

No. 753,845.

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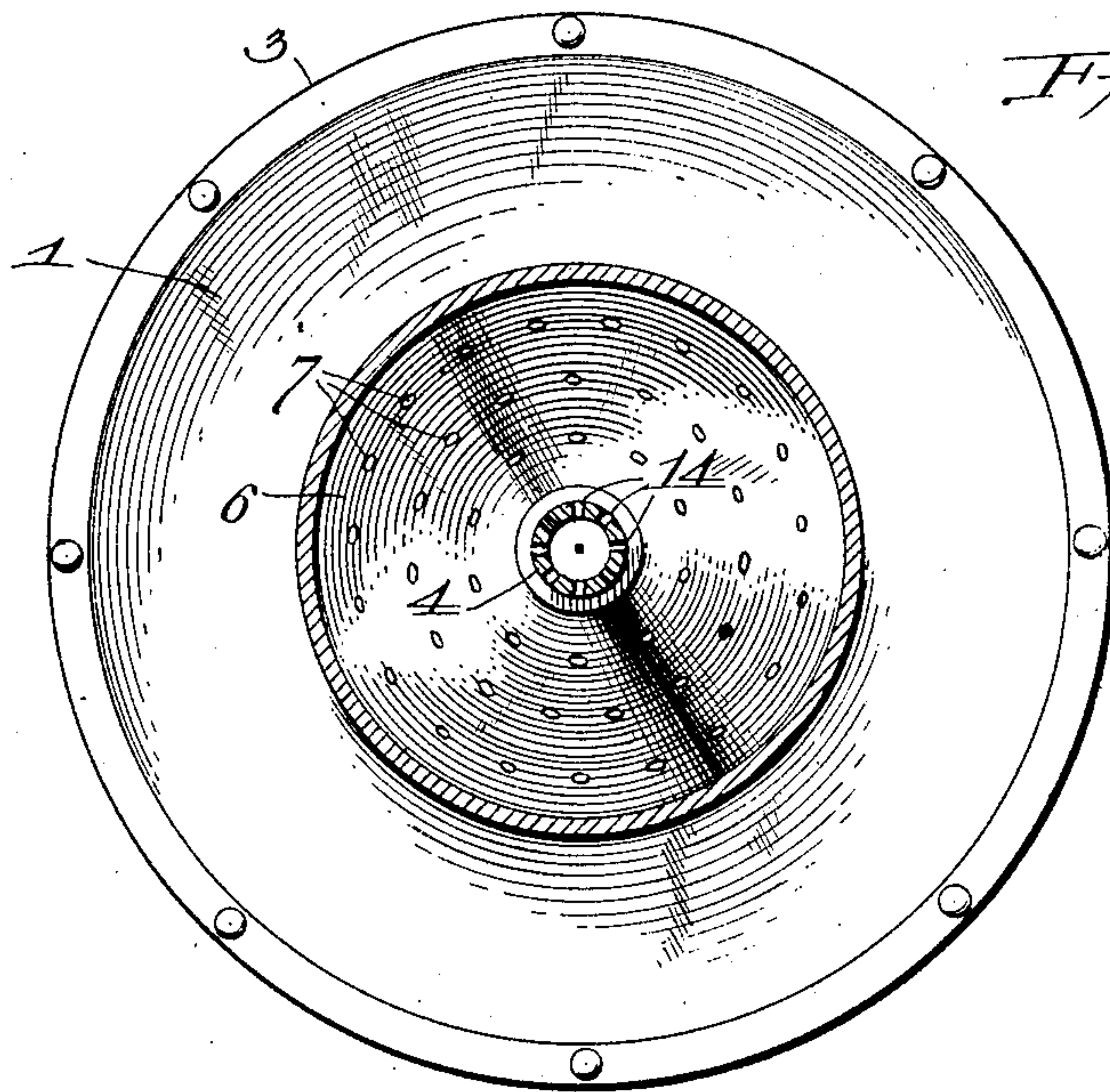
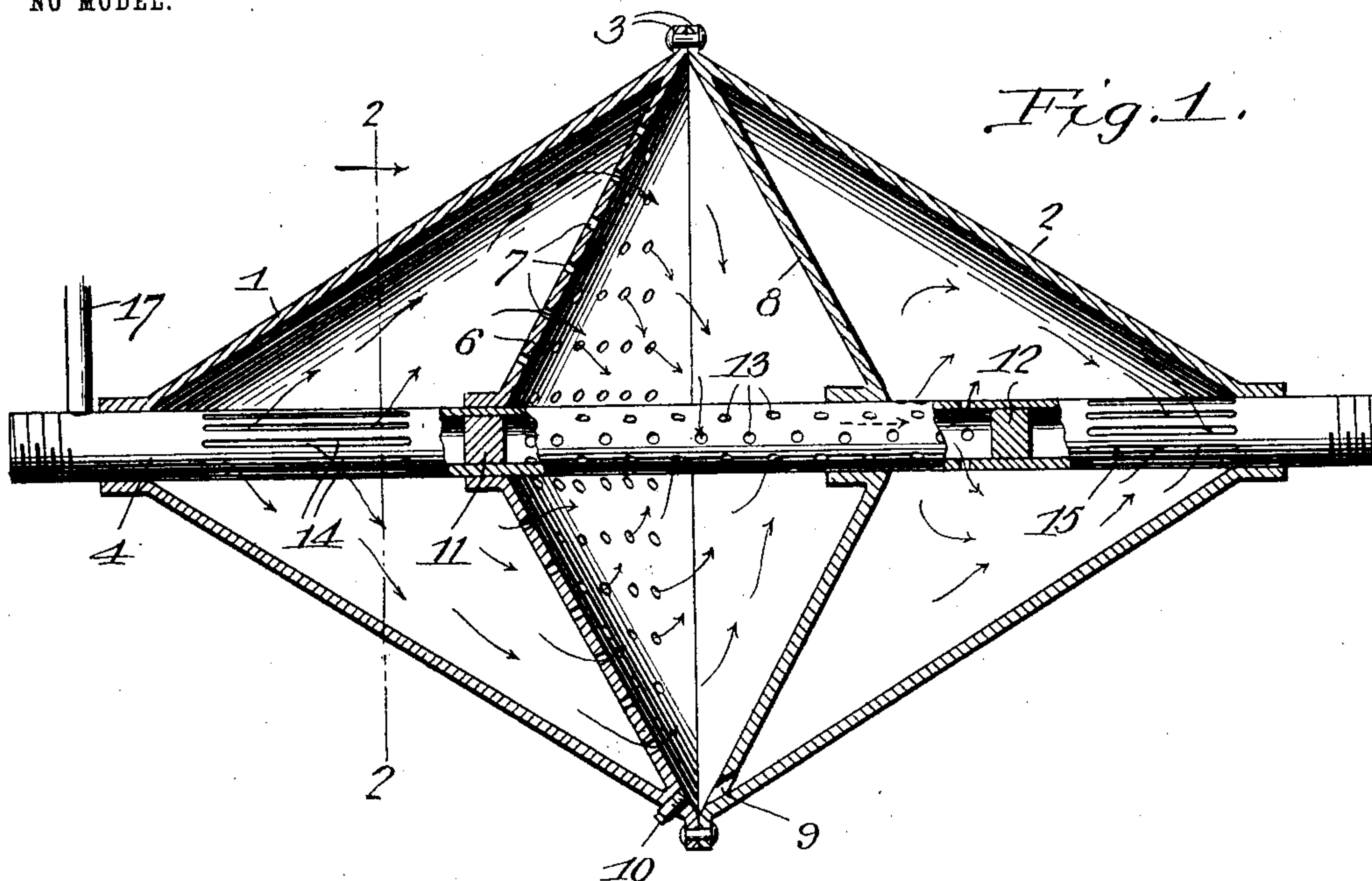
R. W. BROCKWAY & F. J. MECKENSTURM.

GASOLINE ENGINE MUFFLER.

APPLICATION FILED AUG. 7, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses  
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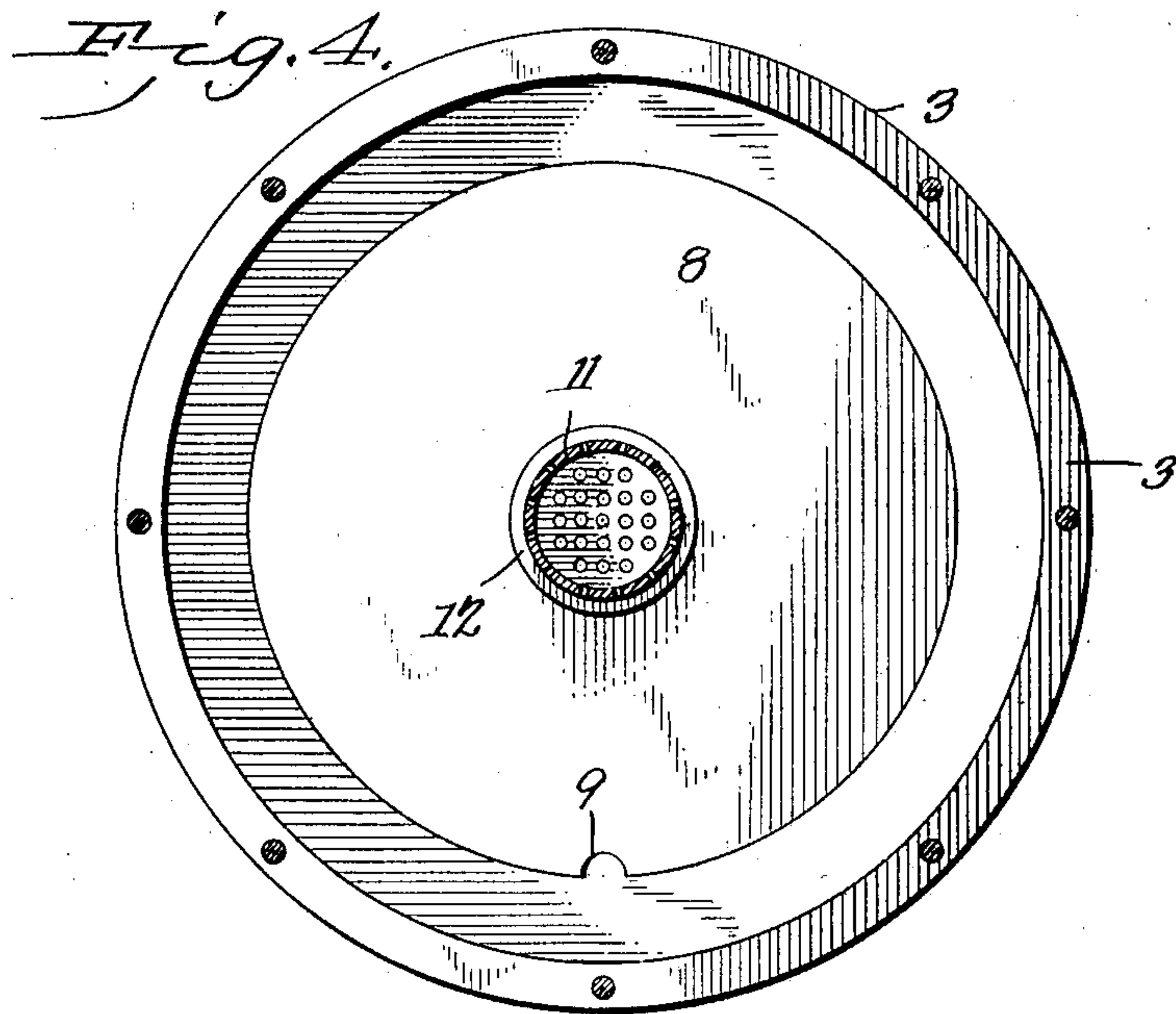
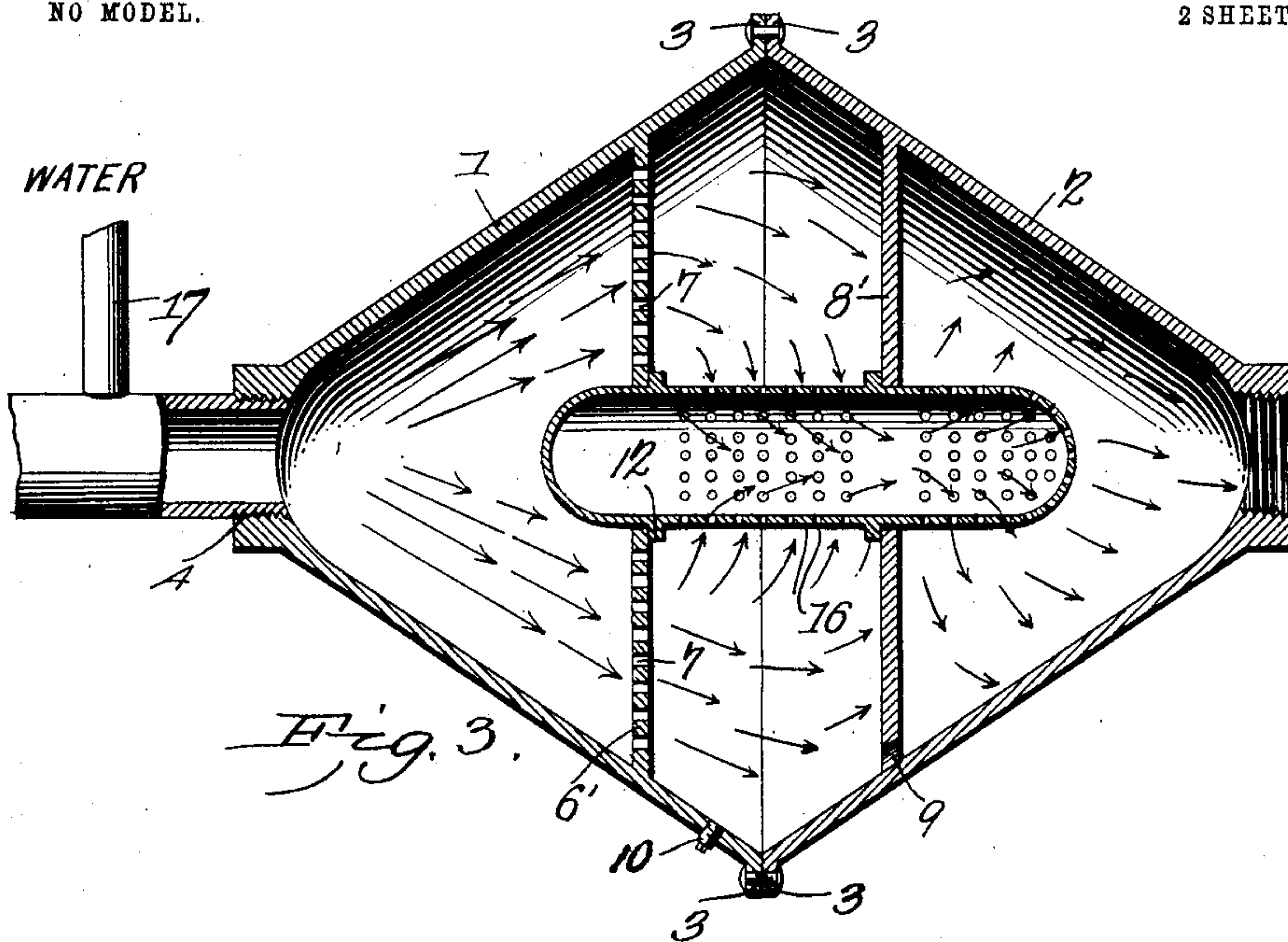
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*J. M. & Parker*

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# UNITED STATES PATENT OFFICE.

RICHARD W. BROCKWAY AND FRANCIS J. MECKENSTURM, OF MOODUS, CONNECTICUT.

## GASOLENE-ENGINE MUFFLER.

SPECIFICATION forming part of Letters Patent No. 753,845, dated March 8, 1904.

Application filed August 7, 1903. Serial No. 168,640. (No model.)

*To all whom it may concern:*

Be it known that we, RICHARD W. BROCKWAY and FRANCIS J. MECKENSTURM, citizens of the United States, residing at Moodus, in the county of Middlesex and State of Connecticut, have invented a new and useful Gasolene-Engine Muffler; of which the following is a specification.

This invention relates to certain improvements in mufflers, and particularly to that class employed for reducing the noise created by the exhaust of explosive-engines, although the principle may be applied for the noiseless exhaust or discharge of steam, air, or other fluids under pressure.

One of the principal objects of the invention is to provide a muffler of simple character, in which a practically silent exhaust might be obtained by permitting the exploded charge to expand in a natural manner within the muffler-chamber and at the same time cool it, so that the pressure will quickly fall, and thence after passing the cool mixture through a small chamber again afford opportunity for expansion before allowing the gas to pass to the final discharge.

A still further object of the invention is to provide a muffler in which the exploded charge will be subjected to the action of water or an equivalent fluid for more quickly cooling the charge.

With these and other objects in view, as will hereinafter more fully appear, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size, and minor details of the structure may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a sectional elevation of the muffler constructed in accordance with the invention. Fig. 2 is a transverse sectional elevation of the same on the line 2 2 of Fig. 1. Figs. 3 and 4 are views corresponding to Figs. 1 and 2, illustrating a slight modification of the invention.

Similar numerals of reference are employed to indicate corresponding parts throughout the several figures of the drawings.

The muffler has two oppositely-disposed conical heads or casings 1 and 2, the larger and adjacent ends of said casings being provided with marginal flanges 3, which may be bolted, riveted, or otherwise secured together in order to form a tight joint. Through these two casings extends a tube 4, connected at one end to the exhaust-port of the engine and the other end connected to a steam or gas discharge-pipe for exhausting directly to the outer air.

In the head 1 is arranged a transverse partition 6, preferably conical in form, but disposed at a lesser angle to the vertical than the conical shell 1. This partition has perforations 7, the combined area of which is equal to or greater than the area of the inlet-pipe, so that no back pressure can result at this point. The head 2 is provided with a solid partition 8, at the lower end of which is a threaded opening 9 to allow the passage of water to the greatest diameter of the muffler, and this water may be drawn off from time to time by the removal of a threaded plug 10.

The pipe 4 is provided with two plugs 11 and 12, so arranged as to form a chamber intermediate of the muffler, and the wall of the pipe between these two plugs is provided with a large number of perforations 13, that permit the free passage of steam from the central chamber formed by the partitions 6 and 8 to the end chamber formed by the head 2. The inlet end of the pipe at a point within the head 1 is provided with a large number of perforations or slots 14 to afford a free passage for the steam or gas and at the outlet end are similar perforations or slots 15 to permit the free escape of the steam or gas.

In the operation of the muffler, which may be placed in either a vertical or a horizontal position, a charge enters through the pipe 4 and passes through the slots 14 to the interior of the head 1, where it is allowed to expand in a natural manner, the conical wall of the head and the conical partition being arranged at suitable angles for this purpose. The charge being now partly cooled and expanded



is divided by its passage through the numerous perforations 7; but, as before described, the combined area of these is equal to or greater than the area of the inlet-pipe, so that  
 5 no back pressure can result at this point. After passing through the perforations 7 further expansion is permitted in the chamber formed between the two partitions, and the charge, now materially reduced as regards  
 10 both temperature and pressure, passes through the perforations 13 and is conveyed by the pipe to the chamber formed in the head 2, being again allowed to expand before its final discharge through the slots 14.

15 In Figs. 3 and 4 is illustrated a slight modification of the structure, similar reference-numerals being employed on parts corresponding to those shown in Figs. 1 and 2. The two partitions 6' and 8' are in the form of trans-  
 20 verse parallel walls and each is provided with a central opening for the reception of a cylinder 16, which for convenience may be provided with a pair of annular flanges fitting, respectively, against the perforations 6' and 8'  
 25 in order that said cylinder may be held firmly in place. Both ends of the cylinder are rounded or dome-shaped and that end which projects through the perforation 6' is solid, while the opposite end and all of the remain-  
 30 ing portion of the cylinder-wall is perforated to permit the free passage of the charge.

In the inlet-pipe of both forms of muffler is connected a small water-pipe 17, through which a stream of water is directed into con-  
 35 tact with the exhaust before its entrance to the muffler and serves to a considerable extent to reduce the pressure of the charge by reducing its temperature.

The muffler is found extremely serviceable  
 40 in use and may be of any size and employed in connection with explosive, steam, and other engines without departing from the invention.

Having thus described the invention, what is claimed is—

45 1. In a muffler, a casing in the form of a double cone, partitions dividing said casing into a plurality of chambers, one of said partitions being perforated, an inlet leading to one of the cones, an outlet leading from the  
 50 other cone, and a duct leading from the intermediate chamber of the muffler through the solid partition to the outlet-cone.

2. In a muffler, a casing in the form of a double cone, a pair of partitions arranged in  
 55 the casing dividing the same into a plurality of compartments, one of said partitions being perforated, and a perforated cylinder extending through the second partition and forming a passage-way for the fluid.

3. In a muffler, a casing, partitions divid- 60  
 ing the casing into a plurality of compartments, one of said partitions being perforated, and a perforated cylinder extending through an opening formed in the second of said par-  
 65 titions.

4. In a muffler, a casing in the form of a double cone, a pair of oppositely-disposed con-  
 ical partitions arranged in the casing and di-  
 70 viding the same into a plurality of compartments, one of said partitions being perforated, and a pipe extending through the walls of the casing and the partitions, said pipe being  
 plugged to form an intermediate cylindrical chamber and being further provided with  
 75 openings to permit the passage of the exhaust from chamber to chamber of the muffler.

5. In a muffler, a casing in the form of a double cone, a pair of oppositely-disposed con-  
 ical partitions arranged within the casing and  
 80 dividing the same into a plurality of compartments, one of said partitions being perforated, a pipe extending through the walls of the casing and the partitions, plugs arranged in said  
 pipe to form a chamber intermediate of the  
 85 length thereof, there being a plurality of perforations formed in that portion of the pipe between the plugs and serving to permit the  
 passage of the exhaust from the intermediate  
 to the final chamber and said pipe being fur-  
 90 ther provided with slots or perforations at points within both the inlet and the final chamber of the muffler.

6. In a muffler, a casing having expansion-  
 chambers, an exhaust-pipe leading thereinto,  
 95 and a water-pipe connected to said exhaust-pipe and adapted to discharge a stream of water thereinto.

7. In a muffler, a casing formed of a pair of  
 conical members secured together at their  
 100 larger ends, a perforated partition carried by one of the members, a second and solid partition carried by the second member, both of  
 said partitions being provided with alining  
 openings, a cylinder extending through said  
 105 openings and supported by the walls thereof, said cylinder having a solid head at that end  
 extending through the perforated partition  
 and the remaining portion of the walls of said  
 cylinder being perforated to permit the pas-  
 110 sage of the fluid.

In testimony that we claim the foregoing as  
 our own we have hereto affixed our signatures  
 in the presence of two witnesses.

RICHARD W. BROCKWAY.

FRANCIS J. MECKENSTURM.

Witnesses:

WILLIAM J. THOMAS,

GEORGE H. VENTRES.