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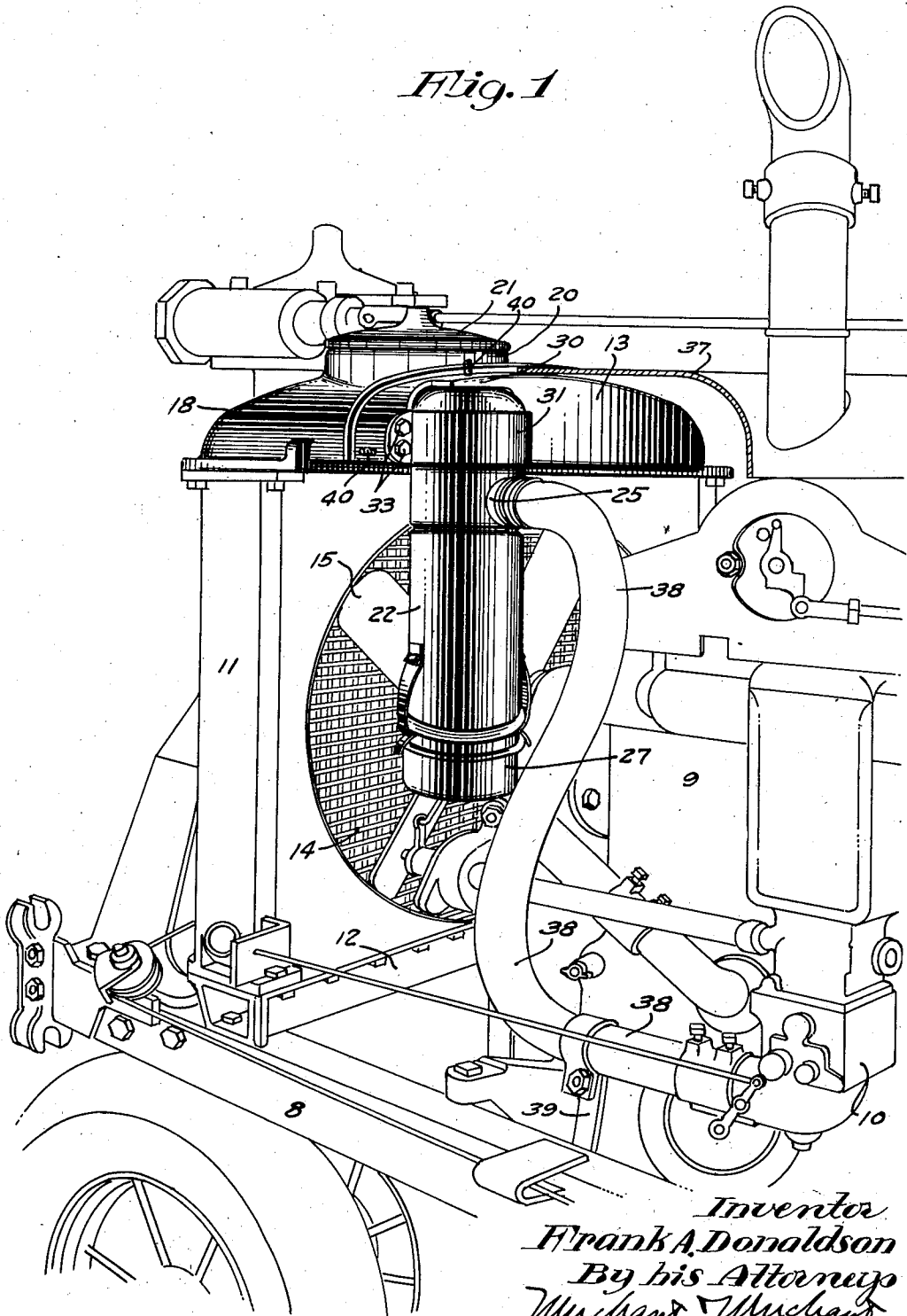
2,203,407

RADIATOR AND AIR CLEANER ASSEMBLY

Filed Aug. 27, 1938

3 Sheets-Sheet 1

Fig. 1



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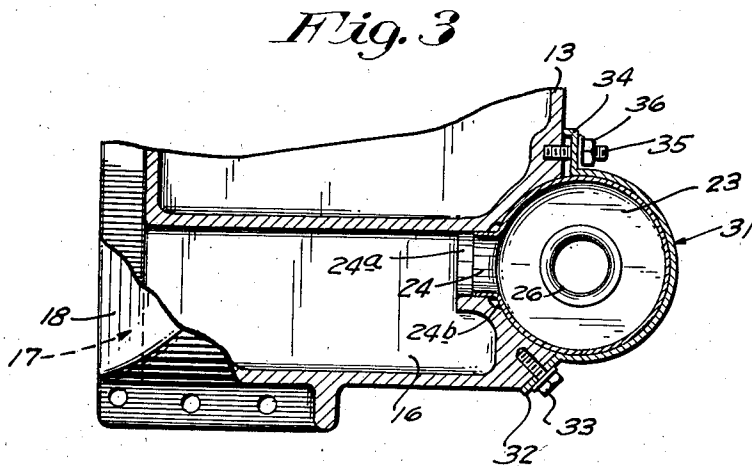
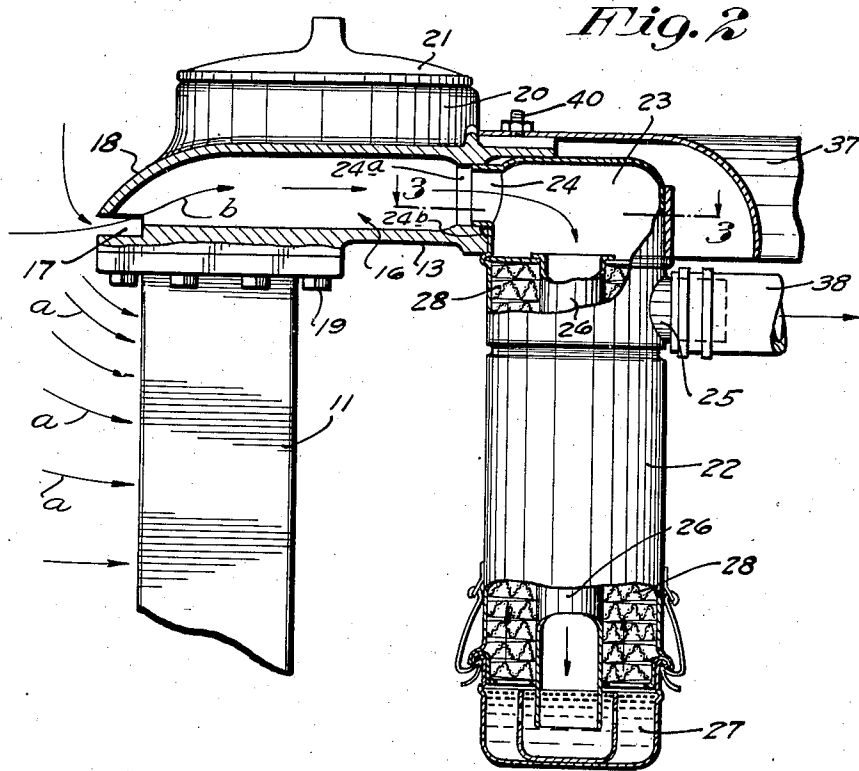
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2,203,407

RADIATOR AND AIR CLEANER ASSEMBLY

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RADIATOR AND AIR CLEANER ASSEMBLY

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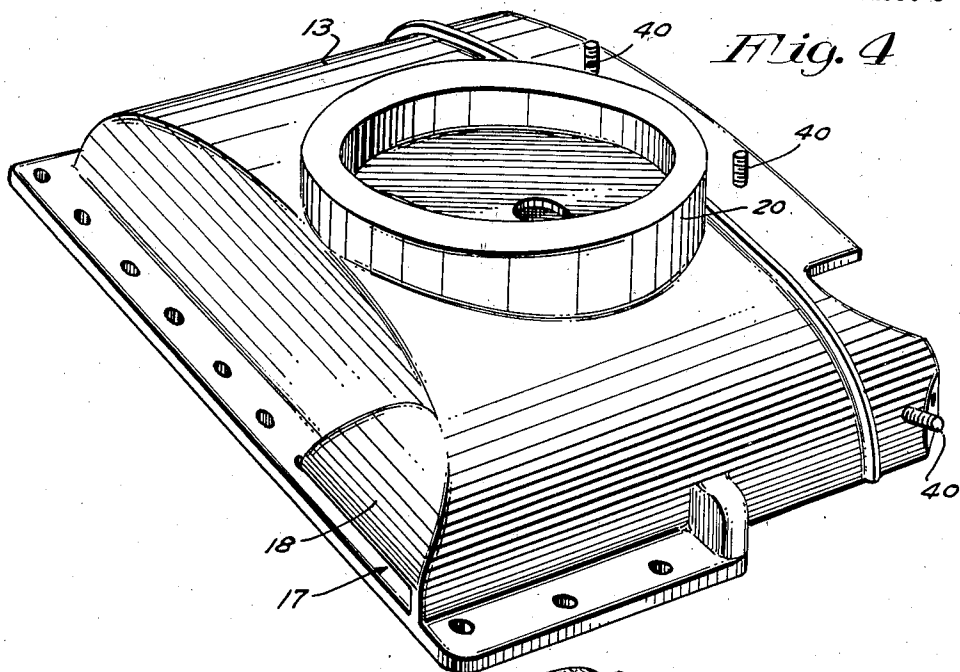


Fig. 4

Fig. 5

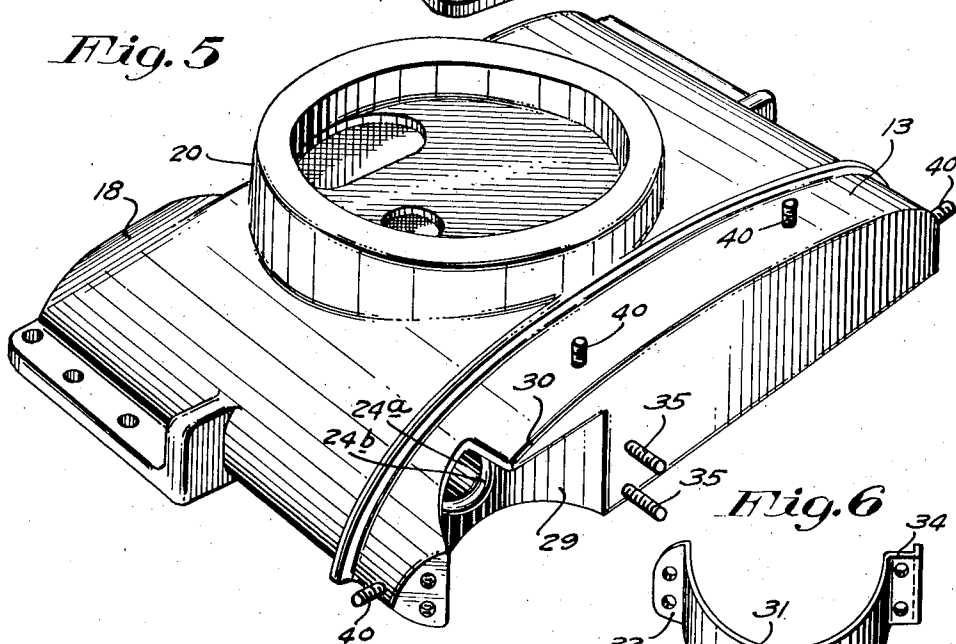


Fig. 6

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UNITED STATES PATENT OFFICE

2,203,407

RADIATOR AND AIR CLEANER ASSEMBLY

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Application August 27, 1938, Serial No. 227,146

4 Claims. (Cl. 123—198)

My present invention provides an improved radiator and air cleaner assembly especially for tractors, but useful more generally in connection with vehicles propelled by internal combustion engines having cooling systems including radiators.

The objects of the invention may be briefly summarized as follows: To provide an inexpensive combination of air cleaner and radiator in which the parts of the air cleaner are easily accessible, in which the shell of the air cleaner is rigidly but detachably secured to the upper tank of the radiator, in which the air cleaner is positioned back of the radiator within the hood structure with the body of the air cleaner depending from the upper radiator tank, and to provide an improved and novel arrangement of the air intake passage in the upper tank of the radiator, which intakes the air and delivers the same to the air cleaner in such a way as to perform, in a limited but substantial way, the function of a preliminary or primary air cleaner located ahead of the main air cleaner or air cleaner proper.

These objects and the advantages obtained thereby will be more readily appreciated after having first described a commercial form and application of the invention, to a tractor that is equipped with an internal combustion engine having a water cooling system including a radiator with upper and lower tanks and in which arrangement a commercial form of air cleaner is connected to the upper tank of the radiator, in a novel way and in a novel co-operative relation.

This invention applied, as indicated, is illustrated in the accompanying drawings wherein like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a perspective showing the front portion of a tractor of the character above indicated, some parts being broken away;

Fig. 2 is a vertical section taken from front to rear through the upper tank of the radiator, other parts of the radiator being diagrammatically indicated and the air cleaner being shown partly in elevation and partly in axial section;

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2;

Fig. 4 is a perspective showing the upper tank of the radiator viewed from the front;

Fig. 5 is a perspective of the said upper tank viewed from the rear; and

Fig. 6 is a perspective showing the clamping

yoke or band for securing the air cleaner to the upper tank.

The drawings, and particularly Fig. 1, show the invention applied to a commercial tractor of well-known construction, and hence, the parts thereof may be, as far as necessary for this case, briefly designated as follows: The numeral 8 indicates the tractor frame, the numeral 9 the internal combustion engine equipped with carburetor 10. The numeral 11 indicates the radiator frame, the numeral 12 the lower radiator tank, the numeral 13 the upper radiator tank, and the numeral 14 the radiator core.

The engine 9 is of the customary water-jacketed form connected to the radiator through the usual pipes. The numeral 15 indicates the engine driven fan. In Fig. 1, the upper tank 13 of the radiator, which in its general features may be of standard form but differs therefrom in the arrangement of the air conduit there-through for connection to the air cleaner. This air conduit 16 extends from front to rear of the tank 13 and at its receiving or front end is formed with horizontally extended vertically narrow air intake port 17 formed below the downwardly curved overlying eave or roof wall 18 of said conduit 16. The tanks 12 and 13 are secured to the radiator frame and are connected to the core in the usual well-known way, preferably by machine screws 19. Also the tank 13 is shown as provided with the customary filler neck normally closed by a cap 21.

At its rear end the air conduit 16 is directly connected to the intake of the air cleaner in a novel manner presently to be noted. The air cleaner may vary in form but, as shown, is of the type disclosed and claimed, for example, in the Wilfred W. Lowther Patent No. 2,000,706 of May 7, 1935. The casing of this air cleaner is a cylindrical metallic shell 22 provided in its upper end with an air intake chamber 23 having a laterally projected sleeve-like intake neck 24. This air cleaner is provided with a lateral clean air outlet neck or sleeve-like projection 25. The internal structure of this air cleaner is not an important part of the present invention, but the further parts of the interior structure may be briefly noted as the vertically extended axial air tube 26, the detachable oil well 27, a filtering media, such as wire screen or the like 28 interposed in the annular space between the tube 26 and the sleeve 22.

At the delivery end of the air conduit 16 the upper tank 13 is formed with a substantially semi-cylindrical pocket 29 and with an overlying

saddle flange 30. The upper end of the air cleaner casing 22 fits snugly into the pocket 29 with its intake neck 24 telescoped into the delivery end 24a of said conduit 16. The air cleaner is rigidly but detachably secured directly to the upper tank 13 positioned as just stated, by means of an approximately semi-cylindrical clamping yoke or band 31 that closely engages the upper end of said casing 22. The yoke 31, at one end, has a projecting ear 32 that is secured to the tank 13 by a machine screw 33, at its other end said yoke is provided with an ear 34 that is detachably secured to the tank 13 by a stud 35 projected from the tank through said ear and provided with a nut 36. The extreme end of the ear 34 is shown as bent laterally to afford a contact edge and to give some resiliency to the ear 34.

It is evident that by the use of the yoke described, the air cleaner can be quickly and rigidly secured to the upper tank of the radiator with its upper end immediately under the engine hood 37 and with its body extended immediately back of the radiator at one side of the machine and in a position aligned with the carburetor 10. When thus suspended, the air outlet 25 is connected to the intake of the carburetor 10, preferably by a flexible hose 38. In Fig. 1, the lower portion of the hose 38 is shown as further supported by a bracket 39 secured to the frame 8.

In the arrangement described, the hood 37 closely overlies the rear portion of the upper tank 13 and, as shown, is anchored thereto by nut-equipped studs 40.

It is important to note that the intake tube or neck 24 of the air cleaner is very short and that the discharge neck or passage 24a, of the air conduit 16, immediately adjacent to the casing 22, has an annular clearance groove 24b. This arrangement is such in respect to the length of the screws 33 and nut-equipped studs 35, that without completely removing the said screws 33 or unscrewing the nuts 36 from the studs 35, the air cleaner can be detached from the upper tank 13. This, when the band 31 is thus released, permits the casing to be moved bodily outward and then by a slight rocking movement to remove the neck 24 from the seat or port 24a. The clearance groove 24b facilitates the removal just stated.

Attention is particularly called to Fig. 2 wherein the arrows marked *a* indicate the lines on which air will be drawn to the radiator core 11 by the action of the fan; and the long arrow marked *b* indicates the line that air will take when it is drawn into the conduit 16 of the upper tank. Under these cross currents indicated by the arrows *a* and *b*, the heavier particles such as dust will, under the required momentum, continue on the lines indicated by the arrows *a* and hence will not be drawn into the conduit 16. Otherwise stated, only relatively clean air or air that has been freed from considerable dust will be drawn into the conduit 16 and from thence to the air cleaner. There is, therefore, a preliminary dust cleaning action at the very place where the air enters the intake port 17 of the conduit 16. The overlying portion 18 of the conduit 16 also tends to deflect outward any dust or heavy particles that may be drawn downward with the air and against the said roof or eave portion 18.

From the foregoing it will be understood that the preferred form of the device illustrated in the drawings is capable of certain modifications with-

in the scope of the invention herein disclosed and claimed.

What I claim is:

1. In a radiator and air cleaner assembly, a radiator tank having an air conduit extending from front to rear thereof, and an air cleaner, the shell of which is seated against and rigidly secured to said tank, said shell having an air intake port connected to the rear end of the air conduit of said tank.

2. In a radiator and air cleaner assembly, a radiator tank having an air conduit extending from front to rear thereof, and an air cleaner the shell of which is seated against and rigidly secured to said tank said shell having an air intake port connected to the rear end of the air conduit of said tank, with the body of said air cleaner depending from said tank at the rear of said radiator, said shell having an outlet opening at the rear portion thereof and adapted for direct connection to a carburetor located at the rear of said assembly.

3. In an internal combustion engine equipped vehicle, an engine cooling radiator located ahead of the engine and having upper and lower fluid tanks connected by an interposed head transferring unit, the upper radiator tank having an air conduit extending through the same from front to rear thereof, an air cleaner having a cylindrical shell provided with a laterally extended tubular air inlet located close to the top of the casing, said tubular inlet neck being telescoped into the outlet end of said radiator tank conduit and said top tank being formed at its rear end with a concave segmental saddle through which said conduit opens and against which the cylindrical shell will be seated when the parts are positioned as indicated, a clamping yoke embracing the upper end of the shell opposite said saddle and secured to said tank by clamping devices adjacent opposite ends of the saddle, an outlet from the casing to the intake of the engine, and means for forcing air through the heat transfer unit of the radiator.

4. In an internal combustion engine equipped vehicle, an engine cooling radiator located ahead of the engine and having upper and lower fluid tanks connected by an air pervious head transfer unit, a hood extending from the upper radiator tank rearwardly over the engine, an air conduit extending through the upper radiator tank from front to rear thereof, an air cleaner having a vertically disposed cylindrical shell provided close to its upper end with a forwardly opening inlet registered with the outlet end portion of said air duct, said top radiator tank being formed at its rear end with a concave segmental saddle through which said air conduit opens and against which the said cylindrical shell is seated, and a clamping yoke embracing the upper end of the shell opposite said saddle by screw threaded clamping elements, an outlet from the air cleaner casing to the engine's air intake, and an engine driven fan located back of the heat transfer unit of the radiator but forwardly of said air cleaner shell, the upper end of said air cleaner shell terminating close to the top of said hood and said shell extending very materially below the top of said head transfer unit, whereby the radiator will serve as a rigid and accessible mounting means for the air cleaner at a point within the hood and said radiator and fan will function as a pre-cleaner ahead of the said air cleaner.

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