

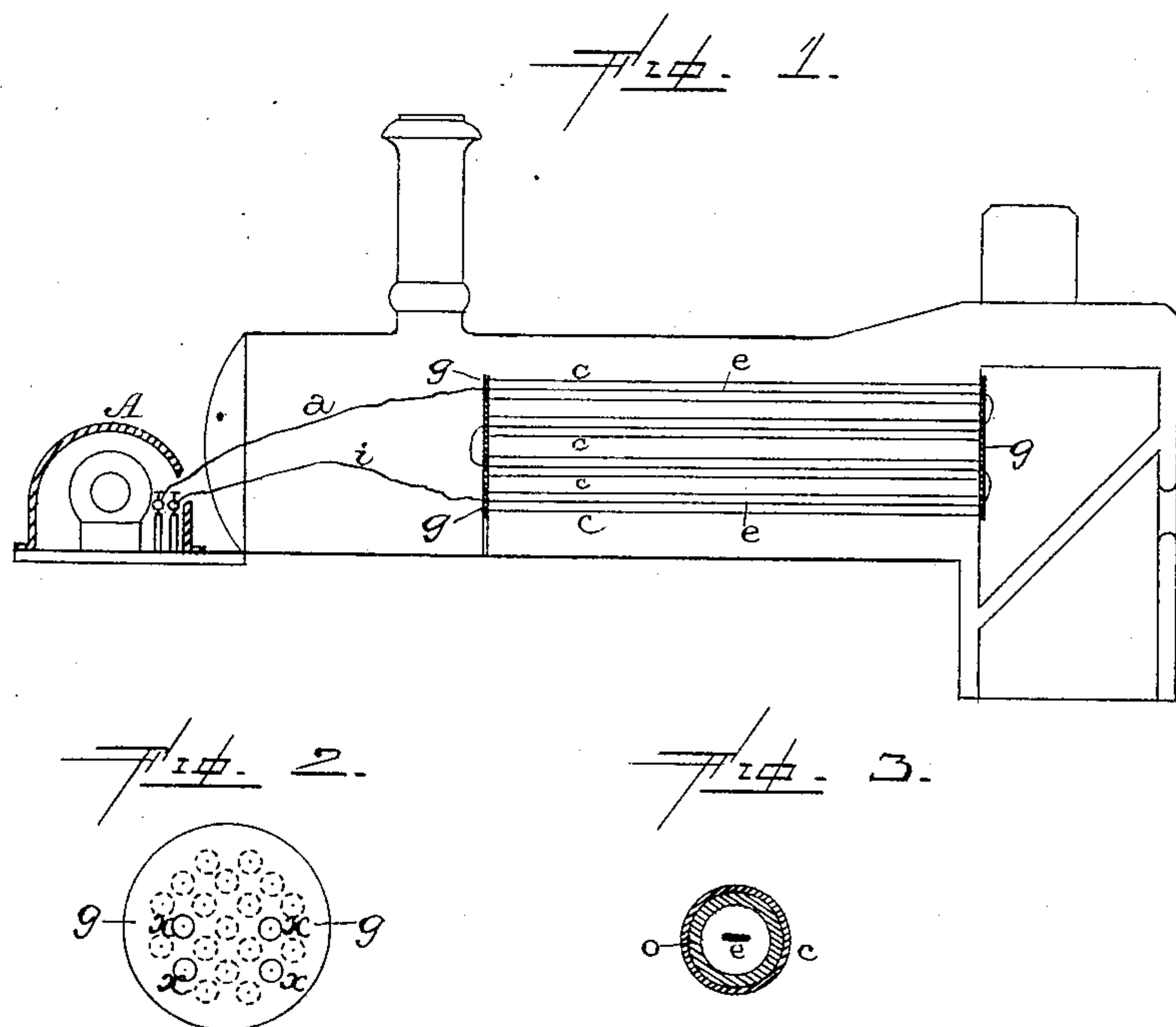
(No Model.)

W. W. VAUGHN & E. D. ELDRIDGE.

MEANS FOR GENERATING STEAM BY ELECTRICITY.

No. 314,277.

Patented Mar. 24, 1885.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

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## MEANS FOR GENERATING STEAM BY ELECTRICITY.

SPECIFICATION forming part of Letters Patent No. 314,277, dated March 24, 1885.

Application filed May 5, 1884. (No model.)

*To all whom it may concern:*

Be it known that we, WALTER W. VAUGHN and EDWARD D. ELDRIDGE, citizens of the United States, residing at Stockton, in the county of San Joaquin and State of California, have invented certain new and useful Improvements in Method of Generating Steam by Electricity, of which the following is a specification, reference being had therein to the accompanying drawings.

Our invention relates to an improvement in means for generating steam by means of electricity; and it consists in the combination of a suitable dynamo-machine, suitable wires which are connected thereto, strips of platinum which are passed back and forth through the flues of the boiler, and suitable means for insulating the strips or wires from the boiler, as will be more fully described hereinafter.

The object of our invention is to generate steam by the means of electricity, and by means of strips or ribbons of platinum which are passed back and forth through the boiler-tubes, and which strips or ribbons are made white hot by the passage of electricity through them.

Figure 1 is a vertical longitudinal section of a locomotive-boiler to which our invention is applied. Figs. 2 and 3 are detail views of the flues.

A represents a dynamo-machine, which will be placed in any desired relation to the boiler, and be operated by any suitable motor or in any suitable manner that may be preferred. This motive power may be electricity or compressed air or gas, springs, or any other known power for operating machinery of any kind. From one of the poles of this machine extends a suitable conducting-wire, *a*, to one of the flues, *c*, of the boiler, at which point it is connected to the wire, strip, or ribbon of platinum *e*. This wire, strip, or ribbon of platinum is passed back and forth through the flues of the boiler, and has its other end connected to the conducting-wire *i*, which is attached to the other pole of the dynamo-machine. When the dynamo-machine is started in operation, the current passes through the strip of platinum and heats it white hot, and the heat from this white strip, ribbon, or wire is imparted to the water in the boiler

from the flues for the purpose of generating steam. As the heat from the platinum is very intense, steam can be quickly and readily raised in the boiler, the same as if a fire were made in the furnace of the boiler in the usual manner. The entire length of each flue through which the platinum strip passes is lined with any suitable insulating material, *o*; but we prefer to use graphite which is purified from all traces of iron, as it prevents corroding of the flues, and is a non-conductor of electricity to a certain extent, while it allows the heat to pass through it rapidly enough to give out a proper degree of heat and still protect the iron of the flues, and will prevent their burning out. Each end of the flues, or that portion of their number which is traversed by the platinum wire, strip, or ribbon, is covered with a perforated plate, *g*, of graphite or other suitable material, the perforations of which permit the passage back and forth of the wires or strips as they pass back and forth through the flues. These plates through which the platinum wires pass will be held in position against the ends of the flues by any suitable means. The perforations are of sufficient size to permit only the exact passage of the wire, hermetically sealing them against the ingress of air, or of any element except the electric current which passes through the wire. The flues traversed by the strips, wires, or ribbon are of smaller diameter than are in use in engines employing the ordinary fuels only, for the purpose of facilitating the direct application of electric heat over a larger given surface of boiler-flues.

Of course the dynamo-machine will be supplied with circuit-closers, whereby the flow of the electric current may be controlled at will. The plates *g* hermetically close all of the flues *c*, except those, *x*, through which the products of combustion pass when a fire is used in raising steam. The flues *x*, as shown in Fig. 2, are left entirely open, so that the products of combustion can pass freely through. Fire will be used when the motive power for the dynamo is not available.

The power of a stream of water, a waterfall, or a windmill placed on a hill may be used to run the dynamo, and the electricity thus generated far away may be used to raise



the steam. When this motive power is out of repair so that it cannot be used, fire will be used under the boiler.

Having thus described our invention, we  
5 claim—

The combination of a steam-boiler provided with suitable flues with a dynamo-machine, suitable wires connected thereto, and a strip, band, or wire of platinum which is passed back  
10 and forth through the flues, which are sealed

hermetically at their ends and lined their entire lengths with graphite, substantially as set forth.

In testimony whereof we affix our signatures in presence of two witnesses.

WALTER W. VAUGHN.

EDWARD D. ELDRIDGE.

Witnesses:

ELIHU B. STOWE,

JOSHUA B. WEBSTER.