

C. H. NEWTON & E. S. CANFIELD.

SILENCER FOR ENGINES.

APPLICATION FILED JAN. 2, 1912.

1,061,775.

Patented May 13, 1913.

3 SHEETS—SHEET 1.

Fig. 1.

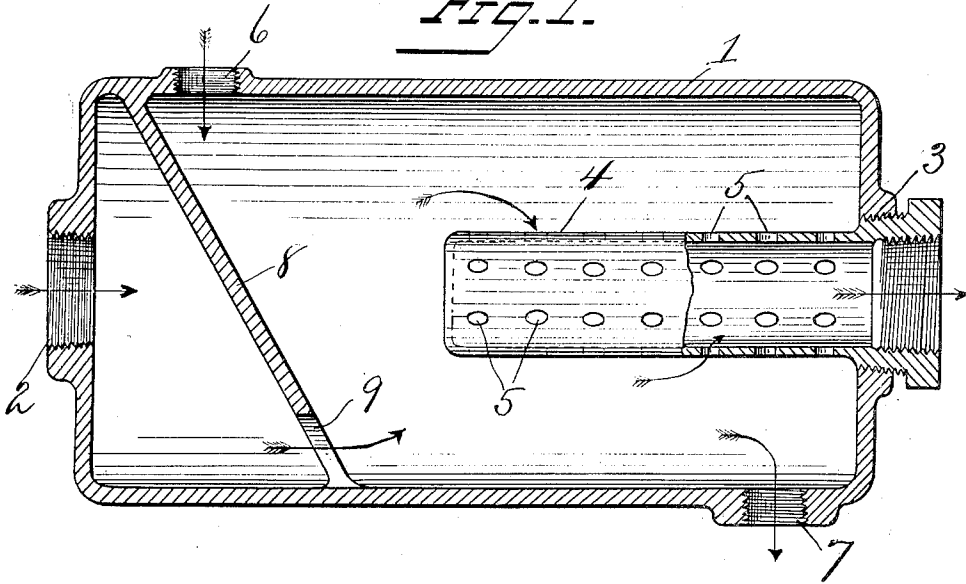
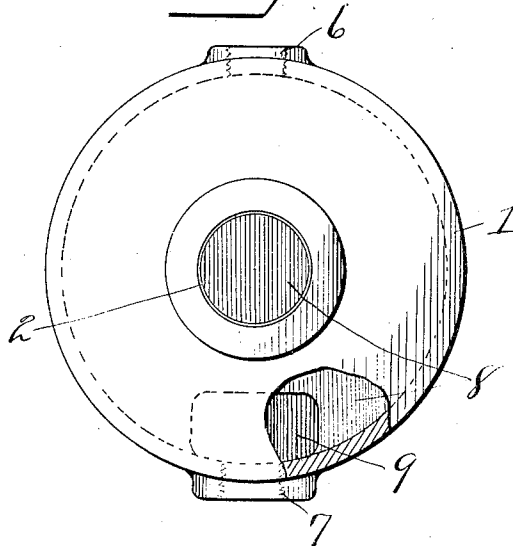


Fig. 2.



WITNESSES

Albert Hopkins
Grace P. Breton

INVENTORS

C. H. Newton
E. S. Canfield
By Shurtland Mason Attorneys

C. H. NEWTON & E. S. CANFIELD.

SILENCER FOR ENGINES.

APPLICATION FILED JAN. 2, 1912.

1,061,775.

Patented May 13, 1913.

3 SHEETS—SHEET 2.

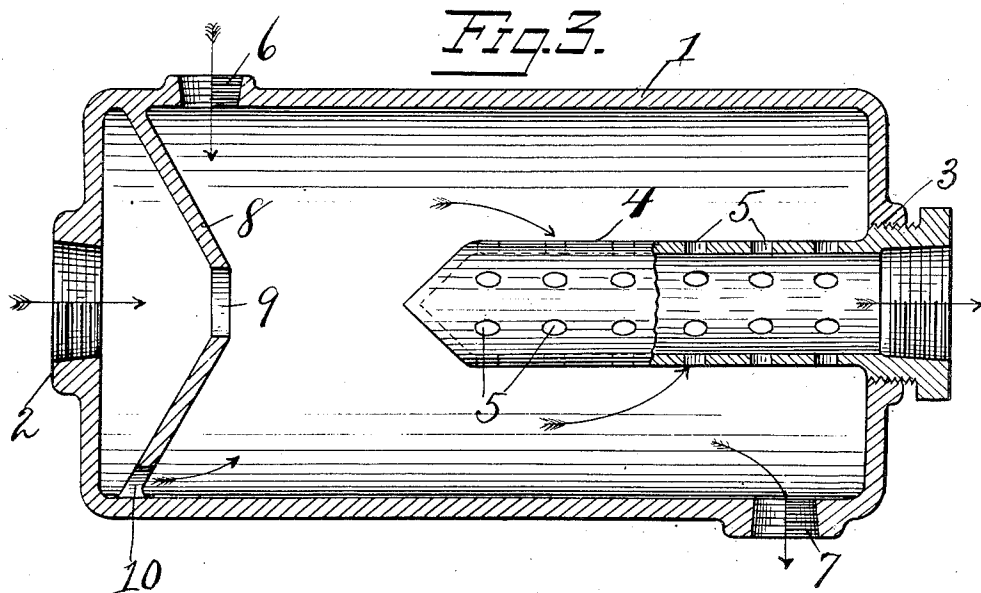
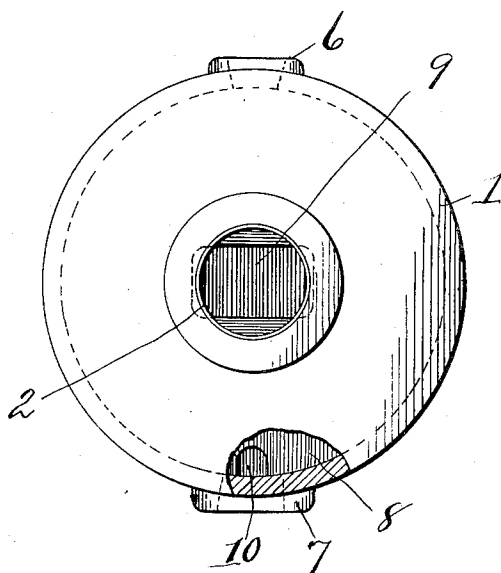


Fig. 4.



WITNESSES

Albert Popkins
Grace P. Bereton

INVENTORS

C. H. Newton
E. S. Canfield
By *Shurtland & Mason*
Attorneys

C. H. NEWTON & E. S. CANFIELD.

SILENCER FOR ENGINES.

APPLICATION FILED JAN. 2, 1912.

1,061,775.

Patented May 13, 1913.

3 SHEETS—SHEET 3.

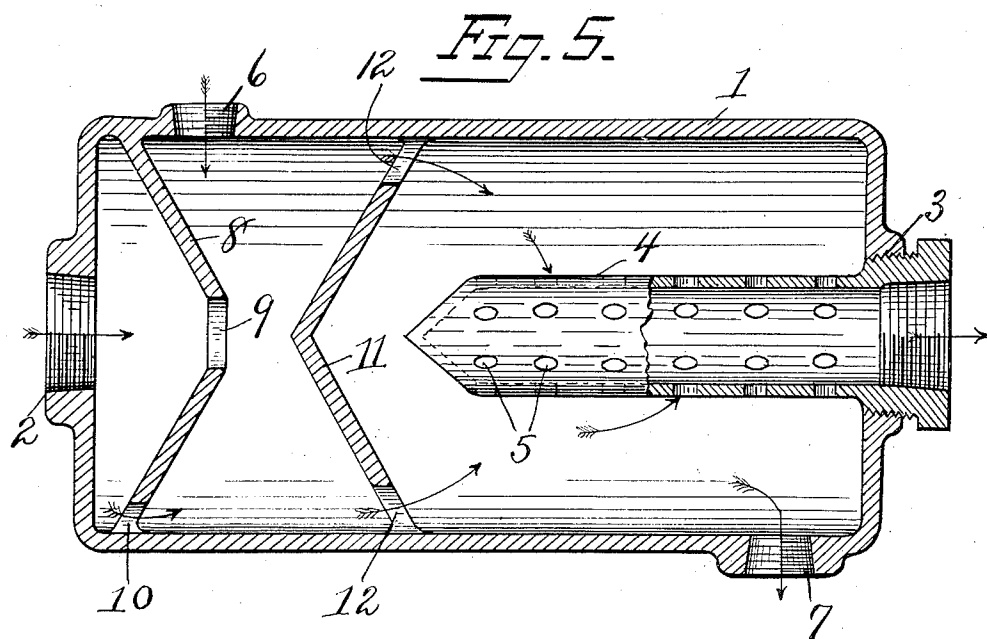
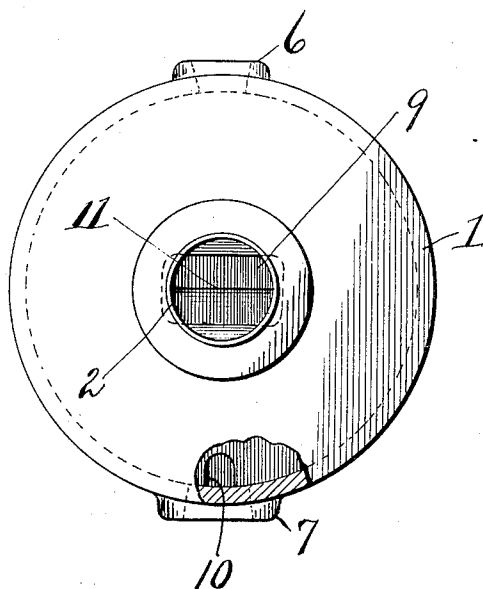


Fig. 6.



WITNESSES

Albert Popkins
Grace P. Breerton

INVENTORS

C. H. Newton
E. S. Canfield
By Samuel M. Mason Attorneys

UNITED STATES PATENT OFFICE.

CHARLES H. NEWTON, OF EAST ORANGE, AND ERWIN S. CANFIELD, OF NEWARK, NEW JERSEY, ASSIGNORS, BY MESNE ASSIGNMENTS, TO STANDARD COMPANY, OF TORRINGTON, CONNECTICUT, A CORPORATION OF MAINE.

SILENCER FOR ENGINES.

1,061,775.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed January 2, 1912. Serial No. 668,989.

To all whom it may concern:

Be it known that we, CHARLES H. NEWTON and ERWIN S. CANFIELD, citizens of the United States, residing at East Orange, Essex county, and Newark, in the county of Essex, State of New Jersey, respectively, have invented certain new and useful Improvements in Silencers for Engines, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

Our invention relates to mufflers or silencers for engines, particularly for internal combustion or gas engines, and its object is to cool the exhaust gases and reduce their volume and consequent pressure, so as to make the exhaust into the atmosphere practically noiseless.

In general, our invention comprises a muffler or silencer in which the exhaust gases enter at one end of the chamber and pass out through the small holes of a silencing sleeve in the other end of the muffler, after passing through a flow of water which enters at the water inlet, flows down over a cooling plate and in a sheet over the opening at the bottom of the plate, through which the gas passes. The water outlet is at the bottom and other end of the muffler. This muffler, therefore, allows the exhaust gases to expand and pass out as noiselessly as possible, and by passing through the flow of water which is the exhaust water from the cooling system of the engine, the gases are cooled, thus assisting in the silencing, and a portion of the water may become evaporated and pass out with the exhaust gas, which relieves the discharge of water as well as assists in the quieting of the exhaust gas.

The invention, therefore, consists in the matters hereinafter described and referred to in the appended claims.

The invention is illustrated in the accompanying drawings, in which,—

Figure 1 represents a vertical section of an expansion chamber or muffler and silencer, constructed in accordance with our invention; Fig. 2 is an end view, part of the end wall being broken away to show the opening in the deflecting plate; Figs. 3 and 4 are similar views respectively, of another form of our invention; and Figs. 5 and 6

similar views respectively of still another form.

In these drawings, and referring first to Figs. 1 and 2, the body or chamber is indicated at 1, and is preferably in the form of a cylindrical drum of cast iron having at one end the bossed threaded inlet opening 2, for the exhaust pipe of the engine; at the opposite end the threaded bossed opening 3, into which is screwed the silencing sleeve 4 having the perforations 5; at the top near the inlet end a threaded bossed opening 6 for a water pipe supplied preferably from the cooling system of the engine; and at the bottom near the outlet end a threaded bossed water outlet 7. Cast integral with the box or chamber is a deflecting plate 8, extending diagonally across the cylinder from the upper wall adjacent the water inlet opening to the lower wall, and having an opening 9 in the center of its lower edge. The exhaust gases coming in through the opening 2 strike the under side of the plate 8, and are deflected downwardly until they reach the opening 9, over which is running a sheet of water supplied from the water inlet opening 6. In this manner the gases in passing through the opening 9, encounter the sheet of water, and are cooled and reduced in volume while some of the water is evaporated or converted into vapor. This vapor mingles with the exhaust gases and expands with such gases in the chamber, such expansion still further reducing the pressure and temperature; they then pass through the small openings 5 into the silencing sleeve 4; thence into the atmosphere practically without noise. Such water as is not evaporated in the chamber passes to the bottom and out through the outlet opening 7. It will, therefore, appear that by our invention, the exhaust gases are cooled and hence caused to contract, or reduced in volume. Simultaneously water vapor is formed which mixes with the exhaust gases, and the whole mixture is allowed to expand in the chamber 1. By these combined operations, the exhaust gases are brought practically to atmospheric pressure, so that they may pass from the muffler through the sleeve; they do so with little or no noise. At the same time, by this arrangement, back pressure in the engine is avoided, and incidentally the water aids in

cooling the chamber, and obviates the disadvantages of an extremely hot muffler.

In Figs. 3 and 4, a modification is shown, in which the plate 8 is truncated, and has its opening 9 directly opposite the exhaust inlet, and has a small opening 10 at the bottom for drainage purposes. In this form also, the silencing sleeve at its inner end is cone-shaped, to spread the gases which have passed through the sheet of water, falling across the opening 9 and deflect them upwardly and downwardly.

In Figs. 5 and 6, the arrangement is the same as in Figs. 3 and 4, except that an additional angular deflecting plate 11 is provided, the apex of which is opposite the opening 9 in the plate 8, and openings 12 are provided above and below, for the passage of the gas and mixed water, vapor and gas.

It will be understood that the operation and result of this combination set forth in the drawings, is substantially the same as to all the different forms, the underlying idea being the same, that is, the arrangement of a deflecting plate practically integral with the cylinder or box, and extending entirely across the same, at an angle, so that the exhaust gases in striking it are caused to pass through an opening in it, over which opening a sheet of water falling upon said plate is caused to pass.

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

1. A silencer comprising a chamber having an exhaust gas inlet at one end, and an outlet at the opposite end, a deflecting plate attached at one end to the wall of the chamber, and extending diagonally across said chamber opposite the gas inlet and having an opening for the passage of the gas therethrough, and a water inlet to the chamber for delivering a cooling stream in a sheet across said opening in the plate, said deflecting plate extending in a plane across the vertical plane, which includes the water inlet.

2. A silencer comprising a chamber having an exhaust gas inlet at one end, a silencing sleeve inserted in the chamber at the op-

posite end, a deflecting plate attached at one end to the wall of the chamber, and extending diagonally across said chamber opposite the gas inlet and having an opening for the passage of the gas therethrough, and a water inlet to the chamber for delivering a cooling stream in a sheet across said opening in the plate, said deflecting plate extending in a plane across the vertical plane, which includes the water inlet.

3. A silencer comprising a chamber having a gas inlet at one end and a discharge outlet at its opposite end, an inclined deflecting plate in the form of a truncated cone extending across the chamber and having an opening therein, opposite the gas inlet with means for admitting a stream of water to the chamber upon the deflecting plate to flow in a sheet over the opening.

4. A silencer comprising a chamber having a gas inlet at one end and a discharge outlet at its opposite end, an inclined deflecting plate extending across the chamber in the form of a truncated cone and having an opening therein with means for admitting a stream of water to the chamber upon the deflecting plate to flow in a sheet over the opening, and a perforated silencing sleeve having an imperforate conical upper end, the apex of which is opposite the opening in the deflecting plate.

5. A silencer comprising a chamber having a gas inlet at one end and a discharge outlet at its opposite end, an inclined deflecting plate extending across the chamber in the form of a truncated cone and having an opening therein with means for admitting a stream of water to the chamber upon the deflecting plate to flow in a sheet over the opening, and an oppositely arranged conical deflecting plate extending across the chamber with its apex opposite the opening in the first deflecting plate, and having openings in its upper and lower edges.

In testimony whereof, we affix our signatures in the presence of two witnesses.

CHARLES H. NEWTON.
ERWIN S. CANFIELD.

Witnesses:

J. E. PETERSEN,
WM. E. KELVIE.