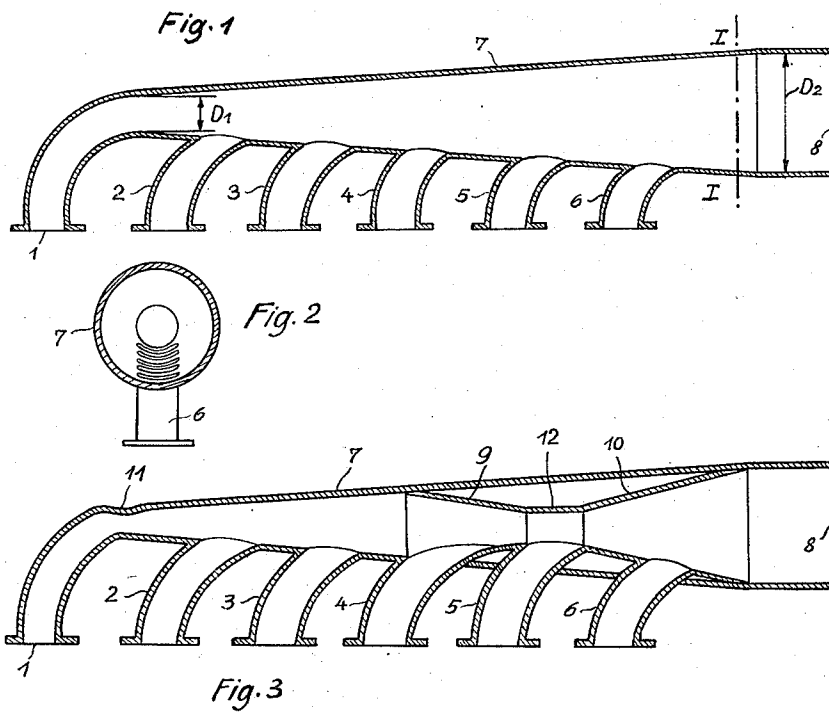


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EXHAUST GAS COLLECTOR
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EXHAUST GAS COLLECTOR

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2 Claims. (Cl. 60—32)

This invention relates to exhaust gas collectors, especially for internal combustion engines.

It is well known to give the collector for the exhaust gases of internal combustion engines the form of a funnel-like container into which the exhaust pipes extending from the single cylinders are laterally introduced. The cross-section of the collector increases in this case toward the outlet end in the same measure as—owing to the summing up of the single currents flowing through the lateral exhaust pipes—the total volume of gas increases toward the outlet end of the collector.

When denoting the minimum diameter of the funnel-like collector by D_1 , its maximum diameter by D_2 , the pitch of the collector is indicated by the proportion $D_2:D_1$. In the usual-collectors the pitch was always chosen in such a manner that the ratio $D_2:D_1$ numerically equalled the square root of the number of cylinders z of the engine. However it was found that when this ratio was equal to or less than $\sqrt{z}$, in the whole device the flow of gas was dammed and therefore a considerable counter-pressure was produced. Hereby the filling of the cylinders was deteriorated and the power of the engine was considerably diminished. Moreover the exhaust plant was subjected to high thermal stresses.

The exhaust gas collector according to the present invention comprises a funnel-shaped container into which the exhaust gases are tangentially introduced through curved pipes in the direction of the flow, the pitch of the container being numerically greater than the square root of the number of cylinders of the internal combustion engine.

The annexed drawing illustrates by way of example some modifications of an embodiment of the invention. Fig. 1 shows the collecting vessel in longitudinal cross-section. Fig. 2 is a cross-section on the line I—I of Fig. 1. Fig. 3 is a similar longitudinal cross-section as Fig. 1 of a collector the cross-sectional area of which is reduced by the insertion of a funnel-shaped member.

The exhaust gases are conducted by the pipes 1, 2, 3, 4, 5 and 6 from the cylinders (not shown) into the funnel-shaped collecting vessel 7 which near its outlet end passes over to a cylindrical form. The pipes 1 to 6 are curved toward the outlet end of the collector thereby imparting to the exhaust gases a direction of flow towards the outlet end of the collector.

The pitch of the funnel-shaped part of the

collector is chosen in such a manner that the ratio of its maximum diameter D_2 to its minimum diameter D_1 is greater than the square root of the number of cylinders of the internal combustion engine.

Advantageously the free cross-sectional area of the outlet end 8 traversed by the whole of the exhaust gases is chosen to be greater than the sum of the cross-sectional areas of all pipes 1 to 6 joining the collector 7, whereas the minimum cross-sectional area of the collector 7 is equal to or less than the cross-sectional area of one of the pipes 1 to 6.

In such a method of construction no damming of gas occurs, and in consequence of this there is no back pressure exerted upon the internal combustion engine. On the contrary it provides a wholly untroubled discharge of the exhaust gas through the collecting chamber 7, which functions in such a manner that a partial vacuum arises in the individual exhaust pipes 1—6, and accordingly an extraction of the exhaust gas by the gas stream existing in the collecting chamber takes place at the mouths of these pipes.

Fig. 3 illustrates a modification in which likewise a funnel-shaped collecting vessel 7 is used containing before the outlet end 8 a funnel-like constricted portion 9 connected by a cylindrical portion 12 with a conical extension 10. Furthermore the collector 7 is provided at the point where it joins the exhaust pipe 1 with a constriction 11. The other exhaust pipes 2 to 6 leading from the cylinders of the internal combustion engine to the collector 7 discharge partly into funnel-shaped extensions, partly into funnel-shaped constrictions.

Owing to the constriction 11 at the first delivery pipe 1 the "pitch" of that part of the collector into which the exhaust pipes 2 and 3 discharge is considerably increased. As the pitch according to the invention exceeds the value of the square root of the number of cylinders of the internal combustion engine, in that part of the exhaust-gas collector the most favorable conduct of flow is realized.

The member composed of the parts 9, 12, and 10 corresponds to the construction of the well-known Venturi tube which has the well-known property of increasing the suction draft of a streaming fluid.

The prompt withdrawal of the exhaust gases from the pipes 1 to 6 and the far reaching unloading of the pistons on opening the outlet valves of the cylinders result in a considerable

increase of power of the internal combustion engine.

We claim:

1. An exhaust gas collector for internal combustion engines comprising a conical vessel, a member inside the said vessel composed of two truncated cones connected at their apices, a row of curved pipes communicating with said vessel, said pipes being bent at the points of communication towards the end of the conical vessel so as to lead the gas smoothly into a path parallel to the axis of said conical vessel, the outlet end of the said vessel having a cross-sectional area greater than the sum of the cross-sectional areas of all the said pipes, and the minimum cross-sectional area of the vessel being at most equal to the cross-sectional area of one of the pipes.

2. An exhaust gas collector for internal combustion engines comprising a conical vessel, a member inside the said vessel composed of two truncated cones and a cylindrical portion connecting the apices of the cones, a row of curved pipes communicating with said vessel, said pipes being bent at the points of communication towards the end of the conical vessel so as to lead the gas smoothly into a path parallel to the axis of said conical vessel, the outlet end of the said vessel having a cross-sectional area greater than the sum of the cross-sectional areas of all the said pipes, and the minimum cross-sectional area of the vessel being at most equal to the cross-sectional area of one of the pipes.

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