

No. 734,868.

PATENTED JULY 28, 1903.

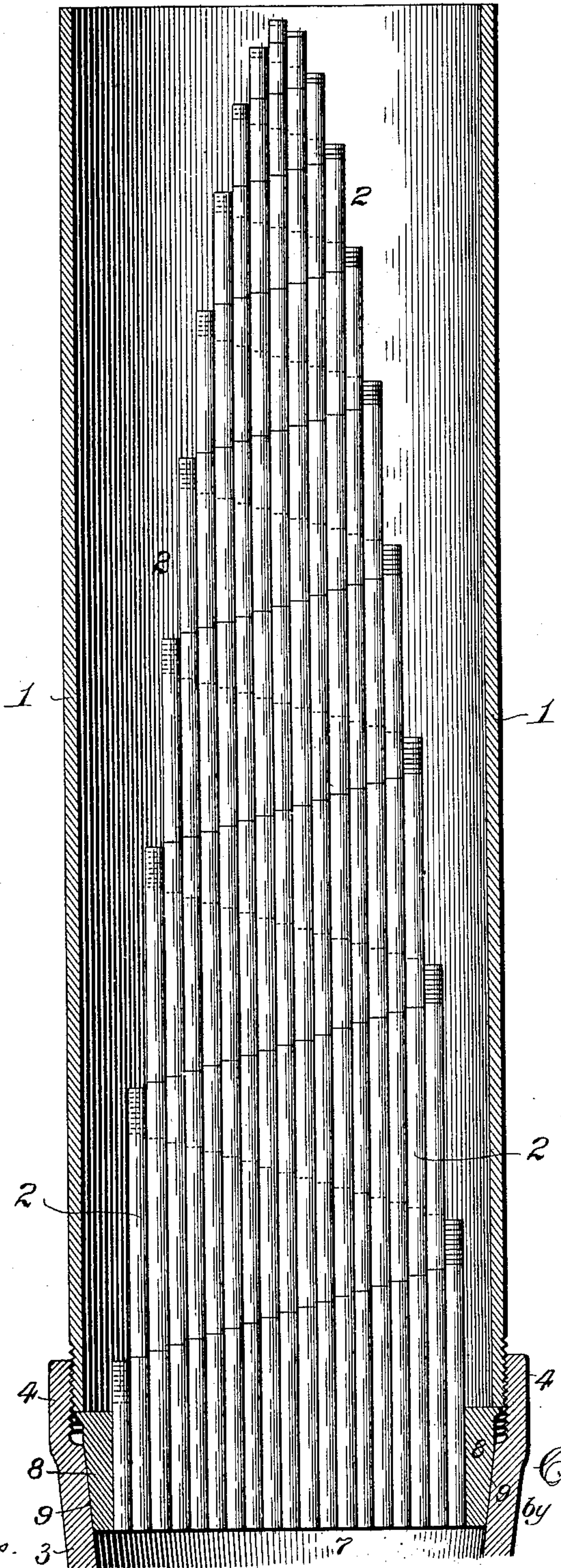
C. C. HILL.
EXHAUST MUFFLER.

APPLICATION FILED JULY 28, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

Fig. 1.



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2 SHEETS—SHEET 2.

Fig. 2

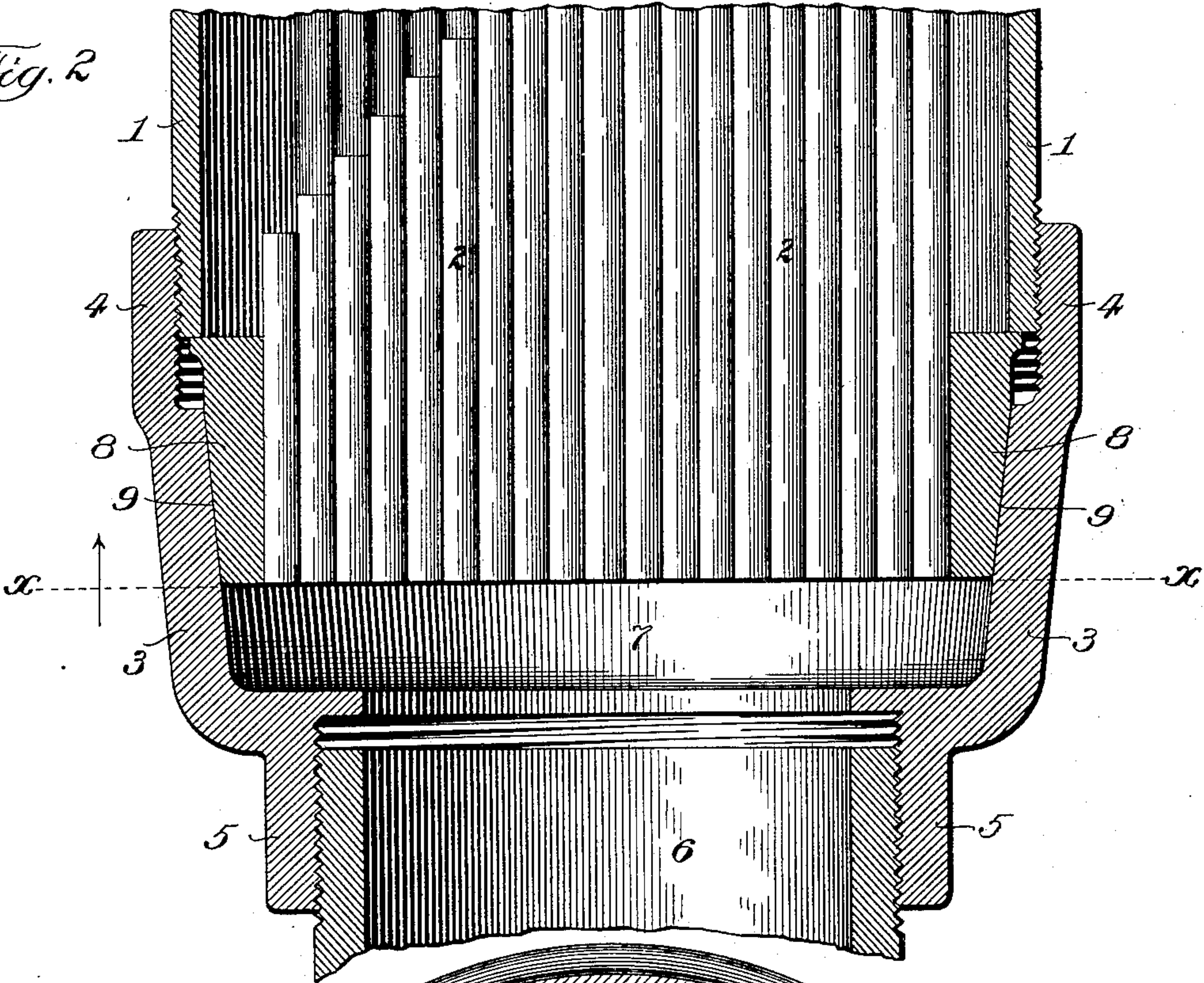
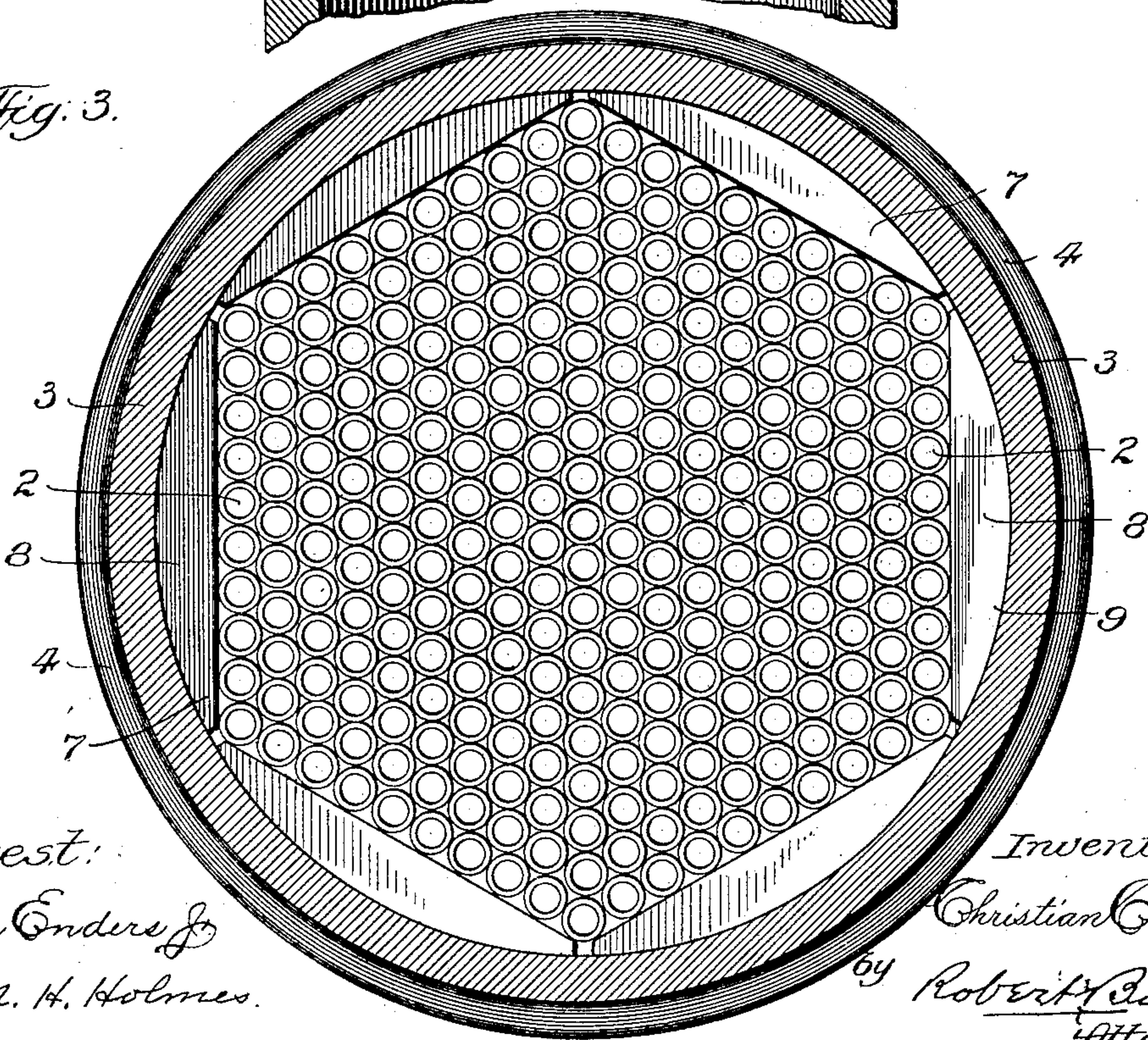


Fig. 3.



Witness:
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UNITED STATES PATENT OFFICE.

CHRISTIAN C. HILL, OF CHICAGO, ILLINOIS.

EXHAUST-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 734,868, dated July 28, 1903.

Application filed July 28, 1902. Serial No. 117,230. (No model.)

To all whom it may concern:

Be it known that I, CHRISTIAN C. HILL, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Exhaust-Mufflers, of which the following is a specification.

The present invention relates to that class of mufflers employed to muffle or deaden the noise of the exhaust from steam-engines, gas-engines, and the like, and has for its object to provide a simple, durable, and efficient construction and arrangement of parts whereby the discharging exhaust steam or vapor is subdivided and the subdivision so made discharged at different and succeeding intervals and with an entire elimination of the noise usual to the discharge of such exhaust in a single volume or body, all as will hereinafter more fully appear, and be more particularly pointed out in the claims.

In the accompanying drawings, illustrative of the present invention, Figure 1 is a central longitudinal sectional elevation of a muffler-head embodying the present invention, the series of tubes comprising the same being shown in elevation, while the inclosing casing, clamping means, &c., are shown in section; Fig. 2, an enlarged longitudinal section of the inner or rear portion of the muffler and its connected parts; Fig. 3, an enlarged transverse section at line *x x*, Fig. 2.

Similar numerals of reference indicate like parts in the different views.

Referring to the drawings, 1 is an outer tubular inclosing casing or housing of any required shape in cross-section, preferably of a circular shape, as shown in Fig. 3 of the drawings, as affording greater capacity and uniformity of action for a given size and which may be of any desired length as the judgment of the constructor may suggest and either of a length to entirely inclose the series of tubes hereinafter described or to only form an attaching or holding base for the same.

2 represents a series of tubes of small diameter entirely filling the bore of the tubular housing at one end of the same and which in the present invention are made of varying lengths to constitute a multiple series of passages through the housing of varying lengths in order that the exhaust steam or

vapor passing therethrough will discharge therefrom at different intervals of time. In my preferred arrangement, as shown in Fig. 1, each individual tube 2 will have a different length from that of any other tube of the series, so that each will discharge its volume of exhaust steam or vapor at an appreciable interval of time from that of any other of the tubes and so that the very longest of the tubes may be receiving a fresh supply of such exhaust at one end while discharging the previous supply of the exhaust at the other end. The cylindrical form of such tubes, as shown in the drawings, is preferred over any other form of tube in view of the fact that the spaces formed between the walls of any three adjacent tubes constitute subpassages or conduits for the exhaust steam or vapor to aid in the muffling action of the appliance and having the same varying lengths as the main passages or conduits formed by the series of tubes.

3 is a head or chest having attaching-necks 4 and 5, to which the tubular casing 1 and the exhaust-pipe 6 from an engine or the like are attached by screwing into such necks or by means of any other equivalent mode of attachment. The body portion of such head or chest forms a receiving-chamber 7 for the exhaust steam or vapor, and such chamber is adapted to deliver in a direct manner such exhaust steam or vapor to the series of tubes 2.

8 represents a series of segmental staves fitting outside the series of tubes 2 and having their outer surfaces beveled, as shown, and adapted to have bearing upon a correspondingly-beveled bore 9 of the head 3, so that when said staves receive a longitudinal adjustment they will at the same time move in radially to firmly bind and clamp the series of tubes 2 in place. Any usual means may be employed to impart such longitudinal adjustment to the series of staves 8. Preference, however, is given to the means shown in Figs. 1 and 2 of the drawings and in which the end of the main casing 1 has bearing against the larger ends of said staves, so that by a screwing motion of said casing in the attaching-neck 4 therefor on the head or chest 3 the desired longitudinal adjustment is imparted to the series of staves in a simultaneous manner.

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

1. In an exhaust-muffler, the combination
5 of a housing formed with a receiving-chamber at one end and a discharge-opening at the other end, and means within said casing for partitioning the bore thereof into multiple series of closely-arranged passages of different
10 lengths and affording a divided discharge area in excess of the main exhaust-passage, substantially as set forth.

2. In an exhaust-muffler, the combination
15 of a housing formed with a receiving-chamber at one end and a discharge-opening at the other end, and means within said casing for partitioning the bore thereof into multiple series of closely-arranged passages of progressively-varying lengths, and affording a divided
20 discharge area in excess of the main exhaust-passage, substantially as set forth.

3. In an exhaust-muffler, the combination
25 of a housing formed with a receiving-chamber at one end and a discharge-opening at the other end, and means within said casing for partitioning the bore thereof into passages of progressively-varying lengths the central passage of which is longest, substantially as set forth.

30 4. In an exhaust-muffler, the combination of a housing formed with a receiving-chamber at one end and a discharge-opening at the other end, and means within said casing for partitioning the bore thereof into multiple
35 series of closely-arranged passages of different areas and varying lengths and affording a divided discharge area in excess of the main exhaust-passage, substantially as set forth.

40 5. In an exhaust-muffler, the combination of a housing formed with a receiving-chamber at one end and a discharge-opening at the other end, and means within said casing for partitioning the bore thereof into passages
45 of different areas and progressively-varying lengths, substantially as set forth.

50 6. In an exhaust-muffler, the combination of a housing formed with a receiving-chamber at one end and a discharge-opening at the other end, and means within said casing for partitioning the bore thereof into passages
55 of different areas and progressively-varying lengths, the central ones of said passages having the greatest length, substantially as set forth.

60 7. In an exhaust-muffler, the combination of a housing formed with a receiving-chamber at one end, and a series of multiple series of closely-arranged tubes connected at one end
65 to the receiving-chamber and having different lengths and affording a divided discharge area in excess of the main exhaust-passage, substantially as set forth.

8. In an exhaust-muffler, the combination
of a housing formed with a receiving-chamber at one end, and a series of multiple series of

closely-arranged tubes connected at one end to the receiving-chamber and having progressively-varying lengths and affording a divided discharge area in excess of the main
70 exhaust-passage, substantially as set forth.

9. In an exhaust-muffler, the combination
75 of a housing formed with a receiving-chamber at one end, and a series of tubes connected at one end to the receiving-chamber and having progressively-varying lengths, the central tube of which is longest, substantially as set forth.

10. In an exhaust-muffler, the combination
80 of a housing having a receiving-chamber at one end, and a series of multiple series of closely-arranged tubes, cylindrical in cross-section, connected at one end to the receiving-chamber, and having different lengths and
85 affording a divided discharge area in excess of the main exhaust-passage, substantially as set forth.

11. In an exhaust-muffler, the combination
90 of a housing having a receiving-chamber at one end, and a series of multiple series of closely-arranged tubes, cylindrical in cross-section, connected at one end to the receiving-chamber, and having progressively-varying
95 lengths and affording a divided discharge area in excess of the main exhaust-passage, substantially as set forth.

12. In an exhaust-muffler, the combination
100 of a housing having a receiving-chamber at one end, and a series of tubes, cylindrical in cross-section, connected at one end to the receiving-chamber, and having progressively-varying lengths, the central tube of which is longest, substantially as set forth.

13. In an exhaust-muffler, the combination
105 of a housing having a receiving-chamber at one end, and a tapering bore near such receiving-chamber, a multiple series of closely-arranged tubes arranged adjacent to said receiving-chamber, a series of taper staves fitting the tapering bore of the housing and
110 adapted to clamp the series of tubes in position, and means for adjusting said staves in a longitudinal direction, substantially as set forth.

14. In an exhaust-muffler, the combination
115 of a housing having a receiving-chamber at one end, and a tapering bore near such receiving-chamber, a multiple series of closely-arranged tubes arranged adjacent to said receiving-chamber, a series of segmental staves
120 having tapered outer surfaces fitting the tapered bore of the casing and adapted to clamp the series of tubes in position, and means for imparting longitudinal adjustment to said staves, substantially as set forth.

Signed at Chicago, Illinois, this 26th day of July, 1902.

CHRISTIAN C. HILL.

Witnesses:

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