(No Model.) 2 Sheets—Sheet 1.

G. L. GARDNER.

MUFFLER FOR ENGINES.

No. 606,280. Patented June 28, 1898.

Fig. 1.

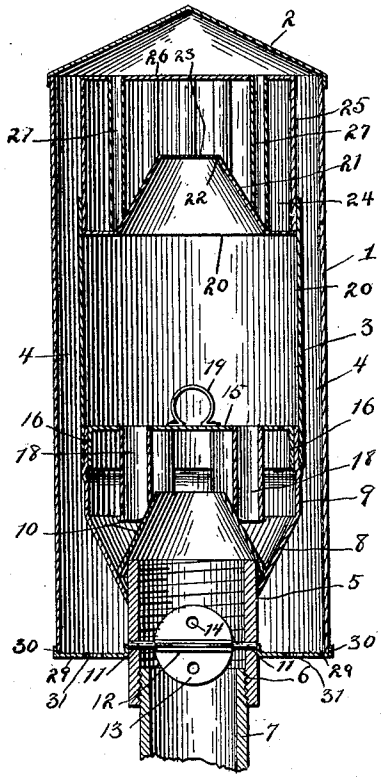


Fig. 2.

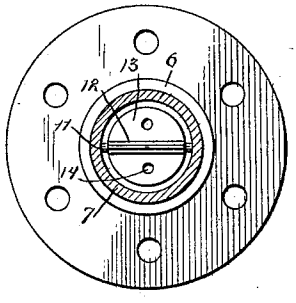
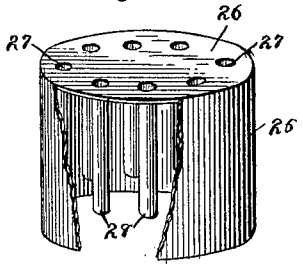


Fig. 3.



WITNESSES:

Henry S. Ashburn.

Victor J. Evans

INVENTOR

George L. Gardner

BY

John Wedderburn

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 4.

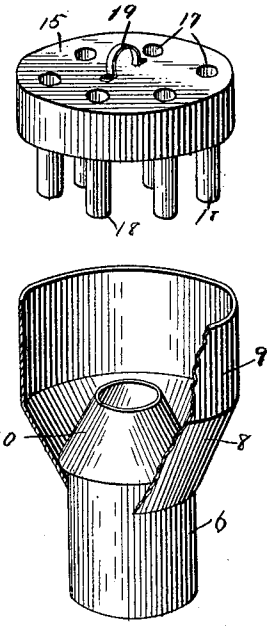
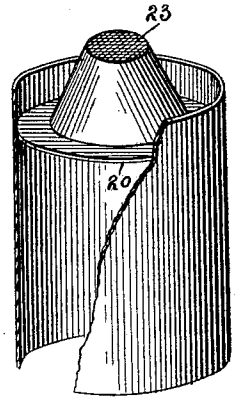


Fig. 5.



WITNESSES:

Henry S. Robinson

Victor J. Evans

INVENTOR

George L. Gardner

BY

John Wedderburn

ATTORNEY.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

GEORGE L. GARDNER, OF DAYTON, OHIO, ASSIGNOR OF ONE-HALF TO F. D. BITTINGER, OF SAME PLACE.

MUFFLER FOR ENGINES.

SPECIFICATION forming part of Letters Patent No. 606,280, dated June 28, 1898.

Application filed August 23, 1897. Serial No. 649,122. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. GARDNER, of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Mufflers for Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide means for preventing noise from the exhaust of gas and other engines.

The invention consists of an attachment for the exhaust-pipe of gas-engines, comprising a cylindrical casing closed at its upper end, having a central circuitous passage through the center thereof formed by an inner tubular portion, and an annular discharge-passage between the inner tubular portion and the outer cylindrical casing.

The invention also consists in other details of construction and combinations of parts, which will be hereinafter more fully described and claimed.

In the drawings forming a part of this specification, Figure 1 represents a vertical sectional view of my device applied to the exhaust of an ordinary gas-engine. Fig. 2 is a bottom plan view of the same. Fig. 3 is a detail perspective view, partly broken away, of the upper member of the central tubular portion. Fig. 4 is a similar view of the lower member of the central tubular portion, the cap thereof, which itself consists of a separate piece, being shown applied. Fig. 5 is a similar view of the intermediate member of the central tubular portion.

Like reference-numerals indicate like parts in the different views.

My improved muffler is made up of a casing 1, preferably of sheet metal, cylindrical in form, and having a closed cone-shaped upper end 2. Located within the casing 1 is a central tubular portion 3, whose outer surface is located a short distance from the inner surface of said casing, forming an annular passage 4 for a purpose which will hereinafter appear. Said tubular portion is made up of a lower member 5, having an internally-screw-threaded shank 6, adapted to fit upon the exhaust-pipe 7 of a gas or other engine, as clearly shown in Fig. 1 of the drawings. The said shank 6 may be constructed of ordinary iron piping and has secured to its upper end a flaring sheet-metal portion 8, which merges into a tubular portion 9. Within the tubular portion 9 is a cone-shaped spout 10, open at its upper end and located directly above the upper end of the shank or stem 6. Beneath the spout 10 and extending transversely of the stem 6 is a rod or shaft 11, which has mounted thereon a rotatable wheel 12, the blades 13 of which are substantially semicircular in form, each of them having an opening 14 therein. The outer edges of the blades 13 are located a short distance from the inner surface of the stem 6, so that the passage of exhaust steam or gas around said wheel is unimpeded.

Fitting upon the upper end of the cylindrical or tubular portion 9 of the lower member 5 is a cap 15, having an annular rim 16, which fits within the upper end of the tubular portion 9. The flat top portion of the cap 15 is formed with a series of circular openings 17 17 therein, from which lead downwardly tubes 18 18, fitting within the cavity formed by the flaring portion 8, the tubular portion 9, and the tapered or cone-shaped spout 10 and located beneath the upper end of said cone-shaped spout. A ring or handle 19 may be connected to the cap 15 for the purpose of removing it or for any purpose desired.

Fitting upon the upper end of the tubular portion 9 of the lower member 5 is the intermediate portion 20, which is cylindrical in form and has a cone-shaped upper end 21, the opening 22 in which is covered by a sheet of reticulated material 23. Between the outer surface of the cone-shaped upper end 21 of the tubular member 20 and the outer edge of said member an annular cavity 24 is formed for a purpose which will hereinafter appear.

The top member 25 of the tubular portion 2 is cylindrical in form and fits within the cylindrical upper end of the central member 20. The top 26 of the upper member 25 is formed with a series of circular openings 27 27, from which lead downwardly tubes 28 28, the lower ends of said tubes fitting within

the annular cavity 24 at the upper end of the intermediate sheet-metal member 20.

The inner tubular member 3, with the parts connected one to the other, as above described, is located within the outer casing 1, the top thereof lying a short distance beneath the top 2 of said casing. The same is held in place at its lower end by means of an annular disk 29, whose outer edge is formed with an upwardly-extending annular flange 30, as clearly shown. The said disk surrounds the shank 6 and is formed with a series of openings 31 31, located in line with the passage 4, located between the inner tubular member and the casing 1.

The operation of my device is as follows: The shank 6 being attached to the exhaust-pipe of a gas or other engine the passage of the exhaust through the device is up through the shank 6, around the wheel 12, rotating the latter and breaking without impeding the passage of the exhaust. It thence passes through the cone-shaped spout 10 and abuts against the under side of the cap 15, passing thence downwardly into the annular chamber or compartment on the outside of the spout 10, and thence upwardly through the tubes 18 18 into the lower part of the central or intermediate member 20 of the cylindrical portion 3. From there it passes upwardly through the opening 22 in the cone-shaped upper end 21 and abuts against the under side of the top part of the upper member 25, passing thence downwardly into the annular chamber 24 and upwardly through the tubes 27 27 into the annular passage 4 between the inner surface of the casing 1 and the outer surface of the tubular member 3 and out through the openings 31 31 in the annular disk 29. Through this course it will be seen that the exhaust from the engine is completely broken up and the noise incident to the discharge of the exhaust is effectually prevented.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A muffler or exhaust-breaker for engines, comprising a casing having a closed upper end, an inner tubular member located within said casing and forming an annular passage between it and the inner surface of said casing, a shank upon the lower end of said tubular member adapted to be secured to the exhaust-pipe of the engine, a circuitous passage through said tubular member including said annular passage, and a rotatably-mounted wheel in said circuitous passage, substantially as and for the purpose described.

2. A muffler or exhaust-breaker for engines, comprising a casing having a closed upper end, an inner tubular member located within said casing and forming an annular passage between it and the inner surface of said casing, a shank upon the lower end of said tubular member adapted to be secured to the exhaust-pipe of the engine, a circuitous passage through said tubular member including said annular passage, and a rotatably-mounted wheel in said circuitous passage whose blades are formed with openings, substantially as and for the purpose described.

3. A muffler or exhaust-breaker for engines, comprising a casing having a closed upper end, an inner tubular member located within said casing and forming an annular passage between it and the inner surface of said casing, a shank upon the lower end of said tubular member adapted to be secured to the exhaust-pipe of the engine, a circuitous passage through said tubular member including said annular passage, a rod or shaft extending transversely of said shank, and a rotatably-mounted wheel on said rod or shaft, the blades of which terminate a short distance from the inner surface of the passage through said shank and are formed with openings, substantially as and for the purpose described.

4. A muffler or exhaust-breaker for engines, made up of a plurality of members, the lower of which has a shank upon it adapted to be attached to the exhaust-pipe of the engine, a cone-shaped spout leading from the upper end of said shank forming an annular cavity between it and the inner surface of said lower member, a cap secured to the upper end thereof, having a series of openings therein, tubes leading downwardly from said openings and fitting within said annular cavity, an intermediate tubular member fitting upon said lower member and having a cone-shaped or tapered opening at its upper end forming an annular cavity between it and the inner surface of said intermediate member, an upper member whose top is formed with a series of openings, and tubes leading downwardly from said openings and fitting within the annular cavity in the upper end of said intermediate member, substantially as and for the purpose described.

5. A muffler or exhaust-breaker for engines, made up of a plurality of members, the lower of which has a shank upon it adapted to be attached to the exhaust-pipe of the engine, a transversely-extending rotatably-mounted wheel in the passage through said shank, a cone-shaped spout leading from the upper end of said shank forming an annular cavity between it and the inner surface of said lower member, a cap secured to the upper end thereof having a series of openings therein, tubes leading downwardly from said openings and fitting within said annular cavity, an intermediate tubular member fitting upon said lower member and having a cone-shaped or tapered opening at its upper end forming an annular cavity between it and the inner surface of said intermediate member, an upper member whose top is formed with a series of openings, and tubes leading downwardly from said openings and fitting within the annular cavity in the upper end of said intermediate member, substantially as and for the purpose described.

6. A muffler or exhaust-breaker for engines,

comprising a tubular casing having a closed upper end, a tubular portion located within said casing and forming an annular passage between it and the inner surface of said casing, the said inner tubular portion being made up of a plurality of members, the lower of which has a shank upon it adapted to be attached to the exhaust-pipe of the engine, a cone-shaped spout leading from the cavity between it and the inner surface of said lower member, a cap secured to the upper end thereof having a series of openings therein, tubes leading downwardly from said openings and fitting within said annular cavity, an intermediate tubular member fitting upon said lower member and having a cone-shaped or tapered opening at its upper end forming an annular cavity between it and the inner surface of said intermediate member, an upper member whose top is formed with a series of openings, tubes leading downwardly from said openings and fitting within the annular cavity in the upper end of said intermediate member, and an annular disk secured to the lower end of the tubular casing surrounding the shank on the lower member of said tubular portion and provided with a series of openings in line with said annular passage, substantially as and for the purpose described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

GEO. L. GARDNER.

Witnesses:
L. BUTZ, Jr.,
ALBERT EMANUEL.