E. W. WINANS.

RADIATOR.

APPLICATION FILED MAY 1, 1909.

955,241. Patented Apr. 19, 1910.

Fig. 2.

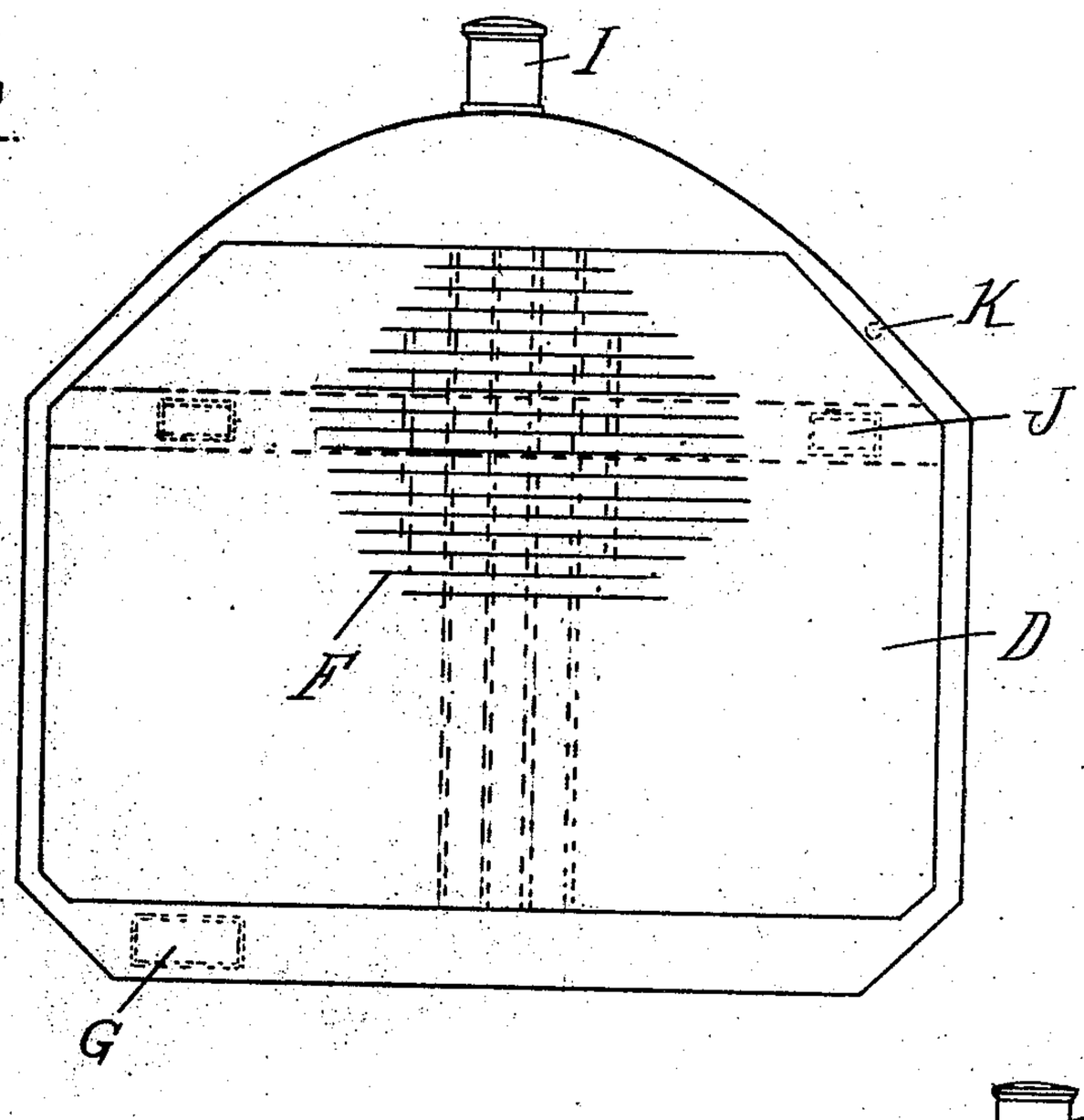
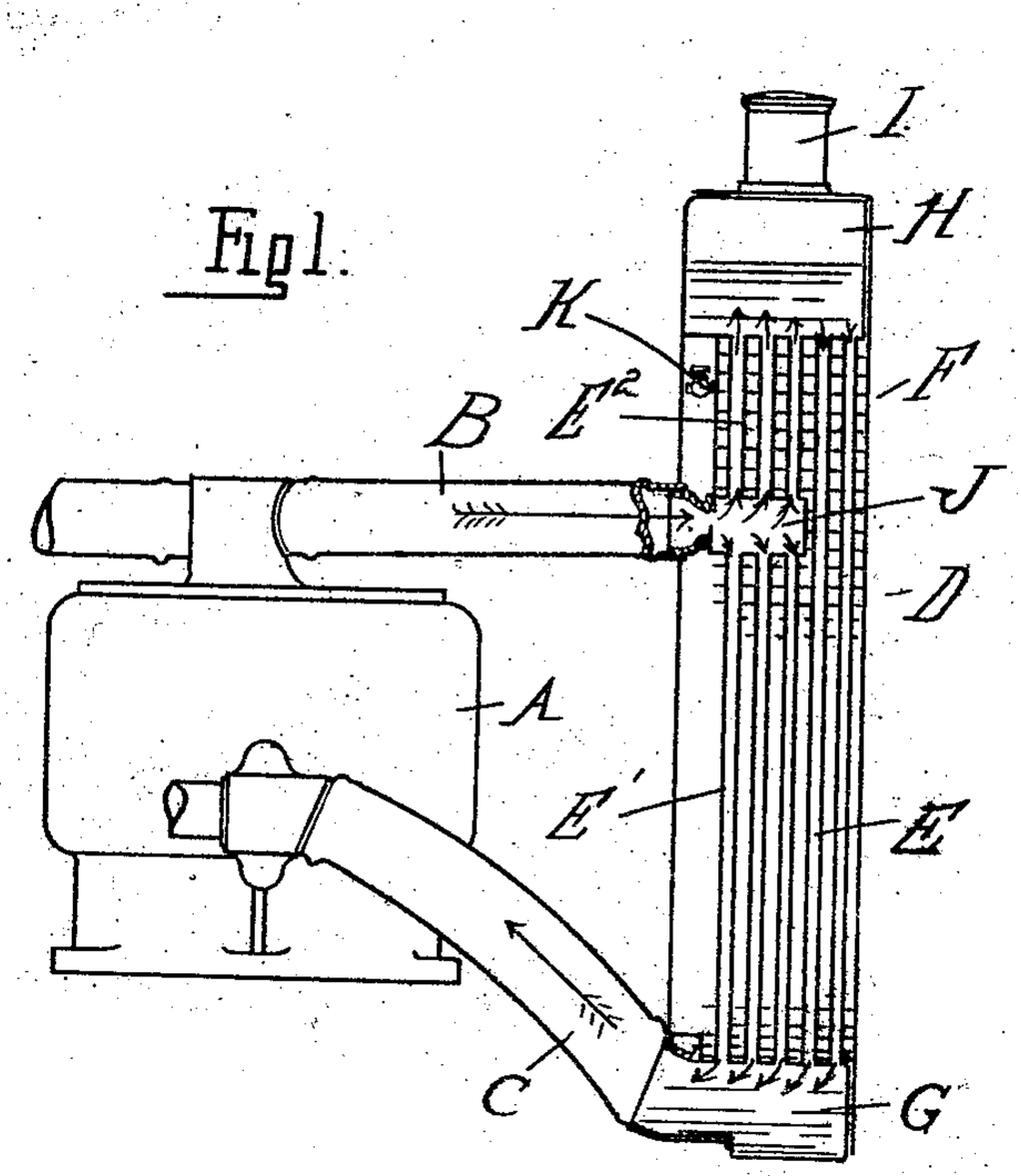


Fig. 1.



Witnesses
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UNITED STATES PATENT OFFICE.

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RADIATOR.

955,241. Specification of Letters Patent. Patented Apr. 19, 1910.

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To all whom it may concern:

Be it known that I, EARL W. WINANS, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Radiators, of which the following is a specification, reference being had therein to the accompanying drawings.

The invention relates to radiators more particularly designed for use as coolers on motor vehicles, and the invention consists in certain features of construction as hereinafter set forth.

In the drawings—Figure 1 is a sectional side elevation of a radiator, as it connects with the cylinder of an explosion engine. Fig. 2 is a front elevation thereof.

A is the water-jacket surrounding the cylinder of an explosion engine. B is the outgoing circulating conduit connected with said jacket at the upper end thereof.

C is the return conduit, and D is the radiator. It is usual to connect the outgoing and return conduits respectively to the upper and lower ends of the radiator, thereby obtaining the maximum length of water column under the cooling influence and promoting a thermo circulation. If, however, the water level in the radiator falls at any time below the level of the inlet, this will produce a break in the water column, which will interfere with the circulation, and, on the other hand, if the inlet connection to the radiator is below the upper end thereof, this will set up an interference between the outgoing hot water and downgoing cooled currents, which also will interfere with an efficient circulation.

It is the object of the present invention to avoid, on the one hand, danger of unsealing of the inlet, and, on the other hand, any interference between circulatory currents in the radiator.

It is a further object to obtain a construction in which the inlet header is arranged below the upper end of the radiator, but is concealed by the placing of the circulating tubes and radiating fins in front thereof. This produces a more pleasing appearance in front elevation, and also increases the efficiency of the radiator, as will be hereinafter described.

The radiator proper may be of any suitable construction, but—as shown—is of the type in which the water passes through vertically-arranged tubes E upon which are arranged the laterally-extending radiating fins F. These tubes E are connected at their lower ends to a header G, which in turn is connected with the conduit C, while the upper end of the tubes is connected with a header H provided with the filler tube I. The conduit E′, instead of being connected with this header H, communicates with an intermediate header J, which is arranged to extend laterally across the radiator upon the rear side thereof, but does not extend to the front. Thus a portion of the tubes E extend uninterruptedly from the lower header G to the upper header H in front of the intermediate header J, while another portion of the tubes E′ extend between the header H and the intermediate header J, with still other tubes E^2 extending from the header J to the header H.

With the construction described in normal operation, the radiator is filled with water so that the water level is above the bottom wall of the header H. This will permit a portion of the heated water passing from the jacket C through the conduit B to continue to pass upward through the tubes E^2 into the header H, and then downward through the long tubes E to the header G. Another portion of the water passing through this conduit E will be directed downward through the tubes E′, passing into the header G and commingling with the water from the tubes E.

It will be observed that there is not the slightest tendency toward conflict between the upgoing and downgoing water currents, as the siphonic action of the tubes E will cause the upward movement of the water in the tubes E^2, while the greater tendency of the cooled water in the tubes E′ will cause a thermo circulation downward to displace the hot water in the jacket A.

Should the water level in the radiator fall considerably below the header H the circulation through the tubes E^2 and E would be interrupted, but the radiator would still continue to be operative by reason of the tubes E′. Thus, though reduced in efficiency, the device will always remain operative until the water supply can be renewed. It sometimes happens that the lack of water in the radiator is first detected where the machine is at a distance from any source of water

supply. Under such a condition, the operator can continue to use his machine until the level of the water is below the header J, but any further use would be undesirable, and result in the overheating of the engine cylinder. To enable the operator to determine the danger point, a water level gage cock K is preferably placed upon the radiator at a point above the header J, but below the header H.

What I claim as my invention is:

1. A radiator comprising top and bottom headers, connecting tubes extending uninterruptedly therebetween, an intermediate inlet header, and oppositely-extending tubes connecting said inlet header with said top and bottom headers respectively.

2. A radiator comprising top and bottom headers, an intermediate inlet header, and separate water circulating conduits connecting said intermediate header with said top and bottom headers, and the latter with each other.

3. A radiator comprising top and bottom headers, an intermediate header arranged in rear of the plane of the radiator front, and radiator tubes connecting said top and bottom headers in front of said intermediate header.

4. A radiator comprising top and bottom headers, and an intermediate inlet header with separate circulating water conduits connecting said intermediate header with said top and bottom headers and with the intermediate header set back of the front plane of the radiating members.

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

EARL W. WINANS.

Witnesses:

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W. J BELKNAP.