

No. 778,417.

PATENTED DEC. 27, 1904.

F. LAMPLOUGH.
MUFFLER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JULY 25, 1904.

2 SHEETS—SHEET 1.

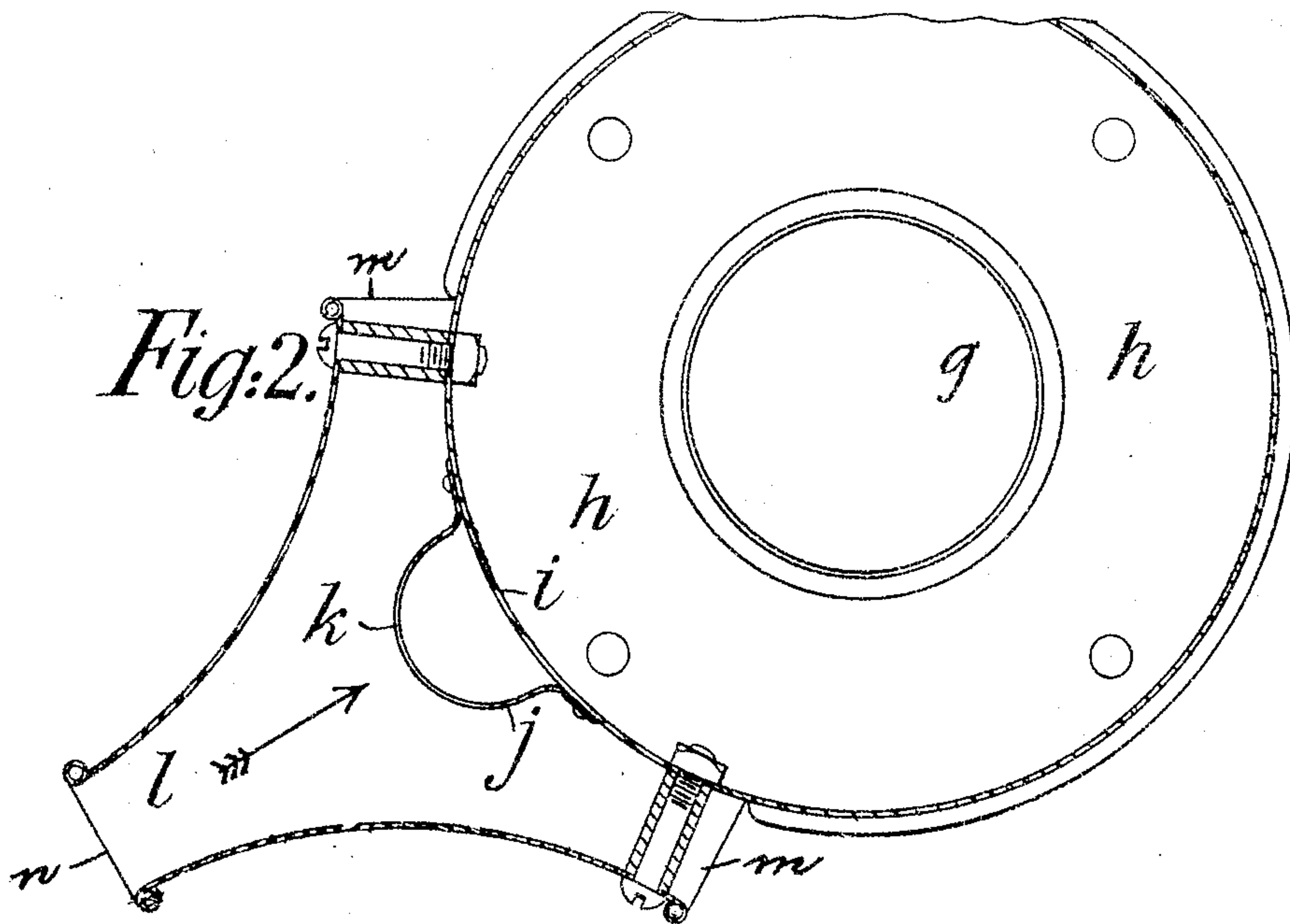
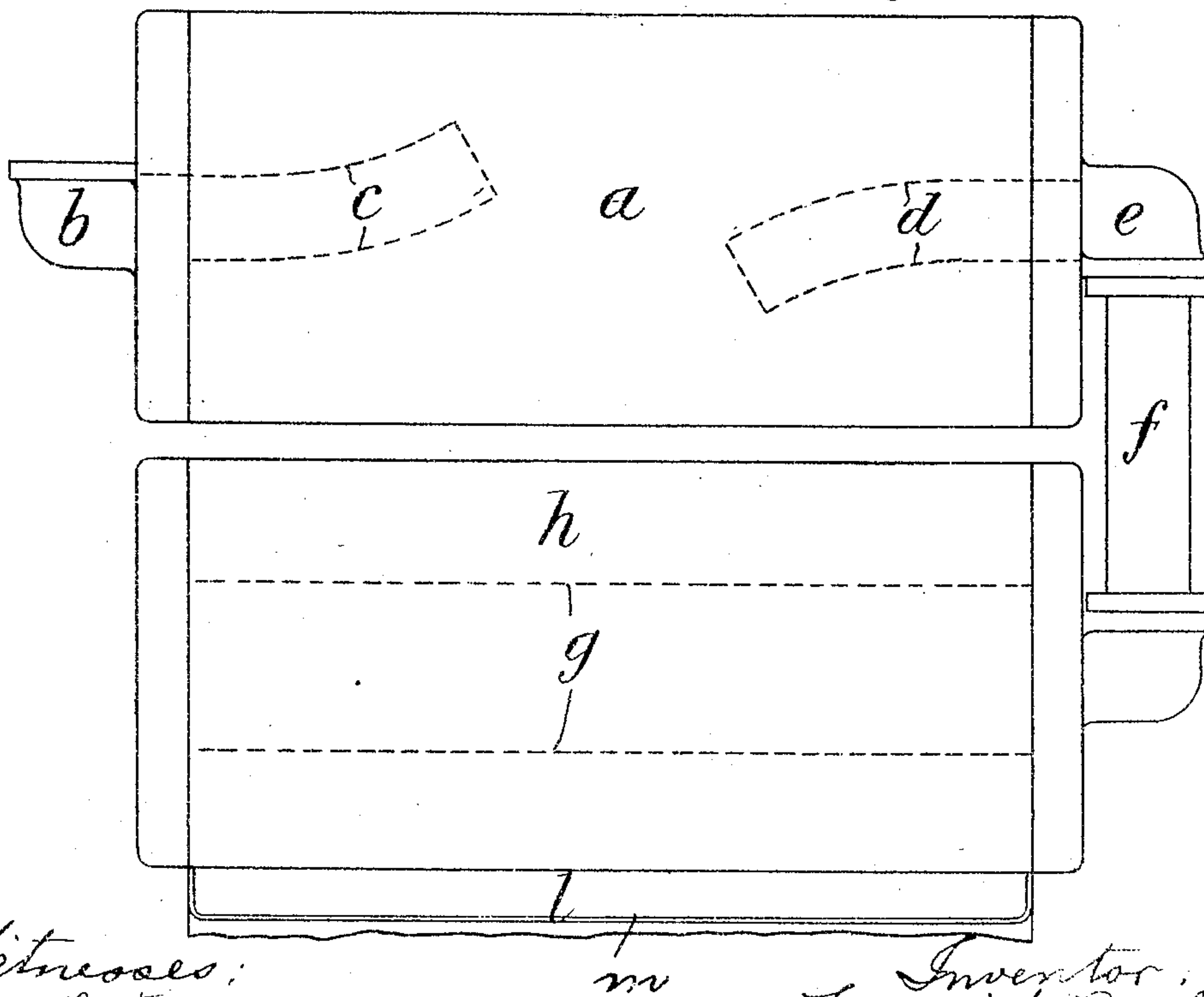


Fig:1.



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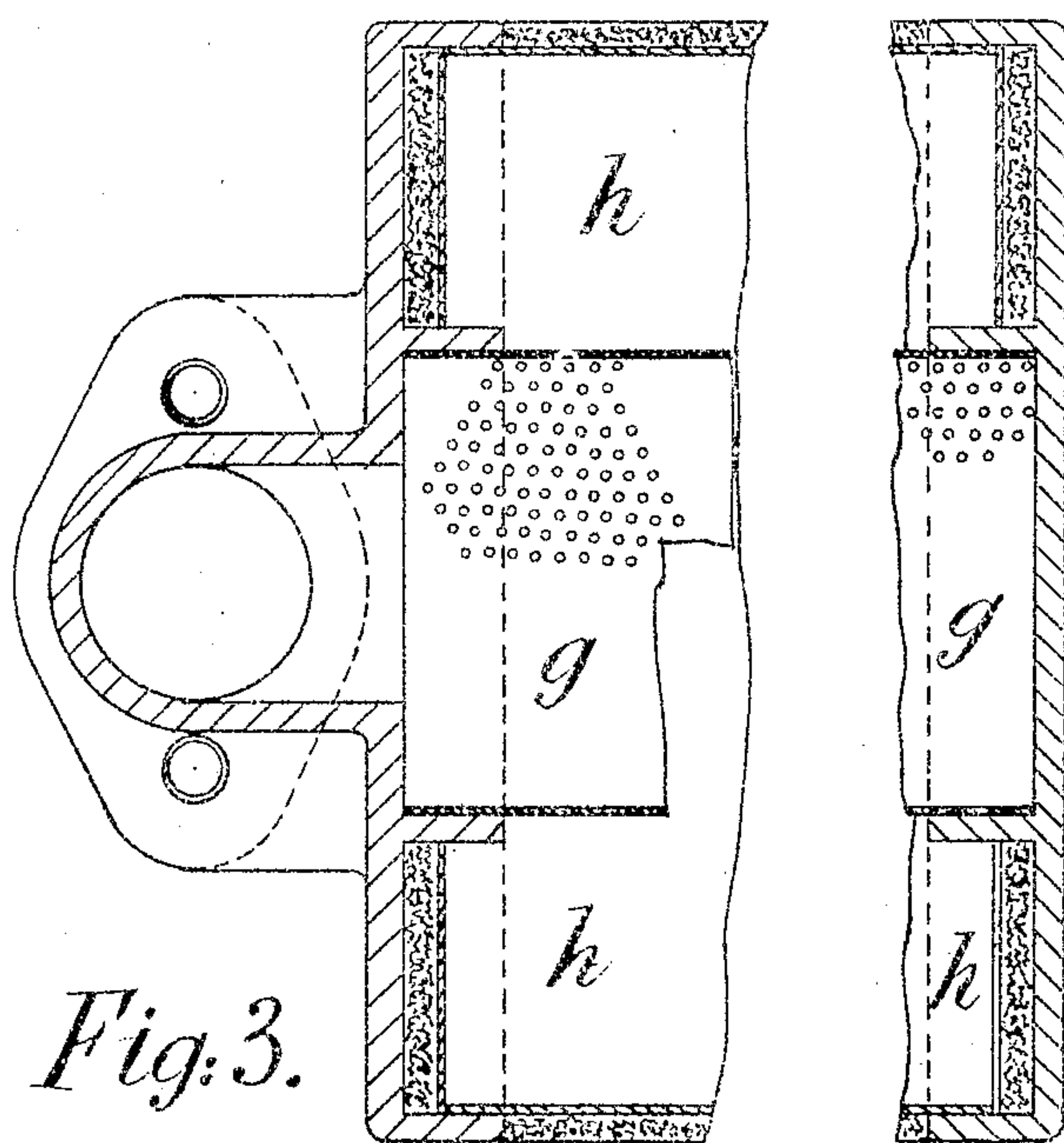
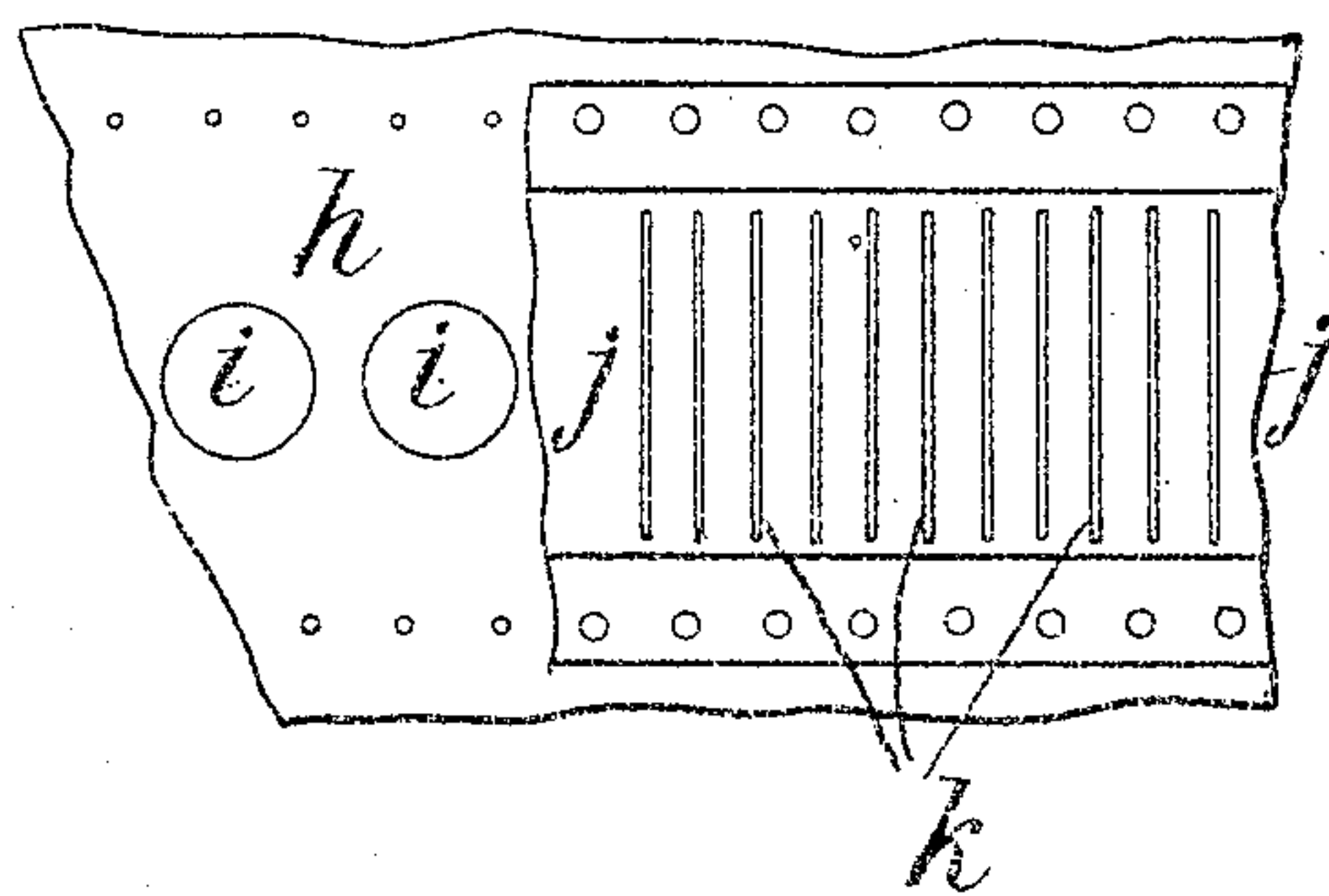


Fig. 4.



Witnesses:
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UNITED STATES PATENT OFFICE.

FREDERICK LAMPLOUGH, OF WILLESSEN, ENGLAND.

MUFFLER FOR INTERNAL-COMBUSTION ENGINES.

SPECIFICATION forming part of Letters Patent No. 778,417, dated December 27, 1904.

Application filed July 25, 1904. Serial No. 217,993.

To all whom it may concern:

Be it known that I, FREDERICK LAMPLOUGH, a subject of the King of Great Britain, residing at Willesden, in the county of Middlesex, England, have invented a certain new and useful Improvement in Mufflers for Internal-Combustion Engines, of which the following is a full, clear, and exact description.

The invention has for its object an apparatus for use with internal-combustion engines in order to muffle or silence the noise of the exhaust emanating from the engine, prevent the odor of burning gases from rising, and cool them sufficiently to prevent their rapid expansion, and thereby prevent clouds of dust rising from the road, as is the case with the usual form of silencer.

I will describe my invention by the aid of the accompanying drawings, in which—

Figure 1 is an elevation of the complete apparatus. Fig. 2 is a cross-section, and Fig. 3 a longitudinal section, of the lower portion of said apparatus; and Fig. 4 is a detail view of parts as seen when looking in the direction of the arrow in Fig. 2.

a is a primary expansion-chamber, into one end of which the exhaust-gases are led through an ajutage *b* and tube *c*, which latter directs them toward the upper part thereof. The said gases pass out of the chamber *a* from its lower part through a tube *d* and ajutage *e*, communicating by a tube *f* with the interior of a perforated cylinder or screen *g*, mounted in the center of a chamber *h*, where a further expansion takes place. From this screen or perforated cylinder *g* the gases pass through the perforations into the surrounding annular space. From the chamber *h* the expanded gases issue through holes *i*, extending along the length thereof, into an inclosure or channel *j* and through the slots *k* thereof into an eductor *l*, which also preferably extends the length of the chamber *h* and in which the cooling of the gases takes place.

The eductor *l* is connected to the chamber *h* in such a way as to form air-inlet passages *m* along the lines of connection, and it has an outlet *n* lengthwise thereof. The eductor may, however, be otherwise formed, so long as the air entering the same is baffled and caused

to mix with the escaping gases. For instance, the gases and air may be caused to pass through tubes arranged similarly to Bunsen burners.

The action of the eductor is as follows: The force of the issuing gases causes air to enter the eductor *l* by the passages *m*, and as the combined area of these inlets is greater than that of the outlet *n* baffling takes place within the eductor *l*, thereby effecting a mixing of air and gas therein. The carbon dioxide or carbonic-acid gas falls to the ground, while the air, not being sufficiently heated to rise, goes to fill the vacuum created underneath the car by its rapid transit over the road.

With motors fitted with the above form of silencer and dust-preventer the dust never rises above the car-axle.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a muffler for internal-combustion engines, the combination with an expansion-chamber into which the exhaust-gases are led, of an eductor having an air-inlet and an outlet the area of which latter is less than that of the air-inlet, substantially as and for the purpose herein described.

2. In a muffler for internal-combustion engines, the combination of primary and secondary expansion-chambers into which the exhaust-gases are successively led, and an eductor having air-inlets and an outlet the area of which latter is less than that of the air-inlets, substantially as and for the purpose herein described.

3. In a muffler for internal-combustion engines, the combination with an expansion-chamber into which the exhaust-gases are led, of a series of gas-exit holes along the length of said chamber, a channel inclosing said holes, slots in said channel, and an eductor having air-inlets and an outlet the area of which latter is less than that of the air-inlets, substantially as and for the purpose herein described.

4. A muffler for internal-combustion engines, comprising a primary expansion-chamber into which the exhaust-gases are led, a second expansion-chamber containing a perforated cylinder into which latter the gases

pass from the primary expansion-chamber and from which they pass into the surrounding annular space, a series of gas-exit holes along the length of the second expansion-
5 chamber, a channel inclosing said holes, a series of slots in said channel, an eductor into which the gases pass from the said slots, and air-inlets and an outlet to said eductor the area of said outlet being less than the com-

bined area of the air-inlets, substantially as to and for the purpose herein described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

F. LAMPLOUGH.

Witnesses:

H. D. JAMESON,

F. L. RAND.