July 14, 1925. 1,546,197

M. W. BROWN

WATER MUFFLER

Filed Oct. 30, 1924

Fig. 1.

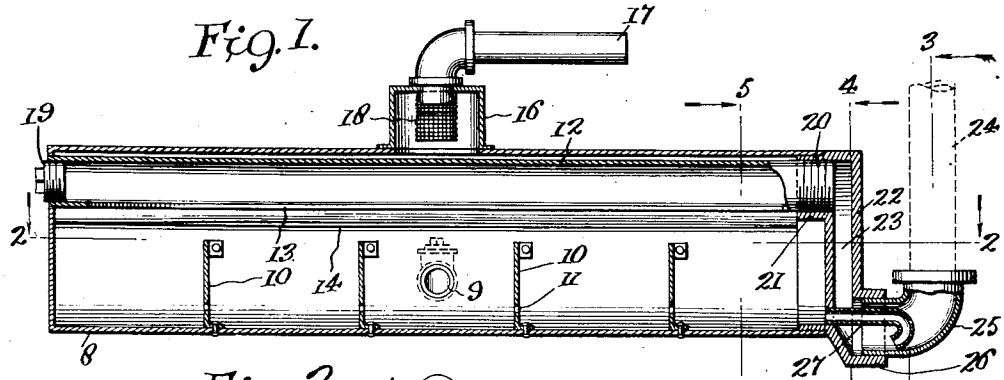


Fig. 2.

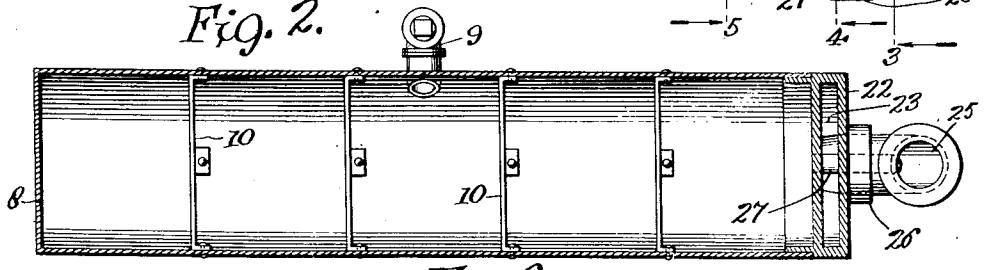


Fig. 6.

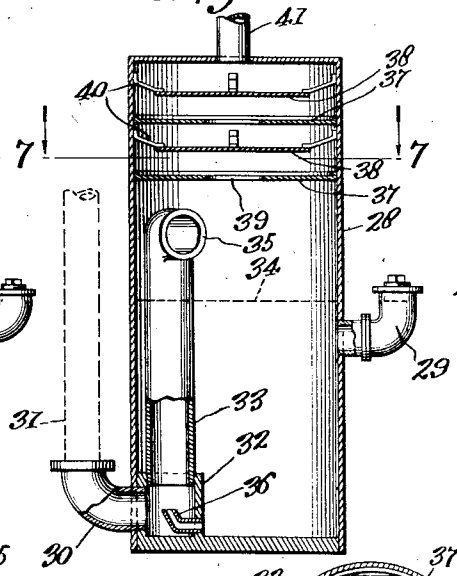


Fig. 3.

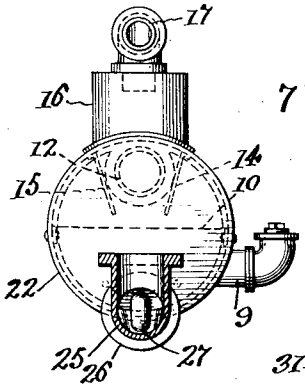


Fig. 4.

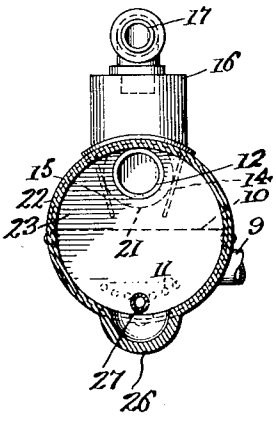


Fig. 5.

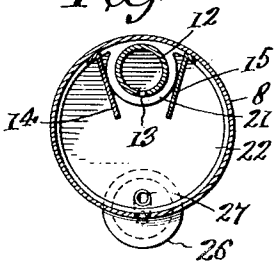
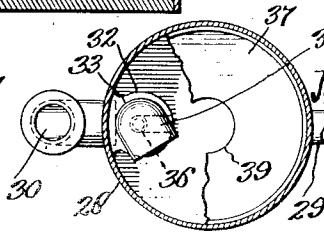


Fig. 7.



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UNITED STATES PATENT OFFICE.

MARTIN WILLIAM BROWN, OF GALVESTON, TEXAS.

WATER MUFFLER.

Application filed October 30, 1924. Serial No 746,892.

To all whom it may concern:

Be it known that I, MARTIN WILLIAM BROWN, a citizen of the United States, residing at Galveston, in the county of Galveston and State of Texas, have invented certain new and useful Improvements in Water Mufflers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to improvements in water mufflers and consists in certain improvements over the device shown and described in my prior co-pending application of similar title, filed August 4, 1924, Serial No. 730,023.

An object of the present invention is to eliminate, as far as possible, the entry of sparks or fire into the muffler casing, much damage being done at the present time because of explosions in the muffler; and I aim to attain this object by providing for the introduction of water or vapor to the exhaust products at a point in advance of the muffler, the water or vapor being intended to extinguish the fire and sparks and to commingle thoroughly with the exhaust products just before the same are admitted to the muffler casing.

The invention has application not only to the device according to my prior invention, but also to upright mufflers and the invention further contemplates certain improvements in the method of introducing the gases into the casing of the upright muffler.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claims appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 shows a longitudinal section through the muffler constructed according to the present invention.

Figure 2 is a section taken on the line 2—2 in Figure 1.

Figure 3 is a transverse section taken on the line 3—3 in Figure 1.

Figure 4 is a similar section taken on the line 4—4 in Figure 1.

Figure 5 is a transverse section taken on the line 5—5 in Figure 1.

Figure 6 shows a vertical section of an upright muffler, and

Figure 7 is a horizontal section taken on the line 7—7 in Figure 6.

Referring more particularly to the drawings and for the present to Figures 1 to 5 inclusive, 8 designates a cylindrical shell or casing of sheet metal or other appropriate material adapted to contain a quantity of water introduced through the filling neck 9. The water is prevented from moving about unduly in the casing by the plates 10 having the perforations 11 to permit of communicating between the compartments cut off by the plates.

Along the top portion of the casing extends an exhaust distributing pipe 12 having a longitudinal slot 13 along its lower side for introducing the exhaust products downwardly against the surface of the water. Inclined baffle plates 14 and 15 secured to the casing extend upon opposite sides of the pipe 12 and converge downwardly with their lower ends extending below the lower edge of the pipe. These plates provide pockets behind same to receive the exhaust products, vapor and water and to prevent the water from being blown out of the casing. The outlet for the cooled and expanded products is through the top housing 16 and pipe 17 communicating therewith. A strainer 18 may be housed within the dome 16 if desired to eliminate any sparks or fire that may have passed through the muffler, but this strainer is not so essential in view of the present invention.

The exhaust introduction pipe 12 is mounted through the casing at one end and is provided with a screw or other plug 19 for giving access to the pipe for purposes of cleaning. The other end of the pipe 12 is screw threaded as indicated at 20 to fit the threads in the boss 21 of the hollow head 22 removably fitted to the casing 8. The pipe thus communicates with the chamber 23 of the hollow head and the exhaust pipe, indicated at 24, from the engine is adapted to be coupled to the elbow 25 which connects with the internal space 23 through an offset nipple 26 upon the outside of the head and offset downwardly from the casing in order to give ample room for the water and vapor pipe 27. This pipe 27 extends into the water chamber of the casing through the inner wall of the head 22, extends outwardly

through the hollow space of the nipple and is curved downwardly and preferably to some extent backwardly upon itself. In this way the open mouth of the pipe 27 is directed in a general way in the direction of path of movement of the exhaust products entering the muffler. As a result an injector action is had, the moving products drawing the water and vapor from the casing into the stream of the exhaust products where such water and vapor is absorbed and commingles with the products extinguishing the fire and flame and subjecting the products to a preliminary cooling. Access may be had to the pipe 27 by simply removing the elbow 25 and this pipe 27 may be of any desired length and it may be of any desired diameter to furnish the quantity of water or vapor desired. This diameter will generally bear a desired relation to the diameter of the elbow and nipple.

In the use of the device the exhaust products from the engine are conveyed by the pipe 24 to the elbow 25, internal chamber 23 of the head 22 and to the exhaust introduction pipe 12. In the course of entering the muffler the exhaust products pick up water and moisture from the pipe 27. This moisture and water vapor is carried back with the products and circulated through the muffler. The exhaust products descend through the slot 13 of the pipe 12 and impinge against the surface of the body of water in the muffler casing thus agitating this water and heating it to some extent, causing vapor to rise and mix with the products. The baffle plates 14 and 15 prevent the water from being blown out the exit pipe 17.

Now referring to Figures 6 and 7, 28 designates a casing of an upright muffler having a water introducing or filling neck 29 and elbow 30 communicating with the lower portion thereof and receiving the exhaust products from the exhaust pipe indicated at 31. Within the casing and connecting with the elbow 30 is a hollow coupling head 32 for removably receiving the stand pipe 33 which rises above the surface of the water indicated at 34. The upper end or nozzle 35 of the stand pipe is turned angularly so as to direct the incoming products substantially tangentially of the casing. A water or vapor introduction pipe 36 communicates with the water space of the muffler and extends into the coupling head 32 having its inner end directed upwardly so that the incoming products may pick up the water from the inner end thereof.

In the upper portion of the casing are a number of pairs of baffle plates 37 and 38. The lowermost plate 37 of each pair is in the form of a disc fitted substantially close to the wall of the casing and having the central opening 39. The upper plate 38 of the series is an imperforate disc of less diameter than the casing held in place by the brackets 40 at intervals and providing a space around the edge of the disc for the circulation of the exhaust products. These series of baffle plates cause the products to take a circuitous course in attaining the exit pipe 41. It is very desirable to have the lower disc 37 fit tightly about the edge to provide a watertight joint.

In the operation the exhaust products come in through the elbow 30, pick up a quantity of water from the pipe 36 which extinguishes spark and flame and then circulates to the muffler through the nozzle 35. The nozzle gives a circular motion to the products preventing the water from being thrown out of the muffler.

Of course the pipes 27 and 36 are not essential but water may be permitted to flow through the openings in which these pipes are secured and vapor will thus be furnished to the exhaust products.

It is obvious that various changes and modifications may be made in the details of construction and design of the above specifically described embodiment of this invention without departing from the spirit thereof, such changes and modifications being restricted only by the scope of the following claims.

What is claimed is:—

1. A water muffler comprising a casing having a water space therein, a pipe in the casing for receiving the exhaust products and delivering same to the interior space of the casing above the water, a chamber in communication with said pipe and extending at a low point with respect to said water space, an exhaust pipe connecting with a low portion of said chamber, a nozzle in said chamber communicating with the water space and with the interior space of the chamber for directing fluid into the exhaust products on entering said chamber.

2. A water muffler comprising a casing having a space therein for containing a body of water, means above the body for conveying off the exhaust products from the muffler, a pipe also above the surface of the body of water for directing the exhaust products into the interior space of the casing and above said body of water, a chamber in communication with said pipe and situated approximately at the lowest level of the water space in said casing, an exhaust pipe connecting with a low portion of said chamber, and a nozzle in communication with substantially the lowest point of the water space in said casing and with said chamber, said nozzle having a bent end extending in the direction of the path of the products of combustion for supplying fluid thereto.

3. A water muffler comprising a casing having an outlet and a space for a body of

water, a distributing pipe extending lengthwise of the casing with an opening in its lowest part to direct the products of combustion against the surface of the water, a chamber at one end of the casing in communication with said pipe, said chamber extending down to a low point with respect to the water space of the casing, an exhaust pipe connecting with the casing at its low point, and a nozzle in communication with a low point in the water space of the casing and extending into said chamber at its low point for furnishing fluid to the incoming products of combustion.

4. A water muffler comprising a casing having an outlet and a space for a body of water, a distributing pipe extending lengthwise of the casing with an opening to direct the products of combustion above the surface of the water, a chamber at one end of the casing in communication with said pipe, said chamber extending down to a low point with respect to the water space of the casing, an exhaust pipe connecting with the casing at its low point, and a nozzle in communication with a low point in the water space of the casing and extending into said chamber at its low point for furnishing fluid to the incoming products of combustion.

MARTIN WILLIAM BROWN.