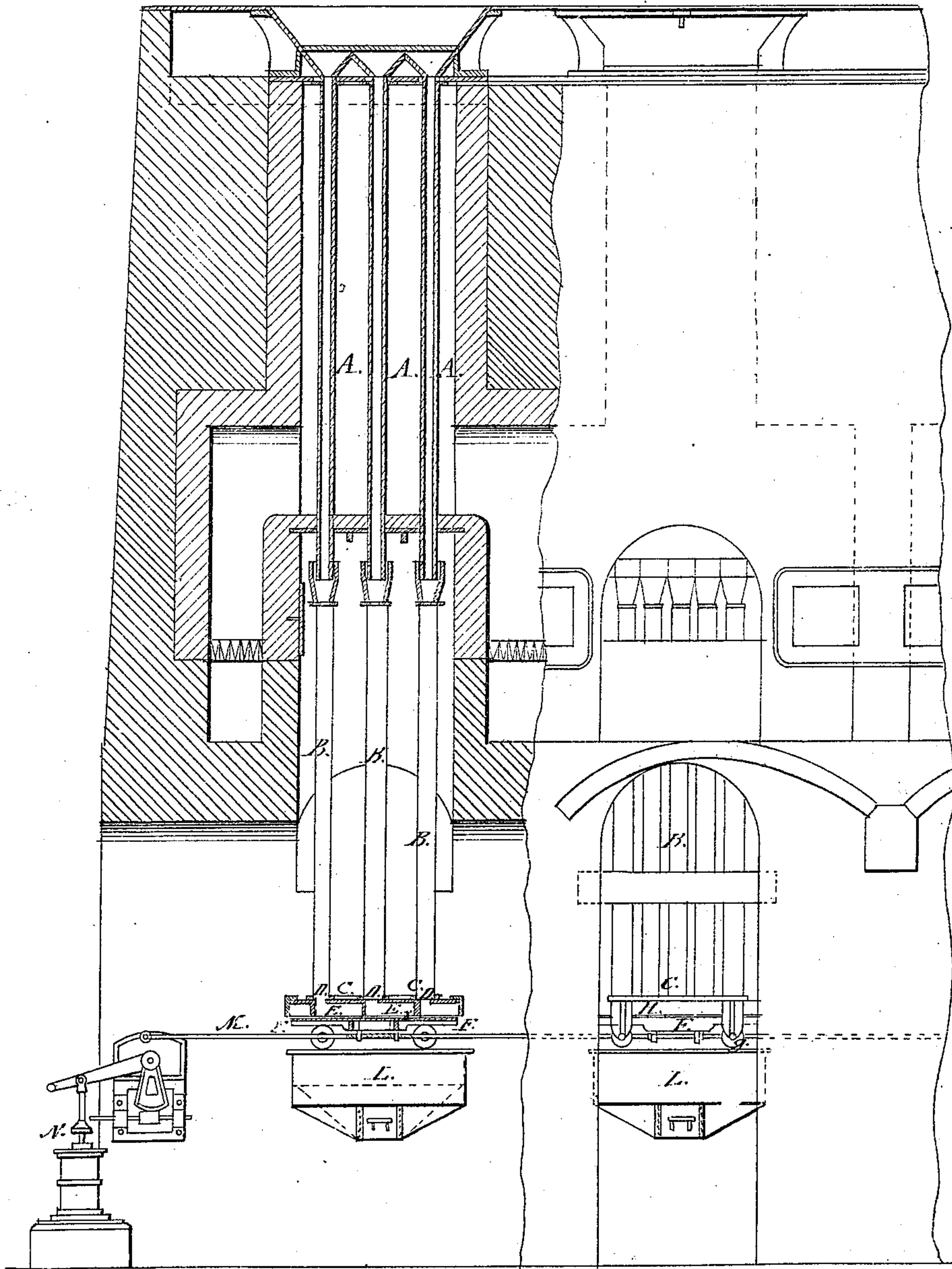


E. Langer's
Filtering Furnace.

Nº 93,208.

Patented Aug. 3. 1869.

Fig. 1.



Witnesses:
Stinchman,
Wm. F. Clark,

Inventor:
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Wm. F. Clark,

E. Langer's Filtering-Furnace.

Nº 93,208.

Patented Aug. 3. 1869.

Fig. 4.

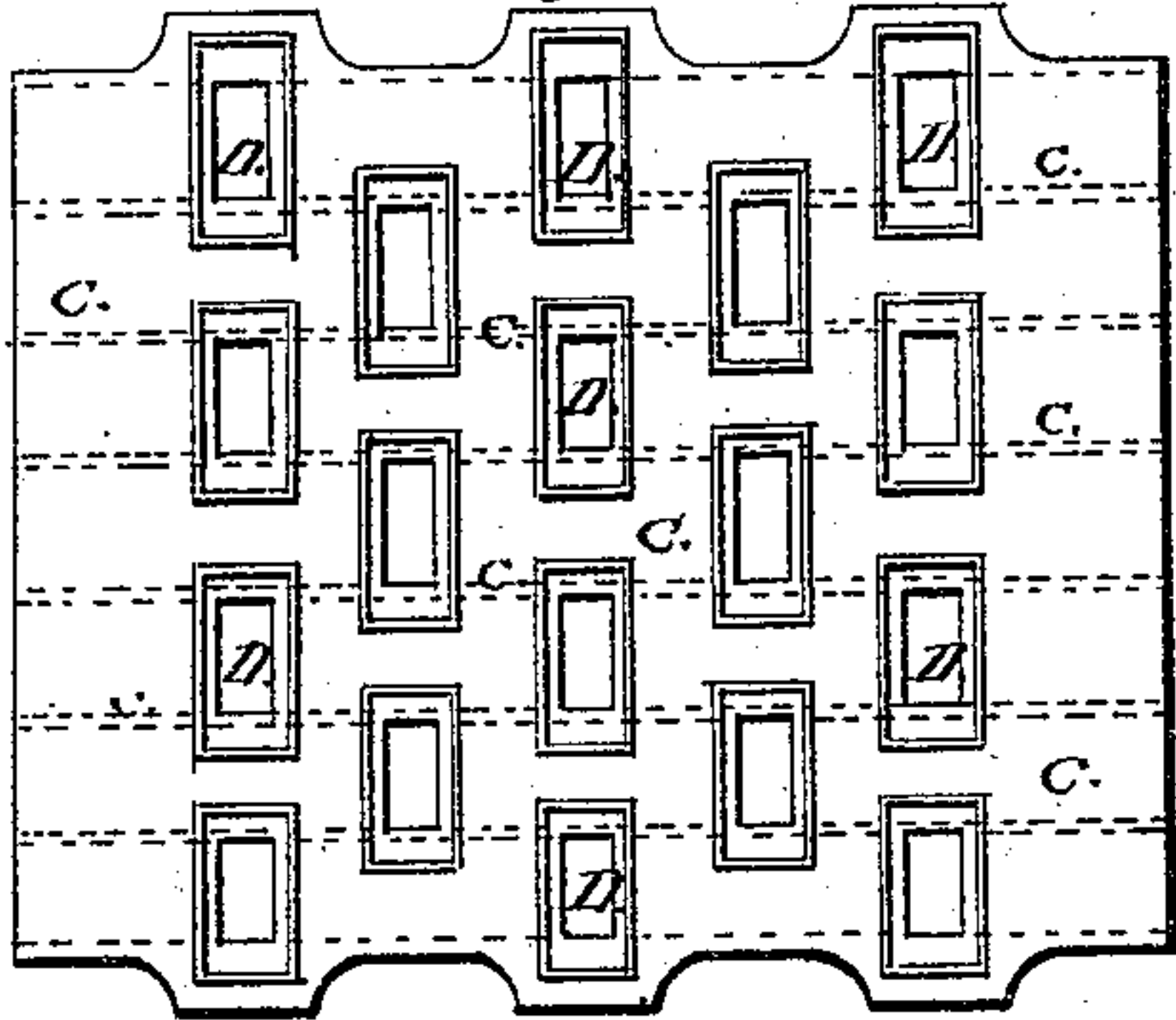


Fig. 6.

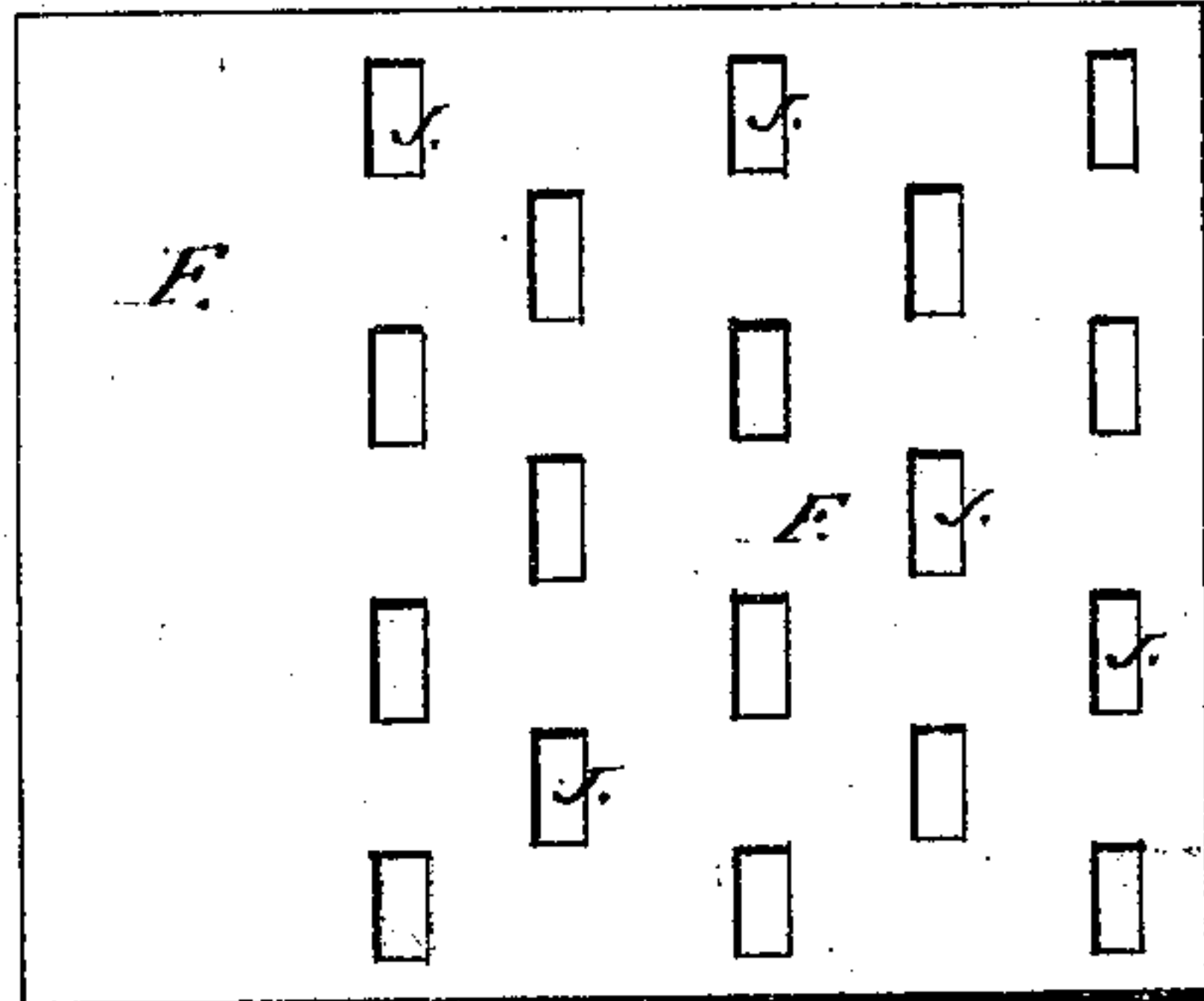


Fig. 5.

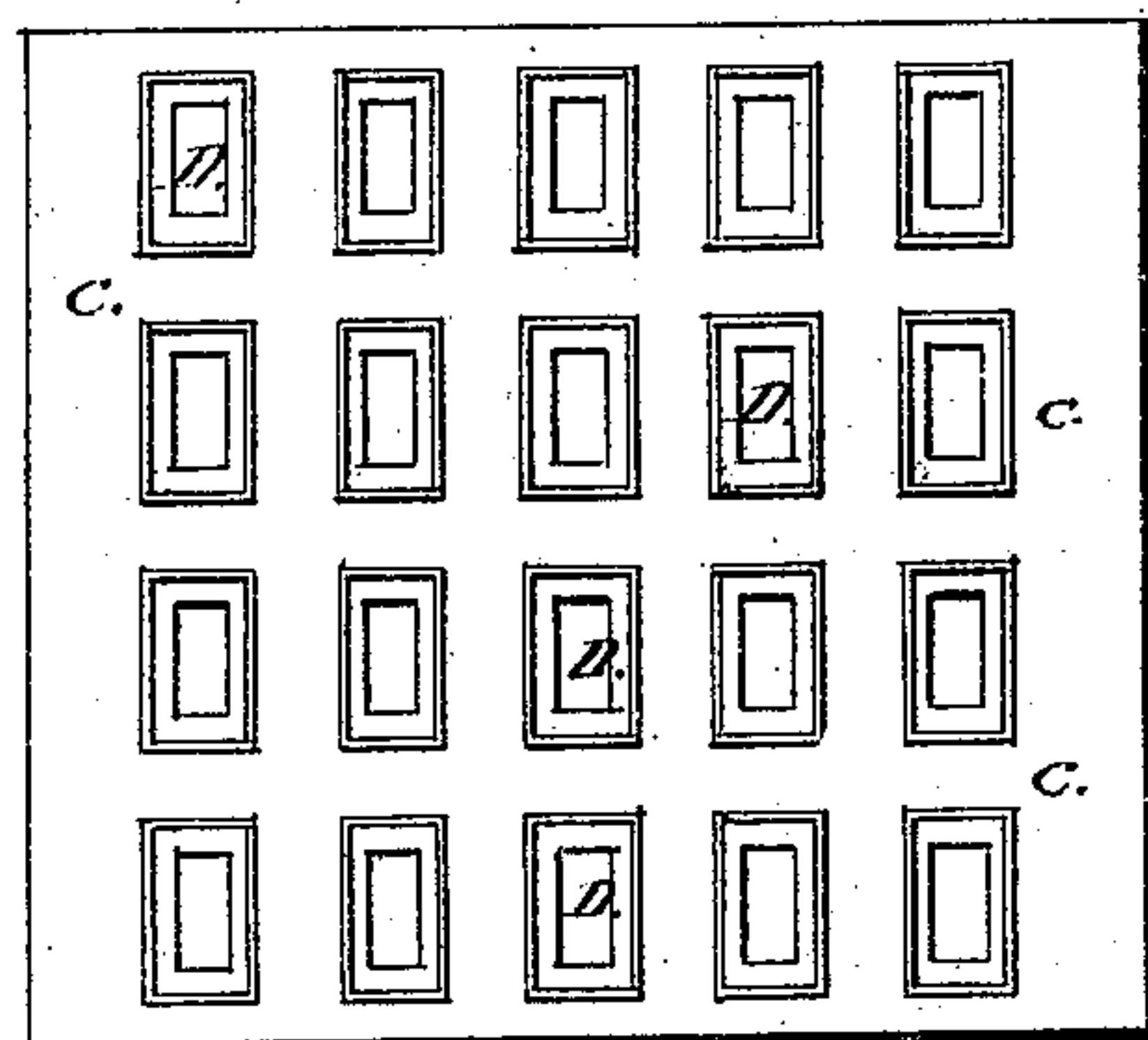


Fig. 2.

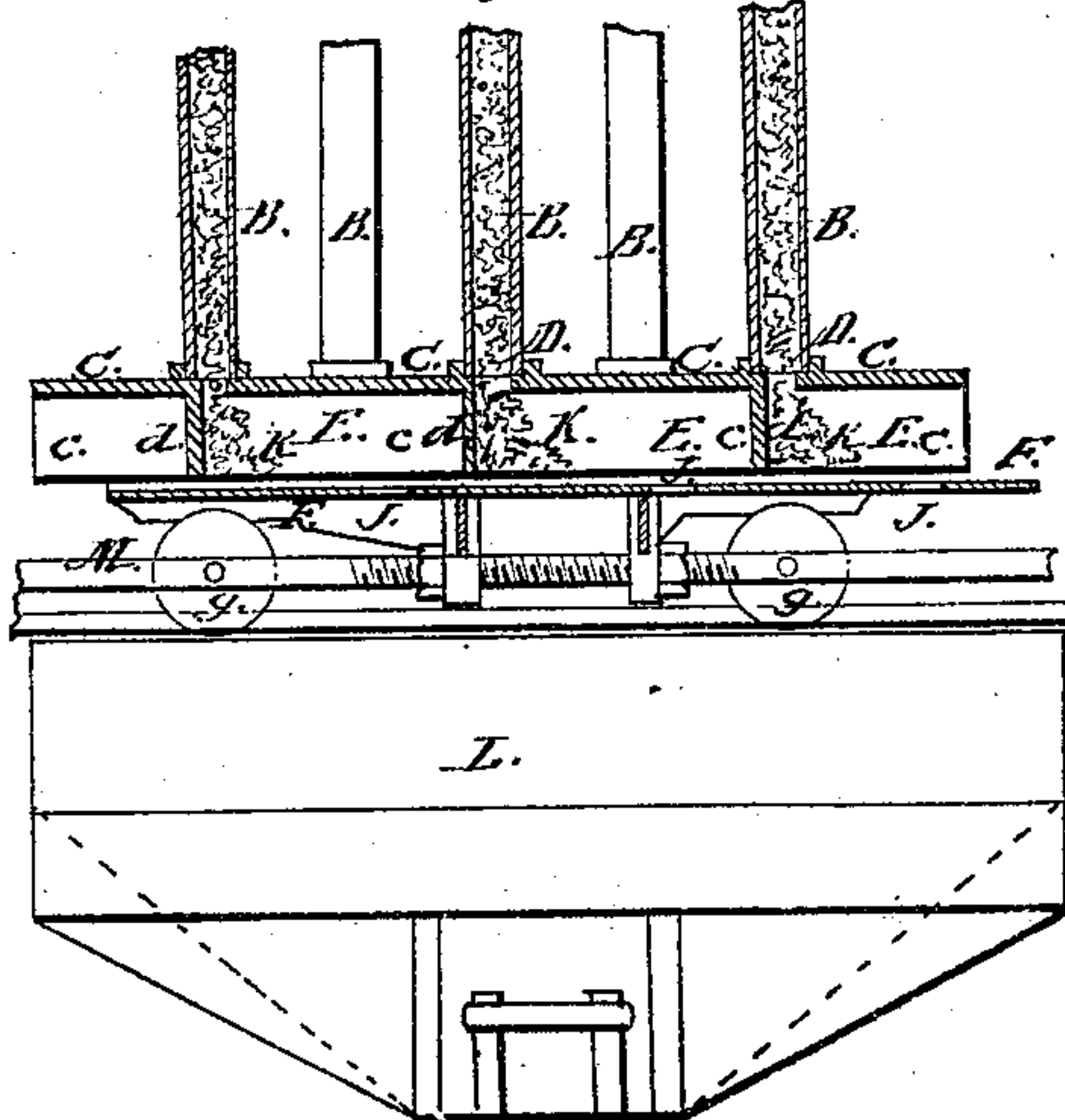
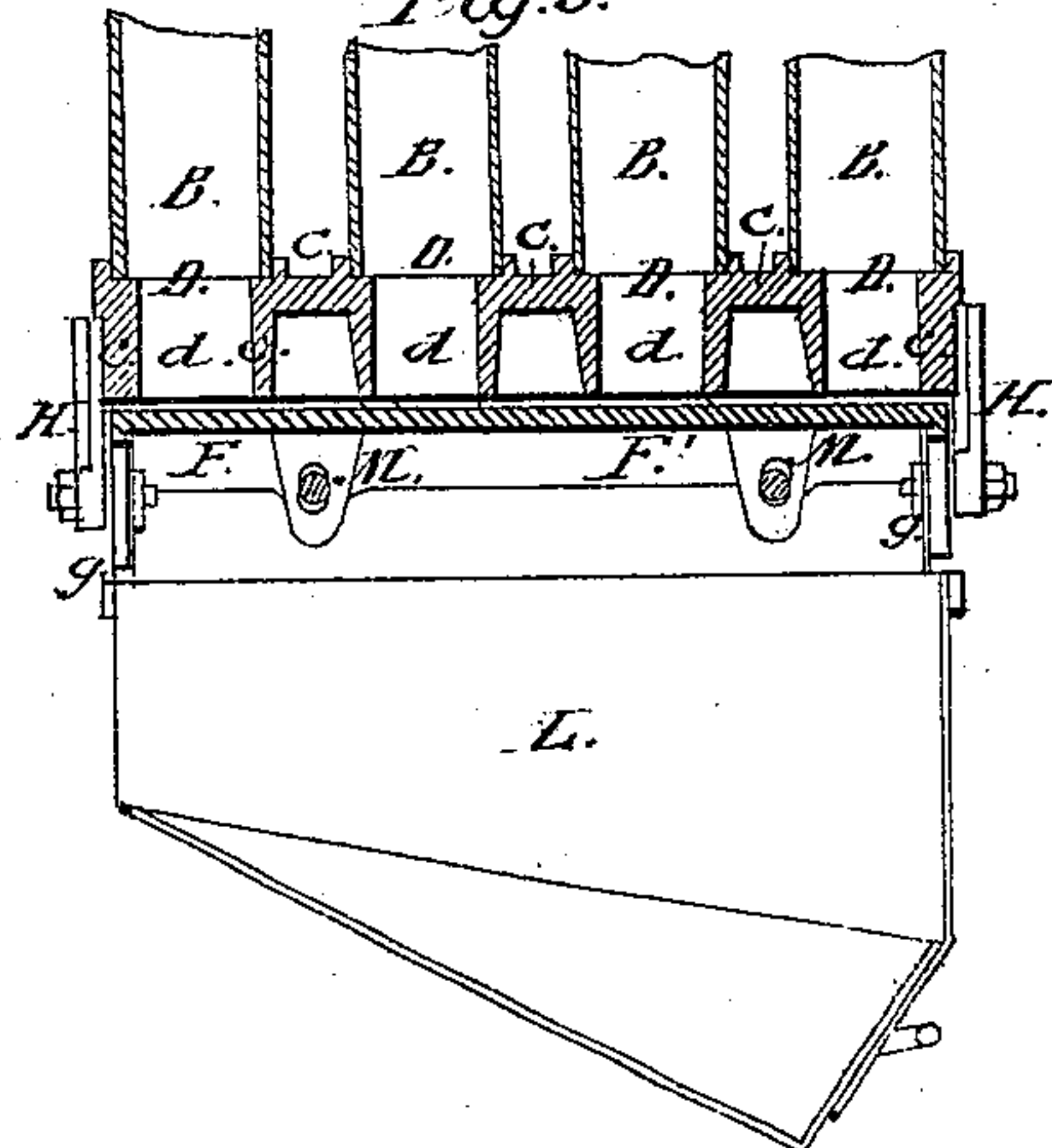


Fig. 3.



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EUGEN LANGEN, OF COLOGNE, PRUSSIA.

Letters Patent No. 93,208, dated August 3, 1869; patented in France, January 23, 1866.

IMPROVED APPARATUS FOR EMPTYING THE COOLING-TUBES OF BONE-BLACK FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, EUGEN LANGEN, of Cologne, in the Kingdom of Prussia, have invented a new and improved Apparatus for Emptying the Cooling-Tubes of Filtering-Furnaces; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has for its object to remove the re-burnt animal charcoal from the vertical cooling-tubes of filtering-furnaces, used in the production of sugar, in an automatic and uniform manner.

The apparatus employed for this purpose is shown in the accompanying sheets of drawings, in which—

Figure 1 represents a vertical longitudinal section of a set of furnaces, with my improved apparatus applied thereto.

Figure 2 is a detail vertical longitudinal section, on an enlarged scale, of the improved apparatus, showing part of the cooling-tubes.

Figure 3 is a vertical transverse section of the same.

Figures 4 and 5 are plan or top views of the apparatus.

Figure 6 is a plan or top view of the sliding plate F, of the same.

Similar letters of reference indicate corresponding parts.

The cooling-tubes B of the furnace, which receive the re-burnt charcoal from the heating-tubes A, arranged in a well-known manner, rest with their lower ends upon a plate, C, fixed in the brick-work, said plate C being formed with corresponding apertures D, that are surrounded by projecting fillets or flanges, between which the tubes B fit, as shown.

On the under surface of the plate C is formed a number of longitudinal ribs or partitions, *c c c*, one being situated at each side of every row of holes D, and across the spaces between these partitions are again formed transverse partitions *d*, one of which is situated under the back edge of every hole D, thus forming separate compartments E E E, with one of which each of the tubes B communicates.

At a slight distance below the lower edges of the partitions *c* and *d*, is arranged a sliding plate, F, resting upon the edges of rollers G, that are hung on pins that project from brackets H, which are fixed to and suspended from the plate C.

The plate F is thus free to receive a reciprocating motion, in a longitudinal direction, beneath the plate C.

The plate F has a number of apertures, J, corresponding to the number of apertures D, and one of which is consequently situated under one of each of the compartments E.

The action of this apparatus is as follows:

The cooled charcoal falls from the lower ends of the cooling-tubes B, through the apertures D, upon the plate F, filling up the compartments E to a certain extent, as indicated in fig. 3.

If now the plate F, whose apertures are not under those of C, be moved slightly to the right, it will carry the charcoal lying upon it with it, and away from the aperture D, and consequently a fresh quantity of charcoal will fall from the tubes B, upon the plate F.

If the latter is now moved back to the same extent that it was moved forward, the partitions *d* will prevent the charcoal from moving back with it, and the charcoal will consequently by such motion be pushed toward the apertures J.

Thus, at every forward and backward motion of the plate F, the quantity of charcoal of each compartment will be first increased by a quantity passing in from the tubes B, and it will then be pushed toward the apertures J, until by each backward motion a quantity of charcoal is caused to fall through such apertures into a suitable receptacle, L, which quantity will, of course, eventually be equal to that which passes into the compartments E from the tubes B, at every forward motion of the plate F.

The requisite reciprocating motion of the plate F may be imparted by any suitable arrangement of mechanism.

Thus, in the arrangement shown in the drawing, the plates F of the apparatus to the several furnaces are all actuated by means of one and the same rod M, to which they are connected, in the manner indicated, and which receives a reciprocating motion from a small water-pressure engine, N, which is particularly applicable, on account of the practically constant power given out thereby, corresponding with the nearly constant resistance offered by the plates F.

The apertures D and J are, in figs. 4 and 6, shown as being arranged in alternate rows, but they may as well be arranged as in fig. 5, that is to say, in parallel rows, as shown.

In this latter position they will be better adapted to the furnaces generally in use in the United States.

Having thus described my invention,

What I claim as new, and desire to secure by Letters Patent, is—

The apparatus for removing animal charcoal from the cooling-tubes, the said apparatus being composed of the plate C, with apertures D and compartments E, and operating in combination with the reciprocating plate F, which is provided with apertures J, substantially in the manner herein set forth, all arranged as specified.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses, this 1st day of February, 1869.

Witnesses:

EUGEN LANGEN.

H. STUET,

A. L. PLOESSEN RUNZE.