

(No Model.)

2 Sheets—Sheet 1.

L. BOYER.  
DIFFUSION APPARATUS.

No. 428,589.

Patented May 27, 1890.

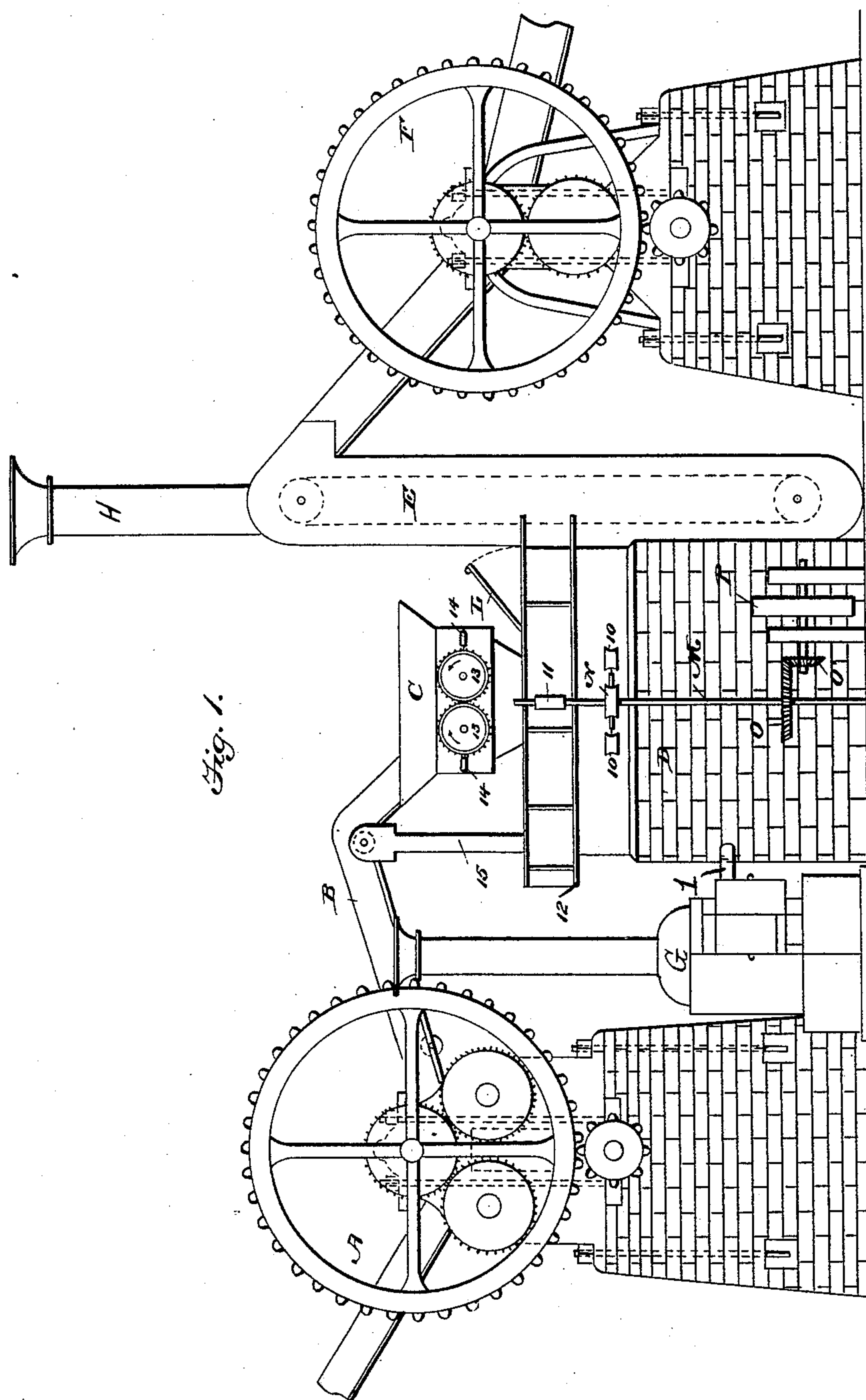


Fig. 1.

Witnesses:  
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2 Sheets—Sheet 2.

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Fig. 2.

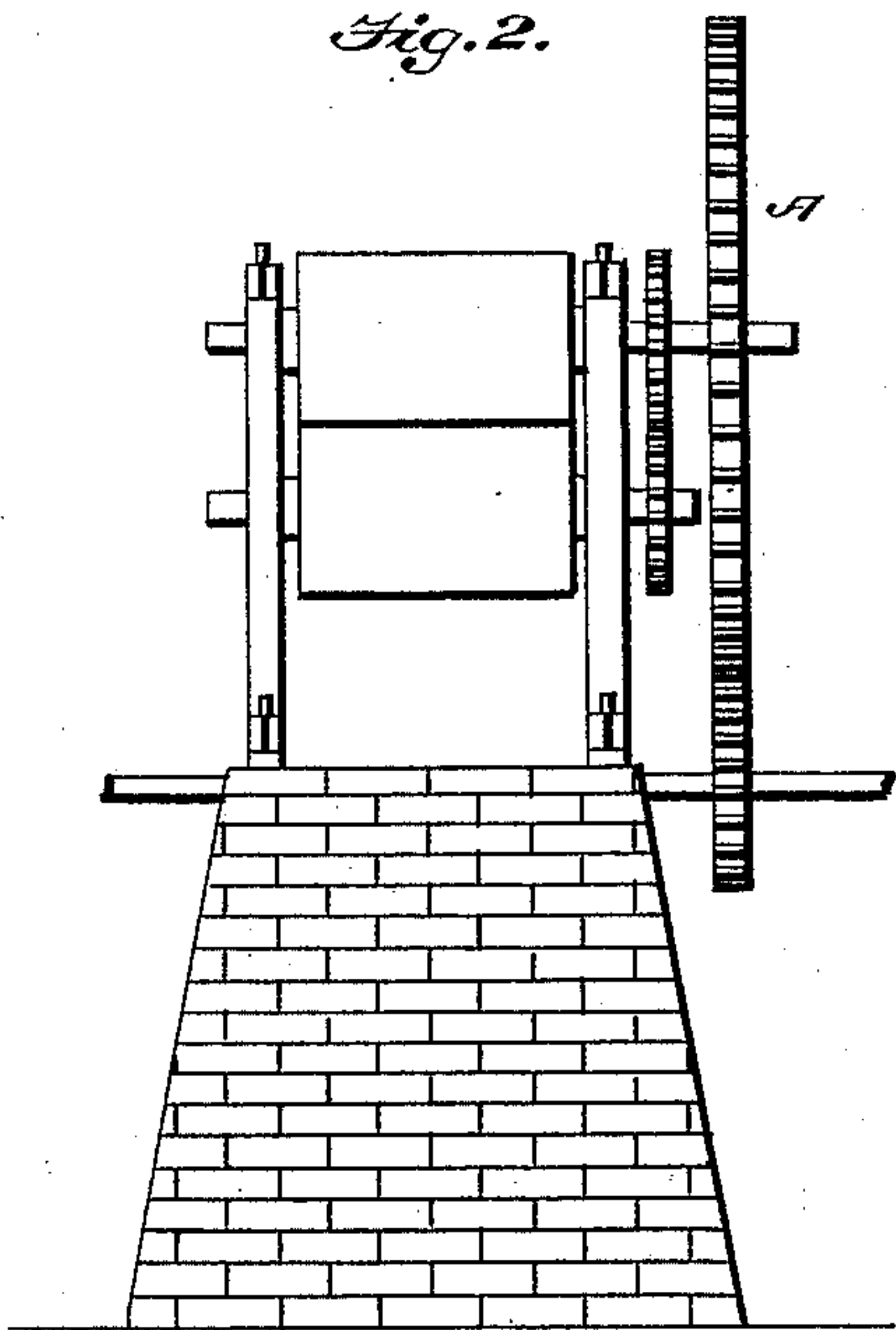


Fig. 4.

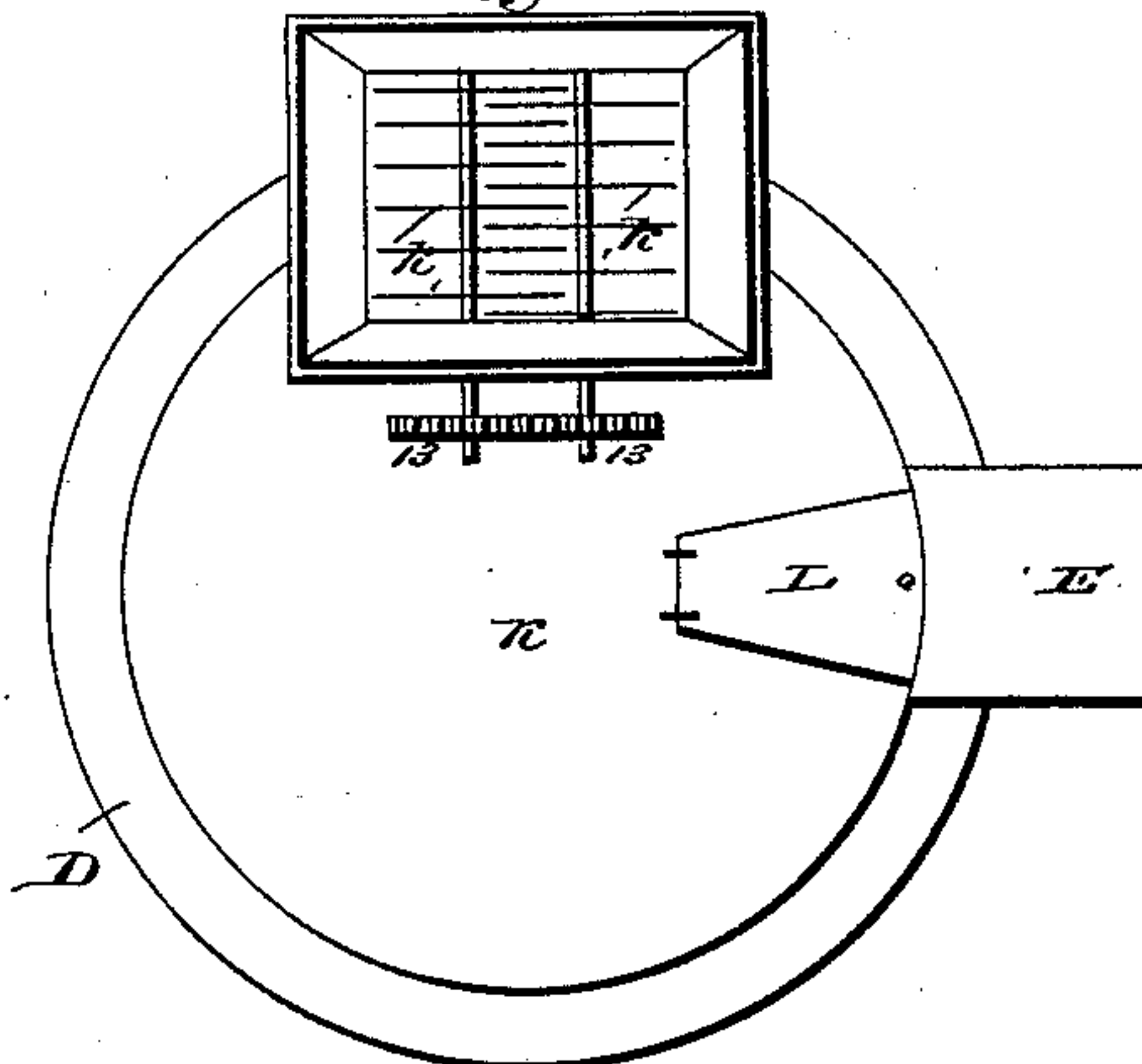


Fig. 3.

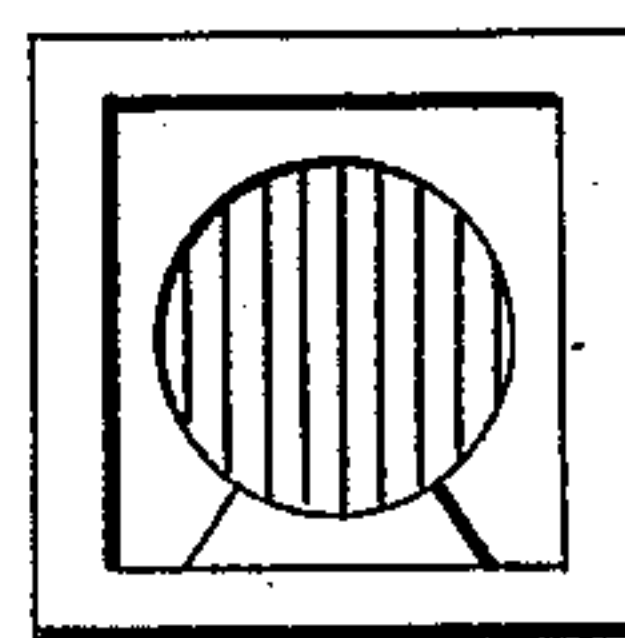


Fig. 7.



Fig. 5.

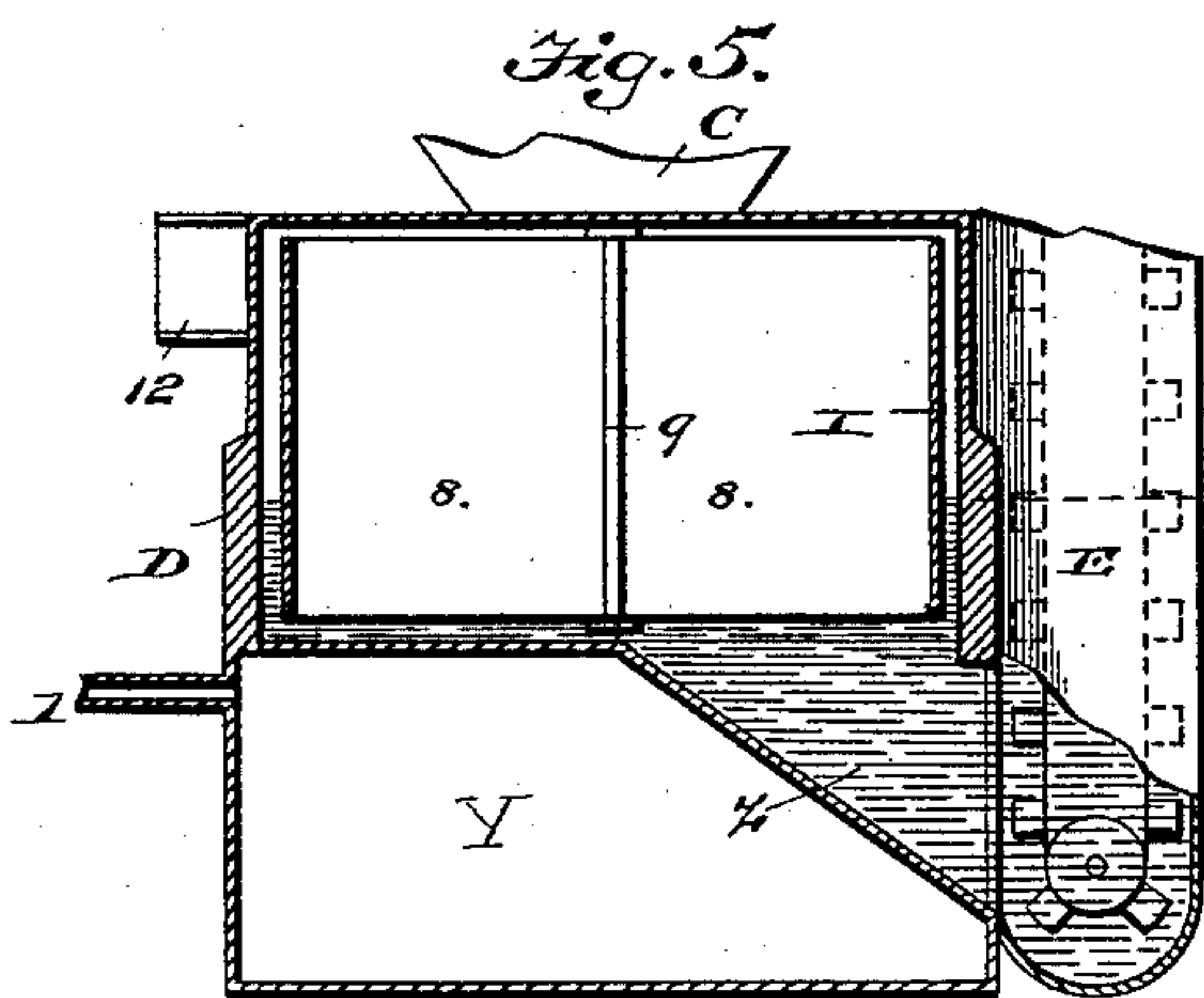


Fig. 6.

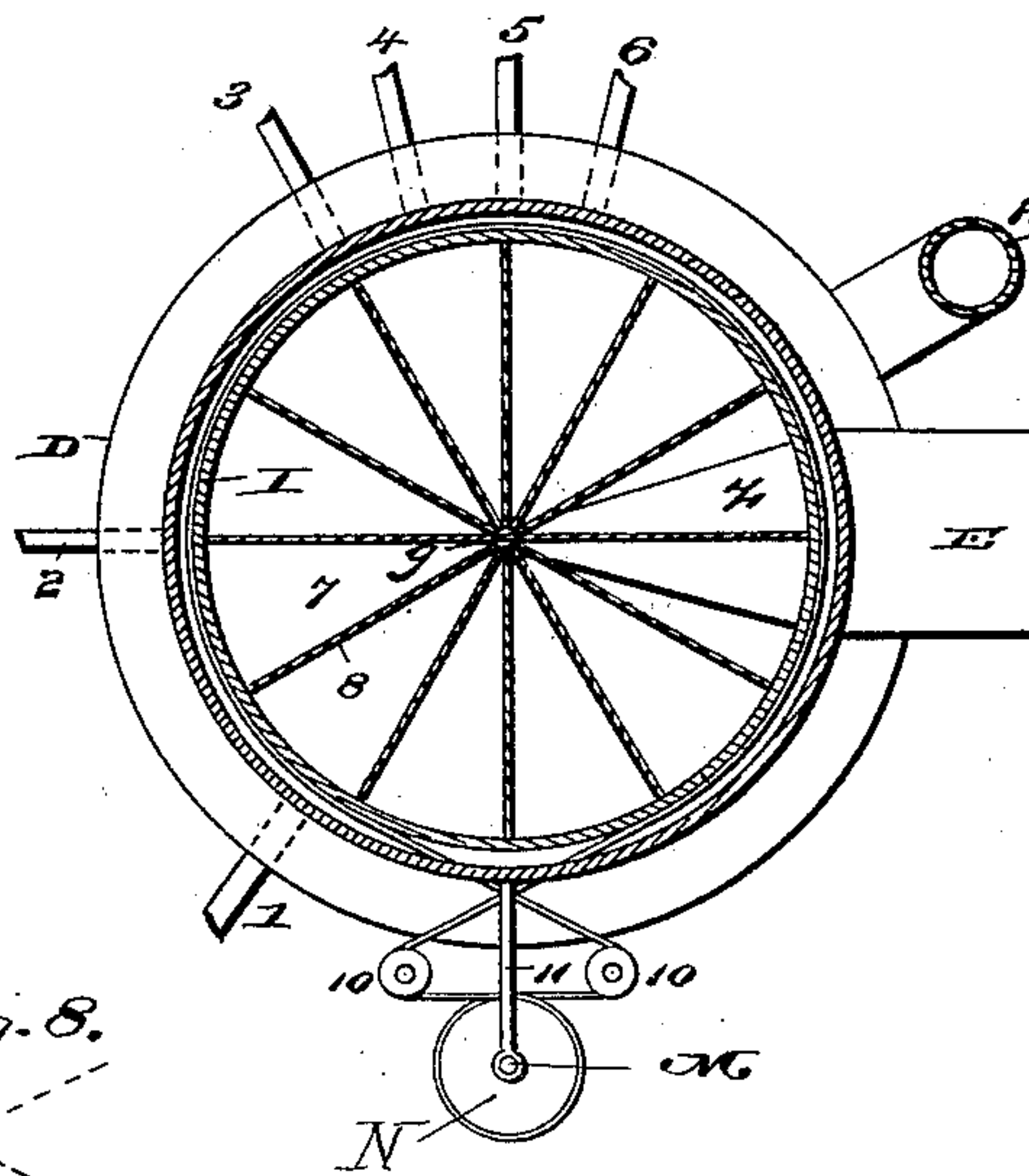
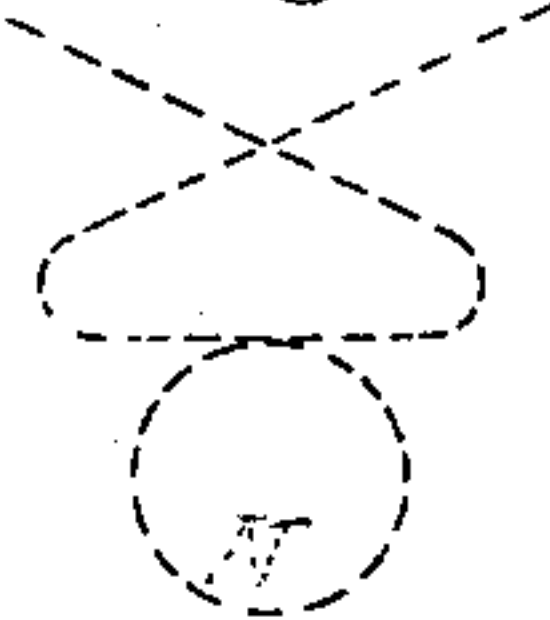


Fig. 8.



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# UNITED STATES PATENT OFFICE.

LEON BOYER, OF NEW ORLEANS, LOUISIANA.

## DIFFUSION APPARATUS.

SPECIFICATION forming part of Letters Patent No. 428,589, dated May 27, 1890.

Application filed June 25, 1889. Serial No. 315,563. (No model.)

*To all whom it may concern:*

Be it known that I, LEON BOYER, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Diffusion Apparatus; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to certain novel improvements in diffusion apparatus, and especially to apparatus for extracting saccharine matter from bagasse, which improvements will be fully understood from the following description and claims, taken in connection with the annexed drawings, in which—

Figure 1 is a side elevation of my improved apparatus or plant complete. Fig. 2 is an end elevation of a three-roller crushing-mill. Fig. 3 is a bottom view of the furnace. Fig. 4 is a top view of the tank and hopper, showing knives in the latter. Fig. 5 is a vertical sectional view centrally through the stationary and revolving tanks. Fig. 6 is a plan view, a part being broken away, of the tanks, showing the compartments in the revolving tank. Fig. 7 is a view of one of the knives, and Fig. 8 is a diagram in dotted lines of a portion of the belt for revolving the inside tank.

Referring to the annexed drawings by letters and figures, A designates a well-known three-roller mill, which is adapted for crushing the stalks of cane and expressing juice therefrom, which latter is received into suitable vessels, (not shown in the drawings;) and B designates a suitable conveyer mounted on a standard 15, and designed for conveying the crushed stalks into a hopper C. This hopper is arranged over a revolving tank I, and it is formed of two horizontally-divided parts hinged together at 14, and provided with revolving knives, the shafts of which are geared together by twin spur-wheels 13 13. The knives finely divide the crushed cane and discharge the same into a revolving tank I, which is subdivided into several compartments 7 by vertical partitions 8, which radiate from and are secured to a central shaft *g*, and also to the wall of the tank shown in Fig. 6.

D is a stationary tank, in which the tank I is arranged, which tank is provided with a

hot-air chamber Y, which communicates with a furnace G by means of a hot-air and smoke pipe 1, the lower part of the tank D being thus heated for warming water in the upper part in which the tank I is arranged.

H indicates a smoke or air pipe leading from chamber Y, which pipe affords a conduit for carrying off the products of combustion from said chamber.

The tank D is provided with an inclined outlet Z in its bottom, (better shown in Fig. 5,) which empties the mass of cane into the lower end of an elevator E, which conveys the mass, after treatment in tank I, into a well-known two-roller mill, which crushes it and expresses the remaining saccharine juice from it. It will thus be seen that I have a hot-air chamber Y beneath the tank D and inclosing the inclined outlet Z, so that the contents of the tank may be kept warm or heated as they are passing out of the discharge.

The tank D is provided with a cover K, having a hinged door L, and also with an exterior platform 12, which will serve as a convenient stand for an attendant. The tank I is revolved by means of a cable belt, which passes around it and also around pulleys 10 10 N, the pulley N being keyed on a vertical shaft M, sustained by an arm 11, which shaft is driven by means of bevel gear-wheels O O' and a belt-wheel P. (Shown in Fig. 1.)

The stationary tank D is provided with a pipe 2 for drawing off free juice; also with pipes 3, 4, 5, and 6. The pipe 3 is for steam, the pipe 4 for supplying water to the tank D, the pipe 5 a waste-pipe, and the pipe 6 a test-pipe.

In operation the cane is first passed through the three-roller mill A. The crushed mass is then conveyed to the hopper C, where it is finely divided by the revolving star-shaped knives *k* and fed into the several compartments 7 of the slowly-revolving tank I, where the mass is saturated with warm water let in by the pipe 4. The saccharine matter is thus extracted from the mass of cane and discharged into the lower end of the elevator E, which conveys it to the two-roller mill F, where it is forcibly squeezed, thus removing all saccharine matter.

I am aware of Patent No. 402,056, in which

a rotatable tank is arranged within a stationary tank and the stationary tank has an outlet in its bottom communicating with an endless elevator, and therefore do not claim such  
5 devices broadly.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

10 In an apparatus substantially as described, the combination, with the water-tank D, of the hot-air chamber Y, arranged beneath the tank, the outlet Z, mainly inclosed by the hot-air chamber and leading from the tank D, the

endless elevator communicating with said outlet, the rotatable tank I, arranged in the tank 15 D and having impervious side walls, partitions dividing said tank into compartments, and means for rotating the latter tank, substantially as specified.

In testimony whereof I affix my signature in 20 presence of two witnesses.

LEON BOYER.

Witnesses:

HELMUTH HOLTZ,  
PERCY D. PARKS.