G. M. LONGACRE.

Evaporating Pan.

No. 13,652.

Patented Oct. 9, 1855.

FIG. 1.

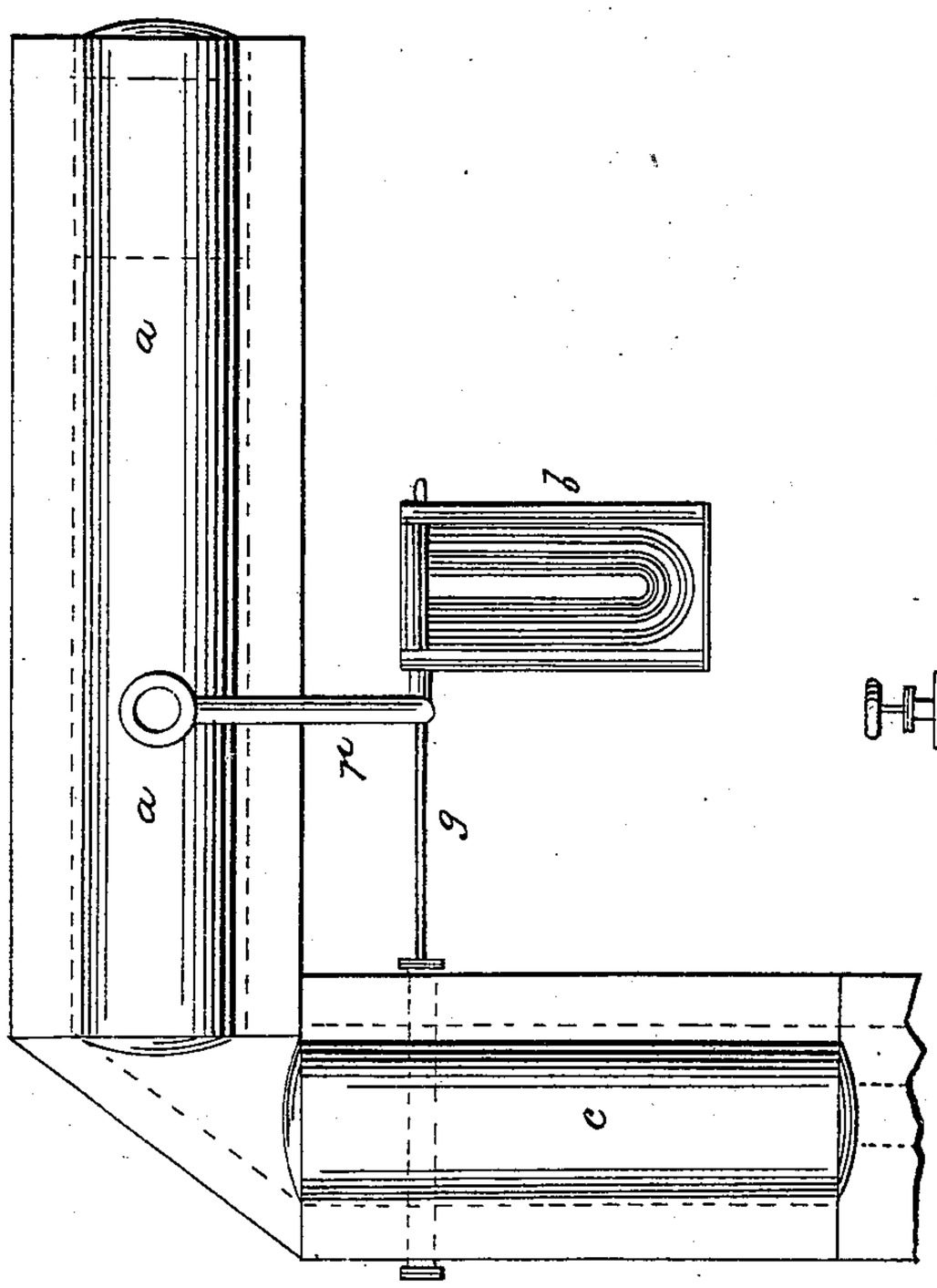
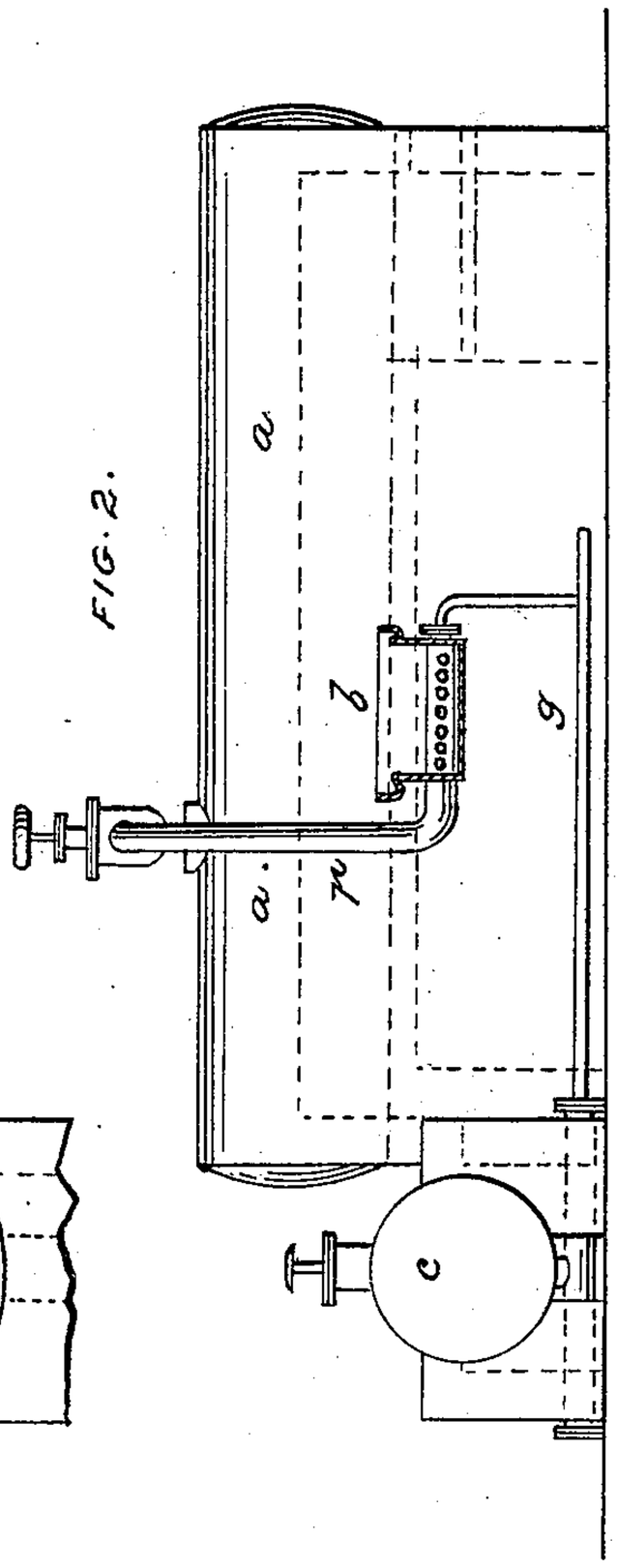


FIG. 2.



INVENTOR.

Geo. M. Longacre

UNITED STATES PATENT OFFICE.

GEO. M. LONGACRE, OF NEW ORLEANS, LOUISIANA.

IMPROVEMENT IN ECONOMIZING STEAM.

Specification forming part of Letters Patent No. **13,652**, dated October 9, 1855.

To all whom it may concern:

Be it known that I, GEORGE M. LONGACRE, of New Orleans, in the State of Louisiana, have invented certain new and useful improvements in economizing fuel and facilitating the evaporating cane-juice, saline, and other solutions and moving machinery in any manufacture where a steam-evaporator is used in conjunction with steam machinery in which my device can be employed; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1 is a plan of the apparatus. Fig. 2 is a side elevation of the parts.

The object of my improvement is to economize fuel, to cause a more rapid and perfect evaporation, and to use the exhaust-steam at a lower pressure after it has passed the evaporators to work the machinery of the mill. To effect this object I employ steam at two different pressures, using the different pressures to keep up a rapid circulation, and employing steam at a very high temperature, without surcharging, for the boiling and evaporating purposes, after which it is made to enter a second generator or boiler, and is thence taken for moving the machinery. For this purpose I employ two sets of boilers. The first set used to generate steam for boiling and evaporating purposes. These are shown at *a a* in the drawings, and are constructed and set in any of the ordinary ways, or, on my improved plan in two rests and with two fire-chambers. The steam is taken directly from these first boilers at high pressure under the evaporators *b*, &c., and from thence to the second set of boilers, *c*, which furnish steam for the grinding and pumping engine. Under the first set of boilers the fire is placed, and in this set the greatest pressure of steam being maintained, the current flows from it toward the second set, which are in a position to receive the waste heat from the fires after they have passed the first boilers. From the second set the fire passes into the chimney.

From the first set of boilers the steam is taken and passed through the connecting-pipes *p* of the various pans, and is returned to the second set of boilers, as clearly illustrated in the drawings by pipe *q*, by which I obtain the following advantages: first, by maintaining a high temperature in one boiler and a lower one in the other, and consequently a higher and lower pressure, the surplus heat is taken up by the second boiler before the gases from the fire pass to the chimney; secondly, the high pressure and temperature of the steam from the first boiler is alone used for boiling, and is essential to evaporate in open pans, as low steam is not hot enough for that purpose, and as the steam in the two boilers is of different pressures, the greater pressure in the first set entirely dispenses with the necessity of a pump to keep up the circulation from the first into the second, and a pump is only used to pump back the water from the second boilers to supply the first boilers; thirdly, a much less surface of pans and length of pipe will answer to produce a given amount of evaporation, as the temperature of the boiling steam is much higher than by any other plan, and the circulation being perfect, the steam when reduced in temperature passes off to the second boiler, thus preventing any waste of heat from escape of steam, for the heat which is not absorbed by the evaporators is employed in working the machinery and for defecating.

Having thus set forth my improvements, what I claim therein as new, and for which I desire to secure Letters Patent, is—

The employment of two sets of boilers in the manner and for the purposes described, having steam of different pressures and temperature therein and passing the steam from the boiler of the highest pressure through the pipes of the evaporators, &c., to the other boiler from whence it is used to move the machinery of the mill.

GEO. M. LONGACRE.

Witnesses:

JACOB HATZEL, Jr.,

SAML. COLEMAN.