M. Groh. & J. V. Weitz.

No. 120,378. *Lime Kiln* Patented Oct. 31, 1871.

Fig. 2.

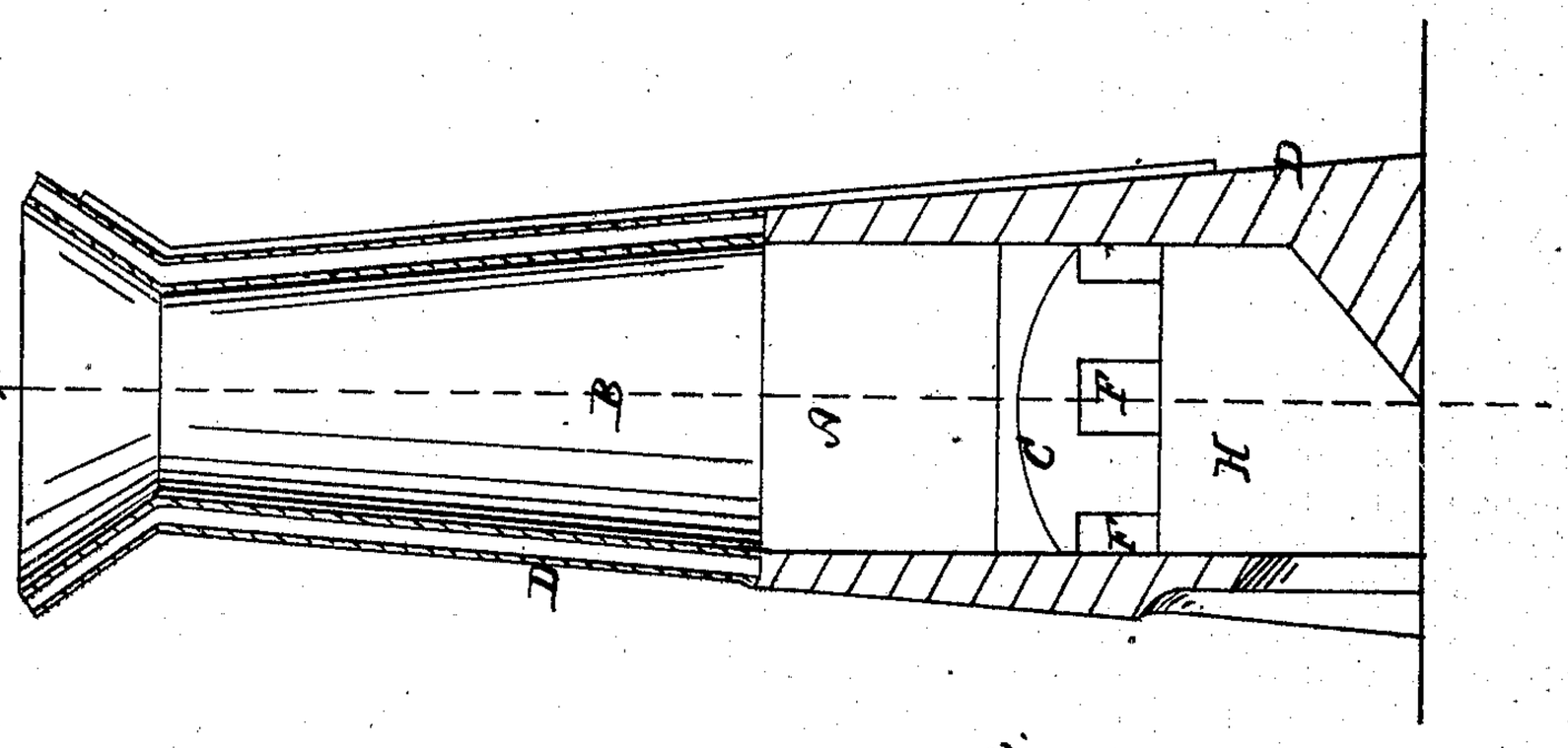



Fig. 3.

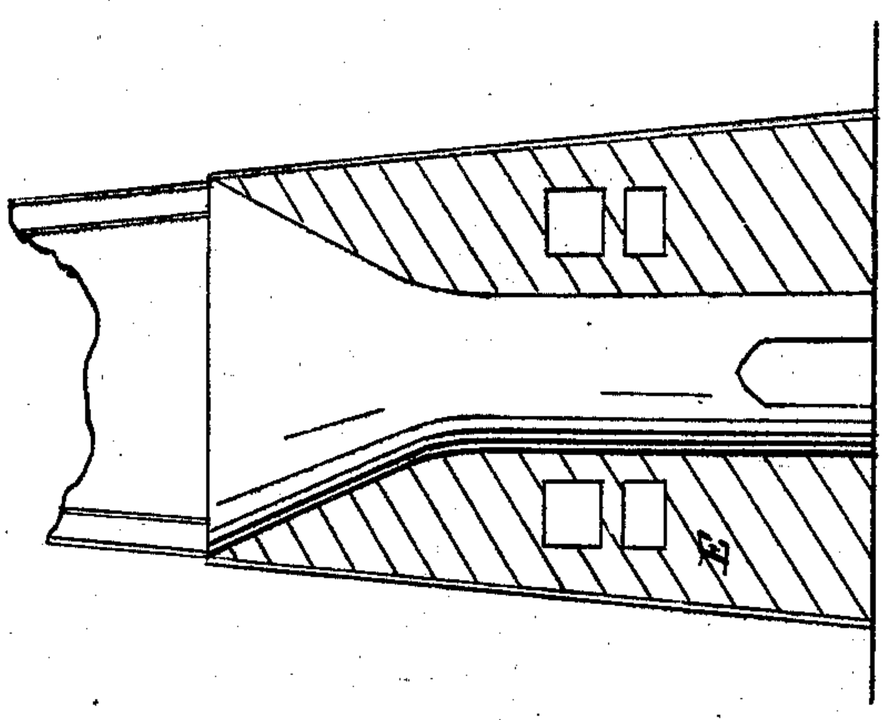



Fig. 4.

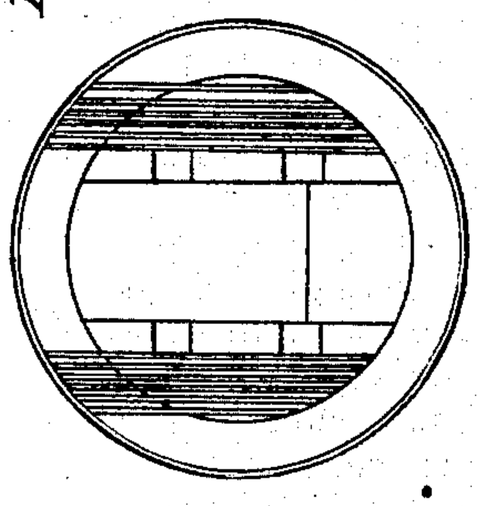
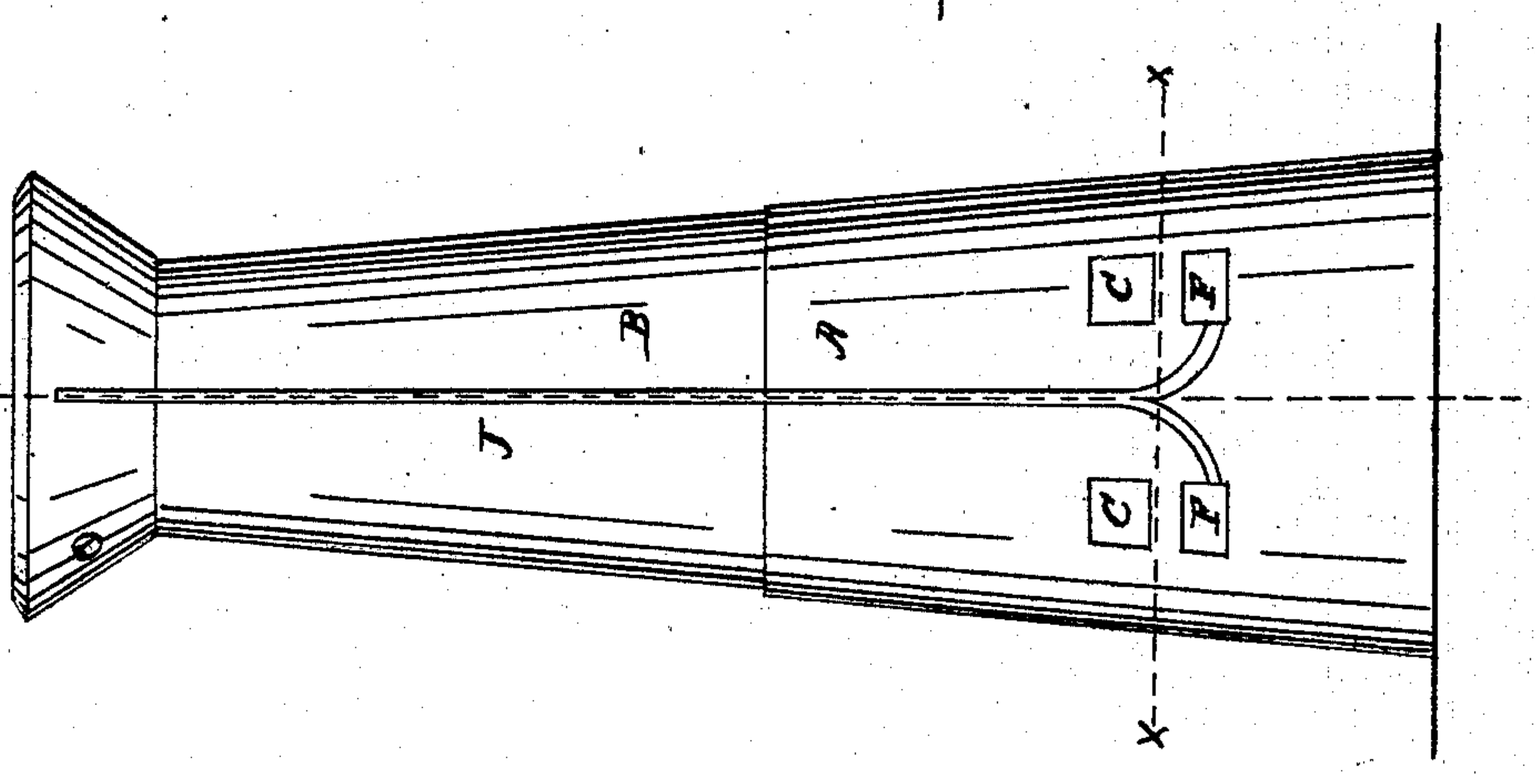


Fig 1




Witnesses.
Fred. C. Burridge
Frank Salden,

Inventors.
Michael Groh.
J. V. Weitz

# UNITED STATES PATENT OFFICE.

MICHAEL GROH AND J. V. WEITZ, OF CLEVELAND, OHIO.

## IMPROVEMENT IN LIME-KILNS.

Specification forming part of Letters Patent No. 120,378, dated October 31, 1871; antedated October 10, 1871.

*To all whom it may concern:*

Be it known that we, MICHAEL GROH and J. V. WEITZ, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Lime-Kilns; and we do hereby declare that the following is a full and complete description of the construction and operation of the same, reference being had to the accompanying drawings making a part of this specification, in which—

Figure 1 is a side elevation; Fig. 2, a vertical section in direction of the line *x x*, Fig. 1; Fig. 3, a vertical section of the base in direction of the line *x x*, Fig. 2; Fig. 4, a transverse section, in direction of the line *x x*, Fig. 1.

Like letters of reference refer to like parts in the different views.

This invention consists in combining, with a lime-kiln, a steam-boiler for the purpose of supplying steam to the fire-grates, thereby preventing said grates from being rapidly burned out; also, that said boiler serves as a flue for the stack or furnace, and having a water-lining instead of fire-brick for its preservation.

The following is a description thereof:

This kiln is constructed in two sections, A B, Fig. 1, of which A is the lower section or base, and B the stack or flue. D, the outside or shell of the kiln, is made of sheet or plate-iron riveted together, whereby a strong and durable outer wall is obtained for the support of the inner wall or lining and furnaces. In the lower section of the kiln are built the furnaces C, Fig. 2, one on each side, as shown in Fig. 1, and which, as will be seen in Fig. 3, are built up in the wall or sides E, which also forms the lining of the section or base. These furnaces are built up of fire-brick, and, as will be observed, form no part of the outer wall or case of the kiln; hence, as the lining and furnaces may become injured by the fire, it can be easily taken down and rebuilt or repaired as may be necessary, without in the least disturbing the shell, it still remaining securely and firmly upon the ground while the repairs are being made. The upper section of this kiln is constructed entirely of iron, having a water-space, I, between the outer and inner walls, and which constitutes the boiler. This boiler is fitted to and rests upon the lower section, as shown in Fig. 2, in which it will be seen that it forms the flue or cupola of the kiln. By thus forming the upper section with double walls, having a water-space between them, no lining of fire-brick or other material is required to protect the flue from being burned out. This section may be extended down near to the furnaces, and thus dispense with much of the brick-work immediately above them. By this arrangement it will be obvious that the heat of the furnaces, as it ascends, passes through the boiler, thereby heating the water to such a degree as to generate a high pressure of steam, a part of which is conducted down through the pipe J to the under side of the fire-grates through the ash-pit F immediately under the doors of the furnaces, and thereby preventing them from being rapidly burned out, and at the same time improving the quality of the lime by adding to its whiteness and strength. The steam may also be used for driving an engine, which may be employed about the kiln for sundry purposes—pumping water, elevating stone, &c.

Lime-kilns are usually constructed of stone, laid up with much care, and of great thickness at the base in order to insure strength to the structure, which, in consequence of the great heat to which it is subjected, will, after a short while, crack and crumble down, thereby causing great loss and expense, as the entire structure must be rebuilt in consequence of such injury. Whereas a kiln built in the manner as above described, with an independent outer wall of iron, cannot crack and crumble down, though the lining may have been burned out, which, as above said, can be easily replaced or rebuilt without in any way effecting the shell. A kiln thus constructed is much cheaper than one built in the ordinary way, and, as will be obvious, is far more durable.

What we claim as our improvements, and desire to secure by Letters Patent, is—

The lime-kiln herein described, consisting of the sheet-iron section A lined with fire-brick, and provided with the furnaces C C and chute H and the upper double section B, forming a steam-boiler, and connected by a steam-pipe, J, with the ash-pits F F, when all these parts are constructed and arranged as shown, and for the purpose set forth.

MICHAEL GROH.
J. V. WEITZ.

Witnesses:
W. H. BURRIDGE,
FRANK S. ALDEN.

(153)