No. 809,654. PATENTED JAN. 9, 1906.

L. T. WEISS.

EXHAUST MUFFLER.

APPLICATION FILED AUG. 18, 1905.

Fig. 1.

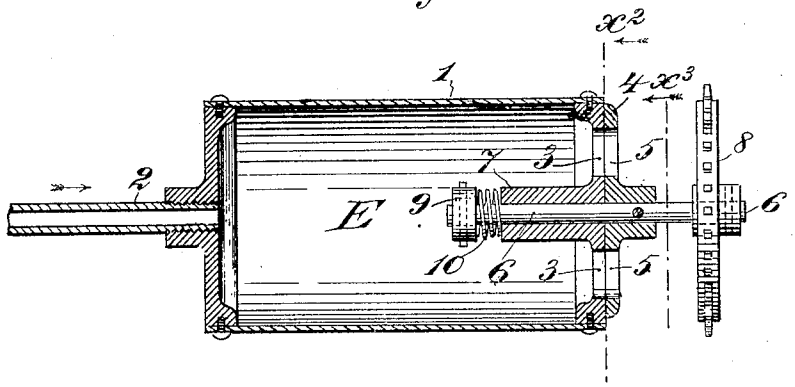


Fig. 2.

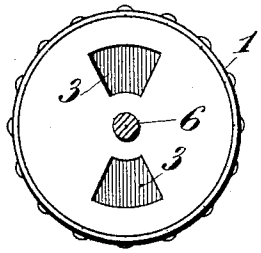


Fig. 3.

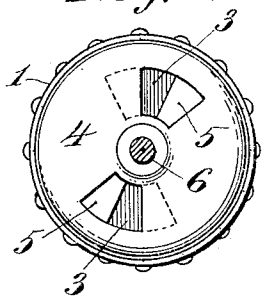
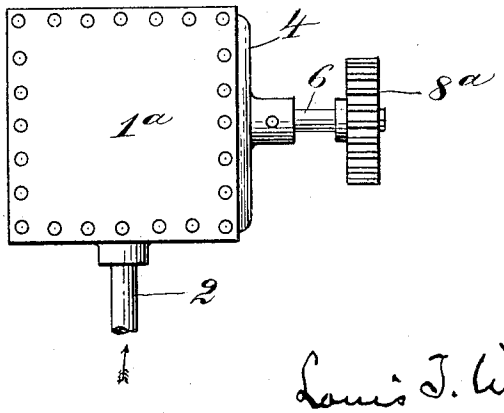


Fig. 4.



Witnesses

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EXHAUST-MUFFLER.

No. 809,654. Specification of Letters Patent. Patented Jan. 9, 1906.

Application filed August 18, 1905. Serial No. 274,742.

To all whom it may concern:

Be it known that I, LOUIS T. WEISS, a citizen of the United States, residing in the borough of Brooklyn, in the county of Kings, in the city and State of New York, have invented certain new and useful Improvements in Exhaust-Mufflers, of which the following is a specification.

This invention relates to means for muffling the exhaust of an engine, and as here shown it is especially well adapted for use on internal-combustion engines.

The object of the invention is to provide an expansion-chamber into which the gases from the engine exhaust and means for opening said chamber to the atmosphere at predetermined intervals for the escape of said gases.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a longitudinal axial section of the muffler. Fig. 2 is a transverse section at x^2 in Fig. 1, showing the ported head of the cylinder. Fig. 3 is a transverse section at x^3, showing the ported rotary valve in elevation. Fig. 4 is a plan view of the device, illustrating a slightly-different arrangement of the parts.

Referring, primarily, to the first three figures of the drawings, 1 designates a cylinder in which is a chamber E to receive the exhaust-gases from the engine which enter through a pipe 2. In the wall of the chamber opposite to the exhaust-inlet are ports 3, controlled by a relatively mounted valve 4, having in it ports 5, which may be made to coincide with the respective ports 3 by rotation of the valve. This valve is mounted on and secured to an arbor 6, rotatively mounted in a bearing 7 on the head of the cylinder. Means are provided by which the arbor 6 and the valve 4, carried thereby, may be rotated in a certain fixed relation as to speed with the engine-shaft, and it may have on it for this purpose a sprocket-wheel 8, whereby it may be driven in a known way through a chain from the engine-shaft or another shaft driven by the engine. The engine and its shaft or shafts have not been shown, as the manner of driving will be readily understood by any good mechanic. Obviously the rotation of the valve 4 will have the effect to open and close alternately and automatically and at regular intervals the ports 3 in the wall of the chamber E, and this is the purpose of the construction, the effect of which will now be explained. The valve 4 will be so set and geared that when the engine exhausts the ports will be closed, so as to muffle the sound due to the rapid outflow of the exhaust-gases, and as soon as this has occurred the ports will be opened, so that the gases may escape from said chamber to the atmosphere. Obviously the timing of the opening and closing of the ports will be governed by the time of exhaust by the engine. Where there is a gang of engines coupled to cranks in the same shaft, a single muffler may be employed; but the valve will have to be timed to control the discharge of the several successive exhausts, as will be readily understood by any one skilled in the art.

Preferably in order to avoid danger from overpressure in the chamber E the arbor 6 will be provided at its inner end with a collar 9, and between this collar and the bearing 7 will be disposed a strong compression-spring 10. This spring holds the rotary valve 4 up to its seat; but if an extra pressure is developed by the gases in the chamber E higher than is safe the spring 10 will yield to compression and allow the valve to move away from its seat, thus opening the ports 3 fully for the escape of the gases.

There may be one or more ports in the wall of the chamber and in the valve, as will be understood by any one skilled in the art, and it is not essential that the chamber E shall be in a cylinder nor that the inlet for the exhaust shall be opposite to or disposed in any special relation to the location of the valve 4. In Fig. 4 the expansion-chamber is in a box 1^a of general rectangular form, and the valve 4 is at the side of said box which is adjacent to that where the exhaust enters. This figure also shows a gear-wheel 8^a for driving.

Any form of valve or means may be employed so long as the same is constructed to effect the object set forth.

It has been stated above that the exhaust-gases pass into the atmosphere after escaping from the muffler; but obviously they may when required be led off through an ordinary flue to any distance from the muffler that may be desired. This is a matter within the knowledge of any one skilled in the art.

Having thus described my invention, I claim—

1. An exhaust-muffler, having an expansion-chamber which receives the exhaust from the engine, said chamber having an out-

let for the exhaust, and automatic means controlling said outlet and opening and closing the latter alternately.

2. An exhaust-muffler, having an expansion-chamber, which receives the exhaust from the engine and which has an outlet for the exhaust, and an automatic, moving valve which closes and opens said outlet alternately, said openings and closings corresponding to the times of the exhaust of the engine.

3. An exhaust-muffler, having a chamber open to the exhaust, said chamber having also an outlet for the exhaust, and a rotating, ported valve controlling the said outlet.

4. An exhaust-muffler, having a chamber open to the exhaust, said chamber having also an outlet for the exhaust, a moving valve controlling said outlet, and a spring which holds said valve yieldingly up to its seat, said spring being so disposed as to yieldingly oppose the pressure of the exhaust-gases.

5. An exhaust-muffler, having an expansion-chamber open to the exhaust, and said chamber having also an outlet-port 3 for the exhaust, a rotating arbor 6, a valve 4 on said arbor and provided with a port 5 adapted to be put into coincidence with the port 3 by rotation of the valve, and spring 10, which holds said valve yieldingly up to its seat.

In witness whereof I have hereunto signed my name, this 16th day of August, 1905, in the presence of two subscribing witnesses.

LOUIS T. WEISS.

Witnesses:

H. G. HOSE,

WILLIAM J. FIRTH.