

No. 624,062.

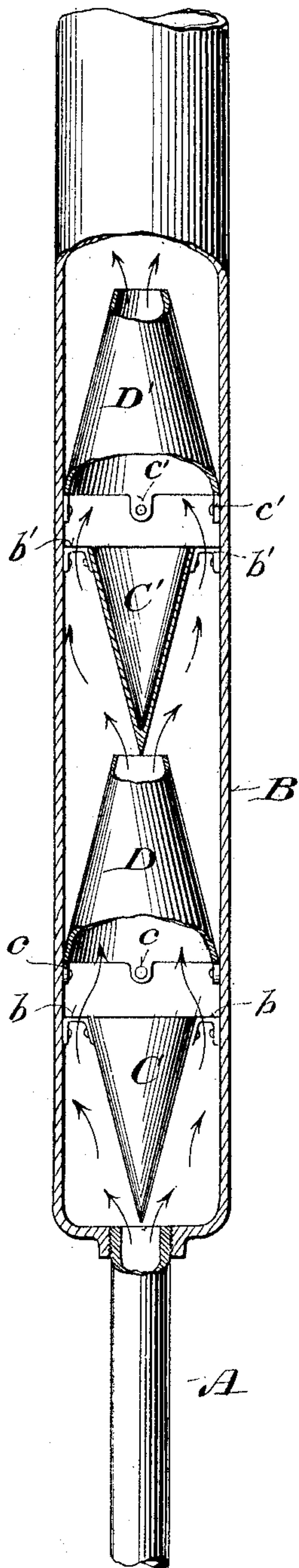
Patented May 2, 1899.

W. MATTEWS & G. ANDRICHT.

EXHAUST NOZZLE.

(Application filed Nov. 4, 1898.)

(No Model.)



Witnesses:  
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# UNITED STATES PATENT OFFICE.

WILLIAM MATTEWS AND GEORGE ANDRICHT, OF MILWAUKEE, WISCONSIN.

## EXHAUST-NOZZLE.

SPECIFICATION forming part of Letters Patent No. 624,062, dated May 2, 1899.

Application filed November 4, 1898. Serial No. 695,447. (No model.)

*To all whom it may concern:*

Be it known that we, WILLIAM MATTEWS and GEORGE ANDRICHT, citizens of the United States, and residents of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Exhaust-Nozzles; and we do hereby declare that the following is a full, clear, and exact description thereof.

Our invention has for its object to prevent noisy exhaust of gas-engines; and it consists in certain peculiarities of construction and combination of parts constituting the exhaust-nozzle hereinafter particularly set forth with reference to the accompanying drawing and subsequently claimed.

The drawing illustrates a lengthwise view of our exhaust-nozzle partly broken away.

Referring by letter to the drawing, A indicates the exhaust-pipe of an ordinary gas-engine, and B a cylindrical shell that is open at both ends, the inner one of the latter being in screw-thread connection with said pipe.

Rigidly secured to spacing-brackets *b*, made fast to the inside of shell B, is a cone C, having its point opposing outlet end of pipe A close to the latter on the same line of center. Inverse to cone C, at a predetermined distance therefrom, is a hollow truncated cone D, having its edge of greatest diameter provided with ears *c*, made fast to the aforesaid shell.

A short shell A and single pair of cones in the arrangement specified may serve as an exhaust-nozzle for an engine of small capacity; but for higher-capacity engines we propose to indefinitely increase the length of shell and multiply the cones therein. Therefore we have shown another pair of cones C' D', succeeding those aforesaid. The cone C' is rigid with spacing-brackets *b'*, made fast to the inside of shell B in position to have the point of the latter cone oppose the outer end of cone D aforesaid close to the latter on the same line of center. The cone D' is similar to cone D and in the same arrangement with respect to cone C' as the cone D is to primary cone C of the series, the ears *c'*, extending from

the edge of greatest diameter pertaining to said cone D', being made fast to said shell.

It will be seen that the greatest area of cone C or C' is less than that of the shell-bore in transverse section, but that the greatest area of the truncated cone D or D' is equal to said area of the shell-bore.

In practice products of combustion generated in a gas-engine have forcible emission through pipe A into shell B and are diffused by cone C, the air ahead of said products being gradually compressed by convergence of the latter in truncated cone D on the way to exit. The immediate diffusion and succeeding convergence of the forcible products of combustion prevent sudden shock that would otherwise come upon the air to produce the noisy sound commonly experienced in the use of gas-engines, and in order to prevent back pressure of air the diffusion and convergence of said products may be indefinitely multiplied on their way to exit by a succession of cones arranged as herein specified, the force of the aforesaid products being gradually diminished as the exit is approached.

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

An exhaust-nozzle for a gas-engine, the same comprising a cylindrical shell open at both ends, cones having their greatest diameter less than the shell-bore within which they are suspended to have their points toward the shell-inlet, and hollow truncated cones having their greatest diameters equal to that of said shell-bore in which they are supported inverse to the former cones alternate therewith.

In testimony that we claim the foregoing we have hereunto set our hands, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WM. MATTEWS.

GEORGE ANDRICHT.

Witnesses:

N. E. OLIPHANT,

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