(No Model.)

B. N. & D. W. PAYNE.

STEAM BOILER.

No. 277,426. Patented May 8, 1883.

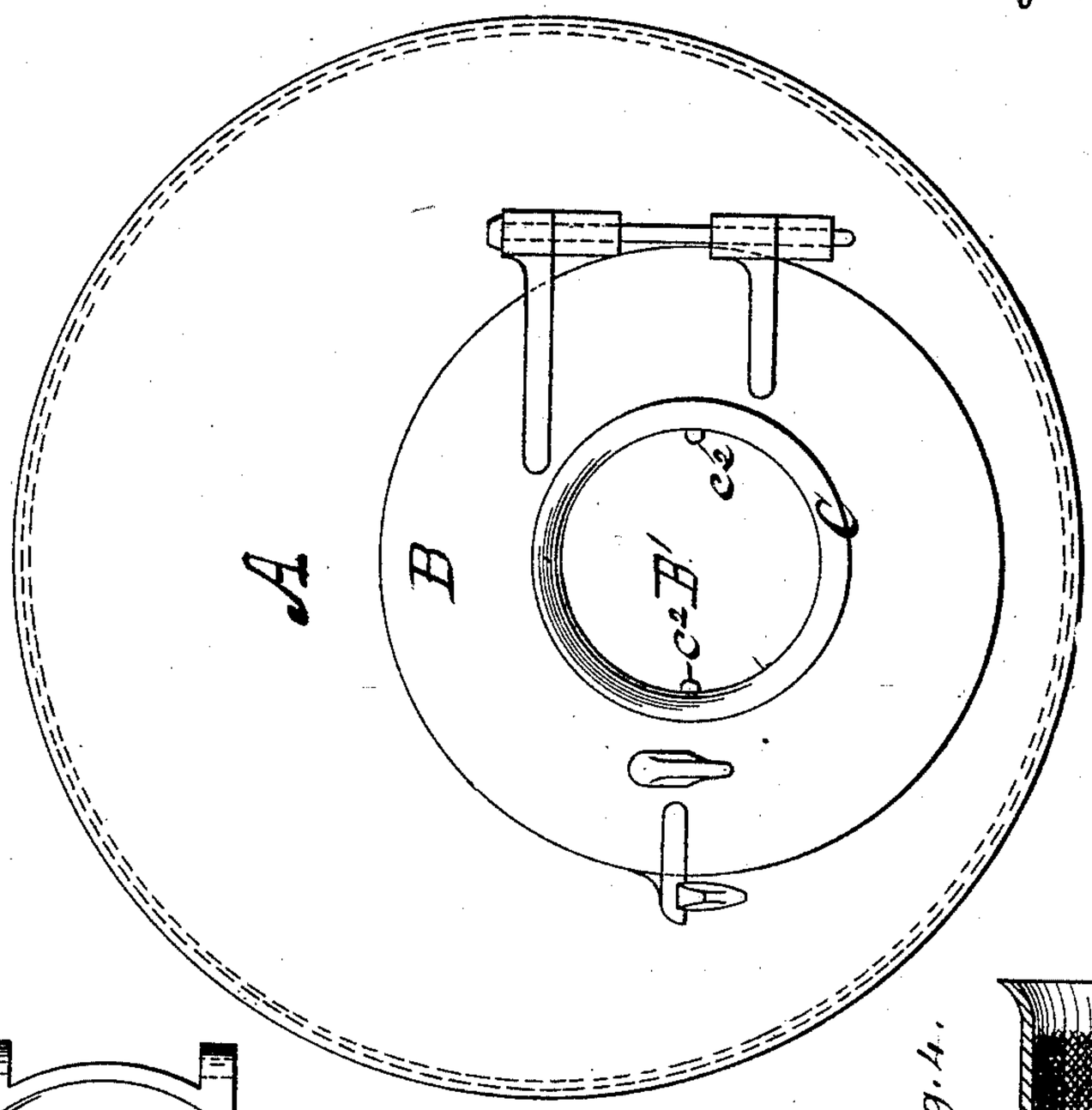


Fig. 2

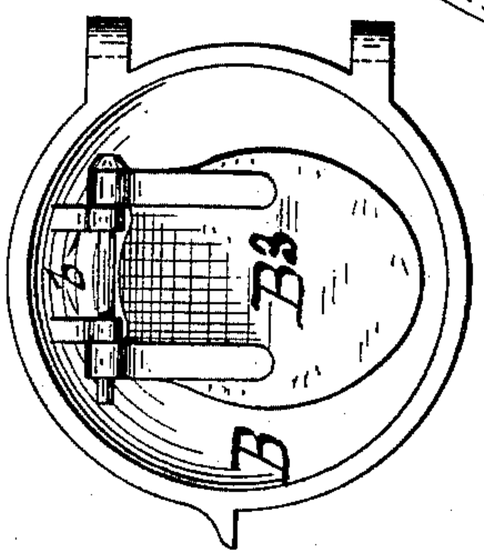
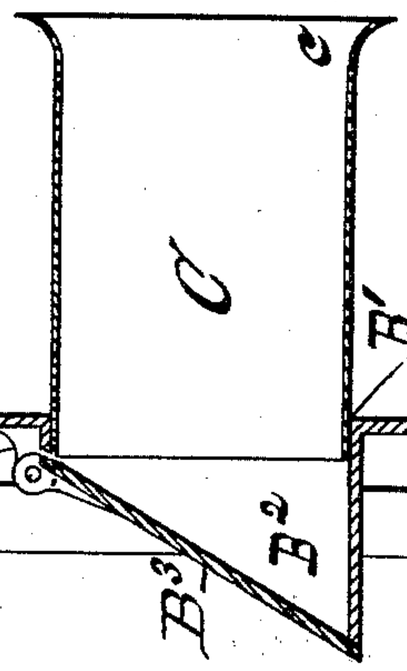


Fig. 3.



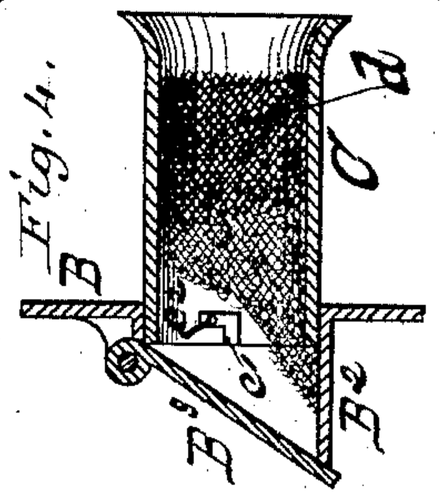


Fig. 4.

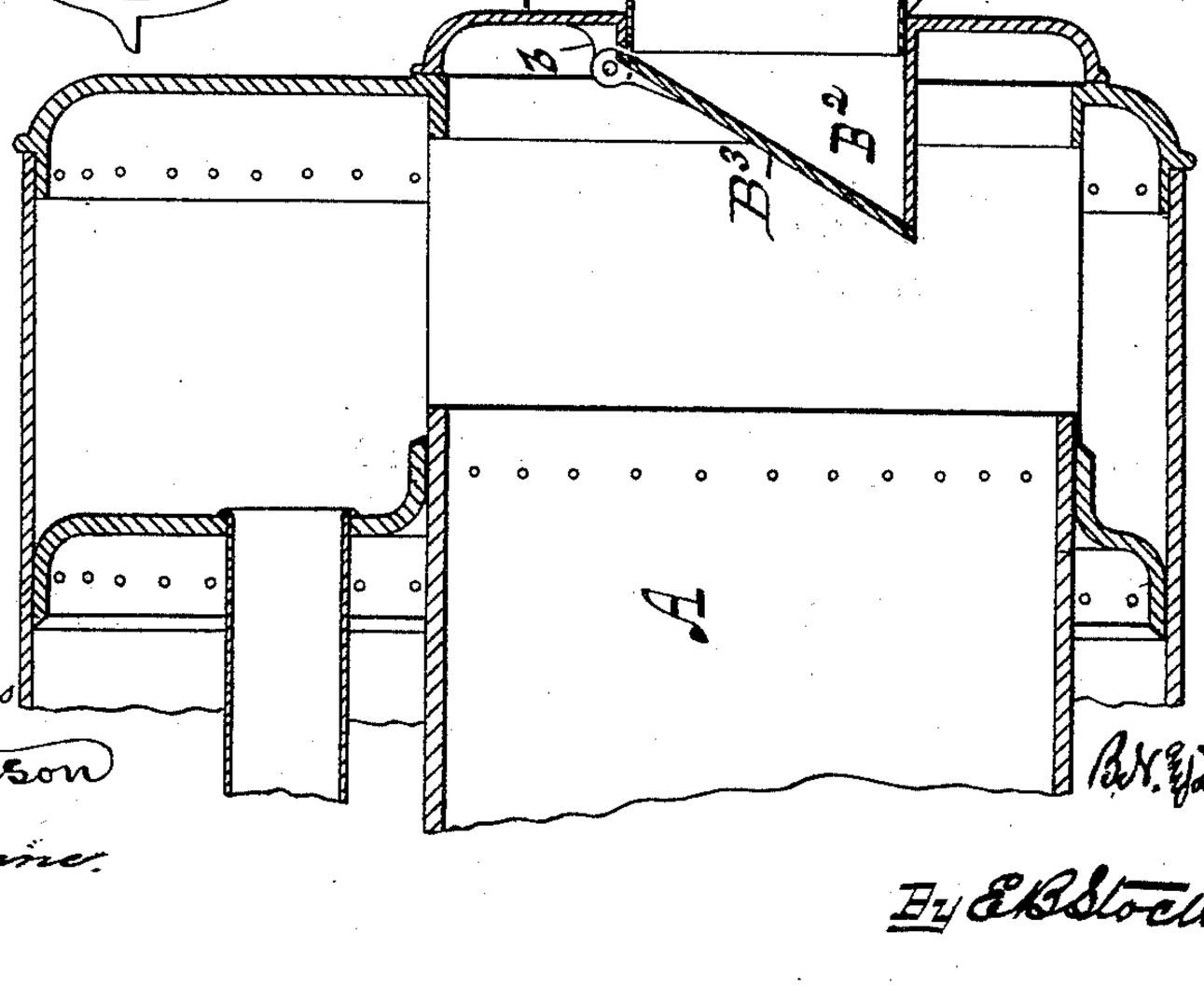


Fig. 1

Witnesses
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By E. B. Stocking Atty.

UNITED STATES PATENT OFFICE.

BENJAMIN N. PAYNE AND DAVID W. PAYNE, OF CORNING, NEW YORK.

STEAM-BOILER.

SPECIFICATION forming part of Letters Patent No. 277,426, dated May 8, 1883.

Application filed January 29, 1883. (No model.)

To all whom it may concern:

Be it known that we, BENJAMIN N. PAYNE and DAVID W. PAYNE, citizens of the United States, residing at Corning, in the county of Steuben and State of New York, have invented certain new and useful Improvements in Steam-Boilers; and we 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.

Referring to the drawings hereto annexed and forming a part hereof, Figure 1 is a central vertical longitudinal section, Fig. 2 a front end elevation, and Figs. 3 and 4 details, of a boiler constructed in accordance with our invention.

Like letters refer to like parts in all the figures.

A represents the boiler proper—that is, so much thereof as is necessary to a clear understanding of the present invention. The boiler in this instance is an ordinary return tubular boiler; but, as will clearly be seen, any boiler may be used in connection with or be provided with the means hereinafter described for rendering the use of straw or other light fuel practically safe.

B represents the door, which may be supported pivotally or in any usual manner upon the boiler-head, whereby it may serve its usual functions when ordinary fuel—such as wood or coal—is being used. The door is formed with a central opening, B′, which, in this instance, is circular; but, if desired, any other outline in cross-section may be adopted. The opening B′ is bounded by an inwardly-projecting continuous flange, which constitutes a pipe or chute, B^2, which is cast integral with the door. There are also cast integral with the door B two hinge-lugs, *b b*, located above the chute, whereby a drop door or valve, B^3, is pivotally supported in a position to close the chute by gravity when not otherwise operated. The chute is tapered off at its inner end, so that its lower side projects within the fire-box to a greater distance than its upper side, and hence the weight of the door serves to maintain it in more close contact with the chute than if it were merely suspended therein. Within the opening, or it may be in line therewith, is supported—in this instance, as shown in Fig. 1, by friction only—a feed-pipe, C, which in cross-section is a complete cylinder and adapted to snugly fit the opening B′, so that it may be retained therein or readily removed therefrom. The mouth of the feed-pipe is flared outwardly, as at *c*, and, if desired, the entire body of the pipe may be flared outwardly, in order to form a conical outline or shape, for a purpose hereinafter set forth. As shown in Fig. 4, the feed-pipe C is provided with a bayonet-slot, *c′*, and in the opening B′ of the door B are lugs c^2, whereby the pipe is removably secured to the door. If desired, the chute may be permanently attached by any suitable means or be cast integral with the door.

In operation straw is forced through the pipe C and chute B^2 into the fire-box until a sufficient quantity is supplied for immediate consumption, and as the straw which is left projecting from the chute burns away the door B^3 gradually falls to a closed position. At this time the straw within the chute and front or inner end of the pipe C is burning; but by reason of the closing of the door and the cylindrical outline of the pipe, and by reason of the closely-packed condition (shown at *d*, Fig. 4) of the straw, resulting from the force exerted thereon in pushing the fuel into the fire-box, the ignited straw in the chute and pipe is smothered, as no appreciable supply of external air can enter within the pipe to such a distance. Not only is it apparent that this operation takes place, but that an additional advantage is secured, in that the external colder air is prevented from coming in contact with and lowering the temperature of the fire within the fire-box. A conical feed-tube would tend to increase the compactness of the straw therein, and hence increase its smothering function.

Heretofore a supplementary grateless fire-box with a feeding-trough having a flat top has been removably attached to the boiler-head, and in no way connected to the fire-box door, the object being to admit no fuel into the fire-box proper. We do not claim such construction as of our invention, as the door proper of the fire-box cannot be closed with-

out removing said trough and supplementary fire-box, and as by reason of the flat top of the feed-trough sharp corners are formed, into which the straw could not readily and would not naturally be compacted sufficiently to prevent access of air within the pipe, and hence its smothering function is practically destroyed. For this reason we show and describe and prefer a cylindrical feed-pipe. Furthermore, said pipe being connected directly to the door of the fire-box proper, it may be employed, and does not in the least affect the use of the boiler for burning heavy fuels.

We are aware that a fire-box door has heretofore been provided with an internally-projecting chute having a valve or door, and do not claim such as of our invention.

Having described our invention and its operation, what we claim as new, and desire to secure by Letters Patent, is—

The combination, with the door B, having a cylindrical opening, B′, therein, and having the chute B^2 and door or valve B^3, of the cylindrical feed-pipe C, removably secured within the opening B′, all arranged substantially as specified.

In testimony whereof we affix our signatures in presence of two witnesses.

BENJAMIN N. PAYNE.
DAVID W. PAYNE.

Witnesses:
GEO. S. MORX,
C. W. SWEETLAND.