STEAM

The

Power Supreme

THORNE Multiple Steam Generator for Heat or Power

Steam has been, is and always must remain the foundation upon which rests the great commercial and industrial structures of business life involving every factor of the affairs of human life and happiness.

Engineering organizations connected with large industries concede steam to be the most economical and reliable form of Power. The railroad and sea-going transportation companies have experimented with and tried out other forms of power, only to return to steam and build better steam locomotives and steam ships to cope with the ever increasing transportation needs of industry.

Away from nature's power gift, the waterfall, central power distributing plants all over the world are operated with steam power supplying in secondary form billions of horse power, heat and light for the convenience of industry and the comfort and happiness of civilization.

Ever since the development of the internal combustion engine and its application to the automobile, the inventor's genius and the engineering intelligence of the entire world has been called upon to build into the internal combustion engine that much desired reliability, flexibility, and smoothness of steam power.

Modern developments in chemistry and mechanical science have made possible the refinements necessary to make steam the ideal power for nearly all classes of transportation. The self-propelled railcar, street car, auto bus, truck, tractor, and the automobile can now be operated economically and satisfactorily with steam power.

With the foregoing in mind, and profiting by more than twenty years of experience in the use, repair and rebuilding of steam propelled vehicles, Mr. Clayton L. Thorne, an expert all 'round mechanic and engineer of wide experience, long ago set about the task of produc-

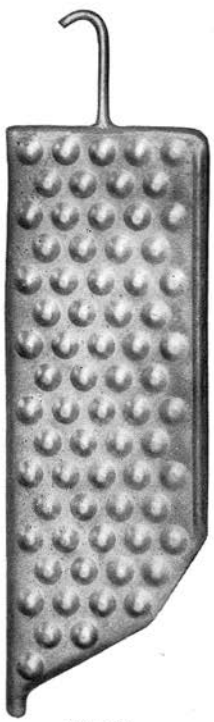
ing a steam generator to meet the crying need of modern transportation. The Thorne Multiple Steam Generator is the result. New in principle, correct in design, it is small in size, light in weight, durable, safe and reliable, with a steam capacity in excess of that of boilers ten times its size.

In practical use under the most trying conditions its performance is entirely satisfactory and fulfills the highest hopes of its inventor. Its installation has transformed old, obsolete cars into the most satisfactory on the road, capable of sustaining a continuous high rate of speed. A new, faster, and better steam propelled automobile should not be far distant.

Unit Member THORNE Multiple Steam Generator

Structural Description

The THORNE MULTIPLE STEAM GENERATOR, as its name implies, is composed of a multiplicity, namely: forty separate units, or members, which are made of pure wrought iron, proven by long experience to be the best and most durable material known for steam boiler construction.



(Fig. 1)

(Figure 1) shows one of these members. It is formed to a special wedge shape with extended surfaces, due to the protuberances disposed in staggered formation on both sides.

This construction adds to the structural strength of the member, and at the same time greatly increases the heating surfaces. The downward slope shown at the bottom of the member serves a double purpose. It accelerates the natural circulation and facilitates the cleaning of the generator, under its own pressure, each member having its own heating surfaces, and a water supply within functions as a perfect and highly efficient steam boiler.

Each member is entirely independent of all others except for the support each gives to, and receives from, its neighbors when assembled in cylindrical form as shown in (Figure 2).

The Assembled Generator

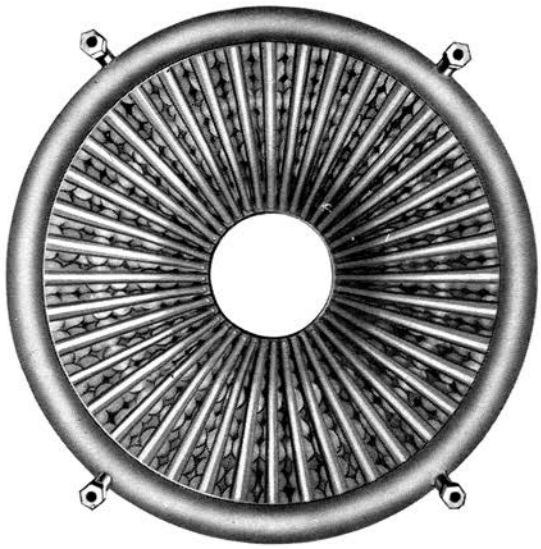
(Fig. 2)

Forty of the unit members fit together perfectly in cylindrical form, and make up the complete generator; the extended surfaces on each side of the members are in perfect contact, and thus support each other against the pressure generated within them.

The protuberances being disposed in staggered formation on the sides of the members, serve a number of purposes, namely: first, they preserve the space between each of the members, through which the heat of the furnace circulates; second: the heating surfaces are increased in a way that accelerates circulation, and the separation of the steam from the water, within the generator; third: the construction prevents heat losses, and contributes to greater fuel economy.

The generator has 156 square inches of heating surfaces to each pound of water content. Efficiency and durability depend upon circulation, and circulation is a salient feature of The THORNE MULTIPLE STEAM GENERATOR.

Bottom View of Generator



(Fig. 3)

Figure three: A bottom view of the THORNE MULTIPLE STEAM GENERATOR, shows the vast amount of effective heating surfaces in the generator, all of which are directly exposed to the active heat of the furnace.

The large amount of concentrated heating surfaces make the generator ideal to be fired with either gas or oil burner.

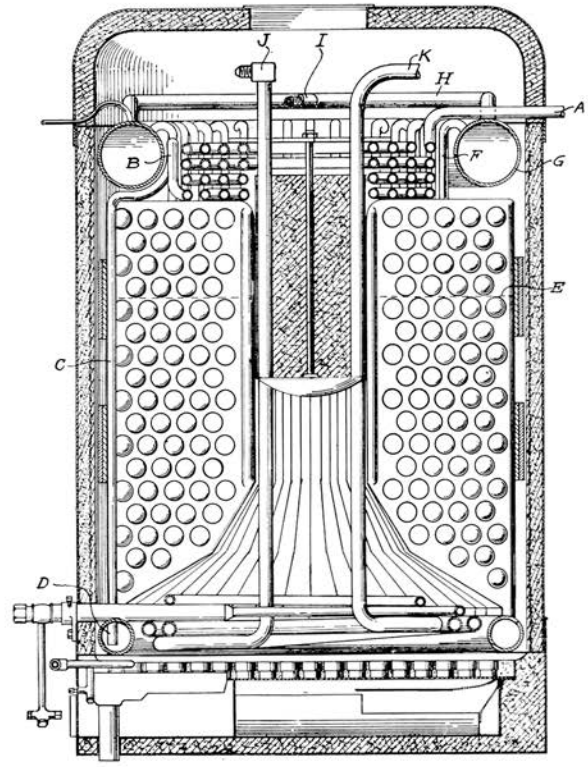
The staggered arrangement of the extended surfaces prevents the heat from passing through the generator without first giving up its usefulness, consequently the temperature of the stack gases is very low.

The risers of the super-heater coil extend up through the opening in the center of the generator; this opening is then closed with a suitable baffle plate, located below the water line, thus confining the heat of the furnace to the wet surfaces of the generator. This arrangement is shown in (Figure 4).

The four outlets shown on the outer ring in (Figure 3), are for cleaning the generator under its own pressure.

For the individual automatic heating of apartments, under the control of the tenant instead of the landlord—an innovation is surely on the way. The THORNE Multiple Steam Generator is as well adapted as it is for all the numerous purposes where steam is used and a predetermined temperature or pressure is wanted.

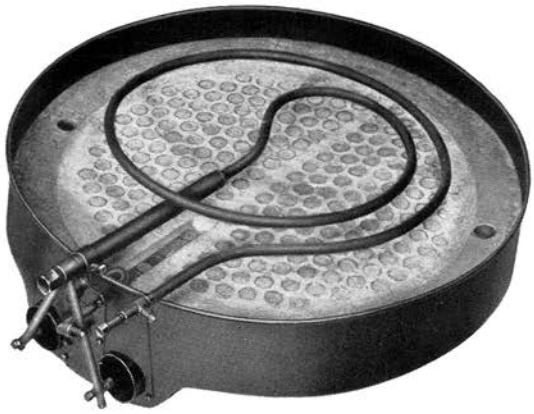
Illustration of Generator



(Fig. 4)

The above illustration graphically shows the construction, and circulation, of the THORNE MULTIPLE STEAM GENERATOR. Starting at A, the water from the pumps or other source of supply, enters the economizer or pre-heating section, consisting of four watch spring like coils, connected one above another, there utilizing the heat of the gasses which have passed through the generating and super-heating sections. The water, now hot, continues through the pipe, forming a trap at B, then down through pipe C, entering the distributing pipe D, which forms a complete circle surrounding the fire and is connected on its upper side with each of the generating members. Consequently the water level in all members is the same, as indicated at E, steam occupying the space above the line E, passes through the small pipe F, to the steam dome, steam is taken from the circular dome through the equalizing pipe H, pipe I, leading directly to the throttle valve, through which the steam flows to J, down through the super-heater coil, located in the hottest part of the fire, leaving at (K) the steam reaches the engine in a dry and highly super-heated state.

The THORNE Multiple Bunsen Burner



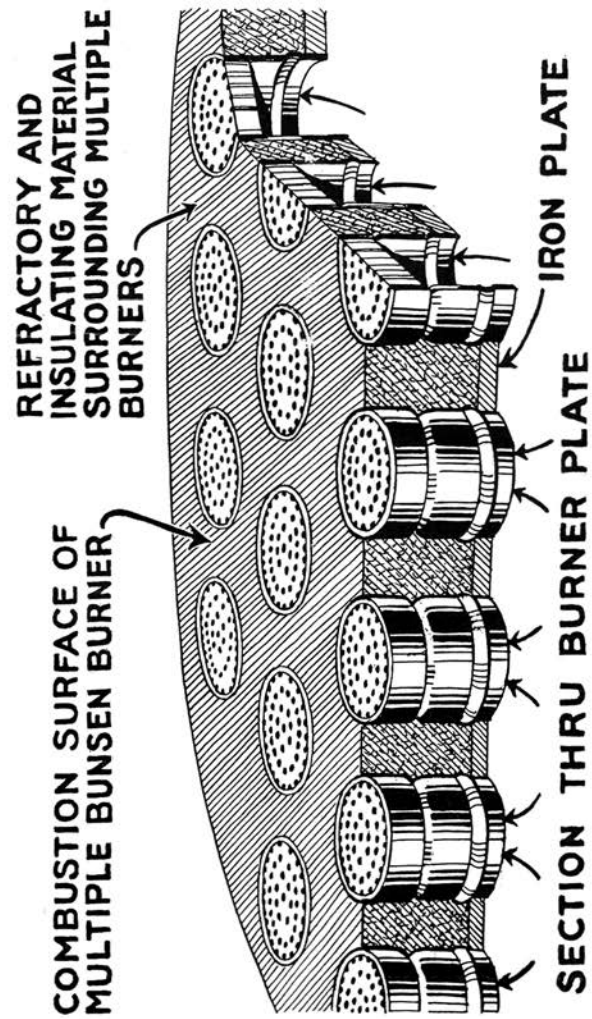
(Fig. 5)

As the name implies, the THORNE burner employs the well known Bunsen principle, it consists of a multiplicity of Bunsen tubes, studded into an iron plate, these tubes being one inch long are fitted in the top with perforated lava discs (see sectional view burner plate construction). Lava being a product of volcanic ash is practically indestructible by the action of heat, it will not oxidize, corode or deteriorate under high temperatures, therefore, lava is the best known material for burner construction.

Burners of drilled or slotted cast iron construction, generally known as the conventional type, are quite practical within certain limits, however, where extremely high temperatures are required, over long periods of time, burners of the cast plate type fail, the reasons for failure are quite obvious, first, excessive heat oxidizes the surface of the burner casting thereby decreasing the open area of slots or holes through which the combustible gases are liberated, increases the pressure on the gases in the mixing chamber and gradually reduces burner efficiency, further, it promotes the hazards of igniting the gases in the mixing chamber, "commonly known as back-firing," which is caused by excessive pressure on combustible gases and overheated burner casting.

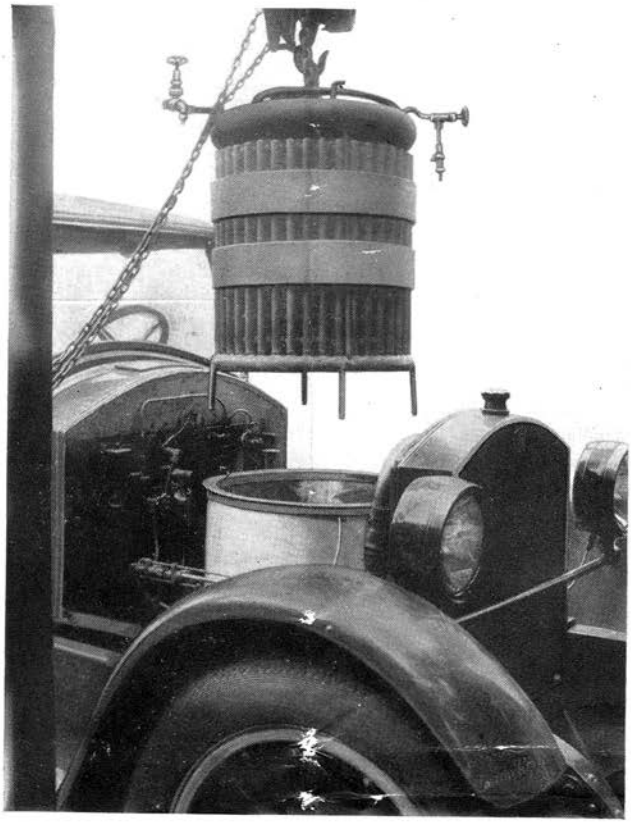
In the construction of the THORNE multiple Bunsen burner all of the foregoing hazards are eliminated, the burner plate being constructed of thick refractory material, with a minimum of metal exposed to the reflex heat of the furnace, eliminates entirely the hazards of overheated burner and back-firing.

In the efficient production of steam there are two essentials, viz.: first, there must be a liberal amount of effective heating surface in the boiler or generator; second, there must be a practical method of supplying sufficient heat to the heating surfaces. The THORNE burner is designed and constructed to produce an abundance of heat, with maximum fuel economy.



(Fig. 6)

Generator Easily Installed



(Fig. 7)

Figure 7: Showing the installation of the THORNE MULTIPLE STEAM GENERATOR in a ten year old Stanley Steam car. Note the accessibility and the ease with which the generator can be removed from its casing.

The Thorne generator is built to a size best suited to automotive installation. Where the steam requirements are greater than a single generator can supply, dual or multiple installation is recommended.

Generator Specifications

Diameter over all	25 Inches
Height over all	36 Inches
Water content, working level	12 Gallons
Total heating surface	104 Sq. Feet
Working pressure	600 Lbs. Sq. Inch
Estimated boiler horse power	48
Weight, approximately	600 Pounds

Manufactured and for Sale by

Automotive Steam Service

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CHICAGO, ILL.