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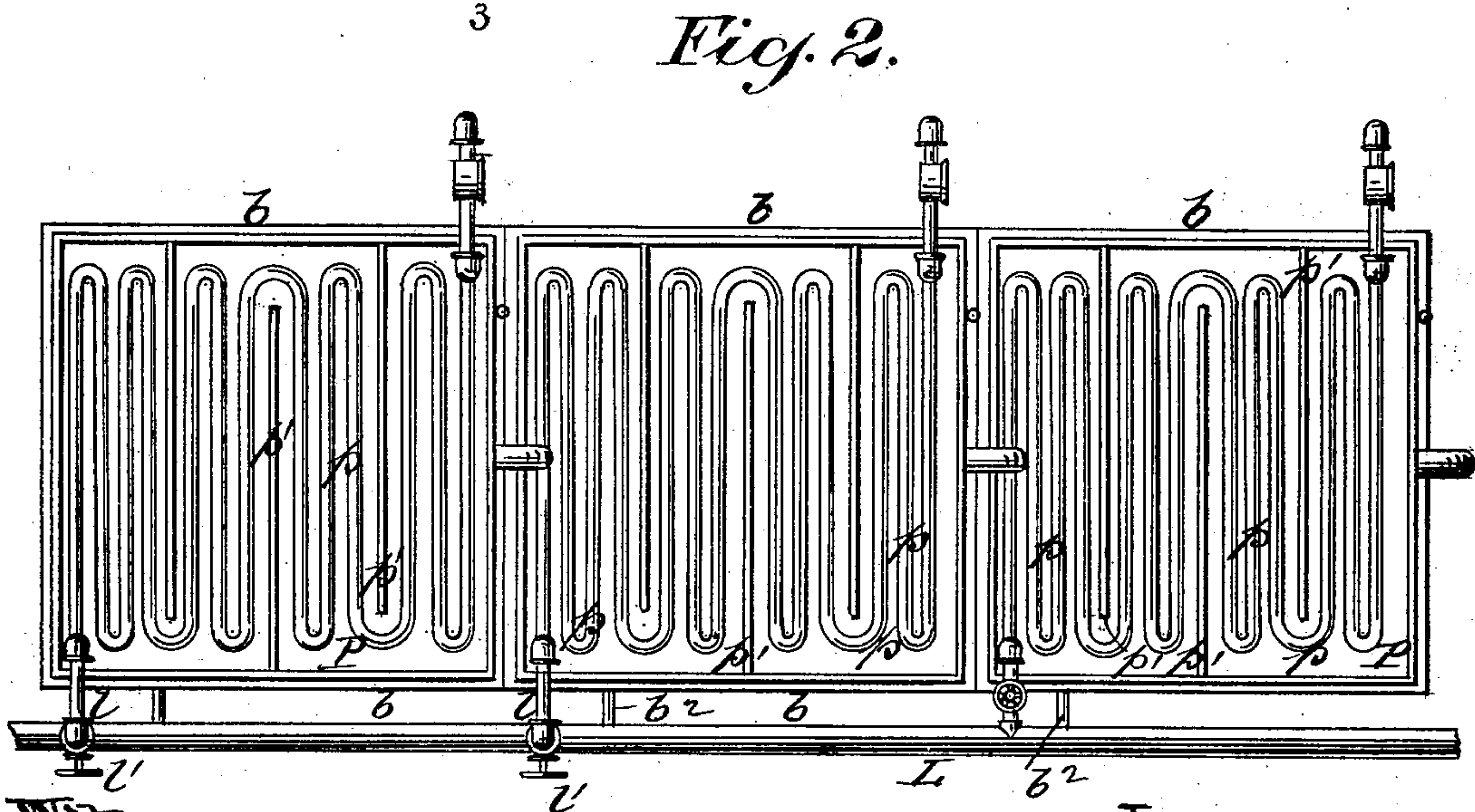
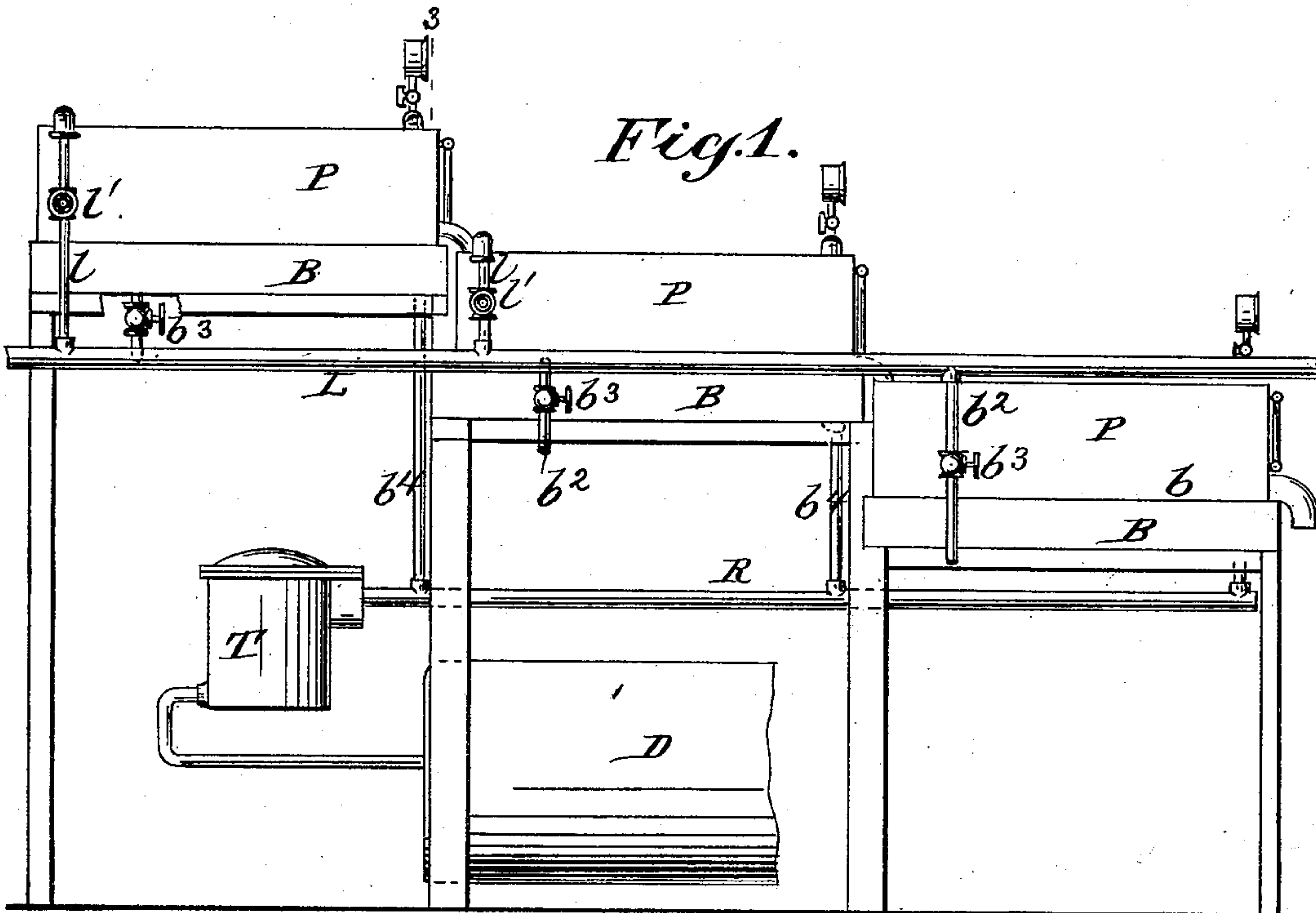
Patented Apr. 15, 1902.

J. H. HILL & J. RIVETT.  
EVAPORATING PAN.

(Application filed Sept. 20, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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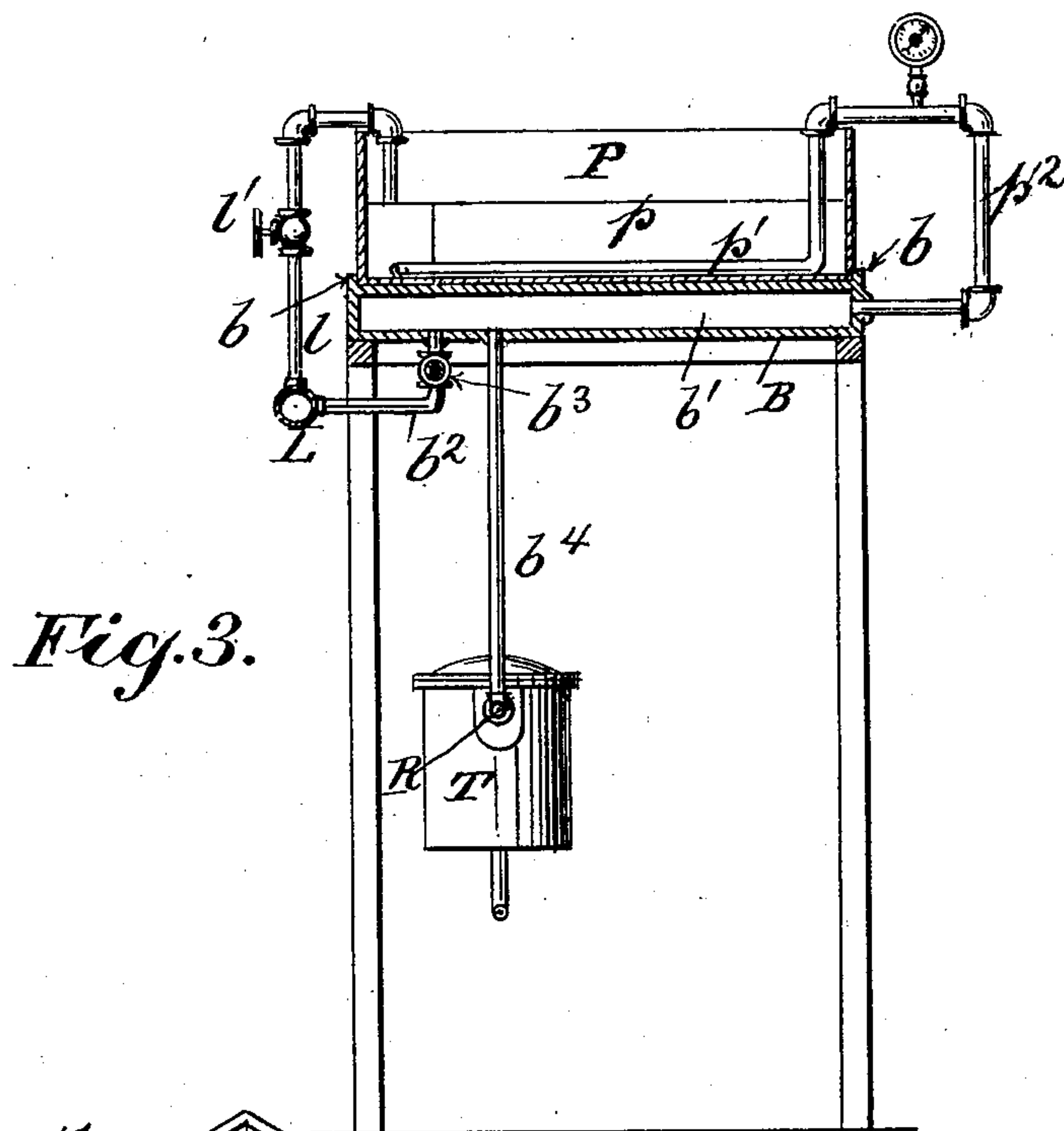
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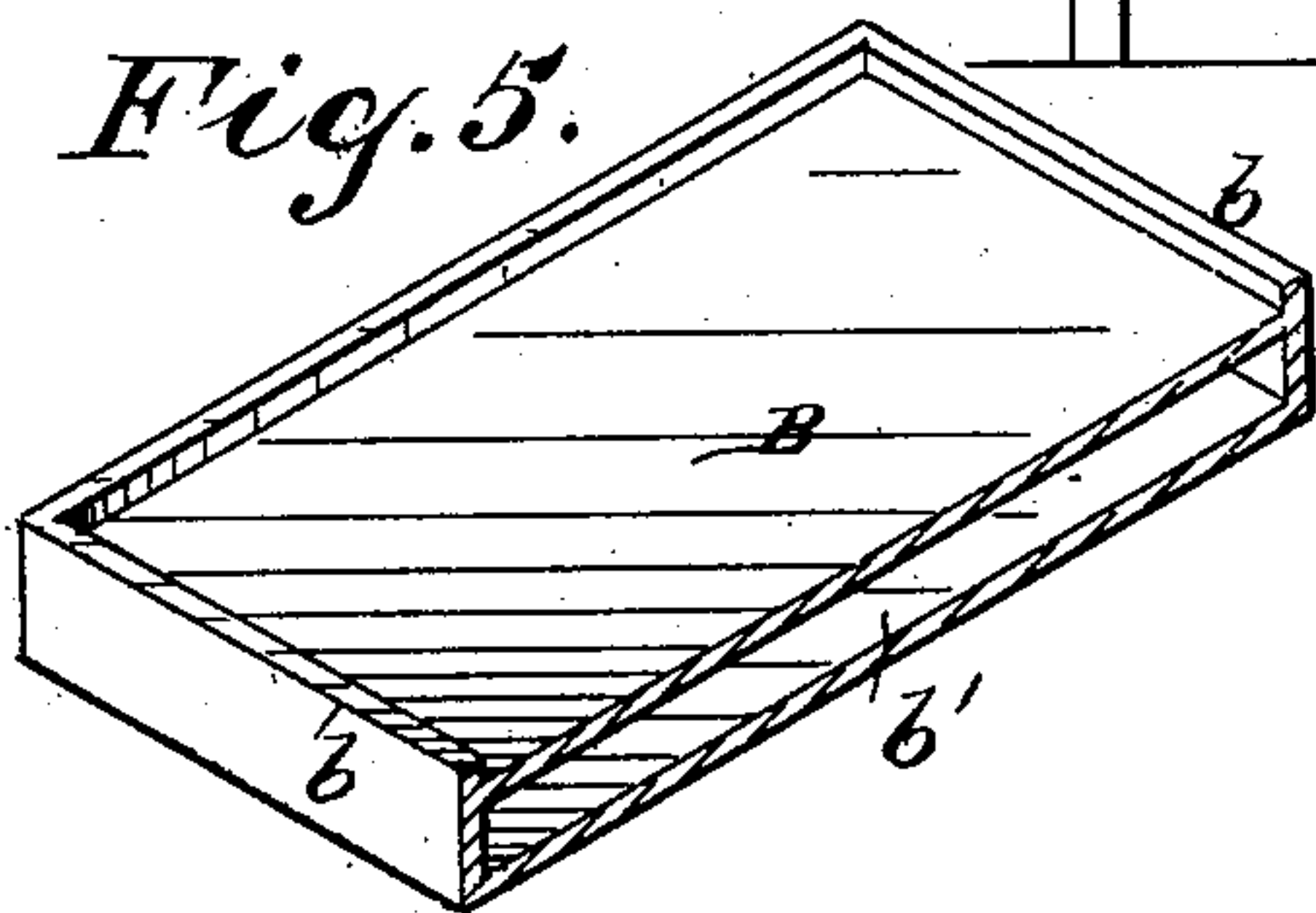
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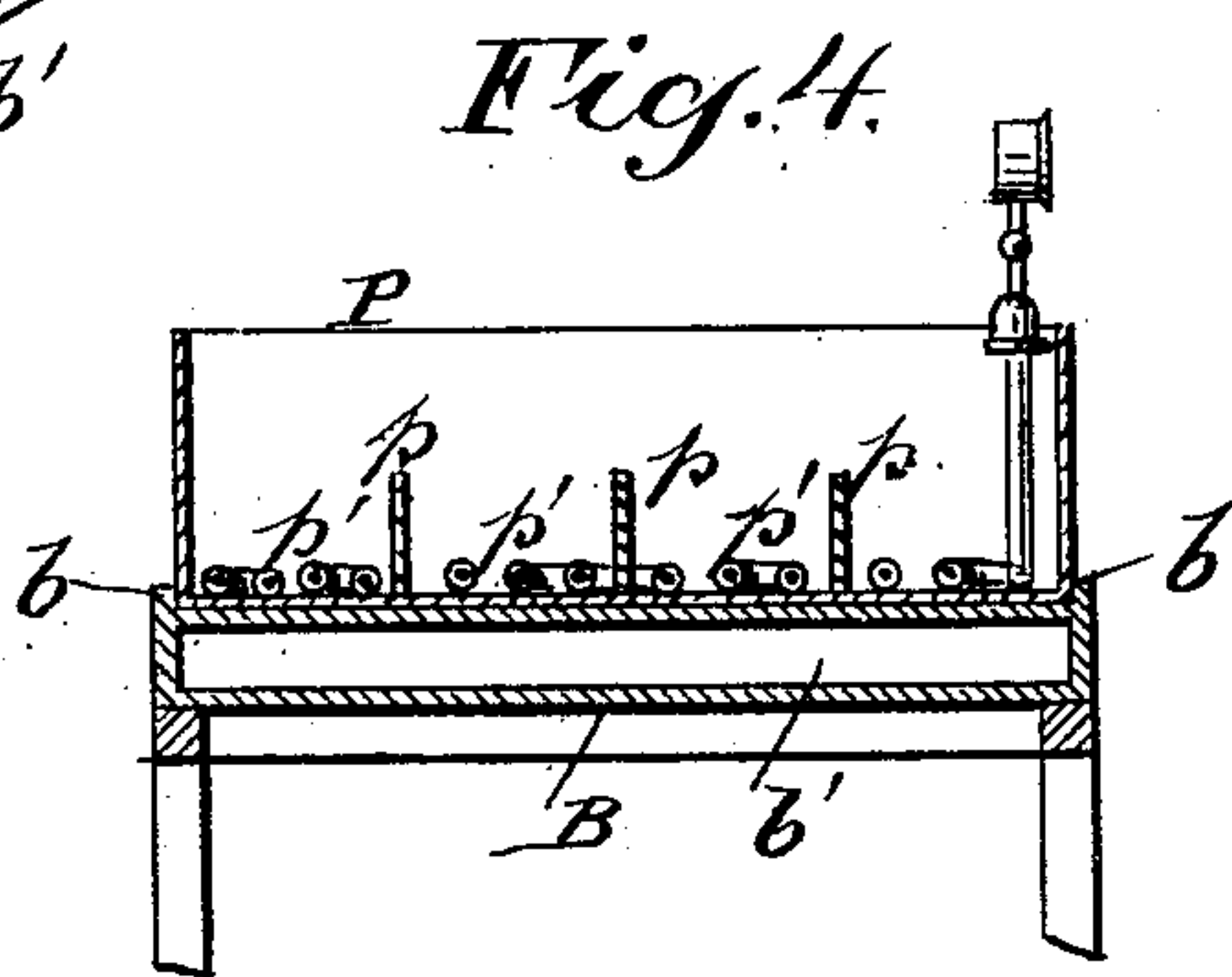
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*Fig. 3.*



*Fig. 5.*



*Fig. 4.*

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# UNITED STATES PATENT OFFICE.

JAMES H. HILL AND JOHN RIVETT, OF HORSESHOE, NEW YORK, ASSIGNORS  
TO ABBOT AUGUSTUS LOW, OF BROOKLYN, NEW YORK.

## EVAPORATING-PAN.

SPECIFICATION forming part of Letters Patent No. 697,484, dated April 15, 1902.

Application filed September 20, 1901. Serial No. 75,726. (No model.)

*To all whom it may concern:*

Be it known that we, JAMES H. HILL and JOHN RIVETT, citizens of the United States, residing at Horseshoe, St. Lawrence county, State of New York, have invented certain new and useful Improvements in Evaporating-Pans, of which the following is a specification sufficient to enable others skilled in the art to which the invention appertains to make and use the same.

Our present invention relates to evaporating apparatus designed more particularly for the reduction of maple-sap, the making of fruit-jellies, and like uses, although applicable in principle to evaporating-pans generally.

Our object is to obtain increased heating capacity, more perfect control in the regulation of the heat, variations in the methods of applying heat to conform to special requirements of material under treatment, greater economy by the utilization of the full heat value of the steam used, and a more uniform distribution and equalization of temperature.

The invention consists, primarily, in forming each evaporating-pan with a steam-jacket below its floor, to be used alone or in conjunction with the heating-coil within the pan, and, secondarily, in the special arrangement and combination of parts hereinafter set forth whereby the steam heat is manipulated and controlled in various ways to attain special results.

In the accompanying drawings we illustrate means for carrying our invention into practical effect, although we do not limit ourselves to the exact construction and arrangement of parts shown, since the pipes, return-trap, boiler, &c., may be varied in position and relation to each other without departing from the spirit and intent of our invention.

Figure 1 is a side elevation of three evaporating-pans equipped with our improvements; Fig. 2, a plan of the same; Fig. 3, a vertical section upon plane of line 3 3, Fig. 1; Fig. 4, a section taken in a plane at right angles to Fig. 3; Fig. 5, an isometrical view of one-half of a steam-jacket.

In the drawings three evaporating-pans P P P are arranged successively upon different horizontal planes, although one or any

number of evaporating-pans may be used in connection with our steam base or jacket B.

The base or jacket B consists, preferably, of a rectangular chamber, of metal, the upper side of which is formed with flanges or projections *b b*, between which the lower outer side walls of the open evaporating-pans P fit. The open evaporating-pans are formed with the partitions *p p p*, between and around which the steam-pipes *p' p'* coil, each pan being furnished with the usual gage and thermometer connections, &c.

L is a steam-pipe conducting live steam from a boiler. Each of the coils *p' p'* is connected with this common steam-supply pipe L by means of a branch pipe *l l*, in which is interposed a valve *l' l'*. Each coil *p'* is connected by a pipe *p<sup>2</sup>* with the steam-space *b'* in the base B underneath. In like manner the steam-space *b'* of each base or jacket B is connected with the supply-pipe L by an independent pipe *b<sup>2</sup>*, in which is interposed a valve *b<sup>3</sup>*. Each of the said steam-spaces *b'* is also connected by a pipe *b<sup>4</sup>* with a return-pipe R, by which the water of condensation is conveyed to a steam-trap T, pump, or other means for forcing said water back into the boiler or into a feed-water heater or other device D for absorbing and utilizing the heat contained in the water of condensation.

In operation the apparatus may be used in either of the following ways: The valves *b<sup>3</sup>* and *l'* both being open, live steam will enter both coils *p'* and the space *b'* in the jacket B, under which conditions the maximum degree of heat will be attained for the rapid or preliminary reduction of sap or other material under treatment, it being understood that the steam from the coils is exhausted into the jacket-space, therein condensed, and returned through the pipe *b<sup>4</sup>* and trap or pump T, or if it is desired to apply the heat primarily directly within the fluid in the open evaporating-pan the valve *b<sup>3</sup>* is closed, when the course of the steam will be through the pipe *l* and valve *l'* into and through the coils *p'* and through the pipe *p<sup>2</sup>* into the space *b'* in the jacket or base B, where it will condense and be returned through the pipe *b<sup>4</sup>*, as before stated. Under these conditions a moderate and uniform degree of heat is attained and



maintained, distributed evenly through the contents of the evaporating-pan; or, again, the valve  $l'$  may be closed and the valve  $b^3$  opened, in which case the live steam will enter directly and only into the space  $b'$  in the jacket B for the purpose of maintaining the contents of the pan at a relatively low temperature, as is desirable at certain stages of a process of reduction or in treating jellies and other delicate material.

By our arrangement of apparatus we utilize the full heat value of the steam under all conditions and at the same time are enabled to vary and control the application of the heat in various ways to the requirements of the material under treatment, thus greatly increasing the scope and capacity of the apparatus, so that it may not only be used for reducing sap, but also for making jellies and other products requiring more delicate and varied manipulation. Furthermore, the desired results may be attained with accuracy and certainty.

The steam-jacket performs a double function in that it insulates and protects the bottom of the open pan, whether in direct use or not, as well as affording means for doubling the heating capacity of the pan.

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

1. The combination with a hollow rectangular base having flanges upon its upper side, of the rectangular evaporating-pan removably supported on the base and held within said flanges, means for supplying steam to

the interior of the said base, coils in said pan, a connection between said coils and the interior of the base, and a return-pipe connecting said base with a trap, substantially as described.

2. The combination with a rectangular hollow base having flanges on its upper face, of a rectangular evaporating-pan removably supported thereon and held within said flanges, alternately-disposed partitions in said pan, a coil in the pan divided into sections by said partitions, means for supplying steam to the interior of said base, a connection between said coil and the base, a trap, and a return-pipe connecting the base and trap, as set forth.

3. The combination of a plurality of open evaporating-pans arranged upon different horizontal planes, separable hollow bases therefor forming steam-jackets, an independent coil in each pan, an outlet from the one pan to the next, a steam-supply pipe, a connection from the same to each of the coils, a connection from each coil to the steam-jacket of said pan, a connection from each steam-jacket to the said steam-supply pipe, a trap, a connection from each jacket to said trap, and means connected to said trap for utilizing the heat thereof, as set forth.

Dated September 2, 1901.

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