

(No Model.)

G. C. HAWKINS.
FUEL ECONOMIZER.

No. 498,211.

Patented May 23, 1893.

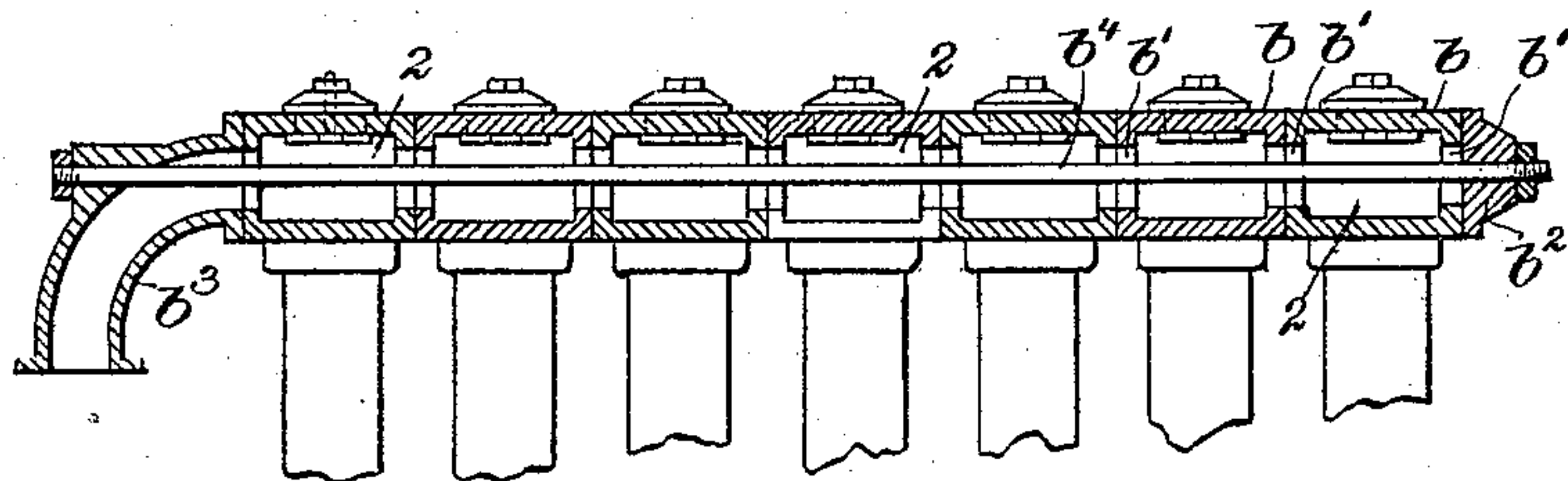
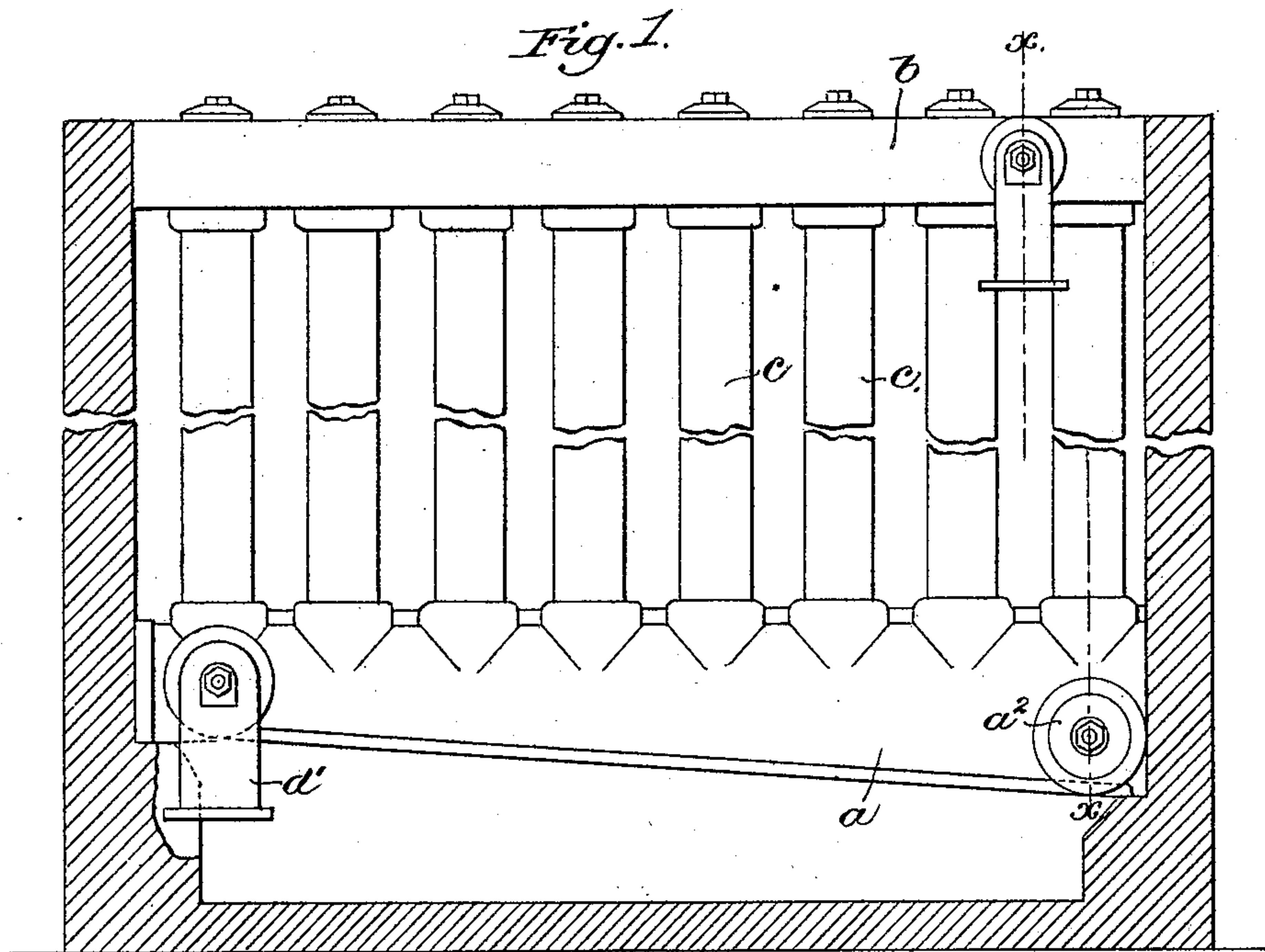


Fig. 2.

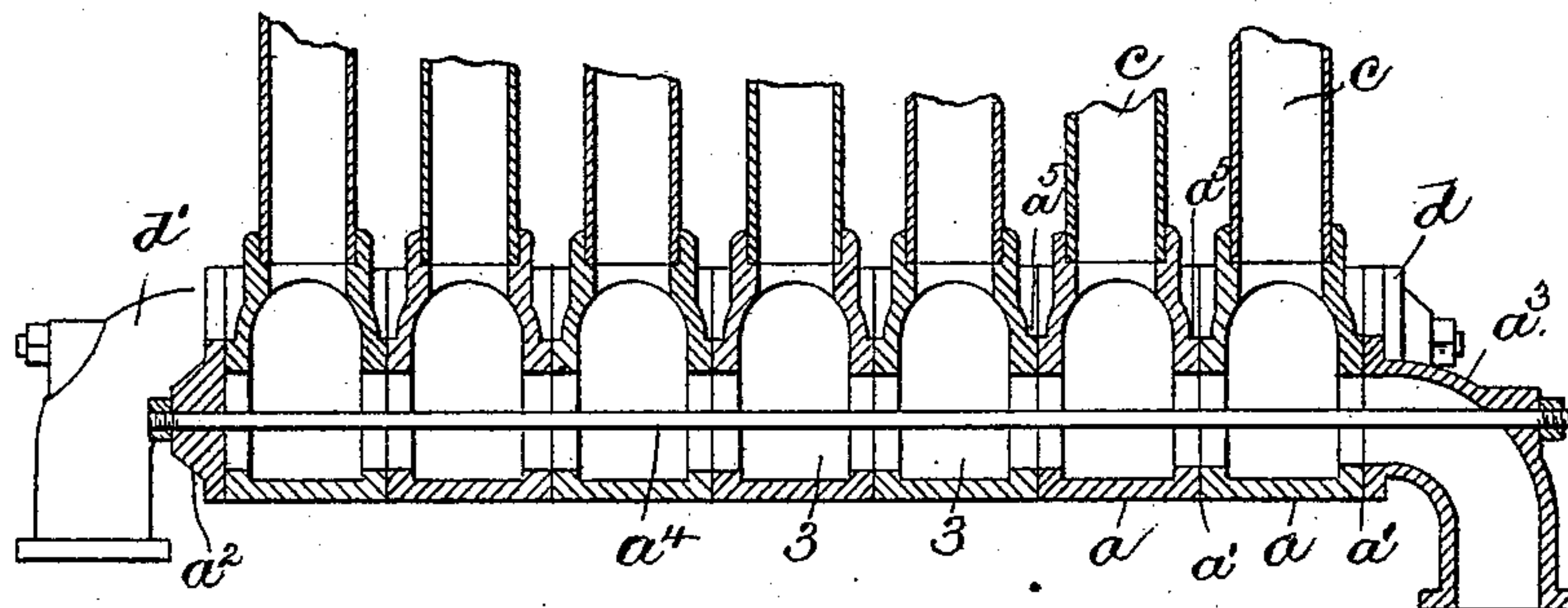
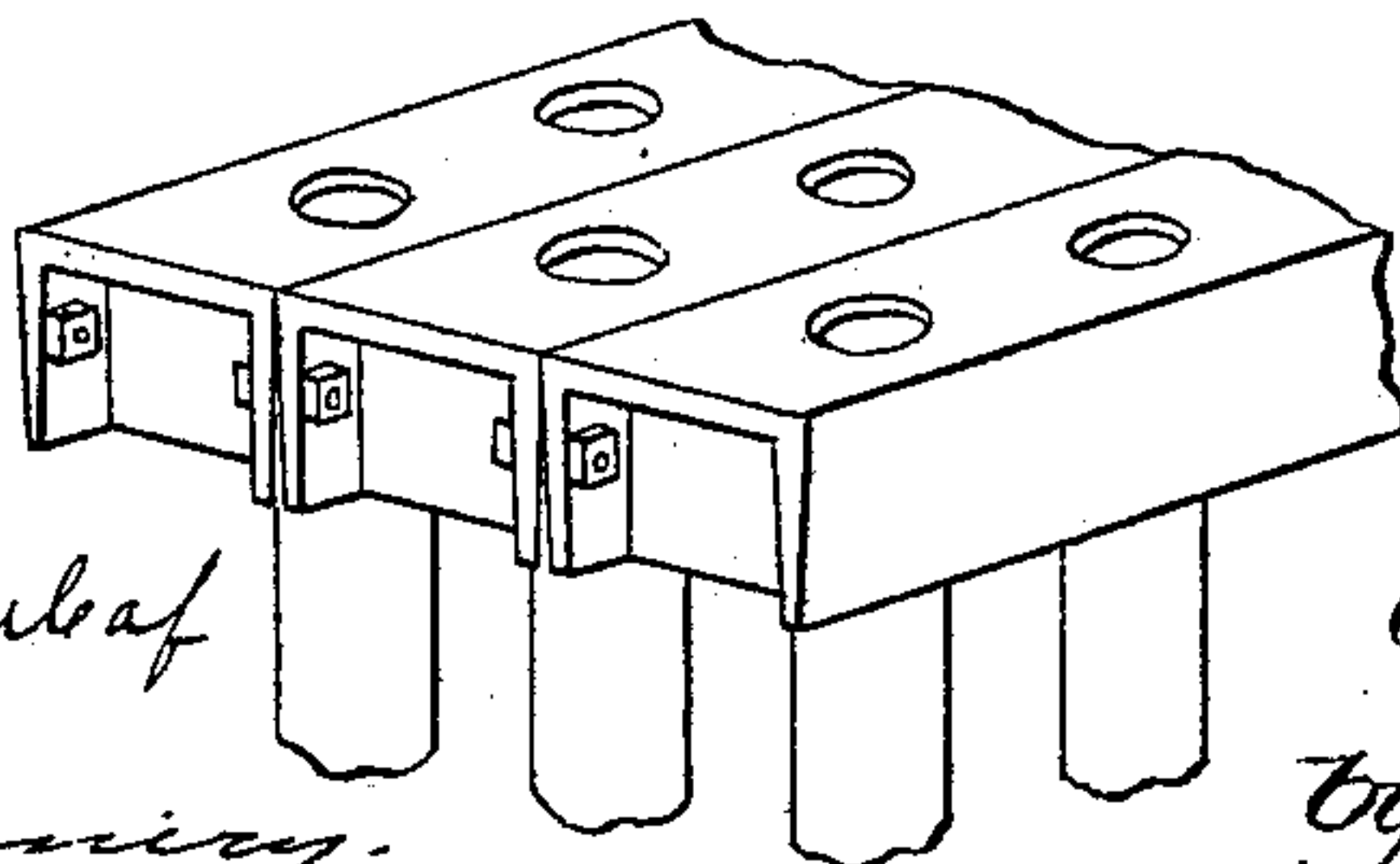


Fig. 3.

Witnesses.
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Inventor.
Gardner C. Hawkins.
by Crosby & Gregory Attys.

UNITED STATES PATENT OFFICE.

GARDNER C. HAWKINS, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HENRY W. PEABODY & CO., OF SAME PLACE.

FUEL-ECONOMIZER.

SPECIFICATION forming part of Letters Patent No. 498,211, dated May 23, 1893.

Application filed October 11, 1887. Serial No. 251,992. (No model.)

To all whom it may concern:

Be it known that I, GARDNER C. HAWKINS, of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Fuel-Economizers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention is an improvement upon United States Patent No. 334,533, dated January 19, 1886, and granted to Lowcock and Sykes, and has for its object to provide suitable means of communication between the several
15 bottom boxes and also between the several top boxes, so that the outside branch pipe located outside the masonry and connecting the several boxes by the ends of the boxes which extend through the masonry may be omitted.

20 In accordance with this invention the several boxes are placed side by side and provided near one end with lateral openings which register so as to form a continuous transverse passage from end to end of the series. One end of the said passage is closed
25 and a pipe is fitted to the opposite end which serves as an outlet pipe. The several bottom boxes, each having an inclined bottom are placed side by side and provided near each
30 end with lateral openings which register so as to form two independent continuous transverse passages from end to end of the series and at opposite ends of the boxes. One of the passages as at the deepest part of the series of boxes or near the point where the declining bottom terminates, serves as a blow-off passage to remove the sedimentary material, and the other passage at the opposite
35 end of the said boxes serves as an inlet passage each of said passages being closed at one end and provided at the other end with suitable pipes.

Figure 1 shows in side elevation a fuel economizer embodying this invention, the
45 vertical pipes being broken to save space upon the drawings and the masonry being taken in section; Fig. 2 a vertical section of the fuel economizer shown in Fig. 1 taken on the dotted line $x-x$, and Fig. 3 a modified form
50 of fastening for the boxes to be referred to.

The bottom boxes a , herein shown as seven in number each having an inclined bottom as represented in Fig. 1; the top boxes b corresponding in number with the number of bottom boxes a , and the vertical pipes c fitted
55 into openings formed in the upper side of the bottom boxes and the under side of the top boxes, eight such pipes being herein shown in connection with each bottom and top box, or fifty-six in all, are similar to corresponding
60 parts in the patent referred to. In the present instance the top boxes b are placed side by side and each is provided with lateral openings as b' which register or communicate with each other to thereby form a continuous
65 transverse passage 2 from end to end of the series of boxes as shown in Fig. 2. The passage 2 thus formed by the openings b' is closed at one end as by a cap b^2 and at the opposite end a curved or other suitably shaped pipe
70 b^3 is fitted which forms a continuation of the said passage 2, said pipe serving as an outlet pipe. A long bolt b^4 passes through the material of the pipe b^3 , thence through the passage 2 to the cap b^2 , said bolt having suitable
75 nuts at each end which serve as fastenings to clamp or hold all the boxes rigidly in position although it is obvious that any other suitable fastening may be employed in lieu of those shown. 80

The bottom boxes a are placed side by side and are provided near one end, namely, at or near the point where the bottom ceases to further decline, with lateral openings a' which register or communicate one with another to
85 thereby form a continuous transverse passage 3 from end to end of the series of boxes a , as shown in Fig. 2, said passage 3 serving as a blow-off passage and being located at the deepest portion of the boxes, is employed to
90 remove the sedimentary material from the apparatus. One end of the passage 3 is closed by a cap a^2 , and the other end is provided with a suitable pipe a^3 . A bolt a^4 passes through the material of the pipe a^3 , thence
95 through the passage 3 and through the cap a^2 , said bolt having at each end nuts which upon being tightened clamp the several boxes rigidly together. To aid in forming tight joint connections lateral flanges a^5 are pro- 100

vided surrounding all the openings a' which
flanges abut against each other. The bottom
boxes, at their opposite ends, are also pro-
vided with lateral openings similar to the
5 openings a' just described, to form a continu-
ous transverse passage at the opposite end,
which passage extends from end to end of
the series and is provided at one end with a
cap d to close it and at the opposite end with
10 a pipe d' , said passage serving as an inlet
passage. A bolt similar to the bolt a^4 passes
through the material of the pipe d' , thence
through the passage and through the cap d ,
which bolt is employed to aid in binding the
15 boxes rigidly together.

In lieu of the bolts herein shown as fasten-
ings, the ends of both top and bottom boxes,
or either of them, may be provided with ears
as shown in Fig. 3, and the said boxes be in-
20 dependently attached one to the other.

By providing the inlet and outlet and blow-
off passages, as shown and described within
the masonry, any one of the sections may be
removed when desired without cutting away
25 the masonry which has been a serious objec-
tion to the form shown in the patent referred
to, as in the said patent each box terminates
by a short pipe passing through the masonry,
said short pipes being connected by an out-
30 side branch or connecting pipe, and to remove
any section the masonry must be cut away to
permit the said short pipe which is formed
integral with the box to be removed.

It is obvious that the essential features of

this invention are equally as well applicable 35
to any form of bottom box whether the lower
side is made inclined or level.

I claim—

1. In a fuel economizer, the bottom boxes,
having inclined under sides and vertical 40
pipes, combined with a longitudinally extend-
ed top-box having the transverse outlet pas-
sage 2, at one end substantially as described.

2. In a fuel economizer, the top-box, and
the vertical pipes, combined with the irregu- 45
lar shaped bottom-box having at or near each
end the herein described transverse inlet and
blow-off passages, substantially as described.

3. In a fuel economizer, the contiguous se-
ries of top-boxes having a transverse outlet 50
passage 2, at one end, and a fastener for the
boxes, and the vertical pipes, combined with
the contiguous attached bottom boxes having
the described inlet and blow-off passages, and
the fastening for said boxes, substantially as 55
and for the purposes set forth.

4. In a fuel economizer the top boxes and
the vertical pipes, combined with the bottom
boxes having one or more transverse passages,
and the longitudinally inclined under side 60
substantially as and for the purposes specified.

In testimony whereof I have signed my
name to this specification in the presence of
two subscribing witnesses.

GARDNER C. HAWKINS.

Witnesses:

BERNICE J. NOYES,
ALBERT F. FESSENDEN.