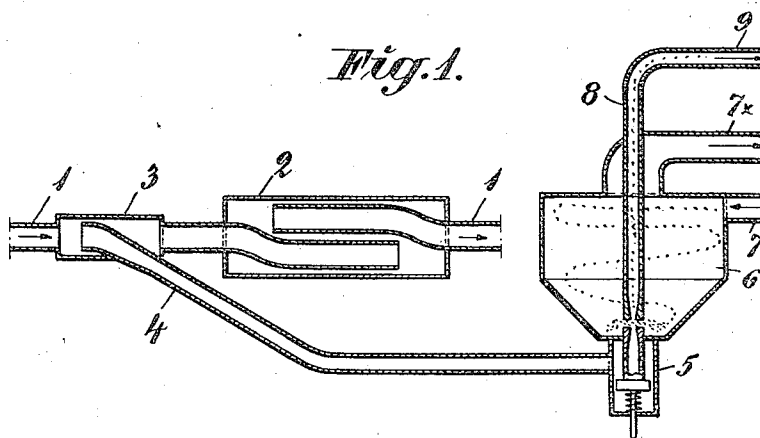
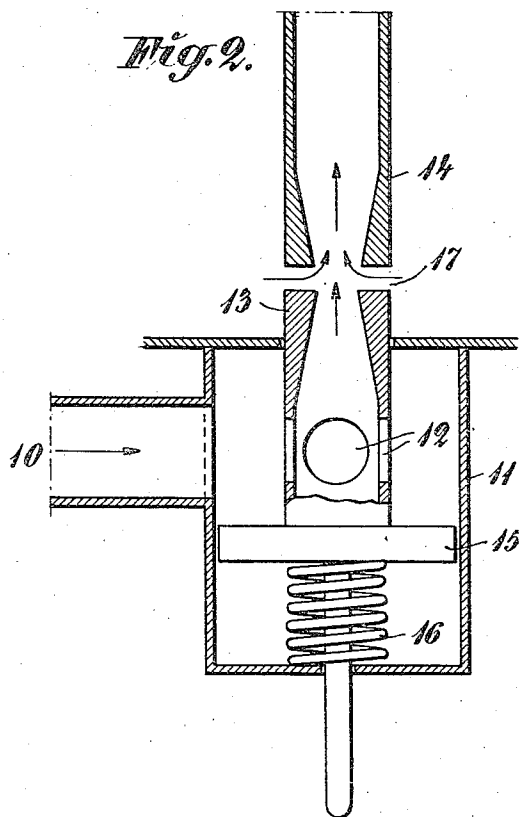


Oct. 15, 1946.

K. T. KÄLLE
DEVICE FOR REMOVING PARTICLE DEPOSITS FROM GAS PURIFYING
APPARATUS ASSOCIATED WITH GAS GENERATORS
Filed May 26, 1941

2,409,211



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UNITED STATES PATENT OFFICE

2,409,211

DEVICE FOR REMOVING PARTICLE DEPOSITS FROM GAS PURIFYING APPARATUS ASSOCIATED WITH GAS GENERATORS

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Application May 26, 1941, Serial No. 395,240
In Sweden February 17, 1941

8 Claims. (Cl. 183—38)

1

The present invention relates to a device which renders possible the automatic removal of charcoal dust, carbon particles or like deposits from gas-purifying apparatus or returning such deposits to the oxidizing zone of a gas generator. To this end a jet device is combined with said gas-purifying apparatus and is so adapted and arranged in such communication with the exhaust pipe of the engine driven by the gas generator, that the energy of motion of the exhaust gases may be utilized for conducting away charcoal dust, carbon particles or the like deposits, which thus can either be blown out into the atmosphere for example or returned to the oxidizing zone of the gas generator.

The jet device preferably co-operates with a discharge pipe occupying a central and stationary position in the body of the gas-purifying apparatus, in combination with which pipe it forms a kind of injector, the intake gap of which is located in the gas-purifying apparatus. The said intake gap is adapted to be dependent upon the energy of motion of the exhaust gases, i. e., a spring-loaded element attempting to close the gap is counteracted by the pressure deriving from the energy of motion of said gases and thus said energy tends to open said gap. The spring-loaded element referred to is so designed that it keeps the gap closed until the engine develops a certain speed and the rate of exhaust gas flow is thereby rendered adequately large for the pressure developed thereby to open the gap and cause the charcoal dust, carbon particles and like deposits to be sucked in through the gap.

Forming part of the said jet device according to the invention are a nozzle and a push member operatively connected thereto, which latter is movable in a cylinder communicating with the exhaust pipe and spring-loaded. The nozzle is co-axially positioned with relation to and co-operates with the stationary discharge pipe centrally located in the gas-purifying apparatus and through which the charcoal dust, carbon particles etc. are removed.

One embodiment of the subject-matter of the invention is represented diagrammatically by way of example in the accompanying drawing, wherein

Fig. 1 represents a vertical section through the device according to the invention, whilst Fig. 2 shows on somewhat larger scale a section through the jet device.

In Fig. 1 the exhaust gas pipe 1 leaving the engine (not shown) is represented together with the associated sound damper or silencer 2. In

2

front of the silencer 2 is an extension 3 of the pipe, from which a pipe 4 branches out, the inlet mouth of which opens out towards the stream of exhaust gases so that the energy of motion of these gases can be utilized to create a pressure in the pipe 4. This pipe 4 is connected up to a jet device 5 which is associated with a gas-purifying apparatus, for example an air purifier 6 of the so-called cyclone type, to which the gas coming from the gas generator (not shown) passes through a pipe 7 and departs through the pipe 7a, as indicated by the arrows in Fig. 1. Centrally arranged in the said purifying apparatus is a discharge pipe 8, the end of which remote from the purifying apparatus can either open out directly into the atmosphere at 9 or be connected to the gas generator 9a. This latter alternative can be applied with advantage on those generators in which a part of the combustion gases can be returned together with the suction air. As is known this can occur on charcoal gas generators, which are supplied with adequate thermal insulation so that a certain amount of excess heat is produced, which excess can be utilized in the reduction zone of the gas generator for reducing carbon dioxide to carbon monoxide.

In Fig. 2 which as already stated above represents the jet device on a somewhat larger scale than in Fig. 1 the branch pipe 4 is connected at 10 to the jet device which is situated in a cylinder 11, into which exhaust gases from the engine flow so that they pass through orifices 12 into a nozzle 13 forming part of the said jet device. Arranged above this nozzle 13 and co-axial therewith is the end 14 of the aforementioned pipe 8, between which and the nozzle 13 a gap 17 may be formed in the manner described below.

The nozzle 13 is capable of being moved towards and away from the pipe end 14, the necessary movement being transmitted by means of a push member 15 fixed to the nozzle and by means of a spring 16 fitted thereunder. This spring 16 tends to bring the push member 15 into such a position that the nozzle 13 abuts the end of the pipe 14.

When the speed of the engine is increased to a certain value it will be apparent that the pressure in the pipe 4 will also be increased and accordingly also the pressure in that part of the cylinder 11 above the push member 15, so that the resistance of the spring 16 is overcome and the push member moves downwards. In this way the gap 17 is formed through which charcoal dust, carbon particles and the like are brought

along from the cyclone gas purifier under the action of the flow of exhaust gases across from the nozzle 13 to the pipe end 14.

The size of the gap and the injector effect thus brought about is therefore dependent on the speed of the engine. The significance of this fact will best be appreciated if it is assumed for example that the generator is set into operation when the engine is at a standstill and only a suction fan or the like is operating. A certain amount of vacuum will then be created in the cyclone gas purifier (assuming a suction fan to be employed) and as a result air will be sucked into the cyclone purifier from the pipes 9 and 4 respectively through the gap 17, if this gap is not fully closed. This flow of air will exercise a certain diffusing and possibly even igniting effect on the generator gas, which in either event will certainly suffer deterioration, thus rendering starting of the engine more difficult. However, it is evident that the spring 16 will keep the nozzle positively in engagement with the pipe end 14 so that the communication of the cyclone purifier with the external air remains blocked until the engine is actually running and has developed a certain speed and the speed of exhaust gas flow in the jet device is adequately large for the carbon particles etc. to be sucked in through the gap 17. As already stated, the charcoal dust and other deposits removed can then either be returned to the oxidizing zone of the gas generator or be blown out into the open air or possibly even collected in a buffer, pocket or the like.

The practical importance of the facility afforded by the present invention of readily removing dust, carbon particles and like deposits from the gas purifying apparatus will be so readily apparent to those with experience of such problems that no further explanation is necessary.

It will finally be appreciated that the present invention as represented by the embodiment described and illustrated herein is capable of a number of modifications particularly in regard to its constructional features without its scope and basic principle thereby being exceeded.

I claim:

1. The combination with a gas purifying apparatus having an inlet and an outlet, a conduit extending into said apparatus and having inlet means to receive solid particles from said apparatus, a jet movable relatively to said conduit and cooperating with said means to control the introduction of solid particles from said apparatus into said conduit, a pipe adapted to lead exhaust gases from an engine to said jet for discharge therefrom into said conduit to induce the flow of solid particles therethrough, and means responsive to increase or decrease in pressure in said pipe for moving the jet relatively to the conduit to increase or decrease, respectively, the flow of solid particles introduced into said conduit.

2. A combination as claimed in claim 1, in which the pressure responsive means comprises yielding means for yieldingly holding the jet in a position to block the entrance of solid particles from said apparatus through said inlet means into the conduit when the pressure in said pipe is below a predetermined minimum.

3. The combination with a gas purifying apparatus adapted to receive fuel gas from a generator and to pass the cleaned fuel gas to an engine, of a conduit extending into said ap-

paratus and having inlet means to receive solid particles from said apparatus, a jet movable relatively to said inlet means to control the introduction of solid particles from said apparatus into said conduit, a pipe adapted to lead exhaust gases from the engine to said jet, and means operatively connected to the jet and responsive to increase in pressure in said pipe for moving the jet relatively to the inlet means to open the latter only after the attainment of a certain minimum pressure of said gases, whereby exhaust gases flowing from the jet into the conduit will induce the flow of solid particles from the apparatus into the conduit.

4. The combination with a gas purifying apparatus having an inlet adapted to receive gas from a generator and an outlet to discharge the cleaned gas to an engine, of a conduit extending into said apparatus and having a straight portion terminating in a mouth arranged in said apparatus, a movable jet adapted to close said mouth and arranged coaxial with the straight portion of the conduit, a pipe adapted to lead exhaust gases from an engine to said jet, and a member operatively connected to the jet and responsive to increase or decrease in pressure in said pipe for moving the jet toward or away, respectively, from the mouth of the conduit.

5. The combination with a gas purifying apparatus having an inlet adapted to receive gas from a generator and an outlet to discharge the cleaned gas to an engine, of a conduit extending into said apparatus and having a straight portion terminating in a mouth arranged in said apparatus, a movable jet adapted to close said mouth and arranged coaxial with the straight portion of the conduit, a pipe adapted to lead exhaust gases from an engine to said jet, a member operatively connected to the jet and responsive to increase or decrease in pressure in said pipe for moving the jet toward or away, respectively, from the mouth of the conduit, said member comprising yielding means to resist movement of said member and for yieldingly holding the jet in contact with the mouth of said conduit.

6. The combination with a gas purifying apparatus having an inlet to receive gas from a generator and an outlet to pass cleaned gas to an engine, of a conduit extending into said apparatus and having an inlet arranged in the apparatus to receive solid particles from said apparatus, a movable jet adapted to close said inlet and movable toward and away from the inlet to vary the flow of solid particles introduced into the conduit, an engine exhaust pipe, a second pipe communicating with the jet and having an open end positioned in the exhaust pipe and facing in a direction away from the exit end of the exhaust pipe, a piston connected to the jet device and movable in response to increase in the pressure in said second pipe for moving the jet away from the inlet of the conduit, and spring means resisting movement of the piston and adapted to hold the jet device in contact with the inlet of said conduit when the pressure in the second pipe is below a predetermined minimum.

7. The combination with a gas purifying apparatus having an inlet and an outlet, a conduit extending into said apparatus and having inlet means to receive solid particles from said apparatus, a jet movable toward and away from said inlet means and adapted to discharge engine exhaust gases through said inlet means into the

5

conduit, a pipe adapted to lead exhaust gases from an engine to said jet for discharge therefrom into said conduit to induce the flow of solid particles therethrough, and means responsive to increase or decrease in pressure in said pipe for moving the jet relatively to said inlet means to increase or decrease, respectively the flow of solid particles introduced into said conduit, said pressure responsive means comprising spring means arranged to yieldingly hold the jet in contact with said inlet means.

8. The combination with a gas purifying apparatus having an inlet and an outlet, a conduit member extending into said apparatus and hav-

6

ing inlet means to receive solid particles from said apparatus, a jet member arranged to discharge exhaust gases into said inlet means, a pipe adapted to lead exhaust gases from an engine to said jet member for discharge therefrom into said conduit member to induce the flow of solid particles from the purifying apparatus through the conduit member, and means responsive to increase or decrease in pressure in said pipe for moving one of said members relatively to the other to increase or decrease, respectively, the flow of solid particles introduced into said conduit.

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