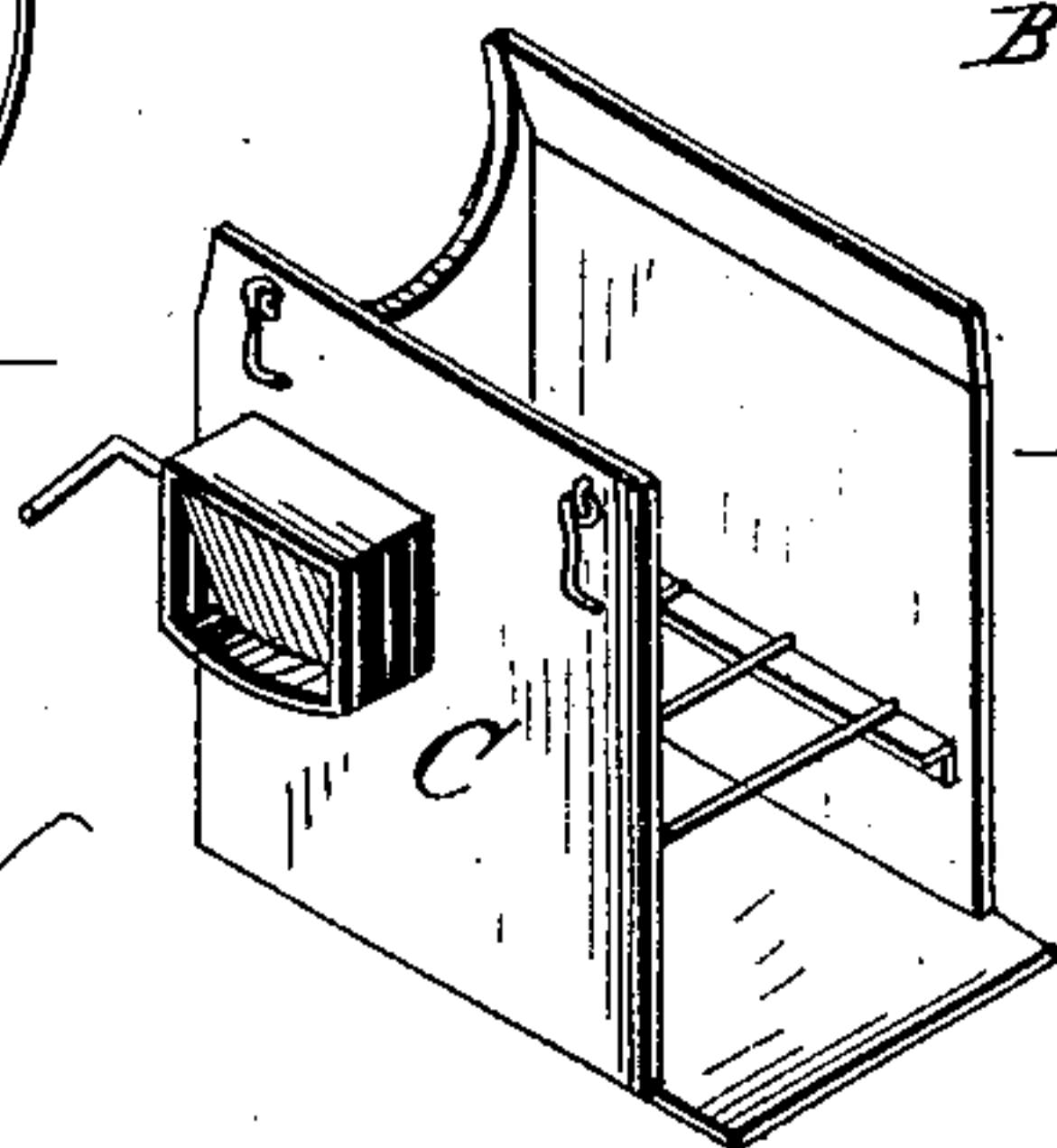
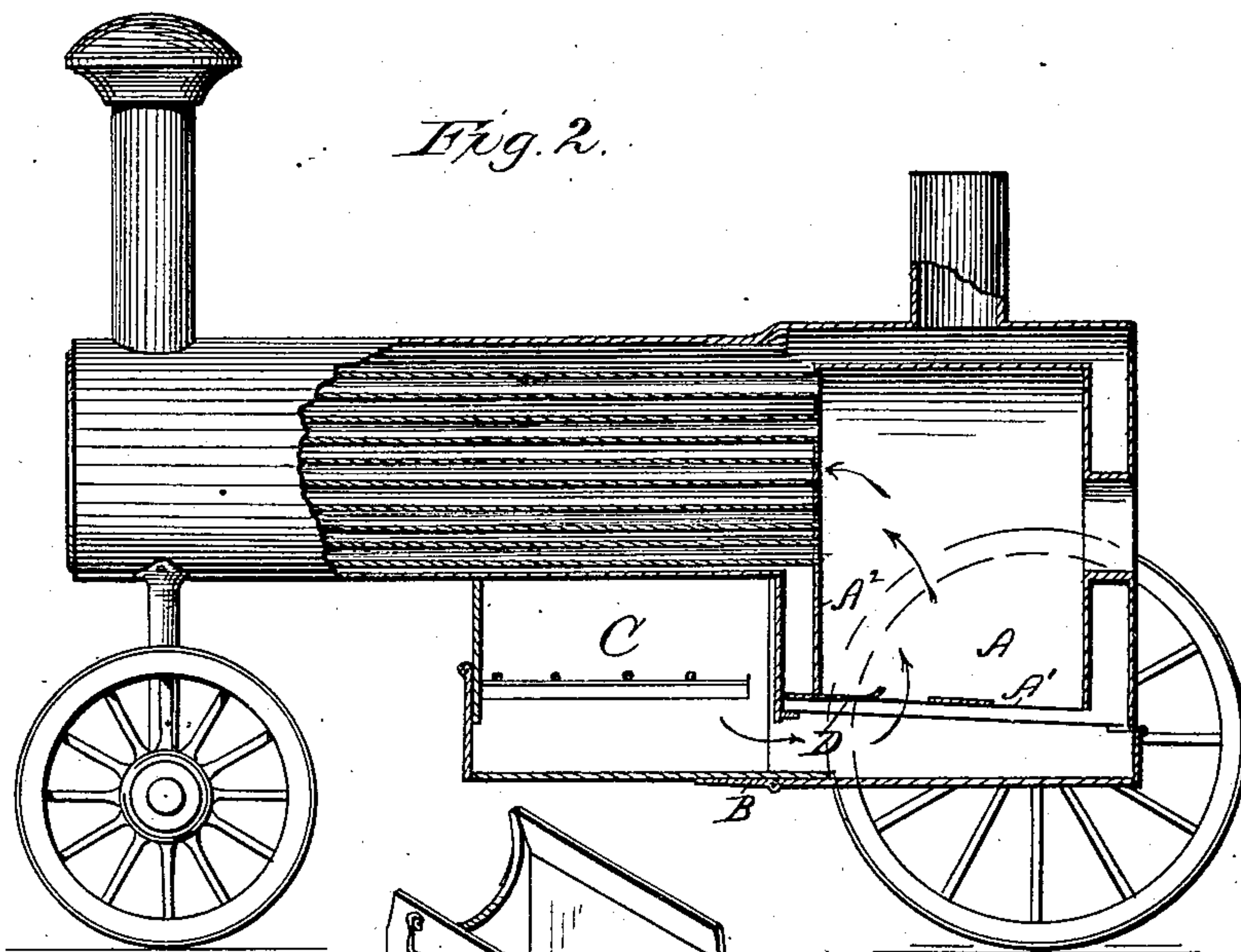
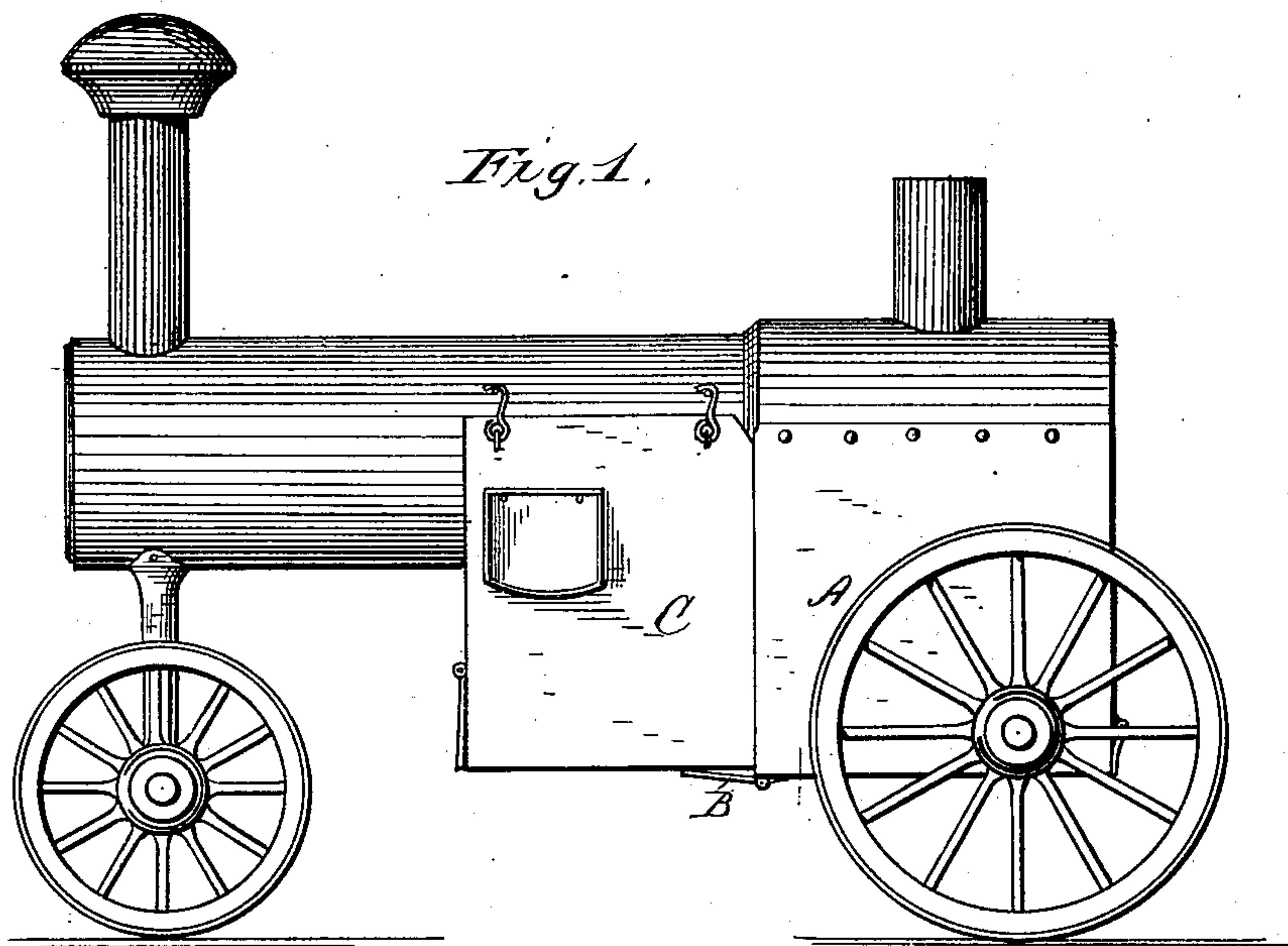


(No Model.)

J. WALRATH.
Straw Burning Furnace.

No. 243,477.

Patented June 28, 1881.



Witnesses,
P. L. Curran
Chas. S. Hoyer.

Inventor
Jesse Walrath
by Charles H. Lee
att'y

UNITED STATES PATENT OFFICE.

JESSE WALRATH, OF RACINE, WISCONSIN, ASSIGNOR TO THE J. I. CASE
THRESHING MACHINE COMPANY, OF SAME PLACE.

STRAW-BURNING FURNACE.

SPECIFICATION forming part of Letters Patent No. 243,477, dated June 28, 1881.

Application filed May 31, 1881. (No model.)

To all whom it may concern:

Be it known that I, JESSE WALRATH, a citizen of the United States, residing at Racine, in the county of Racine and State of Wisconsin, have invented certain new and useful Improvements in and Attachments for Steam-Boiler Furnaces for Burning Straw and Similar Fuel; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to attachments to steam-boilers adapting them for the burning of straw or similar material as a fuel for the generation of steam.

My invention, designed more especially for use on steam-boilers of the locomotive-boiler type, consists, mainly, in the provision of an auxiliary fire-box attachable to the rear side or end of the ordinary fire-box and under the waist of such boiler, the straw fuel being burned in this auxiliary fire-box, which communicates, however, with the ordinary fire-box, so that the escaping products of combustion must pass through the latter before entering the boiler-flues, and can there be mingled with air-currents in sufficient quantity to complete the combustion of practically all combustible matter.

In order that my invention may be clearly understood, I have illustrated in the annexed drawings, and will proceed to describe, the best form thereof at present known to me.

Figure 1 represents a longitudinal elevation of a portable boiler of the locomotive-boiler type embodying my invention, showing the parts in relation as they appear when the boiler is heated with straw fuel. Fig. 2 is a longitudinal section, and Fig. 3 is a perspective view, of the straw-burning fire-box.

The fire-box A is of the ordinary construction; but its rear side or end, A², is provided below the grate A' with a large opening controlled by a damper, B, which remains closed when the fuel for the generation of steam is burned on the grate A'. Whenever straw fuel

is to be used the auxiliary fire-box C, which may be either a fixed or removable attachment, is brought into requisition. It is arranged directly against the end A² of the fire-box A, which forms one side of it, and partly embraces the waist of the boiler, which forms its top, so that the flash-flame and direct heat of the burning straw will strike the waist of the boiler. The damper B must be opened whenever the auxiliary fire-box is in use, so that the products of combustion may pass into the fire-box A and be charged or mingled with fresh-air currents therein before they enter the flues of the boiler. In order to increase the travel of these products of combustion through the fire-box A, a plate, D, is used, extending in a forward direction from the rear end, A², thereof. This plate D may be supported on the grate A', or on the brackets supporting the grate-bars when the latter are removed. It is preferable, though not absolutely necessary, to remove most of the bars of grate A' when the auxiliary fire-box is in use. The straw is fed through an automatically-closing door, C', into fire-box C, and burned on the grate C² thereof. When fire-box C is in use the doors of fire-box A must be suitably set for the most profitable admission of air.

The distinguishing characteristic of this invention is that the flash-flame and direct heat from the burning straw are directed against the waist of the boiler, and that the products of combustion are compelled to make a long circuit before they reach the flues. In consequence thereof, and by reason of the supply of air to the products of combustion during this circuit, the fuel is better utilized, smoke and combustible matter being consumed to that extent that the issuance of live sparks from the stack, so dangerous in portable boilers used for agricultural purposes, is wholly avoided.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination, substantially as before set forth, of the ordinary fire-box of a steam-boiler and an auxiliary fire-box outside, under the waist of the boiler, communicating through said ordinary fire-box with the flues of the boiler.

2. The combination, substantially as before
set forth, of the ordinary fire-box of a steam-
boiler, the plate projecting forward from the
rear end thereof, and the auxiliary fire-box
5 under the waist of the boiler, communicating
with said ordinary fire-box.

3. The combination, substantially as before
set forth, of the ordinary fire-box of a steam-
boiler, an auxiliary fire-box under the waist of
10 the boiler, communicating through said ordi-

nary fire-box with the flues of the boiler, and
the damper controlling the opening of commu-
nication between the two fire-boxes.

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

JESSE WALRATH.

Witnesses:

JOHN TAPLEY,
BYRON B. BLAKE.