

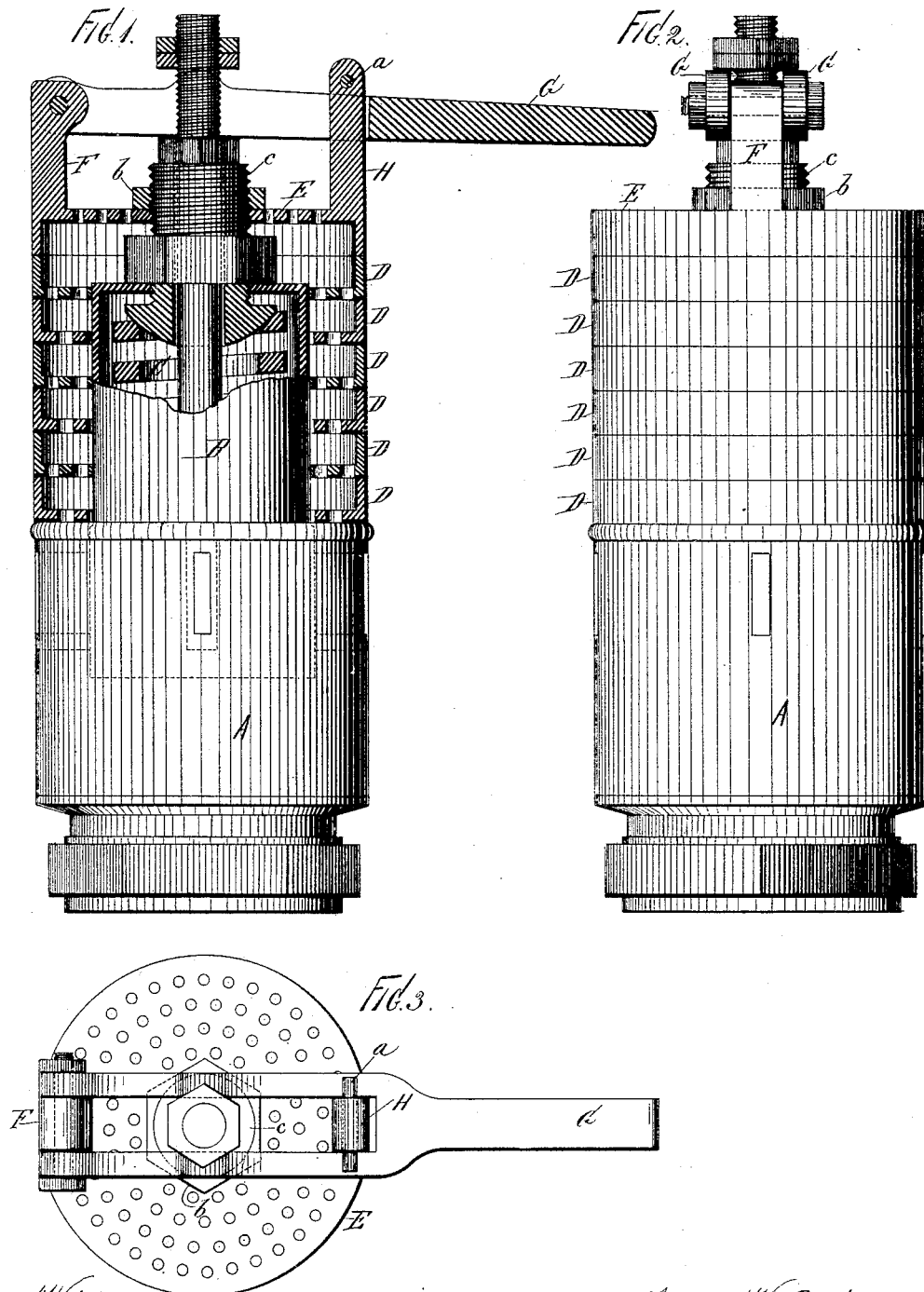
(No Model.)

G. W. RICHARDSON.

STEAM MUFFLER.

No. 344,863.

Patented July 6, 1886.



Witnesses:  
John Buckler,  
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# UNITED STATES PATENT OFFICE.

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## STEAM-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 344,863, dated July 6, 1886.

Application filed February 19, 1886. Serial No. 192,540. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. RICHARDSON, of Medford, county of Middlesex, and State of Massachusetts, have invented certain  
5 new and useful Improvements in Steam-Mufflers, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

10 My invention has relation to that class of devices employed for muffling or subduing the noise of escaping steam, ordinarily known as "mufflers" or "steam-mufflers," and especially to that kind usually employed in connection with steam safety-valves, though for  
15 all purposes of the present invention the improved muffler may be employed in any situation to muffle or subdue the noise of escaping steam or air or gases.

20 The object of my invention is to so construct the muffler that it will be simple, cheap, and effective, and so that it will obviate the rusting or deterioration of metallic parts, caused by contact therewith of steam or moisture, thus enabling me to construct many of  
25 the parts or pieces in and about the muffler or the device with which it is used of iron or steel, preserving the requisite lasting qualities, and securing cheapness of construction and other advantages, as will hereinafter appear.

30 To accomplish this my improvements involve certain new and useful peculiarities of construction, relative arrangements or combinations of parts, and principles of operation, all of which will be herein first fully described, and then pointed out in the claims.

To illustrate my invention I have shown the muffler applied in connection with the casing of a steam safety-valve.

40 In the accompanying drawings, Figure 1 is a vertical section and partial elevation of a steam safety-valve casing having my improved muffler applied thereon. Fig. 2 is a vertical view or elevation of the same, and Fig. 3 a  
45 top or plan view.

In all these figures like letters of reference, wherever they occur, indicate corresponding parts.

A represents the lower part of the casing,

50 which surrounds any safety-valve, and within which steam rises after escaping past the valve, as is well understood.

B is the casing, usually made to surround the valve-loading spring, as C.

The main body of the muffler is made up of  
55 a series of annular disks, (represented at D D,) which may be of any desired number, in the drawings shown to be six. These disks surround the casing B, each having a vertical exterior flange fitted to abut against the flange  
60 of the disk next adjacent, thus forming the exterior wall of the muffler, and each having its horizontal portion perforated for the passage of steam. The muffling effect is best produced by arranging the disks so that the perforations  
65 in one will not fall beneath or over the perforations in that next adjacent. The form of these disks has been set forth in a previous application for patent, filed December 2, 1885, Serial No. 184,582, and I make no claim herein  
70 to their form or arrangement, which, so far as the present invention is concerned, may be considerably modified. Over the top disk of the series is a perforated covering-plate, E,  
75 which carries a standard, F, cast with plate E, upon which standard the lifting-lever G is hinged or fulcrumed, and a guiding-standard, H, on the side opposite F. The lever may be of the first or second order. The standard  
80 H may be supplied with a pin, as a, or other suitable stop by which the lever is arrested in its upward movement. The lever, instead of being forked, may be made solid, and the guiding-standard replaced by a pair of standards, if desired. These standards, however,  
85 are not essential parts of the invention, and may be omitted or changed at pleasure.

Heretofore the muffler, top plate, valve-case, and spring-case have been commonly made of brass or iron. I have discovered  
90 that by making the muffler-rings of zinc, or of a compound in which zinc predominates, they may be easier turned, perforated, and fitted, and when applied in connection with or in contact with brass or other metal a galvanic or electric current is established through  
95 the whole, and this operates in a singularly effective manner to prevent rusting of the

spring or any parts made of iron or steel, and largely to prevent deterioration of other parts, and the current and the beneficial effects thereof are greatly enhanced whenever the  
5 current of steam passes through the muffler. I therefore make the rings or disks of zinc or of a compound in which zinc enters largely—the more zinc the better the effect; and this, then, makes it practical to form the  
10 valve-casing of iron, which is much cheaper than the brass heretofore regarded as practically necessary. The valve-spring (of steel) is, by the peculiar action of the zinc or the current consequent upon its use, preserved  
15 from rust, and thus made more lasting and durable.

The valve-spring is a vital element of the structure. Any deterioration of the spring weakens it and changes the load on the valve.  
20 The necessity and desirability of preserving the spring will be readily appreciated.

The top plate I am enabled by this invention to make of iron or steel, which, besides the advantages of cheapness and ease of construction, has other highly-important advantages. It will be observed that the top plate is employed to hold the rings down, and is itself held down by a nut, *b*, bearing upon its top, and engaging with the adjusting-screw *c*,  
30 by which the tension of the spring is regulated. In other situations than upon a steam safety-valve the top plate is held down in some analogous or equivalent manner. When made of brass, this top plate becomes heated by  
35 escaping steam, and by reason of some inherent quality of the metal becomes set and hardened by the heat, jamming the holding-nut so that it is difficult to remove, and in the situation indicated making it difficult to turn  
40 the adjusting-screw, besides rendering the plate liable to fracture as soon as the nut is

turned in either direction. Without the protecting influence of the zinc this plate would be required to be made of brass; but with the zinc I am enabled to make it of iron or steel, 45 which is not liable to be changed in character by the heat, and which will obviate all the disadvantages above enumerated and secure the desired cheapness and ease of construction. I therefore make this plate of iron or steel. 50 So, also, with the adjusting or tension screw, the nuts, and other parts of the structure, any and all of which may be made of iron or steel, being protected against rust in the manner indicated. 55

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

1. In a muffler of the character herein set forth, the rings or disks made of zinc or a 60 compound in which zinc predominates, and mounted upon or in connection with other metals, substantially as and for the purposes set forth.

2. In a muffler of the character herein set forth, the combination, with the rings or disks 65 made of zinc, of the top plate made of iron or steel, substantially as and for the purposes set forth.

3. In a muffler of the character herein set forth, the combination, with the rings or disks 70 made of zinc and mounted upon the casing, of the top plate of iron or steel, serving to secure the rings in place, substantially as shown and described. 75

In testimony that I claim the foregoing I have hereunto set my hand in the presence of two witnesses.

GEORGE W. RICHARDSON.

Witnesses:

JOHN BUCKLER,  
WORTH OSGOOD.