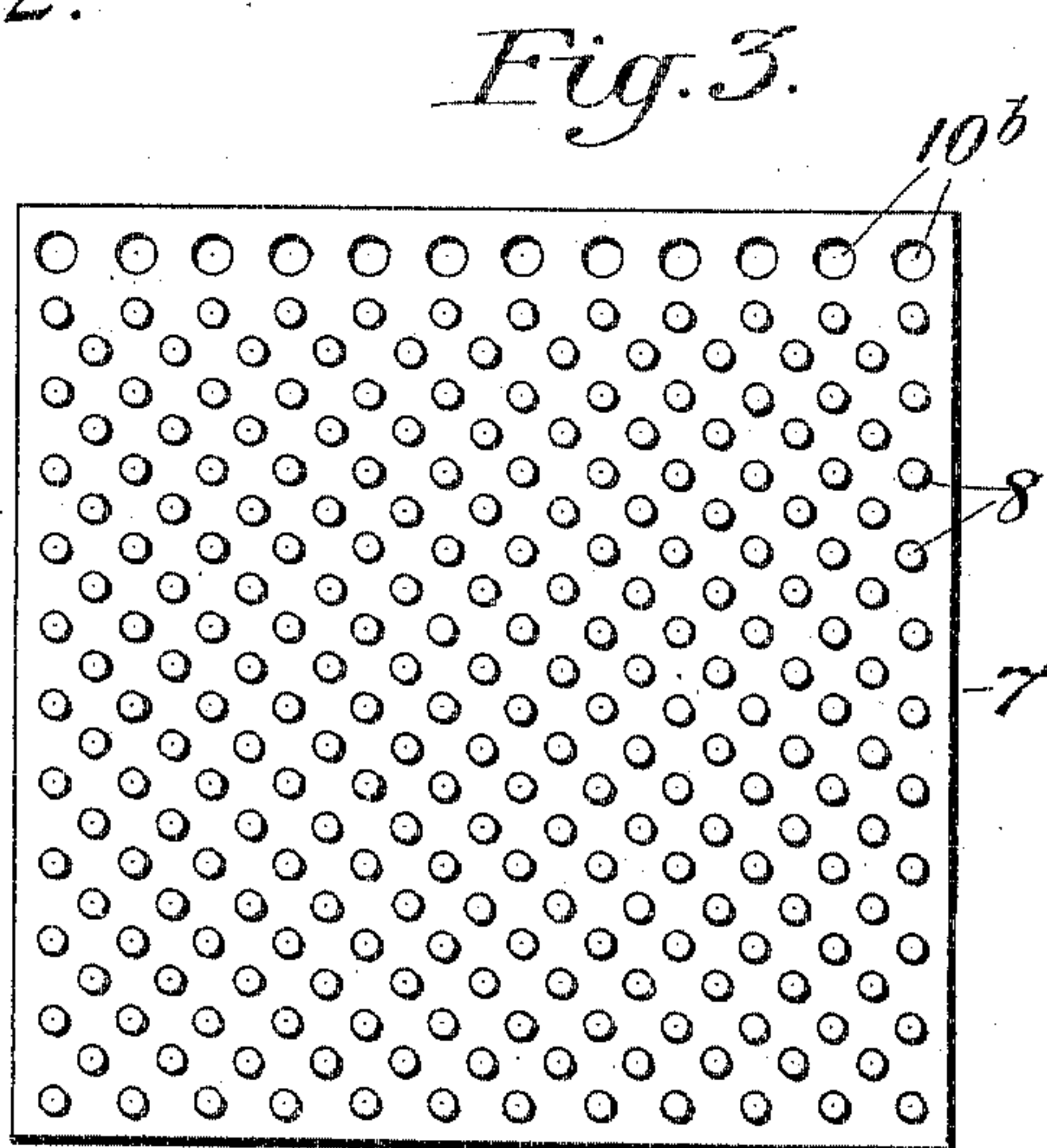
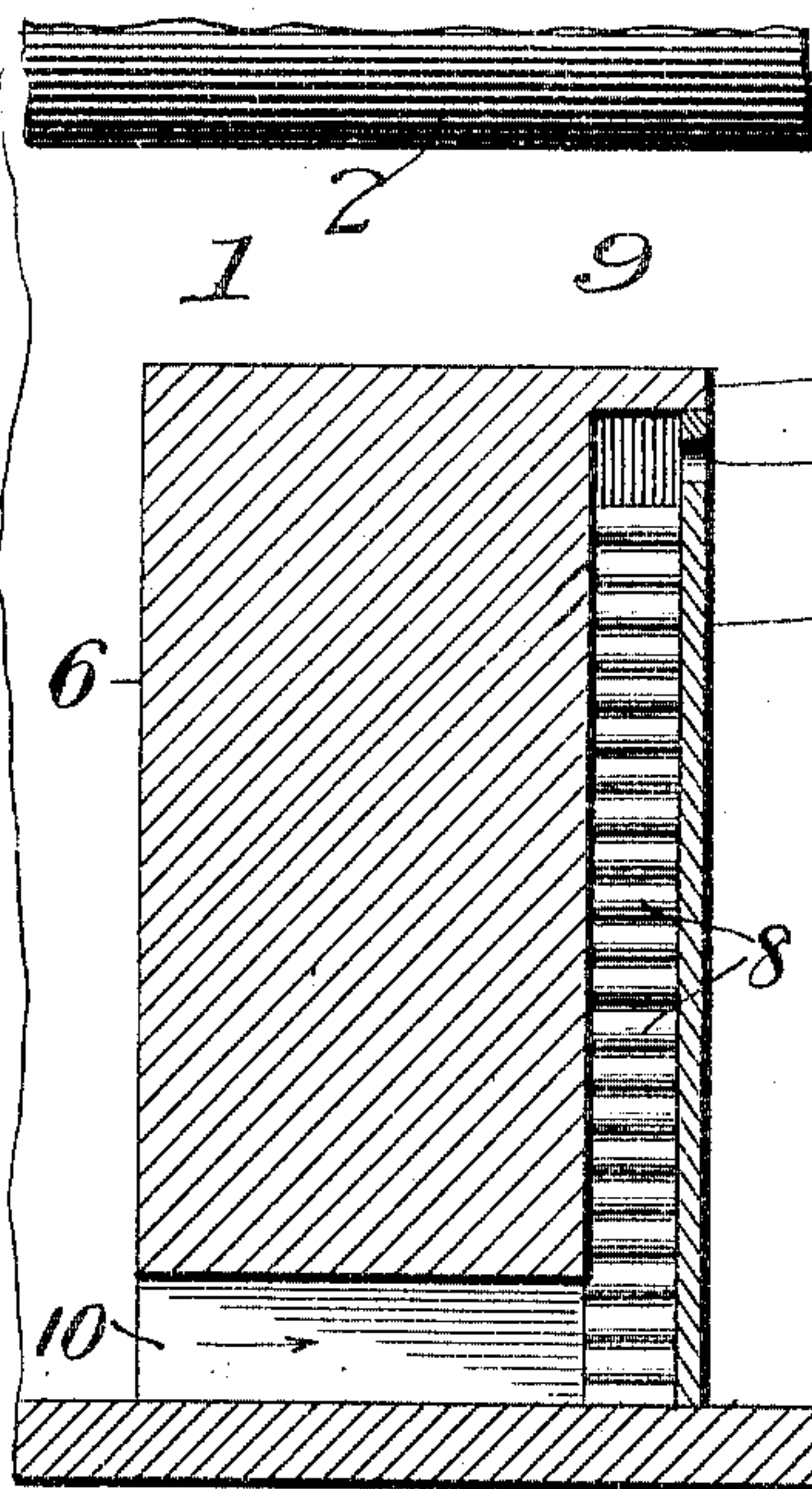
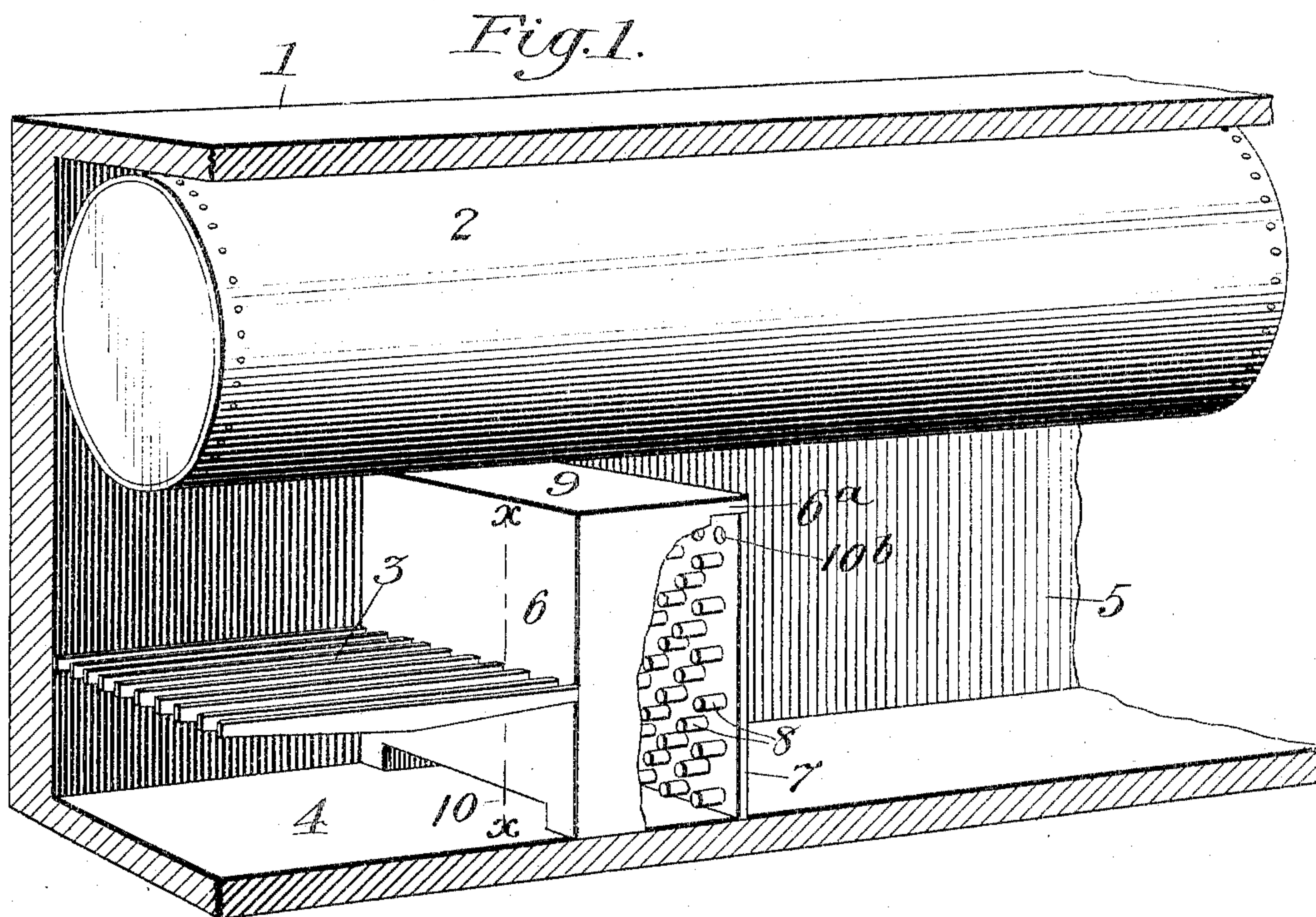


No. 784,106.

PATENTED MAR. 7, 1905.

W. E. COLE.
FUEL ECONOMIZER.
APPLICATION FILED APR. 27, 1904.



Witnesses:

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UNITED STATES PATENT OFFICE.

WILLIAM E. COLE, OF NORFOLK, VIRGINIA.

FUEL-ECONOMIZER.

SPECIFICATION forming part of Letters Patent No. 784,106, dated March 7, 1905.

Application filed April 27, 1904. Serial No. 205,256.

To all whom it may concern:

Be it known that I, WILLIAM E. COLE, a citizen of the United States, residing at Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Fuel-Economizers, of which the following is a specification.

The invention relates to an apparatus for superheating oxygen to aid combustion in boiler-furnaces and furnaces, my object being to produce an oxygen-heater that is economical in first cost and durable.

In the annexed drawings, Figure 1 is a longitudinal perspective view showing the usual boiler-setting and illustrating the arrangement of the oxygen-heater in the rear of the bridge-wall. Fig. 2 is a section of the bridge-wall on line *x x* of Fig. 1. Fig. 3 is a face view of the device apart from the bridge-wall, showing the preferable way the projecting pins should be placed on the plate staggered.

The apparatus consists of the bridge-wall 6, which is generally made of fire-bricks, and therefore non-metallic. It has an air-inlet 10, leading from the ash-pit 4 through its lower portion, and a recess in the rear, into which are placed one or more removable iron plates 7, closing said recess. Said plate 7 has its lower end on a level lower than the air-inlet and is provided with pins 8, integral therewith and preferably staggered relatively to each other and projecting into the recess of the bridge-wall. The plate 7 is provided with openings 10^b near its upper edge to allow the air to escape. The bridge-wall extending at 6" over the recess covers it and protects the top of the plate from the direct action of the flame. The intense heat in the combustion-chamber is reflected against the plate, which is practically the rear part of the bridge-wall, the pins absorb heat from the plate, the oxygen is drawn through the heater by natural draft into the combustion-chamber and mixes with the fuel-gases, and combustion is greatly increased.

I am aware that many bridge-wall devices exist claiming to aid combustion by preheating the oxygen. Those of brick are worthless, because they cannot heat the oxygen to a degree that would be of any benefit, and those of metal are exposed to the flame and do not last long enough to pay the actual expense of installation. It is seen that this apparatus is protected from direct flame, yet at the same time it gets all the heat that the metal can stand and be of a life long enough to be of value. It is also seen that this plate can stand much more heat on account of its having numerous projecting pins on its opposite face. The oxygen continually cooling the pins, the pins are likewise cooling the plate by calling on the plate for the heat the oxygen is getting. I find it convenient to cast the plate, with pins projecting therefrom, with box sides, the sides in measurement being equal the length of the pins and in section—say sixteen inches wide—and use two or three sections, according to the width of the furnace. The apparatus can then be taken in at the furnace-door for installation.

I do not confine myself to any particular shaped projection. The object sought is to retard the oxygen in its passage through the heater that it may become more intensely heated by coming in contact with and working its way upward among the projections.

Having described my invention, what I claim as new is—

1. In a fuel-economizer for boiler-furnaces, the combination of a non-metallic bridge-wall having an air-inlet through its lower portion and a recess in the rear, a removable closure-plate for said recess with its lower end on a level lower than the air-inlet, said plate having pins integral therewith projecting into said recess and provided with openings near its upper edge to allow the air to escape, substantially as described.

2. In a fuel-economizer for boiler-furnaces, the combination of a non-metallic bridge-wall having an air-inlet at the base, a recess in the

rear below the top, a removable closure-plate
for said recess with its lower end on a level
lower than the air-inlet, said plate having pins
integral therewith projecting from its inner
5 side, and provided with openings near its up-
per edge to allow air ascending between the
pins to escape, substantially as described.

In testimony whereof I affix my signature in
presence of two witnesses.

WILLIAM E. COLE.

Witnesses:

H. F. BELL,

A. M. JOHNSON.