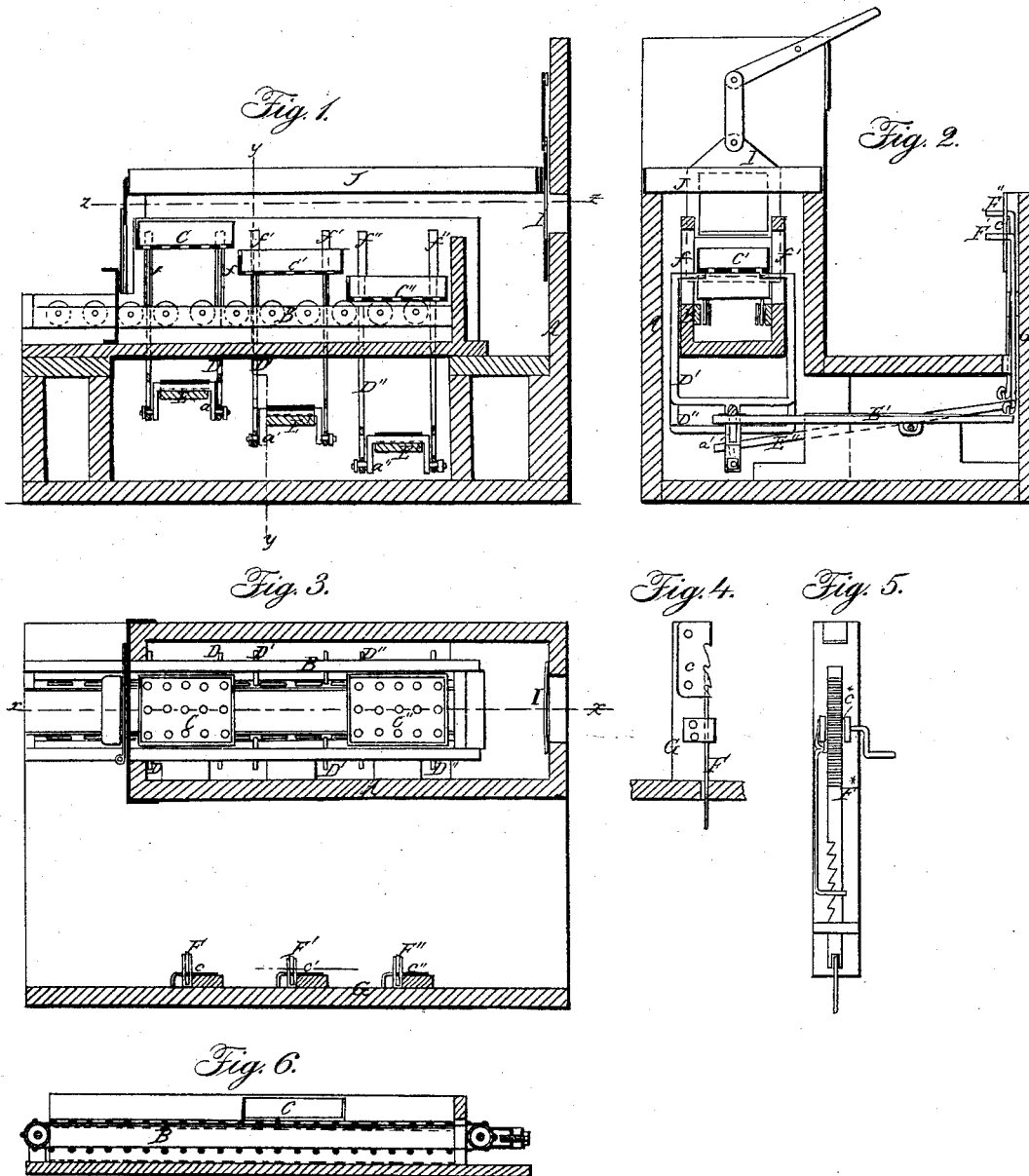


B. BROWN.
Evaporating Pan.

No. 46,069.

Patented Jan. 31, 1865.



Witnesses:

Wm Gruen
Ed Topliff

Inventor:

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per Mum & Co.
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UNITED STATES PATENT OFFICE.

BARCLAY BROWN, OF BYBERRY, PENNSYLVANIA.

IMPROVED APPARATUS FOR EVAPORATING SACCHARINE LIQUIDS.

Specification forming part of Letters Patent No. **46,069**, dated January 31, 1865.

To all whom it may concern:

Be it known that I, BARCLAY BROWN, of Byberry, in the county of Philadelphia and State of Pennsylvania, have invented a new and Improved Furnace for Evaporating Saccharine and other Liquids; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable those skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a longitudinal vertical section of this invention, the line *xx*, Fig. 3, indicating the plane of section. Fig. 2 is a transverse vertical section of the same, the line *yy*, Fig. 1, indicating the plane of section. Fig. 3 is a horizontal section of the same, taken in the plane indicated by the line *zz*, Fig. 1. Fig. 4 is a detached sectional view of the device for adjusting the fire-grates in a larger scale than the previous figures. Fig. 5 is a modification of the same. Fig. 6 is a detached longitudinal section of the mechanism for moving the grates on their track.

* Similar letters of reference indicate like parts.

This invention consists in a furnace provided with sliding sectional grates which are adjustable in a vertical direction in such a manner that each section can be readily withdrawn and replenished with fuel without disturbing the action of the other grates; and furthermore, each of the sections, or one or more of the same, can be raised or lowered independent of the others, and thereby the heat can be regulated with the greatest nicety, and the fuel can be used with the greatest economy. The sectional grates are placed on a track extending through the furnace in a longitudinal direction, and they are moved out or in either by a hook or, when the furnace is very large, by an endless band stretched over pulleys and operated by hand or other power. They are adjusted in a vertical direction by hook-frames which are hinged to levers operated by handles, or any other suitable mechanism in such a manner that each grate can be raised or lowered at any moment, and without disturbing the remaining sections.

A represents a furnace, built up of brick or any other suitable material, and in any suitable form or shape. Through this furnace in

a longitudinal direction extends the track B, which supports a series of sectional grates, C C' C". Said track may either be made as represented in Fig. 1, so that the several grates move on wheels, or it may be constructed as shown in Fig. 6, where an endless band is employed which is stretched over rollers situated at the ends of the track, and which is perforated with a series of holes to admit pins projecting from the under surface of the bottom of the grates, so that by moving the endless band the grates can be moved in either direction, as may be desired. Each section of the grate can thus be moved on the track back and forth either by means of a hook or by turning the endless band in the proper direction. In order to raise the sections of the grate nearer to or to lower the same farther from the top edge of the arch, each section is placed over two hook-frames, D D' D", the lower ends of which are connected by stirrups *a a'*, and these stirrups are firmly secured to levers E E' E", which have their fulcrum on pivots *b*. The outer ends of these levers extend beyond the side wall of the furnace, and they are connected to handles F F' F", which are so arranged that they can be conveniently depressed by hand or any other power. Serrated racks *c c' c"*, secured to an upright wall G in the proper position, serve to adjust the handles, and consequently the levers E E' E", in the desired position.

Instead of using simple handles for adjusting the levers and the grates, toothed bars F* might be applied, such as shown in Fig. 5. These bars are operated by pinions *c**, and they are held in the desired position by spring-dogs catching into ratchet-teeth cut in the edge of the bars. This mechanism is required if the sectional grates are heavy, but for light grates the simple handles can be used.

In practice the sectional grates will be constructed of square or oblong frames having grate-bars in their bottoms, but for small grates the construction shown in the drawings may be retained.

The hooked ends of the rising and falling frames D D' D" pass through guide-slots *ff' f"* in brackets or flanges rising from the sides of the track, and these flanges or brackets may be made in sections according to the size of the furnace.

A damper, I, in the chimney regulates the

draft in the usual manner, and the top of the arch is occupied by a pan, J, in which the liquid to be evaporated is placed.

By means of the sectional grates the heat under the entire bottom of the pan can be regulated and equalized with the greatest nicety, and coal can be employed as a fuel in evaporating saccharine juices or other liquids. If the fire in the several grates goes down, said grates are lifted so as to bring them close to the bottom of the pan, or if the fire in one grate is stronger than that in the other, one is lowered and the other raised. In order to introduce fresh coal into the second grate the first is raised and the second can be withdrawn from under it, and in order to charge the last grate with fresh coal the two first are raised. The several grates can be readily interchanged and the heat under the several parts of the pan can be applied with the greatest advantage. The principle feature of my invention, however, is that by its construction the use of hard coal in evaporators for saccharine and other liquids is rendered practicable because by the sectional grate I am enabled to extend

the grate-surface under the entire length of the pan, and furthermore, by being able to interchange and to raise and lower the several sections I am able to regulate the heat under the pan with the greatest nicety.

I do not claim as my invention a sectional grate; neither do I claim to make the sections of a grate movable either in a horizontal or in a vertical direction; but

I claim as new and desire to secure by Letters Patent—

1. A grate made in sections which can be moved both in a horizontal and in a vertical direction, substantially as and for the purpose described.

2. The hook-frames D D' D'' and levers E E' E'', arranged in combination with the sectional grates C C' C'', and handles F F' F'', or their equivalents, in the manner and for the purpose substantially as set forth.

BARCLAY BROWN.

Witnesses:

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