

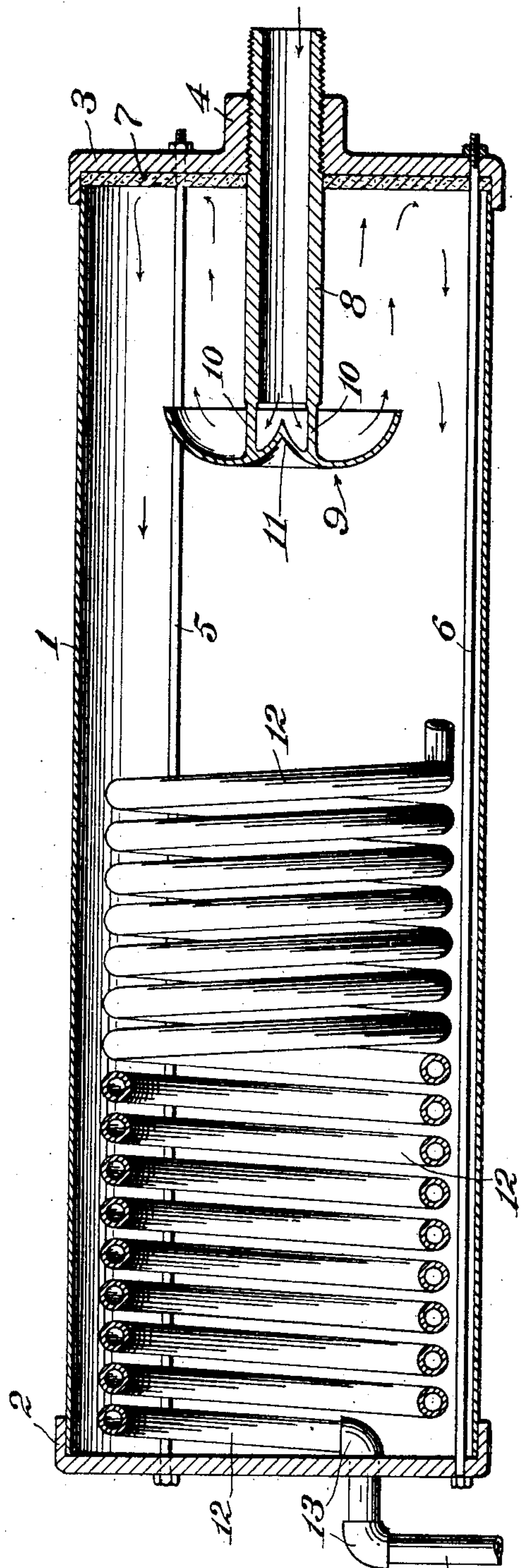
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R. C. SHEPHERD.
MUFFLER FOR EXPLOSIVE ENGINES.

APPLICATION FILED DEC. 22, 1902.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

ROBERT C. SHEPHERD, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO
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MUFFLER FOR EXPLOSIVE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 744,418, dated November 17, 1903.

Application filed December 22, 1902. Serial No. 136,245. (No model.)

To all whom it may concern:

Be it known that I, ROBERT C. SHEPHERD, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Muffler for Explosive-Engines and the Like, of which the following is a specification.

The object of my invention is to produce a muffler which is simple, of economical construction, and which is effective in operation. These objects are attained by the mechanism illustrated in the accompanying drawings.

The muffler comprises a cylindrical shell 1, heads 2 and 3 being attached to opposite ends of the shell 1. The head 3 is provided with an outwardly-directed collar 4, which is provided with female threads. The heads 2 and 3 are held in place over the ends of the shell 1 by means of tie-rods 5 and 6.

7 designates a sheet or disk-like pad of asbestos, which is held in place by being pinched between the edge of one end of the shell 1 and the inner face of the head 3.

8 designates a pipe threaded at one end and screwed to the collar 4, the main portion of the pipe 8 lying within the shell 1 and extending for a considerable distance inside the shell 1.

9 designates a deflector which is carried over the inner end of the pipe 8 by means of bars 10, which bars may be attached to the pipe 8. The bars 10 form slim supports, which do not materially obstruct the passage of the products of combustion. The deflector 9 is a concave-convex body or hood which is provided with a depressed central portion forming a central pyramidal projection 11, which points toward the inner end of the inlet-pipe 8. The outward rim of the deflector 9 is flared in such a way that a tangent drawn from the rim comes somewhat within the inner edge of the end of the shell 1.

12 designates a coiled pipe which lies within the opposite end of the shell 1, the axis of the coil being concentric with the axis of the shell, both ends of the coil being open. The outer end of the coil 12 is provided with elbows 13 and a discharge-pipe 14.

In use the muffler occupies a horizontal position, the threaded end of the inlet-pipe 8

being connected with the exhaust from the engine. The exhaust-gas passes through the pipe 8 in the direction of the arrow, strikes the pyramidal point 11, and is deflected thereby, and the gas following the curvature of the flaring part of the deflector is returned and strikes against the asbestos pad 7, the latter deadening the sound. After striking the asbestos 7 the dead gas passes in the opposite direction and enters the coiled pipe 12, through which it gradually works its way out and from which it is eventually discharged through the pipe 14.

In operation the shell 1 becomes filled with the gas, and the movement of the products of combustion through the coiled pipe 12 is slow and rather uniform, so that it issues from the pipe 14 with a substantially uniform flow. The coiled pipe 12 acts as a condenser, the products of combustion being liquefied or condensed to a marked degree while passing through the series of coils of which the main coil is composed.

It should be observed that the products of combustion after passing through the pipe 8 and after being deflected expands greatly as it enters the shell 1, owing to the great capacity of the latter compared to the size of the inlet-pipe. This serves to equalize the pressure maintained in the shell 1 and pipe 12. I have also found in practice that the shell 1 and pipes 12 act as cooling agents to a marked degree, which is highly favorable to the condensation of the products of combustion. This cooling action is due to the large surface exposure of the shell 1 and pipe 12.

It should be understood that I contemplate making such alterations in the proportions of parts and arrangements thereof as will be advantageous under various conditions which may lie within the spirit of my invention. For instance, the part which performs the function of the coiled pipe may consist of a zigzag or otherwise formed tortuous conduit in which the turns are not in the form of coils.

Having described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. In a muffler, a shell, means to conduct

products of combustion through one end of the shell, means to deflect said products of combustion, and a coiled pipe in the other end of the shell, said pipe having a series of coils and adapted to conduct the products of combustion through said coils from the interior of the shell.

2. In a muffler, a shell, means for conveying the products of combustion to the inside of one end of the shell, a deflector for spreading said products of combustion and returning the same in the opposite direction, and a coiled pipe in the other end of the shell, said pipe having a series of coils and adapted to conduct the products of combustion through said coils from the interior of the shell.

3. In a muffler, a shell, an inlet-pipe in one end thereof, a spreader carried by the inlet-pipe, and a coiled pipe in the other end of the shell, said pipe having a series of coils and adapted to conduct the products of combustion through said coils from the interior of the shell.

4. In a muffler, a shell, an inlet-pipe in one end of the shell, a deflector carried by the inlet-pipe, a pad of asbestos fronting the concave side of the spreader, and a coiled pipe in the other end of the shell communicating with the outside.

5. In a muffler, a shell, heads closing each end of the shell, an inlet-pipe screwed to one head and projecting for a considerable distance inside the shell, a deflector provided with a pyramidal portion which projects toward the discharge end of the inlet-pipe and with a rim which flares in substantially the same direction as the pyramidal portion, and a pipe having numerous turns in the other end of the shell communicating with the outside.

6. In a muffler, a closed shell, an inlet-pipe passing through one end of the shell, an asbestos lining on the adjacent end of the shell, a concavo-convex spreader carried by the inner end of the pipe and provided with a pyramidal portion which projects toward the center of the inlet-pipe, and a condensing-pipe in the other end of the shell embracing several coils and communicating with the outside.

7. In a muffler, a cylindrical shell, heads on each end of the shell, tie-rods within the shell connecting the heads, an inlet-pipe screwed to one head, a concavo-convex spreader carried by the inlet end of the pipe, and a coiled condensing-pipe in the other end of the shell communicating with the outside.

8. In a muffler, a shell, heads closing each end of the shell, one of said heads being provided with a threaded collar, an inlet-pipe screwed to the collar and projecting a considerable distance within the shell, a spreader carried by the inner end of the inlet-pipe, an asbestos pad fronting the flaring mouth of the deflector, and a continuous pipe provided

with several coils one end of the pipe communicating with the outside, the coils of pipe lying close to the shell.

9. In a muffler, a cylindrical shell, heads closing each end of the shell, an asbestos pad carried by one end of the shell, an inlet-pipe passing through said head, a spreader carried by the inner end of the inlet-pipe attached thereto by slim supports, and a coiled pipe in the other end of the shell having numerous turns and communicating with the outside, there being considerable space between the deflector and the nearest coil of the pipe.

10. In a muffler, a cylindrical shell, heads closing each end of the shell, an asbestos pad carried by one end of the shell, an inlet-pipe passing through said head, a spreader carried by the inner end of the inlet-pipe and attached thereto by slim supports, and a coiled pipe in the other end of the shell having numerous turns and communicating with the outside, there being a considerable space between the deflector and the nearest coil of the pipe, the capacity of the shell being much greater than the capacity of the inlet-pipe, the capacity of the coiled pipe being much greater than the capacity of the inlet-pipe.

11. In a muffler, a shell, a pipe adapted to convey products of combustion therinto, and a second pipe having a series of turns and adapted to convey said products of combustion from the shell through said turns.

12. In a muffler, a shell, a pipe adapted to convey products of combustion therinto, and a second pipe having a series of coils and adapted to convey said products of combustion from the shell through said coils.

13. In a muffler, a shell, a pipe adapted to convey products of combustion therinto, and a second pipe having a series of coils within said shell, said second pipe being adapted to convey said products of combustion through said coils to the exterior of the shell.

14. In a muffler, a shell, an inlet-pipe adapted to convey products of combustion therinto, a pad of asbestos within the shell, and a hood mounted on the inlet-pipe for deflecting the current from said pipe against the asbestos pad, there being an outlet leading from the shell.

15. In a muffler, a cylindrical shell, an asbestos pad held between the inner side of the head, and an end of the shell, and a hood for directing products of combustion against said pad.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 15th day of December, 1902.

ROBERT C. SHEPHERD.

Witnesses:

GEORGE T. HACKLEY,
FREDERICK S. LYON.