Sept. 22, 1931. F. C. FISCHER 1,824,078

DEVICE FOR REMOVING CARBON MONOXIDE FROM EXHAUST GASES

Filed Jan. 23, 1929

Fig. 2.

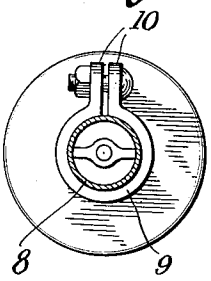



Fig. 1.

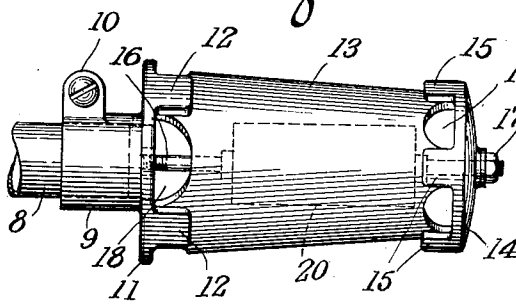



Fig. 3.

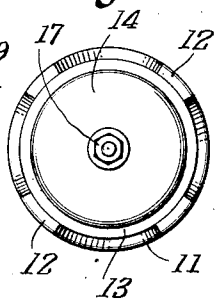



Fig. 4.

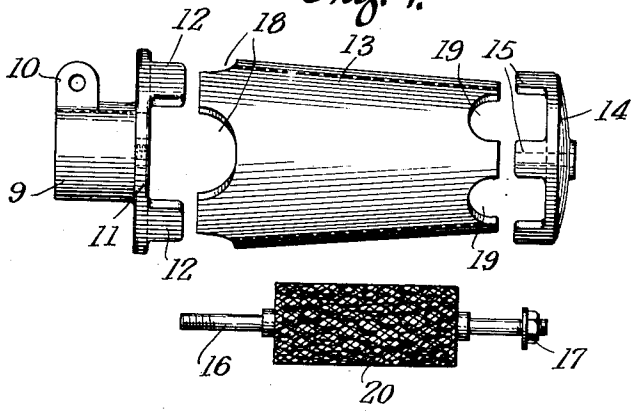



Fig. 5.

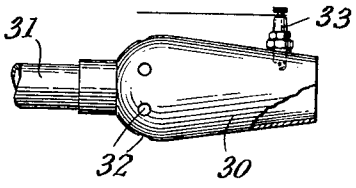
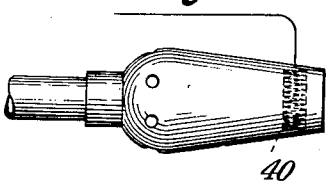



Fig. 6.




INVENTOR

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# UNITED STATES PATENT OFFICE

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## DEVICE FOR REMOVING CARBON MONOXIDE FROM EXHAUST GASES

Application filed January 23, 1929. Serial No. 334,502.

This invention relates to a device for removing carbon monoxide and other similar incompletely oxidized gases from the exhaust gases of internal combustion engines and the like.

Carbon monoxide is a poisonous and dangerous gas and its effect upon human beings is permanent, usually causing death within a few minutes. It is well known that carbon monoxide is always present in the exhaust gases from internal combustion engines and a large number of persons, usually automobilists, are killed each year by carbon monoxide exhausted by automobile and other internal combustion engines.

Since the gas is colorless and tasteless, having a very faint peculiar odor, its presence is not readily noticed and the victim is soon rendered unconscious without realizing that he is being gradually killed by a deadly gas.

It is therefore an object of this invention to provide a device which may be attached to the exhaust pipe of a gas engine to destroy the carbon monoxide gas.

A further object is the provision of a carbon monoxide destroying device which may be readily attached to standard internal combustion engines without alteration.

These and other objects are attained by the novel construction, combination and arrangement of parts hereinafter described and shown in the accompanying drawings, constituting a material part of this disclosure and in which:

Figure 1 is a side elevational view of the preferred form of the device.

Figures 2 and 3 represent end views of the same.

Figure 4 is a disassembled view of the casing used in the preferred form, and of the element used in said casing.

Figure 5 is an elevational view of a modified form of the device.

Figure 6 is an elevational view of another modified form of the device.

Referring to Figure 1 of the drawings, the exhaust pipe 8 of an internal combustion engine has attached thereto the collar 9 which is provided with clamping means 10 for holding the collar tightly about the pipe.

The collar 10 is integral with the cap 11 which has spaced flanged portions 12, the latter embracing the outer wall of the aluminum casing 13.

The other end of the casing 13 has mounted thereon a cap 14 provided with spaced flanged portions 15 and the two caps are held tightly against the ends of the casing by means of a bolt 16 which is threaded at one end to accommodate the tightening nut 17. The casing has a plurality of spaced apertures 18 and 19 at its ends which cooperate with the flanged portions 12 and 15 to regulate the passage of air and gas to and from the casing 13.

Mounted upon the rod 16 is preferably a small wire mesh cylinder 20 in which is placed a quantity of black copper oxide; the wire mesh being of a size sufficient to prevent the copper oxide from falling into the casing and at the same time allowing the free passage of gases through said cylinder containing the copper oxide.

The exhaust gases from internal combustion engines attain very high temperatures and it has been found that at a temperature of about 400 degrees F. and above, the carbon monoxide gas in the exhaust gases in passing over the black copper oxide is converted into carbon dioxide, a non-poisonous gas. Also the exposure of the interior of the aluminum casing to the air and gases causes a film of aluminum oxide to collect thereon and the carbon monoxide at the high temperatures will similarly combine with the aluminum oxide coating to form carbon dioxide.

It will therefore be seen that as the exhaust gases at high temperatures pass through the aluminum casing and the cylinder of copper oxide, the carbon monoxide will be converted into the non-poisonous carbon dioxide, thus removing the danger heretofore present in exhaust gases from internal combustion engines.

The aluminum oxide and copper oxide have great rejuvenating characteristics and as soon as they have been acted upon by the carbon monoxide and reduced, they are readily brought back to their original state by oxygen picked up from the air entering through the

apertures 18, so that the device is at all times in a condition to completely oxidize any carbon monoxide which may be in the exhaust gases.

Of course, other relatively unstable substances besides copper oxide and aluminum oxide may be employed, but the aluminum and copper oxide have been found to give excellent results when used in my device.

In Figure 5 is shown a modified form of the device in which an aluminum casing 30 is attached to the exhaust pipe 31 of an internal combustion engine. The casing 30 is provided with a plurality of apertures 32 to allow the entrance of air, and mounted in the casing is a spark plug 33 which may be connected to the distributor of the gas engine. When the engine is in operation, sparks will issue from the spark plug to ignite carbon monoxide gas, the complete combustion of the carbon monoxide being assisted by the oxygen in the air received through the apertures 32, and by the reduction of the aluminum oxide coating on the interior of the casing.

In the modified form shown in Figure 6, a heating coil 40 is substituted for the spark plug, the object of the coil being to maintain a high temperature during the mixing of the air and the carbon monoxide, thus insuring complete combustion of the carbon monoxide.

It has been found that the aluminum casing alone is sufficient to destroy the carbon monoxide content of the exhaust gas, and it is apparent that the spark plug or heating coil merely serves the purpose of producing additional heat to hasten the reaction. However, since the temperature of the exhaust gases is sufficiently high, the sparking device or the heating coil may be dispensed with and satisfactory results obtained by merely using the aluminum casing. Tests have shown that an exhaust gas having a content of eight per cent carbon monoxide, when passed through the aluminum casing alone, finally has the carbon monoxide content reduced to .2%.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive or limitative of the invention, of which obviously an embodiment may be constructed including many modifications without departing from the general scope herein indicated and denoted in the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a device for converting carbon monoxide, an aluminum casing provided with means for regulating the entrance of air and the escape of the gas.

2. In combination with an internal combustion engine, a device for converting carbon monoxide, consisting of an aluminum casing adapted to be attached to the exhaust of said engine, said casing being provided with means for supplying air thereto.

This specification signed this 22nd day of January, 1929.

FRED'K C. FISCHER.