J. W. ROBINSON.

HEATER FOR MOTOR DRIVEN VEHICLES.

APPLICATION FILED AUG. 14, 1913.

1,117,444.

Patented Nov. 17, 1914.

2 SHEETS—SHEET 1.

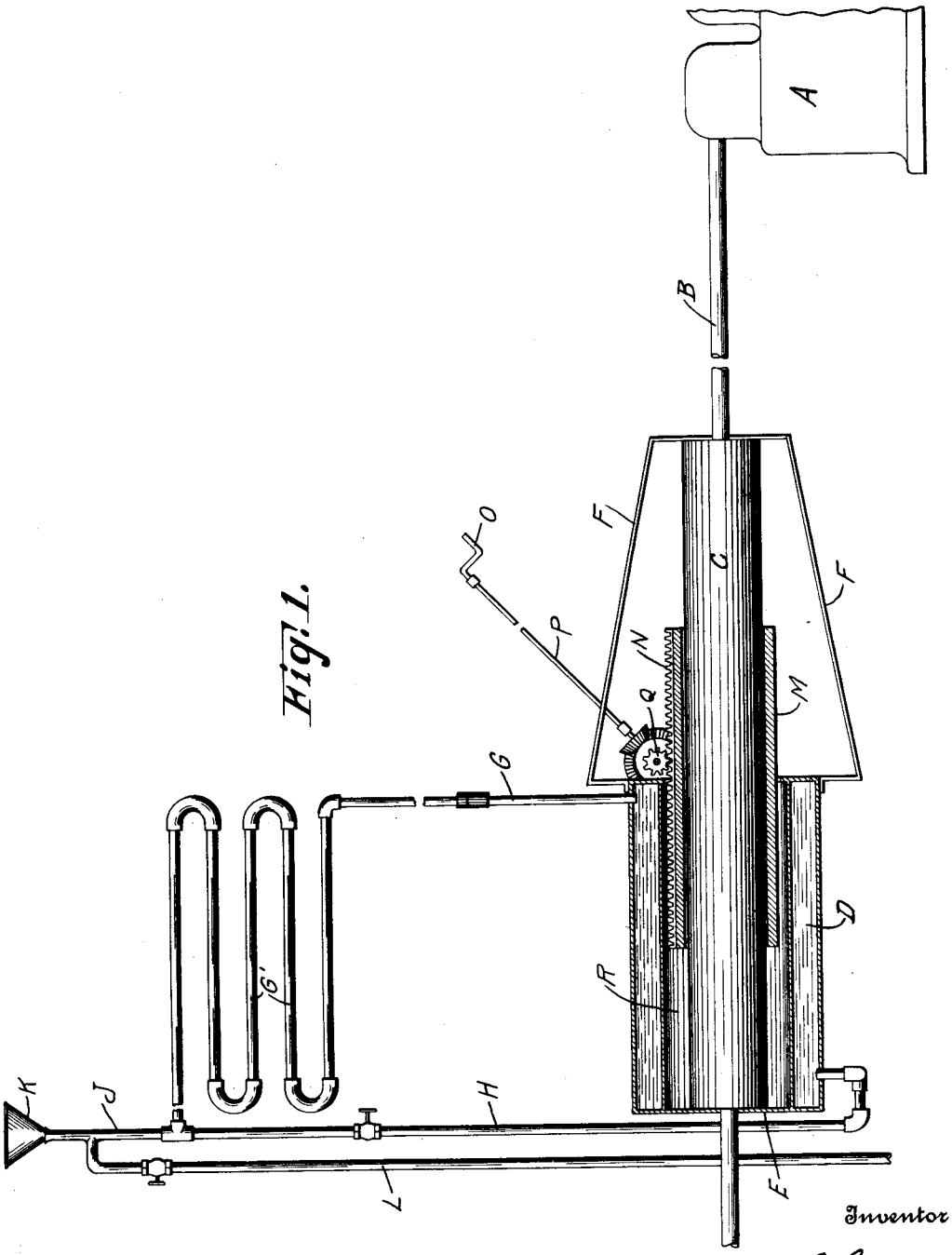


Fig. 1.

Witnesses
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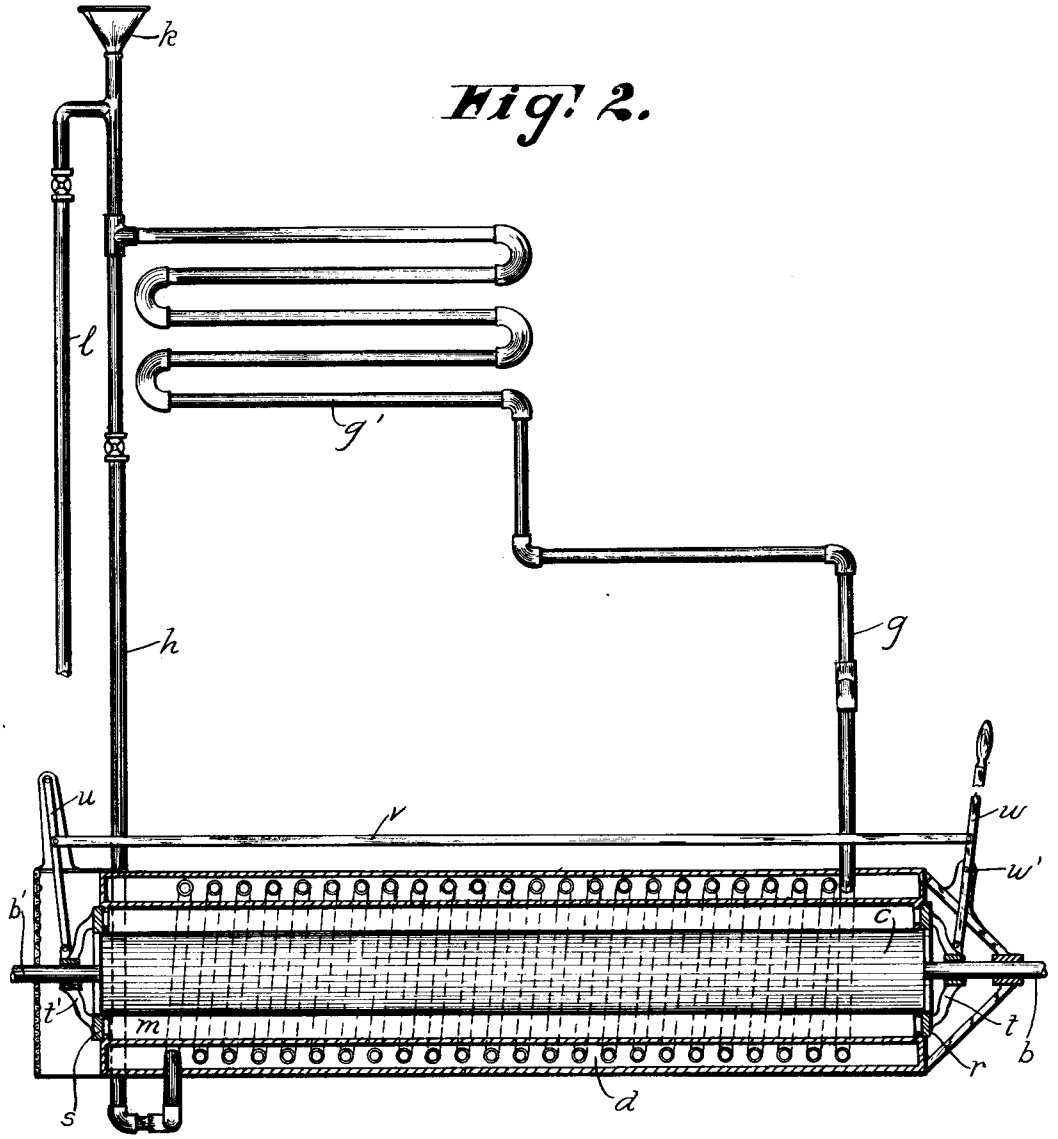
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2 SHEETS—SHEET 2.

Fig. 2.



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UNITED STATES PATENT OFFICE.

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HEATER FOR MOTOR-DRIVEN VEHICLES.

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To all whom it may concern:

Be it known that I, JOSEPH W. ROBINSON, a citizen of the United States, residing at Milwaukee, county of Milwaukee, and State of Wisconsin, have invented new and useful Improvements in Heaters for Motor-Driven Vehicles, of which the following is a specification.

The object of my invention is to provide means for heating a motor driven vehicle in which the exhaust gases of an internal combustion engine employed to drive the vehicle, may be utilized as the source of heat to any extent that may be desired. Heretofore attempts have been made to provide heaters of this type, but so far as I am aware, no means were devised for controlling the heat without seriously interfering with the operation of the engine.

In the following description, reference is had to the accompanying drawings, in which—

Figure 1 is a side elevation partly in vertical section, showing one form of my invention as it is applied to the muffler of a four cylinder internal combustion engine. Fig. 2 is a similar view with the motor omitted, showing a modified form of construction.

Referring to Fig. 1, A is an internal combustion motor of the ordinary four cylinder type. B is the exhaust pipe and C the muffler. These parts are of ordinary construction and need no further description. A water jacket D encircles the muffler C and is spaced therefrom, being supported by an end disk E and by braces F. A circulation pipe G and return pipe H are connected with this water jacket for circulation of liquid from the water jacket through pipe G, coil G′ and back through the return pipe H. Liquid may be supplied to the circulatory system through a pipe J, which is preferably provided with a filling funnel K. An overflow pipe L leads downwardly from near the top of the pipe J, whereby the expanding liquid may escape to the ground without overflowing funnel K in case a surplus of liquid is employed. A sleeve M is mounted to slide upon the muffler C into and out of the annular space between the water jacket D and the muffler. This sleeve is composed in part at least of non heat conducting material, such as asbestos, and on one side the sleeve is provided with a rack bar N, whereby it may be actuated from any convenient point by suitable mechanism, such for example as the crank O, rod P and pinion Q, with which the rod P is connected by ordinary bevel gearing. The pinion is in mesh with the rack bar N, and when the pinion rotates, the rack bar will move inwardly or outwardly in an annular space R, thus obstructing to a greater or less extent the transfer of heat from the muffler C to the jacket chamber D.

The specific means for actuating the sleeve M is not essential to my invention. Any form of heat radiating circulatory system may be employed, and it will of course be understood that the pipes G and H will be so connected with the jacket D as to secure gravity circulation unless a forced circulation is employed. In the drawings, the pipe G is shown in connection at the top, and pipe H at the bottom, of the jacket D.

Referring to Fig. 2, the muffler *c*, water jacket *d*, circulation pipe *g*, return pipe *h*, heat radiating coil *g′*, filler *k* and overflow pipe *l* are all similar in structure, arrangement and function to the corresponding parts in Fig. 1, but in place of the heat obstructing sleeve M in Fig. 1, I employ in Fig. 2 an air chamber *m*, which is adapted to be closed at the front and rear ends by annular valves *r* and *s* respectively. These valves are supported by brackets *t*, *t′*, which are mounted to slide upon the pipes *b*, *b′* respectively. A swinging link *u* is pivotally connected with the rear bracket *t′*. This link is connected by a rod *v* with a lever *w*, said lever being pivoted to a suitable support at *w′* with its lower end pivoted to the forward valve bracket *t*. The lever *w* may be actuated from any convenient point, and when moved to the left, will open both valves *r* and *s* from the closed position in which they are illustrated in Fig. 2. When the valves *r* and *s* are closed, the air in the annular chamber *m* is trapped and allows the heat to radiate through it into the jacket *d*. But when the valves *r* and *s* are open, the external air is permitted to pass through the chamber *m*, and this air current will largely prevent the transfer of heat to the jacket *d*. The effect of the interference or prevention of heat transference to the jacket *d* will of course depend quite largely upon the volume of air passing through the chamber *m*, and therefore it will depend largely upon the extent to which the valves are opened. The forward movement of the vehi-

cle will cause the air to circulate through the passage *m* as soon as the valves are opened, and when opened widely, this circulation will be rapid.

It is not material to my invention whether the water jacket comprises an annular chamber, such as is shown in Fig. 1, or a coil such as is shown in Fig. 2. It will also be understood that this jacket may be applied at any convenient point along the exhaust duct of an internal combustion motor, whether said duct at the point where the jacket is applied is enlarged and used as a muffler, or whether it constitutes merely a passage, such for example as that afforded by the pipe B or *b*. I have referred to the jacket as a water jacket, but it will be understood that any circulating liquid may be used.

I claim—

1. The combination with the exhaust passage of an internal combustion motor, of a hollow jacket encircling the same and spaced therefrom, adjustable means operative in the space between the exhaust passage and jacket, for increasingly and decreasingly obstructing heat transfer from the exhaust passage to the jacket, and a heat radiating coil connected with said jacket for circulation of liquid therefrom.

2. The combination with the exhaust passage of an internal combustion motor, of a hollow jacket encircling the same and spaced therefrom, a heat obstructing medium progressively movable to various positions of adjustment, between the exhaust passage and said jacket, and circulatory connections for said jacket, the space between said passage and jacket being closed with reference to both the jacket space and the exhaust passage.

3. The combination with the exhaust passage of an internal combustion motor, of a hollow jacket encircling the same, means for progressively regulating heat transfer from the exhaust passage into said jacket, and circulatory connections for said jacket.

4. The combination with a tubular exhaust passage of an internal combustion motor, of a set of concentric non-communicating chambers inclosing the walls of said passage, a heat obstructing medium in the inner chamber, a heat absorbing medium in the outer chamber, and means for progressively varying the heat obstructing capacity of the heat obstructing medium.

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

JOSEPH W. ROBINSON.

Witnesses:

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I. D. BREMER.