

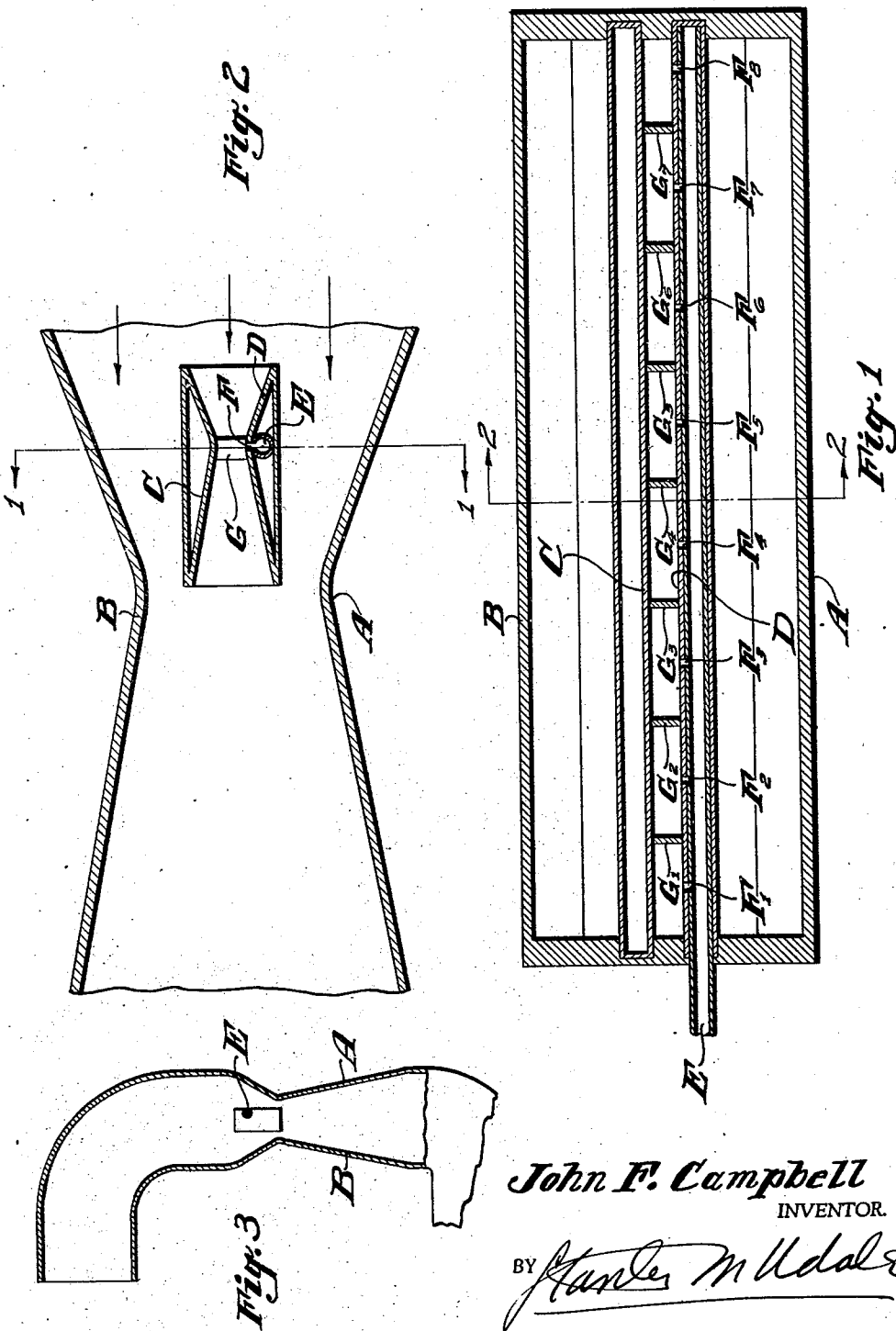
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AIR VENTURI

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AIR VENTURI

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1 Claim. (Cl. 73-213)

The object of this invention is to obtain a true pressure corresponding to a fair average of the velocity of the air entering the carburetor. It is and has been for about 30 years the practice to use a double venturi. The smaller one of the two discharges into the throat of the larger one. The depression in the throat of the smaller venturi is thus greater than the depression in the throat of the larger and is used as a measure of the flow of air. So long as the carburetor does not exceed 100 horse power, this method is very satisfactory. When the capacity of the carburetor exceeds 2000 horse power, for example, this means is inadequate. Furthermore, the dimensions of the venturi become unmanageable. These carburetors have to be fitted in the fuselage of an ordinary airplane. The ordinary engines in use in the air are radial and is it necessary for the carburetor to be mounted immediately to the rear of the engine and to draw its air in immediately from the top of the engine and the entrance to the venturi is located immediately behind the propeller.

I have discovered that if I make the venturi rectangular and have the longer side many times the shorter side, that is if I have a long narrow venturi, I can shorten the length of the venturi. I can also make the necessary 90 degrees turn easier. However, I discovered that with a long narrow venturi, the airflow in various parts of the venturi varies greatly because the air behind the propeller is greatly disturbed and the mere fact that the air makes a 90 degree turn immediately before entering the throat of the venturi is itself a cause of eddies, hence the depression in one part of the venturi will be quite different from the depression in another part of the venturi. The problem was how to sample the air flowing through the venturi so as to get a true reading of the average airflow.

Fig. 1 shows a cross sectional plan view taken on plane 1-1 of Fig. 2.

Fig. 2 shows a cross sectional elevation taken of plane 2-2 of Fig. 1.

Fig. 3 shows on smaller scale the arrangement of the venturi in the air entrance to airplane engine.

In the figures, the two walls of the venturi A and B are curved so as to form a Venturi throat. Into this throat there discharges a venturi of smaller size formed by two walls which are lettered C and D.

A long, narrow venturi results and the smaller venturi is split up at its throat by partitions G1, G2, G3, G4, G5, G6, G7. Into these independent spaces of the throat of the small venturi formed by these partitions G1, G2, G3, G4, G5, G6, G7, are small openings F1, F2, F3, F4, F5, F6, F7, F8. These small openings F1-F8 open into a tube E which is the sampling tube used for determining the flow of air through the venturi.

Operation

During the operation of the plane in flight, the eddies in the air entrance cause variations in the velocity of flow through the small throats formed by the partitions G1-G7, hence a fair average depression is created in the tube E.

What I claim is:

A fluid meter of the double Venturi type comprising a venturi having a relatively large, long, narrow Venturi passage rectangular in cross section, a small venturi rectangular in cross section discharging into the throat of said larger venturi and arranged in line along the long axis of said larger venturi, a plurality of partitions in the throat of the smaller venturi, means forming a common passage having independent connections with the individual spaces formed by said partitions in said smaller venturi.

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