

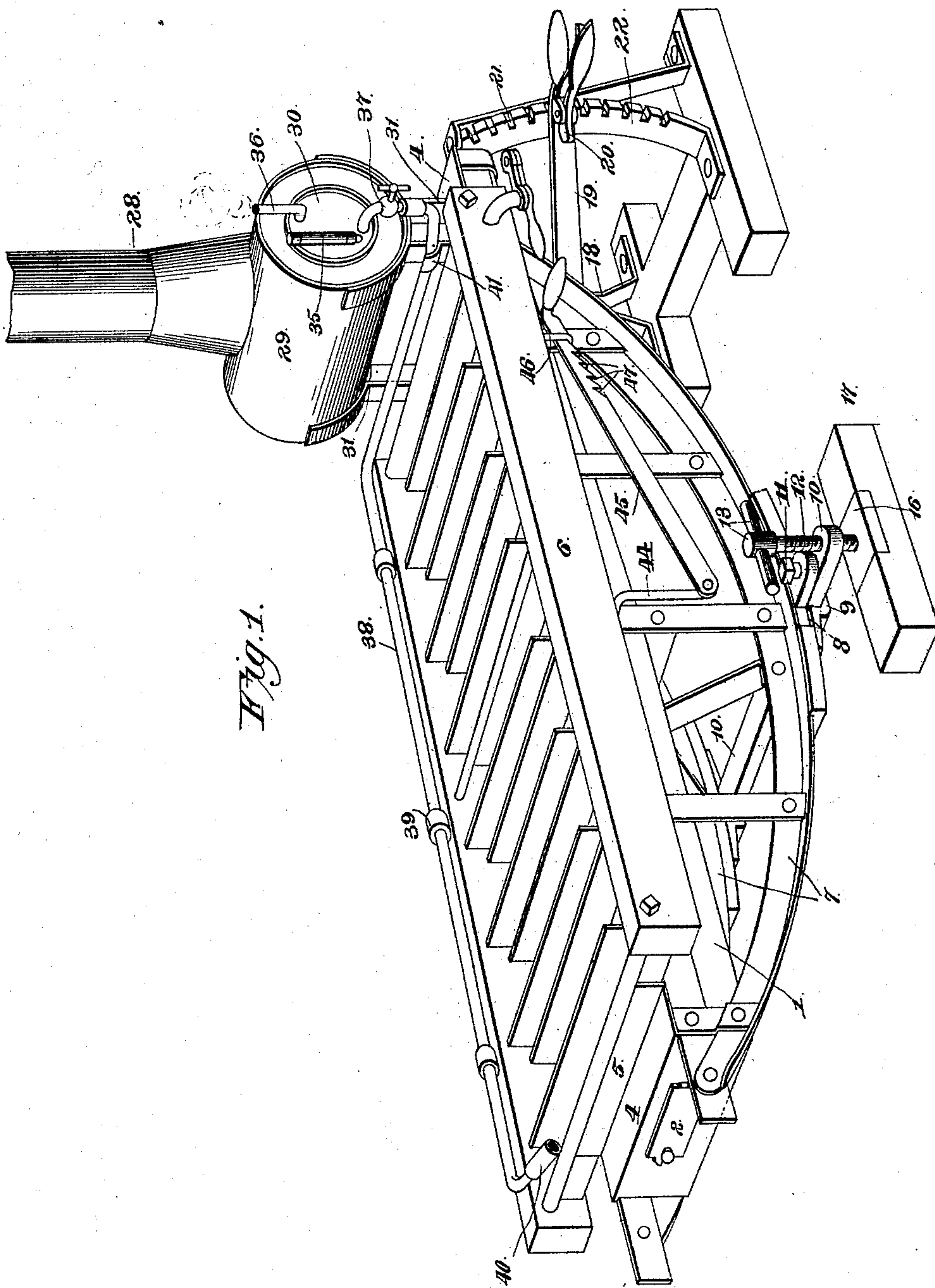
(No Model.)

3 Sheets—Sheet 1.

W. O. JOHNSON.
EVAPORATOR.

No. 442,122.

Patented Dec. 9, 1890.



Witnesses

M. Fowler
Wm. Bagger

Inventor

William O. Johnson

By his Attorneys,

C. A. Snow & Co.

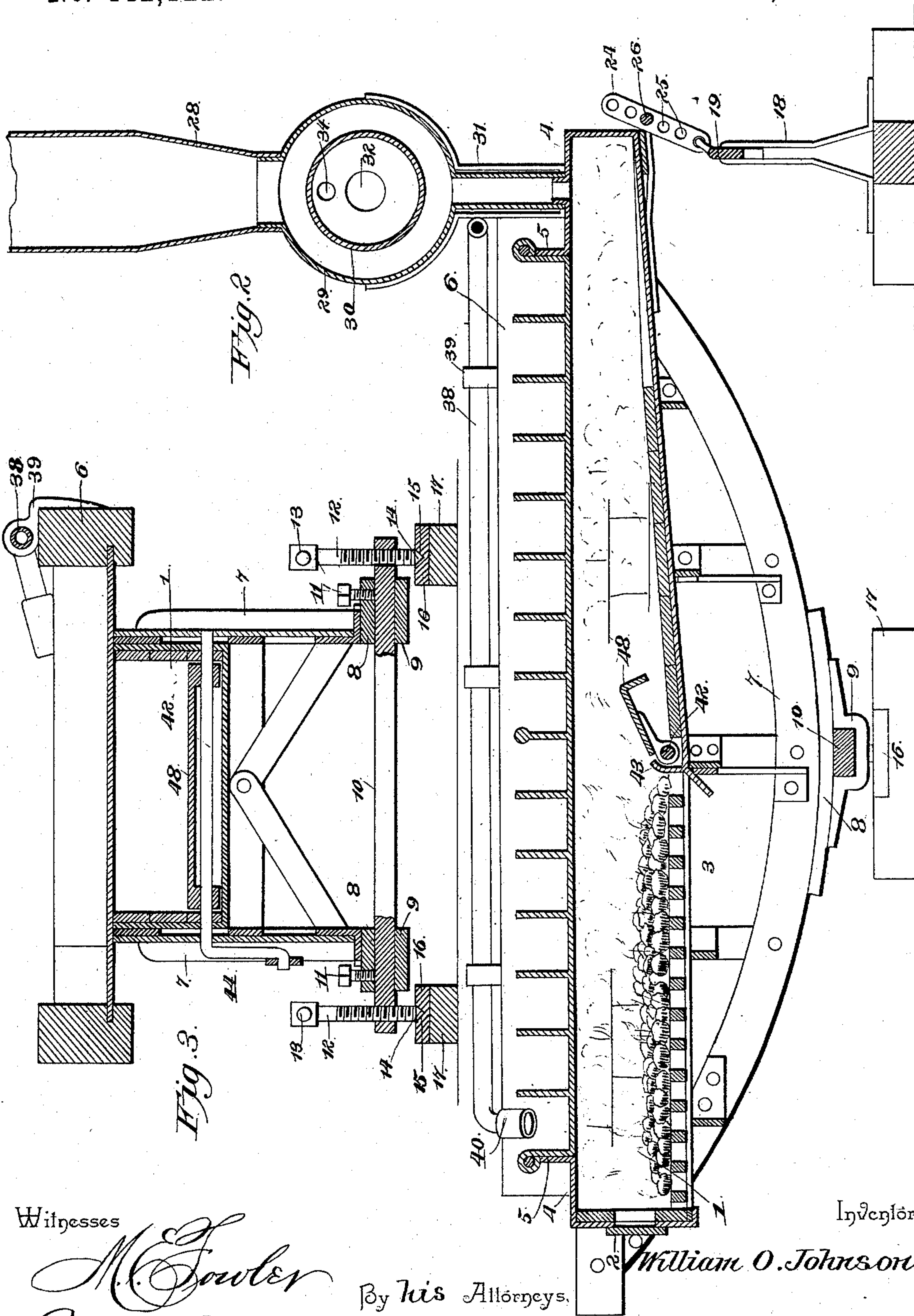
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Fig. 5.

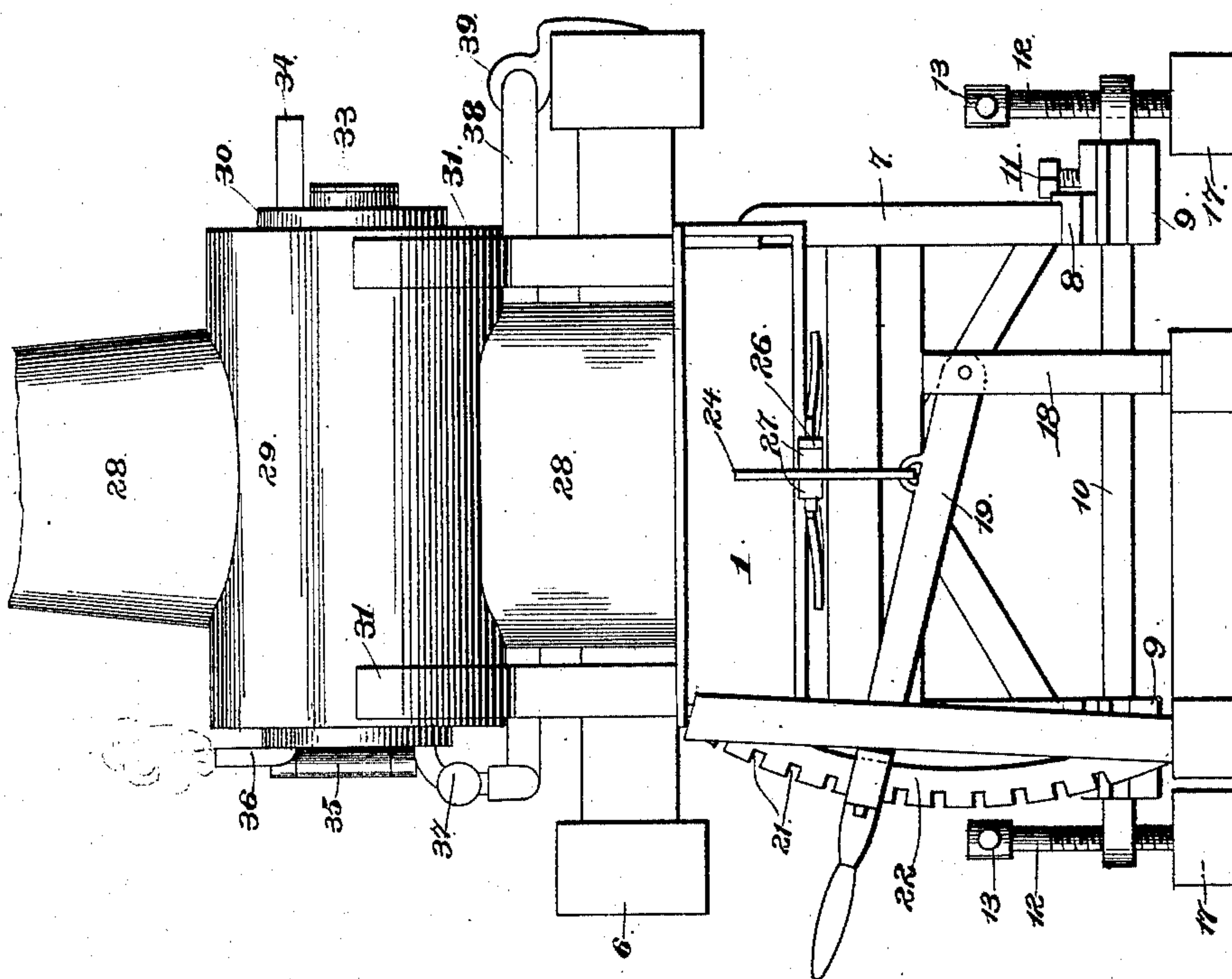
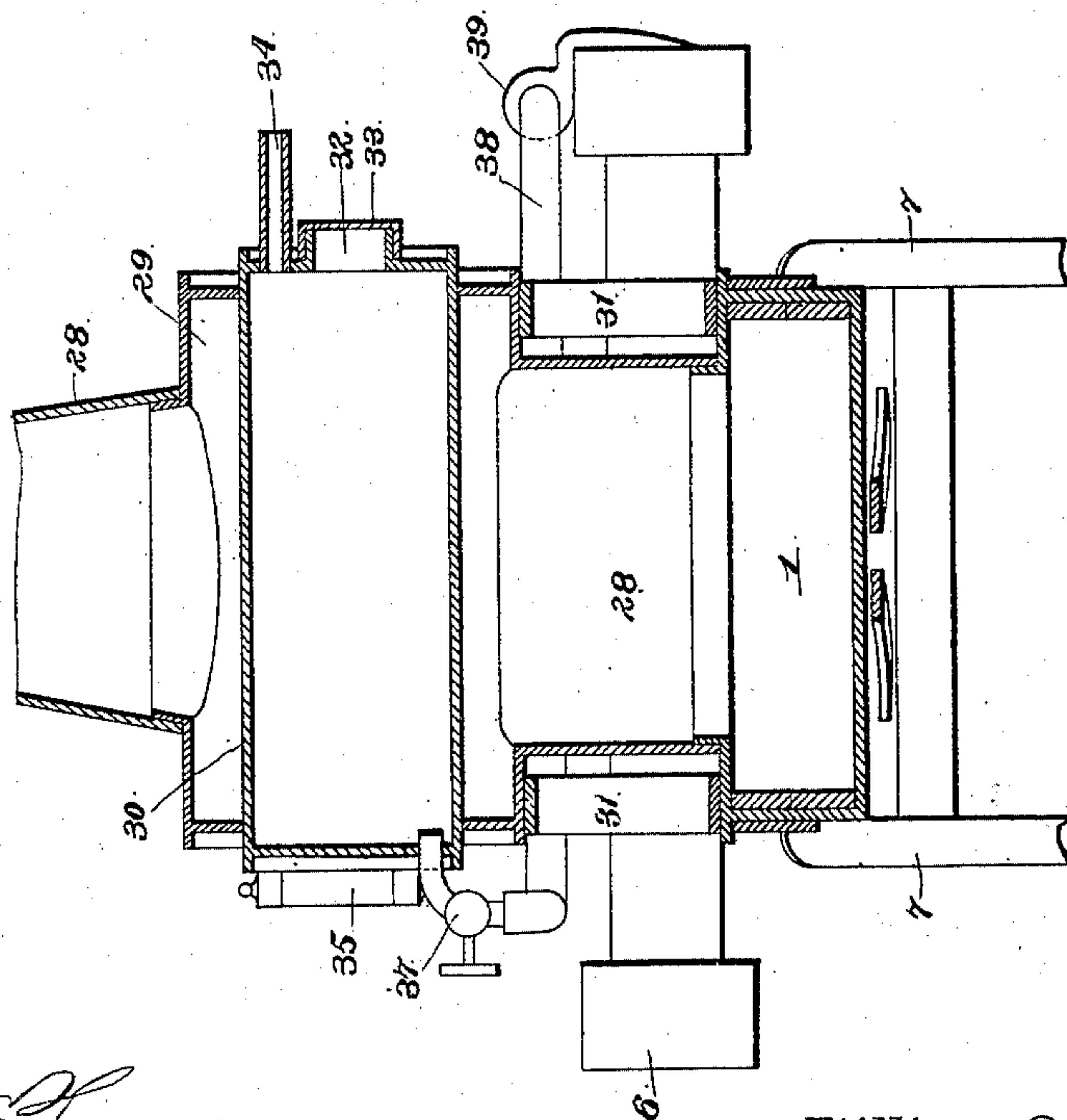


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM OSCAR JOHNSON, OF PEEDES, TEXAS.

EVAPORATOR.

SPECIFICATION forming part of Letters Patent No. 442,122, dated December 9, 1890.

Application filed February 26, 1890. Serial No. 341,782. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM OSCAR JOHNSON, a citizen of the United States, residing at Peedes, in the county of Kaufman and State of Texas, have invented a new and useful Evaporator, of which the following is a specification.

This invention relates to evaporators such as are used principally for evaporating cane-juice; and it has for its object to construct a device which may be easily and conveniently leveled or tilted, as occasion may require, by means of which the cane-juice shall receive a preliminary heating before it is discharged into the evaporating-pan and which shall be in all respects simple, convenient, and efficient.

With these ends in view the invention consists in the improved construction, arrangement, and combination of parts, which will be hereinafter fully described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a perspective view of an evaporating-furnace embodying my improvements and showing the evaporating-pan in position for operation. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a vertical transverse sectional view taken centrally through the furnace. Fig. 4 is a vertical transverse sectional view taken through the smoke-stack, the drum, and the supplemental heater. Fig. 5 is an end elevation of the apparatus.

Like numerals of reference indicate like parts in all the figures.

1 designates the furnace, which is provided at its front end with the charging-door 2 and with the grate 3, which is of ordinary construction. The front and rear ends of the furnace are provided with top plates 4, having upwardly-extending flanges 5, between which the evaporating-pan 6 is mounted. It will thus be seen that the furnace proper is of greater length than the evaporating-pan and extends beyond the ends of the latter, which is thus subjected throughout its length to the heat from the furnace and not merely for a portion of its length, as is the case ordinarily when the ends of the evaporating-pan are permitted to extend several inches beyond the ends of the furnace.

The furnace-bed is mounted upon the rock-

ers 7, which are mounted slidingly in caps 8, having transverse openings 9 to receive the transverse supporting-bar 10. The latter is adjustable in the said holding-caps, and may be held securely at any desired adjustment by means of set-screws 11, passing through lugs or brackets extending laterally from said holding-caps. The ends of the transverse supporting-bar 10 are provided with vertical screw-threaded perforations, through which extend the supporting-screws 12, the upper of which ends are provided with handles 13 and the lower ends of which have points 14, that rest in recesses or sockets 15, formed in bearing-plates 16, which are mounted in the longitudinally-arranged sills or supporting-blocks 17.

Under the rear end of the furnace is arranged an upright 18, to the upper end of which is pivoted a lever 19, having a spring-catch 20, adapted to engage any one of a series of notches or recesses 21 in a segmental bar or bracket 22, which is arranged concentrically with the fulcrum of the lever 19. Pivotaly connected with the latter is a connecting-rod 24, having a series of perforations 25, any one of which may be connected by a transverse pin or bolt 26 with the ears or lugs 27, that extend rearwardly from the rear end of the furnace.

The top plate 4, at the rear end of the furnace, is provided with the upwardly-extending smoke-stack 28, which is provided with a drum 29, the ends of which are open to receive a cylindrical vessel 30, which is arranged removably in the said drum. The upper side of the latter supports the upper end of the smoke-stack, as will be seen in the drawings. Brackets 31 are mounted upon the rear end of the furnace-casing to support the weight of the drum and of the cylindrical vessel within the latter. Said cylindrical vessel is provided at one end with a hand-hole 32, closed by a removable cap 33, which may be secured detachably in any suitable manner. The end of the cylindrical vessel which has the hand-hole is provided with a filling-tube 34, which may be connected by a flexible tube or in any other convenient manner with the vat or vessel containing the raw juice, which may thus be fed into the cylindrical heating-vessel 30. The opposite end of the latter is provided

with a gage-glass 35, through which the contents may at all times be observed by the operator. This end of the heating-vessel is also provided with a vent-tube 36 for the escape
 5 of the vapor, and with a cock or faucet 37, which is in alignment with the mouth or receiving end of the feed-tube 38, by means of which the juice is conveyed from the heating-vessel 30 to the front end of the evaporating-
 10 tank. The said feed-tube 38 is mounted in bearing or supporting sleeves 39 on one side of the evaporating-tank, and its front end has a discharge-spout 40, opening into the forward compartment of the said evaporating-tank. The rear end of the feed-tube 38 is bent parallel to the rear end of the evaporating-tank, and is supported upon a lug 41, extending from one of the supporting-brackets 31. The extreme rear end of the feed-
 20 tube 38 is bent upwardly and fits over the mouth of the faucet 37.

Located about centrally in the furnace in rear of the grate is a transverse shaft 42, in front of which is arranged a wall or deflector
 25 43, which protects said shaft from the direct action of the flames and from being burned out and destroyed. One end of the shaft 42 is provided with a crank 44, to which is pivoted an operating lever or handle 45, extending
 30 through a staple 46 and having a series of notches 47, any one of which may be made to engage said staple, thereby holding the operating-lever and the crank-shaft 42 in any position to which they may be adjusted. Suitably secured upon the shaft 42 between the
 35 side walls of the furnace is a fire wall or damper 48, whereby the draft in the furnace may be regulated by simply adjusting the said damper by the operating mechanism
 40 which has just been described.

The operation and advantages of my improved evaporating-furnace will be readily understood from the foregoing description, taken in connection with the drawings hereto
 45 annexed.

The importance of keeping the furnace and the evaporating-pan supported thereon normally in a level position is well understood, and evaporating-furnaces have heretofore
 50 been provided with or mounted upon rockers for the purpose of enabling them to be adjusted to a level. Heretofore, however, it has been necessary to pry the furnace to a level position by the use of levers or crow-bars,
 55 after which they have been propped to secure them in position.

By my present improvement the adjustment may be more speedily, conveniently, and accurately effected by the use of the adjusting-screws 12 at the ends of the transverse
 60 supporting-bar 10.

The evaporating-pan used in connection with my invention is of ordinary well-known construction; but it will be seen that by the
 65 improved construction of the furnace, as herein described, the said evaporating-pan is exposed for its entire length to the action of

the fire in the said furnace, thereby causing the contents of the evaporating-pan to be more thoroughly and effectually evaporated
 70 than would otherwise be the case.

The draft in the furnace may be accurately regulated by means of a damper, which is in perfect control of the operator by the herein-described adjusting mechanism. The operator
 75 may also, by the cock or faucet 37, regulate the admission into the evaporating-pan of the juice which has been previously heated in the cylindrical vessel 30. The juice when admitted into the front end of the evaporating-
 80 pan is at or near a boiling-heat, and the temperature of the contents of the evaporating-pan will consequently rise to the desired point much more quickly than when the juice is fed cold into the evaporating-pan. In case
 85 of the juice cooking too fast at the front end of the evaporating-pan the furnace may, by manipulating the lever 19, be tilted so as to cause a portion of the sirup from the rear end
 90 of the pan to flow forward, and vice versa, in the event of the sirup cooking too slowly. By means of the damper the draft in the furnace may be controlled so as to avoid scorching the sirup. Again, if by any chance too
 95 much juice should get into the evaporating-pan and crowd the sirup too much, the operator may, by manipulating the lever 19, in a moment raise the rear end of the furnace and evaporating-pan, thereby causing the un-
 100 cooked juice to flow to the fire end of the evaporator, or should the juice get too low and the sirup accumulate too fast, the operator may by a reverse movement of the lever cause the sirup to pass out quickly before the sirup gets scorched or burned. By
 105 the use of the supplemental heater the juice will be heated, as described, before being discharged into the evaporating-pan, and a considerable saving in fuel may thus be effected.

The general construction of my improved
 110 evaporating-furnace and its attachments is simple and inexpensive, and it may be very easily and conveniently operated with most satisfactory results.

Having thus described my invention, what I
 115 claim is—

1. In an evaporator, the combination of the furnace, the rockers supporting the same, the caps forming bearings in which said rockers may slide, and suitable supporting devices,
 120 substantially as set forth.

2. The combination of the sills or supporting-blocks, the evaporating-pan, the evaporating-furnace mounted upon rockers, the caps forming bearings in which said rockers
 125 may slide longitudinally, the supporting-bar transversely adjustable in the said caps, and the supporting-screws extending vertically through the ends of said supporting-bar, substantially as set forth.

3. The combination of the evaporating-pan, the furnace mounted upon rockers, the caps forming bearings in which said rockers may slide longitudinally, the supporting-bar
 130

transversely adjustable in said caps, the set-screws securing said bars in position, the vertically-adjustable supporting-screws in the ends of said supporting-bar, and the sills having bearing-plates provided with sockets or recesses to receive the points of the supporting-screws, substantially as set forth.

4. In an evaporator, the combination, with the evaporating-pan and the furnace provided with rockers, of the supporting-bar, the vertical supporting-screws, an adjusting-lever pivoted to an upright near the rear end of the furnace, means for securing said lever in any position to which it may be adjusted, and a link connecting said lever adjustably with the rear end of the furnace-bed, substantially as set forth.

5. In an evaporator, the combination, with the evaporating-pan and the furnace, of a transverse shaft journaled in the sides of the same in rear of the grate, a fire-wall or deflector arranged in front of said shaft, a damper mounted upon the latter, and mechanism for adjusting the said damper-shaft and for retaining it in any position to which it may be adjusted, substantially as set forth.

6. In an evaporator, the furnace supporting the evaporating-pan and provided at its rear end with a top plate, in combination with the smoke-stack rising from said top plate and having a drum, the brackets mounted upon said top plate and supporting the said drum, and a heating-vessel mounted detachably in the ends of the said drum, substantially as set forth.

7. In an evaporator, the combination of the evaporating-pan, the furnace, the smoke-stack having a drum, the heating-vessel mounted detachably in the said drum and having a filling-tube and a discharge-faucet, the evaporating-pan mounted upon the furnace, and

the filling-tube mounted in bearings upon one side of the evaporating-pan and having a discharge-spout opening into the front compartment of said evaporating-pan and having an upturned rear end aligning with the discharge-faucet of the supplemental heating-vessel, substantially as set forth.

8. The combination of the furnace supporting the evaporating-pan and having a top plate at its rear end, the smoke-stack rising from said top plate and having a drum, a supplemental heating-vessel mounted detachably in the latter and having a filling-tube and a discharge-faucet, the evaporating-pan mounted upon the furnace-bed, the filling-tube secured to said evaporating-pan and having a discharge-spout opening into the front compartment of the evaporating-pan and an upturned rear end aligning with the discharge-faucet of the supplemental heating-vessel, and a lug extending forwardly from one of the drum-supporting brackets and supporting the said filling-pipe in operative position, substantially as set forth.

9. In an evaporator constructed substantially as herein described, the supplemental heating-vessel consisting of a cylindrical vessel mounted detachably in the smoke-stack drum of the furnace and provided at one end with a filling-tube and a hand-hole having a detachable cap and at the other end with a discharge-spout, a gage-glass, and a vent-tube, substantially as and for the purpose set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

WILLIAM OSCAR JOHNSON.

Witnesses:

J. T. JOHNSON,
W. L. MCCALL.