

O. C. KREIS, JR.
MUFFLER FOR INTERNAL COMBUSTION ENGINES.
APPLICATION FILED APR. 28, 1910.

981,770.

Patented Jan. 17, 1911.

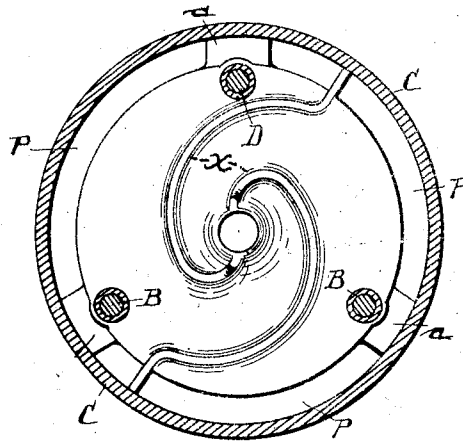


Fig. 2.

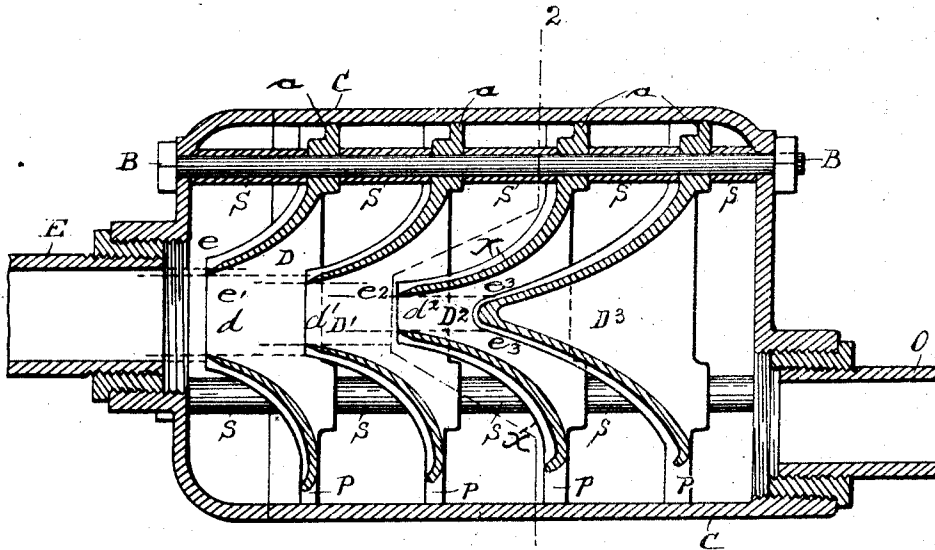


Fig. 1.

Witnesses

O. B. Baenziger.
W. C. Jennings

Inventor

Oscar C. Kreis Jr.
Parker & Burton

Attorneys

UNITED STATES PATENT OFFICE.

OSCAR C. KREIS, JR., OF DETROIT, MICHIGAN, ASSIGNOR TO THE GRAY MOTOR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

MUFFLER FOR INTERNAL-COMBUSTION ENGINES.

981,770.

Specification of Letters Patent.

Patented Jan. 17, 1911.

Application filed April 28, 1910. Serial No. 558,102.

To all whom it may concern:

Be it known that I, OSCAR C. KREIS, JR., a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Mufflers for Internal-Combustion Engines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to mufflers for internal combustion engines, and an object of my improvements is to provide an improved muffler of such construction that it shall successively deflect and arrest the velocity of successive small portions of the volume of the gas discharged from the exhaust pipe of the engine. I attain this object in the device illustrated in the accompanying drawings, in which,—

Figure 1, is a sectional view of a device embodying my invention. Fig. 2, is a cross section taken on the line 2—2 of Fig. 1, looking from the left of said figure.

C, C, is an inclosed casing.

E, is the exhaust pipe or passage, of an engine opening centrally to the casing C, C, at one end of said casing.

O, is the outlet pipe which extends from the opposite end of the casing C, C, to that into which the exhaust pipe E opens, and the outlet pipe O is adjacent to the bottom of the casing so that it shall carry off water which may be in the casing.

D, D¹, D², D³ are diaphragms secured in the casing C, C, by bolts B, B, passing through lugs a, which secure the casing together and the diaphragms in place.

S, indicates sleeves upon the bolts B, B, B, by which sleeves the diaphragms D, D¹, D², D³, are spaced from each other. The said diaphragms are of less diameter than the casing C, C, so as to leave passages P, P, P, between the periphery of said diaphragms and the inner wall of the casing C, C. The diaphragms D, D¹, D², have apertures d, d¹, d², at their centers. These apertures are arranged axially in line with each other and with the exhaust passage, and are of continually decreasing diameter, the diaphragm D having the larger aperture d, being adjacent to the end of the exhaust pipe E. The aper-

ture d is of less diameter than the exhaust pipe E and is located a short distance from it. The diaphragm D³ has no central aperture, but simply provides a deflecting surface. The said diaphragms are provided with walls, the surfaces of which extend in the direction of the issuing exhaust gases and outward so as to present an acute angle to the portion of the exhaust gases that strike them, and such walls terminate in narrow edges bounding the apertures d, d¹, d², in the diaphragms D, D¹ and D².

In the ordinary operation of an internal combustion engine, the exhaust is discharged from the pipe E, and extends in a cylindrical jet of approximately one diameter for a distance greater than the length of the casing C, C.

X, X, are spiral ribs formed on the faces of the diaphragms D, D¹, D², D³; these ribs act to give the deflected gases a spiral motion or a velocity of rotation about the axis of the muffler.

By the construction here shown and described, successive small portions of the jet of gases are taken from the periphery of the jet and deflected by the surface of the diaphragms D, D¹, D², and D³ and the spiral ribs thereon to the periphery of the casing C, C, and the velocity of such portions is arrested in the operation. The portions of the jet taken off by each diaphragm is indicated by the line c, c¹, c², which indicate that a small portion, annular in cross section, is cut off and deflected by each of the diaphragms D, D¹, D², leaving the smaller cylindrical jet between the dotted lines c³, to be deflected by the diaphragm D³. After the vis viva of the exhaust gases is arrested in this way, they are silently discharged from the outlet O.

The above described muffler is intended to be used with marine engines, and a small portion of cooling water is thrown into the exhaust pipe E.

What I claim is:—

1. The combination with an exhaust passage adapted to discharge the gases in a jet, of a series of diaphragms spaced from each other, each of said diaphragms having an opening therein axially in line with said exhaust passage, each of said openings being a little less in cross section than the jet reaching said diaphragm, each of said diaphragms being provided with a surface bor-

dering the said aperture therein and presenting an acute angle to the line of the motion of the portion of the jet striking said diaphragm, substantially as and for the purpose described.

2. In an apparatus of the kind described, the combination of the exhaust passage adapted to discharge the exhaust gases in a jet, of a series of diaphragms having openings therein axially in line with said exhaust passage, said opening being respectively of somewhat less cross section than the jet which reaches said diaphragms, and a final diaphragm having no aperture therein adapted to arrest the motion of the jet passing through the aperture in the last of said apertured diaphragms, each of said diaphragms being provided with a surface presenting an acute angle to the portion of the jet striking said diaphragm.

3. In an apparatus of the kind described, the combination with an exhaust passage adapted to discharge the exhaust gases in

a jet, of a diaphragm having an aperture located axially in line with said exhaust passage of such a size that the edge of said aperture shall deflect a portion of said jet, said diaphragm being provided with a surface adapted to deflect the gases, and a curved rib upon said surface, substantially as and for the purpose described.

4. The combination of an exhaust passage adapted to discharge the exhaust gases in a jet, of a series of diaphragms spaced from each other, each of said diaphragms having an opening therein axially in line with said exhaust passage, each of said openings being a little less in cross section than the jet reaching said diaphragm, substantially as and for the purpose described.

In testimony whereof, I sign this specification in the presence of two witnesses.

OSCAR C. KREIS, JR.

Witnesses:

LOTTA LEE BRAY,

ELLIOTT J. STODDARD.