N. M. ELWELL.

COMBINED PRIMING AND AUXILIARY AIR SUPPLY APPARATUS.

APPLICATION FILED MAY 1, 1918.

1,370,801. **Patented Mar. 8, 1921.**

2 SHEETS—SHEET 1.

Fig. 1.

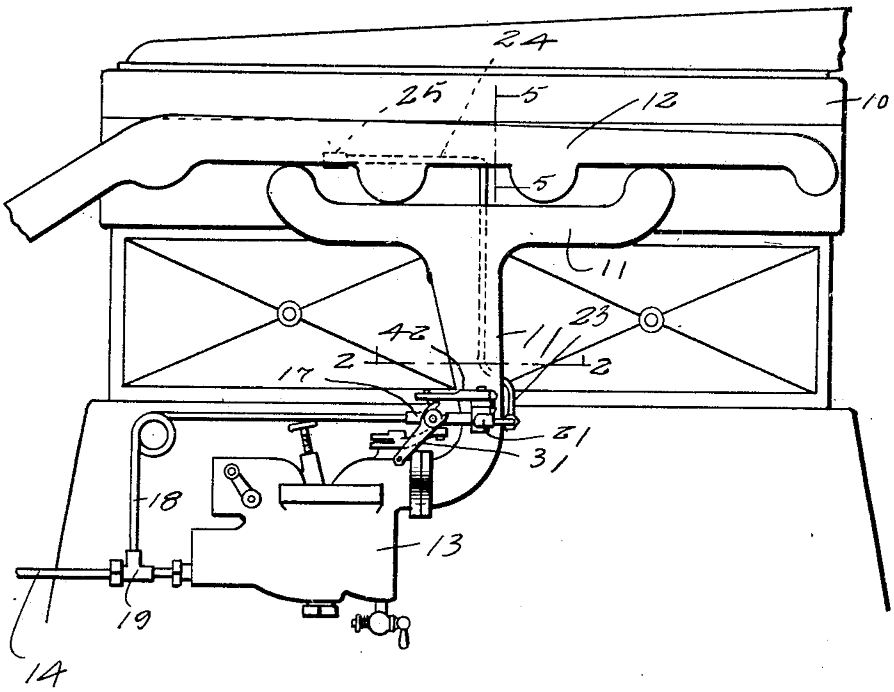


Fig. 5.

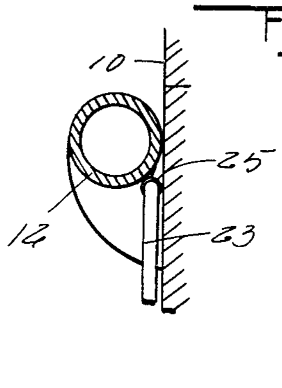
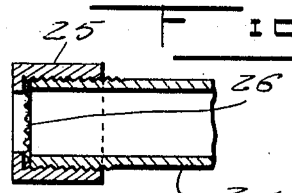


Fig. 6.



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2 SHEETS—SHEET 2.

Fig. 2.

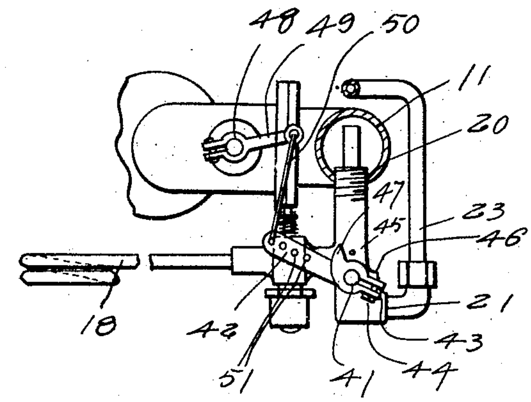

Fig. 3.

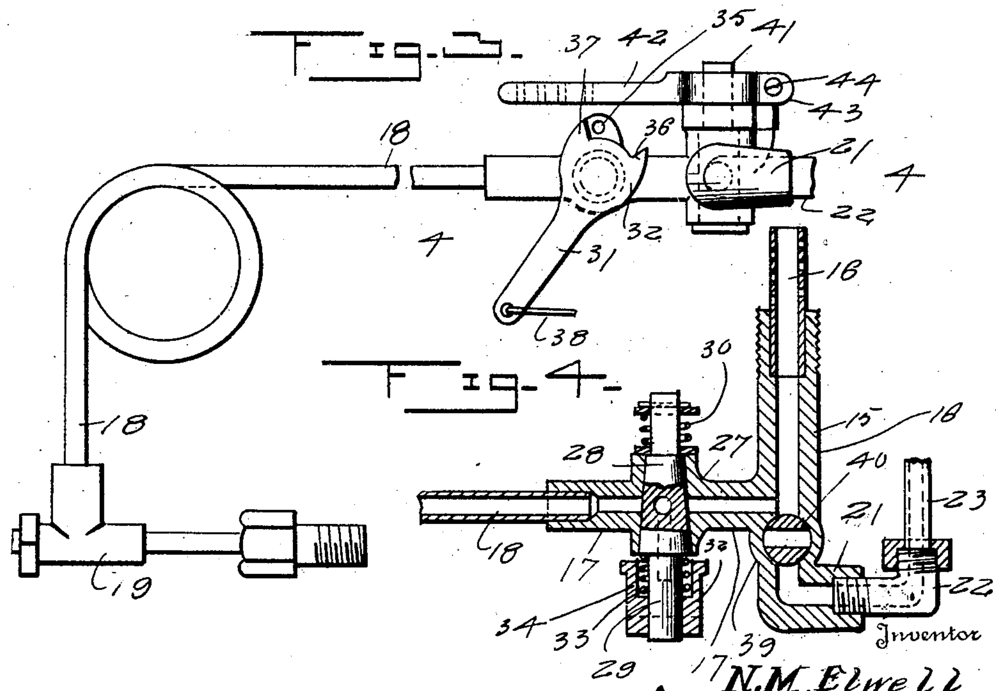

Fig. 4.

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UNITED STATES PATENT OFFICE.

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COMBINED PRIMING AND AUXILIARY AIR-SUPPLY APPARATUS.

1,370,801. Specification of Letters Patent. Patented Mar. 8, 1921.

Application filed May 1, 1918. Serial No. 231,936.

To all whom it may concern:

Be it known that I, NORRIS M. ELWELL, a citizen of the United States, residing at Phoenixville, in the county of Chester and State of Pennsylvania, have invented certain new and useful Improvements in Combined Priming and Auxiliary Air-Supply Apparatus; and I do hereby 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.

My invention relates to a combined priming and auxiliary air supply apparatus, for use in connection with internal combustion engines.

An important object of the invention is to provide means for connecting up the air supply valve with the carbureter valve, whereby both valves are under a single control.

A further object of the invention is to provide apparatus of the above mentioned character, which is simple in construction, inexpensive to manufacture, strong, durable, and highly convenient in use.

Other objects and advantages of the invention will be apparent during the course of the following description.

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

Figure 1 is a side elevation of apparatus embodying my invention, the same being shown in use,

Fig. 2 is a horizontal sectional view taken on line 2—2 of Fig. 1,

Fig. 3 is a side elevation of the priming and air supply valves, together with associated elements,

Fig. 4 is a horizontal section through a T coupling and associated elements embodied in the invention,

Fig. 5 is a transverse section through the exhaust pipe, taken on line 5—5 of Fig. 1, showing the hot air supply pipe, and,

Fig. 6 is an elevation of the intake end of the hot air supply pipe, showing a strainer element thereon.

In the drawings wherein for the purpose of illustration is shown a preferred embodiment of my invention, the numeral 10 designates an internal combustion engine, having a gas intake manifold 11, and an exhaust pipe or manifold 12. The inlet manifold 11 has connection with the outlet end of a carbureter 13, of any well known or preferred construction. A pipe 14 is connected with the carbureter and serves to supply gasolene or the like to the same. The gasolene is fed through the pipe 14 under suitable pressure, as is well known.

My improved apparatus comprises a T-coupling 15, including a transverse arm 16, and a longitudinal arm 17. Connected with the free end of the longitudinal arm 17 is a priming pipe 18, having connection with the pipe 14 by means of a T-coupling 19, as shown. The transverse arm 15 has one end thereof screw-threaded within an opening 20, formed in the intake manifold 11, as more clearly shown in Fig. 2. The transverse arm 16 is provided with an elbow 21, at the opposite end thereof, having screw-threaded engagement with a coupling 22, in turn connected with a hot air supply pipe 23. This hot air supply pipe, as clearly shown in Figs. 1 and 5, extends upwardly and has a horizontal portion 24, disposed behind and in proximity to the exhaust manifold 12, to be heated thereby. As shown in Fig. 6, the intake end of the portion 24 of the pipe 23 is covered by a cup-shaped strainer element 25, to exclude dust or the like from the intake manifold. As clearly shown in Fig. 4, the screw-threaded end of the transverse arm 16 carries a perforated spray device or nozzle 16′.

The longitudinal arm 17 has a valve casing 27 formed therein, pivotally receiving a priming valve 28, having a stem 29. This valve is held to its seat by a spring 30. A crank 31 is provided, having a head 32, which is rigidly secured to the stem 29. The head 32 has a recess 33 formed therein, receiving a coiled spring 34, one end of which is attached to the head 32, and the opposite end to the valve casing 27, and the function of this spring is to retain the crank 31 in the normal starting position with the priming valve closed. As clearly shown in Fig. 3, a stationary stop 35 is arranged between a pair of extensions 36 and 37, formed upon the head 32. When the lever 31 is in the normal starting position, the extension 37 engages the stop 35. The crank 31 is moved forwardly to open the priming valve by means of a cable 38 or the like, extending forwardly to the dash or the point in convenient reach of the operator of the automobile.

The transverse arm 16 is provided with a

valve casing 39, pivotally receiving a hot air supply valve 40, which is vertically arranged and is provided at its upper end with a stem 41. The numeral 42 designates a crank having an opening formed therein to receive the stem 41, and provided with spaced jaws 43, which are adjustably connected by a bolt 44. It is thus seen that means are provided to lock the crank 42 to the stem 41, at desired annular positions. The numeral 45 designates a stationary stop, disposed between extensions 46 and 47, the same serving to limit the movements of the crank 42. When the valve 40 is completely closed, the extension 47 engages with the stop 45.

The numeral 48 designates the stem of the carbureter or butterfly valve, having a crank 49 rigidly secured thereto. The crank 49 has pivotal connection with a link 50, the opposite end of which is pivoted within a selected opening 51 formed in the crank 42. A rod or rods (not shown) is connected with the crank 42 and extends to the steering wheel for connection with the usual gas lever. If required several rods may displace the link 50.

The operation of the apparatus is as follows:

In starting the engine a rich charge or mixture is desirable, and with the carbureter valve suitably opened or closed, the operator pulls the cable 38 forwardly, thereby swinging the crank 31 forwardly, and moving the priming valve to the open position. The engine is then cranked, which may be effected by a self starter or manually, and the usual suction created within the cylinders, will draw a suitable amount of gasolene through the priming pipe 18 into the intake manifold 11. This gasolene passes into the intake manifold and becomes mixed with the air therein and is fed to the cylinder. When the engine starts the cable 38 is released and the priming valve 28 automatically closes.

The engine will now operate upon the lean mixture supplied from the carbureter, and the speed of the engine is increased by opening to a greater extent the carbureter valve. As this valve is further opened the hot air supply valve 40 is correspondingly opened, and the hot air is drawn in through the pipe 23 and discharges into the intake manifold, to become mixed with the incoming carbureted air.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same, 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 claim.

Having thus described my invention what I claim is:

In a combined priming and auxiliary air supply apparatus, the combination with an internal combustion engine having intake and exhaust manifolds and a carbureter, of a T coupling having longitudinal and transverse arms, said transverse arm being provided with an elbow, a coupling threaded therein, an upwardly extended hot air supply pipe connecting with the last mentioned coupling and having a screened upper end disposed behind and in proximity to the exhaust manifold of the engine, a valve positioned in said elbow, the remaining transverse arm of the T coupling being extended into the intake manifold, a perforated spray device mounted on the last mentioned transverse arm of the T coupling within the intake manifold, means for operating said valve of the elbow for limiting movement of said valve to its open and closed positions, connections between said valve operating means and the butterfly valve of the carbureter whereby opening one of said valves will result in corresponding closing of the other of said valves, a priming pipe extended from the longitudinal arm of said T coupling and connected with the carbureter gasolene supply pipe, a valve within said longitudinal arm of the T coupling, means for resiliently retaining said last mentioned valve in position, means for operating said valve to move the same to closed and open position and means for limiting movement of the operating means in either direction.

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

NORRIS M. ELWELL

Witnesses:
LEO A. GOTWALS,
TERESA MCDADE.