

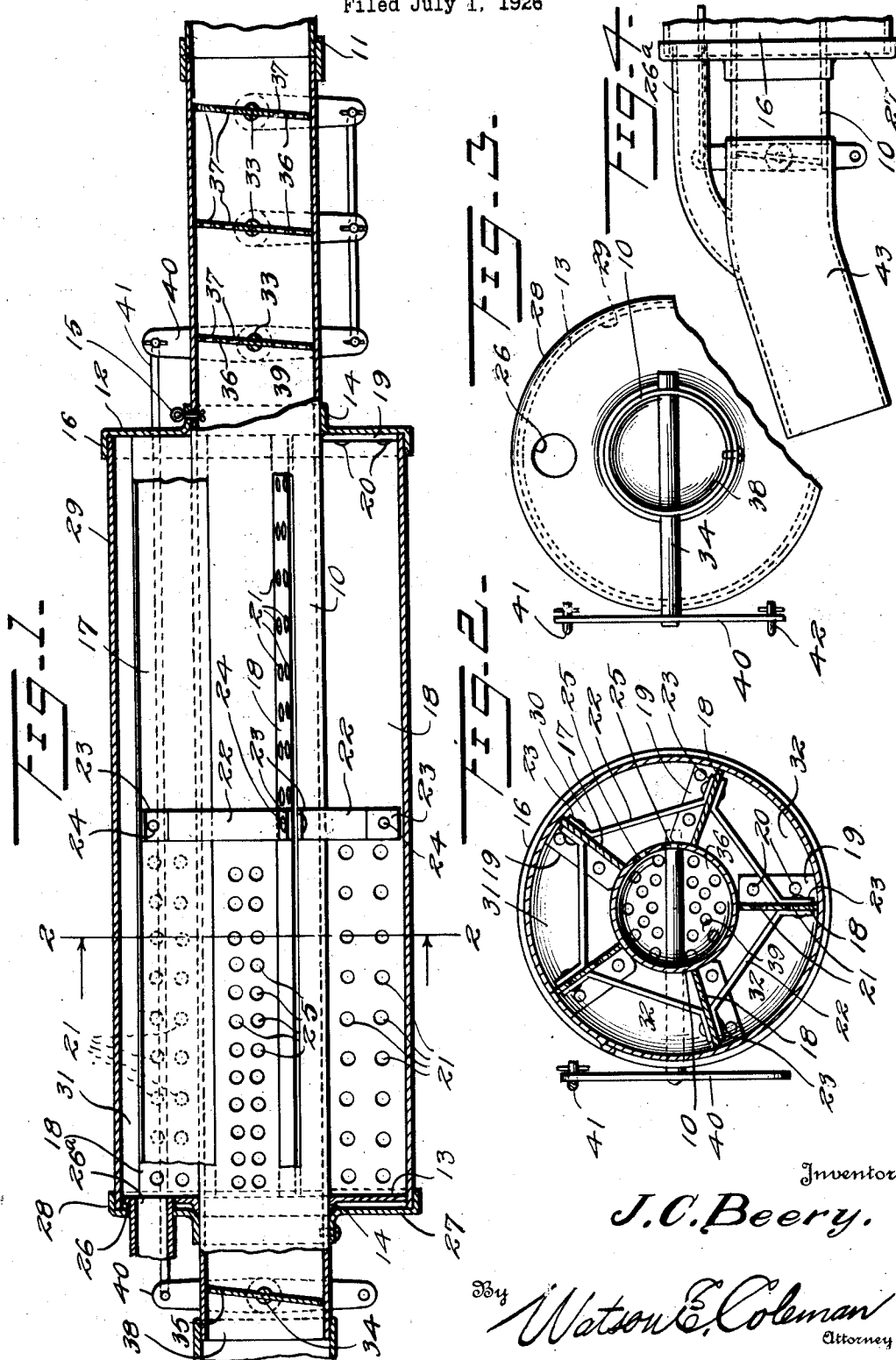
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COMBINED MUFFLER AND CUT-OUT

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COMBINED MUFFLER AND CUT-OUT.

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This invention relates to a combined muffler and cut-out for the exhausts of internal combustion engines and has for an important object thereof the provision of a single structure embodying these elements.

A further object of the invention is to provide a device of this character which may be very readily and cheaply manufactured and at the same time made very durable and efficient in service.

A further object of the invention is to provide a device of this character which may be readily disassembled to clean the same.

A still further object of the invention is the provision of a device of this character wherein the exhaust pipe leading to the muffler has associated therewith baffle structures enabling the use of the exhaust pipe as an additional muffler chamber.

These and other objects I attain by the construction shown in the accompanying drawings, wherein for the purpose of illustration is shown a preferred embodiment of my invention and wherein:—

Figure 1 is a longitudinal sectional view through a muffler constructed in accordance with my invention;

Figure 2 is a section on the line 2—2 of Figure 1;

Figure 3 is a rear end elevation of the muffler;

Figure 4 is a fragmentary perspective of the rear end of the muffler showing the manner of conducting the gases to the exhaust pipe after they have passed through the muffler.

Referring now more particularly to the drawings, the numeral 10 generally designates a tube adapted for connection with the muffler pipe 11 of a vehicle. Surrounding this pipe at spaced points are disks 12 and 13 hereinafter referred to as the front and rear disks. Each disk has a portion 14 fitting the periphery of the tube 10 and through the portion 14 of the front disk and the tube, aligning openings are formed for the passage of a cotter pin 15 or a similar securing element. The front disk 12 is of slightly greater diameter than the rear disk 13 and is provided at its periphery with an annular flange 16 directed toward the disk 13.

The numerals 17 and 18 generally designate baffle strips, there being one baffle strip 17 and baffle strips 18 of a desired number,

four being at present disclosed. These baffle strips are of the same width as the distance between the periphery of the tube 10 and the periphery of the disk 13 and each have their ends flanged at 19 and riveted to the disks 12 and 13 at 20. The strip 17 is imperforate while the strips 18 each have at one side of the longitudinal center thereof a plurality of openings 21. The strips 18 are so secured to the disks 12 and 13 that of alternate strips, the perforations of one strip are arranged at one end, while in the other strip, the perforations are arranged at the opposite end thereof. The strips 17 and 18 are uniformly spaced about and readily disposed to the tube 10 and at their centers, these strips are braced by braces 22, each having angular end portions 23 flatly fitting against the associated strip. The angular end portions 23 at opposite sides of each strip are connected to one another through the strip by a rivet 24. The tube 10 is provided with a longitudinally extending series of openings 25 arranged between the strips 17 and an adjacent strip 18 at one side thereof, these openings being arranged adjacent the end of the strip 18 which has no perforations. Between the strip 17 and the strip 18 adjacent thereto and at the opposite side thereof, the end disk 13 has formed therein an opening 26. From the outer surface of this disk a tube 26^a paralleling the tube 10 extends in surrounding relation to the opening 26.

A rear end cover plate 27 for the disk 13 is provided similar in construction to the end disk 12, the flange 28 thereof overlying the peripheral edge of the disk 13 in sufficiently spaced relation to admit therebetween a longitudinally split cover tube 29, the opposite end of which extends beneath the flange 16 of the front end disk 12. This cover disk combines with the tube 10 and strips 17 and 18 to produce an inlet chamber 30 and an exhaust chamber 31 arranged upon the opposite side of the strip 17 from the inlet chamber 30 and a plurality of intermediate chambers 32 through which the gases must pass from the inlet chamber 30 to reach the exhaust chamber 31. The purpose of longitudinally splitting the cover tube 29 will hereinafter appear.

Rotatably directed through the tube 10 at opposite ends of the muffler thus provided are a pair of shafts 33 and 34. The

shaft 34 which is arranged at the rear end of the tube has secured thereto an imperforate butterfly valve 35, while the shaft 33 has secured thereto a perforated butterfly valve 36 through the openings 37 of which gases may pass to the sections of the tube lying between the valves when the valves are in the closed position. If desired, the tube 10 may be extended and other shafts 33 and valves 36 arranged therein. Since the cover tube 29 is split, it will be obvious that by removing the securing element of the rear end cover plate 27 and shifting this cover plate longitudinally, the tube will be free to shift and may be removed by aligning the slit thereof with either shaft 33 and 34 to permit extension and cleaning of the chambers 30, 31 and 32 of the muffler. It will also be obvious that when the valves 35 and 36 are in the closed position, outlet of gases from the open rear end 38 of the tube 10 is impossible. At this time, the gases will pass through the openings 37 of the valve 36 into the chamber 39 formed between the valves, from this chamber 30 through openings 25 of the tube 10, thence through the chambers 32 by way of openings 21 to chamber 31 from which it passes to the atmosphere through the outlet tube 26. In passing through the chambers 30, 32 and 31, the arrangement of the openings 21 in the strips 18 will necessitate longitudinal travel of the gases in each chamber so that the gases escaping from the opening 26 are spent and the sounds of explosions practically eliminated. The valve 36 with its perforations 37 provides an additional muffler chamber 39 in which the gases may expand after being checked at the valve, thus further increasing the efficiency of the muffler. When the valves 35 and 36 are in the open position, it will be obvious that the gases will pass directly into the atmosphere from the open rear end of the tube 10. Any suitable means may be provided for simultaneously operating the valves 35 and 36. In the present instance, each of the shafts 33 and 34 is shown as provided with a T-head 40, corresponding arms of the heads being connected by a link 41. The opposite arm of either of the heads may be connected with a suitable control device 42. An extension 43 may be provided for the rear or exhaust end of the tube 10. To this extension, the tube 26^a is secured and the tube communicates with this extension, so that gases passing from the muffler will be caused to travel along the same path as those gases which are bi-passed when the device is being employed as a cut-out. That portion of the tube 26^a adjacent the end plate 13 parallels the tube 10, so that the false end plate 27 may be shifted longitudinally of the tube 10 a distance sufficient to permit release of the cover 16.

It will be obvious that the construction

hereinbefore set forth is obviously capable of a certain range of change and modification without materially departing from the spirit of the invention and I accordingly do not limit myself to such specific structure except as hereinafter claimed.

I claim:—

1. In a muffler, a cylindrical casing having end walls, a tube directed through said end walls and co-axial with the casing, means subdividing the space between the tube and wall of the casing into a series of muffler chambers one of which is in communication with the atmosphere, the tube being in communication with a second chamber of the series, a butterfly valve arranged within the tube adjacent one end of the casing, a perforated butterfly valve arranged within the tube adjacent the opposite end of the casing and means for simultaneously shifting said valves to open and closed positions.

2. In a muffler, a tube, circular end members carried by the tube and secured thereto at spaced points, a cylindrical wall connecting the peripheries of said end members, a plurality of baffle strips each having their ends secured to said end members and extending radially between the tube and said cylindrical wall, one of said strips being imperforate, the remaining strips each having openings formed therein at one end, the openings of each of the last named strips being at the opposite end thereof from the openings of adjacent strips whereby a plurality of communicating muffler chambers are produced, a connection between the muffler chamber at one side of the first named strip and the atmosphere and a connection between the muffler chamber at the opposite side of said strip and the interior of the tube, the rear end of said tube having a valve therein sealing the rear end of the tube when in closed position, the forward end of said tube likewise having a valve therein, the last named valve being perforated whereby it partially obstructs the tube when in closed position.

3. In a muffler, a tube, circular end members carried by the tube and secured thereto at spaced points, a cylindrical wall connecting the peripheries of said end members, a plurality of baffle strips each having their ends secured to said end members and extending radially between the tube and said cylindrical wall, one of said strips being imperforate, the remaining strips each having openings formed therein at one end, the openings of each of the last named strips being at the opposite end thereof from the openings of adjacent strips whereby a plurality of communicating muffler chambers are produced, a connection between the muffler chamber at one side of the first named strip and the atmosphere, a connection between the muffler chamber at the opposite

- side of said strip and the interior of the tube, the rear end of said tube having a valve therein sealing the rear end of the tube when in closed position, the forward end of said tube likewise having a valve therein, the last named valve being perforated whereby it partially obstructs the tube when in closed position and a connection between said valves for simultaneously shifting the same.
4. In combination, an exhaust tube, a muffler having its inlet communicating with the tube intermediate the inlet and outlet ends thereof, a valve between the point of communication and the outlet of the exhaust tube and in one position thereof closing the tube, a second valve between the point of communication and the inlet of the exhaust tube and in one position thereof partially closing the tube and means for simultaneously shifting said valves into or out of said positions.
5. In combination, an exhaust tube, a muffler having its inlet communicating with the tube intermediate the inlet and outlet ends thereof, a valve between the point of communication and the outlet of the exhaust tube and in one position thereof closing the tube, a second valve between the point of communication and the inlet of the exhaust tube and in one position thereof partially closing the tube, means for simultaneously shifting said valves into or out of said positions and means connecting the outlet of the muffler with the exhaust tube between the outlet thereof and the first named valve.
- In testimony whereof I hereunto affix my signature.

JOSEPH C. BEERY.