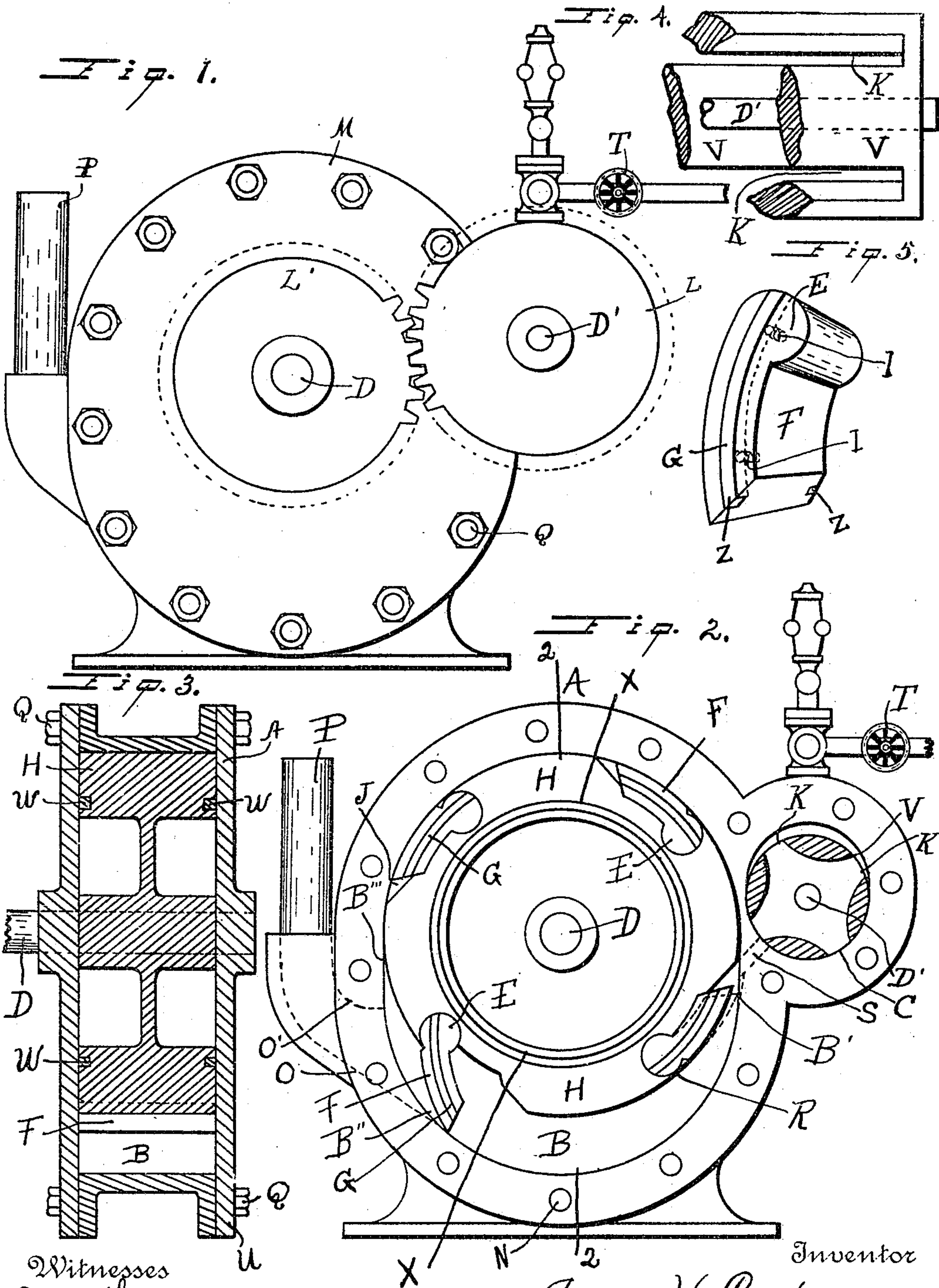


No. 819,724.

PATENTED MAY 8, 1906.

A. H. CARPENTER.
ROTARY ENGINE.

APPLICATION FILED MAR. 23, 1905.



Witnesses
M. H. Ayres.
S. S. Rose

Inventor
Amos H. Carpenter

UNITED STATES PATENT OFFICE.

AMOS H. CARPENTER, OF STOCKTON, CALIFORNIA.

ROTARY ENGINE.

No. 819,724.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, AMOS H. CARPENTER, a citizen of the United States, residing at Stockton, in the county of San Joaquin, State of California, have invented a new and useful Improvement in Rotary Engines; and I declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it ap-
10 pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to certain improve-
15 ments in rotary engines; and the object of my improvement is to provide a machine that will utilize steam economically and to the best advantage and receive the steam directly against projecting blade-arms at any
20 desired distance from the axle, and thereby develop more power than can be obtained from engines now in use with a like amount of steam. This I accomplish by the use of the peculiar construction, novel combina-
25 tion, and adaptation of parts hereinafter described, and particularly pointed out in the claims hereunto annexed, reference being had to the accompanying drawings for a better comprehension thereof, in which—

30 Figure 1 is a view of the top side of the engine, showing cover, entrance-pipe, exhaust, and gear-wheels that operate the rotary valve. Fig. 2 is a view of the same side with the cover removed, showing inside hub with
35 blade-arms and a cross-sectional view of the rotary valve. Fig. 3 is a cross-sectional view of the engine on a line drawn through its center. Fig. 4 is a side view of the rotary valve detached from the steam-chamber in which
40 it is incased. Fig. 5 is a perspective view of a blade-arm detached from the inside hub.

My improvement consists, essentially, of the hollow basin A, the general outline of which is circular in form, its sides being con-
45 structed at right angles to its floor and lid and which may be made of any desired depth or diameter and which is provided on one side with a narrow slot-like passage-way S, which leads to an adjacent steam-chamber C, which
50 is rigidly attached to the side of said basin and in which is located the rotary valve V, and on the other side by a larger opening (shown by the dotted lines O and O') through the side of the basin, which leads to the ex-
55 haust-pipe P, where the steam escapes.

T represents the throttle-valve, through which the steam is admitted into the steam-chamber C, inclosing the rotating valve V, and B is the passage-way for the steam through the engine between the hub H and
60 the inner surface of the basin. The inside of the basin is made to receive a cylindrical hub H, the length of which is equal to the depth of the basin, and its diameter must likewise
65 suitably correspond with that of the basin, wherein it is made to revolve. A shaft or axle D is made to pass through the center of said hub and projects through the floor and
70 lid of said basin and is journaled therein at a point outside of their respective centers, so that the periphery of said hub on one side
loosely touches the surface of the inner side of the basin and leaves on the other side a suf-
75 ficient space for the passage of the steam through the basin from B' to B'' through the passage-way B.

A suitable number of cylindrical recesses R, with sides penetrating through the periph-
ery of said hub, are constructed in said hub at a suitable distance apart and extend its en-
80 tire length. Said recesses are parallel with the axis and exterior surface of said hub, and the openings therefrom to the rim appear like slots running lengthwise through the sur-
85 face of said hub and are made to receive the floats or blade-arms F. The outer end of the blade-arms is beveled, as shown in Figs. 2 and 5, and upon the inner end is fastened lat-
90 erally a cylindrical post-like attachment E, which is made to fit loosely and turn in the said cylindrical recess R of the hub, and there-
by forms a hinge in its periphery, and which is of the same length as the hub, and when
95 placed in position in said recess the attached float or blade-arm projects through the lateral opening thereof from the periphery of the hub and is broad and long enough to com-
pletely fill the passage-way B for the steam on the outer side of the hub from B' to B''.

The slot-like passage-way S from the steam-
100 valve chamber C enters the side of the basin at a point where the said inner surface of the basin recedes from the periphery of the in-
side hub and is so constructed that the steam in making such passage strikes the beveled
105 outer end of the blade-arms and forces them to open outward across the passage-way B in the revolution of the inside hub, and at B'', where said inner surface of said basin begins
110 to approach the periphery of said hub, such

surface is beveled and forms a cam whereby the floats or blade-arms in making such passage-way are closely folded against the side of the hub, thereby completely filling the space
5 between the periphery of the hub and the interior surface of the basin from B''' to B'.

The blade-arms may be curved laterally, so that their outer surface may closely fit the interior surface of the basin, and are provided
10 on each side with a groove G, extending throughout their entire length and in which groove is placed a packing-strip Z of any suitable material, which is kept in place by one or more spiral springs I, which pass through
15 the body of such blade-arms and press such strips closely against the sides of said basin to prevent the steam from passing between such blade-arms and the inside surface of the basin. At the outer end of each
20 blade-arm when folded against the hub a small triangular or other suitably-formed chamber J is made in the periphery of the hub, so that the beveled ends of said blade-arms may receive the first impact of the steam
25 as it enters the basin from the passage-way S, and such arms are thereby forced to open and to project across the passage-way B in the revolution of the inside hub without the use of any mechanical means for that purpose,
30 and the process of opening and closing such blade-arms is likewise assisted by gravity, for it will be observed that as soon as the outer end of the float passes the point B' its own weight will cause it to fall across the passage-way B, and when it reaches the point B''
35 its weight will also cause it to gradually fold itself against the periphery of the hub.

The rotary valve V is incased in a cylindrical basin C, steam being admitted thereto
40 through the throttle-valve T, and consists of a hollow cylinder having closed ends and a shaft passing through its center and through the floor and lid of its basin, in which its said shaft D' is journaled, and having lateral openings K therein running lengthwise from end
45 to end and extending from its periphery inward to its inside chamber and is designed by its rotation to alternately open and close the slot-like passage-way S, that leads from
50 its incasing steam-chamber C to the basin. For the purpose of operating said valve and keeping the same adjusted to the movement of the inside hub there is firmly fixed upon the exterior end of its shaft D', projecting
55 through the lid of the steam-chamber, a cog-wheel L, whose cogs mesh with the cogs of a similar wheel L', having the same number of cogs, that is rigidly fixed upon the protruding shaft D of the hub H.

60 The cover M of the basin is made flat, and its general form is designed so as to cover the hole in the basin and its adjacent steam-chamber C, that contains the rotary valve V, and the same is bolted to the basin by means
65 of bolts Q, that pass through the bolt-holes N

of such cover and the projecting flange U of the floor of the basin.

To prevent the steam from passing between the ends of the hub H and the floor and lid of the basin, a circular groove W is
70 made in each end of said hub close to the lateral openings in its periphery, and steam-rings X, made of any suitable material, are placed therein and press closely against the floor and lid of the basin.
75

When the hub H, with its blade-arms F, hinged in its periphery, is placed in position in the basin, the lid bolted tightly thereon, and steam is made to pass into the engine
80 through the throttle-valve T, it fills the steam-chamber C and the rotary valve V therein, and when the lateral openings K of the valve V reach or cover the passage-way S the steam enters and strikes the beveled end
85 of the adjacent blade-arm F, and as the hub revolves and the blade opens across the passage-way B it presses against the rear side thereof and forces the hub to which said blade is attached to revolve until the latter
90 comes in contact with the cam portion formed upon the interior side of the basin and folds itself against the periphery of the hub. As soon as the lateral opening in the rotary valve V passes said passage-way S the steam
95 ceases to enter the basin, and the blade-arm is then forced forward in its revolution by means of the steam expanding in the passage-way B until such blade reaches the exhaust-tube, (shown by the dotted lines O and O',) where the steam escapes through the
100 side of the basin by means of the pipe P. Such exhaust-tube (shown by lines O and O') being of less depth and height than the basin leaves a space both above and below the opening to hold the blade-arms in place in
105 their revolutions with the hub. By connecting the axle of the hub with any convenient pulley power may be obtained for any desired purpose.

What I claim as my invention, and desire
110 to secure by Letters Patent, is—

1. A hollow basin, provided with a suitable lid covering the chamber therein, a suitable entrance thereto and exit therefrom, and adapted on the inside to receive a cylindrical wheel with opening and closing blade-arms, a cylindrical hub whose axis is journaled in the lid and floor of said basin at a point a suitable distance outside of their respective centers, which is provided with
115 floats or blade-arms, hinged in its periphery, which are designed to project therefrom on one side of the hub and which fold against its periphery on the other side leaving a small chamber or opening in the periphery of the hub at the rear end of said blade-arms which
120 extends the entire length of said hub and under the entire rear end of said blade-arms, whereby steam may readily penetrate the same and, by its pressure against the entire
125 130

end of such float, open said blade-arm and project the same across the passage-way for such steam, substantially as set forth.

2. The combination of a hollow basin, the sides of which are constructed at right angles to its floor and lid, provided with a suitable cover for the opening therein and means for fastening the same thereon, suitable entrance thereto and exit therefrom for steam that are adapted to fit and connect the same with ordinary pipes or mains, a cylindrical hub, of any suitable diameter, the length of which is equal to the depth of the basin, and the axle of which is journaled in said lid and floor of the basin, at a suitable distance outside their centers, and from the periphery of which project a suitable number of floats or blade-arms, hinged in a cylindrical recess constructed in its periphery, by means of a post-like attachment laterally attached to an end of the float or blade-arm that works loosely in said recess and thereby to open and extend crosswise of the passage-way in the basin on one side, and to close against the periphery of the hub on the other side leaving a small chamber or opening between the rear end of said blade-arm and the periphery of said hub whereby steam may penetrate the same and by its pressure against the end of such float open said blade-arm and project the same across the passage-way for such steam, and the inner wall of said basin having a cam portion in the pathway of said blades to operate and swing the same against the periphery of said hub, and provided with a cylindrical steam-chamber adjacent thereto and connected therewith by means of a suitable passage-way, in which is incased a suitable hollow cylinder, the axis of which passes through its center and is journaled in the lid and floor of such chamber, and which has lateral openings therein running lengthwise from end to end, and extending from its periphery inward to its inside chamber, and suitable means for rotating said cylinder disposed therein in conjunction with said inside hub, substantially as set forth.

3. The combination of a hollow basin, provided with a suitable lid covering the chamber therein, a suitable entrance thereto and exit therefrom, and adapted on the inside to receive a cylindrical wheel with opening and closing blade-arms, a cylindrical hub whose axis is journaled in the lid and floor of said basin at a point a suitable distance outside of their respective centers, which is provided with floats or blade-arms, hinged in its periphery, which are designed to project therefrom on one side of the hub and which fold against its periphery on the other side leaving a small chamber or opening under the rear end of said blade-arms, whereby steam may penetrate the same and by its pressure against the end of such floats, open said blade-arms and project the same across

the passage-way for such steam, and having a cylindrical steam-chamber adjacent thereto and connected therewith by means of a suitable passage-way, in which is incased a suitable hollow cylinder, the axis of which passes through its center and is journaled in the lid and floor of such chamber, and which has lateral openings therein running lengthwise from end to end, and extending from its periphery inward to its inside chamber, and which has upon the exterior end of its said shaft a cog-wheel, which intermeshes with a cog-wheel of the same size upon the shaft of the hub, and a cog-wheel upon the protruding end of the shaft of the hub, a groove encircling each end of said inside hub close to the lateral openings in its periphery, suitable rings to rest therein against the lid and floor of said basin, grooves on each side of said blade-arms, packing-strips to rest therein, and spiral springs to keep the same in place and press the same against the floor and lid of the basin, and a suitable throttle-valve, substantially as set forth.

4. The combination, in rotary engines, of the basin A, the lid M, the bolt-holes N, the throttle-valve T, the steam-chamber C, the rotary valve V, with its shaft D', lateral openings K and cog-wheel L, the slot-like passage-way S, the inside hub H, with its shaft D journaled in the lid and floor of the basin at a point outside of its center, leaving the passage-way B for the steam between the periphery of the inside hub and the inside surface of the basin, the cylindrical recesses R in its periphery, the floats or blade-arms F with their cylindrical post-like attachment E and beveled rear end and hinged in the recesses R, with groove G, packing-strips Z and spiral springs I, the circular grooves W in the hub, the circular packing-rings X, the cam portion B'' to B''' on the inside surface of the basin, the exit-hole O and O' for the steam, the triangular chamber J, the cog-wheel L' on the shaft of the hub, the bolts Q, substantially as shown and described and for the purposes set forth.

5. The combination, in rotary engines, of the basin A, the lid M, the steam-chamber C, the rotary valve V, with its shaft D', lateral openings K and cog-wheel L, the passage-way S, the inside hub H, with its shaft D journaled in the lid and floor of the basin so as to leave the passage-way B for the steam between the periphery of the inside hub and the surface of the basin, the cylindrical recesses R in its periphery, the floats F with their post-like attachment E and beveled rear end, grooves G, packing-strips Z, and spiral springs I, the triangular chambers J, the cog-wheel L', the exit-hole O and O' for the steam, and the bolts Q, substantially as shown and described and for the purposes set forth.

6. The combination, in rotary engines, of

the hollow basin A, provided with a suitable entrance thereto and exit therefrom for the steam, and adapted on the inside to receive a cylindrical wheel with opening and closing
5 blade-arms, the lid M, the inside cylindrical hub H, whose axis is journaled in the lid and floor of the basin at a suitable point outside of their respective centers, which is provided with the blade-arms F hinged in its periphery,
10 which open across the passage-way B on one side thereof and fold against its periphery on the other side, leaving a small chamber or opening J in the periphery of the hub at the rear end of such blade-arms which chamber
15 extends the entire length of said hub and un-

der the entire rear end of said blade-arms, whereby the steam may readily penetrate the same, and by its pressure against the entire end of such floats open the same and project them across the passage-way B for the steam, substantially as shown and described and for the purposes set forth. 20

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

AMOS H. CARPENTER.

Witnesses:

KARL C. BRUECK,
MORGAN CRANFORD.