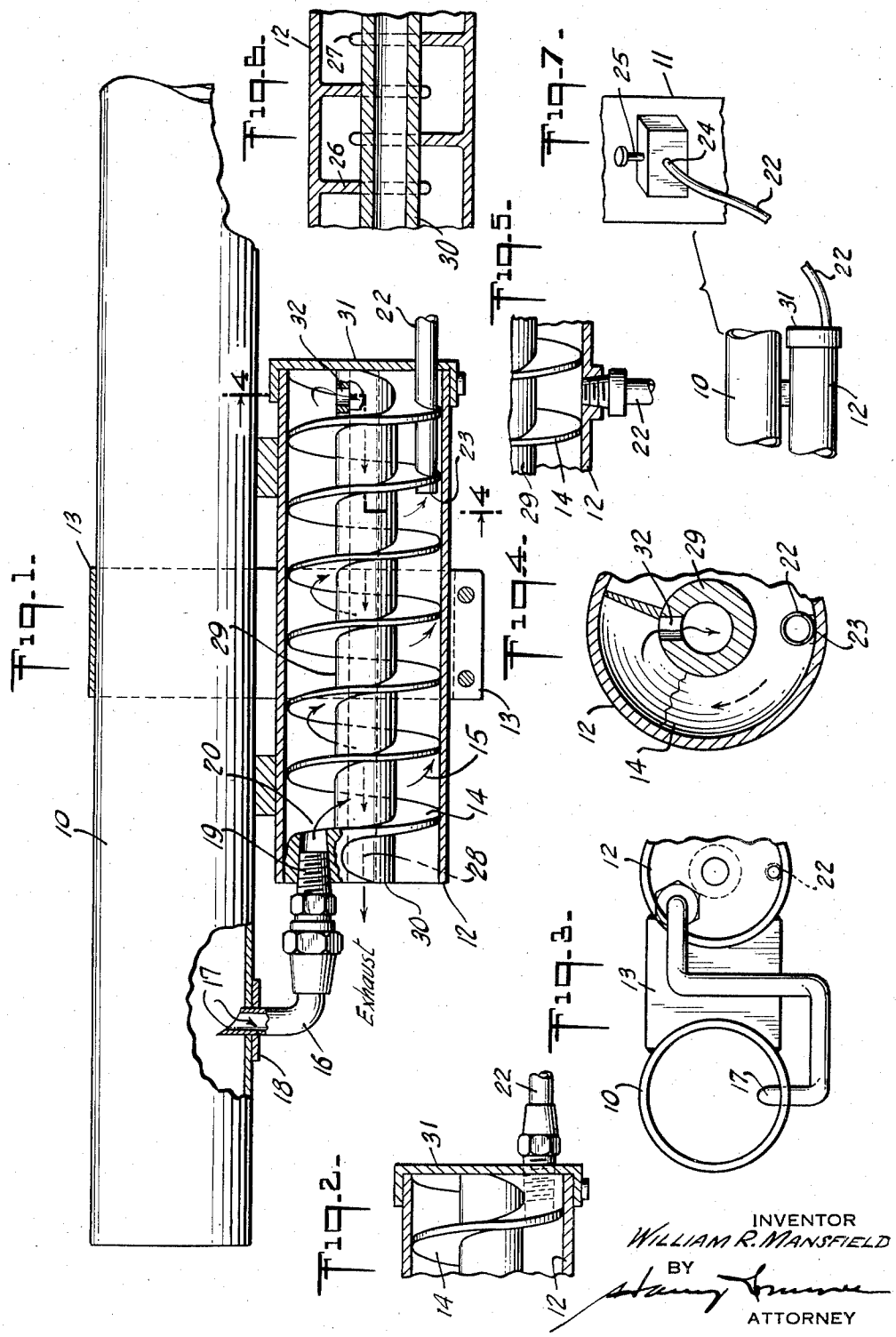
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INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

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INJECTION DEVICE FOR INTERNAL COMBUSTION ENGINES

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This invention relates to internal combustion engines wherein fuel and air are mixed in a carburetor and from which passed through the internal combustion engine proper, the spent fuel then being discharged through an exhaust pipe. It has long been recognized that it is advantageous to add water to the fuel mixture, for smoother engine operation, and auxiliary devices have been designed for the purpose. They have proved objectionable for a number of reasons, including the requirement for maintenance and the difficulty of adjusting them to the varying volume in which the fuel is usually fed to the engine. The present invention provides a means for injection of moisture and the heavy ends of gasoline which would normally be discharged through the exhaust pipe automatically into the carburetor at a ratio or volume identically corresponding to that of the fuel mixture, in an automatic fashion, requiring no attention on the part of the user, and further enhancing the efficiency of the engine.

Examples of practical devices embodying the invention are described below and in the accompanying drawings; the invention is not limited thereto, but covers all other forms coming within the scope or purview of the disclosure herein.

In the drawings:

Fig. 1 is a longitudinal sectional view of a device embodying the invention, shown secured to the exhaust tail pipe of an internal combustion engine,

Fig. 2 is a fragmentary, vertical sectional view of one end of a further form thereof,

Fig. 3 is an end elevational view of a further form thereof,

Fig. 4 is a vertical sectional view taken at line 4—4 of Fig. 1,

Fig. 5 is a fragmentary sectional view of an end of the casing shown in Fig. 1, having the second tube 22 connected to the casing 12 in a different position than that shown in Fig. 1,

Fig. 6 is a fragmentary sectional view of another form of the invention, and

Fig. 7 is a schematic, fragmentary view, showing the manner in which the casing is connected to the carburetor.

As shown in the drawings, the device of the invention is adapted for use intermediate the exhaust pipe 10 of an internal combustion engine and the carburetor of said engine, which is shown schematically at 11 in Fig. 7, said device comprising an elongated casing 12, which may be suitably mounted, for example, by bracket (Fig. 1) 13 mounting the casing 12 below the tail pipe, or as in Fig. 3 at another location relative thereto. Means 14 are provided in said casing defining a helical path (arrows 15, Fig. 1) for the exhaust gases admitted through a first tube 16 having one end connected as at 17, to the exhaust tail pipe 10 and opening interiorly thereof (preferably at the bottom) and connected as at 19 at the other end to the casing 12 and opening interiorly thereof as indicated by the arrow 20. A second tube 22 is connected at one end

23 to the casing and opens interiorly thereof at the bottom so as to pick up heavy ends of gasoline and moisture at that point of the casing, said second tube being connected to the carburetor 11 as shown in Fig. 7 at the other end 24 thereof, directly or through a valve 25, which may be provided to afford a needle control, for example, if desired. The valve, if used, would require a single or occasional adjustment and might be dispensed with. The means 14 defining a helical path 15 (Fig. 1) in casing 12 may be an elongated spiral member closely fitted in said casing. Said spiral path may be defined by forming the casing with alternately inwardly extended fins 26, 27 (Fig. 6) to the same end. The first tube 16 opens interiorly of the casing at 19 (Fig. 1) at one end of the spiral path means 14 and the second tube 22 opens interiorly of the casing at the other end of the means defining the spiral path as at 23, Fig. 1. The first tube 16 so opens interiorly of the casing at a point above the axial center line 28 of the spiral path means 14 and the second tube 22 opens interiorly of the casing at a point 23 below said axial center. Means are provided for discharging exhaust gases from the casing, such as (Fig. 1) an elongated tube 29 passing through the spiral path 14 and having an open end 30 for discharging the exhaust gases from the casing. Means are provided for closing said other end of the elongated tube 29, such as a plate 31 (Fig. 1) to be secured to the end of the casing 12 and closing said other end of tube 29 (Fig. 1). The elongated tube 29 has an opening 32 (Fig. 1) at its closed end for admission of the exhaust gases at the upper end of spiral path 15 thereinto, said exhaust gases then flowing through said tube and out of the open end 30 thereof. The casing 12 or spiral path means 14 may be made of magnesium to enhance the beneficial effect, as it has been found that, by forming them of magnesium, an apparently catalytic effect is attained on the exhaust gases flowing in contact therewith.

The second tube 22 may open interiorly of the casing 12 by passing said second tube through the spiral path means 14 as in Fig. 1 or by passing it through the plate 31, Fig. 2, or by passing it through the bottom of the casing 12 (Fig. 5).

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

1. A water and heavy fuel ends injecting device for use intermediate the exhaust tail pipe of an internal combustion engine and the carburetor of said engine, comprising an elongated casing, means in the casing defining an elongated spiral path for gases in said casing, a first tube connected at one end to said exhaust tail pipe and opening interiorly thereof so as to pick up exhaust gases passing through the exhaust tail pipe, said tube connected at the other end to the casing and opening interiorly thereof so as to discharge exhaust gases passing through said tube from the tail pipe into the casing, a second tube connected at one end to said casing and opening interiorly thereof at the bottom so as to pick up heavy ends of gasoline and moisture in the casing at that point, said second tube connected, at the other end, to the carburetor and means in the casing for discharging the exhaust gases from the casing.

2. In a device as set forth in claim 1, said first tube so opening interiorly of the casing at one end of said spiral path means and said second tube so opening interiorly of the casing at the other end of the means defining the spiral path.

3. In a device as set forth in claim 1, said first tube so opening interiorly of the casing at a point above the axial center of said means defining said spiral path and said second tube so opening interiorly of the casing at a point below said axial center.

4. In a device as set forth in claim 1, said means in the casing for discharging exhaust gases comprising an elongated tube passing through said spiral path means and having an open end for discharging the exhaust gases from the casing and having the other end thereof closed, means to close the adjacent end of the casing, said elongated tube having an opening for admission of the exhaust gases thereinto.

5. In a device as set forth in claim 1, said spiral path means comprising an elongated spiral member closely fitted in said casing.

6. A water and heavy fuel ends injecting device for use intermediate the exhaust tail pipe of an internal combustion engine and the carburetor of said engine, comprising an elongated casing, a first tube connected at one end to said exhaust tail pipe and opening interiorly thereof so as to pick up exhaust gases passing through the exhaust tail pipe, said tube connected at the other end to the casing and opening interiorly thereof so as to discharge exhaust gases passing through said tube from the tail pipe into the casing, a second tube connected at one end to said casing and opening interiorly thereof at the bottom so as to pick up heavy ends of gasoline and moisture at that point of the casing, said second tube connected at the other end to the carburetor, an elongated tube disposed in the casing, and means in said casing to close one end of said casing and to close the adjacent end of the elongated tube, said elongated tube having an opening for admission of the exhaust gases thereinto.

7. In a device as set forth in claim 6, said first tube so opening interiorly of the casing at a point above the axial center of said means defining spiral path and said second tube so opening interiorly of the casing at a point below said axial center.

8. In a device as set forth in claim 7, said casing being made of magnesium.

9. In a device as set forth in claim 1, said means in the casing defining an elongated spiral path being made of magnesium.

No references cited.