

S. G. POCHÉ.
REGENERATOR.

APPLICATION FILED JAN. 25, 1911.

1,004,901.

Patented Oct. 3, 1911.

2 SHEETS—SHEET 1.

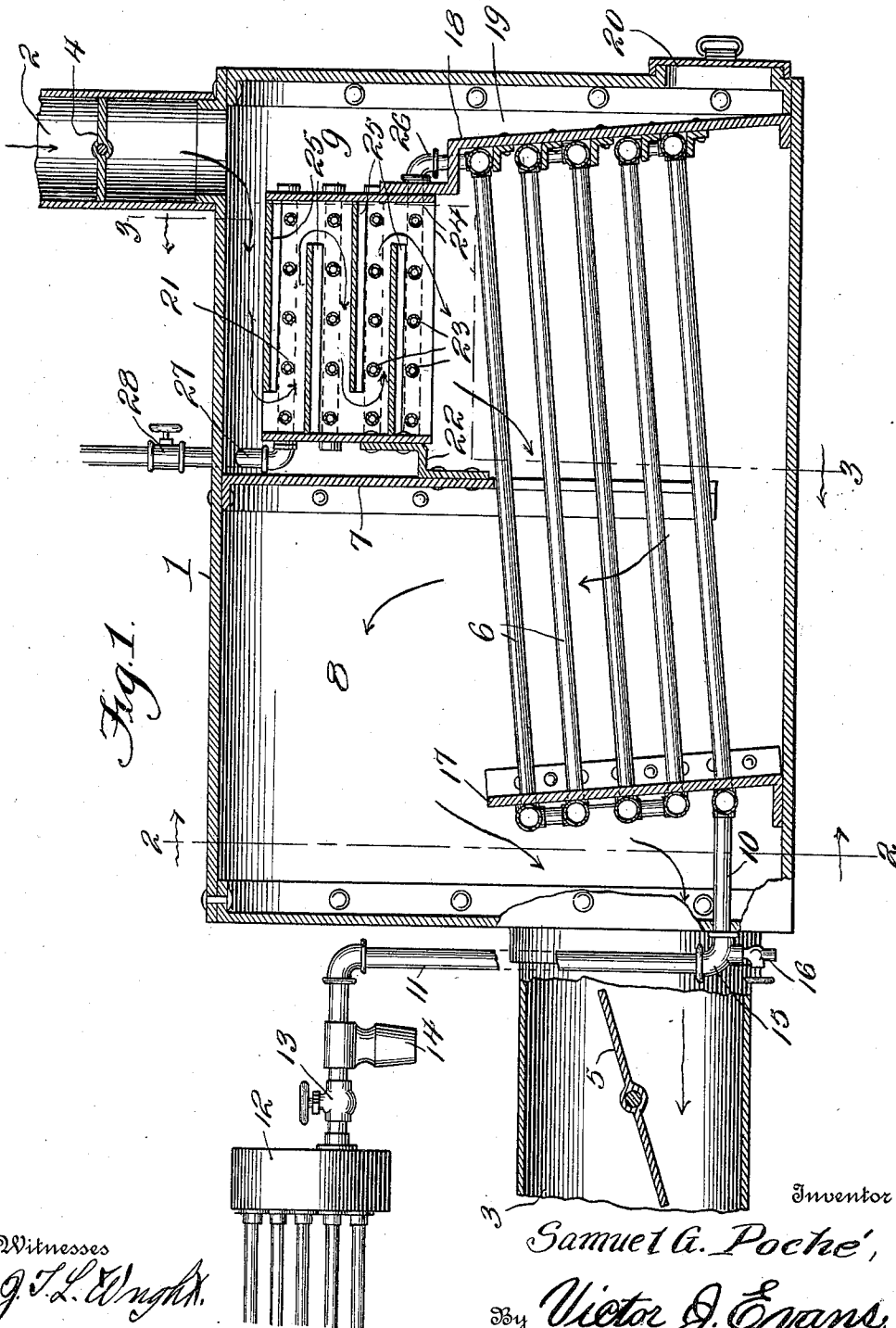


Fig. 1.

Witnesses
J. L. Wright.
C. C. Hines.

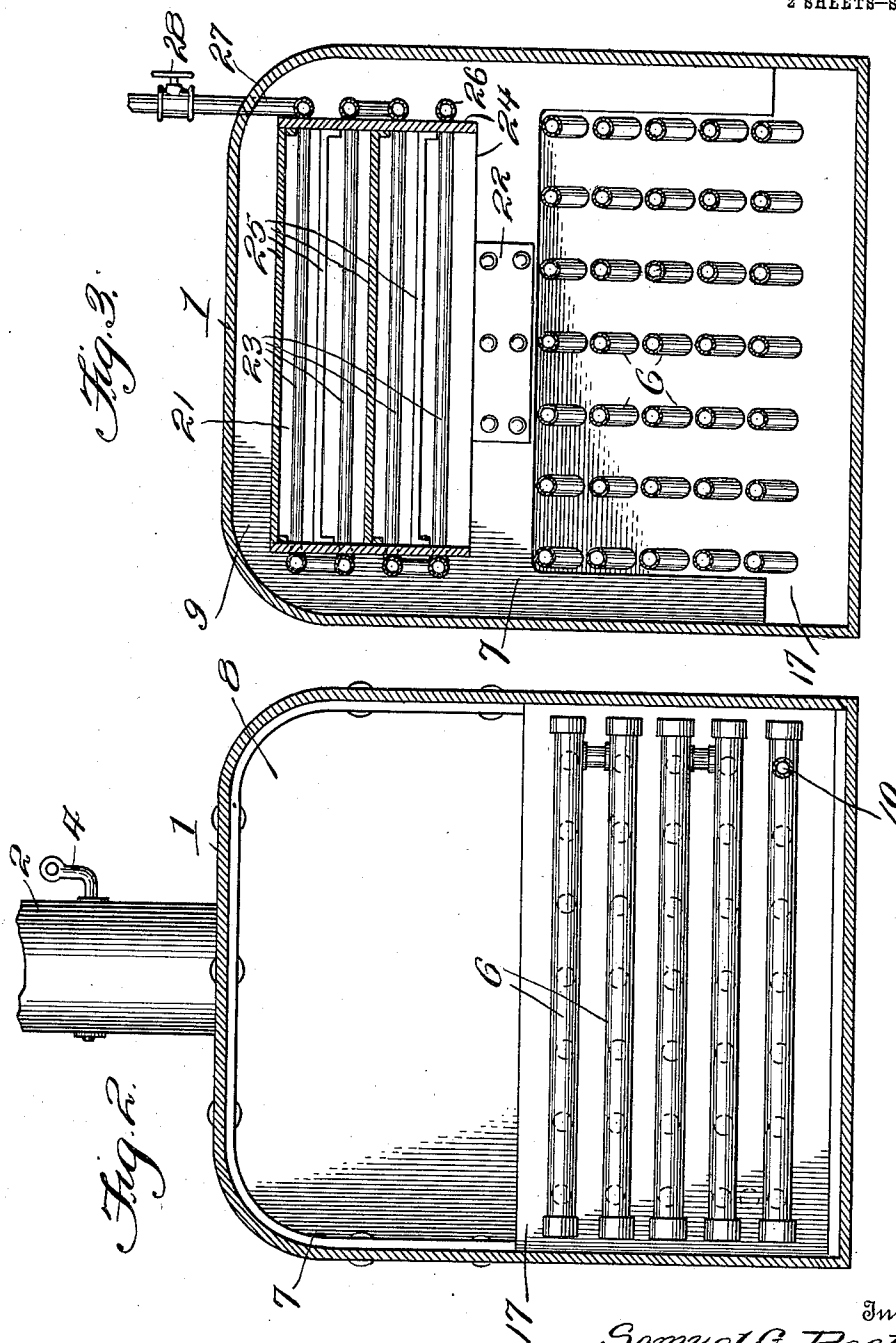
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Samuel A. Poche',
By *Victor J. Evans,*
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UNITED STATES PATENT OFFICE.

SAMUEL GEORGE POCHÉ, OF BELLEROSE, LOUISIANA.

REGENERATOR.

1,004,901.

Specification of Letters Patent.

Patented Oct. 3, 1911.

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To all whom it may concern:

Be it known that I, SAMUEL GEORGE POCHÉ, a citizen of the United States, residing at Bellerose, in the parish of Assump-
tion and State of Louisiana, have invented
new and useful Improvements in Regener-
ators, of which the following is a specifica-
tion.

This invention relates to a regenerator or
heater for reheating the exhaust steam from
steam power plants, and particularly to an
apparatus of this character adapted espe-
cially for use in sugar refining plants for
reheating the exhaust steam from the en-
gines and utilizing the same over again as
a power agent or employing it as a heating
medium for boiling the juice, heating vacu-
um pans and performing other like oper-
ations.

The object of the invention is to provide
a simple, reliable and effective apparatus of
this character which may be applied to any
existing plant to reheat the exhaust steam
from all the engines, and which will utilize,
as the heating medium, the products of com-
bustion from the furnaces, which are usually
allowed to go to waste, thus securing greater
economy in the operation of such plants.

The invention consists of the features of
construction, combination and arrangement
of parts hereinafter fully described and
claimed, reference being had to the accom-
panying drawings, in which:—

Figure 1 is a vertical longitudinal section
through a generator embodying my inven-
tion. Fig. 2 is a vertical transverse section
on line 2—2 of Fig. 1. Fig. 3 is a vertical
transverse section on line 3—3 of Fig. 1.

Referring to the drawings, 1 designates
the regenerator box or casing which is pro-
vided with an inlet 2 and an outlet 3 for the
inflow and exhaust of the heated products
of combustion or escaping gases of the fur-
naces of the plant. The inlet 2 is in the
nature of a pipe or conductor with which
pipes leading from the chimneys of the fur-
naces are connected in any suitable manner,
said inlet being provided with a controlling
damper 4. The inlet 2 is located at the top
of the rear portion of the casing 1, while
the outlet 3, which is provided with a con-
trolling damper 5, is located at the bottom
of the rear end of said casing 1.

The box or casing 1 is of proper dimen-
sions to receive a secondary heater 6, said
heater consisting of a bank or coil of heat-

ing tubes or pipes extending at an upward
inclination from a point adjacent the rear
wall of the heater to a point adjacent the
front wall thereof. Midway of its length
the casing 1 is sub-divided at its top by a
partition 7 to provide circulating chambers
or compartments 8 and 9, the lower end of
said partition extending around the sides
of the secondary heater 6, so as to cause the
gases or products of combustion entering
through the inlet 2 to first pass downwardly
in the chamber 9 and through the upper
front ends of the tubes 6, thence upwardly
through the rear portions of the tubes 6
into the front portion of chamber 8, and
thence downwardly through the rear por-
tion of the said chamber 8 to the outlet 3.

The inlet end 10 of the secondary heater
or coil is connected at one end with a steam
supply pipe 11 leading from a manifold 12
with which are connected in practice the
conducting pipes leading from the exhaust
pipes of the engines or steam utilizing ele-
ments of the power plant, which exhaust
steam is reheated by the regenerator for fur-
ther use. Arranged in the upper portion of
the pipe 10 is a valve 13 for cutting off the
flow of steam from the manifold to the pri-
mary heater 6, and also arranged in said
portion of the pipe is a separator 14 to
separate the steam from the water of con-
densation. At the point where the lower
end of the pipe 11 connects with the inlet
10, a coupling connection 15 is provided
which forms a trap into which the water
of condensation collects and from which it
may be discharged through a drain valve
or cock 16. The said secondary heater 6 is
supported wholly or in part by suitable
headers 17 and 18, the header 18 being ar-
ranged to form a baffle plate to cause the
direct downflow of the products of com-
bustion from the top to the bottom of the
chamber 9, as well as to provide a passage
into which the carbon or other products
liberated from the discharging gases and
dropping into the casing may be collected
or removed through a door 20.

Arranged within the top of the chamber
above the upper portion of the primary
heater 6 is a primary heater 21 supported
by an extension from the header 18 and suit-
able brackets 22. This heater consists of a
series of superimposed horizontal coils,
of which any suitable number may be em-
ployed, said coils being supported within

an open work frame 23 and partially separated by interposed baffle plates 25 by which the products of combustion are caused to pass in a back and forth or zigzag path downwardly through the said primary heater before discharging entering the lower end of chamber 9, but are retarded sufficiently in their flow so that a maximum amount of the heat units carried thereby will be extracted and absorbed by the coils 23. The inlet end of the lower coil 23 is connected with the outlet end 26 of the secondary heating coil 6, and the discharge end of the lower coil 23 is in turn connected with the inlet end of the coil next above it, and so on throughout the series, the outlet of the top coil 23 being connected with a discharge pipe 27 leading to the exterior through the top of the casing 1 and provided with a suitable controlling valve 28.

From the foregoing description, it will be understood that the waste steam exhausted from the various engines and other steam employing elements of the plant is conducted to the manifold 12 and passes first through the secondary heater 6 and then through the primary heater 21, and is heated to a high degree on its passage through said heaters, so that upon its discharge through the outlet pipe 27 it may be employed again as a motive fluid for engines or as a heating fluid for boiling the sap for heating vacuum and other pans and for performing various other heating operations in plants of the character described. By the construction and arrangement of the two heaters, it will be seen that the exhaust steam will be heated to a very high degree within a compact form of regenerator which may be arranged at a suitable point in the building of the plant and connected for use with any ordinary plant without modifications or changes in the construction thereof. It will also be seen that by utilizing the waste heat from furnaces of the plant, which heat is employed in the most effective manner, the steam may be heated without extra cost for fuel, thus securing greater economy in the operation of the plant.

By the described arrangement of the secondary heater, and its mode of construction, it will be seen that the steam will be subjected to the heat from the products of combustion at the point where said products are hottest, whereby increased efficiency is secured.

Having thus described the invention, what I claim as new, is:—

1. A regenerator comprising a casing having compartments communicating at their lower ends, a secondary heater extending

into both compartments for the circulation of a heating medium therethrough in a circuitous path, an inlet for heating fluid communicating with the top of one of said compartments, an outlet for the heating fluid leading from the base of the other compartment, a steam supply pipe communicating with the inlet end of said secondary heater, a primary heater communicating with the outlet end of the secondary heater and arranged between the same and the said outlet, said primary heater being provided with a discharge for the re-heated steam, and controlling devices arranged in the inlet and outlet and steam supply pipe.

2. A regenerator comprising a casing having a central partition in the upper portion thereof forming inlet and discharge chambers in communication at their lower ends, a flue communicating with the upper end of the inlet compartment for the supply of a fluid heating agent thereto, a flue leading from the lower end of the discharge compartment for the outlet of said heating agent, a secondary heater comprising a coil extending below the partition into the two compartments, a valved steam supply pipe communicating with the inlet end of the heater within the discharge compartment, a primary heater arranged within the upper end of the inlet compartment and communicating with the discharge end of the primary heater, and a valved outlet leading from said primary heater.

3. A regenerator comprising a casing having a central partition in its upper portion forming inlet and discharge compartments in communication at their lower ends, an inlet flue communicating with the upper end of the inlet compartment, an outlet flue communicating with the lower end of the discharge compartment, a secondary heating coil arranged below the partition and extending into the two compartments, a valved steam supply pipe connected with the inlet end of said coil within the outlet compartment, a primary heater comprising a series of superposed communicating coils arranged in the upper portion of the inlet compartment between the secondary heater and inlet flue and having its lower coil connected with the discharge end of said secondary heater, and a valved outlet leading to the exterior of the casing from the outlet end of the upper coil of said primary heater.

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

SAMUEL GEORGE POCHÉ.

Witnesses:

N. T. LE BLANC,
P. P. LANDRY.