITED STATES PATENT OFFICE.

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## EXHAUST ATTACHMENT FOR GAS-ENGINES.

1,229,471. Specification of Letters Patent. Patented June 12, 1917.

Application filed August 3, 1914, Serial No. 854,657. Renewed September 27, 1916. Serial No. 122,548.

*To all whom it may concern:*

Be it known that we, EL DORADO JONES and RAY P. UPTON, citizens of the United States of America, and residents of Moline, in the county of Rock Island, State of Illinois, have invented certain new and useful Improvements in Exhaust Attachments for Gas-Engines, of which the following is a specification.

This invention relates to that type of attachments for the exhaust ducts of internal combustion engines in which an inclosed wheel of the turbine or like type derives momentum from the escaping products of combustion, to aid in muffling the same, and assist in the withdrawal of the final products of combustion from the combustion chamber of the engine.

And the present improvement has for its object to provide a simple and efficient structural formation and combination of parts, adapted to insure increased momentum and effectiveness to the inclosed spiral bladed wheel of the appliance in the attainment of the scavenging action in the combustion chamber after each explosion therein, and at the same time attain an effective muffling action on the products of combustion before their discharge to the atmosphere, all as will hereinafter more fully appear.

In the accompanying drawings:—

Figure 1, is a longitudinal section, illustrating the preferred form exhaust attachment for internal combustion engines.

Fig. 2 is a transverse sectional elevation on line $x$—$x$, Fig. 1, illustrating the internal construction of the inlet head of the present appliance.

Fig. 3, is a similar view on line $x'$—$x'$, Fig. 1, illustrating the spiral bladed fan of the appliance.

Fig. 4, is a similar view on line $x^2$—$x^2$, Fig. 1, illustrating the detail construction of the baffle plates of the appliance.

Similar reference numerals indicate like parts in the several views.

Referring to the drawings, 1 represents the main casing of the present appliance, preferably of the cylindrical form shown, and provided at its forward end with an inlet head 2, and at its rear end with an outlet head 3. In the present construction the inlet and outlet heads 2 and 3, are of a funnel form with the respective inlet and outlet necks 4 and 5 disposed eccentrically to the center of the heads, and in alined relation with a marginal portion of the respective heads to provide flaring cavities in the respective heads 2, 3 with the flare wholly toward that marginal portion of a head 2 or 3, which is opposite to that marginal portion of said heads that is in alinement with the necks 4 and 5 of said heads, as illustrated in Fig. 1.

6 designates a fixed semi-annular web or partition disposed in the aforesaid flaring cavity of the inlet head 2, in a plane between the inlet neck 4 and the center of said inlet head, and as so disposed is adapted to direct the passing products of combustion toward an alined outer portion of the spiral bladed or fan wheel hereinafter described. In the preferred construction shown in the drawings, the web or partition 6 is connected solely at its ends to the wall of the head 2 with its forward end disposed a distance back of said wall to provide a communicating passage or opening 7 between the portions of the flaring cavity of the inlet head 2 above and below said web or partition. With the described provision, any great increase in volume of the passing products of combustion may be relieved by an escaping part through the opening 7, into the front portion of the main casing 1, and thus avoid any "back pressure" in the combustion chamber of the engine.

8 designates a spiral bladed propeller wheel of any usual construction, journaled in the forward portion of the casing 1, immediately back of the above described inlet head 2 and its inlet neck 4 and with circular partition 6, and in transverse relation thereto, and with its axis of rotation longitudinal and central of the casing 1, as shown in Fig. 1. In the special construction shown the bearings for the arbor of said propeller wheel 8, are formed in a hanger portion of the partition 6 aforesaid, and in a spider attached to an adjacent baffle plate, hereinafter described.

9 designates a series spaced counterpart baffle plates secured transversely in the interior of the casing 1, and having a circular form corresponding with the transverse area of the casing 1. Each baffle plate is formed with one or more marginal orifices or passages 10, and said passages 10 are in turn disposed in alternated or staggered relation

to the corresponding passages of the next adjacent plate or plates as shown in Fig. 1. With the described arrangement the series of baffle plates 9 are adapted to impose a circuitous route upon the products of combustion passing through the casing 1, in the practical operation of the apparatus, and thus attain the usual muffling action upon said products.

In the practical operation of the present invention, the intermittent discharges or volumes of the products of combustion from the combustion chamber of the engine, are conducted by the usual engine exhaust manifold or trunk into the inlet neck 4 of the present appliance, and by said inlet neck 4 and the semi-annular partition 6, said products of combustion are directed against an outer portion of the spiral bladed propeller wheel 8, to impart rapid rotation thereto. Owing to the fact that such impulses succeed each other rapidly the said propeller wheel acquires a high and constant velocity of rotation, and in consequence, and during the periods between the intermittent discharges from the combustion chamber of the engine, the said spiral bladed propeller wheel 8 will produce a suction action in the front portion of the main casing 1, to draw off the spent gases from the combustion chamber and exhaust manifold of the engine in a very effective manner, and at the same time force said spent gases backward past the baffle plates 9 in an even and effective manner.

Having thus fully described our said invention what we claim as new and desire to secure by Letters Patent, is:—

1. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having an inlet neck disposed in longitudinal alinement with the propeller wheel, and a series of baffle plates disposed back of said propeller wheel, substantially as set forth.

2. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, and a transverse partition in said cavity and disposed between said inlet neck and the center of the inlet head, substantially as set forth.

3. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, and a semi-annular partition arranged transversely in said cavity between said inlet neck and the center of the inlet head, substantially as set forth.

4. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, and a transverse partition in said cavity and disposed between said inlet neck and the center of the inlet head, said partition having spaced relation at its forward end to the wall of the inlet head to provide an auxiliary passage between the cavity of the inlet neck and that of the inlet head, substantially as set forth.

5. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, and a semi-annular partition arranged transversely in said cavity between said inlet neck and the center of the inlet head, said partition having spaced relation at its forward end to the wall of the inlet head to provide an auxiliary passage between the cavity of the inlet neck and that of the inlet head, substantially as set forth.

6. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, a transverse partition in said cavity and disposed between said inlet neck and the center of the inlet head, and a series of transverse baffle plates arranged in spaced and staggered relation in the casing to the rear of the propeller wheel aforesaid, substantially as set forth.

7. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity a semi-annular partition arranged transversely in said cavity between said inlet neck and the center of the inlet head, and a series of transverse baffle plates arranged in spaced and staggered relation in the casing to the rear of the propeller wheel aforesaid, substantially as set forth.

8. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head hav-

ing a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, a transverse partition in said cavity and disposed between said inlet neck and the center of the inlet head, said partition having spaced relation at its forward end to the wall of the inlet head to provide an auxiliary passage between the cavity of the inlet neck and that of the inlet head, and a series of transverse baffle plates arranged in spaced and staggered relation in the casing to the rear of the propeller wheel aforesaid, substantially as set forth.

9. In an exhaust attachment for gas engines, the combination of a casing, a spiral bladed propeller wheel arranged transversely in said casing, an inlet head having a marginal inlet neck disposed in alinement with an outer portion of the propeller wheel, said inlet head having a flaring cavity, a transverse partition in said cavity and disposed between said inlet neck and the center of the inlet head, a series of transverse baffle plates arranged in spaced and staggered relation in the casing to the rear of the propeller wheel aforesaid, and an outlet head having a flaring cavity and an outlet opening near its margin and forming a terminal for said flaring cavity, substantially as set forth.

Signed at Moline, Illinois, this 29th day of July, 1914.

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