

Feb. 7, 1928.

1,658,166

R. L. JACKSON

AIR COOLED INTERNAL COMBUSTION ENGINE

Filed Jan. 4, 1927

2 Sheets-Sheet 1

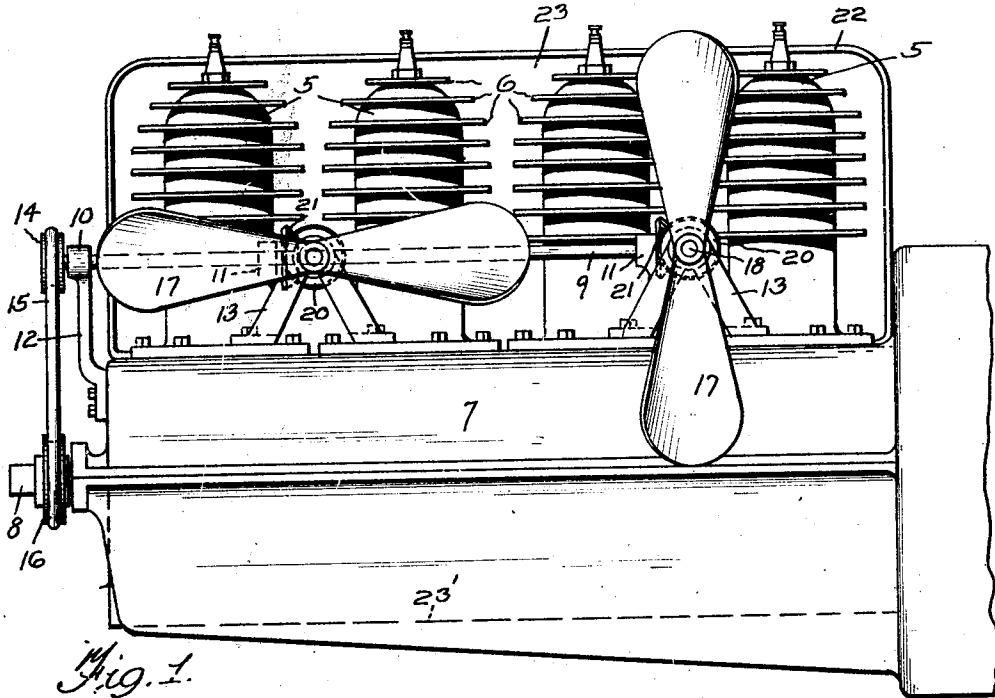


Fig. 1.

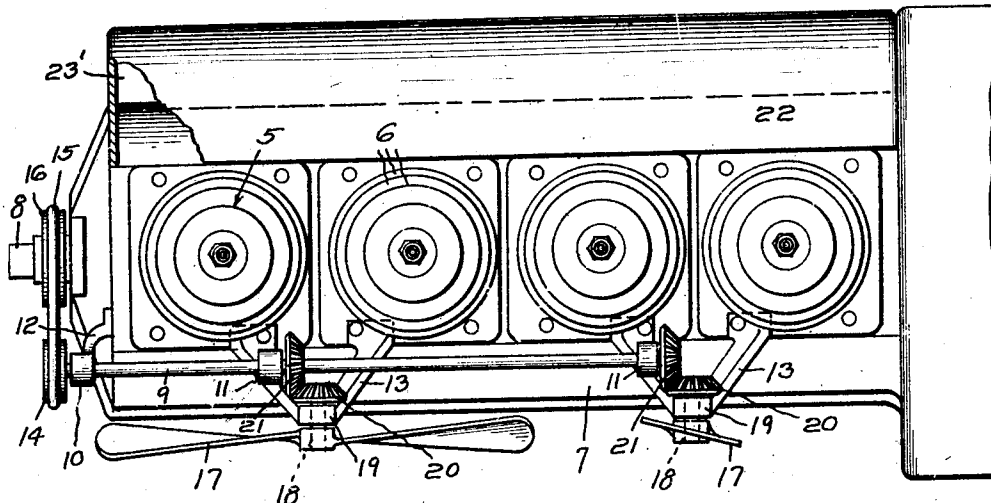


Fig. 2.

Inventor

R. L. JACKSON,

By Jerry A. Mattheu

Attorney

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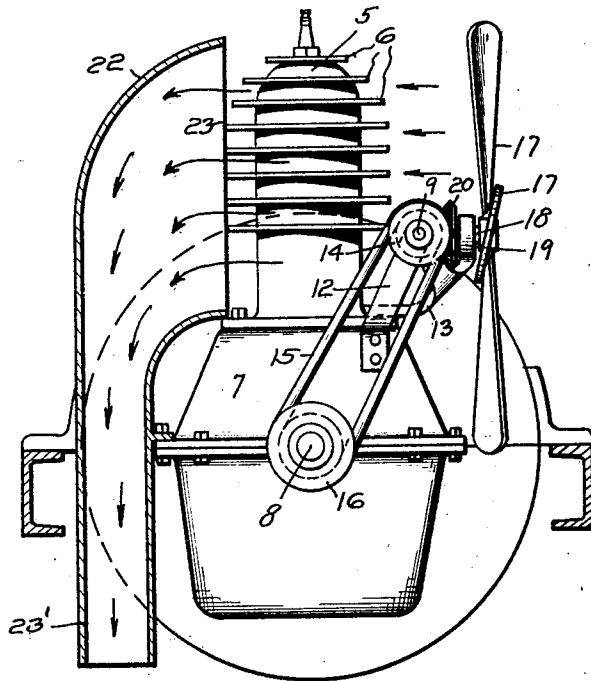


Fig. 3.

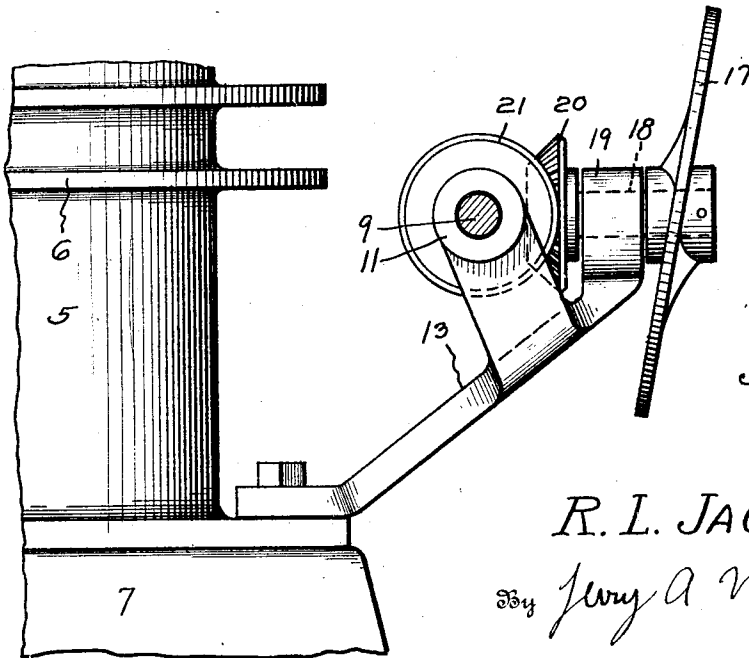


Fig. 4.

Inventor

R. L. JACKSON,

By J. A. Matthews

Attorney

UNITED STATES PATENT OFFICE.

ROBERT L. JACKSON, OF CLARKSBURG, WEST VIRGINIA.

AIR-COOLED INTERNAL-COMBUSTION ENGINE.

Application filed January 4, 1927. Serial No. 158,909.

My invention relates to improvements in air cooled internal combustion engines.

I am aware of the fact that internal combustion engines are cooled by means of air.

5 The usual practice, is to draw the air downwardly over the cylinders and about the crank case. When this is done, the heated air passing over the crank case heats the oil in the crank case, with the result that its
10 lubricating properties are seriously impaired.

In accordance with my invention, I provide means for passing currents of air horizontally over or about the cylinders of the
15 engine, in a manner to effectively retain the cylinders properly cooled. The air passing about the cylinders becomes heated and additional means is provided to conduct air to a discharge point, thereby preventing the air
20 from passing downwardly over the crank case, and heating the same.

In the accompanying drawings, forming a part of this specification and in which like numerals are employed to designate like
25 parts throughout the same.

Figure 1 is a side elevation of the internal combustion engine embodying my invention,

Figure 2 is a plan view of the same,

30 Figure 3 is a transverse section through the air catching hood, the engine being in elevation, and,

Figure 4 is an enlarged side elevation of one of the supporting brackets.

In the drawings, wherein for the purpose
35 of illustration is shown a preferred embodiment of my invention, the numeral 5 designates the cylinders of an internal combustion engine, which cylinders are vertically arranged, and spaced, for the free passage
40 of air between them. These cylinders are equipped with spaced horizontal radiating fins 6. The cylinders 5 are mounted upon a crank case 7, as shown. Extending longitudinally within the crank case is the usual
45 crank shaft 8, driven by the pistons in the cylinders. The operating parts of the engine are of the usual construction and it is thought that no further description is necessary.

50 Arranged upon one side of the cylinders 5 and spaced therefrom, is a horizontal drive shaft 9, held within bearings 10 and 11. The bearing 10 is carried by a bracket 12, while the bearings 11 are carried by brackets
55 13, all of which are bolted or rigidly attached to the crank case, as shown. The drive shaft

9 is equipped at its forward end with a pulley 14, driven by a belt 15, engaging a pulley 16, rigidly mounted upon the crank shaft 8.

The numeral 17 designates a pair of rotatable fans or air propellers, which are rigidly mounted upon the stub shafts 18, journaled in bearings 19, carried by the brackets 13. These stub shafts have bevel gears 20, rigidly attached to their inner ends. These
60 bevel gears are in permanent engagement with bevel gears 21, rigidly mounted upon the drive shaft 9. Each propeller has its shaft 18 in alinement with the center of the space between the adjacent pair of cylinders
65 5, and the propeller is sufficiently long to extend beyond the pair of cylinders, in the adjacent unit, both horizontally and vertically. This is important, as it renders it certain that the cylinders will be completely
70 covered by the currents of traveling air. The propellers are arranged in such close relation that they project into the path of travel of each other, and when starting, one propeller may be horizontal and the other
75 vertical, and they are positively geared together and driven at the same speed, where-
80 by they will interfit during rotation, without liability of striking.

85 Arranged upon the opposite side of the cylinders is a substantially vertical air catching hood 22, formed of sheet metal or the like. This hood is of sufficient size to completely surround the area of the cylinders, as clearly shown in Figure 2, and the
90 inner side 23 of this hood is entirely open. The hood may be suitably bolted to the crank case of the engine. The hood 22 leads into the downwardly discharging enclosed conduit 23', extending for the entire length
95 of the hood. The ends of the hood and the ends of this passage are closed. The hood has its outlet ends preferably arranged beneath of the crank case.

In operation, the fans are driven in the
100 direction to force the currents of cooling air horizontally across and about the entire area of the upstanding cylinders. The air passing over the cylinders becomes heated and enters the catching hood 22 and passes
105 through the conduit 23' to the atmosphere. It is thus seen that the heated air does not come in direct contact with the crank case of the engine. This is an important feature of the invention.

110 While I have shown the invention as applied to a four cylinder engine, it is obvious

that it may be applied to an engine embodying any number of units of two cylinders. It is preferred to have one fan for each unit of two cylinders, while the invention is not necessarily restricted to this arrangement.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred embodiment of my invention, and that various changes in the shape, size and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. The combination with an internal combustion engine comprising spaced cylinders and a crank case, of substantially vertically rotating fans arranged upon one side of the cylinders and adapted to force air about and between them to the opposite side of said cylinders, and a hood disposed upon the opposite side of the cylinders and adapted to catch the air from the fans and to conduct the air from the crank case so that it does not pass about the crank case.

2. The combination with an internal combustion engine comprising spaced cylinders and a crank case, of fans arranged upon one side of the cylinders and adapted to force air about and between the cylinders to the opposite side thereof, and a hood disposed upon the opposite side of the cylinders and adapted to catch the air and to conduct the same to a point of discharge so that the air will not pass about the crank case.

3. The combination with an internal com-

bustion engine comprising pairs of upstanding spaced cylinders and a crank case, of a substantially vertically rotating fan arranged upon the side of each pair of cylinders and having its axis of rotation in alignment with the space between the cylinders in the pair, said fan being sufficiently long to cover the vertical and horizontal areas of said cylinders, and a hood arranged upon the opposite side of the cylinders to catch the air from the fans and conduct the same from the crank case.

4. The combination with an internal combustion engine comprising pairs of spaced cylinders and a crank case, a rotating fan arranged upon one side of each pair of cylinders and sufficiently long to cover the vertical and horizontal areas of the cylinders, said fans projecting into the path of travel of each other, means to positively gear the fans together, and means to drive the fans.

5. The combination with an internal combustion engine comprising spaced vertical cylinders and a crank case, of fan means arranged upon one side of the cylinders and adapted to produce generally horizontal currents of air passing about the cylinders to the opposite side of the same, and a hood disposed upon said opposite side of the cylinders and adapted to catch the generally horizontal currents of air and having a depending outlet discharging at a point beneath the bottom of the crank case.

In testimony whereof I affix my signature.

ROBERT L. JACKSON.