J. CARON.

MUFFLER FOR AUTOMOBILES.

APPLICATION FILED MAR. 10, 1913.

1,092,017.

Patented Mar. 31, 1914.

3 SHEETS—SHEET 1.

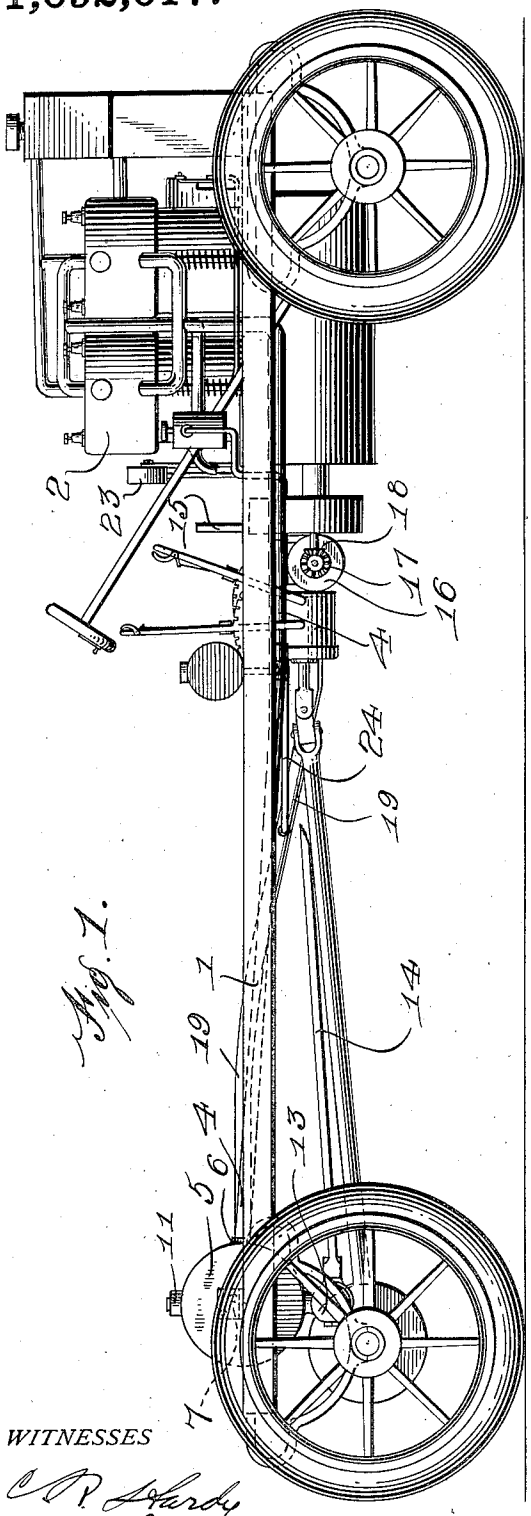


Fig. 1.

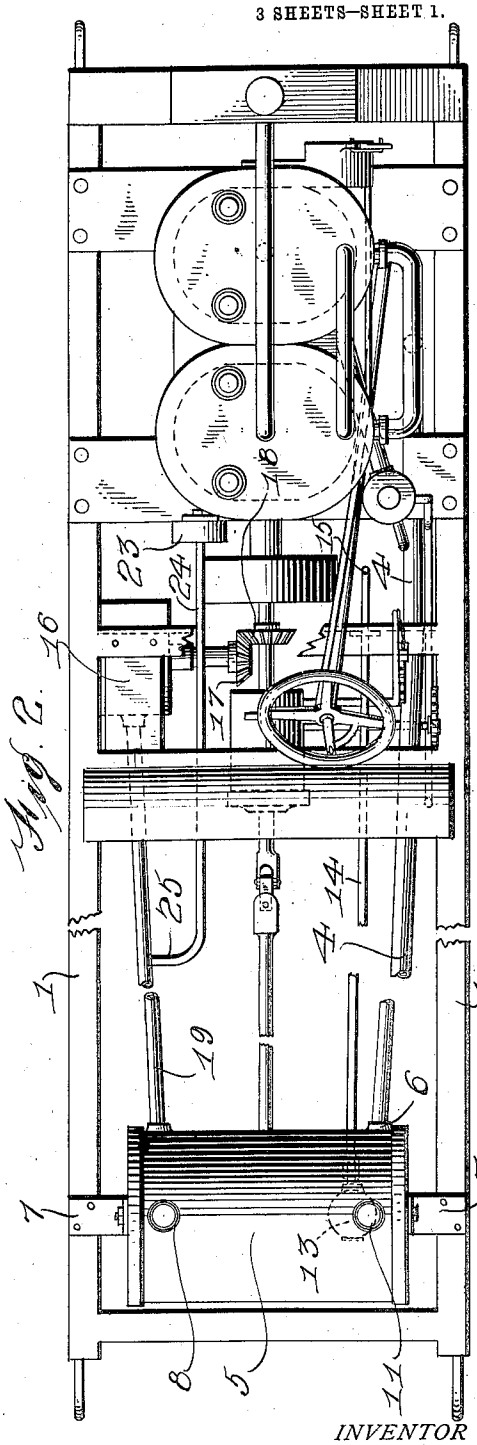


Fig. 2.

WITNESSES

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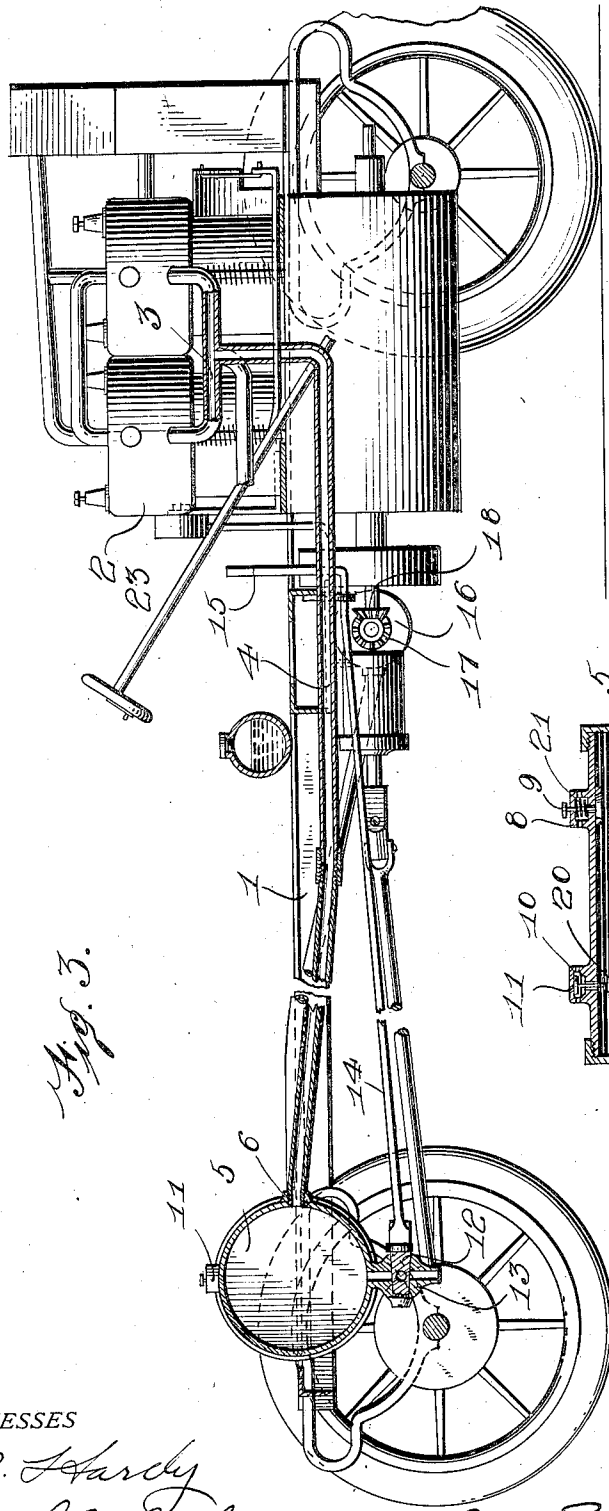


Fig. 3.

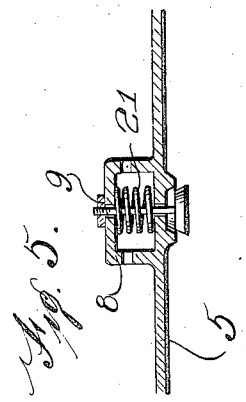


Fig. 5.

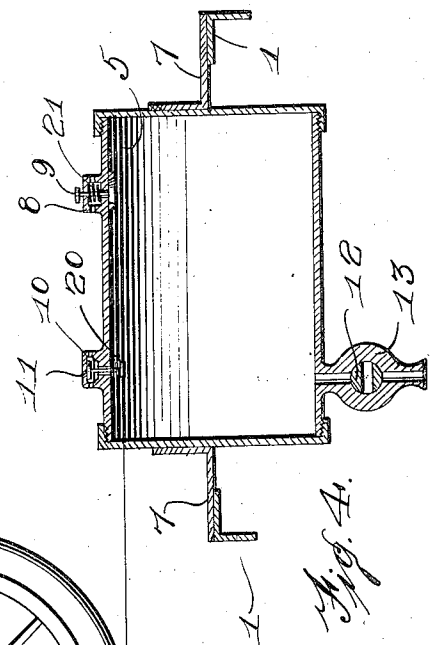


Fig. 4.

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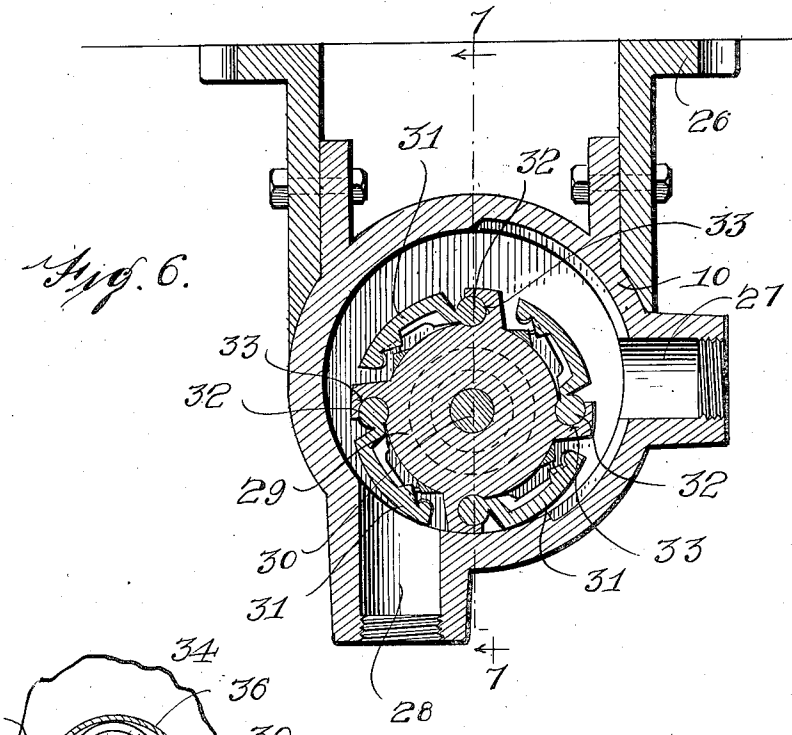
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3 SHEETS—SHEET 3.

Fig. 6.



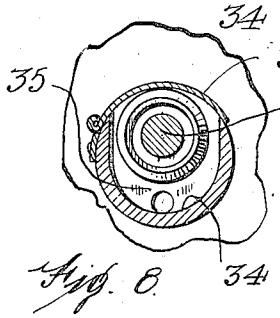
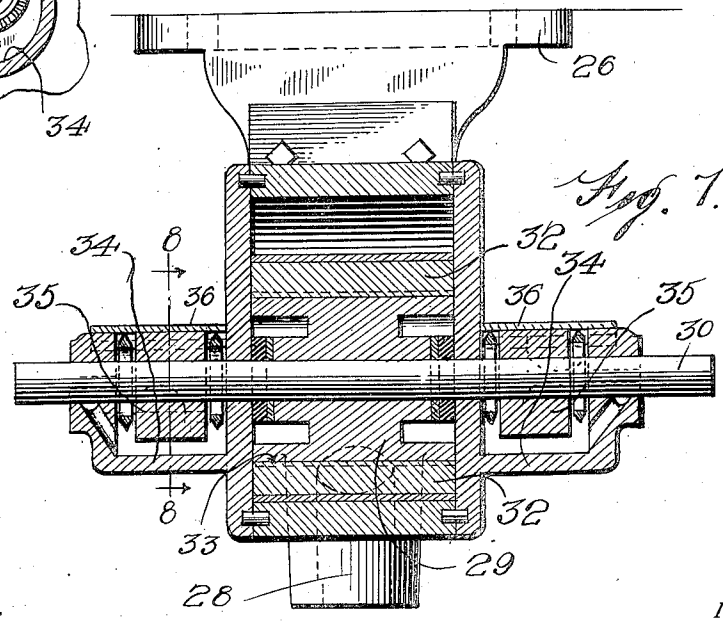


Fig. 8.

Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

JACOB CARON, OF NAMPA, IDAHO.

MUFFLER FOR AUTOMOBILES.

1,092,017. Specification of Letters Patent. Patented Mar. 31, 1914.

Application filed March 10, 1913. Serial No. 753,381.

To all whom it may concern:

Be it known that I, JACOB CARON, a citizen of the United States, residing at Nampa, in the county of Canyon and State of Idaho, have invented certain new and useful Improvements in Mufflers for Automobiles, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to mufflers for explosive engines and has for its object the production of a simple and efficient means for controlling the exhaust from an explosive engine in such a manner as to eliminate the waste of power and reducing the sound of the explosion as is usually the case in an explosive engine which is now in use, especially when an engine is traveling under a heavy load.

Another object of this invention is the production of a vacuum or suction exhaust treatment device which will eliminate all noise or sound of the exhaust from the engine.

With these and other objects in view, this invention consists in certain novel constructions, combinations and arrangements of parts, as will be hereinafter fully described and claimed.

In the drawings:—Figure 1 is a side elevation of an automobile frame showing the device applied to an automobile. Fig. 2 is a top plan view of an automobile frame showing the exhaust treatment device applied to the frame. Fig. 3 is a longitudinal section through the frame of a machine taken longitudinally of the exhaust supply pipe from the engine to the exhaust cylinder. Fig. 4 is a longitudinal sectional view through the exhaust cylinder. Fig. 5 is an enlarged sectional view through the inlet valve carried by the exhaust cylinder. Fig. 6 is a vertical section through the vacuum pump used in connection with the present device. Fig. 7 is a section taken on line 7—7 of Fig. 6. Fig. 8 is a section taken on line 8—8 of Fig. 7.

By referring to the drawings, it will be seen that 1 designates the frame of an automobile which may be replaced by means of any suitable base for supporting the engine 2. The engine 2 carries an exhaust outlet pipe 3 which exhaust outlet pipe communicates with a second outlet pipe 4 and this outlet pipe 4 has its opposite end connected to the exhaust cylinder 5 as indicated at 6. The exhaust cylinder 5 is placed at any convenient place upon the frame 1 or at any convenient place relative to the engine 2, and as illustrated in Figs. 1, 2 and 3, the exhaust cylinder 5 is preferably placed upon the rear of the frame as this is the most convenient place for the cylinder and furthermore, for the reason that the cylinder will be held out of the way of dust or dirt which might gain entrance by the valves carried by the cylinder as hereinafter described.

The exhaust cylinder 5 is supported upon the frame 1 of the machine by means of brackets 7 and this cylinder carries an inlet valve casing 8 in which is placed an inlet valve 9. An outlet valve casing 10 is carried by the opposite end of the cylinder 5 and within this valve casing 10 is placed a valve 11. A manually operating valve 12 is supported within the valve casing 13 and this manually operating valve 12 is connected to a rotating rod 14 which rod is connected to a foot lever 15 so that the valve 12 may be opened by pushing the foot lever 15 downwardly.

A suction or vacuum pump 16 is suspended from the frame 1 as illustrated in Figs. 2 and 3 and this suction or vacuum pump 16 carries a beveled gear 17 which gear is driven by means of a beveled gear 18 carried by the engine 2. A suction or vacuum pipe 19 is connected to the exhaust cylinder 5 and to this suction pump or vacuum pump 16 and is adapted to create a vacuum just about atmospheric pressure to overcome all the noise of the explosion of the passing of the exhaust gases through the cylinder 5. It will be seen that this suction or vacuum pump 16 will keep a vacuum in the casing 5 and in the pipes 4 and 19 so as to allow the exhaust gases when discharged from the engine to be exhausted into a vacuum space thereby eliminating all the noise whatsoever as is usually created by the exhaust from an engine.

It is desired to point out, and it will be clearly seen by carefully considering Fig. 4, that the exhaust cylinder 5 does not have any baffle plates which would tend to retard the passage of the exhaust as the same passes through the cylinder, and by eliminating these baffle plates which are usually employed, it will be seen that there will be practically no resistance to the passage of the exhaust through the exhaust treatment system hereinbefore described.

The valve 11 carries a spring 20 which spring is of sufficient strength to hold the valve closed under normal circumstances and is only intended to allow the valve to come to an open position in case something should happen to the suction pump or the pipe 19.

The valve 9 is provided with a spring 21 which normally holds the valve 9 in a closed position and this spring is of sufficient strength to hold this valve in a closed position under the ordinary suction of the suction pump but in the case that too much suction is obtained from the exhaust, the valve will automatically open and allow the admission of a small amount of air through the valve casing 8.

It is desired to point out that the valves 9 and 11 are only intended to operate in the case of an emergency as just described; otherwise these valves remain inactive.

A pressure gage 23 is carried by the frame 1, preferably adjacent the engine 2, and is so placed as to be readily viewed by the operator. A pressure pipe 24 is connected to this gage 23 and also to the pipe 19 as indicated at 25 so that the operator of the engine may readily ascertain the fact that the vacuum is not being created either through the failure of the pump 16 to operate or the breakage of the pipe 19. If such an accident should occur as to stop the suction or vacuum pump 16 or break the pipe 19, the valve 11 will automatically open to allow the exhaust to pass out through the casing 10 and as soon as the operator perceives the variance of the indicator hand upon the gage, he will readily know that the vacuum is no longer being created in the cylinder 5 and by pressing down upon the foot lever 15, the valve 12 may be thrown wide open and allow the exhaust to pass out through the casing 13 from the exhaust cylinder 5. It should be understood that this valve 12 is only thrown open in case of an emergency and that the valve 11 also only operates in case of an emergency. The vacuum or suction pump 16 is suspended from the casing 1 by means of brackets 26 and this suction pump is provided with an inlet opening 27 and an outlet opening 28. A centrally rotating cylinder 29 is mounted upon the supporting shaft 30 within the casing of the pump and is provided with a plurality of hinged shoes 31 which are adapted to swing outwardly so as to produce the desired suction within the casing and draw the explosive gas into the pump and create a vacuum in the casing 5. The hinged shoes 31 have their rear ends provided with a circular portion 32 which fits in a circular pocket 33 formed in the cylinder 29 so as to allow the shoes to readily swing outwardly.

The casing of the pump 16 is provided with laterally extending auxiliary casings 34 upon opposite sides and within these casings is placed an oiling ring 35 which is carried by the shaft 30 for the purpose of efficiently oiling the shaft and keeping the same well lubricated.

A cover 36 is secured to the outer face of the auxiliary casing 34 so as to constitute a closure for the casing or journal and prevent the ready evaporation of the oil contained upon the oiling ring 35.

From the foregoing description, it will be seen that a very simple and efficient device has been produced whereby the exhaust from the explosive engine will be taken directly from the explosive cylinders into a vacuum chamber and then exhausted to the atmosphere through the means of a suction or vacuum pump. This pump, as explained above, will cause the exhaust gases to be thrown into an empty space, whereupon the usual noise which accompanies the discharge of the explosive gases will be eliminated and by having the tank 5 formed of a plane tubular body, it will be seen that no baffle plates or other obstructions will be placed in the way of the gases which would tend to retard the passage of the exhaust gases and thereby reduce the power of the engine.

The device as herein illustrated has been actually tested and it has been shown that an ordinary engine which has produced only a two-horse power pull has been able to produce a full three-horse power pull by the use of the present exhaust treatment wherein the exhaust gases are not retarded by any baffle plates or the like in its passage to the open air. It has also been found that by having the exhaust treatment as above described, all noise of the explosive gases has been eliminated and an automobile equipped with the present exhaust treatment has been able to pull a steep grade with the full power of the engine without throwing the exhaust into the open air as is usually the case with the exhaust devices or mufflers used in the engines which are produced or placed upon the market at the present time.

It should be understood that the present device is capable of being applied to a vertical explosive engine or to an engine of any type whether mounted upon the body of a car or mounted upon a stationary base or used for a purpose other than an automobile. The principle of a device may, therefore, be accomplished whether used upon an automobile or an engine of the stationary type.

Having thus described the invention, what is claimed as new, is:—

1. In an exhaust muffler the combination with an explosive engine, of an exhaust cylinder, means connecting said exhaust cylinder with said explosive engine for conveying the exploded gases therefrom to said cylinder, a vacuum pump, means for connecting said vacuum pump with said exhaust cylinder, vacuum indicating means connected to said last mentioned means, and auto-

matic valve means carried by said exhaust cylinder for allowing the discharge of the exhaust from said casing in case of injury to said vacuum pump.

2. In an exhaust muffler the combination with an explosive engine, of an exhaust cylinder, a pipe connecting said explosive engine with said exhaust cylinder, a vacuum pump connected to said exhaust cylinder and constituting a normal outlet therefor, automatic valve means carried by said cylinder for allowing the discharge of exhaust from said exhaust cylinder in case of accident to said vacuum pump, an automatic inlet valve carried by said exhaust cylinder for admitting air into said exhaust cylinder in case sufficient amount of exhaust does not pass into said exhaust cylinder from said explosive engine.

3. In an exhaust muffler the combination with an explosive engine, of an exhaust tank, a vacuum pump, a drive gear coöperating with said engine, a gear coöperating with said drive gear for driving said vacuum pump, means connecting said explosive engine with said exhaust cylinder, means connecting said exhaust cylinder with said vacuum pump for creating a vacuum in said exhaust cylinder, and automatic valve means carried by said exhaust cylinder for admitting air into said cylinder and discharging exhaust therefrom.

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

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Witnesses:

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