2 Sheets—Sheet 1.

F. BIGALOW.
Feed-Steamer.

No. 206,075. **Patented July 16, 1878.**

Fig. 1.

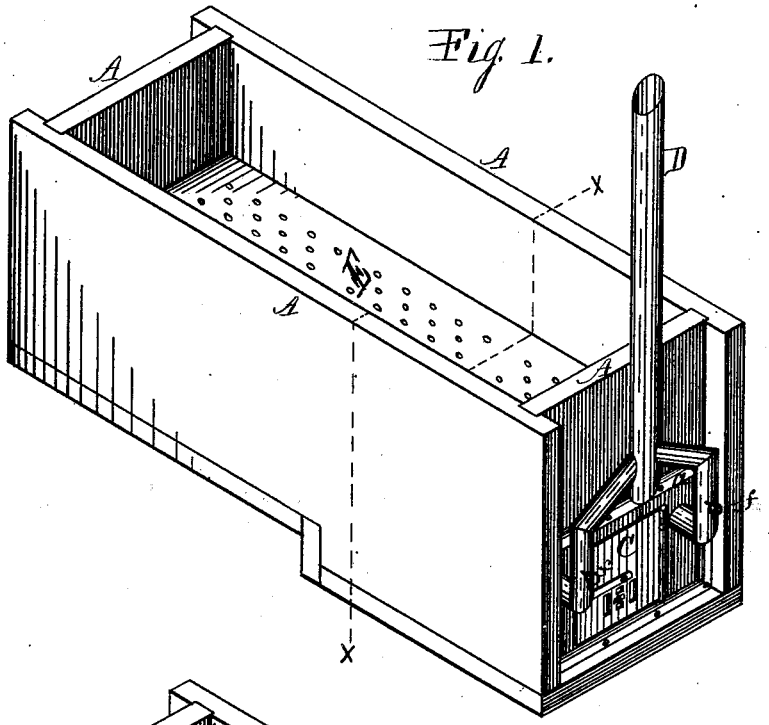
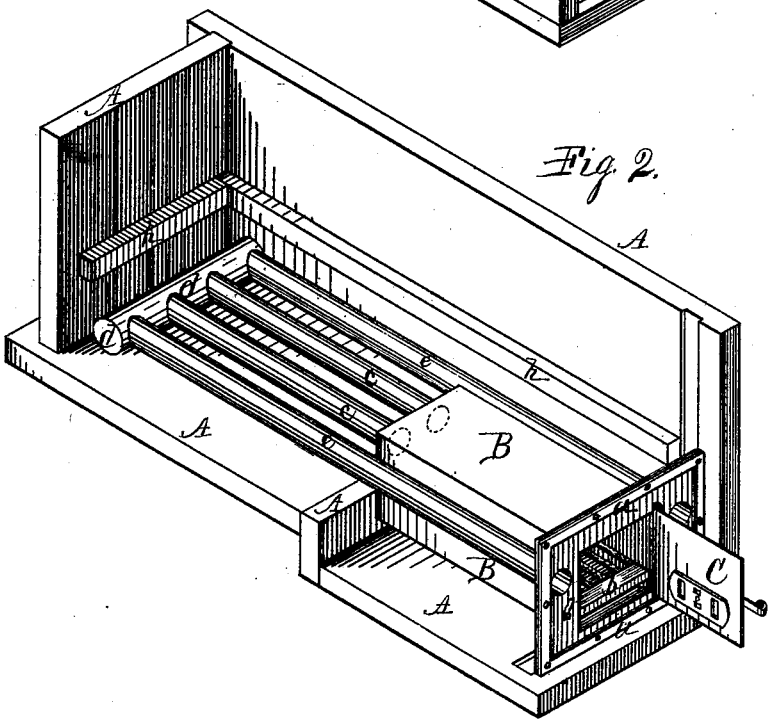


Fig. 2.



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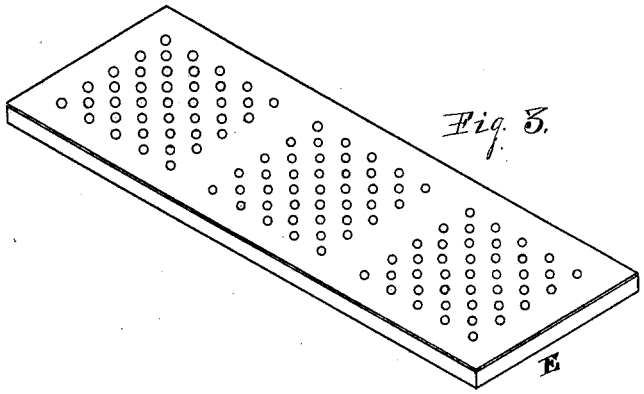


Fig. 3.

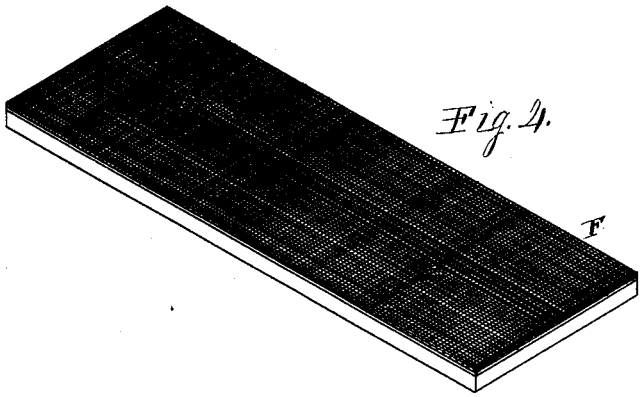
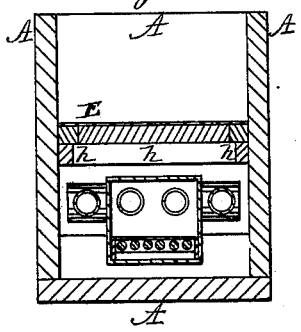


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

FREDERICK BIGALOW, OF ROCKFORD, ILLINOIS, ASSIGNOR OF ONE-HALF HIS RIGHT TO PETER SAMES, OF SAME PLACE.

IMPROVEMENT IN FEED-STEAMERS.

Specification forming part of Letters Patent No. **206,075**, dated July 16, 1878; application filed February 5, 1878.

To all whom it may concern:

Be it known that I, FREDERICK BIGALOW, of Rockford, Illinois, have invented a new and useful Improvement in Feed-Steamers, of which the following is a specification:

This invention relates to that class of feed-steamers employed in the preparation of feed for stock in which the feed may be boiled or cooked by steam in the same vessel in which the steam is generated; and it consists in the devices employed, and their construction and arrangement, as represented in the accompanying drawings, in which—

Figure 1 is an isometrical representation of my improved feed-steamer. Fig. 2 is a similar representation of the same, in which the one side and the upper portion of the front end are omitted, for the purpose of showing more clearly the fire-box and gas or hot-air flues placed inside of the box. Figs. 3 and 4 are isometrical representations of the perforated screen and cloth-covered shelves. Fig. 5 is a transverse vertical section on dotted line *x*.

The object of this invention is to provide an efficient feed-steamer of cheap construction, in which feed, either solid or ground, can be boiled or cooked by steam in the same vessel in which the steam is generated, the fire-box, hot-air or gas flues, and the water being contained in the same vessel. To this end I have designed and constructed the steamer represented in the accompanying drawings, in which—

A represents the outer casing or boiler of my improved feed-steamer, which, in this instance, is of wood, constructed in rectangular box form, having its forward end of greater depth than its rear portion. This greater depth is formed by increasing the depth of the sides and forward end and placing the bottom on a lower plane than that of the rear portion of the boiler. This increased depth is designed to receive the greater portion of that part of the fire-box which is below the tubular gas or hot-air flues, which extend from the upper portion of the rear end of the fire-box rearward, and return through the forward end of the casing, and serve to reduce the quantity of water necessary to cover the fire-box and flues.

B represents the fire-box, made in rectangular form, connected at its front end to the front plate *a*, through which it opens outward. C is a door, hinged to the front plate *a* in such a manner as to swing on its hinged connection to close the front opening of the fire-box. This door is provided with a latch of ordinary construction, by means of which it may be held in a closed position, and is also provided with a sliding register, for regulating the admission of air to control the consumption of fuel in the fire-box.

b is a removable grate, placed in the fire-box, to support the fuel above the bottom of the box, in such a manner as to permit the air which passes through the register to pass under it and upward through it, to support complete combustion. *c* are tubular flues secured in the rear end of the fire-box, near the upper surface of the box, and open into it. These tubular flues extend to the rear end of the boiler, nearly, where they connect with a transverse tubular flue, *d*, of similar size, placed horizontally, and extending outside of the tubes *c*. Other similar tubular flues, *e*, connect with the outward-projecting ends of the horizontal tube *d*, and lie parallel to the tubes *c*, and extend to and open through the front plate *a*. This construction and arrangement of fire-box and gas or hot-air flues is placed in the box-formed boiler, as represented in the drawings, with the fire-box B in the deeper portion of the boiler, and in such a manner that the face-plate *a* rests against the outer face of the boiler end, to which it is secured, with packing between it and the end of the boiler, in such a manner as to make it water-tight, and to hold the fire-box B and the tubes connected thereto above the bottom of the boiler.

The rear portion of the fire-box, and also the rear portion of the flues, may rest on proper supports resting on the bottom of the boiler.

D is a tubular stack-pipe, forked at its lower end, provided with elbow-connections, fitted to connect with the opening ends of the lengthwise flues *e* where they open through the front plate *a*. The lower forked ends of the stack-pipe are provided with dampers, as at *f*, for the purpose of regulating the draft.

From the foregoing it will be seen that the inner horizontal flues open into the rear end of the fire-box, and when the stack-pipe is removed the outside horizontal flues open on

the outside of the front end of the boiler, through which the flues can be readily cleaned.

h are strips of proper size, secured to the sides and ends of the boiler, on its inner side, a proper distance above the fire-box and flues, to admit of a sufficient quantity of water to properly cover the fire-box and flues without rising over the strips. These strips furnish a support for the feed-supporting shelves to rest on.

E is a perforated shelf, composed of a rectangular sash-work frame, covered with perforated-plate material, and is of proper size to drop into the boiler and rest on the strips *h*, secured to the inner sides of the boiler, and is represented in place at E, Figs. 1 and 5. This form of shelf is designed to be employed in cooking solids, as whole grains and vegetables, which are to be placed on the shelf in the boiler.

F represents a shelf, substantially the same as the shelf last above described, except that it is provided with an additional covering of cloth of suitable quality, which is placed on the upper side of the perforated-plate material, and is secured at its edges to the frame of the shelf. This shelf is of proper size to be used instead of shelf E, and is designed to be used in cooking ground feed, and such feed as when cooked would be likely to pass through the perforated shelf. This cloth covering may be secured to the perforated shelf in any other suitable manner than that above described, or it may be secured to a separate or independent frame-work, and when required may be placed in the boiler, to rest on the perforated shelf.

When required, these shelves may be fixed in position in the boiler by any of the usual devices, such as buttons, bolts, hooks, or other similar devices, to prevent their rising when immerged in water.

In the use of my improved feed-steamer, when used to cook feed by steam, water is placed in the boiler to fill it nearly to the under side of the shelves, and the feed to be cooked is then placed on the shelf. The boiler is then covered with a close-fitting lid. Fire is then started on the grate in the fire-box, which will soon generate steam, which will rise through the perforated shelf and come in contact with the food, and soon cook it, and when properly cooked the lid is removed and the feed removed from the boiler. This operation is substantially the same in cooking solid or ground food.

In using my improved steamer to boil solid feed, it is filled with water to sufficiently cover the feed placed on the perforated shelf; and in boiling ground feed the boiler is filled with water to the proper height above the cloth-covered shelf, and the ground feed is then stirred in the water until the proper consistency is obtained.

In practice it is found that nearly all the heat generated in the fire-box above the temperature of the water in the boiler is absorbed by the water in the passage of the heat through the flues. From this fact I am enabled to accomplish greater results with the same amount of fuel than can be done in any other cheap machine known to me.

In the foregoing I have represented my improved feed-steamer with boiler constructed of wood in box form, and the feed as being cooked in the same vessel; but it is evident that the boiler may be made of any other proper material, and in any other proper form than that of a rectangular box, and that it may be employed as a boiler from which steam may be conducted to other vessels containing feed to be cooked by steam; and it may be employed for the purpose of heating water, or as a steam-generator, for any purpose to which it would be applicable. I have also represented the shelves covered with perforated-plate material, instead of which wire-cloth with meshes of proper size may be employed.

I am aware that it is not broadly new with me to form a fire-box and a system of flues beneath the feed-supporting shelf of an agricultural boiler, and hence I restrict my invention to the particular construction shown in the drawings and pointed out in the claim.

I claim as my invention—

A feed-steamer consisting in the combination, with boiler A and fire-box B, of the flues *c*, which connect the rear end of said fire-box with the transverse flue *d*, and the forward return-flues *e*, said flues being in the same horizontal plane with the fire-box, and leaving the top surface of the same freely exposed to the water, substantially as set forth.

FREDERICK BIGALOW.

Witnesses:

R. S. BEYMER,

A. A. DICKINSON.