

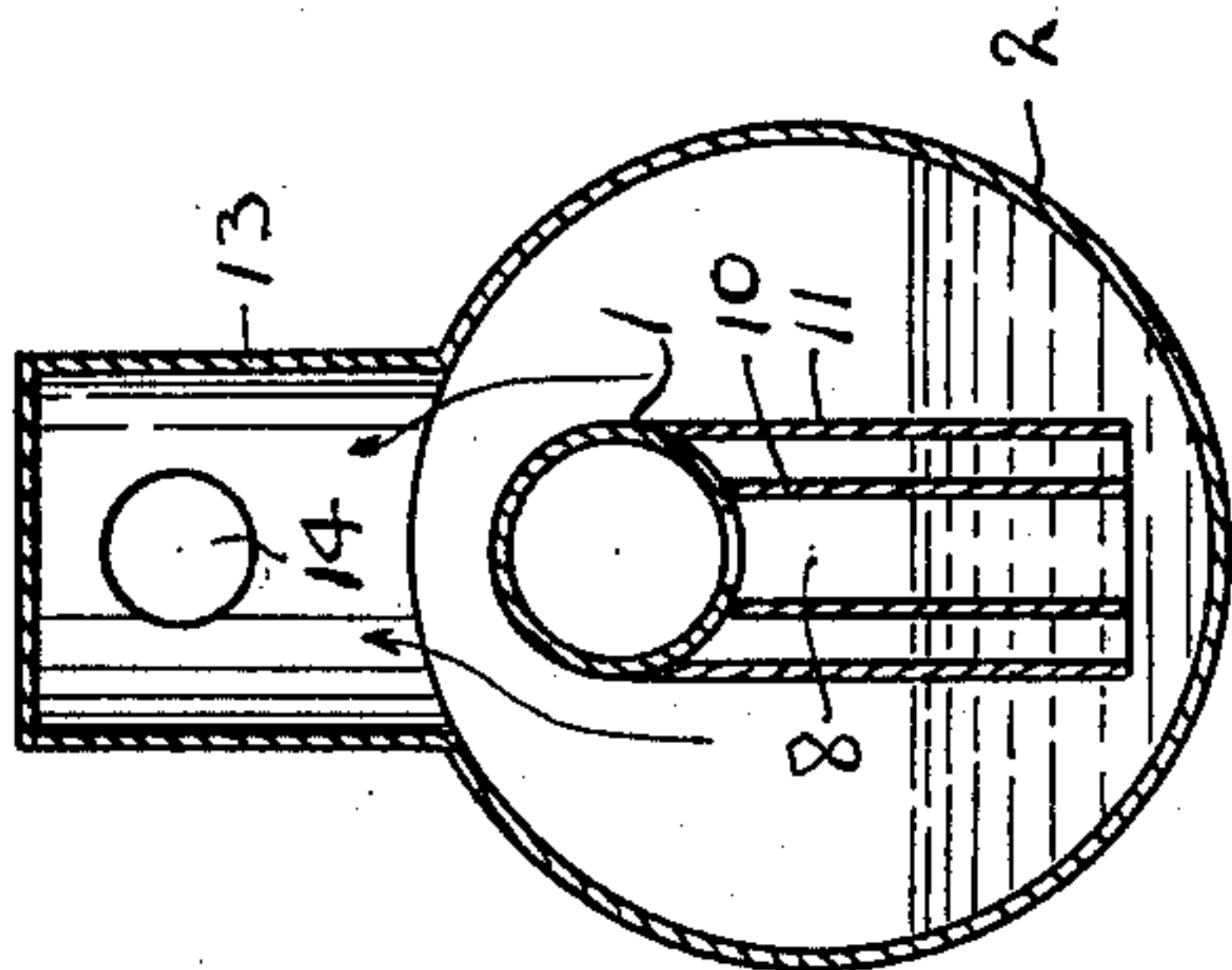
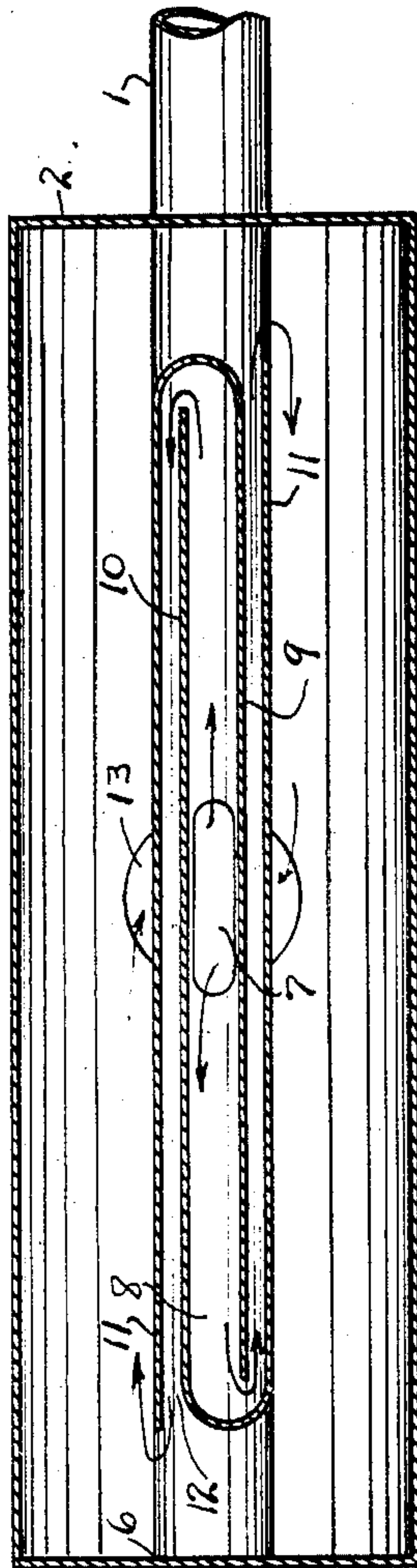
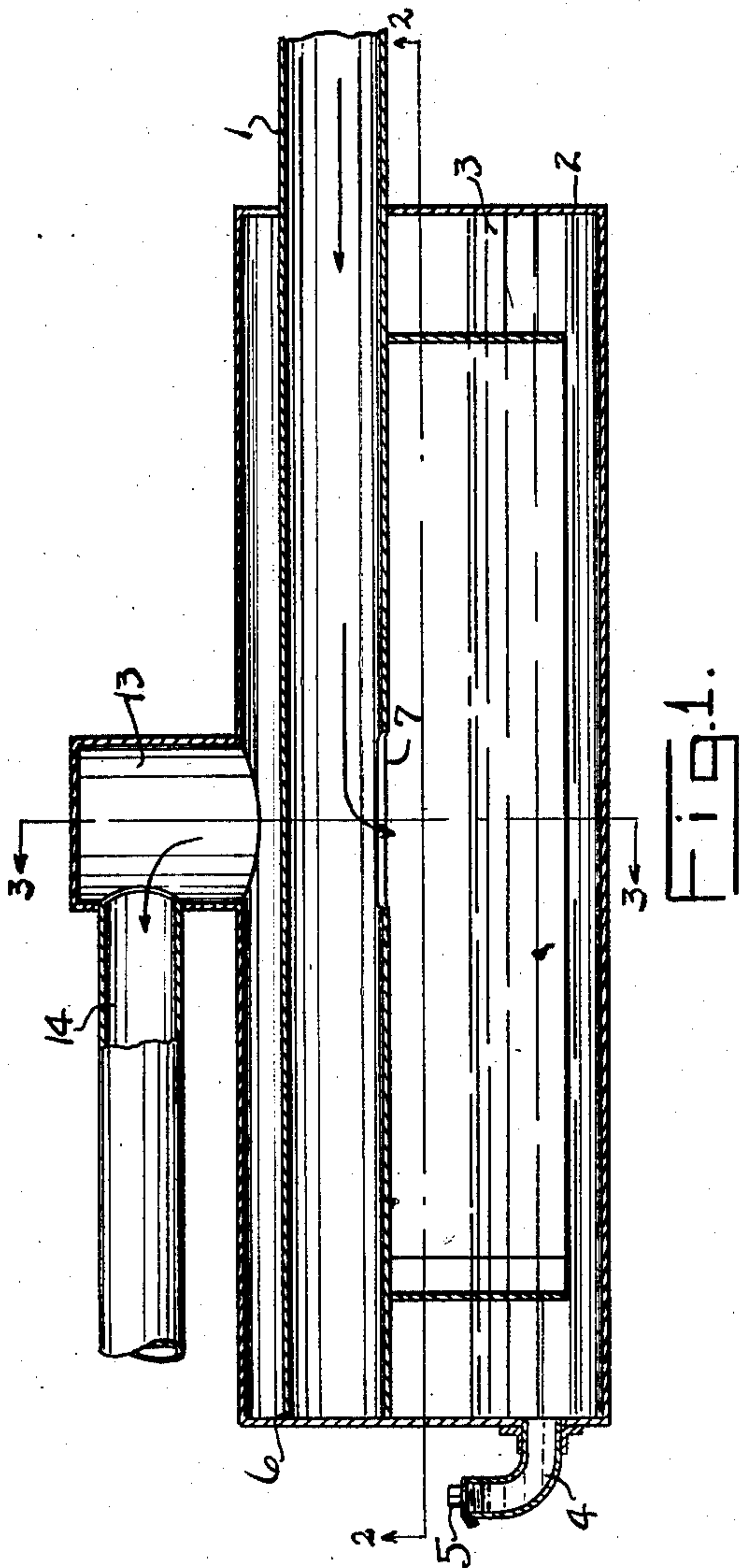
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A. P. J. VOIGT

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MUFFLER FOR INTERNAL COMBUSTION ENGINES

Filed Oct. 22, 1926



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## UNITED STATES PATENT OFFICE

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MUFFLER FOR INTERNAL-COMBUSTION ENGINES

Application filed October 22, 1926. Serial No. 143,354

The invention relates to mufflers or silencers to be used in connection with the exhaust from internal combustion engines.

It is an object of the invention to provide a muffler to receive the exhaust from an internal combustion engine and muffle the report of the exhaust, and also to eliminate the danger due to fire from the exhaust gases and sparks.

It is desired to form a muffler of simple and substantial construction, which will eliminate the noise from the exhaust in a particularly efficient manner. The invention involves the passage of the exhaust gas into contact with water or other similar liquid, and carrying the exhaust gas through a tortuous passage to the outlet.

Referring to the drawing herewith, Fig. 1 is a central vertical section longitudinally of the muffler in incorporating the invention. Fig. 2 is a central horizontal section on the line 2—2 of Fig. 1. Fig. 3 is a transverse vertical section on the line 3—3 of Fig. 1. Like numerals of reference are employed to designate like parts in all the views.

In carrying out the invention, I contemplate delivering the exhaust gas from the engine through a pipe 1 which passes into a cylindrical shell 2; said shell being adapted to contain water, indicated at 3, up to a certain predetermined level. A water inlet tube 4 is provided at one end of the shell, the inlet tube being curved upwardly to the desired height, and is adapted to be closed by a threaded plug 5.

The pipe 1 extends into the shell 2 and is fixed at its inner end to the end wall 6 of the shell, being thereby closed at its end. Approximately centrally of the shell 2, the tube 1 is provided with an opening 7 on its lower side, through which the exhaust gases may be discharged downwardly into a chamber 8. The said chamber 8 is formed between the adjacent walls of two curved baffles 9 and 10 respectively. The baffles 9 and 10 are connected at their upper edges to the lower side of the tube 1, as shown best in Fig. 3. The baffle 9 is U-shaped in general outline; it extends from a point 11, spaced from one end of the shell parallel with the axis of the

shell, to a point, spaced from the opposite end of the shell, where it is recurved, extending back to a point approximately equal in length to the other leg of the U.

The baffle 10 is of similar construction and interfits with the opposite baffle, as shown in Fig. 2, and it will be noted that the interfitting sides of the two baffles are spaced apart so that the gas entering within the chamber 8 formed between the walls of the two baffles may pass in either direction toward the ends of the shell and around the legs of the baffles through the outlets 12 adjacent the ends 11 of the baffles. The lower sides of the baffles are open, but are submerged below the level of the water, as will be seen from Figs. 1 and 3.

The upper side of the shell 2 has connected therewith an outlet chamber 13, having the discharge tube 14 connected thereto at one side. Said discharge tube 14 may be of any desired length, sufficient to discharge the exhaust at the point desired.

The operation of this device is easily understood from the drawing. The gas entering the tube 1 from the engine will follow the direction of the arrows in the various figures. It will pass from the tube 1 through the opening 7 into the chamber 8 between the adjacent baffles and will come in contact with the upper surface of the water within the shell, the water serving to close the lower side of the passage for the gas. The gas will find its way around the ends of the baffles and through the outlet 12 into the chamber provided within the shell above the water level and will from thence pass through the outlet chamber 13 and discharge tube 14, as previously set out.

It will be noted that the construction of this device is exceedingly simple, and due to the fact that the burnt gases will come in contact with the water during its passage through the muffler, the burning gases and sparks which might otherwise escape, will be extinguished before the gas finds its way to the outlet pipe 14. The device will not only be approximately silent in its action but will safeguard against the discharge of burning



gases. A common danger of fire hazard will be thus eliminated.

Having thus described the invention, what I claim as new and desire to protect by Letters Patent is:

1. A muffler for internal combustion engines, comprising an inlet tube having an opening on its lower side, a plurality of interfitting U-shaped baffles open on their lower sides and forming a chamber into which said opening discharges, a shell closing the end of said tube and enclosing said baffles, said shell being adapted to contain water to a predetermined level closing the lower sides of said baffles, gases from said inlet being adapted to impinge on said water, and an outlet pipe connected with the upper side of said shell.

2. A muffler for internal combustion engines including a shell adapted to contain liquid to a certain level, an exhaust pipe discharging in said shell above said liquid, baffles suspended from said pipe into said liquid and forming a tortuous passage of greater length than said shell, and which is closed from below by said liquid, and an outlet pipe from said shell.

3. A muffler for internal combustion engines comprising a shell having an upper outlet opening therein, an exhaust pipe having an outlet discharging downwardly into water in said shell, and a series of interfitting curved baffles about said discharge from said exhaust pipe, whereby the exhaust gases are compelled to traverse a length greater than the said shell while in contact with the water.

4. A muffler for internal combustion engines including an exhaust pipe, having an opening therein to allow discharge of the exhaust downwardly, interfitting U-shaped baffles with vertical walls secured to the said exhaust pipe at their upper edges and adapted to be immersed in water on their lower edges, a shell enclosing one end of said pipe and said baffles forming a receptacle for the water in which said baffles are immersed, and an opening in said shell above said water for the escape of gaseous fluid.

5. A muffler for internal combustion engines including a shell adapted to contain liquid to a desired level, an exhaust pipe from the engine extending longitudinally of said shell and having a downwardly directed discharge port above the liquid level, recurved baffle plates on said pipe about said port projecting into the liquid and allowing escape of the gas from said port at their ends and compelling said gaseous fluid from said port to travel a tortuous passage around said plates above the liquid, and an outlet pipe on said shell above said exhaust pipe.

6. A muffler for internal combustion engines including a shell adapted to contain liquid to a desired level, an exhaust pipe from said engine extending longitudinally of said

shell and having a downwardly directed discharge port above said liquid level, baffles secured directly to said exhaust pipe at the side of said port and projecting into the liquid and allowing escape of gas at their ends remote from said opening, and an outlet pipe on said shell above said exhaust pipe, said baffle plates being so constructed that the exhaust gases must be deflected at least four times before reaching said outlet.

7. In a muffler for internal combustion engines, an exhaust pipe, a housing about said pipe having an outlet opening therein, means forming a plurality of tortuous passages for the exhaust gases from said pipe to the outlet, said housing being adapted to contain liquid which will act as one of the walls of said passages, whereby sparks in the gases will be extinguished.

8. In a muffler for internal combustion engines, an exhaust pipe, a housing about said pipe, said housing having an outlet opening above said pipe, means forming a plurality of tortuous passages for the exhaust gases from said pipe to the outlet, said means being so constructed that the gases are compelled to negotiate at least two reverse curves.

9. In a muffler for internal combustion engines, a shell, an exhaust pipe, said pipe having a port therein, and a pair of inverted U-shaped baffles suspended from said pipe, said shell being partially filled with liquid at least above the lower edges of said baffles, whereby a plurality of passages are formed from the port to an outlet, each of said passages being of greater length than said shell, and a portion of each baffle forming at least one wall of each passage.

In testimony whereof I hereunto affix my signature this 14th day of October, A. D. 1926.

ALBERT P. J. VOIGT.