(No Model.)

J. E. WEYMAN & J. A. DRAKE.

MEANS OR APPARATUS FOR EFFECTING AND CONTROLLING THE SUPPLY OF HYDROCARBON TO HYDROCARBON MOTORS.

No. 528,836. Patented Nov. 6, 1894.

Fig. 1.

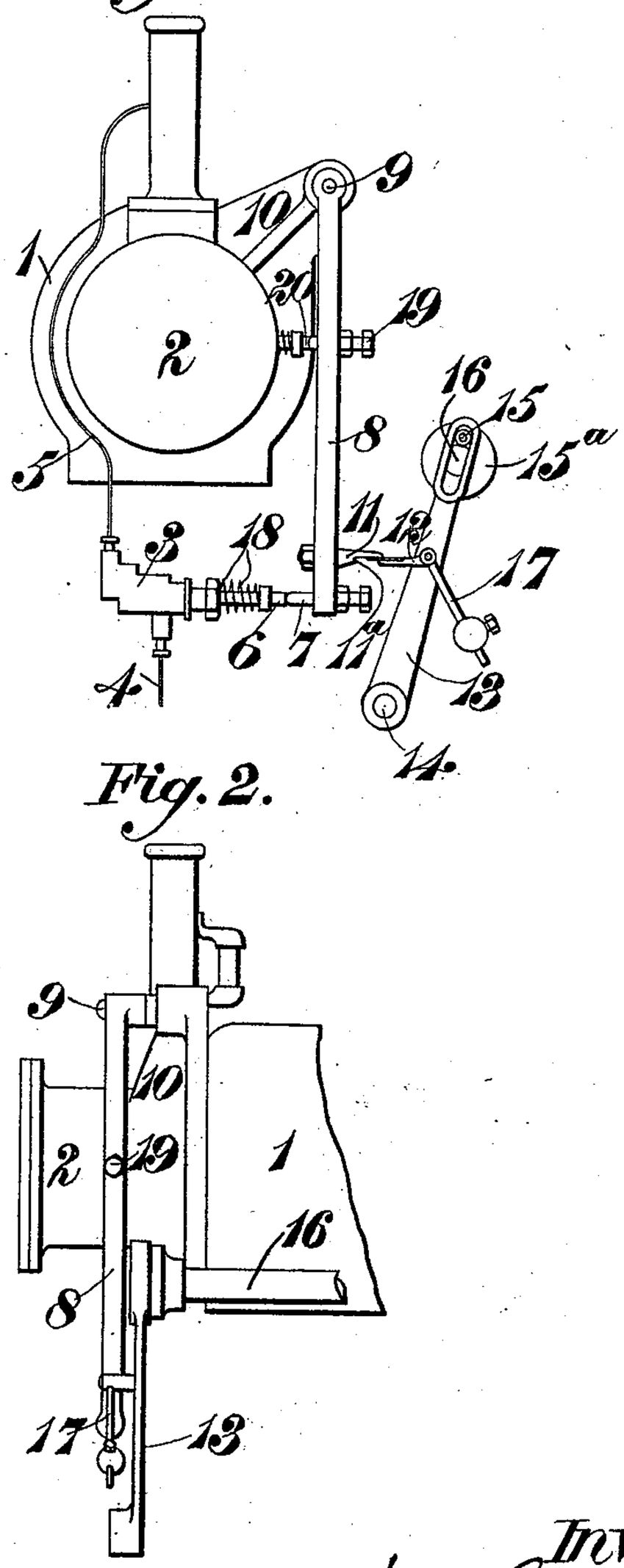

Fig. 2.

Witnesses
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JAMES EDWARDES WEYMAN AND JAMES ARTHUR DRAKE, OF GUILDFORD, ENGLAND.

MEANS OR APPARATUS FOR EFFECTING AND CONTROLLING THE SUPPLY OF HYDROCARBON TO HYDROCARBON-MOTORS.

SPECIFICATION forming part of Letters Patent No. 528,836, dated November 6, 1894.

Application filed November 6, 1893. Serial No. 490,175. (No model.) Patented in England August 21, 1891, No. 14,133.

To all whom it may concern:

Be it known that we, JAMES EDWARDES WEYMAN, and JAMES ARTHUR DRAKE, subjects of the Queen of Great Britain and Ireland, residing at Guildford, in the county of Surrey, England, have invented Improved Means or Apparatus for Effecting and Controlling the Supply of Hydrocarbon to Hydrocarbon-Motors, (for which an English patent was granted, No. 14,133, dated August 21, 1891,) of which the following is a specification.

This invention has for its object to provide simple, inexpensive and efficient means or apparatus for effecting and controlling the supply of liquid hydrocarbon to hydrocarbon motors. For this purpose the pump by which liquid hydrocarbon is delivered to the vaporizer is operated from a suitable moving part of the motor through knife edges, tappets or equivalent parts (hereinafter referred to as tappets), one of which is controlled by a suitable governor in such a manner that when the motor is running at its normal speed the tappets are brought into action so as to operate the pump and cause hydrocarbon to be delivered to the vaporizer, but upon the speed of the motor exceeding the normal, the tappets are caused to so move relatively to each other by the action of the governor, that the one fails to operate the other and the pump ceases to deliver oil, until the speed of the motor is reduced to the normal. The said apparatus in addition to effecting and controlling the supply of liquid hydrocarbon to the vaporizer, may advantageously be adapted to control the passage of hydrocarbon vapor from the vaporizing chamber to the combustion chamber of the motor.

As will be obvious apparatus to operate according to this invention can be constructed in various forms.

In the accompanying drawings, Figures 1 and 2 are respectively end and side elevations showing apparatus according to this invention applied to a hydrocarbon motor, part only of which is shown.

1 is the motor cylinder, and 2 a vaporizer secured to the combustion end thereof.

3 is a plunger pump by which heavy hydrocarbon, such as kerosene or paraffin oil, supplied by a pipe 4, is delivered by a pipe 5 to the vaporizer within.

6 is the pump plunger. It is moved inward to deliver hydrocarbon by the action of a pin 7 adjustably fixed to a lever arm 8 pivoted at 9 to an extension 10 of the motor cylinder, and operated in one direction through two tappets 11 and 12, one of which, namely, 11 is fixed to the said lever arm 8 while the other 12 is pivoted to a vibrating arm 13 that is journaled at 14 and is operated in any suitable manner from the crank shaft of the motor. In the arrangement shown, vibratory movement is imparted to the said arm 13 by a crank pin 15 working in a slot in the free end of said arm and carried by a disk 15^a fixed to one end of a rotary shaft 16 the other end of which is driven in any suitable manner from the crank shaft of the engine.

17 is a governor of the inertia type, and consisting of a rod connected with the pivoted tappet 12 so as to form therewith a two-armed lever, and a ball or weight adjustably fixed on said rod.

18 is a spring, for effecting the outward or return stroke of the pump plunger.

With the arrangement described when the motor is running at or below its normal speed, the governor 17 will hold the tappet 12 against the tappet 11 so that each time the lever arm 13 moves to the left, the tappet 12 will abut against a shoulder 11^a on the tappet 11 and thereby cause the lever arm 8 to move to the left and cause the pump plunger to make its inward stroke and deliver a charge of hydrocarbon to the vaporizer, the outward or return stroke of the pump plunger and arm 8 being effected by the spring 18 while the arm 13 and tappet 12 are moving to the right. When the speed of the motor exceeds that for which the governor 17 has been adjusted, then by virtue of the inertia of the ball of the governor, the tappet 12 will be depressed and its free end moved out of line with the shoulder 11^a on the tappet 11 so that this tappet and the attached parts will fail to be operated when the arm 13 next moves to the left and a stroke or strokes of the pump will be lost. The supply of hydrocarbon will thus be cut

off and will remain cut off until the speed of the motor is reduced to the normal, when the tappet 12 will be returned to its original position, and the operation of the pump and delivery of hydrocarbon will be resumed.

In the arrangement shown the lever arm 8 is provided with a second adjustable pin 19 arranged in line with the stem 20 of the valve controlling the passage of hydrocarbon vapor from the vaporizing chamber to the combustion chamber of the motor cylinder, the arrangement being such that each time the lever arm 8 is moved to the left to operate the pump plunger, it will open the valve and permit hydrocarbon vapor to pass to the combustion chamber, but will cease to do so when the speed of the motor exceeds the normal.

What we claim is—

In a hydro-carbon motor the combination of two levers, a pump and a vapor controller operated by the free end of one of the levers, a means for vibrating the free end of the other lever, and a centrifugal hit and miss operating connection between the free ends of said levers, whereby when the vapor controller is in or out of operation the pump is in the same condition for the purpose described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

JAMES EDWARDES WEYMAN.
JAMES ARTHUR DRAKE.

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