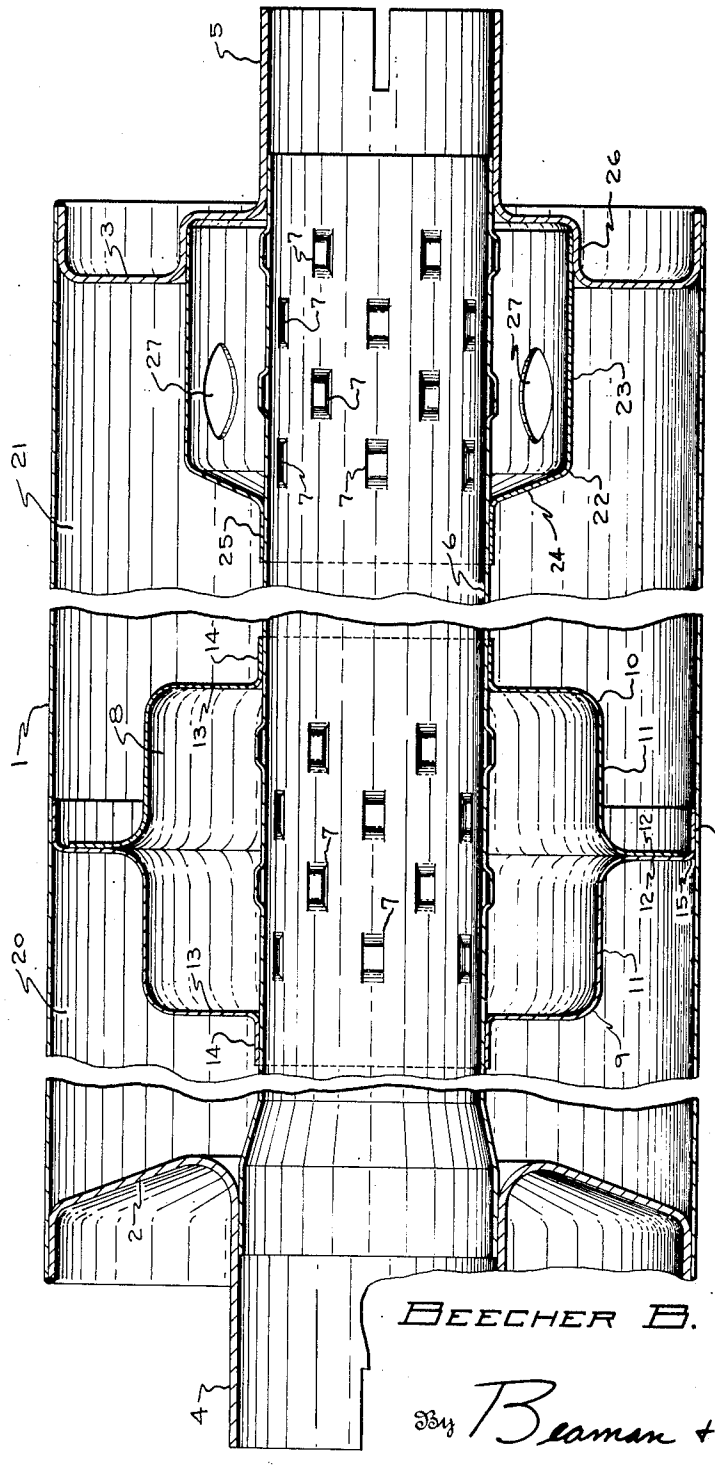
Feb. 25, 1941. B. B. CARY 2,233,341

MUFFLER CONSTRUCTION

Filed July 27, 1938




Inventor

BEECHER B. CARY

By Beaman & Langford

Attorneys

Patented Feb. 25, 1941 2,233,341

# UNITED STATES PATENT OFFICE

2,233,341

## MUFFLER CONSTRUCTION

Beecher B. Cary, Jackson, Mich., assignor to Hayes Industries, Inc., Jackson, Mich., a corporation of Michigan

Application July 27, 1938, Serial No. 221,471

5 Claims. (Cl. 181—48)

This invention relates to improvements in the construction of mufflers and more particularly to mufflers for silencing the noises of the exhaust or intake of internal combustion engines.

Present day muffler constructions comprise for the most part an arrangement of tubular members, shells and baffles so as to form resonating chambers and the like having different characteristics for the attenuation of the different frequency tones found in the intake or exhaust gases, as the case may be. According to the present invention, the manufacture of mufflers is simplified by providing resonating chambers having end and side walls comprised of integral sections. In its specific form the resonating chambers fabricated according to the present invention may comprise two oppositely disposed abutting cup shaped members or a single cup shaped member abutting against a member such as a baffle.

An object of the invention is to provide resonating chambers for mufflers having integral side and end portions.

Another object of the invention is to provide resonating chambers for mufflers by stamping cup shaped members and disposing them about perforated gas carrying tubes.

Still another object of the invention is to provide a muffler construction having a resonating chamber having an integral baffle associated therewith, said baffle being in a second resonating chamber.

These and other objects will be apparent from the following specification when taken with the accompanying drawing wherein the figure illustrates a single muffler employing two embodiments of the present invention.

Referring particularly to the drawing, the reference character 1 indicates the outer shell of a muffler having sections broken out therefrom and showing only as part thereof two embodiments of the present invention. The shell 1 is provided with heads 2 and 3 having, respectively, inlet and outlet connections 4 and 5. The muffler disclosed is of the straight through type and has concentrically disposed within the shell 1 a straight through tube 6. The tube 6 is provided with a plurality of perforations 7 of any desired character.

Disposed about the tube 6 and enclosing certain of the perforations 7 is a resonating chamber 8 having walls consisting of two cup shaped members 9 and 10. Each cup shaped member 9 and 10 has a tubular portion 11, an outwardly projecting radial flange 12, an inwardly projecting radial flange 13, and an axially extending annular flange 14. The annular flanges 14 are in circumferential engagement with the periphery of the tube 6 and are telescopically related thereto. In manufacture, the flanges 14 are originally of such a diameter as to permit them to slide over the perforations 7, after they have been arranged on the tube 6, as disclosed in the drawing. They are reduced in diameter in a manner well known in the art, usually by crimping excess metal to bring them into the snug engagement with the tube 6 as disclosed. The radially projecting flanges 12 abut against one another. The annular flanges 14 and the tube 6 are connected together, as by spot welding, as are the outwardly projecting, radially extending flanges 12, the respective joints being continuous to provide substantially gas tight connections. One of the flanges 12 is provided with an extension 15, having at the periphery thereof an annularly axially extending portion 16 telescopically disposed within the shell 1, contiguous with the inner surface thereof, and secured thereto as by spot welding.

From the description thus far it will be evident that the flanges 13 and tubular portions 11 form the walls of the chamber 8 about a portion of the tube 6, the chamber 8 being a resonating chamber for attenuating high frequency tones, since it is relatively small in size. Also, the flanges 12 and the extension 15, together with the flanges 13, comprise a baffle within the shell 1, dividing the shell 1 into chambers 20 and 21. It will be understood, however, that as far as the present invention is concerned the flanges 12 and extension 15 may be dispensed with if a complete baffle in the shell 1 is not desired.

Another form which the invention may take comprises the member 22 disposed about the tube 6 and certain other of the perforations 7. The member 22 comprises a tubular portion 23, a generally inwardly extending flange 24, and an axially extending annular flange 25 integrally associated with the flange 24 and telescopically disposed about the tube 6 in circumferential contact with the periphery thereof. The flanges 25 are brought into snug engagement with the tube 6 in the same manner as the flanges 14. As in the case of the flanges 14, the flange 25 is secured to the tube 6, as by spot welding, for instance. The opposite end of the member 22 is open and abuts against the head 3. To provide a more tight seal between the member 22 and the head 3 the head 3 is provided with a cylindrical portion 26 in which the tubular portion 23 of the

member 22 is telescopically received, after which the tubular portion 23 may be secured as by spot welding. An advantage of the member 22 is that before securing the same to the tube 6 and the head 3, it may be adjusted axially with respect to the tube 6 to vary the size of the chamber for which it provides walls and thus tune the muffler to take out a particular frequency tone. If desired, the member 22 may be provided with openings 27, which may be varied as to size and number for further tuning.

The members 9, 16 and 22, are preferably formed from sheet metal by stamping and drawing. Their use not only makes possible the building up of a resonating chamber from a fewer number of parts than heretofore thought possible, but also reduces the amount of material required and the labor required in assembling muffler constructions. While the invention has been disclosed as applied to a straight through type of muffler having a single shell thereabout, it will be understood that the principle thereof need not be so limited, but may be applied to other portions of other or more complex muffler structures. As an example, the members 9 and 16 or 22 may be applied to gas conducting tubes other than straight through tubes of the character of the straight through tube 6 illustrated in the drawing.

Having thus described my invention, what I desire to secure by Letters Patent and claim is:

1. In a muffler of the character described, a tube having a plurality of perforations therein, a shell surrounding said tube, a member disposed about said tube and within said shell overlapping said perforations, said member having two abutting tubular portions spaced from said tube and substantially concentrically related thereto, integral end portions at opposite ends of said tubular portions, said end portions having substantially concentric openings therein receiving said tube, said tubular and end portions comprising walls of a chamber disposed about said tube, and a flange comprising an angularly disposed integral continuation of one of said tubular portions, said continuation having its periphery in engagement with said shell and comprising a baffle therein.

2. In a muffler of the character described, a tube having a plurality of perforations therein, a member disposed about said tube overlapping said perforations, said member having two abutting tubular portions spaced from said tube and substantially concentric with respect thereto, said tubular portions at their inner ends having radially extending flanges in abutting relation and at their outer ends radially inwardly extending flanges having substantially concentric openings therethrough receiving said tube, one of said abutting flanges having its periphery in engagement with said shell comprising a baffle therein, said tubular and end portions comprising walls of a chamber disposed about said tube.

3. In a muffler of the character described, a tube having a plurality of perforations therein, a shell disposed thereabout substantially concentric therewith, a member disposed about said tube overlapping said perforations, said member having a tubular portion spaced from said tube and an integral angularly inwardly extending portion having a substantially concentric opening therein receiving said tube, and a partition within said shell having a concentric opening therein receiving said tube, said member having one end thereof abutting against said partition, said member and a portion of said partition comprising the walls of a chamber disposed about said tube.

4. In a muffler of the character described, a tube having a plurality of perforations therein, a member disposed about said tube overlapping said perforations, said member having a tubular portion spaced from said tube and an integral, angularly related, inwardly extending portion having a substantially concentric opening therein receiving said tube, and a baffle having a concentric opening therein receiving said tube, said baffle having a portion thereof offset to provide a tubular portion for receiving the tubular portion of said member, said tubular portions being telescopically related and in circumferential contact.

5. In a straight through muffler of the acoustic resonator type, the combination with a perforated through tube having an outer shell spaced therefrom, of a combined thin walled baffle and high frequency resonator chamber comprising a pair of opened end cup shaped sheet metal stampings having openings in the closed ends thereof to closely embrace said through tube, said stampings being located upon said through tube in opposed relation to each other with their open ends in abutting relation to collectively form a high frequency resonator chamber embracing a perforated portion of said through tube and spaced inwardly from said outer shell, at least one of said stampings supporting a radial flange extending from said resonator chamber to said outer shell to form a thin wall baffle embracing said resonator chamber and dividing the chamber between said outer shell and said through tube into a plurality of lower frequency resonator chambers.

BEECHER B. CARY.