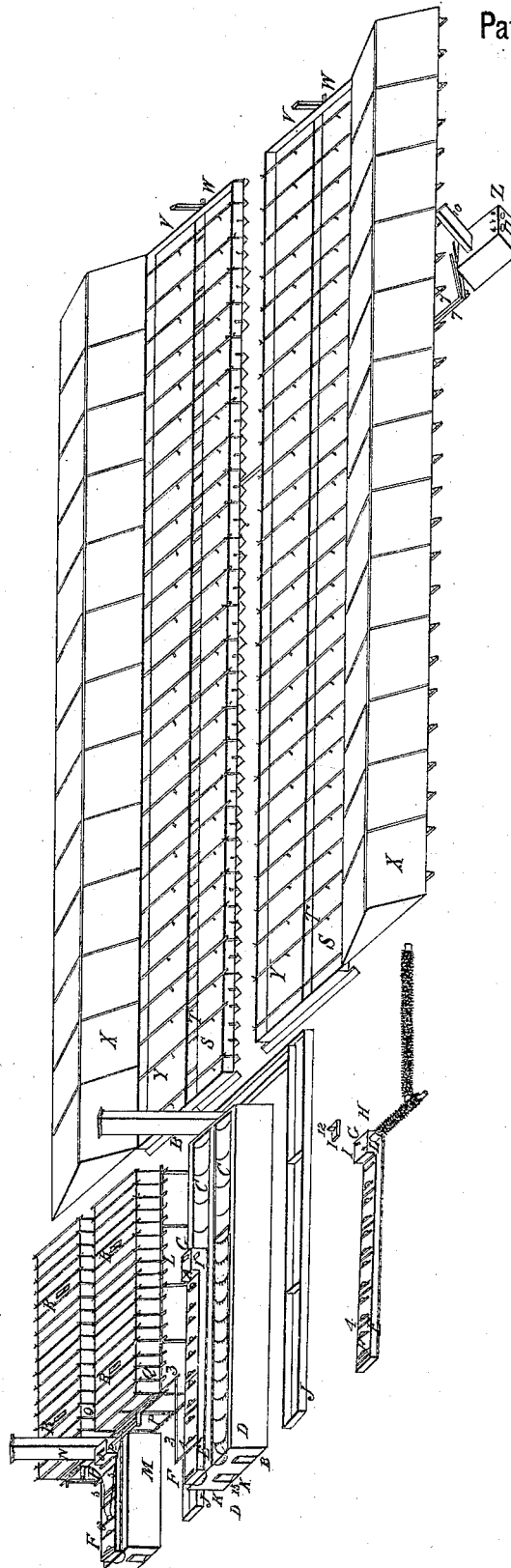


C. GUTEAU.
Evaporating Pan.

No. 2,735.

Patented July 23, 1842.



Witnesses:

Edward P. Reed
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Inventor.

C. Guteau

UNITED STATES PATENT OFFICE.

CALVIN GUTEAU, OF GEDDES, NEW YORK.

IMPROVEMENT IN SALT-WORKS.

Specification forming part of Letters Patent No. 2,735, dated July 23, 1842.

To all whom it may concern:

Be it known that I, CALVIN GUTEAU, of the village of Syracuse, town of Salina, in Onondaga county and State of New York, have invented a new and Improved Mode of Manufacturing Coarse and Fine Salt; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists of four boilers, set in walls made of stone and brick. The two front boilers are forty feet long, and are intended to make brine and generate steam, and are made of sheets of cast-iron, with flanges on the inner side of each sheet from one and a half to two inches wide, so as to be drilled through and riveted together. The boilers are of an exact semicircle, three feet across, about nine-tenths of an inch thick at the bottom, and about three-tenths of an inch at the upper side of the boiler, and of a true taper from the bottom to the upper side of the flange. There is a flange from two and a half to three inches wide turned to a horizontal level, which supports the boilers on the walls in which they are set, and then turns up perpendicular about four inches, through which holes are bored about ten inches apart. The heads are of cast-iron, and are carried up to the same level with the flange, as above described, through which holes are also bored. The rear boilers may be made of boiler sheet-iron, with a horizontal flange about three inches wide to support them on the walls; or both front and rear boilers may be made of cast-iron sheets, as above described, without the inner flange, by a band of iron of at least a quarter inch thick, and about four inches wide, laid on where cast-iron sheets come together on the outside, and so drilled through the sheet and bands as to be riveted substantially together, and be well cemented on the inner side in the joints. There is a fifth boiler, made the same as the above-described forty-foot front boilers, but only twenty feet in length, and is used to generate steam to heat the crude salt-water in the reservoir and make brine.

A is the walls, of stone and brick, in which the above four boilers are set, the two in front to generate steam and make brine, and the two in rear to make fine salt, which are filled with and boil pure saturated brine only. (See the annexed plan, the boilers *c c c c*.) The

walls are eleven feet wide. The bottom of the boilers in front are five feet above the hearth of their fire-places.

D D are the cast-iron frames in front to support the walls, and have two iron rods on each side secured through the cast-iron, which extend about four feet into the walls, with their ends turned at right angles, and so laid in by mason-work as to give strength and security. (See the plan 13.) Six inches in from the front of the fire-place and eight inches above the hearth cast-iron plates are secured in the wall on each side, projecting out one inch, on which projection the mouth-irons rest on which the wood is laid. The hearth of the fire-places is made of brick, and laid edgewise, with thin clay mortar mixed with salt-water and extended in three feet from the front on a level. The brick are then laid flatwise with the same kind of mortar, on an inclined plane seventeen feet, which brings it up to within six inches of the bottom of the boiler, keeping the width of twenty inches between the walls. It is then expanded in direct lines, and carried down the canals or flues from the twenty inches in width to twenty-three inches at the chimney and ten inches below the bottom of the boiler. The flues or canals are then turned down, so as to enter the flues of the chimney on its upper side as low and on a level with the canal or flues above described, being ten inches below the bottom of the boiler. The wall about the sides of the boilers is laid on a circle from the upper sides, which circle falls six inches below the bottoms of the boilers. Where the flues come six inches below the bottom of the boilers, as above expressed, the whole of the flue is estimated at one hundred and eighty square inches, and at the chimney two hundred square inches, up the flue of the chimney two hundred and fifty square inches, which chimney must be made with a substantial partition from the bottom to the top, so that each fire is kept in its own flue.

E E represent a two-inch pine plank sixteen inches wide, twenty feet long, set in and fitted to the flange which supports the boilers on the walls, with holes bored corresponding with the holes in the flange which supports the side plank, through which iron bolts are placed with screws on the ends, on which nuts are fitted, and in the same manner at the heads K K, also the rear ends. When screwed up is

made secure by calking with hemp, flax, or cotton, incorporated with white-lead and oil between the flange and plank to prevent leaking. At the rear end the planks are carried up, so as to attach steam-conductors to them to carry the steam to the salting-vats, and are closely covered by two-inch plank in the form of a box.

F F are covers with wooden handles and with cross-pieces of two-inch plank framed across into the side plank to support the same. The covers are made of half-inch pine boards, and of two or three in thickness, by placing them together lengthwise, so as to break joints, and when swelled by steam the swelling and shrinking will be equal. They must be well put together by suitable nails, and at the sides and ends cut down to an angle of forty-five degrees, also the upper side of the plank and cross-pieces, so that when placed over the boilers they will set to a joint and to a uniform level. When the covers are laid on as above explained, take pure clay mortar, and with the finger press it into the joints of the covers (as still-caps are pasted on) to secure against the escape of steam.

G G represent the opening four by five inches, to let off the steam as occasion requires.

H H represent an iron rod, which passes through the cover of the steam-box and is attached to a wooden slide on the inside and secured to the plank on each side by cleats. By the iron rod the slide is pushed down, which closes the steam-conductor. When raised the passage is open for the steam to pass to the steam-box of the salting-vat.

I I are openings twelve inches square.

U is a box open at each end, and is secured at one end into the opening at I, the other end secured in the opposite opening at I, which box, so fitted in slide 12, opens a passage for steam from one boiler to the other, through the center of which box, on the upper side, an opening is made, and on the inner side of the box, down each side, it is grooved and a slide is made and so fitted in when pushed down to stop the passage of steam, and when pulled up the passage is opened. By the use of this box the steam of both boilers may be turned and used either way, or by closing the passage by the slide, as above explained, the steam is confined on each side to its own conductor.

J J J are the side vats with their partitions, where the brine which is discharged from the boilers and carried by wooden spouts into the front end of each side vat 5° from saturation, (by a hydrometer graduated at 100° for saturation,) where a constant stream is falling onto salt, which completes the saturation, and the last of the impurities are precipitated. The first partition stops most of the impurities, from which they are thrown or shoveled out. The brine is then drawn into the second apartment, where the most or all of the impurities which remain settle. The brine is then carried to the third apartment, from which it is drawn into vats in a perfectly pure state and

distributed into the salting-vats, excepting what has been carried into the rear boilers for making fine salt, which require a supply of from thirteen to sixteen hundred gallons every twenty-four hours.

K K are the heads of front boilers. The uppermost hole is secured by a faucet to test the depth of brine, which is stopped by a long tapering tap to prevent being blocked by impurities and prevent being burned by steam. The second hole is larger than the first about one inch below, and secured in the same manner, where a constant stream is running into a spout and carried into the front end of the side vat, as above explained. Great care is required to avoid approaching to saturation, which would throw down the impurities in bulk and block the boilers; but by not approaching nearer than 5° of saturation, and drawing out the impurities as they are thrown from their suspended state by the force of heat and rise to the surface, the impurities are safely carried in the water to and deposited in the side vats. The hole near the bottom is for discharging the whole when cooling down the works, and may be stopped by a faucet and tap or plug. At the rear end of the walls the brick are so laid in with clay mortar that they may be taken out and the ashes scraped out, which may be there deposited and in the same manner closed up again.

L L are the logs which carry the steam from the covers of the steam-boilers into the steam-boxes of the salting-vats; are of twelve-inch bore.

M represents the walls of a furnace where a boiler is set to heat the reservoirs when filled with crude salt-water; also, a cast-iron frame in front, to support the walls, with a mouth-iron on which the wood is laid in front of the fireplace. The boiler is the same in size as the forty-foot boilers at C C; differs only in length, being twenty feet. The setting in the walls differs only in dropping down the flue at the upper point of the incline plain, which is carried into the chimney on the same plan as above explained at D D.

N is the chimney, the plank on the sides, ends, and covers, and the fixtures at the rear ends the same as the other already described. (See the plan E E.)

O is the door with a wooden handle, which opens to the inside of the steam-box on the rear end of the boiler which heats the reservoir.

P P P P are logs of six-inch bore, which conduct the steam from the boiler into the steam-boxes of the reservoirs, which pass through the center on the bottom of each reservoir, and are covered with copper sheets. The plank which inclose the steam-boiler are opened near the rear part on each side, so as to admit the bored log, (steam-conductors,) and to be so secured as to conduct off the steam. The log to carry the steam to the reservoir is left open, while the opposite one is plugged. When the reservoir is insufficiently heated it is plugged with the plug

sixty feet to two hundred feet, the steam in the rear brought in serves to equalize the heated brine, extends the room and time for continuing the process, and thereby increasing the weight. To make heavy salt, the brine must be deep. If not deep, light flakes and light salt will be the result. The salt should be moved once or twice in twenty-four hours. It presents a new side of each crystal and the weight greatly increased.

What I claim as my own invention, and desire to secure by Letters Patent, is as follows, viz:

1. The manner of setting my four boilers, as described by the annexed plan, with their fixtures for carrying out and effecting thereby the object of simplifying the mode of making more coarse and fine salt with less labor, fuel, and expense than has ever been done or known before in the United States. With two salting-vats of one hundred and sixty feet each in length, with three one-fourth cords of wood one, hundred and fifty bushels are made weighing from seventy to eighty pounds to the measured bushel, and from the rear boilers fifty bushels of pure fine salt from pure saturated brine with an overplus of brine remaining.

2. The extension of the salting-vats to two

hundred feet in length and bringing in the steam from the two boilers to increase and equalize the heat in the rear part of the salting-vats will greatly increase the amount of salt with but a small addition of wood; also, by the use of the condensed steam from the rear end of the steam-boxes, which being pure water will avoid blocking the boilers with limy incrustation as could not be avoided by the use of the fresh water of this region of country being universally impregnated with lime.

3. Avoiding blocking the boilers by keeping short of saturation and drawing off the water with its impurities 5° from saturation as they are driven from their suspended state by the force of heat, and rise to the surface and are drawn into the side vats, and saturation completed by fine salt taken from the rear boilers where in this manner the last of the impurities are separated and deposited. By this process the great difficulties of making salt are remedied, and is not only new but the most useful of anything known or used in the history of salt-making.

CALVIN GUITEAU.

Witnesses:

EDWARD P. REED,
JUSTUS W. HALE.