A. PIEL.

MUFFLER CUT-OUT.

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1,065,391.

Patented June 24, 1913.

Fig. 1.

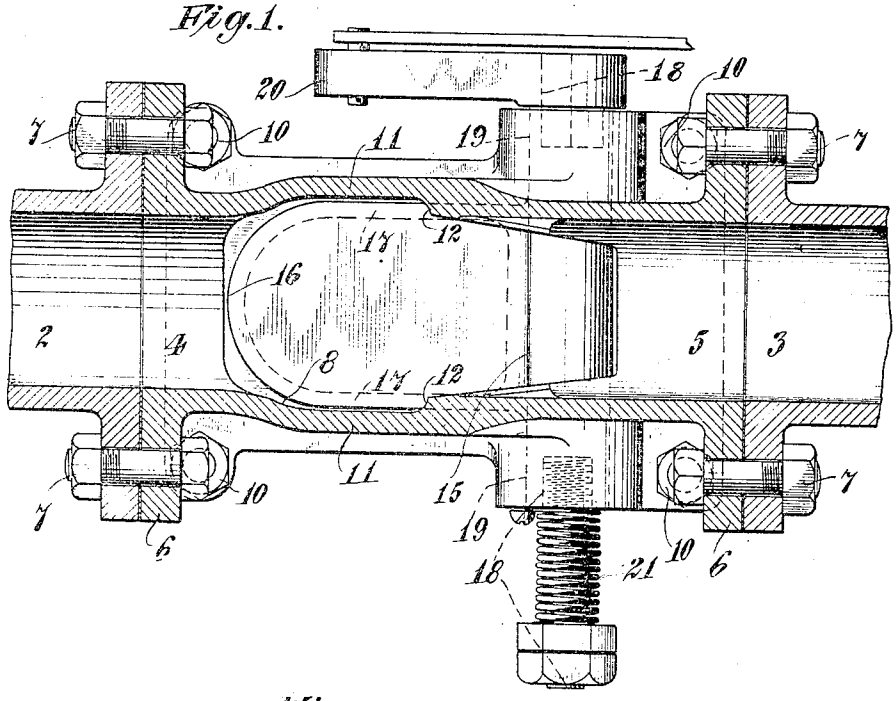
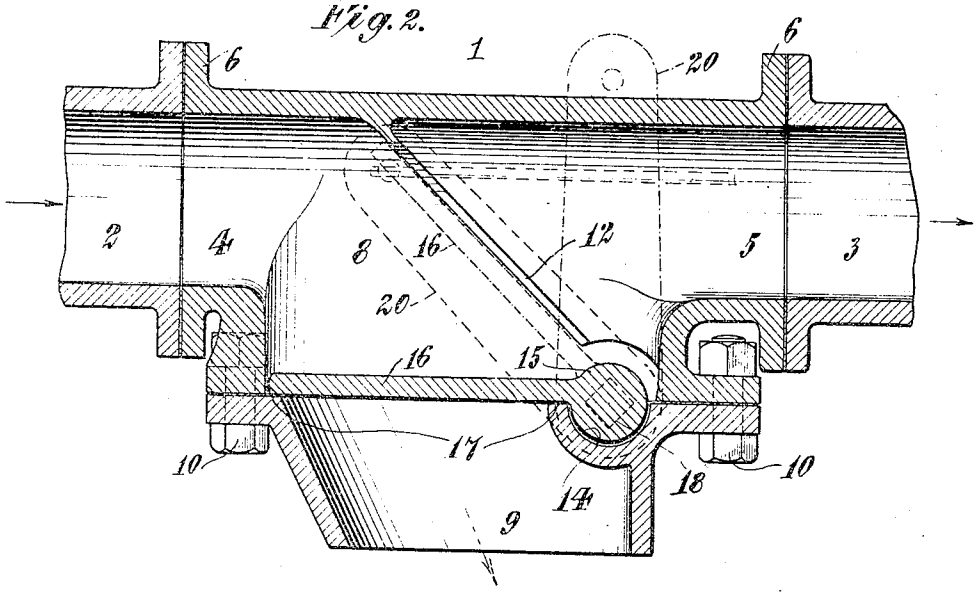


Fig. 2.



Witnesses.
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UNITED STATES PATENT OFFICE.

ARTHUR PIEL, OF NEW YORK, N. Y.

MUFFLER CUT-OUT.

1,065,391. Specification of Letters Patent. Patented June 24, 1913.

Application filed January 17, 1911. Serial No. 603,130.

To all whom it may concern:

Be it known that I, ARTHUR PIEL, a citizen of the United States, residing in the borough of Manhattan of the city of New York, in the State of New York, have invented certain new and useful Improvements in Muffler Cut-Outs, of which the following is a specification.

The object of this invention is to provide means arranged in the exhaust pipe of an engine, such as a gas or hydrocarbon engine, whereby the exhaust gases may be directed or exhausted without passing through the muffler.

The invention consists in the new and novel features of construction and combinations of parts hereinafter set forth and claimed and relates particularly to improvements on the construction set forth and claimed in my application for Letters Patent filed April 13, 1910, Serial No. 555,255.

In the accompanying drawings:—Figure 1 is a plan view partly in section of my improved muffler cut out. Fig. 2 represents a side elevation in section.

The cutout 1 may be arranged in the exhaust pipe between the pipe section 2 connected to the engine and the pipe section 3 connected to the muffler. The cutout is secured by its respective ends 4 and 5 to the sections 2 and 3 respectively by any suitable means as the flanges 6 secured in place by suitable bolts 7.

The cutout comprises a central or drum portion 8 and a cutout by-pass 9 which may be formed of a separate piece secured thereto by means of the bolts 10. Preferably the side walls of the drum portion are flared somewhat as at 11 so as to provide a greater cross-sectional area in the drum than in the adjacent sections 2 and 3 and the top of said drum portion is provided with an inclined semi-circumferential valve seat 12.

The by-pass of the cutout has its axis arranged at an angle to the axis of the exhaust line and is provided at one end with a horizontal socket or recess 14 transversely positioned with respect to the axis of the exhaust pipe, which forms a bearing for the cylindrical end 15 of a valve 16. The by-pass is also provided with a small inwardly projecting ledge or flange 17 which provides a seat for the edge of the valve, the said ledge or flange being symmetrical with respect to the valve seat 12. The trunnions 18 are secured to the cylindrical end of the valve and project through suitable openings 19 formed in the sides of the drum. A crank or lever 20 is secured to one of said trunnions whereby the valve may be raised and lowered and a helical spring 21 is secured to the other trunnion so as to normally hold the valve in position to close the by-pass.

In normal operation, when the exhaust gases are passing through the muffler, the valve remains in its closed position resting upon the seat 17. When, however, it is desired to direct the gases through the by-pass, the valve is raised into engagement with the circumferential valve seat 12 which causes the valve to be arranged at an acute angle to the axis of the exhaust pipe, thereby directing the gases of explosion downward and outward through the by-pass. The diameter of the exhaust pipe section 2 and of the muffler pipe section 3 are approximately the same, but the cross-sectional area of the drum is considerably larger than the cross-sectional area of either of said pipes, so that no recoiling or choking action upon the gases is possible. When the gases are being directed from the exhaust pipe through the by-pass they are directed through an opening which is constantly increasing in area, since the area of the narrowest portion of the passage, assuming the valve is in its raised position, is greater than the cross-sectional area of the exhaust pipe. Therefore, in this position of the valve, any choking action upon the gases is impossible.

By means of this construction I am enabled to provide a muffler cutout in which the passage through the exhaust pipe is completely closed, but in which choking of the exhaust gases is absolutely prevented by reason of the uniformly enlarged areas of the successive sections of the exhaust passage. Furthermore this construction provides means whereby the gases may be deflected gradually from their normal path by an inclined surface instead of having their motion arrested and their direction completely and suddenly changed. The cutout can be easily and readily detached from the main line of the exhaust pipe or access may be had to the valve without removing the cutout as a whole merely by detaching the bolts 10 which secure the by-pass to the drum.

It is obvious that the cutout may be secured to the exhaust pipe in a number of

ways without using the bolts shown and that the gases of explosion may be directed from the by-pass in any desired direction, and that various other changes within the skill of the mechanic may be made in the construction herein shown without departing from the spirit of the invention, provided the means set forth in the following claims be employed.

I claim as my invention:—

1. In a muffler cutout the combination with the exhaust pipe, of a drum secured in the line of said pipe, and having a circumferential inclined valve seat formed integral therewith, a by-pass detachably secured to said drum and communicating therewith, a valve mounted on said by-pass and normally engaging a seat provided on said by-pass, and means for causing said valve to engage with said circumferential valve seat and completely close the passage through the exhaust pipe.

2. In a muffler cutout the combination with an exhaust pipe, a drum secured in line therewith, a by-pass secured to said drum and having a larger cross-sectional area than the exhaust pipe, and means adapted to be arranged at an angle to the normal path of the gases through said exhaust pipe to deflect said gases into the by-pass through a passage having a constantly increasing cross-sectional area substantially as described.

3. In a muffler cutout the combination with the exhaust pipe, of a drum in said exhaust pipe in line therewith, a by-pass secured at an angle to said drum and having a greater cross-sectional area than said drum, a valve adapted to seat on the end of the by-pass and close the same in its lowered position and to seat against the inner wall of the drum and close the passage therethrough in its raised position; said valve in its raised position being arranged at an angle to the axis of the exhaust pipe and in a plane approximately parallel to the opposing wall of the by-pass.

4. In a muffler cutout the combination with the exhaust pipe, of a centr ' section detachably secured to the exhaust pipe line and having a larger cross-sectional area than the exhaust pipe, a circumferential inclined valve seat formed integral with said central section, a by-pass secured to said central section and having a greater cross-sectional area than said central section, a valve adapted to engage said valve seat in the central section and completely close the passage through the exhaust pipe, whereby the exhaust gases may be deflected through a constantly enlarging passage.

5. A muffler cutout comprising a central section adapted to be detachably secured in an exhaust pipe line and having a circumferential internal flange integral therewith and gularly arranged with respect to the exhaust pipe line, a by-pass pipe detachably secured at an angle to said central section and having its end forming a valve seat symmetrical with respect to said internal flange, a valve in said cutout adapted to engage said seat and close the by-pass in its lowered position and to engage said flange and close the exhaust line in its raised position, said valve in its raised position forming one wall of a continuous passage from the exhaust pipe to the by-pass of a gradually increasing cross-sectional area.

This specification signed and witnessed this 10th day of January A. D., 1911.

ARTHUR PIEL.

Signed in the presence of—

AMBROSE F. O'SHEA,

HELEN M. DAMES.