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COOLING SYSTEM FOR COMBUSTION ENGINES.

APPLICATION FILED MAY 1, 1916.

1,264,281. Patented Apr. 30, 1918.

Fig. 1.

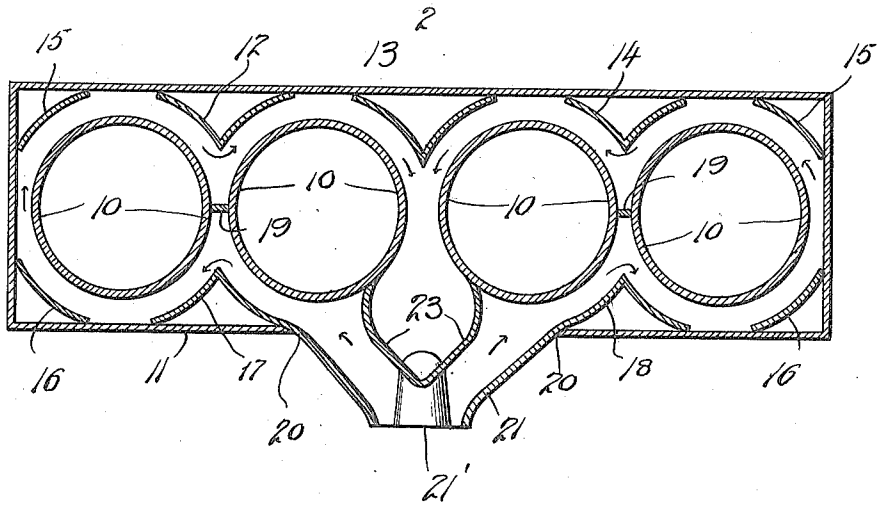


Fig. 2.

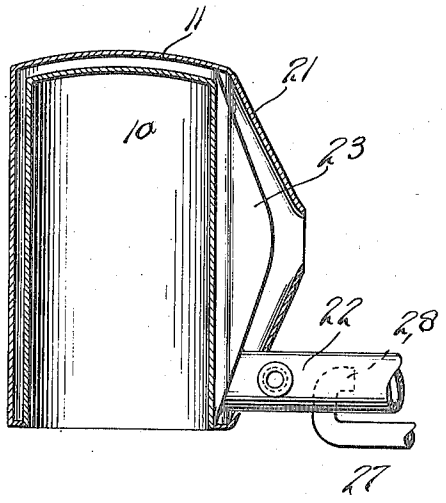
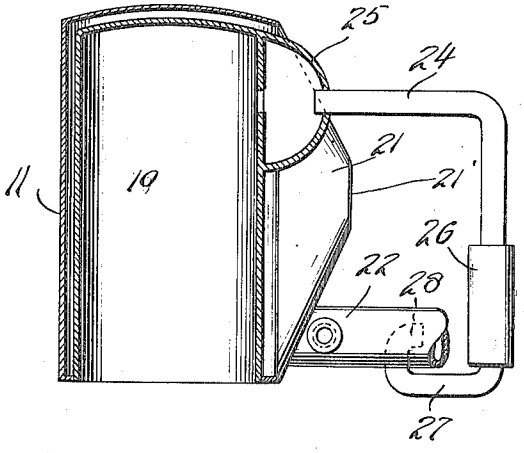


Fig. 3.



WITNESSES

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COOLING SYSTEM FOR COMBUSTION-ENGINES.

1,264,281. Specification of Letters Patent. Patented Apr. 30, 1918.

Application filed May 1, 1916. Serial No. 94,740.

To all whom it may concern:

Be it known that I, WILLIAM DAUGHERTY, a citizen of the United States, residing at Sainte Genevieve, in the county of Sainte Genevieve and State of Missouri, have invented certain new and useful Improvements in Cooling Systems for Combustion-Engines, of which the following is a specification.

This invention relates to improvements in cooling systems for internal combustion engines, and contemplates, primarily, the provision of an improved system whereby the suction created by the egress of exhaust gases may be utilized to promote a continuous or intermittent flow of air about the cylinder or cylinders, thereby preserving the latter in an adequately cooled condition at all times.

My invention further comprehends an improved casing structure to be associated with the cylinder or cylinders of the engine whereby the air will be properly guided during its course about the cylinders and utilized, in this manner to effect the maximum cooling of the cylinder walls.

Another object of my invention is to provide a system of the above nature, that may be advantageously employed in conjunction with either single or multi-cylinder engines and which, by reason of the utilization of the exhaust suction, will promote a flow of air of greater velocity about the cylinders consistent with the increase of speed of the engine and likwise a decrease of the flow consistent with the "slowing down" of the engine.

A further object of my invention is to provide a device of the type in question that is extremely simple in construction, strong and durable, and highly practical from both the standpoint of the manufacturer and the standpoint of the user; and which, it is believed, may be manufactured at a comparatively low cost.

Various other objects and advantages will become apparent during the continuance of the following description.

These objects are accomplished by such means as are shown in their preferred form in the accompanying drawings, described in the following specification and then more specifically pointed out in the appended claims.

In the accompanying drawings wherein like characters designate like parts throughout the several views:—

Figure 1 is a view in horizontal section, showing diagrammatically a series of cylinders and, my invention, as in its preferred embodiment associated therewith.

Fig. 2 is a view in vertical section, taken on line 2—2 of Fig. 1, illustrating, more clearly the relative position of the structure.

Fig. 3 is a view similar to Fig. 2, showing the exhaust manifold of the engine and the method of conducting the exhaust gases therefrom to the outlet or egress pipe of the cooling device.

In the present embodiment, 10 designates a series of cylinders, of conventional type, the same being shown diagrammatically, in Fig. 1. Cylinders 10 are jacketed, through the instrumentality of a preferably metallic casing or hood 11, which by reason of its peculiar construction, may accommodate suitable partitions and baffle plates, as hereinafter described, so as to create a flow of air about the entire outer wall of the cylinders 10 and thus effect the maximum cooling thereof. As will be noted upon reference to Fig. 2, a casing or hood 11, is placed above the heads of the cylinders, thereby permitting a circulation of air thereabout, as is obvious.

Adjacent one side of the partition or hood 11, I position a series of baffle plates 12, 13 and 14, that are so disposed that they confine the flow of air in proximity to the adjacent walls of the cylinders, and thereby render the same very effective as a cooling medium. Baffle plates, above referred to, are preferably constructed of metal and arranged in suitably spaced relation with respect to the adjacent walls of the cylinders, preferably as shown in Fig. 1. Other baffle plates 15 are arranged at opposite corners of hood or casing 11 and these plates tend to direct

the air about the end one of the cylinders 10, as is obvious.

Baffle plates 16 are also disposed at the adjacent ends of the hood or casing 11, to be opposed to baffle plates 15, above referred to, these latter baffle plates being likewise suitably spaced from the respective outer walls of cylinders 10, in the usual manner. Finally I employ, in conjunction with the inner ones of the cylinders, other baffle plates 17 and 18 which direct the air to the outlet structure, hereinafter described, while suitable partitions 19 are disposed between the end cylinders and the ones adjacent thereto, in order to insure a flow of air entirely about the end cylinders and to prevent the air from being drawn between the respective cylinders instead of passing entirely about the end cylinders.

Hood or casing 11 has provided therein, an opening 20 that receives the flared end of an outlet hood 21, said outlet hood being arranged and constructed so as to be open to the entire vertical length of the air passage about the cylinders 10 whereby it will promote a greater flow about the cylinders during operation of the device, as will be hereinafter stated. However, hood 21 is preferably frusto-conical configuration (but it may be shaped or fashioned in other advantageous manners) and connected at its lower end with a discharge conduit 22, as illustrated in Fig. 2. The discharge conduit 22 extends through hood 21, (see Fig. 2,) and is mounted in a partition 23 that is arranged within hood 21 and which connects cylinders 10, as illustrated in Fig. 1. In other words, the inner end of outlet conduit 22 is open between the two inner cylinders and the air sucked thereinto, as will be hereinafter pointed out, will be drawn from the far side of the adjacent cylinders in the direction indicated by the arrows in Fig. 1.

Another conduit 24 connects with the manifold 25 of the engine and with a muffler 26; the muffler in turn opening into a pipe 27, whose free end forms a nozzle 28 interiorly of the outlet conduit 22. Nozzle 28 opens toward the outer end of outlet conduit 22, so that the exhaust gases passing into conduit 22, by way of pipe 27 tend to create a suction and thus promote a flow of air over and about cylinders 10, as is obvious. It is pointed out that muffler 26 may be eliminated, if it is so desired, since the same forms no particular part of the present invention.

As shown in Fig. 1, I further contemplate to provide hood 21 with an inlet port 29 to which may be connected a suitable pipe from the carbureter to deliver the warm air from the carbureter into the said hood. Consequently, the carbureter may be also embraced in with the cooling system.

The operation of my invention is substantially as follows:—

The exhaust gases emitted from nozzle 28 passing outwardly to conduit 22 tend to promote a suction within the conduit and thus promote a flow of air into hood 21 by way of the intake port and hence about the several cylinders, in a path indicated by the arrows in Fig. 1. The heated air passes outwardly through the conduit 22, together with the exhaust gases, as is obvious. From the foregoing, it will be apparent that the system that I have provided not only provides for the effectual cooling of the several cylinders of the engine but enables the conventional form of engine to be equipped with a cooling system, at a minimum cost. It further provides for cooling the cylinders about their maximum exposed surface. Therefore, since the advantages and novel features of my invention are apparent from the foregoing, it is believed that further detail description is deemed unnecessary.

In reducing my invention to practice, I find that the form referred to herein as the most practical and preferred embodiment is the most efficient, but realizing that certain conditions will necessarily vary in concurrence with the adoption of my device, I desire to emphasize the fact that various minor changes in the details of construction and in the proportion of parts may be resorted to when required without sacrificing any of the advantages of my invention, as defined in the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a device of the character described, the combination with a multiple cylinder engine of a hood to embrace the cylinders, said hood provided with an intake and outlet port, means controlled by the engine to create a suction adjacent the outlet port of said hood and thus promote a circulation over and about said cylinders, means to prevent the passage of air between certain of said cylinders and the cylinder next adjacent thereto.

2. In a device of the character decribed, the combination with a multiple cylinder engine of a hood disposed about the cylinders thereof and having partitions and baffle plates positioned to project between the cylinders and thus to form a tortuous path over and about said cylinders, an intake for said hood, an outlet for said hood, and means controlled by the engine to create a suction adjacent the outlet and thereby to promote a flow of air over and about the cylinders in the aforesaid tortuous path, substantially as described.

3. In a multiple cylinder engine, a plurality of pairs of cylinders, the cylinders

of each pair being connected with one another so as to prevent the passing of fluid therebetween, a hood surrounding said cylinders of each pair so as to form a passage substantially around each pair and including an outlet passage-way between each pair, an inlet passage for each pair of cylinders and communicating respectively with the passages around the cylinders, and an outlet port communicating with said outlet passage and being common to said pairs of cylinders.

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

WILLIAM DAUGHERTY.

Witnesses:

WILLIAM KUHLMAN,

WILLIAM P. HUCK.