

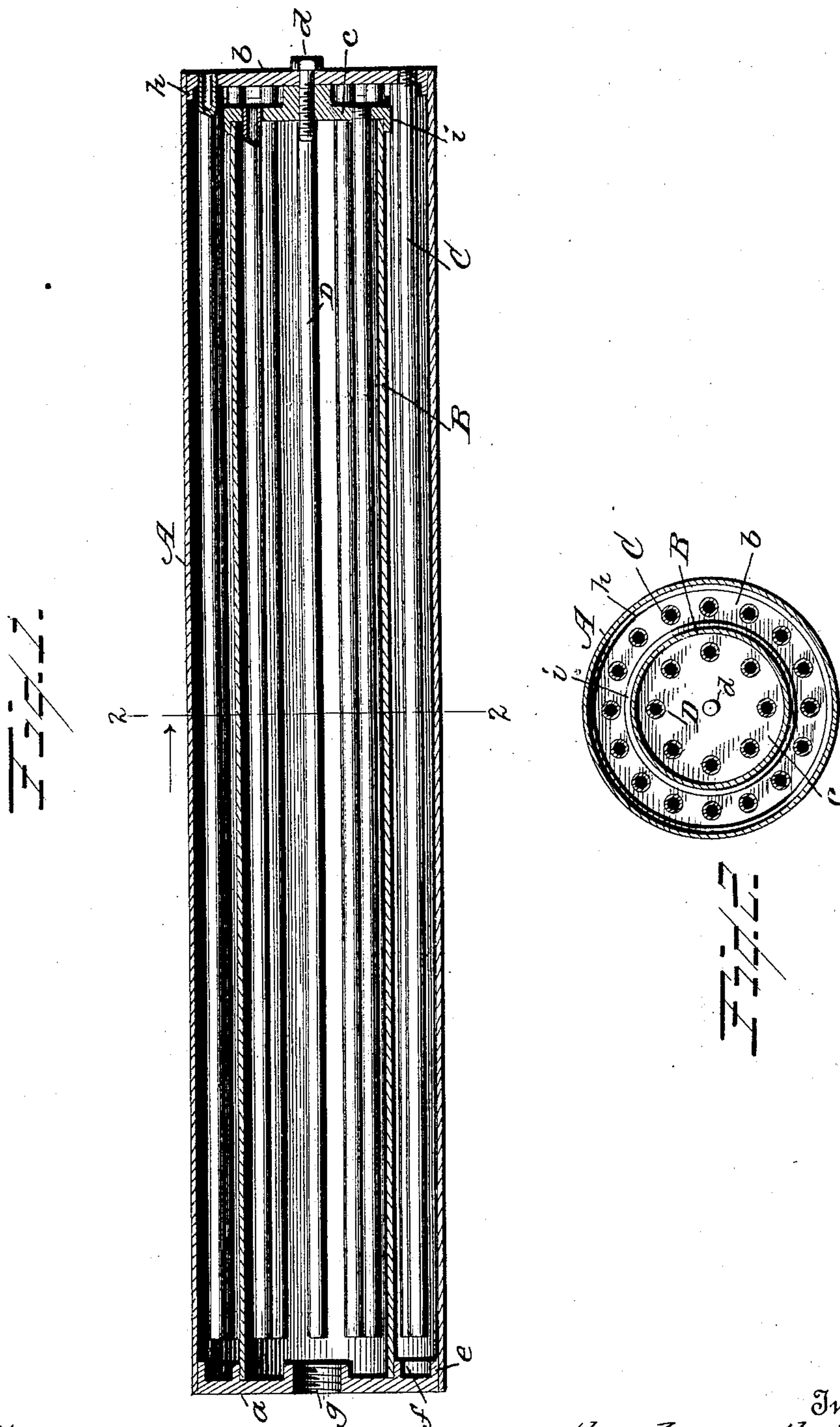
No. 717,078.

Patented Dec. 30, 1902.

C. E. CHRISTMAN.
MUFFLER.

(Application filed Aug. 8, 1902.)

(No Model.)



Witnesses
E. J. Williamson
M. E. Moore

Inventor
Charles E. Christman
per *Cha. H. Fowler*
Attorney

UNITED STATES PATENT OFFICE.

CHARLES E. CHRISTMAN, OF SAN JOSE, CALIFORNIA, ASSIGNOR TO
CHRISTMAN MOTOR CARRIAGE CO., OF SAN JOSE, CALIFORNIA,
A CORPORATION OF WEST VIRGINIA.

MUFFLER.

SPECIFICATION forming part of Letters Patent No. 717,078, dated December 30, 1902.

Application filed August 8, 1902. Serial No. 118,881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. CHRISTMAN, a citizen of the United States, residing at San Jose, in the county of Santa Clara and State of California, have invented certain new and useful Improvements in Mufflers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon.

The present invention has for its object to provide a simple and effective device for the muffling of escaping steam, vapor, or gas discharged under pressure into the atmosphere whereby the noise thereof is materially lessened, and the invention is designed as an improvement upon my former patent of May 27, 1902, No. 701,151; and it consists in a muffler constructed substantially as shown in the drawings and hereinafter described and claimed.

Figure 1 of the drawings is a longitudinal section of a muffler embodying my invention, the several steam-pipes being shown in elevation; Fig. 2, a transverse section thereof, taken on line 2 2 of Fig. 1 and looking in the direction of the arrow.

In the accompanying drawings, A B represent the outer and inner cylinder, respectively, said cylinders being of any suitable length and diameter and are connected together by heads *a b*, the head *c*, and the clamping-screw *d*. The head *c* forms the head of the inner cylinder B, which is independent of the head *b*, and the head *a* forms the head to the opposite end of the inner cylinder and also the head to the outer cylinder, as shown in Fig. 1 of the drawings. The head *a* is formed with inwardly-extending concentric flanges *e f*, to which the outer and inner cylinders A B are secured, respectively, said head having a central screw-threaded opening *g* for coupling thereto the usual exhaust-pipe. The head *b* has inwardly-extending circumferential flange *h* for connecting thereto the outer cylinder A, and the head *c* has similar flange *i* for connecting thereto the inner cylinder B. The head *c* is

formed with a central screw-nut *j*, with which engages the clamping-screw *d*, thereby tightly connecting the two heads together.

In the space between the outer and inner cylinders A B are arranged a plurality of steam-exhaust pipes C, through which the steam, gas, or vapor is discharged into the atmosphere, said pipes being somewhat shorter than the cylinder, one end of which is connected to the head *b*, and through this end the steam, vapor, or gas escapes and is discharged into the atmosphere.

The inner cylinder B contains a plurality of conducting-pipes D, one end of which is connected to the cylinder-head *c* and the opposite ends of the pipes receiving the steam, vapor, or gas from the exhaust-pipe coupled to the screw-opening *g* in the cylinder-head *a*, as shown in Fig. 1 of the drawings.

The two cylinders one within the other, in connection with the arrangement of conducting-pipes and the arrangement of discharge-pipes located, respectively, in the inner cylinder and the space between the walls of the outer and inner cylinders, provides a muffler in many respects superior both in simplicity and practicability to those heretofore in use, each cylinder having and containing its respective set of pipes in place of the two sets of pipes being contained wholly within the space between the inner and the outer cylinder as heretofore.

The exhaust steam, vapor, or gas as it passes through the exhaust-pipe into the end of the inner cylinder B enters the open ends of the conducting-pipes D and passes out through the opposite ends of the pipes into the space between the inner and the outer cylinders, after which the steam, vapor, or gas will enter the open ends of the discharge-pipes C and will pass along said pipes and pass out through the discharge ends thereof into the atmosphere.

I do not desire to be understood as limiting my invention to the precise details of construction, as many changes and modifications therein may be resorted to without in any manner affecting the essential features of the invention, and any such changes as would

come within ordinary mechanical skill and judgment may be made in the invention without departing from the principle thereof.

Having now fully described my invention, 5 what I claim as new, and desire to secure by Letters Patent, is—

1. A muffler comprising an outer and an inner cylinder, means for connecting the exhaust with the inner cylinder, a plurality of 10 condensing-pipes located in the inner cylinder and communicating with the exhaust and with the outer cylinder, and a plurality of discharge-pipes located in the outer cylinder and communicating with the inner cylinder 15 and with the atmosphere, substantially as and for the purpose set forth.

2. A muffler comprising an outer and an inner cylinder, conducting-pipes and discharge-pipes located respectively in the inner and in the outer cylinders, suitable flanged heads 20 connecting the cylinders together, the head of the inner cylinder having a screw-nut and a clamping-screw extending through the head of the outer cylinder and engaging the nut, as specified. 25

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

CHARLES E. CHRISTMAN.

Witnesses:

CHAS. H. HOGG,
ERNEST STILL.