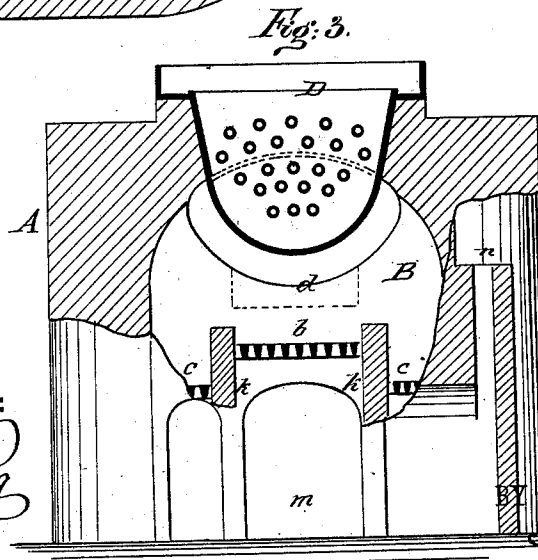
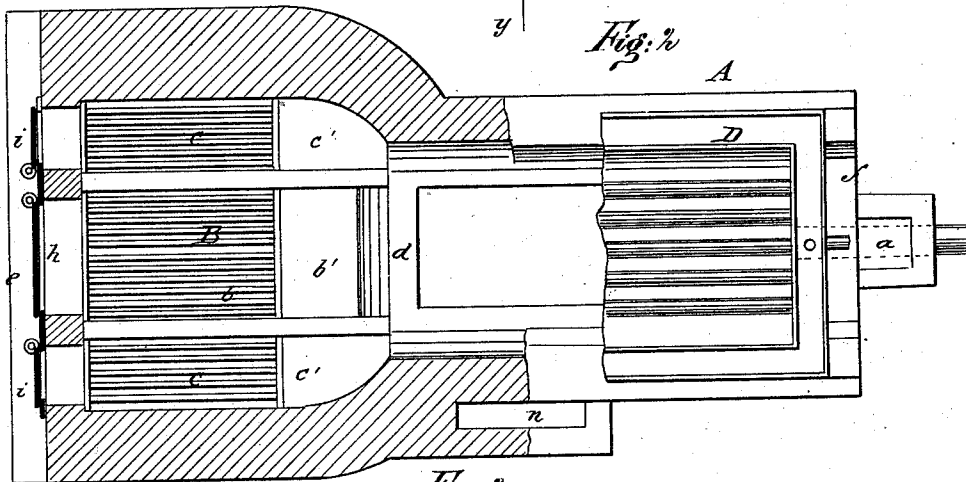
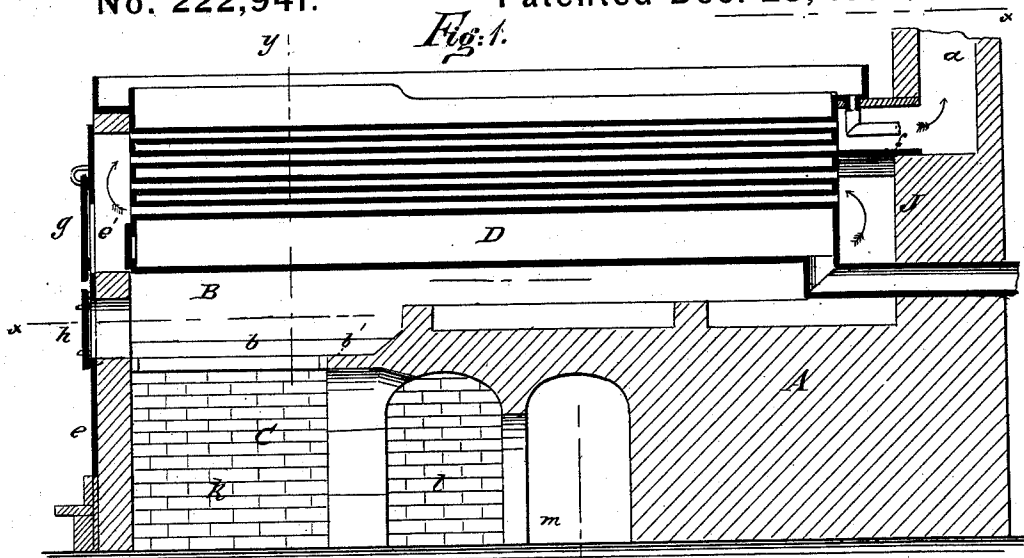


F. PEREZ de la TEGA.
Furnace.

No. 222,941.

Patented Dec. 23, 1879.



WITNESSES:

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INVENTOR:

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UNITED STATES PATENT OFFICE

FELIPE PEREZ DE LA TEGA, OF HAVANA, CUBA.

IMPROVEMENT IN FURNACES.

Specification forming part of Letters Patent No. **222,941**, dated December 23, 1879; application filed July 30, 1879.

To all whom it may concern:

Be it known that I, FELIPE PEREZ DE LA TEGA, of Havana, Cuba, have invented a new and Improved Furnace, of which the following is a specification.

My improvements relate especially to furnaces for burning bagasse, or bagasse with other fuel, but are applicable to furnaces generally.

The object of the invention is to consume the smoke and gases thoroughly; to aid the combustion of slow-burning fuel, such as wet bagasse, by burning with it a quick-burning fuel; to permit the keeping of a small fire when active operations are suspended, and to prevent the accumulation of carbonized fuel in the ash-pit of the furnace.

In my improved furnace there are three grates—a central grate with a smaller one at each side and on a lower level. Above the side grates the fire-chamber is formed with arches, which, being intensely heated by a quick fire on the side grates, the smoke and gases are quickened to a rapid combustion. The grate-surfaces are formed with a solid portion at the back, on which the carbonized bagasse or other fuel collects and is consumed, and beneath the furnace is an arched passage, connecting with the ash-pit and outer air at the side of the furnace, whereby the ash-pit space is kept cool and danger from fire driven out by back pressure is prevented.

In the accompanying drawings I have shown my improved furnace as fitted in connection with an evaporating-pan, for which pan I have made application for Letters Patent.

Figure 1 is a vertical longitudinal section. Fig. 2 is a section-plan view on the line *x x* of Fig. 1. Fig. 3 is a vertical transverse section on the line *y y*.

Similar letters of reference indicate corresponding parts.

The furnace-stack A will be built of brick, in suitable proportions of length and width. It is formed with the fire-chamber B and ash-pit C at the front, and escape-flue *a* at the rear. *b* is the main or central grate, and *c c* the side grates, supported on suitable bearers, the grate *b* being on a higher level than grates *c*. At

the rear of these grates is a blind portion or shelf, *b' c'*.

The fire-chamber B is arched above the grates *c*, and drawn in at the back to the bridge-wall *d*, so that the space for the escape of the products of combustion is about the width of the central grate, *b*.

The pan or boiler D extends from the front wall, *e*, to near the rear wall, J. The space between J and the rear of the boiler is divided by a horizontal partition, *f*, which causes the products of combustion to return to the front, and back again, by the tubular flues of the pan, before their final exit by flue *a*.

The front wall, *e*, is formed with a space, *e'*, into which the tubes open, and a door, *g*, permits access to the tubes. The front wall is also provided with openings and doors *h i i*, for giving access separately to the grates *b c c* in firing.

The ash-pit C is divided by walls *k*, running lengthwise, so that there is a separate space for each grate, which spaces open at the rear to the arched space *l* beyond the grate, so that the ashes from beneath each grate can be raked into the space *l*. At the rear side of space *l* is an arched space, *m*, opening from one side of the furnace A, and connecting at the opposite side with an upwardly-opening flue, *n*. This space *m* gives access beneath the furnace, furnishes the air for draft, and maintains a current of air which cools the ashes. Doors may be fitted for closing the openings to space *m* when required.

In burning bagasse the fuel becomes carbonized from an insufficient supply of air, and, falling into the ash-pit, is there ignited, so that the grates are rapidly burned out.

Another difficulty has been, especially where high winds prevail, that the fire is forced backward through the draft-openings in long sheets of flame, which ignite the accumulations of bagasse and cause a general conflagration. The construction above described obviates these difficulties. The carbonized fuel can be pushed upon the blind surfaces *b' c'*, and will there be gradually consumed. The space beneath the grates may be kept clear of refuse and the refuse cooled. The furnace has an ample supply of air, and in case of back-drafts

the pressure is equalized by the arched space *m* being open at both ends.

Heretofore, if the bagasse fuel was too wet to burn, a more expensive fuel, such as coal, had to be used. By the use of the triple grates, as shown and described, a fire of wood or coal can be kindled upon the smaller side grates, and the wet bagasse placed on the center grate, where it will be dried and consumed. The arches above the grates *c* will become highly heated, and the smoke, coming in contact therewith, will be ignited and pass in hot flames over the bridge-wall. The triple grates are also advantageous for keeping up a limited amount of heat and small pressure of steam by a fire of slow-burning fuel on the smaller grates during the night, so that in the morning active work may be quickly resumed by placing the lighter fuel on the grate *b*.

This furnace is especially useful for sugar-evaporating, and can be used with open or vacuum pans. By using pans or boilers with the return-flues, as shown, the heat is utilized

to the greatest extent, and at least one-half less fuel required than heretofore to perform the same work.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. The improved furnace for steam-generators or evaporating apparatus, provided with the arched fire-space *B*, triple grates *b c c*, bridge-wall *d*, escape-flue *a*, divided ash-pit *C*, arched passages *l m*, and flue *n*, substantially as described and shown, and for the purposes set forth.

2. In furnaces for burning bagasse, the combination, with the ash-pit *C* and closed front wall, *e*, of the passage *l* and cross-passage *m*, open to the outer air at both sides of the furnace, substantially as and for the purposes specified.

FELIPE PEREZ DE LA TEGA.

Witnesses:

JOS. A. SPRINGER,
JOS. A. RAPHEL.