

E. M. KLUCK.

MUFFLER.

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1,060,768.

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Fig. 1.

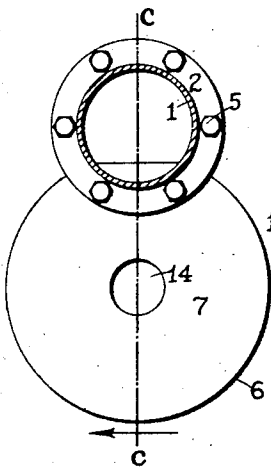


Fig. 3.

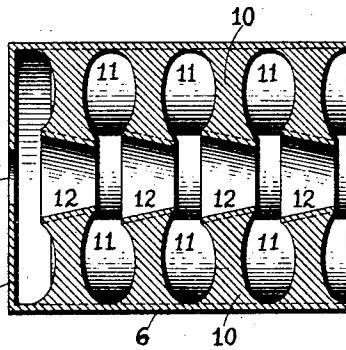


Fig. 2.

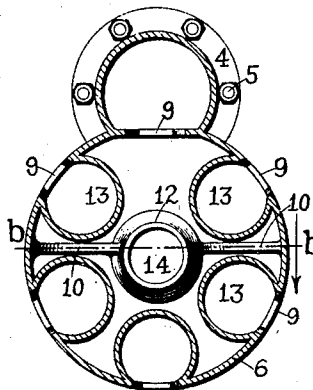


Fig. 4.

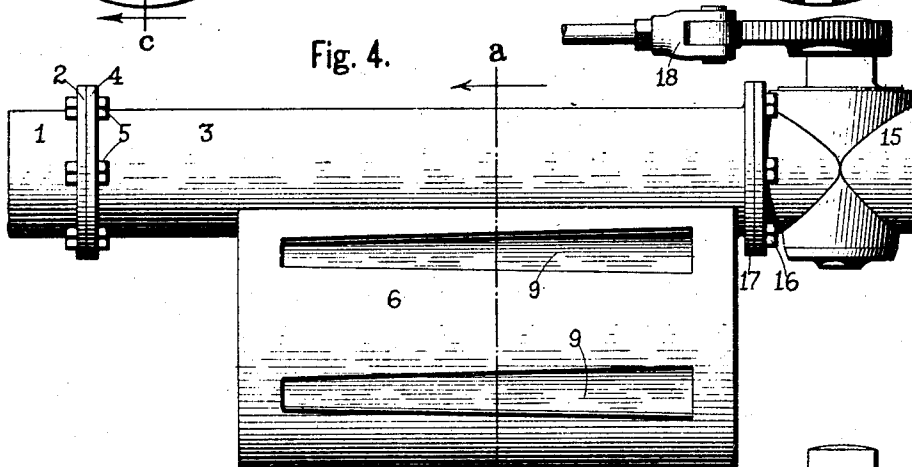
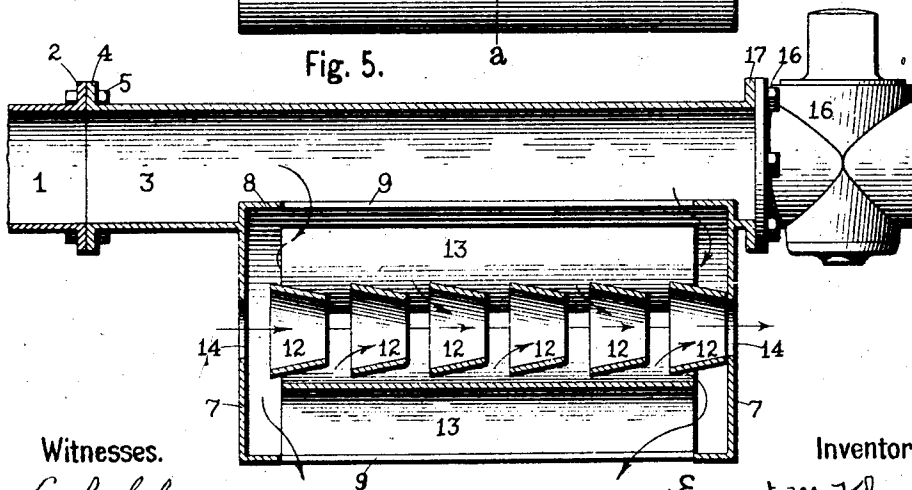


Fig. 5.



Witnesses.

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MUFFLER.

1,060,768.

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To all whom it may concern:

Be it known that I, ERNEST M. KLUCK, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented new and useful Improvements in Mufflers, of which the following is a specification.

This invention relates to improvements in mufflers or silencers for internal combustion 10 motors.

One of the features of the invention consists in arranging a muffling device at one side of the exhaust pipe of the motor and in longitudinal parallelism with said exhaust 15 pipe, so that the gases of combustion will pass laterally out through the side of the exhaust pipe into the muffler.

Another feature consists in arranging a series of telescoping tubular muffling elements in separated arrangement in a longitudinal row in the muffler.

Another feature consists in attaching a cut out directly to the end of the exhaust pipe which when opened will permit the exhaust gases to pass in a straight longitudinal line through the exhaust pipe into the atmosphere.

The invention also relates to certain details of construction which will be herein after described and claimed reference being had to the accompanying drawings in which a preferred adaptation of the improvement is shown.

Figure 1 is a transverse section through an exhaust pipe with the improved muffler connected thereto. Fig. 2 is a transverse section through the exhaust pipe and muffler on line *a, a* Fig. 4, looking in the direction of the arrow. Fig. 3 is a fragmentary longitudinal section through the muffler on line *b-b* Fig. 2. Fig. 4 is a side elevation of the rear portion of an exhaust pipe and the improved muffler attached thereto. Fig. 5 is a central longitudinal section on line *c, c*, Fig. 1, the cut or free exhaust valve being shown in side elevation.

In referring to the drawings in detail like numerals designate like parts.

In the adaptation of the invention shown in the accompanying drawings, a pipe of substantially the same size as the exhaust pipe is detachably fastened to the rear end of the exhaust pipe forming a removable

continuation of said exhaust pipe and the muffler is connected to and arranged on one side of said pipe.

Referring to Figs. 4 and 5 of the drawings, 1, indicates the exhaust pipe proper, having a flange, 2, at its rear end which constitutes one member of a coupling. A pipe, 3, of substantially the same circumference as the exhaust pipe has a similar flange, 4, at its forward end and bolts, 5, are fitted through the flanges to detachably fasten the pipe to the rear end of the exhaust 65 pipe. The pipe, 3, extends in longitudinal alinement with the exhaust pipe and constitutes a continuation of said exhaust pipe.

The muffler in the adaptation illustrated consists of a drum having a cylindrical body, 6, of larger circumference than the pipe, 3, and closure plates or heads, 7, at the ends of said body, and a series of muffling elements within said body. The body, 6, of the drum is attached to the side of the pipe, 3, so that a slight portion thereof at one side extends within the pipe as indicated at 8 in Fig. 5 and extends parallel with the pipe, 3. A series of elongated longitudinally extended slots, 9, are formed in the 80 circular wall of the body of the drum at regular intervals around the same which extend from near the front end to near the rear end of said body, as shown in Figs. 4 and 5. These slots are preferably tapered 85 and inclined gradually from the front to the rear of the drum. One of the slots, 9, is located in the portion of the drum within the pipe, 3, and constitutes the inlet from the pipe, 3, within the drum and the 90 other forms outlets for the exhaust gases from the muffler drum into the atmosphere. The interior of the drum is divided horizontally by central horizontal walls or partitions, 10, as shown in Figs. 2 and 3, and said 95 wall or partition is provided at intervals with transverse openings or slots, 11, for the passage of exhaust gases. A series of short tubular muffler elements, 12, arranged in separated longitudinal alinement are supported centrally within the body of the drum, as shown in Figs. 3 and 5. These elements it will be noted are gradually tapered or reduced in size from the front toward the rear in the adaptation illustrated. A 105 series of long tubular muffler elements, 13,

are also arranged within the drum and around the short central muffling element, 12. The long muffling elements, 13, are of a straight cylindrical form and of about the same length as and equal in number to the slots, 9. Each of the elements, 13, is arranged so that it incloses the inner side of one of the slots, 9, as shown in Fig. 2 so that the exhaust gases are interrupted in their passage into and out of the drum through the slots, 9, and are compelled to also pass into and through the elements, 13. The closure plates or heads, 2, are each provided with central openings, 14, to allow for a free circulation of cooling air through the center of the muffler as indicated by the center arrows in Fig. 5.

A cut out or free exhaust valve, 15, is fastened to the rear end of the pipe, 3, being detachably bolted by bolts, 16, to a flange, 17, at the rear end of said pipe, 3. The cut out or free exhaust valve is manually operated in the usual well known manner through a connecting rod, 18, a fragment of which is shown in Fig. 4. It will be noted that the cut out is located at the rear end of the exhaust pipe so that a straight longitudinal passage for the exhaust gases through the muffler when the cut out is closed is indicated by arrows in Fig. 5.

I claim

1. In a device of the class described, the combination with an exhaust pipe, of a pipe of substantially the same size as the exhaust pipe detachably fastened to the rear end of the exhaust pipe and forming a removable continuation of said exhaust pipe, and a cylindrical muffler of larger circumference than the detachable pipe connected throughout its length to one side of and having slotted communication with said exhaust pipe.

2. In a device of the class described, the combination with an exhaust pipe, of a cylindrical muffler connected throughout its length to one side of said exhaust pipe and extending parallel with said exhaust pipe; said cylindrical muffler being considerably larger in circumference than the exhaust pipe and having closed ends and a plurality of side slots.

3. In a device of the class described, the combination with an exhaust pipe of a cylindrical muffler connected throughout its length to one side of said exhaust pipe and consisting of a drum having side slots one of which forms a communicating opening

between the drum and exhaust pipe and others of which constitute exhaust openings.

4. In a device of the class described, the combination with an exhaust pipe of a muffler connected to one side of said exhaust pipe and consisting of a drum having tapering longitudinal side slots, one of which forms a communicating opening between the drum and exhaust pipe and others of which constitute exhaust openings.

5. In a device of the class described, the combination with an exhaust pipe of a muffler connected to one side of said exhaust pipe and consisting of a drum having tapering longitudinal side slots, one of which forms a communicating opening between the drum and exhaust pipe and others of which constitute exhaust openings and a cut out or free exhaust valve attached to the rear end of said exhaust pipe.

6. In a device of the class described, the combination with an exhaust pipe of a cut out or free exhaust valve attached to the rear end of said exhaust pipe and a cylindrical muffler connected throughout its length to one side of the exhaust pipe in front of the cut out or free exhaust valve.

7. In a device of the class described, a muffling drum, having side slots, a side series of long tubular muffling elements within the drum equal in number to and inclosing the side slots in said drum and a central series of short tubular muffler elements arranged in separated longitudinal alinement within said drum.

8. In a device of the class described, a muffling drum, having side slots, a side series of long tubular muffling elements within the drum equal in number to and inclosing the side slots in said drum, a central series of short tubular muffling elements arranged in separated longitudinal alinement within said drum and a central perforated wall or partition extending through and dividing the interior of said drum.

9. A muffler consisting of a hollow drum having side slots and end openings, a series of short separated tubular muffling elements arranged centrally in longitudinal alinement within the drum, and a series of long side tubes within the drum and, surrounding the central tubes, and inclosing the side slots.

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