T. E. HALLIDAY.

VAPORIZER FOR USE WITH INTERNAL COMBUSTION ENGINES.

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1,157,101. Patented Oct. 19, 1915.

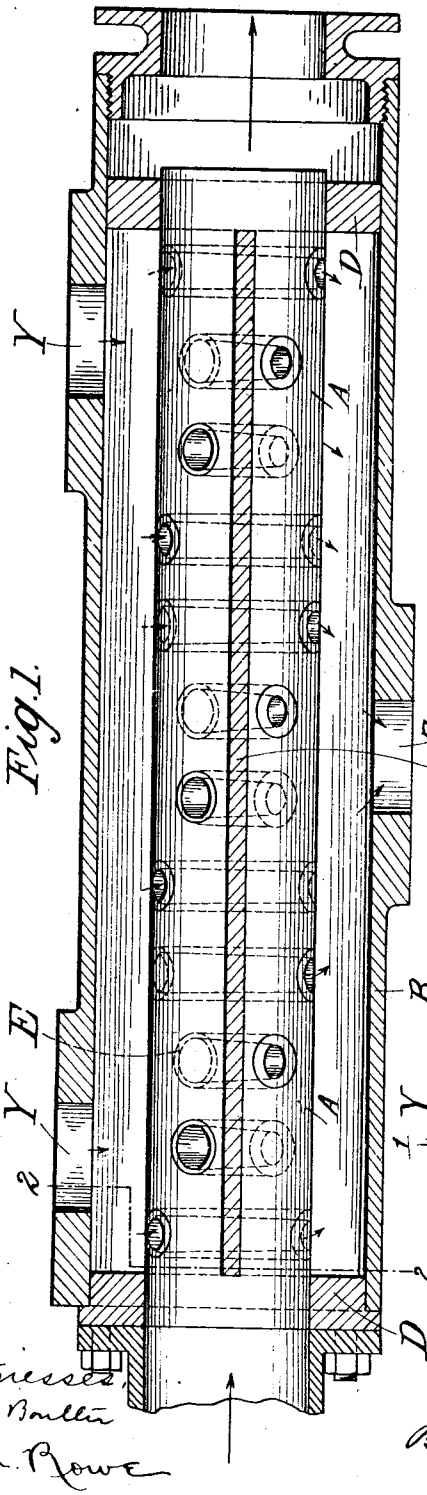


Fig. 1.



Fig. 4.

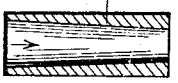


Fig. 3.

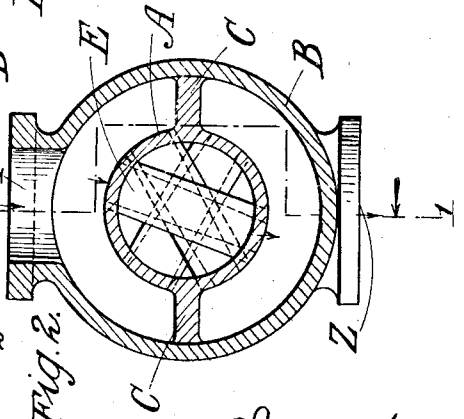


Fig. 2.

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UNITED STATES PATENT OFFICE.

THOMAS ERNEST HALLIDAY, OF BISHOPSTOKE, ENGLAND.

VAPORIZER FOR USE WITH INTERNAL-COMBUSTION ENGINES.

1,157,101. Specification of Letters Patent. Patented Oct. 19, 1915.

Application filed March 31, 1913. Serial No. 758,001.

To all whom it may concern:

Be it known that I, THOMAS ERNEST HALLIDAY, a subject of the King of Great Britain, residing at Bishopstoke, in the county of Hampshire, England, have invented certain new and useful Improvements in or Relating to Vaporizers for Use with Internal-Combustion Engines, of which the following is a specification.

This invention relates to vaporizers for use with internal combustion engines, and has for its object to provide an improved construction of the same.

The vaporizer comprises a jacketed pipe through which the gas to be heated passes, while the exhaust gas, or other heating fluid, passes through the jacket.

According to this invention, the jacket is provided with partitions, and cross tubes are arranged in the vapor pipe, so that the gas which furnishes the heat has to flow through these tubes from one side of the jacket to the other, and these tubes taper internally, being larger at the inlet end. Thus intimate contact of the heating fluid with the walls of the tubes is maintained throughout the passage of the hot gas through the tubes in spite of its gradual cooling, and great efficiency is obtained even at low engine speeds.

In the accompanying drawings, Figure 1 is a longitudinal section on line 1—1 of Fig. 2 of one form of vaporizer constructed in accordance with this invention. Fig. 2 is a transverse view on the line 2—2 of Fig. 1. Fig. 3 is a longitudinal section of one of the cross tubes. Fig. 4 is a corresponding view of a modified form of cross tube.

Like letters indicate like parts throughout the drawings.

In the construction shown in Figs. 1—3 the vapor pipe A is mounted approximately centrally in the jacket B which is formed with diametrical webs C dividing the jacket into two parts. The pipe is carried in end plates D forming part of the jacket and arranged transversely to it is a number of tubes E of tapered bore the larger end being on the inlet side. The exhaust gas enters the jacket on this side, passes through the tapered tubes, and issues from the jacket as shown by the arrows, suitable inlets Y and outlet Z being provided.

It will be understood that the gas to be heated passes through the pipe A which is surrounded by the exhaust gases which flow through the jacket B. The interior of the pipe is further heated by the passage of the exhaust gases through the cross tubes E. If desired, instead of the tubes internally tapering, they may be bored out to different diameters throughout their lengths, the largest diameter being at the inlet end as shown in Fig. 4.

It will be seen that by this invention a very simple and efficient form of vaporizer is provided.

The efficiency of the vaporizer may be varied slightly by varying the setting of the tubes E. In the drawings it will be noticed that these are arranged spirally along the length of the tube, which probably gives the highest efficiency as it causes the charge to come into greater contact with the heated tubes.

What I claim as my invention, and desire to secure by Letters Patent, is:—

1. In combination, a vapor pipe, a jacket around said pipe provided with intake and outlet openings for exhaust gas, webs connecting the vapor pipe and the jacket, the said webs and vapor pipe together forming a partition in the said jacket, internally tapered cross tubes arranged within the vapor pipe and communicating at their opposite ends with the spaces surrounding the said vapor pipe and adapted to conduct the exhaust gas from one side of the partition to the other, the cross tubes being so arranged that the larger end of the bores is at the intake end of the said tubes.

2. In combination, a vapor pipe, a jacket around said pipe provided with intake and outlet openings for exhaust gas, webs connecting the vapor pipe and the jacket, the said webs and vapor pipe together forming a partition in the said jacket, internally tapered cross tubes arranged within the vapor pipe and communicating at their opposite ends with the spaces surrounding the

said vapor pipe and adapted to conduct the exhaust gas from one side of the partition to the other, the cross tubes being mounted spirally throughout the length of said vapor pipe and with the larger end of the bores at the intake end of the said cross tubes.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS ERNEST HALLIDAY.

Witnesses:
HARVEY J. BAVERSTOCK,
CHARLES PACK.