

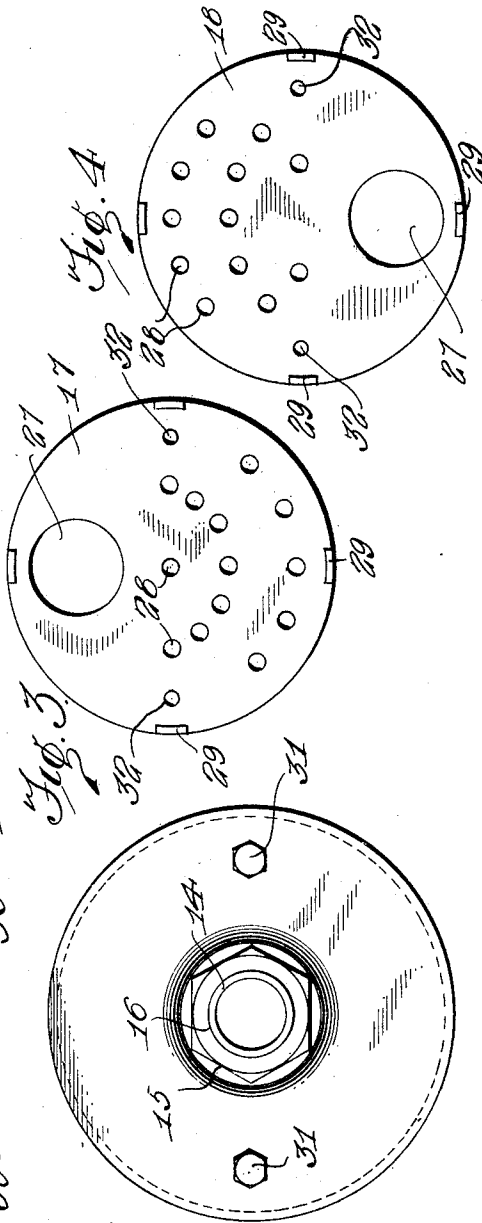
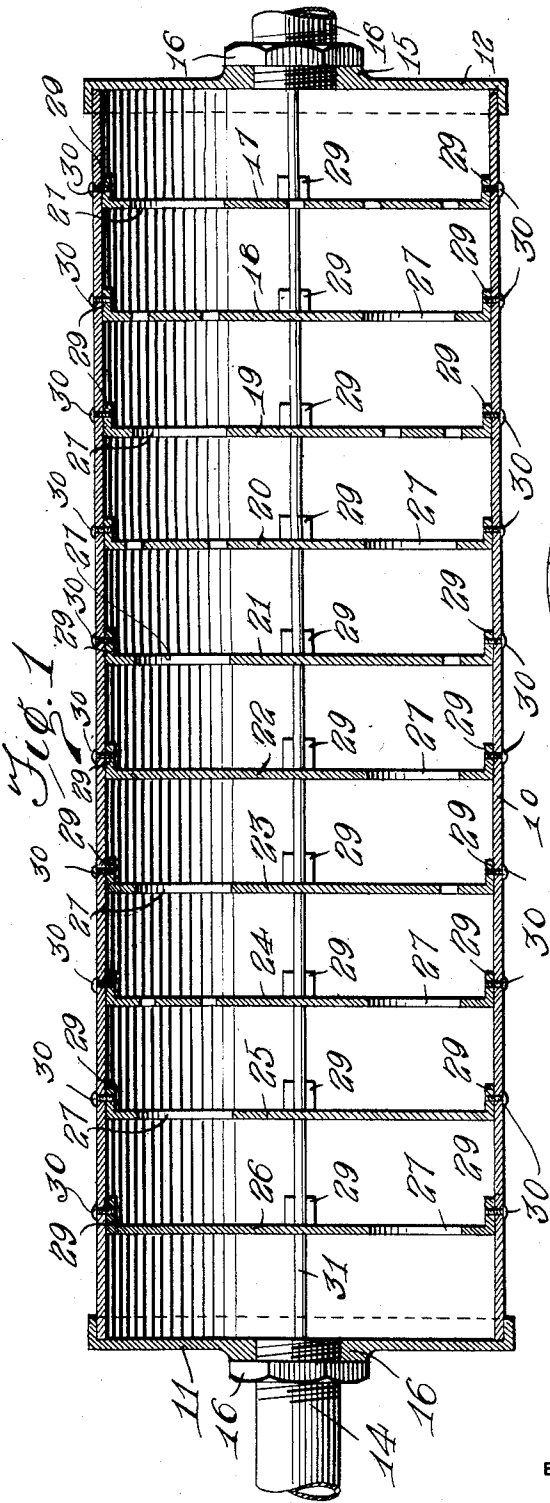
F. W. BECKER.  
MUFFLER.

APPLICATION FILED SEPT. 28, 1915.

Patented June 6, 1916.

2 SHEETS—SHEET 1.

1,186,067.



*Fig. 2.*

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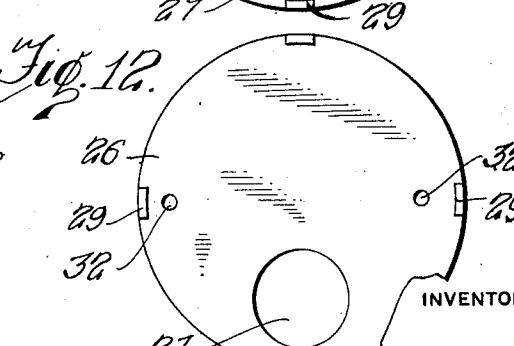
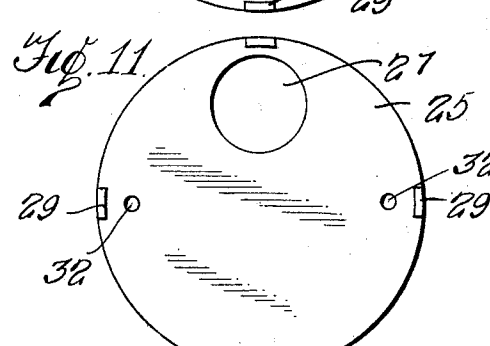
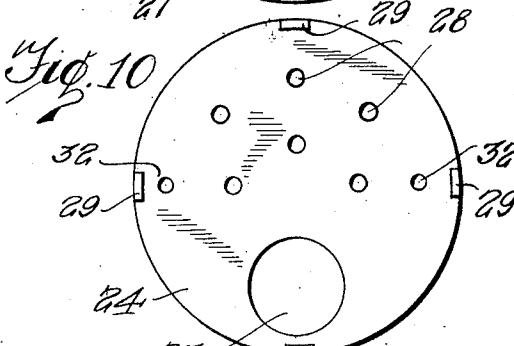
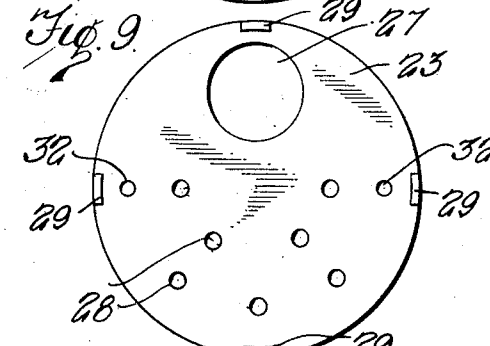
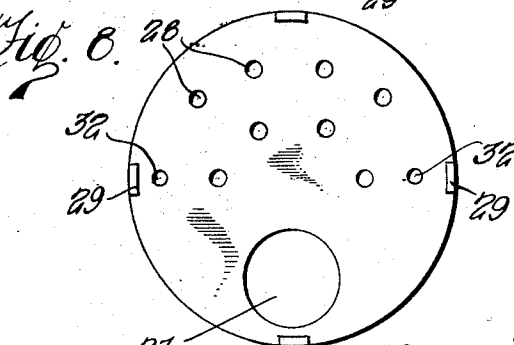
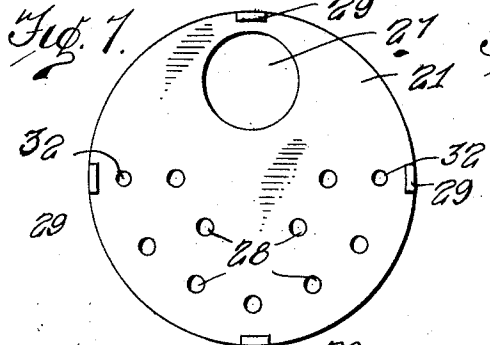
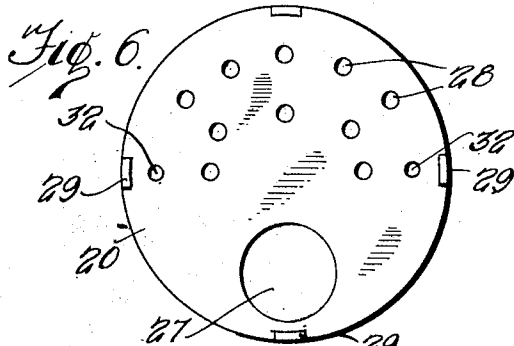
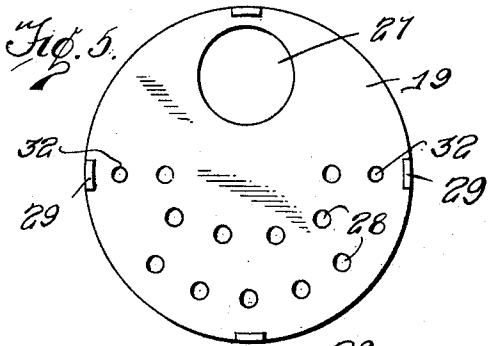
ATTORNEY

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INVENTOR

*Fredrick W. Becker*  
*Ross J. Woodward*

BY

ATTORNEY

# UNITED STATES PATENT OFFICE.

FREDRICK W. BECKER, OF WASHINGTON, DISTRICT OF COLUMBIA, ASSIGNOR OF ONE-HALF TO WILLIAM A. RAWLINGS, OF WASHINGTON, DISTRICT OF COLUMBIA.

## MUFFLER.

1,186,067.

Specification of Letters Patent.

Patented June 6, 1916.

Application filed September 28, 1915. Serial No. 53,153.

*To all whom it may concern:*

Be it known that I, FREDRICK W. BECKER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Mufflers, of which the following is a specification.

This invention relates to an improved muffler and the principal object of the invention is to provide a muffler with an improved type of baffle plates so constructed and assembled as to eliminate back pressure and prevent noise.

Another object of the invention is to so construct the baffle plates that a small portion of the gases may pass directly through the plates when striking the same, the greater portion of the gases being retarded and caused to take a tortuous course through the muffler.

Another object of the invention is to so mount the baffle plates as to permit of easy removal from the casing when cleaning the muffler.

This invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in longitudinal section through the muffler, Fig. 2 is a view showing the muffler in end elevation, and Fig. 3 through 12 are views in elevation of the baffle plates which are shown in Fig. 1.

This muffler is provided with a cylindrical casing 10 which may be of any suitable length and diameter and has its ends closed by the caps 11 and 12, the inlet pipe 13 being connected with the cap 12 and the outlet pipe 14 leading from cap 11. These pipes 13 and 14 may be removably connected with the caps 11 and 12 in any suitable manner, but for the purpose of illustration, they have been shown screwed into the enlargements 15 and secured by the locking nuts 16.

Within the casing 10 there is provided the baffle plates 17, 18, 19, 20, 21, 22, 23, 24, 25 and 26 each of which is provided to one side of the center with a relatively large opening 27 through which the greater portion of the gases will pass as they travel through the muffler. It should be noted that these openings are positioned in staggered relation as shown in Fig. 1 and therefore the gases will be guided through the casing in a tortuous course. The opposite side portions of the first eight baffle plates are provided with relatively small openings 28, which are pref-

erably arranged as shown in Figs. 3 through 10 but which may be grouped in any other manner if desired. It should be noted, however, that the openings 28 decrease in number from plate 17 to plate 24, this being an essential feature of the invention as will be hereinafter brought out in the description of the operation. The last two plates 25 and 26 are not provided with openings 28 as these two plates do not require them.

In assembling this muffler the casing 10 is cut the proper length and after tongues 29 of the baffle plates are bent as shown, the plates are put in place as shown in Fig. 1 and secured by the removable fasteners 30. The caps 11 and 12 are now put in place and the securing bolts 31 which pass through the openings 32 in the baffle plates and assist in holding the plates in the proper position are put in place and tightened thus securely holding the caps upon the casing in tight engagement therewith. It is obvious that if desired one cap and the bolts can be first put in place and the baffle plates then slipped into the casing upon the bolts thus causing the plates to pass into the casing in the proper position to permit the removable fasteners to engage the tongues 29.

When the muffler is in use the gases from the engine enter the casing through the pipe 13 and strike that portion of the plate 17 having the small openings formed therein. A portion of the gases will pass through the small openings but most of the gases will move across the casing and pass through the large opening 27 of plate 17 and strike plate 18. This plate is provided with a fewer number of small openings than plate 17 and while they will permit a portion of the gases to pass directly through the plate, a larger proportion of the gases will pass across the casing and pass through the large openings of plate 18 to strike plate 19. This is repeated until the gases have passed through plate 24, the proportion of gases passing through the large openings increasing with each plate as the small openings decrease in number. Plates 25 and 26 are only provided with openings 27 as by the time the gases have reached the plate 25 all the force has been removed from the gases and they can pass through the two remaining plates and out through pipe 14 without creating any noise. It will thus be seen that this arrangement of baffle plates with large open-

ings positioned in staggered relation and small openings decreasing in number toward the outlet end of the casing prevents noise and further prevents back pressure which would decrease the power of the engine.

When it is desired to clean the muffler the bolts 31 are removed, the caps taken off the casing and after fasteners 30 are removed, the plates taken out. The casing, plates and caps can then be easily and thoroughly cleaned and the muffler assembled.

What is claimed is:—

1. A muffler comprising a casing, closure caps for said casing provided with passageways, and disks mounted in said casing and provided with relatively large openings positioned in staggered relation, the opposite side portions of the disks being provided with relatively small openings, the small openings of the succeeding disks decreasing in number from the inlet end of said casing toward the outlet end.

2. A muffler comprising a casing having an inlet and an outlet, and vertically extending baffle plates positioned in said casing, each being provided with a relatively large opening positioned out of alinement with the large openings of the adjoining plates and with relatively small openings positioned in alinement with the large openings of the adjoining plates.

3. A muffler comprising a casing having an inlet and an outlet, and vertically extending baffle plates in said casing for directing the passage of gases through the same, the

plates being provided with openings decreasing in number from the inlet end toward the outlet end of the casing.

4. A muffler comprising a casing having an inlet and an outlet, and vertically extending baffling means removably mounted in said casing and positioned in overlapping relation to guide gases through the casing in a tortuous course, the baffling means being provided with openings permitting a portion of the gases to pass directly through the same when striking the baffling means and the openings of the succeeding baffling means decreasing in number from the inlet toward the outlet end of said casing.

5. A muffler comprising a casing, and vertically extending baffling means in said casing provided with openings, the openings of the succeeding plates decreasing in number from the inlet toward the outlet end of said casing.

6. A muffler comprising a casing, and baffle plates provided with relatively large openings forming main gas passages and relatively small openings forming auxiliary gas passages, the auxiliary gas passages of the succeeding plates decreasing in number from the inlet end toward the outlet end of said casing.

In testimony whereof I affix my signature in presence of two witnesses.

FREDRICK W. BECKER.

Witnesses:

ROSS J. WOODWARD,  
R. S. STUNZ.