(No Model.)

2 Sheets—Sheet 1.

B. PEER, Jr.

HOP KILN.

No. 345,535. Patented July 13, 1886.

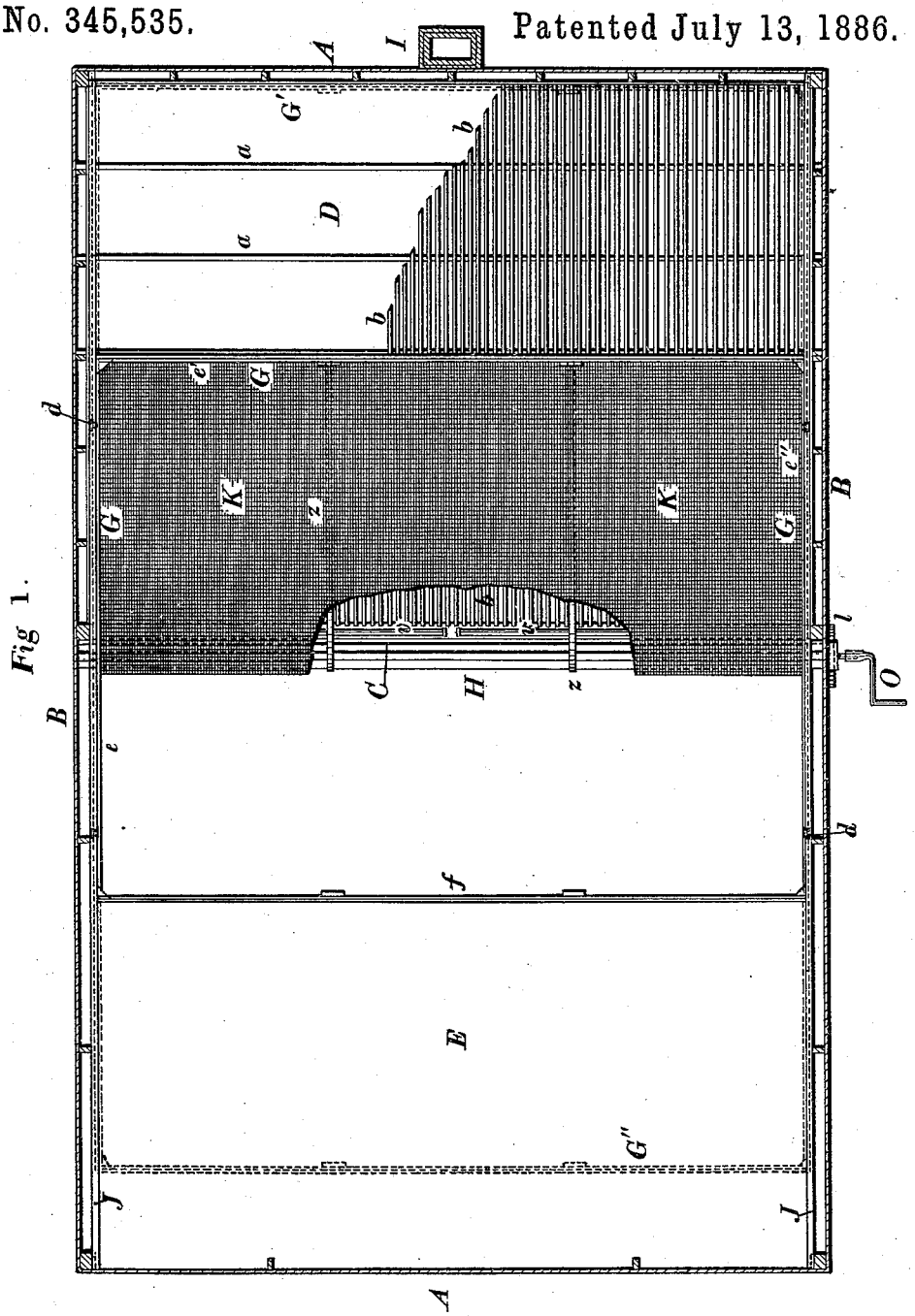

Fig 1.

WITNESSES

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(No Model.)

2 Sheets—Sheet 2.

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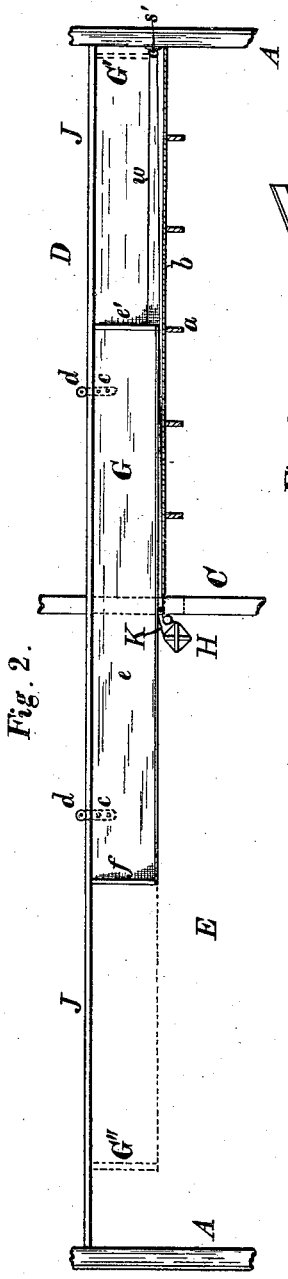

Fig. 2.

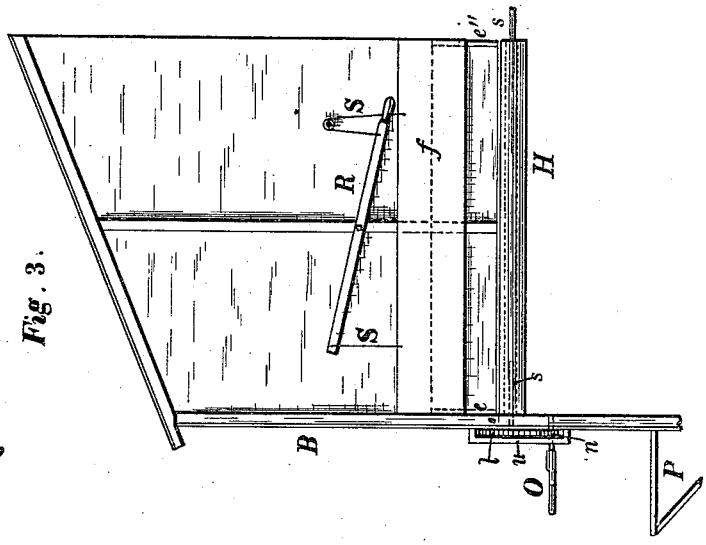

Fig. 3.

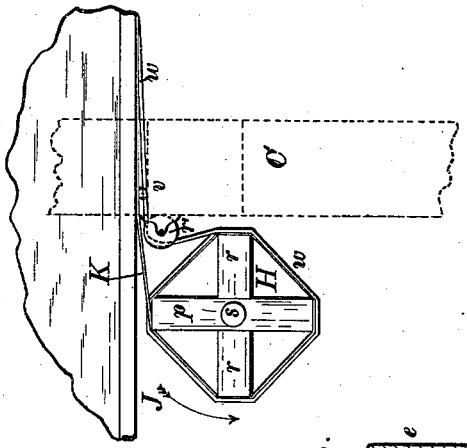

Fig. 4.

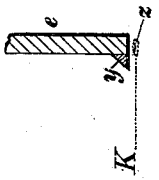

Fig. 5.

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UNITED STATES PATENT OFFICE.

BENJAMIN PEER, JR., OF HONEOYE FALLS, NEW YORK.

HOP-KILN.

SPECIFICATION forming part of Letters Patent No. 345,535, dated July 13, 1886.

Application filed January 2, 1886. Serial No. 187,362. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN PEER, Jr., of Honeoye Falls, Monroe county, New York, have invented certain Improvements In Hop-Kilns, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in hop-kilns, whereby the handling of hops during the drying operation is facilitated and rendered less expensive by means of the apparatus described and illustrated in the following specification and accompanying drawings, the novel features of which are specified in the annexed claims.

My improvements in hop-kilns are represented in the accompanying drawings, in which Figure 1 is a horizontal section through a building fitted up for drying hops and containing my invention, the plane of section being taken above the movable tray with flexible bottom on which the hops are dried, which parts are shown in plan. Fig. 2 is a vertical longitudinal section. Fig. 3 is a vertical transverse section. Fig. 4 is a sectional view through the reel on which the kiln-cloth is wound, made on an enlarged scale. Fig. 5 is a vertical section through one of the sides of the movable tray.

In the accompanying drawings, A A and B B represent the walls or sides of a suitable building adapted to the purpose of drying hops. The building is divided by a vertical partition, C, into two sections or compartments, one of which, D, is used for drying hops, while the other, E, receives the hops after they are dried, the transfer from the drying section being effected by the movable tray G, having a flexible bottom of suitable cloth or fabric which is wound about the reel H. The drying-compartment is provided with a suitable horizontal platform consisting of the cross-beams *a a* and the slats *b b*, which support the flexible bottom of the tray G, on which the hops are placed during the drying operation. Below the platform, in the drying-compartment, is placed a suitable heater or hot-air furnace, adapted to heat the air and cause it to rise through the slatted platform, the kiln-cloth forming the bottom of the tray and the hops placed thereon, thereby effecting the drying of the latter. Suitable openings are made in the compartment D below the tray for the admission of air to be warmed by the heater, and above the same, or in the roof of the building, for the escape of the heated air. The chimney I, Fig. 1, by which the products of the combustion of the fire in the heater are carried away, may be placed either inside or outside the wall of the compartment D. In order to economize the heat as much as possible, the compartment D is preferably lathed and plastered. On two of the opposite sides of the building are placed the horizontal guides or ways J J, on which the tray G is supported by means of the arms *c c*, provided with rollers *d d*, so that it may be moved backward and forward on the ways. The tray G consists of the three vertical sides *e e' e''*, secured together at the corners, so as to inclose a rectangular space slightly smaller than the dimensions of the drying-compartment, and a fourth side, *f*, which may be either secured to the others or detachably connected thereto.

In Figs. 1 and 2 of the drawings the tray G is shown in full lines as occupying a position in about the middle of its travel, the kiln-cloth being partially wound up on the reel H; but when the operation of drying the hops is in progress the tray would occupy the position indicated by the dotted lines G', the kiln-cloth loaded with hops extending entirely over the drying-compartment D, and when it is desired to deposit the dried hops in the compartment E the tray is moved along to the position indicated by the dotted lines G'', during which movement the cloth is wound up on the reel H, the side *e* forcing all the hops off the kiln-cloth and insuring their delivery into the receptacle E. One end of the canvas or kiln-cloth K, which forms the flexible bottom of the tray, is attached to the bottom of the side *e'* of the tray, its other end being connected to the reel H. The apron of kiln-cloth is attached to the drum or reel H by being nailed to the surface of the drum, or to one of the longitudinal timbers *p* of the reel, when the latter form of construction is used. After the hops on the tray have been sufficiently dried the tray is moved from right to left in Figs. 1 and 2 by turning the reel H and winding the canvas bottom of the tray upon it, thereby transferring the dried hops from the drying-compartment D to the receiving-compartment E. For convenience of

illustration the tray is shown in full lines at about the middle of its horizontal movement, the canvas being partially wound on the reel H; but during the operation of drying the hops the tray would occupy the position in the drying-chamber D indicated by the dotted lines G′, while the extremity of its travel to the left is represented by the dotted lines G″. The direction in which the reel revolves when the tray is being moved from the drying-chamber to the receiving-compartment is indicated by the arrow in Fig. 4.

In order to facilitate the movement of the tray when loaded with dried hops, I attach to the reel H a spur-gear, *l*, which meshes with a pinion, *n*, provided with a hand-crank, O, a suitable platform, P, being attached to the side of the building to enable the attendant to operate the crank. The reel H may be a simple cylindrical drum or roller; but I prefer to make it, as shown in Fig. 4, of the longitudinal timbers *p r r*, which are attached together and provided with metallic spindles *s s* at each end, which revolve in suitable journals affixed to the walls of the building. The gear *l* is fastened to the outer end of one of the spindles *s*, a suitable bracket or housing, *u*, being attached to the side of the building to support the gear and pinion. By using a reel of the form shown in the drawings I give the cloth an irregular or jerking motion as the reel revolves, thereby insuring the separation from the cloth of any adhering hop-dust.

In order to strengthen and support the cloth forming the bottom of the tray, I provide it with the metallic strips *z z*, which are fastened at one end to the end *e′* of the tray and at the other to the winding drum or reel. The strips are made of brass, or some metal sufficiently flexible to permit the winding of the strips about the drum at the same time with the cloth. The cloth is turned over the strips *z z* at its edges and secured thereto, as indicated in the sectional view, Fig. 5, which also shows a molding, *y*, which I may apply to the lower inner edge of the walls of the tray, for the purpose of strengthening the same and preventing any of the hops from escaping. If the capacity of the receiving or cooling room E be limited, it may be desirable to make the end *f* of the movable tray G so that it can be removed before the dried hops are dumped, as otherwise it might prevent the free movement of the tray by coming in contact with the hops already deposited in the cooling-room. I therefore in such cases construct the end *f* so that it may be detached from the tray or lifted up out of the way, as indicated in Fig. 3, in which it is shown connected to a lever by means of the ropes S S, so that it may be elevated by the movement of the lever. The lever R is pivoted to a post or bar depending from the roof or any suitable cross-beams of the building, one of the ropes S being led around a corner-pulley attached to any suitable support, so that the board or partition *f*, which forms one end of the tray, when the hops are being dried, may be raised equally at both extremities. The ends of the board *f* are arranged to slide up and down in suitable guides or ways on the side of the building, and at its center it may be provided with a guide arranged to slide up and down on the post which supports the pivot of the lever R.

In order to support the cloth where it passes through the partition C, I place the roller *v* underneath the cloth at this point. The roller serves to relieve the friction. It consists of a wooden cylinder provided with spindles at each end arranged to revolve in suitable journals attached to the partition or walls of the building. Suitable bearings may be provided near the middle of the roller to prevent its bending from the pressure of the cloth upon it.

In order to insure the return movement of the tray after a kilnful of hops has been deposited in the cooling-room, I employ the return-ropes *w*—one on each side of the tray—which are attached to the winding-drum near each end thereof, and pass around the rollers *r′*, Fig. 4, underneath the sides of the tray, to the wall of the building, where they are led around the corner-pulleys *s′* and back to the tray, to which they are attached in any suitable manner. By giving the winding-drum a movement the reverse of that indicated by the arrow in Fig. 4 the ropes *w* way be wound up on the drum, the cloth unwound, and the tray moved back to the position over the slatted platform, ready for the operation of drying another kilnful of hops.

By the use of my improved hop-kiln I am enabled to save all the dust, which is ordinarily lost by sifting through the cloth when the kiln is emptied by shoveling. I also save the employment of the help necessary for the removal of the dried hops from the drying-room, and hops dried by my invention are better and bring a higher price than when handled in the ordinary way.

I claim—

1. The combination, with a hop-kiln consisting of the drying-compartment D and the receiving-room E, of the movable tray G, having flexible apron K, attached at one end to one side of the tray and at the other end to the winding-drum H, substantially as described.

2. The combination, with a hop-kiln consisting of the drying-compartment D and the receiving-room E, separated by the partition C, of the tray G, movable from one room to the other, flexible support or apron K, attached at one end to the tray and at the other to the winding-drum H, substantially as and for the purposes described.

3. The combination, with the movable tray G, having flexible apron K, attached at one end to one side thereof and at the other end to the winding-drum H, of the supporting-platform consisting of slats *a a*, substantially as described.

4. The combination, with the movable tray G, having flexible apron K, attached at one end to one side thereof and at the other end

to the winding-drum H, of the return-rope *w*, substantially as described.

5. The combination, with a hop-kiln consisting of two compartments separated by a partition, of the ways J, movable tray G, constructed to travel on the said ways, and the apron K, attached at one end to one side of the tray and at the other end to the winding-drum H, substantially as described.

6. The combination, with the movable tray G, of the winding-drum H, flexible apron K, attached at one end to one side of the tray and at the other to the winding-drum, and provided with two or more metallic strips, *z z*, substantially as described.

7. The combination, with the movable tray G, of the flexible apron K, attached at one end to one side of the tray and at the other end to the reel H, constructed of polygonal form and adapted to impart an irregular jerking motion to the cloth by its rotation, substantially as described.

8. The combination, with the movable tray G, consisting of the sides *e e' e''* and removable board *f*, of the flexible apron K, attached at one end to one side of the tray and at the other end to the winding-drum H, substantially as described.

9. The combination, with the movable tray G, having flexible apron K, attached at one end to one side of the tray and at the other to the winding-drum H, and the supporting-roller *v*, substantially as described.

BENJAMIN PEER, JR.

Witnesses:
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H. G. PHILLIPS.