

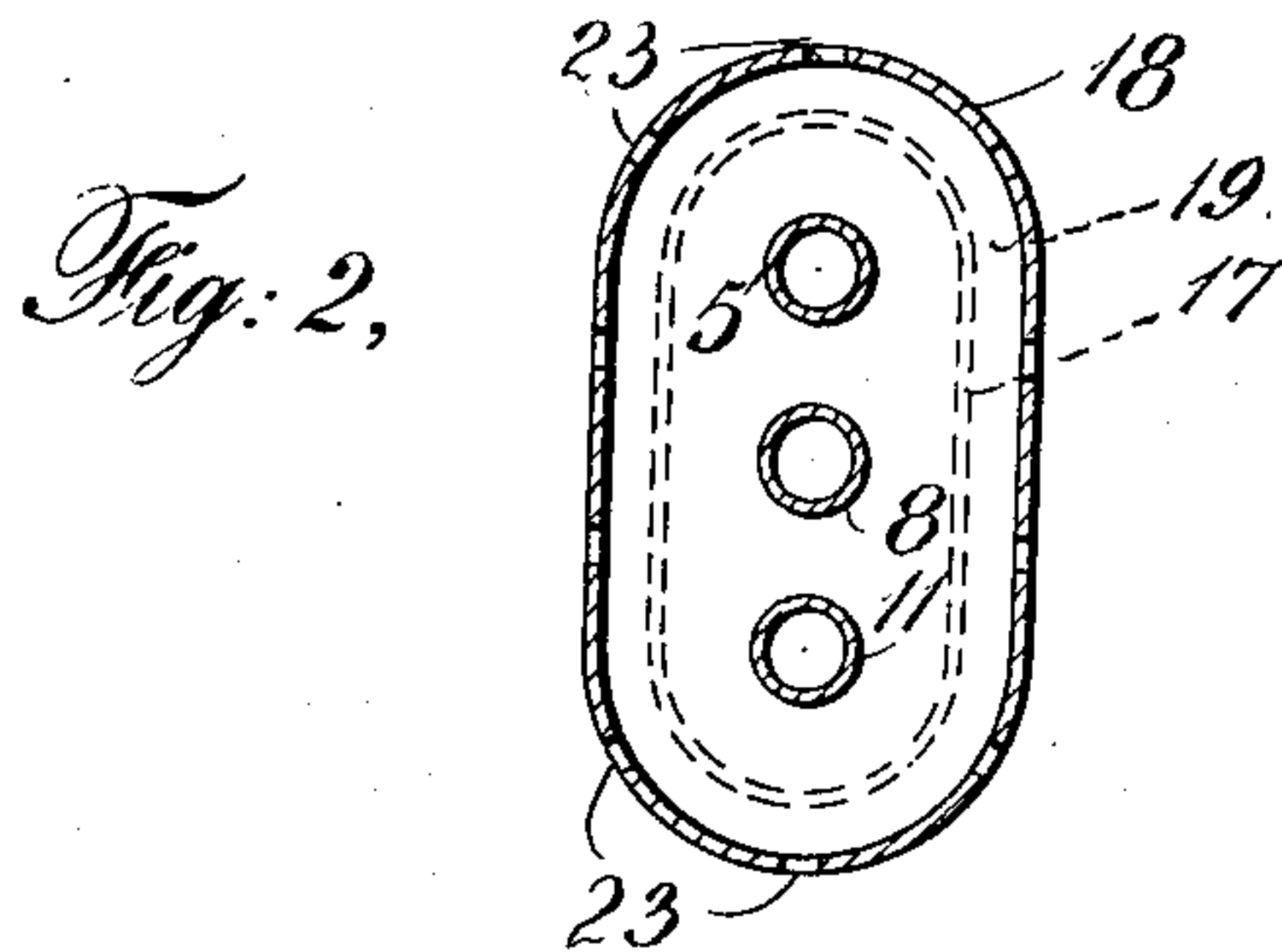
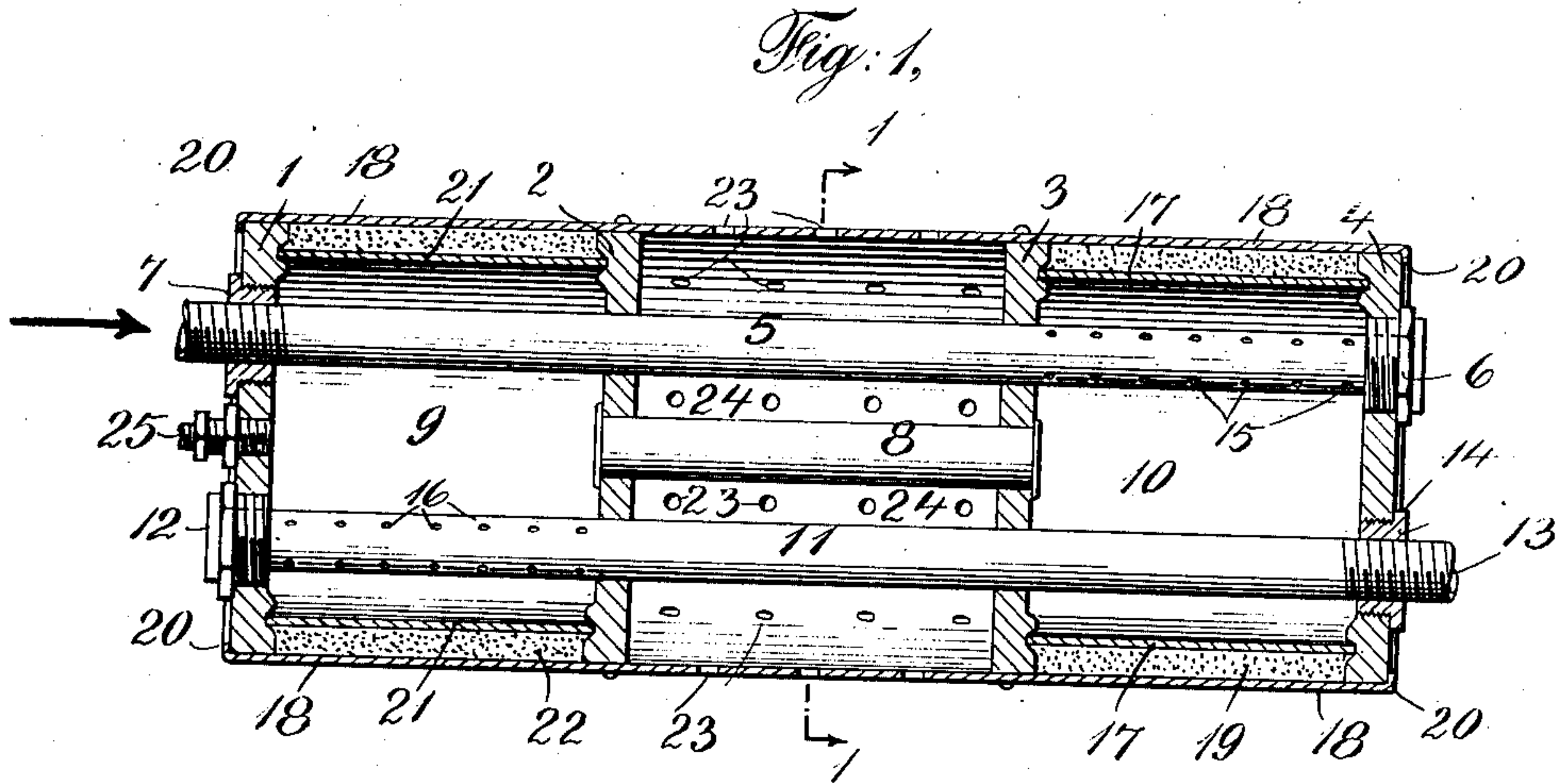
A. S. COLES.

MUFFLER.

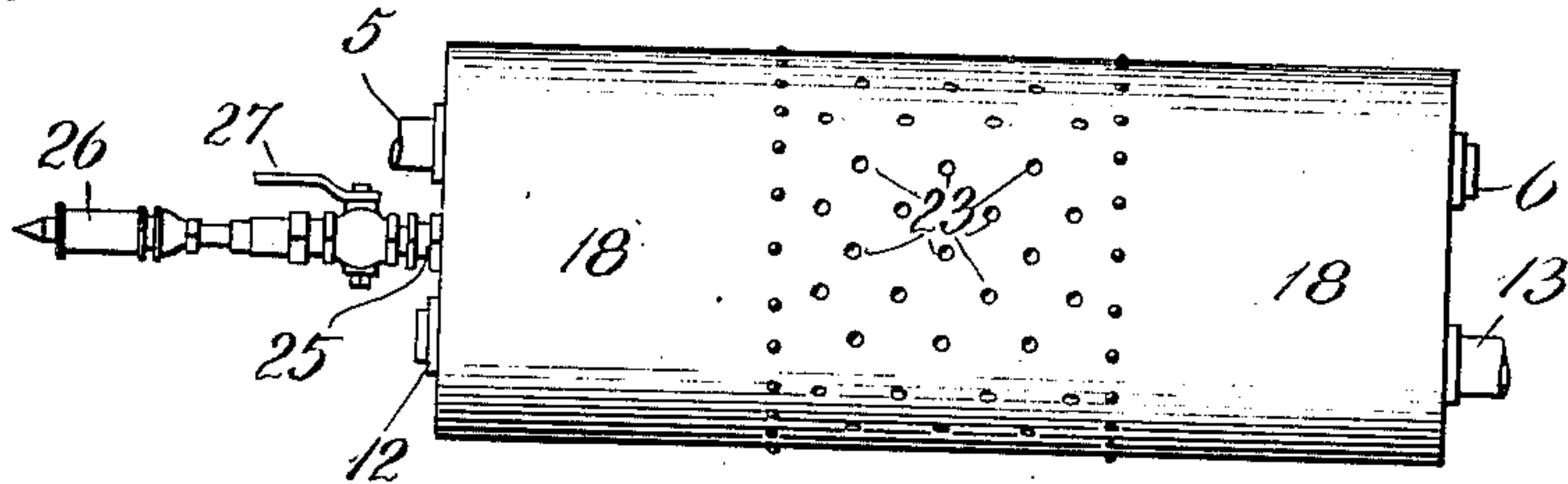
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*Fig. 3.*



Witnesses:  
Max B. A. Doring.  
F. M. Dousbach

Andrew S. Coles, Inventor  
By his Attorney Phillips Abbott



# UNITED STATES PATENT OFFICE.

ANDREW S. COLES, OF MAMARONECK, NEW YORK.

## MUFFLER.

No. 929,656.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed December 3, 1908. Serial No. 465,840.

*To all whom it may concern:*

Be it known that I, ANDREW S. COLES, a citizen of the United States, and a resident of the village of Mamaroneck, county of Westchester, State of New York, have invented a new and useful Improvement in Mufflers, of which the following is a specification, reference being had to the accompanying drawings, in which—

10 Figure 1 illustrates a longitudinal vertical sectional view of the muffler; Fig. 2 illustrates an endwise sectional view taken on the line 1—1 of Fig. 1 and looking in the direction of the arrow; Fig. 3 illustrates a 15 side elevation.

It is the purpose of this invention to construct a muffler on desirable mechanical lines which shall be inexpensive in cost, of relatively light weight, of reduced size relative 20 to its efficiency and one in which there can be no back pressure, and the structure is so arranged that either end of the muffler can be connected with the engine exhaust and, if desired, the exhaust be passed through 25 the structure in two differing ways. It is so arranged also that a horn or whistle, with suitable cut-outs, can be readily connected to the muffler and thus operated by the exhaust.

30 1, 2, 3 and 4, represent cast metal diaphragms. They may be made of cast iron, or other suitable material.

5 is a pipe which we will assume in the present case connects with the engine exhaust. This pipe extends through the diaphragms 1, 2 and 3 and is threaded into a plug 6 in the diaphragm 4. The plug of course closes the end of the pipe. It passes through a threaded block 7 also which is 40 located in the diaphragm 1.

8 is a pipe the ends of which are expanded or which may be threaded, as preferred, into the diaphragms 2 and 3, and connects the open chambers 9 and 10 at the 45 two ends of the structure.

11 is a pipe the same in all respects as pipe 5, excepting that the end toward the engine is closed by a plug 12 which is in all respects the same as the plug 6, and 50 the exhaust is at the opposite end of the pipe 13 where it passes through a similar block 14 in the diaphragm 4. The pipes 5 and 11 are perforated, as shown at 15 and 16 respectively at opposite ends of the structure. 55

17 is a shell of sheet steel or equivalent material which is supported in rabbets on opposed faces of the diaphragms 3 and 4 and extends entirely around the chamber 10 and has deposited between its outer surface 60 and the inner surface of the outer shell of the structure 18 a suitable deposit of asbestos cement, 19, or equivalent material. The outer shell 18, which is preferably of strong sheet steel, incloses the entire exterior of the 65 structure and the ends of this outer shell 18 are flanged as shown at 20 upon the outside of the first diaphragm 1, and also of the last diaphragm 4, so as to afford a firm, durable outer covering or jacket for the structure. 70

The chamber 9 is insulated in the same manner as the chamber 10, that is to say: it has an interior steel casing 21, which is the same in all respects as the casing 17 and supported in a similar manner and it also has a deposit, 75 22, of asbestos cement, or equivalent insulating material. The outer casing 18 is perforated, as shown at 23, opposite the interior chamber 24 of the structure.

25 is a pipe threaded into the diaphragm 1 80 and which connects with the chamber 9 upon which a suitable horn, or whistle 26 (see Fig. 3) is connected, there being a suitable valve or cut-out 27, provided, whereby the horn may be sounded as desired. 85

The operation is as follows: In the instance shown the exhaust comes from the engine in the direction of the arrow and enters the pipe 5. It passes through that pipe to its opposite end and thence escapes 90 through the perforations 15 made therein and expands in the chamber 10. It thence passes from right to left through the pipe 8 and additionally expands in the chamber 9. It thence enters pipe 11 through the perforations 16 and passing through pipe 11 from 95 left to right is discharged at 13. The insulating material 19 and 22 reduce the heat of the exterior shell and likewise materially reduce the noise, and the perforations 23 in the exterior casing 18 allow free circulation 100 of the air so as to additionally reduce temperatures.

The operation of the horn or whistle will be at once understood from what has already 105 been said.

It will be seen from the foregoing that my muffler embodies a number of advantageous features, that is to say: The four diaphragms are inexpensive parts, requiring 110



little if any machining. The piping can be bought in the general market of all sizes desired and all that is required to adapt them to use in the apparatus is the perforations and threading. The exterior and the interior steel jackets are easily and quickly made and put together and the asbestos cement and other insulating material can be easily and inexpensively applied when the interior jackets are in place but before applying the exterior one. The edges of the jackets exterior and interior, may be crimped, welded or riveted together as preferred.

I call particular attention to the fact that either end of the muffler may be connected with the engine and also that if preferred the plugs 6 or 12 being removed the connection with the engine may be made at that end, the opposite ends of the pipe being closed, and in this event the exhaust will pass through the perforations 15 or 16, as the case may be upon first entering the muffler instead of passing longitudinally through it as above described.

It will be obvious to those who are familiar with such matters that many modifications may be made in the details of construction without departing from the essentials of the invention. I therefore do not limit myself to the details.

I claim:

1. A muffler divided interiorly into three chambers, pipes for conducting the exhaust extending longitudinally through the structure each having perforations in one of the end chambers and a pipe connecting the two end chambers.

2. A muffler divided interiorly into three chambers, pipes for conducting the exhaust extending longitudinally through the structure and each opening into one of the end chambers and a pipe connecting the two end chambers.

3. A muffler divided interiorly into three chambers, pipes for conducting the exhaust extending longitudinally through the structure and which open into one of the end chambers, a pipe connecting the two end chambers and a pipe tapped into one of the chambers to which a horn or whistle may be connected.

4. A muffler divided interiorly into three chambers, pipes for conducting the exhaust extending longitudinally through the structure each connecting with one of the end chambers, and insulating material surrounding the end chambers.

5. A muffler divided interiorly into three chambers, an exterior casing inclosing all the chambers, insulating material surrounding the two end chambers and perforations in

the exterior casing opposite the central chamber.

6. A muffler divided interiorly into three chambers, an exterior casing inclosing all the chambers, insulating material surrounding the two end chambers, perforations in the exterior casing opposite the central chamber, pipes for conducting the exhaust extending respectively through one of the end chambers and the central chamber and opening into the opposite end chamber.

7. A muffler divided interiorly into three chambers, an exterior casing inclosing all the chambers, insulating material surrounding the two end chambers, perforations in the exterior casing opposite the central chamber, pipes for conducting the exhaust extending respectively through one of the end chambers and the central chamber and opening into the opposite end chamber and a pipe tapped into one of the chambers to which a horn or whistle may be connected.

8. A muffler embodying four diaphragms which divide its interior into three separate chambers, the two end chambers being expansion spaces and the interior chamber the cooling section.

9. A muffler embodying four diaphragms which divide its interior into three chambers, insulating material surrounding the two end chambers, a perforated jacket surrounding the interior chamber and two pipes which respectively extend through one of the end chambers and the central chamber and discharge into the opposite end chamber and another pipe connecting the two end chambers through the central chamber.

10. A muffler embodying two end chambers having insulating material surrounding them, and another chamber between the end chambers having a perforated jacket and means to convey the exhaust from the engine into one of the chambers, thence into the other and thence to the point of discharge.

11. A muffler embodying two end chambers having insulating material surrounding them, and another chamber between the end chambers having a perforated jacket and means to convey the exhaust from the engine into one of the chambers, thence into the other and thence to the point of discharge, and a pipe tapped into one of the end chambers to which a horn or whistle may be connected.

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

ANDREW S. COLES.

Witnesses:

F. M. DOUSBACH,  
PHILLIPS ABBOTT.