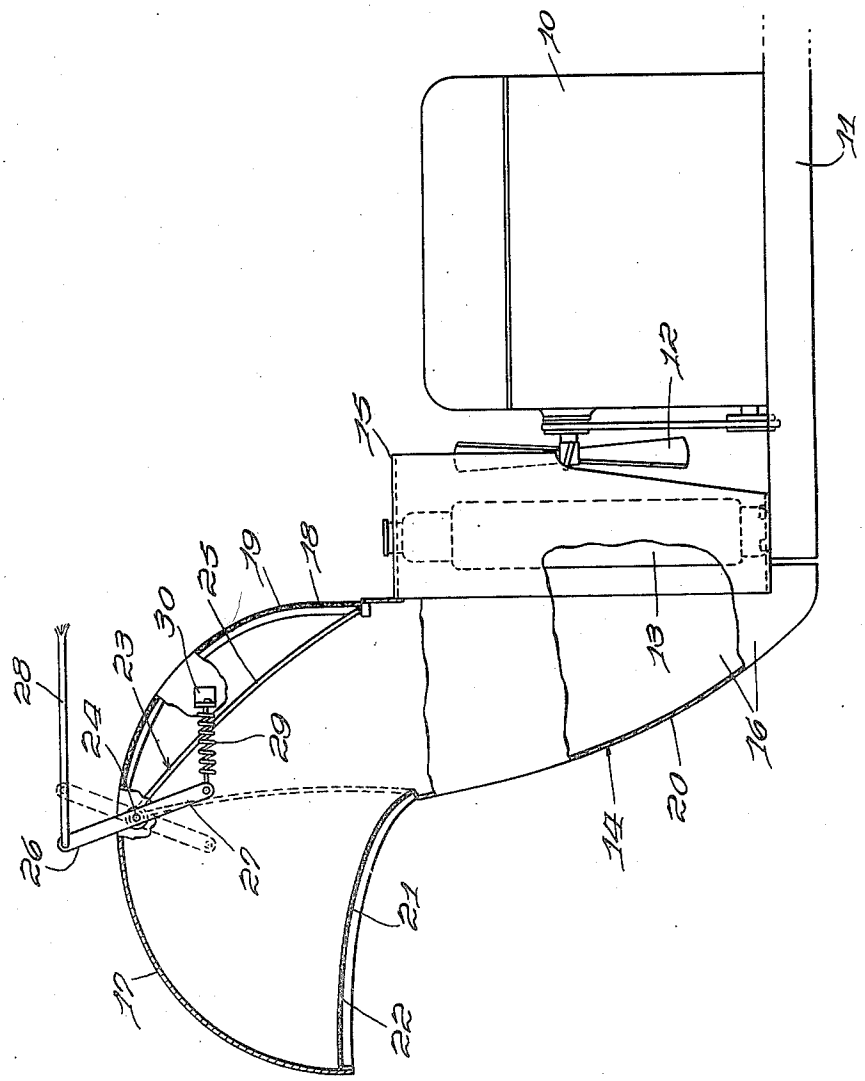
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AIR CIRCULATING SYSTEM

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AIR CIRCULATING SYSTEM

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This invention relates to an air circulating system. More specifically the invention relates to such a system for use in supplying cooling air to an internal combustion engine. As representative of one particular use of the invention, reference will be had to the problems attendant upon the use of an internal combustion engine as the source of power for a threshing machine or similar machine. In the operation of such machine, the air is constantly filled with chaff and other flying particles of material which eventually clog the radiator of the engine, in which case the engine fan can no longer draw cooling air through the radiator. The result is of course that the engine becomes overheated and the machine must be stopped at intervals so that the radiator can be cleaned.

The principal object of the present invention is to provide an air circulating system of such a type as to eliminate the necessity of stopping the engine.

An important object of the invention is to provide means for directing air to be drawn through the radiator engine by the fan, this means consisting of a hood structure having a pair of air inlets, each of which is screened and each of which may be opened or closed independently of the other.

Another object is to provide this hood structure as an inexpensive attachment adapted to be associated with any form of internal combustion engine.

And, still another object is to adapt the principles of the invention to other air cooling or ventilating systems.

A complete understanding of the foregoing and other desirable objects may be had from the following detailed description and accompanying sheet of drawing, wherein the single figure illustrates a preferred embodiment of the invention as associated with a conventional type of internal combustion engine.

The numeral 10 designates an internal combustion engine carried on a suitable frame 11 and having a conventional type of air circulating fan 12. The fan and the drive therefor may be of any suitable construction and the details thereof have been omitted. The forward end of the frame, or that portion of the frame ahead of the engine 10, carries a water cooling radiator 13 through which the fan 12 draws cooling air in the usual manner.

According to the present invention, means are provided for directing air through the radiator to the fan. This means comprises preferably a hood structure generally indicated at 14 having a portion 15 enclosing the sides, top, and front of the radiator 13. The hood is provided with a pair of transversely spaced, vertically disposed side walls 16 which extend forwardly from the radiator 13 and upwardly about the top of the radiator. The upper portion of each side wall 16 is curved, and these curved upper edges are joined together by a transverse curved wall 17. Although the upper edge of each side wall 16 is substantially semicircular, the arcuate wall 17 encloses only about one half of this distance, thereby leaving an air inlet opening 18. A screen 19 is carried by the hood and conforms generally to the curvature of the upper portions of the side wall 16, forming generally a continuation of the arcuate wall 17.

A front wall 20 cross-connects the forward portions of the side walls 16 and extends upwardly in spaced relation to the front of the radiator 13. This wall terminates at a point a little more than half way upwardly of the hood structure, and the edge thus provided is spaced away from the lower forward edge of the curved upper wall 17, providing thereby an opening 21. A screen 22 is carried between the front wall 20 and the lower portion of the wall 17. It will be noted that this screen is substantially horizontal.

The screened openings 18 and 21 provide a pair of air inlets through which the fan 12 may draw air for cooling the engine. However, it is desired to use these openings individually. For the purpose of controlling the entrance of air through either opening, the hood structure is provided with suitable valve or damper means, generally indicated at 23. This means comprises a shaft 24 extending transversely between the side walls 16 at the upper portion of the hood. This shaft carries a downwardly extending damper 25 which is swingable on the shaft from a position to close the opening 18 to a position to close the passage from opening 21. Suitable operating mechanism is provided for positioning the damper, this means comprising a lever 26, an arm 27, a pull rope 28, and a tension spring 29. The tension spring is connected between a bracket 30 on the outside of one wall 16 and the arm 27 and serves to maintain the damper 25 in position to close the air inlet opening 18, as shown in full lines in the drawing. The pull rope 28 provides means for swinging the damper to the dotted line position shown in the drawing.

In the operation of a system including the invention, and particularly that form illustrated and described, the damper 25 is positioned so as

to close one of the air inlet openings. As shown in the drawing, the inlet 18 is closed and the inlet 21 is opened. Cooling air is drawn through the hood structure 14 and radiator 13 by the fan 12. Foreign particles in the air are of course trapped by the screen 21 and are prevented from entering the hood structure, with the result that the radiator 13 can never become clogged. However, the screen 22 may become clogged much as the radiator would in the absence of the hood 14. When this condition obtains, overheating of the engine is likely. At such time the damper 25 is swung over to a position closing the air inlet 21, at the same time opening the air inlet 18. Air is then drawn through the screen 19 and overheating of the engine is eliminated. Eventually the screen 19 will become clogged and it will be necessary to swing the damper 25 back to its original position, thus bringing into use the air inlet 21.

While the inlet 18 is being used as the opening through which air is drawn, there is no suction applied to the inlet 21. Since the screen 22 is substantially horizontal and has its outer surface facing downwardly, the major portion of particles clinging to the screen will drop off. Other particles will be shaken off because of the inherent vibration caused by the engine. Therefore, when the damper 25 is swung back to open the inlet 21 that opening will be substantially free from clogging and air may be readily drawn therethrough. The disposition of the screened inlet 18 is such that the outer surface of the screen 19 is also directed downwardly. Hence, this screen will be kept clean in the same manner as the screen 22. During the operation of the system, it is necessary only to shift the damper valve 25 in accordance with clogging of the screens 19 or 22.

It will be seen from the foregoing that a simple and inexpensive attachment has been provided as means for directing cooling air to the air circulating system of an internal combustion engine. The damper valve is selectively operable to permit the entrance of air through either of two openings, the other opening being then closed off to prevent the application of suction thereto. During the interval in which suction is absent, the screen that is closed off becomes freed of clogging particles. It will be obvious of course that the principles of the present invention may be suitably adapted to other systems for the circulation of air or fluid.

It will be further appreciated that only a preferred embodiment of the invention has been illustrated and described and that numerous modifications and alterations may be made without departing from the spirit and scope of the present invention as defined in the appended claims.

What is claimed is:

1. For use with an internal combustion engine having a cooling fan: a hood structure associated with the engine and fan to provide means for directing air to the fan, said hood having a first air inlet including a substantially horizontal screen and a second air inlet including a downwardly sloping screen, and a damper movably carried in the hood and movable from a first position to close one air inlet while the second remains open to a position to close the second inlet while opening the first.

2. For use with an internal combustion engine having a cooling fan: a hood structure associated with the engine and fan to provide means for directing air to the fan, said hood having a first air inlet including a screen having a downwardly directed surface and a second air inlet including a screen having a downwardly directed surface, and a damper movably carried in the hood and movable from a first position to close one air inlet while the second remains open to a position to close the second inlet while opening the first.

3. For use with an internal combustion engine having a radiator and cooling fan: a hood structure adapted to enclose the radiator to provide means by which the fan draws cooling air through the radiator, said hood including a pair of spaced vertical side walls, a vertical front wall and an upper wall connecting the side walls and spaced from the front wall to provide an air inlet opening in the hood, said upper wall having a second air inlet opening, a pair of screens disposed respectively in the openings, and a swingable damper carried between the side walls for swinging movement selectively from a position closing only one opening to a position closing only the other opening.

4. For use with an internal combustion engine having a cooling fan: a casing adapted to be associated with the engine to direct air to the fan, said casing having a pair of air inlets, a screen over each inlet, each screen forming an exterior portion of said casing and being arranged so as to facilitate gravitational discharge of foreign particles therefrom in the absence of air passing therethrough, and means settable for selectively opening either inlet pursuant to closing the other.

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