

(No Model.)

W. C. CROZIER.

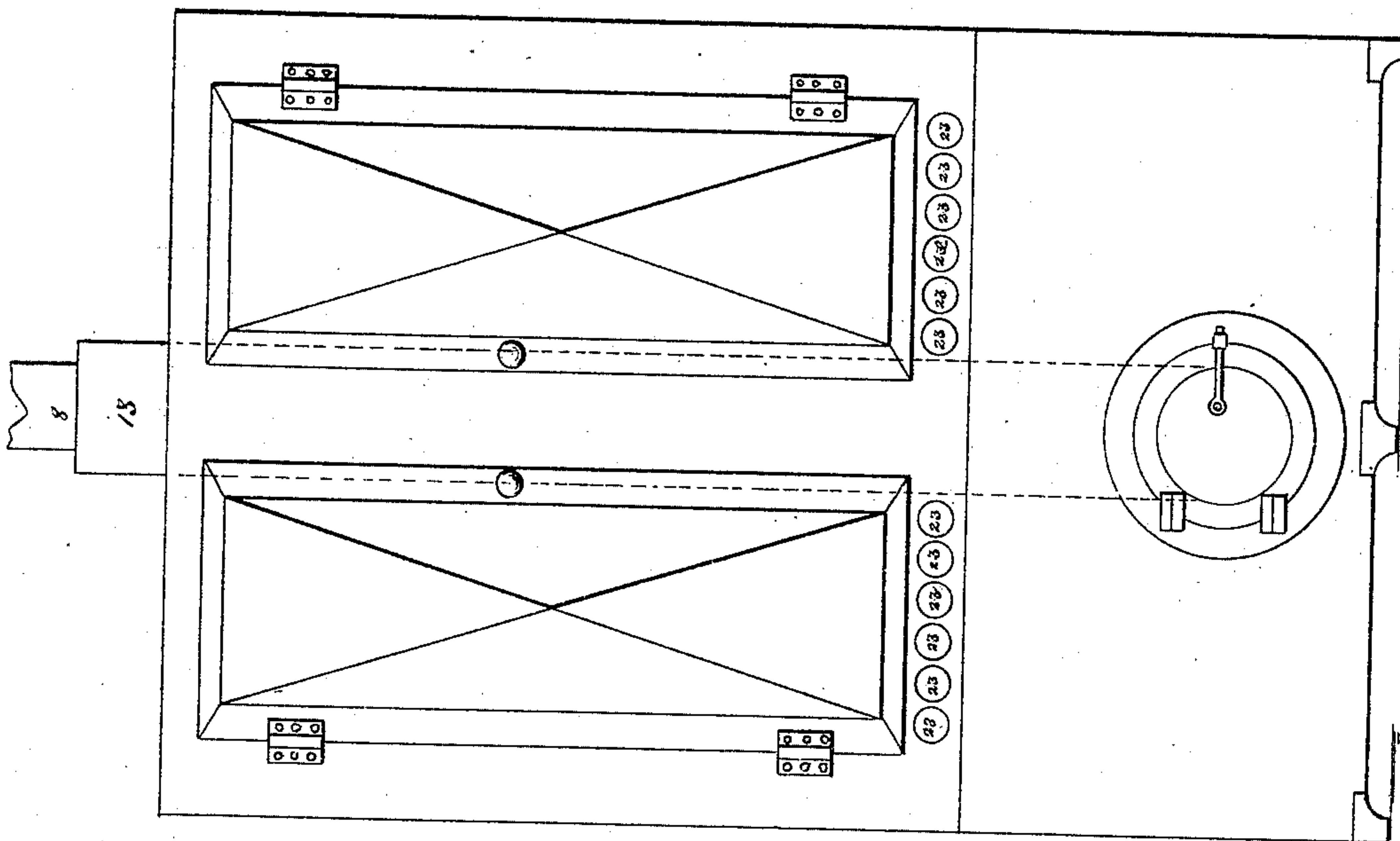
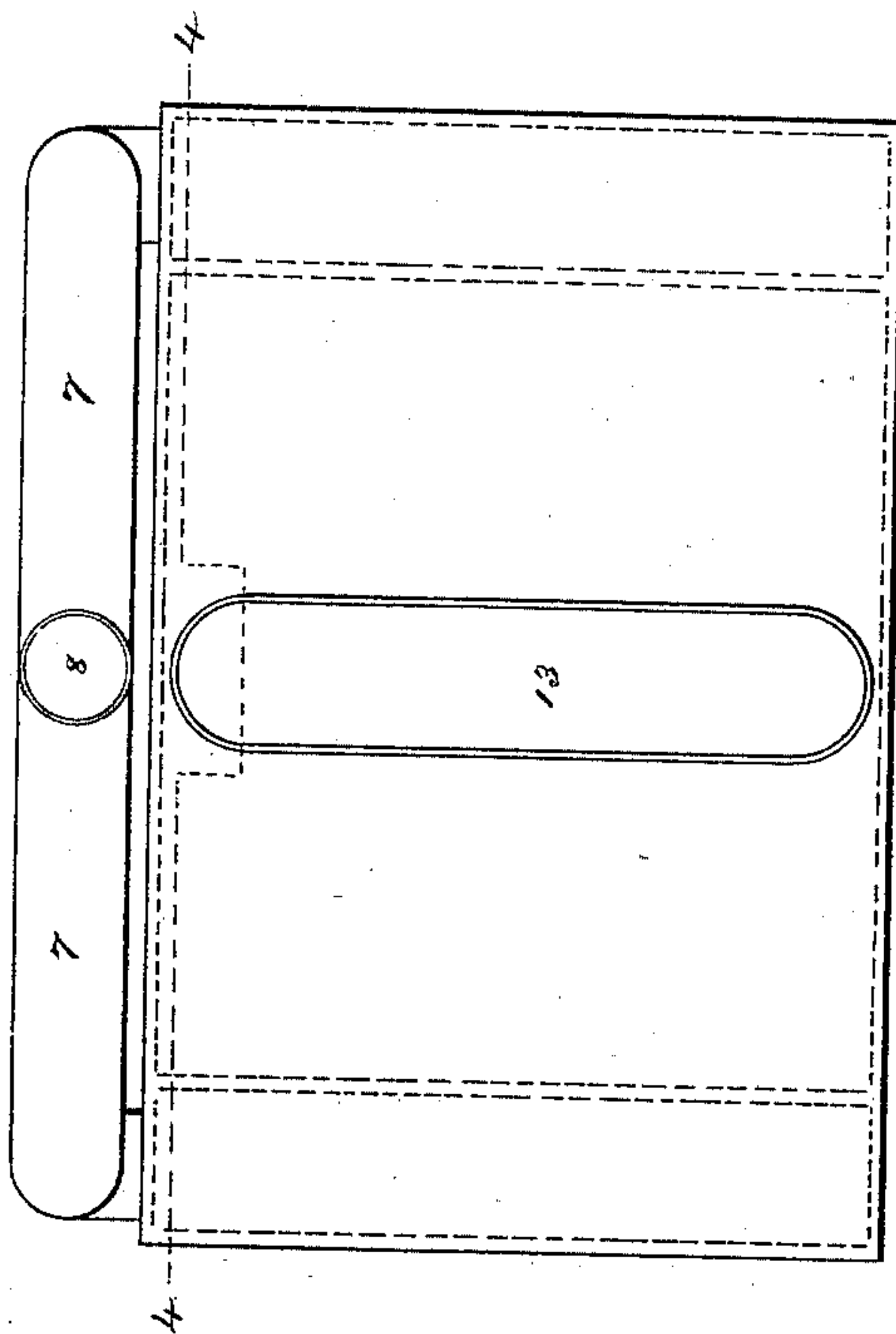
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FRUIT DRIER.

No. 277,685.

Patented May 15, 1883.

Fig 2.



Attest.

Geo. T. Smallwood Jr.  
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Fig 1.

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(No Model.)

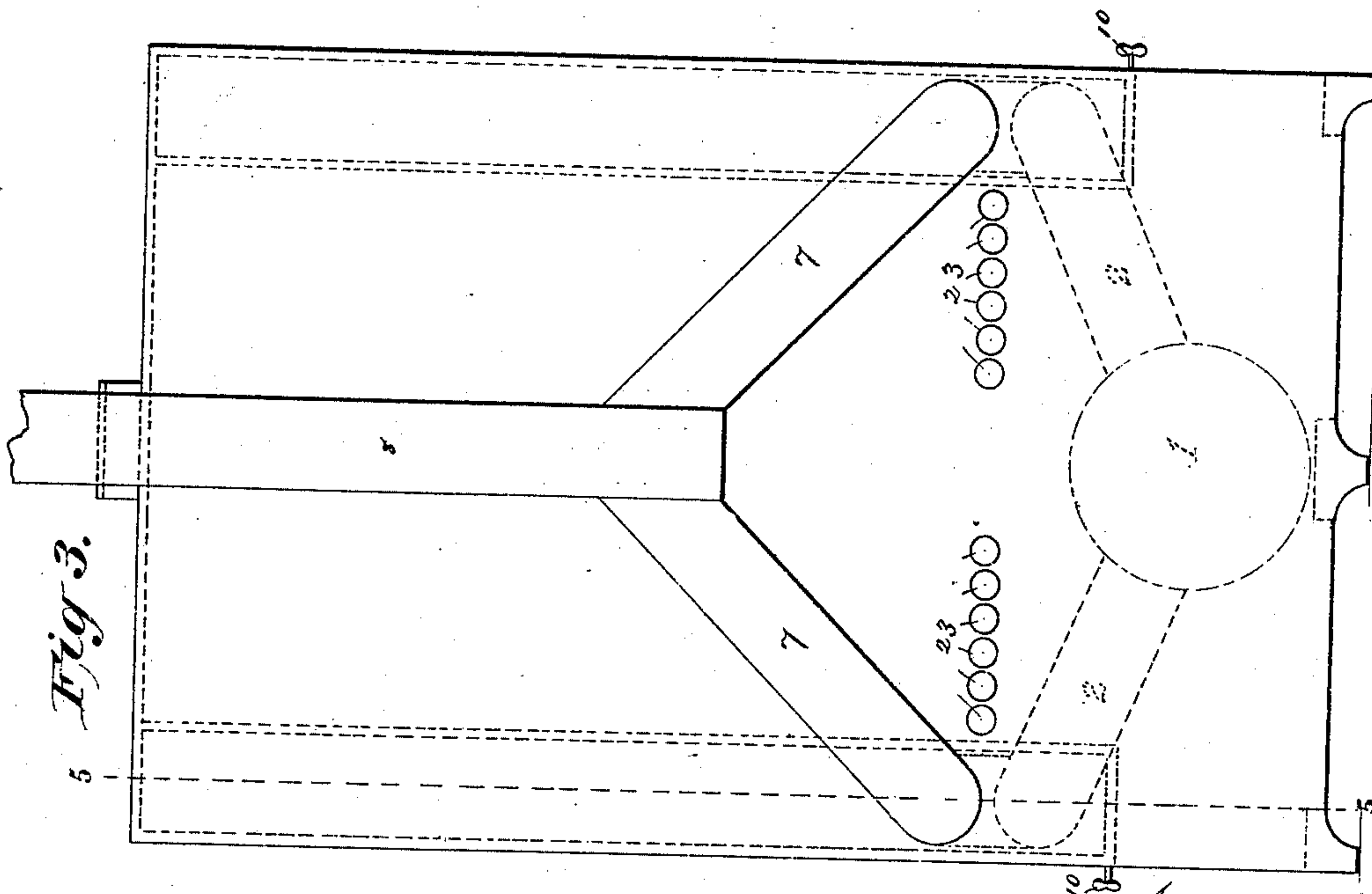
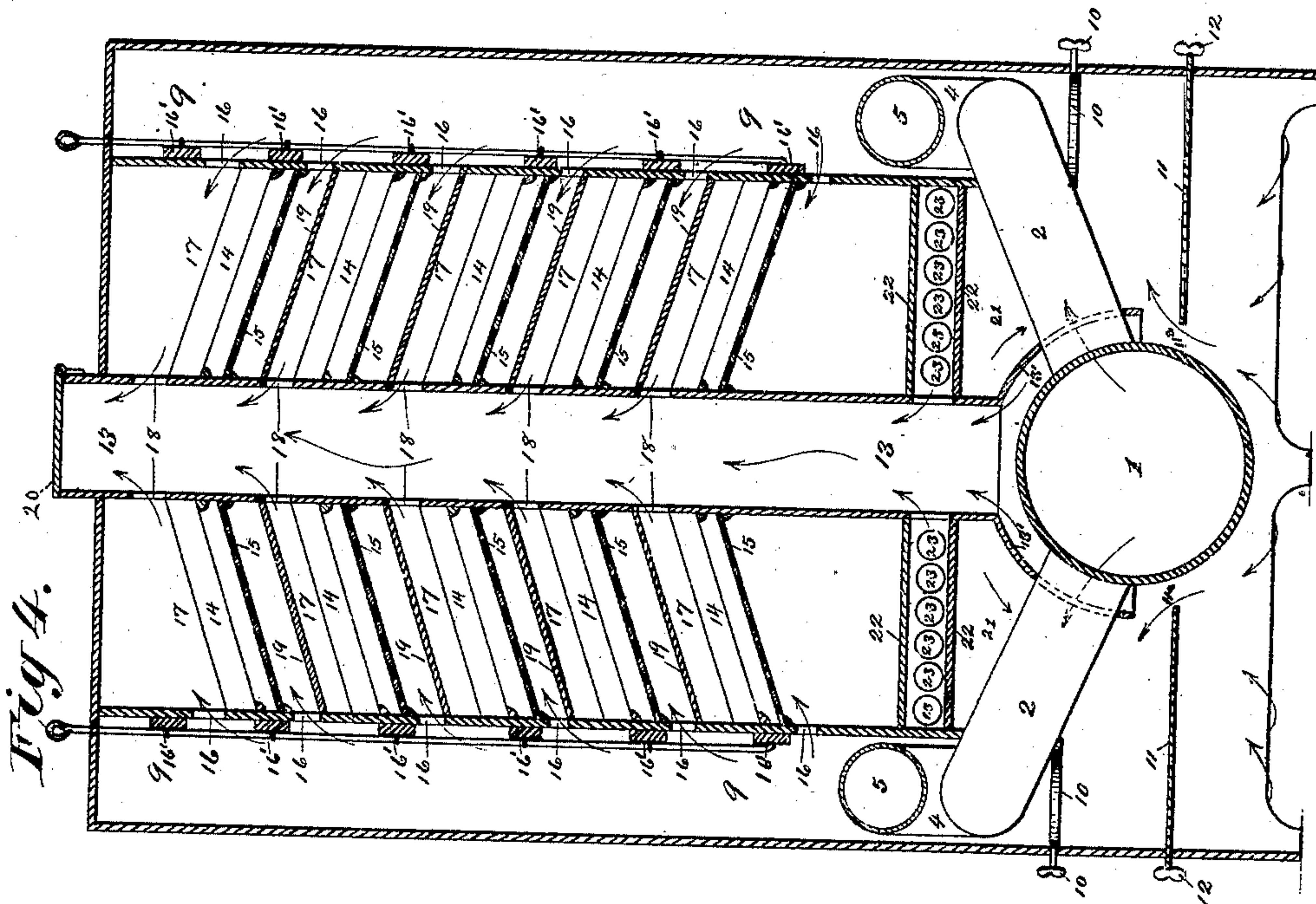
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FRUIT DRIER.

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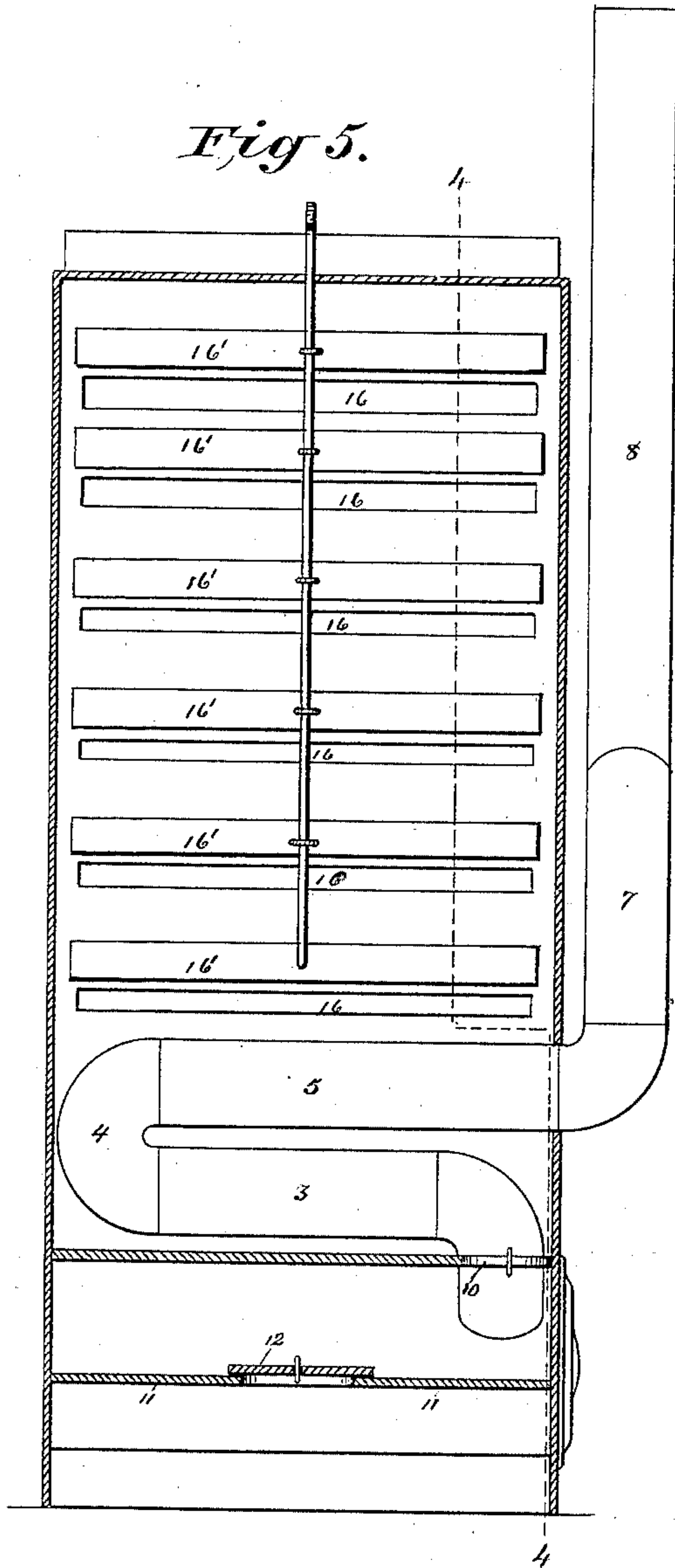
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FRUIT DRIER.

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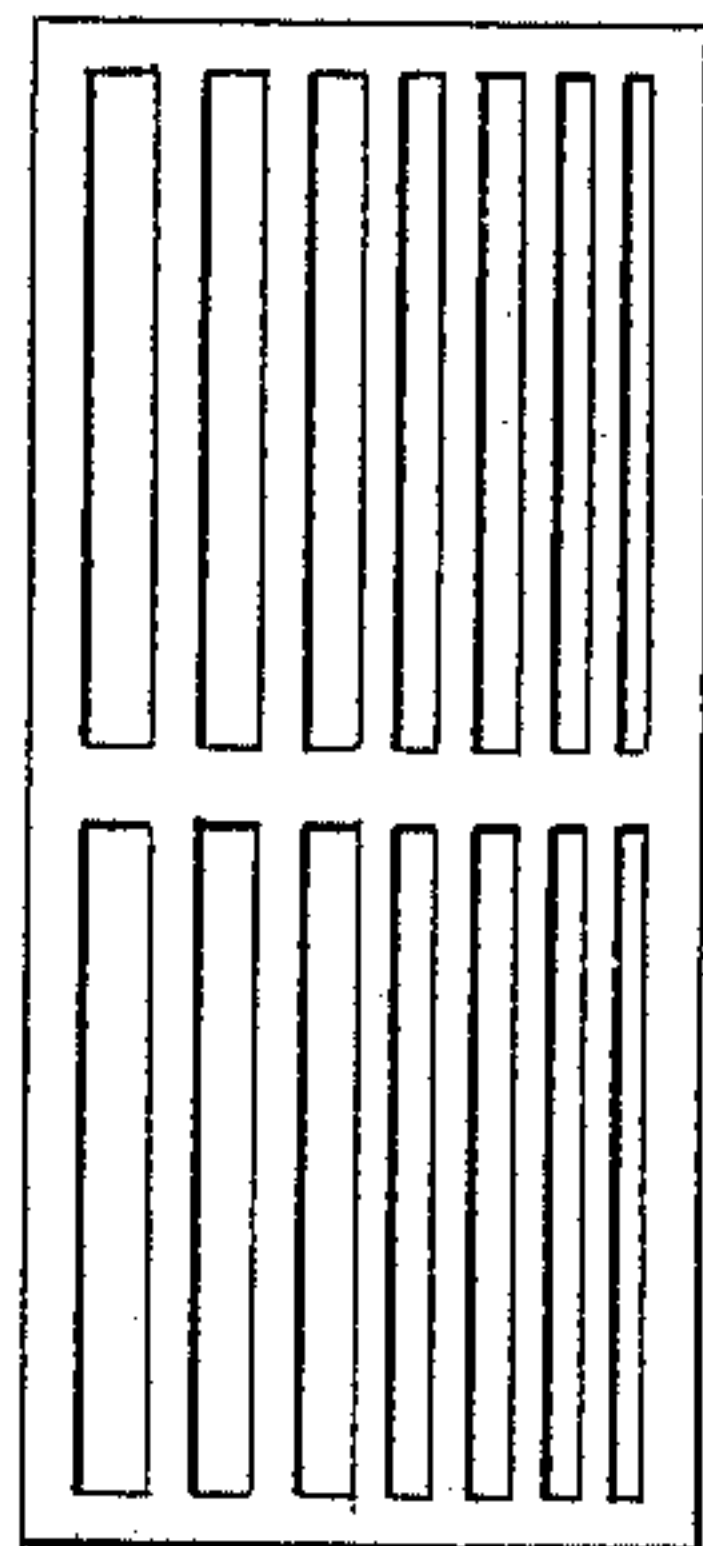
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*Fig 5.*



*Fig 6.*



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# UNITED STATES PATENT OFFICE.

WILLIAM C. CROZIER, OF KNOXVILLE, TENNESSEE.

## FRUIT-DRIER.

SPECIFICATION forming part of Letters Patent No. 277,685, dated May 15, 1883.

Application filed January 9, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM C. CROZIER, a citizen of the United States, residing at Knoxville, in the county of Knox and State of Tennessee, have invented certain new and useful Improvements in Fruit-Driers, of which the following is a specification.

My improved drier belongs to that class in which stove or furnace heat is employed, through the medium of suitable conducting chambers and passages, to apply heat to a number of trays of fruit required to be dried; and my invention particularly consists of means by which the heated air may be more evenly divided to all parts of the fruit, while no portion of the air once used will be allowed to come again in contact with the fruit. A perfect draft and a perfectly regulable quantity of heat are kept up in the apparatus, or different degrees of heat or amounts of draft may be employed in different parts of the drier, according to the kind of fruit or stage of the drying operation.

In order that my invention may be more fully understood, I will proceed to describe it with reference to the accompanying drawings, in which—

Figure 1 is a front elevation. Fig. 2 is a plan, and Fig. 3 is a rear elevation, of my improved drier. Fig. 4 is a vertical section on the line 4 4, Figs. 2 and 5. Fig. 5 is a vertical section on the line 5 5, Fig. 3. Fig. 6 is a plan view of one of the perforated plates or regulators.

1 is the fire-chamber, from the back of which inclined flues 2 2 lead to the rear end of drums 3 3, running from back to front of the apparatus and connected at their forward ends by pipe-bends 4 4 to drums 5 5, placed over and running from front to back of the apparatus parallel with the drums 3 3. The drums 5 are at their back passed through the rear wall, 6, of the drier, where they, through upwardly-inclined pipes 7, discharge the products of combustion into the stack 8. The drums 3 and 5 are situated within hot-air reservoirs 9, one on each side of the drier. The bottoms of these reservoirs are open and are adapted to be closed altogether, or to any degree, by means of dampers 10 in or near the bottoms thereof.

Diaphragms or division-plates 11 11 extend on either side of the drier from the side wall

thereof to within a short space, 11<sup>a</sup>, of the fire-chamber. Dampers 12 12 in these diaphragms, at points near the sides of the drier, enable the control of draft, so that air may be allowed a direct draft from the exterior of the apparatus to the reservoirs 9 when the dampers 10 and 12 are open, or may be obliged to pass in proximity to the fire-chamber, and thus warmed when the damper 12 is closed. By means of these dampers the temperature and dryness of the air entering reservoirs 9 may be accurately regulated, or the temperature of the air may be different in the two reservoirs.

A vertical draft and escape pipe, 13, of depth equal to that of the drier, as shown in Fig. 2, is provided at its base with curved or straight flanges 13', forming a funnel-shaped chamber surrounding the upper portion of and concentric with the fire-chamber 1.

Arranged between the sides of draft and escape flue 13 and the inner walls of the reservoirs 9 are fruit-trays 14, placed at an angle of twenty degrees (more or less) to the horizontal.

Below the fruit-trays and parallel therewith are perforated plates 15, which I call "regulators," and the construction of which is shown clearly in Fig. 6.

Below each of the regulating-plates 15 in the inner wall of the reservoirs 9 is formed a port, 16, through which heated air from reservoirs 9 flows into passages 16<sup>a</sup>, beneath the plates 15, through apertures therein, and thence through the trays 14 and fruit thereon into the ports 17, whence it escapes by ports 18 (made slightly larger than ports 16) into the central escape-pipe, 13. These passages 16 are provided with dampers 16' for regulating the flow of heat from the reservoirs 9, which dampers are operated by one and the same, or each by a separate, rod, as may be desired, passing out through the top of the evaporator. The apertures in plates 15 are graduated from bottom to top, as shown in Fig. 6, the smaller apertures being at the lower ends of the plates, so as to perfectly regulate the amount of air applied to all parts of the trays, that each portion of fruit therein may receive the same amount of air.

Division-plates 19 at the tops of passages 17



prevent the air which has passed through one tray from afterward entering another, and direct the said air into the central pipe, 13, to the end that air of uniform dryness shall be supplied to all the fruit in the drier.

It will be observed that, by reason of the heated air rising from around the cylinder 1 and passing up through the pipe 13, said pipe acts not only passively in receiving and emitting the moist air from the trays, but creates a draft by means of which the air is exhausted and a circulation constantly maintained in the trays. A damper, 20, at the top of the draft and escape pipe 13 enables the proper government of the draft.

In order to protect the lowermost trays from receiving too great a degree of heat, and to insure the passage of the air in chambers 21 21 into reservoirs 9 9, I employ double floors 22 22, between which fresh air is admitted by openings 23. At their inner ends the chambers between the floors 22 22 open into draft-pipe 13. Heated air which pervades the chambers 21 21, being deflected by means of the double floors 22 22, passes out through the opened dampers 10 10 into reservoirs 9 9. The openings 23 23 admitting fresh air between the floors prevents the heat from radiating through said floors into the space below the lowermost trays.

A constant circulation being thus maintained in the space between the floors, the parts of the drier immediately above the same do not become overheated, and derive, as do the other portions of drier, their heat directly from the reservoirs 9 9.

I am aware that radiating-flues and division-plates are old, and therefore do not claim the same.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. In a fruit-drier, the combination of a central fire-chamber with hot-air reservoirs, one at each side, a central draft and escape pipe, intermediate ranges of fruit-trays, arranged substantially as described, and hot-air passages 16<sup>a</sup>, open at the top to allow the heated air to pass through the fruit in the trays, and closed at their inner ends to prevent the escape of said air into the central draft-pipe until it shall have passed through the fruit-trays, as set forth.

2. The combination of hot-air reservoirs 9, situate one on each side of a fruit-drier, and having ports 16 in the inner walls of said reservoirs, central draft and escape pipe, 13, having ports on each side of its walls to permit of the escape of the heated air after its passage through one of the series of trays, regulating-plates 15, and trays 14, extending from the inner wall of the reservoirs to the central draft-pipe, for the purpose set forth.

3. In a fruit-drier, the combination, with the heating-chamber 1, situate at its base, the heat-reservoirs 9, having at their base dampers 10, and diaphragms 11, extending from the walls of the drier nearly to the fire-chamber and provided with dampers 12, substantially as and for the purpose set forth.

4. The combination, with the central draft-pipe, of the double floors 22, situate between the chamber 21 and the drying-trays, and the openings 23 in the front and rear walls of the evaporator, by means of which a current of air which escapes into the central draft-pipes is constantly maintained between said floors.

WILLIAM C. CROZIER.

Witnesses:

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