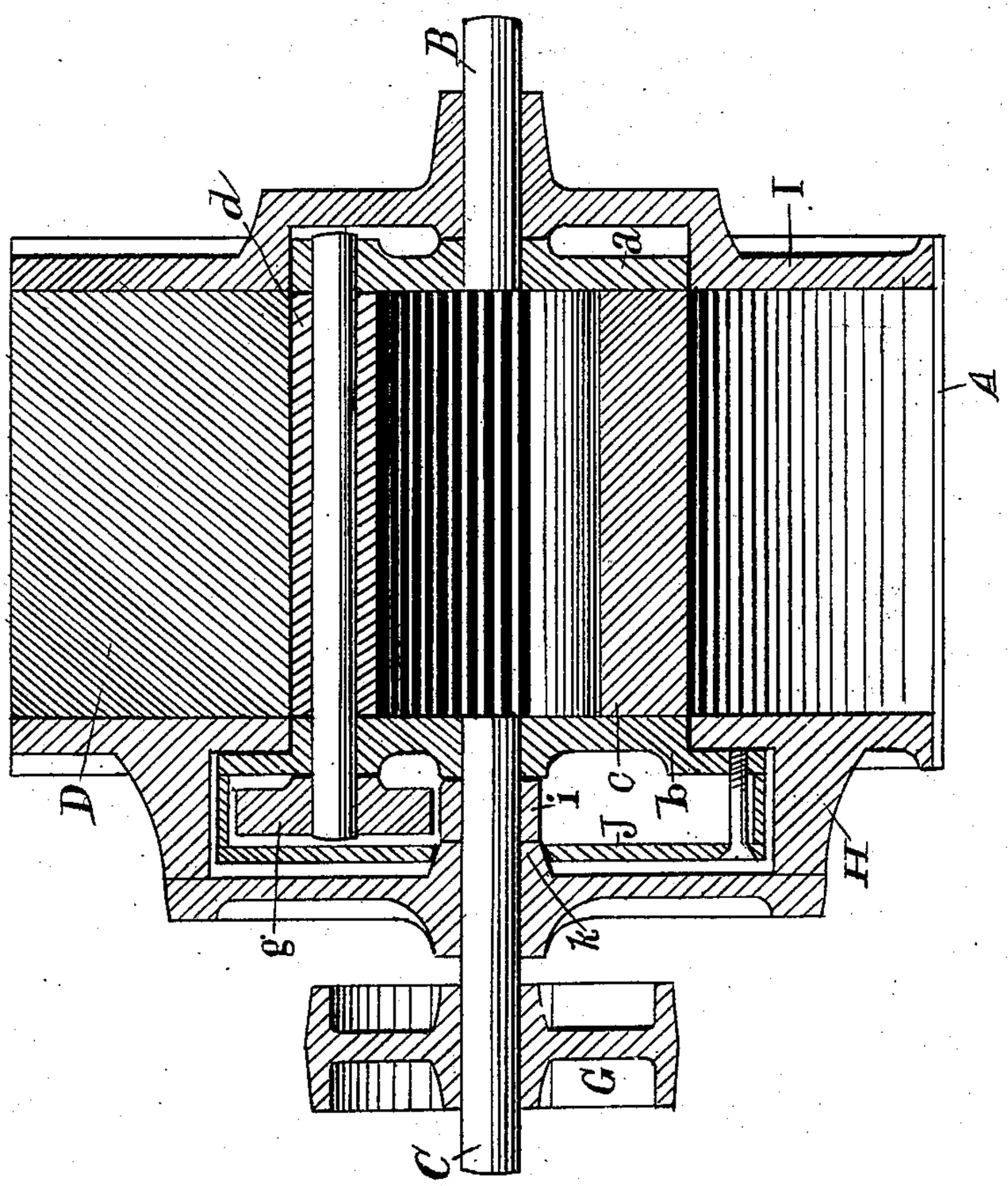
(No Model.) 2 Sheets—Sheet 1.

A. S. REED.

AIR BLOWING MACHINE.

No. 534,578. Patented Feb. 19, 1895.

Fig. 1.



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(No Model.) 2 Sheets—Sheet 2.

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Fig. 3.

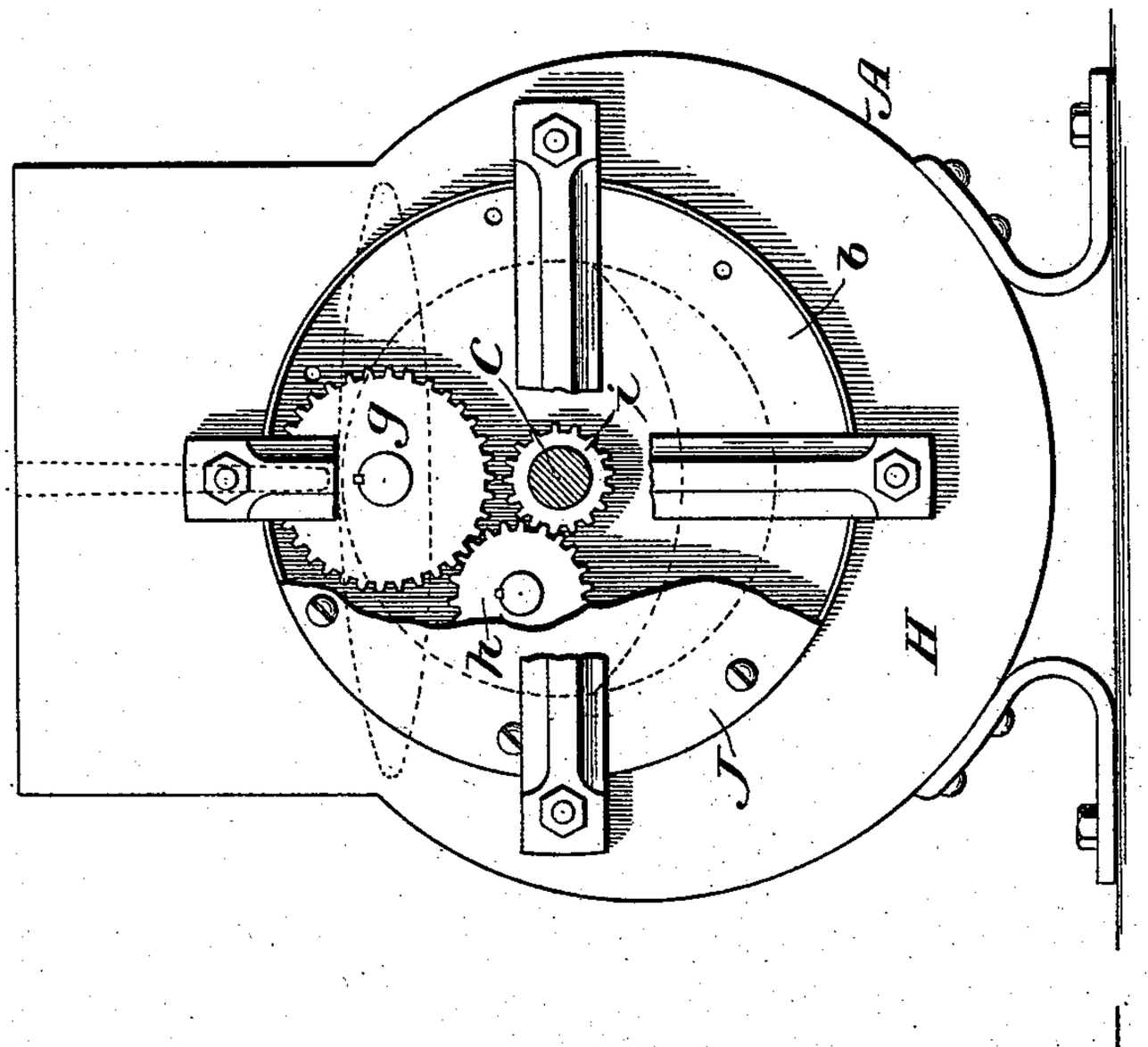
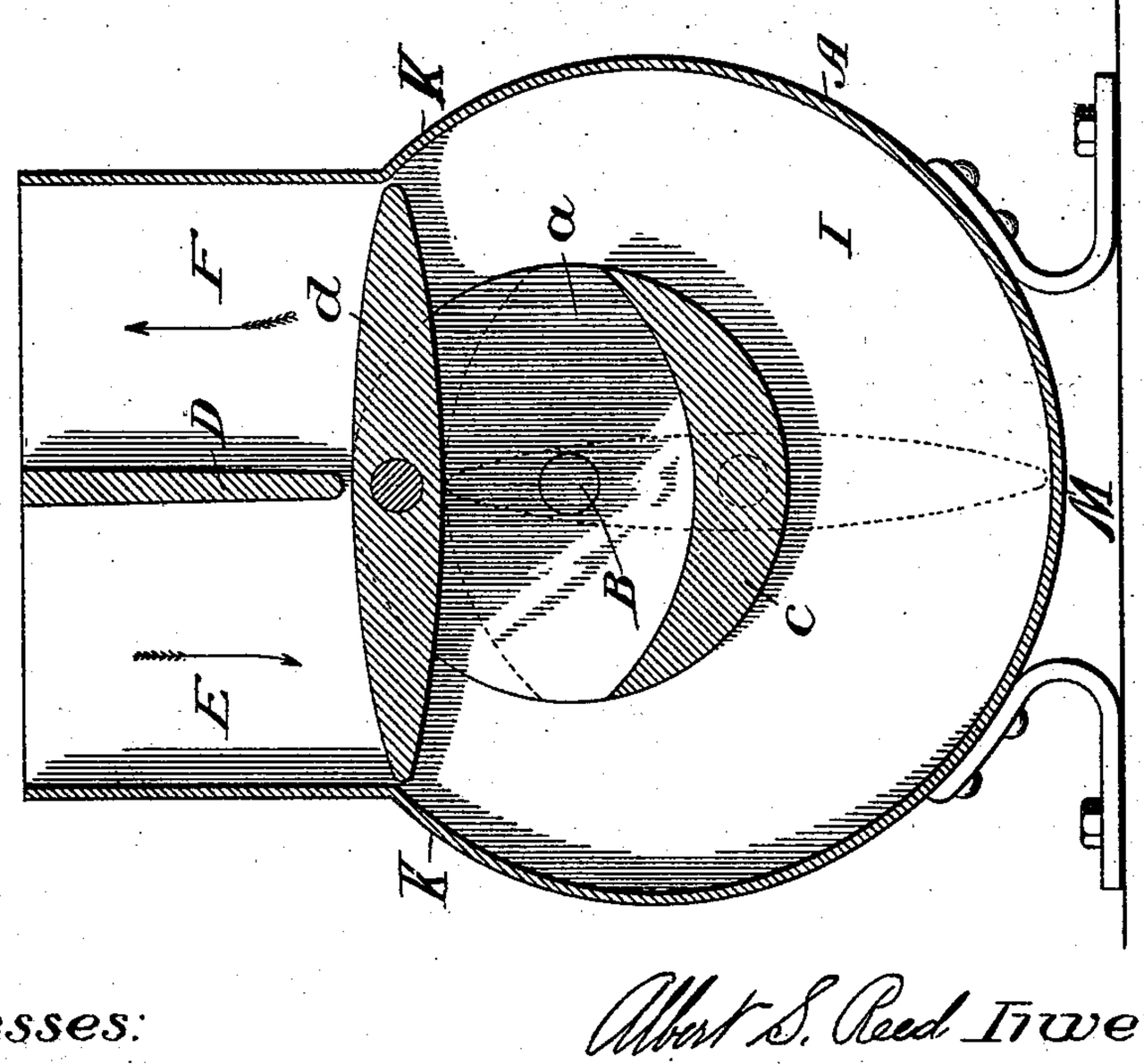


Fig. 2.



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UNITED STATES PATENT OFFICE.

ALBERT S. REED, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-HALF TO FRANKLIN J. REED, OF SAME PLACE.

AIR-BLOWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 534,578, dated February 19, 1895.

Application filed April 10, 1893. Serial No. 469,798. (No model.)

To all whom it may concern:

Be it known that I, ALBERT S. REED, a citizen of the United States, residing at Chicago, in the county of Cook, in the State of Illinois, have invented a new and useful Improvement in Air-Blowing Machines; and I hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to a high pressure air blowing machine, the general shape of which is cylindrical with an open rectangular box attached on the side for intake and discharge ports or openings; the said intake and discharge ports being separated by a partition. The end sought is a direct high pressure blast without any return current or escape except through the discharge port. This is accomplished by a revolving frame, which is made to fit the drum. The revolving frame consists of two cylindrical heads connected by a crescent shaped side similar to the segment of a circle, the convex side being a circle the same as the cylindrical heads and being thicker in the middle than at the ends is crescent shaped in cross section, the whole frame having axles or shafts on which it revolves and carries a rectangular paddle or piston having both sides convex and revolving on its own axis between the cylindrical heads described, as the whole frame rotates. The ends of the drum are cut away enough to permit the cylindrical shaped heads of the revolving frame to revolve therein, and are placed flush with the inside of the ends of the drum. The cylindrical end of the revolving frame has a circular disk bolted to the head of the revolving frame, larger in diameter than the cylindrical head *b* of revolving frame, making a flange; or the head may be cast with a flange on it. To this flange of the revolving frame head a cap is attached, which forms a case for gear wheels that control the reversing movement of the piston or paddle inside the drum. The axle of the revolving frame passes through the center of the cap, through the hub of the bearing frame outside of the revolving cap. The revolving cap described is cut away to admit the bearing through which the axle of the revolving frame passes. On the inside end of the bearing and within the revolving cap, rigidly secured in position, is a stationary cog wheel, through which the axle of the revolving frame loosely passes. Into this stationary cog wheel another transmitting cog wheel, having preferably an odd number of cogs, and revolving on a post or axle attached to the cylindrical head of the revolving frame, meshes. This transmitting cog wheel also meshes into another cog wheel that is keyed to the axle of the rectangular convex paddle or piston and which has twice the number of cogs that the stationary cog wheel has. As the revolving frame turns on its axis the transmitting cog wheel is made to revolve by traveling around the small stationary cog wheel, and by meshing into the cog wheel that is keyed to the axle of the rectangular paddle or piston. The position of the latter is continually changed as it sweeps around the air chamber of the drum forcing the air out through the discharge port.

To enable others skilled in mechanics to make and use my invention, I submit the following description of its construction and operation.

Figure 1. is a vertical section of the entire machine. Fig. 2. is a transverse section showing interior position of the rectangular convex paddle or piston, as the forward end has closed the intake port and the rear end closed the discharge port; also shows the end of the revolving frame and the end of the curved connecting bar of the revolving frame. Fig. 3. is an end view showing the revolving cap or gear case and the hub and bearing frame cut away exposing the gear wheels.

The cylindrical drum A and the box which constitute respectively intake and discharge ports (E and F Fig. 2.) form the outside case. The intake and discharge ports, E and F are separated by a suitable partition D.

Within the drum A is a revolving frame having two cylindrical heads, *a* and *b* (Figs. 2. and 3.) with a curved connecting bar crescent shaped in cross section appearing on its outside as a segment of a cylinder, and crescent shaped by reason of its being thicker in the middle than at its edges.

The cylindrical heads *a* and *b* of the body of the revolving frame as described have axles

or shafts, B and C (Fig. 1.) whereby it is rotated; and the saddle or piston *d* is rectangular shaped with two convex sides and has attached to each end axles, that have their bearings journaled in each of the cylindrical shaped heads *a* and *b* of the revolving frame near their outer edges, and directly opposite the crescent shaped side *c* of said revolving frame. The paddle or piston *d* revolves on its axis between the cylindrical heads *a* and *b* of the revolving frame, and also revolves with the revolving frame. Each time the revolving frame makes a revolution the paddle or piston *d* makes half a revolution, and reverses edges. The ends H and I of drum, A are cut away sufficiently to allow the cylindrical heads *a* and *b* of the revolving frame, to turn therein without friction. To the end of cylindrical head *b* of the revolving frame is a flange fastened by bolts or screws, or the flange may be cast on cylindrical head *b* to which is fastened by bolts or screws a circular shaped cap or gear case *j* (Fig. 3.) cut away in the center sufficiently to admit the bearing *k* (Fig. 1.) through which the axle or shaft C,—to which is fitted and keyed pulley G of the revolving frame—passes. On the inside end of the bearing K within the cap or case *j* through which the axle C passes, is fastened a stationary cog wheel *i*. (Figs. 1. and 3.)

The circular cap or gear case *j* (Fig. 3.) is considerably larger in diameter than the cylindrical head *b* of the revolving frame. Within cap *j* and attached to cylindrical head *b* is a post or axle on which cog wheel *h* having preferably an odd number of cogs, turns. On the end of the axle of the paddle or piston *d*, within the cap or gear case heretofore described, is keyed gear wheel *g* (Fig. 3.) having twice the number of cogs that stationary cog wheel *i* has. Gear wheels *g* and *h* travel with the revolving frame, and as the frame revolves, gear wheel *h* meshes into and travels around stationary cog wheel *i*, and it also turns on its own axle and meshes into cog wheel *g* that is keyed to the axle of the rectangular paddle or piston, which having twice the number of cogs stationary cog wheel *i* has, through which it gets its motion by means of transmitting cog wheel *h*, it follows, that at each revolution of revolving frame the paddle or piston makes half a revolution—*i. e.*, reverses edges at each revolution of the revolving frame.

As the revolving frame carrying the paddle or piston makes a revolution, the paddle or piston sweeps the air chamber in the drum A forcing the air out through discharge port F. The paddle or piston *d*, is so arranged that as soon as it leaves the intake port E the crescent shaped side *c* of the revolving frame commences to pass partition D thereby preventing the return or escape of any air through the intake port E. As the paddle or piston passes through the air chamber the gear wheels heretofore described shift the position of it so that it discharges all the air through the discharge port F, without any return current, as that is prevented by the position of the crescent acting as a cut off or stop, thereby greatly reducing the friction and increasing the pressure.

The general form of the interior of the case is cylindrical as before stated, but it will be noted that it is not a true cylinder for in order to keep the edges of the paddle or piston in close contact with the interior of the case it is contracted at K and enlarged at bottom or at M as shown in Fig. 2. It will also be seen that the interior frame may be revolved in either direction so that the terms inlet and outlet as applied to the openings depend upon the direction of revolution. The blower may also be used for a pump. The whole may be made of metal, or wood and metal as desired.

What I do claim for my invention, and desire to secure by Letters Patent, is—

1. The combination of a cylindrical case or shell having inlet and outlet openings, and a division plate with an interior revolving frame having its ends or disks connected by a cross bar curved on its exterior to fit against the division plate of the openings to maintain the division between the parts for a portion of the distance, and a revolving paddle or piston to continue such division for the remainder of the distance and expelling the contained fluid, substantially as specified.

2. The combination of an exterior case or shell having inlet and outlet openings and a division plate with an interior revolving frame having end plates or disks connecting at one side of its axis by a bar curved on its exterior to fit against the division plate between the openings and concaved on its interior on the segment of a circle adapted to fit against the edges of a revolving paddle or piston which is journaled in the end plates and made to revolve with them and to have an independent revolving movement, substantially as specified.

3. In combination with a case or shell having a cylindrical interior with inlet and outlet openings and a division between them, a revolving frame having a connecting bar as described at one side, and a paddle or piston journaled in the opposite side which is carried around by the frame and given an independent half revolution for each complete revolution of the frame by suitable gearing and arranged to close the space under the division between the openings when not closed by the connecting bar, and to sweep around in contact with the shell to expel the fluid and also to close the space in the frame by sweeping across the connecting bar in contact therewith, whereby a continuous current is maintained at the outlet, substantially as specified.

4. The combination of the case or shell having inlet and outlet openings with a division between them, with an interior revolving frame having its ends connected by a bar curved on its outer face to fit against the di-

viding plate for the openings and its inner face concaved to fit against the edges of a paddle or piston journaled in the frame opposite to said bar and a paddle or piston having two convex surfaces adapted to fit against the dividing plate, and its edges to fit against the interior of the case and the inner concave of the connecting bar and geared by suitable mechanism to make an independent half revolution for each complete revolution of the revolving frame, substantially as specified.

5. The combination of the case A having the inlet opening E, outlet opening F, and partition D, with the revolving frame having the end plates or heads *a*, *b* and connecting bar *c*, the paddle or piston *d* journaled in the heads by a shaft or projection carrying the wheel *g* driven by the fixed wheel *i* on the bearing of the shaft C of the revolving frame, substantially as specified.

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Witnesses:
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