

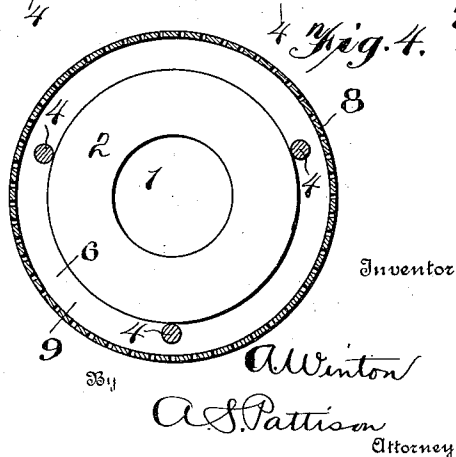
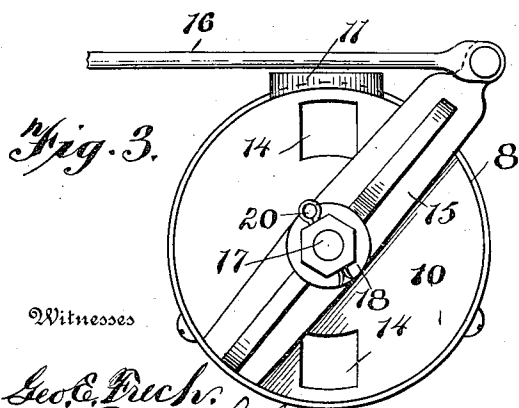
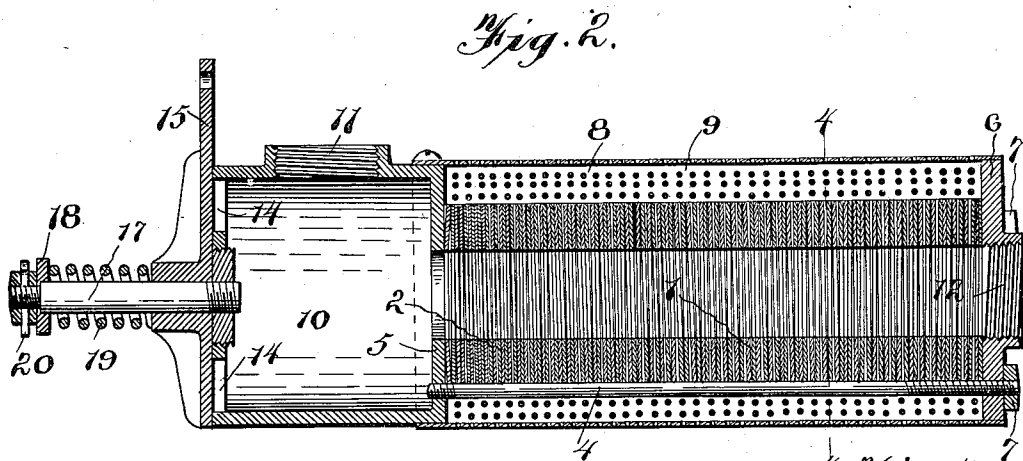
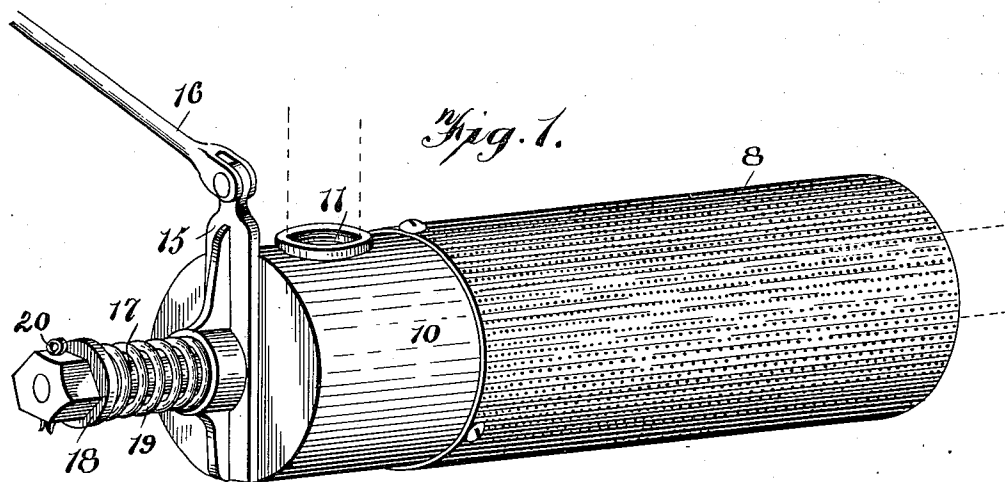
No. 723,111.

PATENTED MAR. 17, 1903.

A. WINTON.
EXHAUST MUFFLER.
APPLICATION FILED DEC. 2, 1901.

NO MODEL.

2 SHEETS—SHEET 1.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 5.

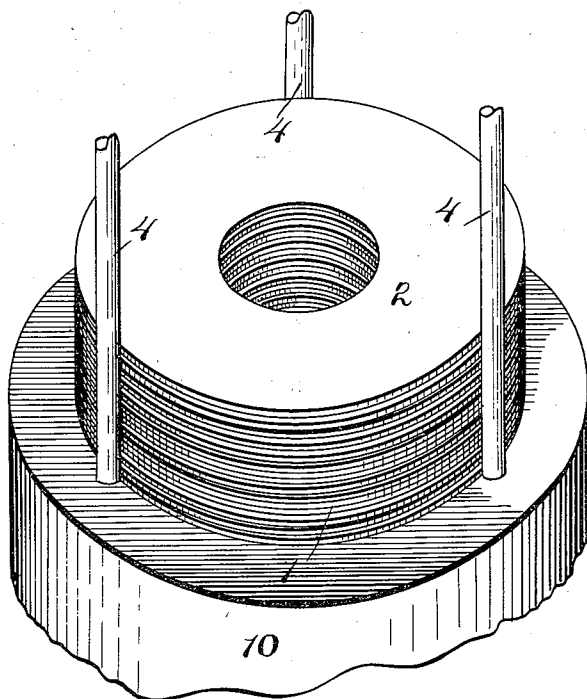


Fig. 6.

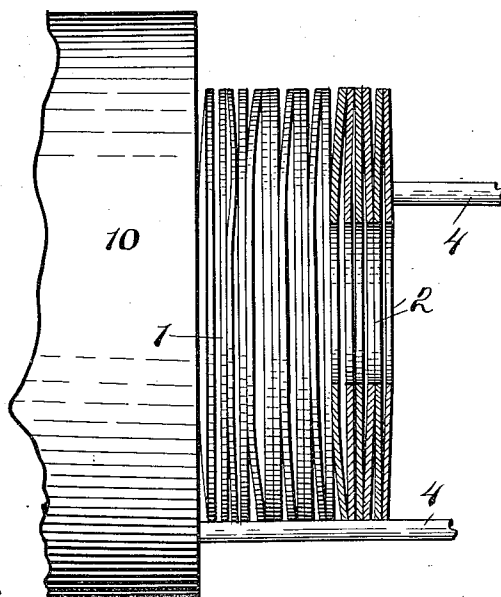
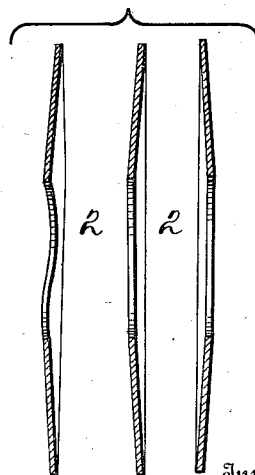


Fig. 7.



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UNITED STATES PATENT OFFICE.

ALEXANDER WINTON, OF CLEVELAND, OHIO.

EXHAUST-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 723,111, dated March 17, 1903.

Application filed December 2, 1901. Serial No. 84,341. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER WINTON, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented new and useful Improvements in Exhaust-Mufflers, of which the following is a specification.

My invention relates to improvements in exhaust-mufflers, and is especially intended and adapted for use in connection with the exhaust of explosive-engines used as the motive power in automobiles.

The object of my present invention, generally speaking, is to provide an efficient muffler for use in connection with explosive-motors, and the construction of my muffler is such that it is simple as well as efficient, is easily cleaned, is durable, is capable of adjustment to regulate the muffling effect as desired, and is capable of throwing the muffling portion proper out of action to relieve the consequent back pressure, and thus increase the power of the engine according to the desires of the chauffeur or to meet the necessities of any situation requiring the full power of the motor.

Referring to the accompanying drawings, Figure 1 is a detached perspective view of my improved muffler. Fig. 2 is a longitudinal central sectional view of the same. Fig. 3 is a view of the valve or gate end thereof. Fig. 4 is a transverse sectional view on the line 4 4 of Fig. 2. Fig. 5 is an enlarged detached view of a portion of the muffler, the surrounding perforate casing removed, and showing in enlarged perspective the muffler-plates. Fig. 6 is a side view of Fig. 5. Fig. 7 is an enlarged detached central sectional view of several of the muffler-plates, illustrating in part their irregular cross-sectional shape.

The primary feature of my invention includes a muffling-cylinder the wall of which is composed of a plurality of plates between which the exhaust escapes. The arrangement is preferably such that the plurality of plates can be adjusted more or less compact for the purpose of regulating the muffling effect.

In the accompanying drawings I show one specific form of construction for carrying out my invention and in which the cylinder 1 is

composed of a plurality of centrally-perforated plates 2. The perforations of the plates are arranged to register and constitute a chamber or space into which the exhaust from the motor passes and expands and passes thence laterally outward between the said plates. From this it will be readily understood that the muffling effect of my improved structure depends upon the degree of compactness or nearness of the flat faces or sides of the plates or disks between which the exhaust passes. The manner of supporting these plates and of regulating the compactness or nearness thereof may be various; but my preferred way at present is that here illustrated and which includes a suitable number of screw-rods 4, situated outside of the plates, which project from a suitable head or end piece, as 5, and through an adjustable head or end piece or plate 6 and carry upon their projecting ends the heads or nuts 7, whereby the plates can be compressed and the muffling effect thereof thereby regulated.

As here shown, I prefer to surround the plate-cylinder 2 by a perforate casing 8, and which forms a surrounding auxiliary expansion-chamber 9, into which the gases and products of combustion enter after passing between the plates of the cylinder 1. This construction allows a relatively large expansion of the escaping gases, which are further interrupted by the surrounding casing 8, and they consequently issue from the casing when under comparatively slight pressure and in practice, it is found, with but little noise.

My improved muffler is preferably provided with an initial expansion-chamber 10, which is in communication with the plate-cylinder 1 and which permits an expansion of the escaping gases immediately upon entering the muffler. This chamber, as here shown, is located at one end of the plate-cylinder and is provided with an exhaust-inlet opening 11, with which the exhaust of the motor is connected in any desired manner. When the muffler is used in connection with a two-cylinder motor, the exhaust of one cylinder is connected with the said opening 11 and the exhaust of the other cylinder is preferably connected with the inlet-opening 12 at the opposite end of the cylinder 1, though this relative connecting arrangement of the exhausts

of a plurality of motors may be varied. When but a single-cylinder motor is used, one of the said openings is closed by means of a suitable plug and the motor-exhaust connected with the other opening, or the muffler may be constructed with but one exhaust-inlet opening, as will be readily understood by those skilled in the art.

It is a well-recognized fact that exhaust-mufflers for motors cause a back pressure upon the motor-piston, and consequently reduce the power of the motor. For the purpose of relieving the engine of this back pressure, and consequently enable the driver to obtain the full power of his engine when desired, I provide means for throwing out or practically cutting off the action of the muffler. The means used by me consists in providing a controlled escape for and in communication with the motor-exhaust, whereby the exhaust may be permitted to pass into the air without passing through the muffler-cylinder. This I prefer to accomplish in the manner here shown, and which consists in providing the chamber 10 with one or more escape-openings 14 and a controlling valve or gate 15 therefor. An operating-rod 16 serves as means for controlling the gate, and which rod will connect with any suitable form of operating device (not here shown) within reach of the driver. Preferably this gate or valve is spring-pressed, whereby a tight joint is always insured and which also serves in the nature of a relief-valve for the pressure within the muffler should it get too high. As here illustrated, the gate is intermediately pivoted upon a centrally-projecting rod 17, carrying a nut and washer 18, and a spiral spring 19 is located between the washer and valve. Preferably the nut is keyed by a transverse pin 20 to prevent any possibility of its coming loose or detached.

The plates 2, which constitute the muffling-cylinder 1, are stamped from thin sheet metal and are preferably left in their irregular shape as they come from the press, the irregularity of the plates making more effective an adjustment of their muffling effect under compression, though I do not limit my invention to such irregularity. This irregularity of the plates (which are here shown in the form of flat rings) is illustrated in Figs. 6 and 7, and the spaces between the plates are also illustrated in the perspective view Fig. 5. By reference to Figs. 6 and 7 it will be noted that this irregularity of the plates consists principally on account of their tendency to a concavo-convex in cross-section, which is the result of the stamping process. They are preferably placed in position promiscuously and without regard for the direction of the cross-sectional contour of adjacent plates.

A muffler of the construction herein shown is easily disassembled for the purpose of being cleaned. It is only necessary to loosen the nuts 7 and the screws 22, which latter serve

to hold one end of the casing in place, when the head 6, the casing 7, and plates constituting the muffling-cylinder can all be removed and ready access had to all parts of the muffler that need attention.

While I here show the escape-casing 8 composed of perforated sheet metal, it will be readily understood that other forms of perforate casings may be substituted therefor, so long as it serves the function of the form of casing here shown. It will also be understood that the cross-sectional contour of the muffling-cylinder may be varied and that instead of being of the shape here shown may be made square or of other cross-sectional contour. The use of the term "cylinder" in the appended claims when used without qualification is meant to be generic and to include any form which has a muffling chamber or chambers with surrounding escape-walls.

I do not limit myself to the specific construction herein shown, for it may be varied without affecting the spirit of my invention;

What I claim, and desire to secure by Letters Patent, is—

1. A muffler having a muffling-chamber provided with a muffling-escape, and a yielding relief-valve independent of said muffling-escape.

2. A muffler having a combined automatically-acting yielding relief and manually-operated escape valve.

3. A muffler including a muffling-chamber having its inner wall provided with circumferentially-extending escape-passages, and a surrounding casing closely perforated throughout its entire surface.

4. A muffler including a muffling-chamber composed of a plurality of annular plates placed side by side, the inner edges of the plates constituting the inner wall of said chamber.

5. A muffler having a relief-opening, a valve for said opening, the valve having an automatic yielding movement in one direction, and capable of a positive movement in another direction.

6. A muffler having a relief-opening, and a valve therefor having an endwise-yielding and transverse movement in respect to said opening.

7. A muffler including a muffling-chamber composed of a plurality of annular plates placed side by side, the inner and outer edges of said plates constituting respectively the inner and outer walls of the chamber, and a surrounding casing provided with transverse openings substantially throughout its entire circumference.

8. A muffler having a relief-opening, a pivoted valve having an endwise-yielding movement upon its pivot, and also a transverse manual movement upon its pivot.

9. A muffler including a muffling-chamber

composed of a plurality of plates placed side by side, the inner edges of the plates constituting the inner wall of said chamber.

10. A muffler having a muffling-chamber provided with a wall composed of a plurality of plates placed side by side, and non-yielding adjustable means for controlling the compactness of said plates.

11. A muffler having a muffling-chamber provided with a wall composed of a plurality of irregular plates.

12. A muffler having a muffling-chamber provided with a wall composed of a plurality of irregular plates placed side by side, and means for regulating the compactness of said plates.

13. A muffler-chamber composed of a plurality of transversely-irregular plates side by side, said plates having transverse registering openings constituting a muffling-chamber.

14. A muffler including a muffler-chamber composed of a plurality of circular transverse irregular plates side by side and provided with transverse registering openings, the openings constituting a muffling-chamber, a surrounding perforate casing removed therefrom and forming an intervening expansion-chamber.

15. A muffling-chamber composed of a plurality of plates side by side and provided with transverse registering openings, supporting members for and passing transverse the plates, and non-yielding plate-compressing members.

16. A muffling-chamber composed of a plu-

rality of plates side by side and provided with transverse registering openings, heads at opposite ends of the plurality of plates, and non-yielding adjustable members connecting the said heads.

17. A muffling-chamber composed of a plurality of plates side by side and provided with transverse registering openings, heads projecting beyond the peripheries of said plates, and a perforate cylinder supported by said projecting heads.

18. A muffler including an initial expansion-chamber, having inlet and outlet openings, and a muffling-chamber composed of annular plates placed side by side, the openings of the plates registering with each other and with said outlet-opening.

19. A muffler including an elongated horizontal muffling-chamber composed of a plurality of annular plates set on edge side by side, whereby a uniform escape resistance between said plates can be maintained.

20. A muffler including an elongated horizontal muffling-chamber composed of a plurality of plates set on edge side by side, whereby a uniform escape resistance between said plates can be maintained.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALEXANDER WINTON.

Witnesses:

GEO. H. BROWN,
THOS. HENDERSON.