

UNITED STATES PATENT OFFICE.

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THE WHITE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

STEAM-AUTOMOBILE.

971,810.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ROLLIN H. WHITE, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Steam-Automobiles, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

Heretofore steam automobiles have employed either a stack or stacks of some sort into which the products of combustion at the burner rise and are conducted away without downward flow, or else some of the exhaust steam has been required to be used to force a down draft.

The stacks which have before been used on cars which did not force a down draft have necessarily prevented the use of side doors permitting entrance to the rear seat, and have compelled the use of a rear door for this purpose. Moreover the stacks, which, during the past two or three years, have been almost invariably placed at the sides of the car, have not been at all pleasing to the eye of a fastidious motorist.

The use of exhaust steam to force a down draft is objectionable because it is the present approved practice to condense the steam and use the water over again, thereby diminishing the size of the water tanks required to give satisfactory mileage without refilling.

The present invention is a practical solution of the problem of eliminating the stacks of a steam automobile and conserving the steam.

The invention is shown in connection with a White steam car of the latest design in which the now familiar White steam generator is used.

In the drawing Figure 1 shows a part of a steam automobile in side elevation but partly broken away to show the novel features of the present invention, which are shown in central, longitudinal, vertical section. Fig. 2 is a bottom plan view of that part of the automobile which is shown in Fig. 1. Fig. 3 is a rear view in the plane indicated by line 3—3 of Fig. 2.

Referring to the parts by letters, A, A' represent the side members, and B, B', B² transverse members of the chassis.

C represents the body secured upon the

chassis,—*c* being the rear seat, *c'* the front seat, *c²* one of the side doors, and *c³* the floor of said body.

D represents a cylindrical combustion chamber casing having laterally projecting external brackets *d* secured to its side and to the frame members A, A' and B, B'. E represents the burner which is secured to the lower end of said casing so as to entirely close the same. This burner differs from those which have been commonly used heretofore in that its bottom is imperforate, wherefore all of the air required for the combustion of the hydro-carbon vapor is of necessity supplied through the induction tube *e*.

G represents the generator of familiar form, composed of a large number of connected superposed horizontal coils of tubing. A spider F, which has downwardly extended legs *f* resting upon the top of the cylinder D, supports these coils, which are connected to said spider by several U-bolts *e'*. More than one-half of the generator coils are below the top of cylinder D, but the rest of said coils are above said top; and the spider F does not interfere in any appreciable degree with the flow of the products of combustion.

H is a bonnet, cylindrical in form and closed at the top but open at the bottom, which embraces the upper part of the generator and of cylinder D, and is secured to and supported by the same frame members which support cylinder D. The diameter of cylindrical bonnet H is considerably greater than the diameter of the combustion chamber casing D, wherefore there is formed outside of said casing and the upper coils and between them and the bonnet, an annular flue of large capacity which is closed at the top and open at the bottom. The gaseous products of combustion from the burner pass upward in intimate contact with the coils. Some of said gases flow over the top of the casing D, and between the upper coils into the annular flue, and the remainder of said gases are deflected downward by the top of said bonnet, and they all flow downward in the large annular flue and escape beneath the lower edges of the bonnet. The heat will have been almost entirely taken from these escaping gases before they reach the lower edge

of the hood, and they are dissipated into the air without any inconvenience to the passengers in the car. It has been thought desirable, however, and has been found advantageous to combine with the structure described a rearwardly extended inverted trough K whose front end is connected with the lower edge of the rear part of the bonnet. This trough is secured beneath the floor of the car and has downwardly bent side edges which rest upon the side frame members A, A'. The rear half of the lower edge of the hood is cut away for a distance equal to the height of the downwardly turned edges of this trough. It is found in practice that a greater part of the products of combustion flow rearwardly in this trough and between the side frame members of the car. To facilitate the escape of such rearwardly flowing gases, the body of the car at its rear end, just above the side frame members, is cut away; and an inclined transverse member J which is secured to the body and extends from the top of the hole c^4 to the rear end of said trough, directs gases in an inclined direction upward and rearward through said hole c^4 . This hole is preferably covered by a grill or open screen M, of some sort.

It will be understood asbestos lining N is to be placed wherever required, as around the bonnet, and over its top, and between the trough K and floor c^3 .

Having described my invention, I claim:

1. In a steam automobile, the combination of a coil generator, a combustion chamber casing which is open at its top, and which surrounds the generator and extends from a plane below the lowest coil upward to a plane some distance below the upper coil, a burner secured beneath said casing and closing the lower end thereof, a bonnet which is closed at its top and open at its bottom and embraces the upper part only of said generator and casing and is of larger diameter than the casing, thereby forming an annular flue which is open at its bottom only, substantially as specified.

2. In a steam automobile, the combination of a combustion chamber casing which is open at its top, means supporting the same, a burner supported below said casing and closing the lower end thereof, a coil steam generator within the combustion chamber above the burner, and extending above the top of the combustion chamber casing, with a bonnet which is closed at its top and open at its bottom and surrounds the upper part of the generator and combustion chamber casing, and is of larger diameter than the latter, thereby forming an annular flue which is open at its bottom only, and a straight rearwardly extended bottomless flue secured below the floor of the automobile and connected at its front end with the

lower rear part of said bonnet in communication with said annular flue.

3. In a steam automobile, the combination of a combustion chamber casing which is open at its top, means supporting said casing, a burner supported below the casing and closing its lower end, a steam generator within the combustion chamber above the burner, a bonnet which is closed at the top and open at its bottom and embraces the upper part of the generator and combustion chamber casing and is of larger diameter than the latter, thereby forming an annular flue which is open at its bottom only, and a rearwardly extended substantially horizontal bottomless flue which is substantially as wide as the diameter of said bonnet, and has its open front end connected with the lower rear part of said bonnet and extends therefrom rearwardly in a substantially horizontal plane beneath the floor of the automobile body.

4. In a steam automobile, the combination of a combustion chamber casing which is open at its top, means supporting the same in the automobile frame, a burner below the casing and closing the lower end of the same, a steam generator within the combustion chamber above the burner, a bonnet which is closed at its top and open at its bottom and embraces the upper end of the combustion chamber casing and is of larger diameter than the latter, the rear part of the lower edge of this bonnet being cut away, and a bottomless flue which is fixed to the automobile frame and has its front end in communication with the annular flue through the space formed by cutting away the lower edge of said bonnet as described, and extends therefrom rearward in a substantially horizontal plane, substantially as specified.

5. In a steam automobile, the combination of the combustion chamber casing supported upon the automobile frame, a burner supported below said casing, a steam generator supported within the combustion chamber over the burner, a bonnet which is closed at its top and open at its bottom and embraces the upper part of said generator and combustion chamber and is of larger diameter than the latter, an automobile body which is secured to the frame over the parts before mentioned and has a hole through its rear wall, an inclined piece extending from the top of said hole downward and forward to the automobile floor, and an inverted trough secured beneath the automobile floor and connected to the rear lower part of said bonnet in communication with said annular flue and extending therefrom rearwardly to said inclined member.

6. In a steam automobile, the combination of the frame having side frame members, a combustion chamber casing secured to said

frame, a burner supported below the casing,
a steam generator within the casing over the
burner, and a bonnet which is closed at its
top and open at its bottom and embraces
5 the upper part of said generator and cas-
ing,—the rear half of its lower edge being
cut away, and an inverted trough which is
secured to the rear part of said bonnet, and

has down-turned lateral edges which rest
upon the side frame members. 10

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

ROLLIN H. WHITE.

Witnesses:

E. B. GILCHRIST,

H. R. SULLIVAN.