B. W. KING.

PREËXHAUST PORT ATTACHMENT.

APPLICATION FILED MAY 21, 1909.

1,008,039.

Patented Nov. 7, 1911.

Fig. 2.

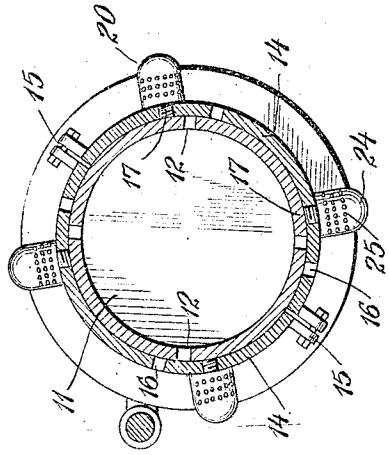


Fig. 3.

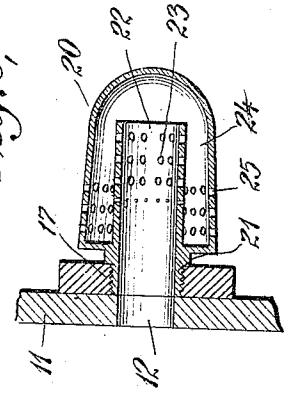
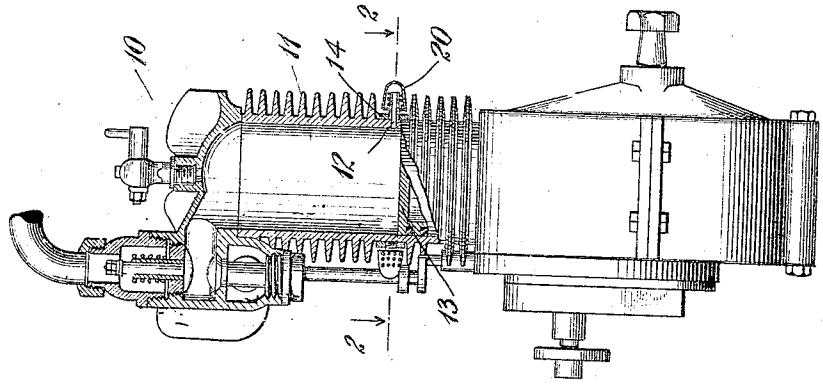


Fig. 1.



WITNESSES

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PREËXHAUST-PORT ATTACHMENT.

1,008,039. Specification of Letters Patent. Patented Nov. 7, 1911.

Application filed May 21, 1909. Serial No. 497,456.

To all whom it may concern:

Be it known that I, BERTELL W. KING, a citizen of the United States, and a resident of the city of New York, in the county of New York and State of New York, United States of America, have invented certain new and useful Improvements in Preëxhaust-Port Attachments, of which the following is a specification.

My invention relates to a pre-exhaust port attachment for use in conjunction with internal combustion engines, and its object is to provide a simple device which may be used to protect the engine and to reduce the sound of its exhaust.

I will describe my invention in the following specification and point out the novel features thereof in the appended claims.

Referring to the drawings, Figure 1 is a side elevation, partly in section, of an internal combustion engine of well-known design and construction, with my invention shown in conjunction with its pre-exhaust ports. Fig. 2 is a sectional plan view of some of the parts shown in Fig. 1, the section in this figure being taken on the line 2—2 of the latter figure. Fig. 3 is a sectional side elevation, on an enlarged scale, of a preferred form of muffler which I use in conjunction with my invention.

Like characters of reference designate corresponding parts in all of the figures.

10 designates an internal combustion engine which may be of any desired form or construction. I have shown it as a four-cycle air-cooled motor of a type commonly used on motor cycles. The parts of such an engine are well-known, so I will point out only such of them as will be necessary to describe my invention.

11 is the cylinder of the engine. The usual intake and exhaust ports with their controlling valves are situated near the upper end of this cylinder and are so shown in Fig. 1. Near the lower end of the cylinder are a plurality of pre-exhaust ports 12 which are arranged to be uncovered by the piston 13 when the latter reaches the lower limit of its travel. These pre-exhaust ports are in common use and are for the purpose of relieving the pressure in the cylinder after the piston has been driven down, and for leading off a portion of the exhaust gases before the piston starts on its upward stroke. As these pre-exhaust ports are opened rapidly while the gases within the cylinder are under pressure, the passage of the gases through them produces a disagreeable noise. When the piston reaches the lower limit of its movement on the suction stroke some air also passes into the cylinder through these ports. Again, as the piston reaches the upper limit of its movement these pre-exhaust ports are uncovered by the lower edge of the piston, and as a certain amount of air will then pass from the outside of the engine through these ports, there is a liability of dust and dirt getting into the lower part of the cylinder through them. One of the purposes of my invention is to materially overcome both of these difficulties by a simple attachment which will reduce the explosive sound of the exhaust and will effectively screen the ports and prevent extraneous matter from passing through them into the engine.

Outside of that portion of the engine which forms the cylinder a groove is provided in alinement with the pre-exhaust ports 12. Rotatably mounted in the groove is a collar 14 which, as may be seen from Fig. 2, is made up of two parts clamped together by bolts as at 15. In this collar are two sets of ports 16 and 17. Each of these sets corresponds in number and in circumferential position with the number and the position of the pre-exhaust ports.

Over each of the ports 17 is attached a muffler 20, which is a metallic member of peculiar design. Each of these members is provided with a threaded stem 21 which is arranged to be screwed directly into the ports 17 which, of course, are first tapped to fit the stem. The stem 21 is carried out in the form of a hollow cylinder 22 in which are a plurality of perforations 23. Integral with these parts is a dome-like hood 24 in which are perforations 25. These perforations are preferably back nearer the engine than are those in the cylinder 22, so that the structure forms tortuous passages for the exhaust gases. The perforations in the hood 24 are preferably of very small size but of sufficient number to together form ample area for the outward flow of exhaust gases and the inward flow of air. Because of their small size the perforations in this hood form a screen which protects the cylinder from dirt and dust getting into it through the pre-exhaust ports. At the same time these

attachments act as mufflers for that part of the exhaust which passes out through the ports to which the devices are applied.

The collar 14, when in a position in which it is shown in Fig. 2, is arranged to close all of the pre-exhaust ports. By loosening its clamps and rotating it a certain amount the ports 16 may be brought into alinement with the pre-exhaust ports 12, in which case the latter are in direct communication with the outer air and the engine will act in exactly the same manner as it would without my invention applied to it. By rotating it in the opposite direction the ports 17 may be brought into alinement with the pre-exhaust ports 12, in which case the exhaust gases will be muffled and the inflowing air screened. It is evident that these changes in the position of the collar 14 may be easily made and that the collar may be securely clamped in any one of its desired positions.

While my invention is shown as applied to a motor cycle engine in Fig. 1, it is evident that it may be applied to engines of different types having pre-exhaust ports, and in some cases it may be used to advantage with the main exhaust ports of internal combustion engines.

What I claim is—

1. The combination with an internal combustion engine having a cylinder provided with an exhaust port, of an attachment for said port comprising a member movably mounted over said port, said member being constructed to form an opening, and a device connected with the member at said opening arranged to form an expansion chamber and tortuous passages for the exhaust gases, said member being arranged to close the exhaust port or to connect such port with said device.

2. The combination with a four-cycle internal combustion engine having a cylinder provided with a pre-exhaust port, of an attachment for said port comprising a member movably mounted over said port, said member being constructed to form openings, and a device connected with the member at one of the openings in said member arranged to form an expansion chamber and tortuous passages for the exhaust gases, said member being arranged in its different positions to close the pre-exhaust port, to connect said pre-exhaust port with said device or to have one of the openings in said member exclusive of that opening to which said device is connected in alinement with said port.

3. The combination with a four-cycle internal combustion engine having a cylinder provided with a plurality of pre-exhaust ports in circumferential alinement with each other, of a collar rotatably supported by the cylinder and over said ports, said collar being provided with one set of openings corresponding in number and in relative positions with said ports, a device over each of said openings for muffling the exhaust gases and preventing dirt from being drawn back into the engine; said collar being also provided with a second set of openings supplying free passages through the collar, said second set of openings also corresponding in number and in relative positions with said exhaust ports; said collar being so arranged that it may be moved so that none of the openings or either set of openings therein will be in register with said pre-exhaust ports.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

BERTELL W. KING.

Witnesses:
ERNEST W. MARSHALL,
ELLA TUCH.