J. L. KELLY.

AIR FEEDING DEVICE FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED JAN. 2, 1917.

1,249,968. Patented Dec. 11, 1917.

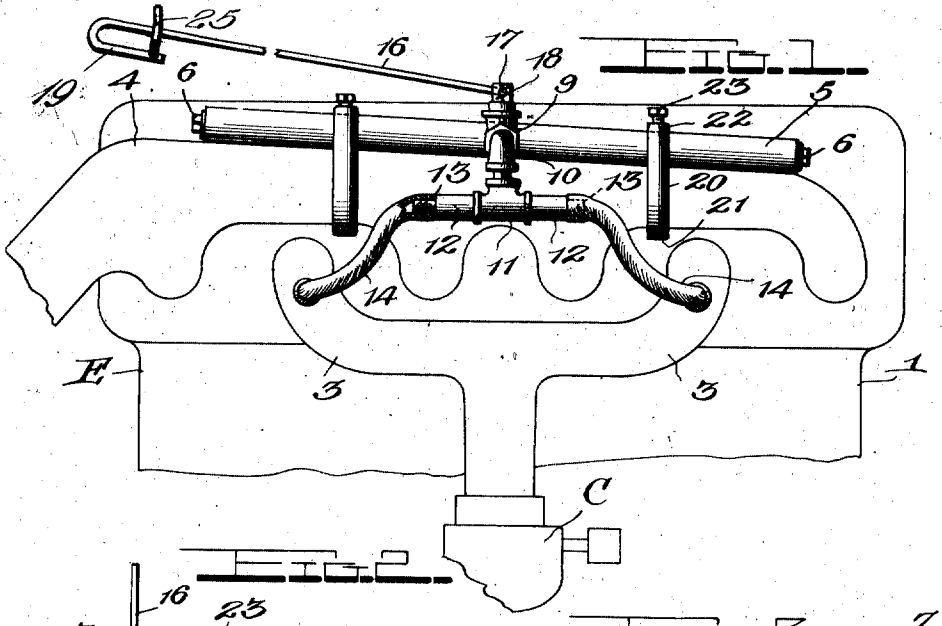


Fig. 2.

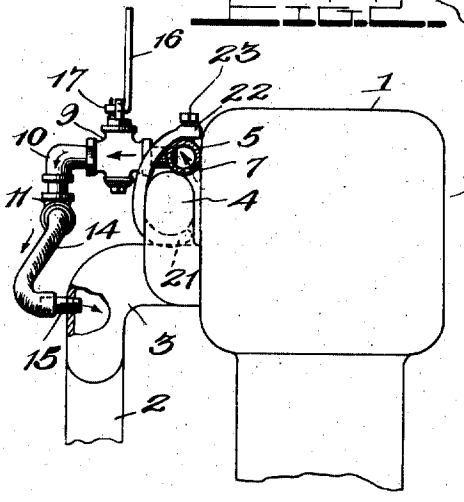
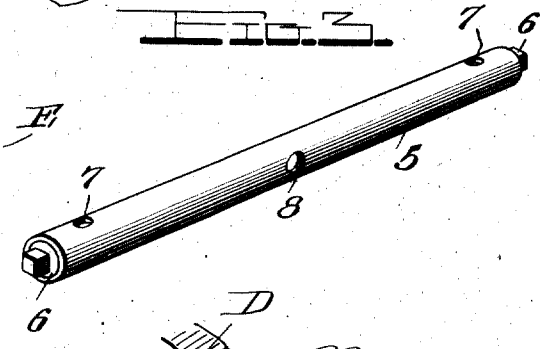


Fig. 3.



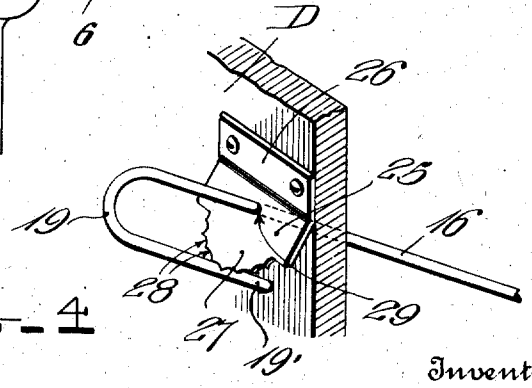


Fig. 4.

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AIR-FEEDING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

1,249,968. Specification of Letters Patent. Patented Dec. 11, 1917.

Application filed January 2, 1917. Serial No. 140,148.

To all whom it may concern:

Be it known that I, JAMES L. KELLY, a citizen of the United States, residing at Nowata, in the county of Nowata and State of Oklahoma, have invented certain new and useful Improvements in Air-Feeding Devices for Internal-Combustion Engines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in attachments for internal combustion engines, particularly means for feeding heated air to the combustible mixture on its way to the cylinders.

The main object of the invention is to provide a simple and efficient combination of elements whereby heated air may be fed into the intake manifold of an internal combustion engine in varying quantities.

An additional object is to provide a device of this character which can be very quickly and easily attached to practically any type of internal combustion engine.

With these and other objects in view, the invention resides in the novel features of construction, combination and arrangement of parts which will be hereinafter more particularly set forth in the following specification and claim.

In the accompanying drawings:

Figure 1 is a side elevation of a portion of an internal combustion engine showing my improved air feeding mechanism attached thereto;

Fig. 2 is an end view of the parts shown in Fig. 1, a portion of the air feeding means being in section;

Fig. 3 is a detail perspective view of the heater from which heated air is supplied to the intake manifold of the engine;

Fig. 4 is a detail perspective view showing one end of the operating rod and its relation to the locking plate, the latter being secured to a portion of the dashboard of the vehicle.

While this invention is designed particularly for use on automobile engines, it is obvious that it may be readily used on any other type of internal combustion engines. In the present instance, it is shown applied to an engine of conventional design designated by the letter E which is formed of a number of cylinders 1, the combustible mixture being fed to said cylinders from the carbureter C by way of the intake manifold 2, the latter having a pair of arms 3. The exhaust gases are forced from the engine cylinders 1 into an exhaust manifold 4 which extends longitudinally of the engine and substantially horizontal. It will be noted that the engine illustrated has both the intake and the exhaust manifolds on the same side thereof, but when they are on the opposite sides, the invention is slightly modified to accommodate this change.

As hereinbefore mentioned, the invention consists of means for heating air and feeding the same to the intake manifold between the cylinders 1 and the carbureter C. In carrying out this idea, a heater comprising a rather long open ended tube 5 is provided, said tube being positioned longitudinally of the exhaust manifold 4 in engagement therewith and also in contact with the side of the engine E. In most instances, the exhaust manifold is in the form of a round pipe and since it is disposed in close proximity to the engine cylinders, a natural seat is provided for the tube 5. The ends of this tube are internally threaded and closed by means of screw plugs 6. Air, however, can enter said tube through a pair of inlet openings 7, one being disposed adjacent each end and formed in the side nearest the manifold 4. This causes air to be drawn from between the exhaust manifold and the engine into the tube; thus the air is slightly heated before it enters said tube.

In the construction illustrated, the tube 5 is positioned on top of the exhaust manifold, the openings 7 therein being disposed downwardly, and an outlet opening is formed substantially midway the ends and in a plane at right angles to a plane passing through the openings 7. The last-mentioned opening is formed in the outer side of the tube and is threaded to receive a short section of the pipe 8, the latter having a stop cock 9 connected thereto. This stop cock or any other preferred form of valve is used to control the flow of heated air from the tube 5 to the intake manifold 2, said air passing downwardly through the elbow 10 and the T coupling 11 after passing through the stop cock.

The T coupling is inverted as illustrated in the drawings and the opposite ends thereof each carry a pipe 12, the outer end of each of which is reduced as shown at 13. These reduced ends 13 receive the upper ends of flexible tubes 14 by which the T

coupling is connected to the arms 3 of the intake manifold. In order that these flexible tubes might be connected to the manifold, the latter has its arms tapped in the proper places to receive the nipples 15, the latter having the lower ends of the flexible tubes fixed thereto. Thus, communication is had from the heater consisting of the tube 5 to both arms of the intake manifold 2, the flow of heated air from said tube being controlled, as hereinbefore mentioned, by the valve 9.

Since the above described mechanism is disposed beneath the hood of an automobile when the device is used on the engine thereof, means must be provided for operating the valve 9 from the driver's seat. This is accomplished by the rod 16 which has one end bent laterally as shown at 17 and disposed in the eye 18 of the plug of said stop cock, the other end being extended through the dash board of the vehicle and rotatably mounted therein adjacent the steering post of the vehicle. The upper end of the rod 16 is provided with a handle 19 so that upon rotation thereof, the plug of the stop cock will be moved to throw the opening therein into or out of registration with the openings in the sides of the valve. The stop cock and the operating rod 16 connected to the plug thereof may be disposed at various angles with respect to the other parts of the invention in order that they can be effectively operated from the driver's seat as above mentioned.

The handle 19 of the rod 16 is formed by bending the free end of said rod upon itself as shown particularly in Fig. 4, and is adapted to coact with a locking plate 25 so as to hold the valve in open or closed position. The locking plate 25 has an attaching flange 26 by which the same is secured to a suitable portion of the dash D of the vehicle, and a flange 27 whose outer edge is arcuate and provided with a plurality of notches 28, said notches being engaged by a portion 19′ of the handle. Said flange 27 is also provided with an opening 29 to receive the rod 16, said opening being the center of the arcuate edge of the plate. The parts of the handle 19 will have sufficient resiliency to permit the end 19′ to readily spring into or out of any one of the seats formed by the notches 28, so that the valve may be readily held in any desired position so as to control the flow of heated air from the tube 5 to the intake manifold.

Although any preferred means may be used for holding the tube 5 in position on the exhaust manifold, the device shown consists of a pair of substantially U-shaped yokes 20. Each of these yokes has its lower end 21 curved to conform to the curvature of the under side of the exhaust manifold, the upper end, however, being straighter as shown at 22, said upper end having a threaded aperture to receive a set screw 23. Upon placing one of these yokes 20 adjacent each end of the tube, engaging the ends 21 with the under side of the exhaust manifold, and then tightening the set screw 23, the heater will be effectively held against movement.

The purpose of supplying heated air to the combustible mixture of an internal combustion engine is well known in the art to which this invention relates, and therefore, I do not claim this broadly. It is desired to call particular attention, however, to the simple improved formation of the parts and their relation to the intake and exhaust manifolds of an engine.

I claim:—

An air heating device for internal combustion engines formed principally of pipe fittings and comprising a straight one-piece pipe having an inlet opening and a central outlet opening, removable caps closing the ends of said pipe, means for clamping said pipe on the exhaust manifold of an engine, a nipple tapped into said outlet opening and extending horizontally from said pipe, a valve into which the outer end of said nipple is tapped, an elbow tapped into said valve and turning downwardly therefrom, a nipple tapped into the lower end of said elbow, a T into whose shank said last named nipple is tapped, other nipples tapped into the head of said T, and tubes leading from said last named nipples and adapted for connection with the branches of an intake manifold.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES L. KELLY.

Witnesses:
C. W. McVickers,
W. H. Mock.