2 Sheets—Sheet 1.

B. COE & M. GEON.

Vessel for Evaporating Saccharine Juices.

No. 31,590. Patented Mar. 5, 1861.

Fig. 6

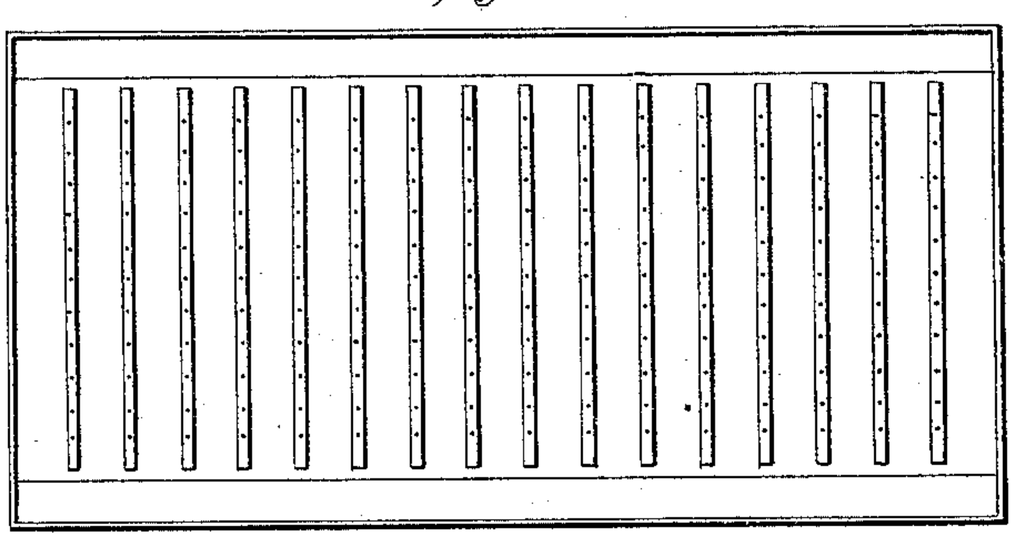


Fig. 3.

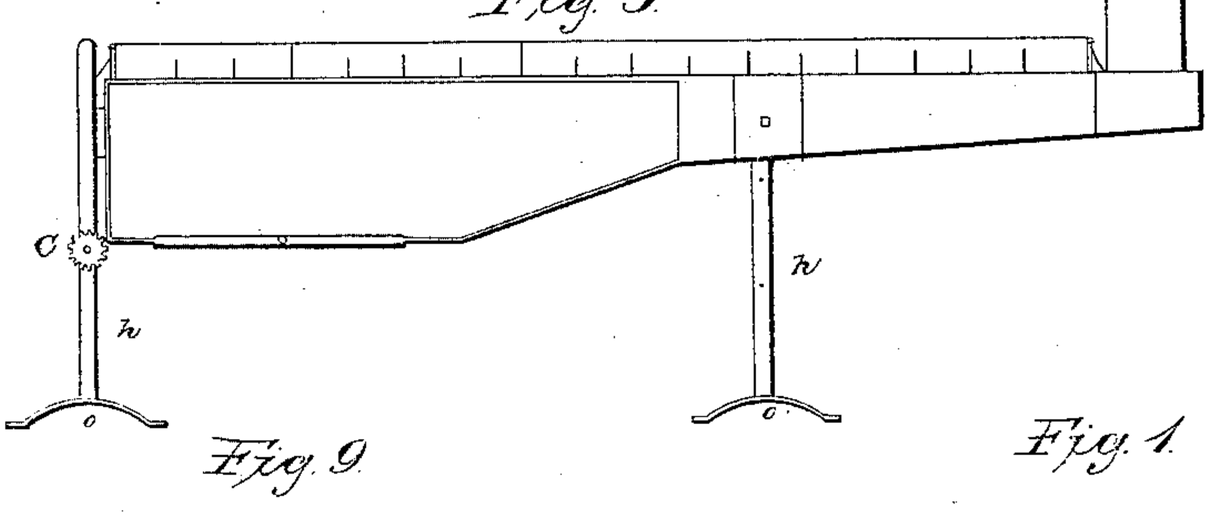


Fig. 9.

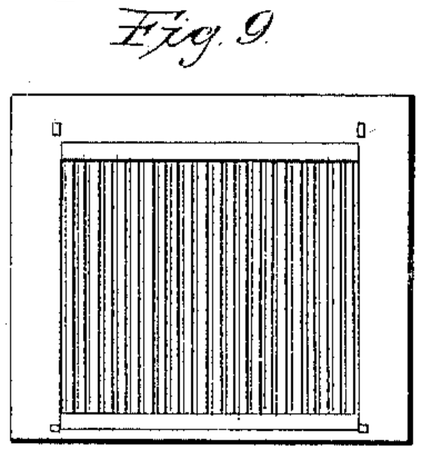


Fig. 5

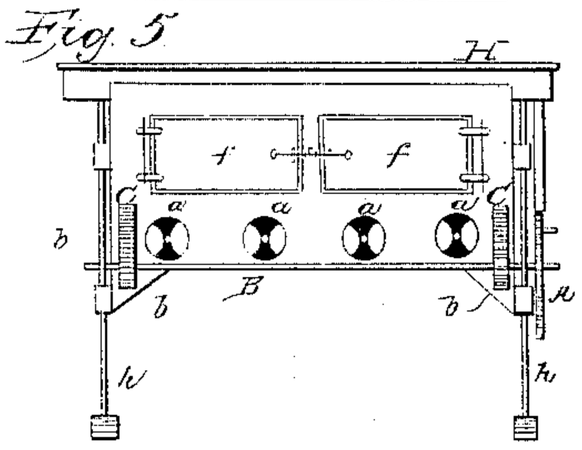
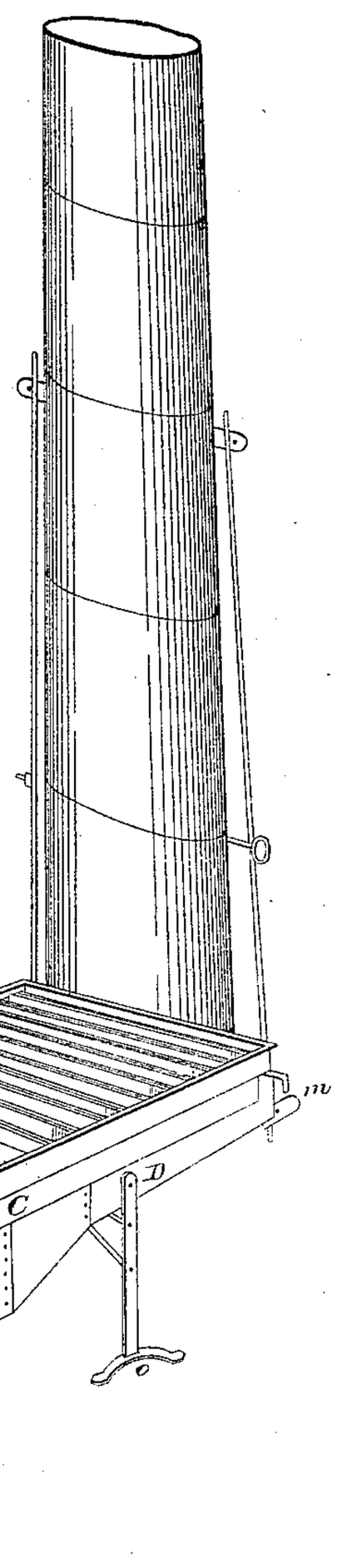


Fig. 1.



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2 Sheets—Sheet 2.

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Vessel for Evaporating Saccharine Juices.

No. 31,590. Patented Mar. 5, 1861.

Fig. 6.

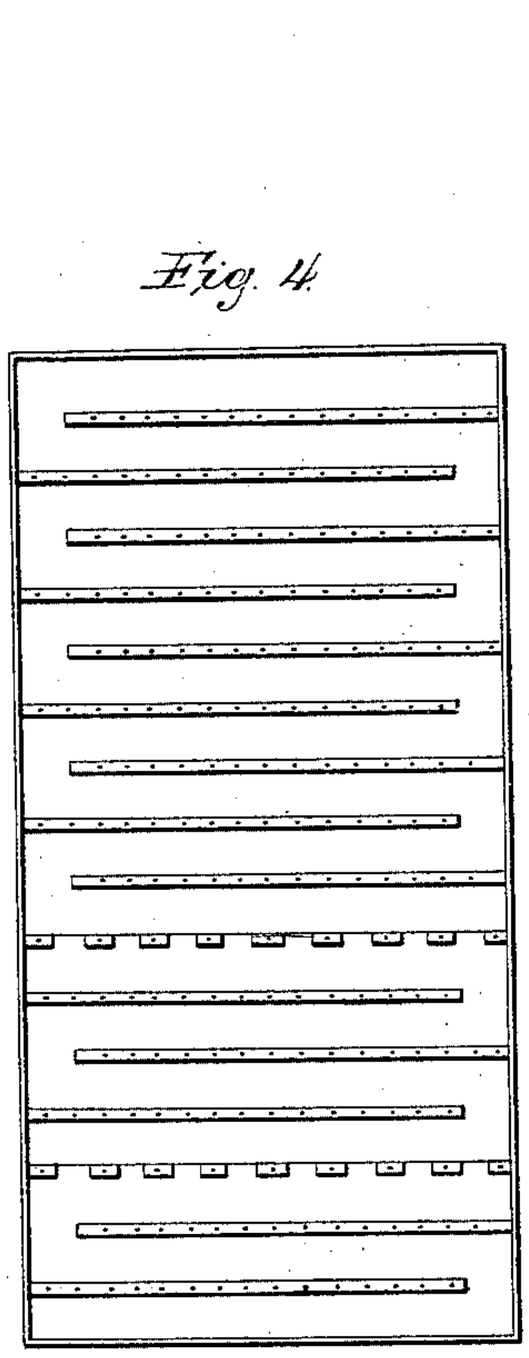
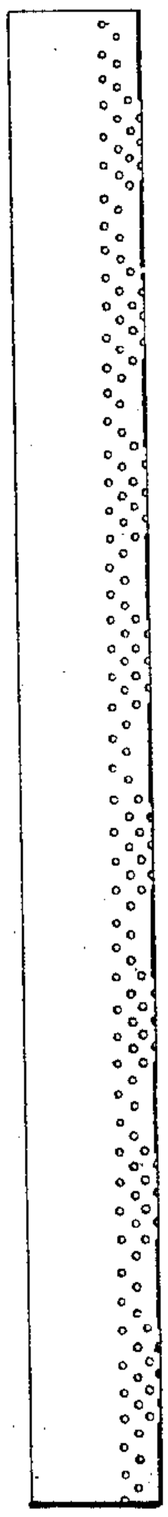


Fig. 4.



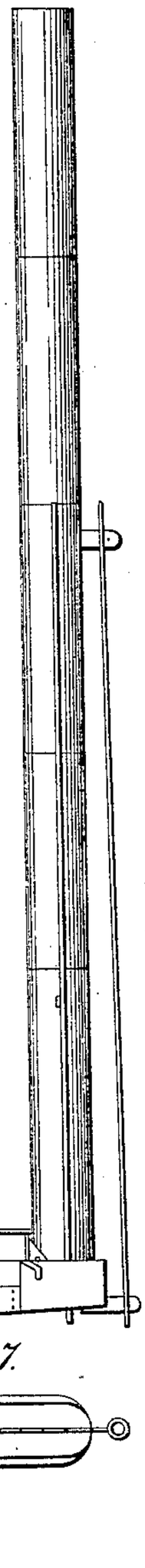


Fig. 10.

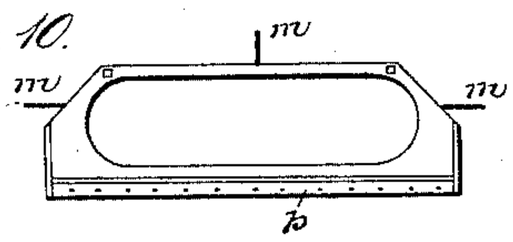


Fig. 2.

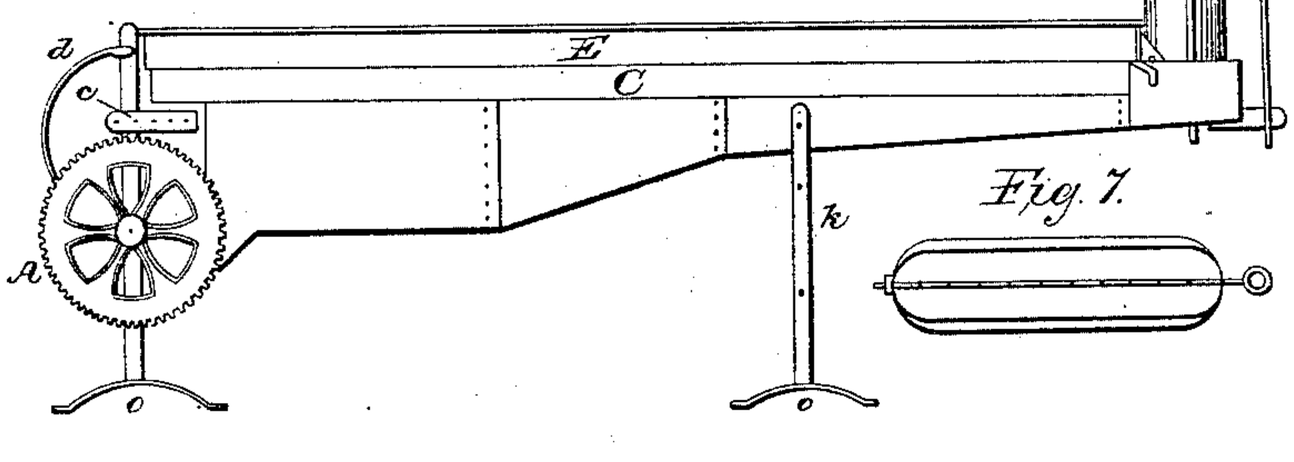


Fig. 7.

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UNITED STATES PATENT OFFICE.

B. COE AND M. GOON, OF DALTON, OHIO.

IMPROVEMENT IN VESSELS FOR EVAPORATING SACCHARINE JUICES.

Specification forming part of Letters Patent No. **31,590**, dated March 5, 1861.

To all whom it may concern:

Be it known that we, BENJAMIN COE and MICHAEL GOON, of the town of Dalton, and county of Wayne, in the State of Ohio, have invented a new and useful Machine for the Purpose of Evaporating Sorghum or Sugar-Cane Juice, called the "Ohio Evaporator;" and we do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view. Fig. 2 is a longitudinal view; Fig. 3, an interior side view of furnace and protectors. Fig. 4 is a top view of the pan; Fig. 8, a bottom view. Fig. 5 is a front view of machine. Fig. 6 is a side view of filterer in pan; Fig. 7, damper; Fig. 9, grate and bottom plate of fire-bed; Fig. 10, cast-iron collar for flue to rest on.

Fig. 1 is perspective view of the evaporator. The ratchet-wheel A is fourteen inches in diameter, and is attached to the shaft B, which is five-eighths of an inch in diameter and two feet nine inches long. *b b* are two pinions attached to the shaft B, which move the segments *c c*, which are cast with the front plate of the furnace, and in such a position that the shaft will not interfere with the opening of the doors of the furnace. There is a handle on the ratchet-wheel A, by means of which the shaft and pinion are turned. The object of the shaft and the pinions moving in the segments is to raise and lower the ends of the pan and furnace, which vibrate on the pinion D, so as to cause the fluid in the pan to flow swift or slow, as may be desired, in evaporating the juice. *e e e e* are sliding loops attached to the side of the furnace H by rivets. They are placed on the upper and lower side of furnace. The upper ones are three and one-half inches below the upper edge of the furnace. The lower ones are placed one inch below the bottom of furnace on a flange cast on the side of the front plate of the furnace. These loops are made of wrought-iron one-fourth of an inch thick and two inches wide. The posts *h h*, by which the front of the furnace is supported by means of the loops *e e e e*, passing through the loops, are made of wrought-iron two inches by three-eighths of an inch, and are two feet high. The bottom of these posts are fastened to an elliptic circle, *o o o o*, and rest on them with a shoulder (made of wrought-iron one-half inch thick and one and one-half inch wide and ten inches long) by riveting the lower end, and in such a manner as to permit the post to vibrate in its sockets backward and forward three inches in a parallel line with the pan to prevent lockage and tilting of the feet, the holes in the feet being made large enough to permit this oscillatory motion. The posts *h h* pass through the loops *e e e e*, which hold the furnace in position. On the top of the right-hand post is attached the lock *d* by a rivet to the side of the post, which holds the ratchet A in whatever position it may be placed. An iron stop is placed in each post *h h* at a proper distance, so as to prevent the pinions from running off the segments by the loops resting on the stops. The shaft B passes through the post *h h* in such a manner as to place the pinions *b b* in the center of the segments *c c* when the furnace and pan are perfectly level. The back part of the furnace is supported by two posts, *k k*, (the bottom of which are constructed in the same manner as the front,) by means of an iron pivot, D, passing through the sides of the furnace two-thirds of the way back from front end. These posts are held together by means of an iron bar supported by two braces. The sides of the furnace in which the pivot D works are braced by an extra piece of sheet-iron riveted to them on the inside, as shown in Fig. 3.

The pan, as shown by E and Figs. 4 and 8, is made out of galvanized sheet-iron, is six feet long, three feet wide, extending out over the sides of the furnace three inches on each side. There are sixteen divisions in it four inches apart, the ends of which are alternately fastened to the pan, leaving each one open at one end three inches from the side of the pan. There are two filterers in the pan, making the three and seven divisions each extending across the pan, and fastened to the sides and bottom by means of rivets. They are perforated with four rows of holes, each alternately one-fourth of an inch apart. These filterers are attached to the pan by means of flanges one-half an inch square between the flanges,

and on the bottom of each filterer is a row of half-holes, through which all the fluid may pass from the pan.

The bottom of the pan, as shown in Fig. 8, is stayed with sixteen bars of D-iron placed opposite to each division and riveted on the pan, and are one-half inch wide and one-fourth of an inch thick. These bars may be placed either on the inside or outside of the pan. The rivets by which these bars are attached to the pan pass through the flanges, which hold and support the divisions and filterers in the pan. There is a flange on each side of the bottom of the pan, as shown by *l l* in Figs. 1 and 2, fastened by rivets three inches from the outer edge. These flanges pass down on the outside of the furnace, and are made of sheet-iron three inches wide, and for the purpose of holding the pan on the furnace. There is a stop-cock at the right-hand corner of the pan for the purpose of running off the sirup.

The furnace, as shown by H in Fig. 1, is six feet long inside where pan rests, and two feet six inches wide, and is made of sheet and cast iron. The front, as represented by Fig. 5, is two feet three inches high, and is made of a cast-iron plate, which runs four inches back on the sides. On the front corners are flanges cast on the plate for the purpose of supporting the loops and segments. In it are two cast doors, *f f*, and on the bottom, in front, are four air-holes, *a a a a*, in which are movable slides for the purpose of regulating the draft. The sides of the furnace, as shown in Fig. 2, are two inches lower than the front, (there being a projection in front of two inches to hold the pan in its place,) and are as far back as fire-bed reaches, which is twenty-five inches one foot high from fire-bed back to the throat of furnace, ascending from one foot to six inches, and from throat of furnace to collar or elbow from six inches to four inches high.

The inside wall of furnace and fire-bed, as shown in Fig. 3, are protected by movable fluted cast-iron plates standing in an oblique position along the sides of furnace and resting on the bottom plate and throat. At the bottom they are four inches from side of furnace, and held in position by flange on fire-plate, the tops resting against side of furnace. They are twelve inches high, three and one-half feet long, and one-fourth of an inch thick. They are placed in this oblique position so as to allow a passage for a current of air coming in at two of the holes *a a* in front to pass between them and the sides of the furnace, the object of which is to protect the sides of the furnace from burning and the attendant from excessive heat, and also to allow a current of air to pass into the throat of the furnace to produce an equalization of heat under the pan and give force to the draft.

The bottom of fire-bed, as shown in Fig. 9, is a cast-iron plate and round grate-bars. The front part of the plate is one inch wide, the back and sides four inches wide, one-fourth of an inch thick. The bars are one-fourth of an inch apart, covering a space of twenty-two inches wide, twenty-one inches long, and three-eighths and one-sixteenth of inch thick. This plate rests on a groove in the front plate of furnace, and so much of the sides as are cast (the sheet-iron of the sides) is turned under and riveted to said bottom plate. The throat of furnace is composed of three plates of sheet-iron riveted together on the bottom, the flue of one sheet of iron, the sides turned up, and is riveted on the bottom and side of throat, as shown in Fig. 2.

Fig. 10 represents the collar or elbow, which is composed of two cast-iron plates, the upper part and sides being one piece, and are screwed together by bolts *n n*. On the top plate is cast a flange extending across the width of plate and supported by two small corner-flanges, as seen in Fig. 2. The object of this flange is to hold the back end of pan in place.

The stack, as shown in Figs. 1 and 2, is composed of sheet iron ten feet high, two feet wide, and six inches through. This width is made with reference to the width of the grate, whereby the best draft is obtained, and is self-supported by three stays of one-fourth inch round iron attached to the third joint of pipe and to three flanges, *m m m*, riveted on the bottom plate of the collar, one on each side and one on back end. Inside of the stack, and at the top of first joint, is placed a damper, as shown in Fig. 1. (Damper represented in Fig. 7.) This damper is so placed in the stack as to leave a space, when it is in a horizontal position, of three-fourths of an inch between it and sides of stack, by means of which a greater draft is given. The damper is made of sheet-iron and riveted on the handle. The rods by which the stack is supported are fastened by flanges riveted onto the pipe, the end of the rod flattened, and a hole punched through corresponding in size to that of the flange, and held in place by pins through the flange. The lower end same way. The bars that stay the pan do not reach entirely across the pan, but a sufficient distance, when on the inside, to permit the pan to set down close on the furnace. The pan is three inches deep, made out of a single sheet of iron turned up and riveted at the corners, with a wired edge.

What we claim as our invention, and desire to secure by Letters Patent, is—

The evaporator, in combination with the protectors to the furnace, as shown in Fig. 3, the shaft B, the pinions *b b*, the segments *c c*, the sliding loops *e e*, the ratchet-wheel A, lock *d*, and the pivot D, as shown in Fig. 1, as described, and for the purposes set forth.

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MICHAEL GOON.

Witnesses:
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T. S. JOHNSON.