J. TALLEY, Jr.
Hydraulic-Engines.

No. 213,952. Patented April 1, 1879.

Fig. 1.

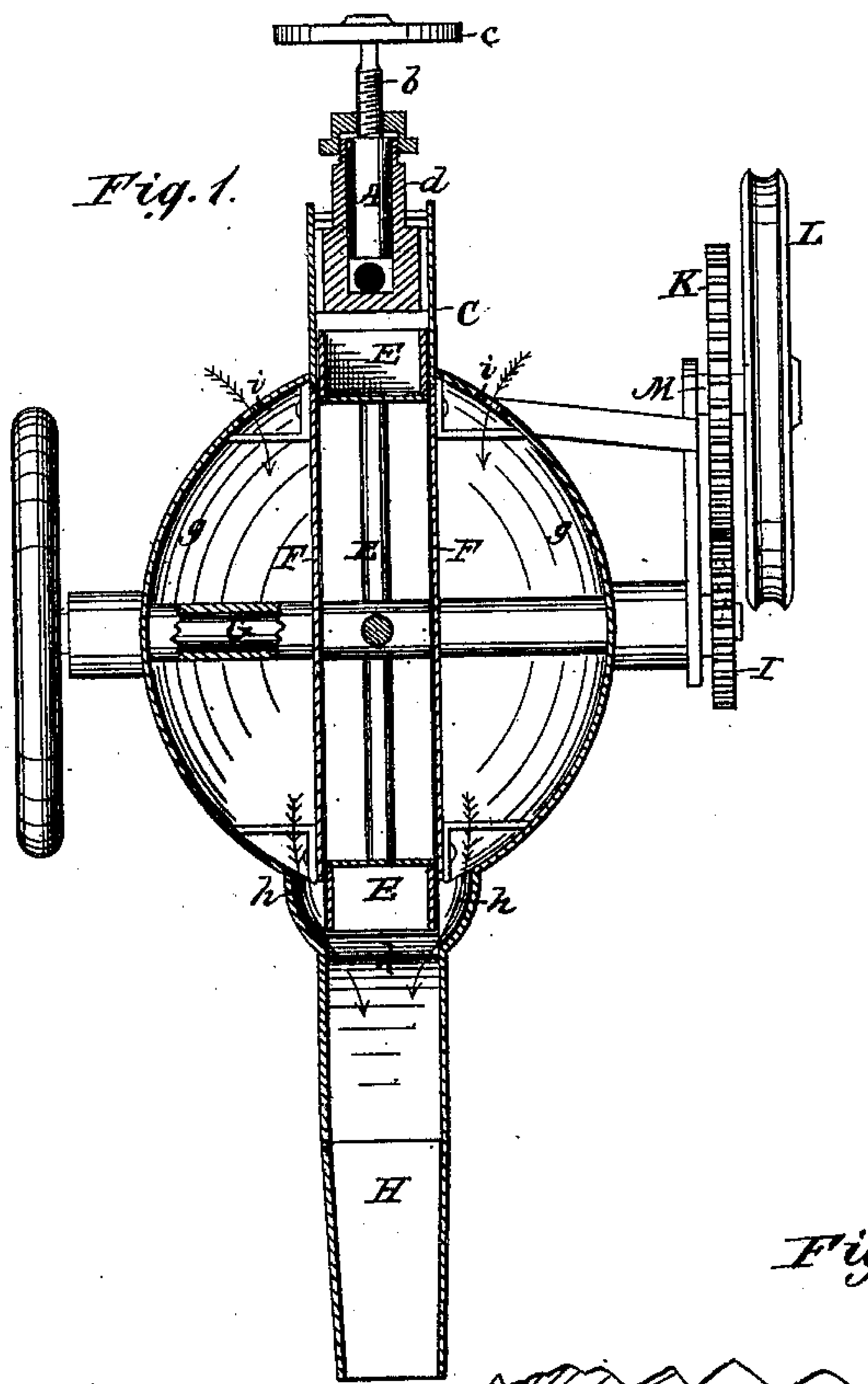


Fig. 2.

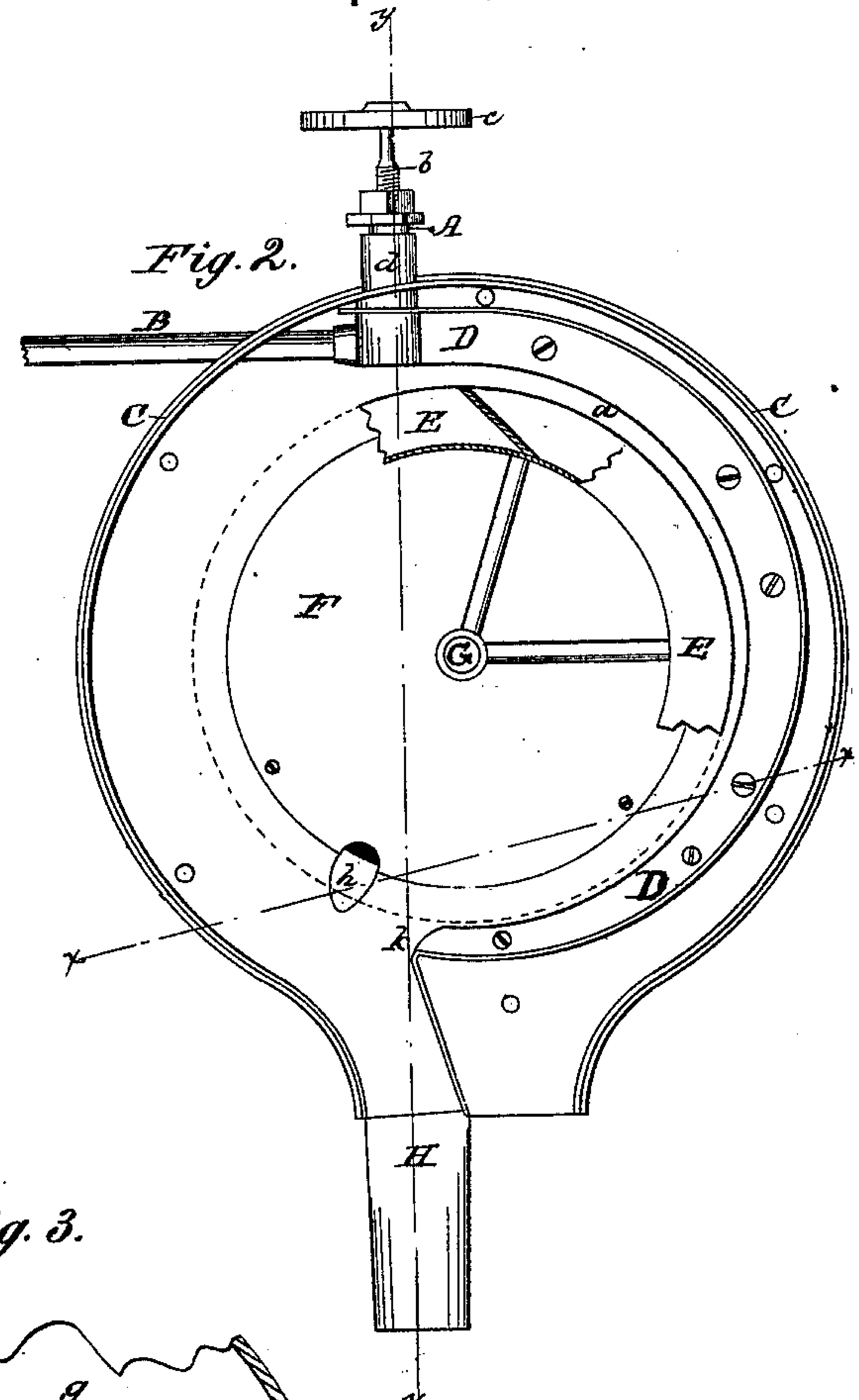
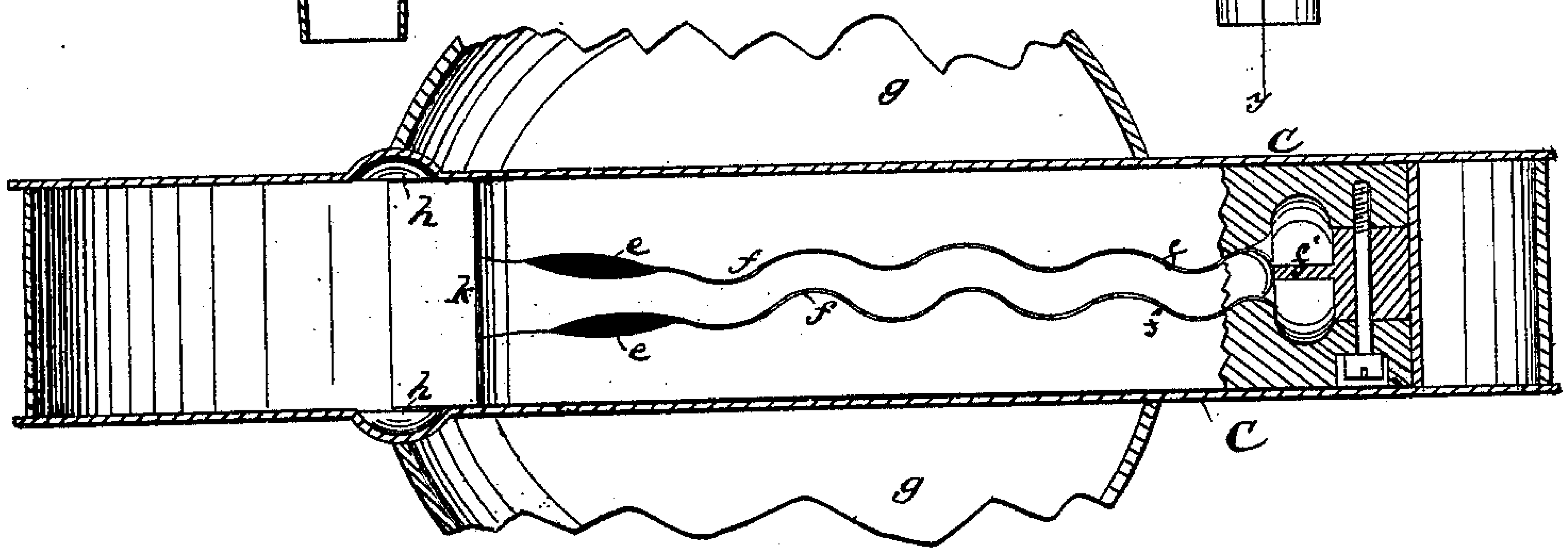


Fig. 3.



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UNITED STATES PATENT OFFICE.

JAMES TALLEY, JR., OF KANSAS CITY, MISSOURI.

IMPROVEMENT IN HYDRAULIC ENGINES.

Specification forming part of Letters Patent No. **213,952**, dated April 1, 1879; application filed September 23, 1878.

To all whom it may concern:

Be it known that I, JAMES TALLEY, Jr., of Kansas City, in the county of Jackson and State of Missouri, have invented a new and useful Improvement in Hydraulic Engines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention belongs to the class of hydraulic engines having a rotary piston or wheel, and is more particularly an improvement upon the engine for which I have obtained Letters Patent of the United States No. 196,266, dated October 16, 1877.

The chief features of improvement are the construction and arrangement of parts for regulating the volume and force of the water allowed to act on the wheel or rotary piston; also, for facilitating the discharge of water from the wheel-casing by admission of air at the point of attachment of the draft or discharge-pipe; also, for increasing the discharge of water at the lower end of the wave-line chute, thereby increasing its discharge at other points and heightening its general effect on the wheel.

In the accompanying drawings, forming part of this specification, Figure 1 is a sectional front elevation of my invention, taken in line *y y* of Fig. 2. Fig. 2 is a side elevation of the same, with the outer or face plate removed and a portion of the wheel E broken away, so as to show the form of one of the buckets. Fig. 3 is an enlarged horizontal section taken in line *x x* of Fig. 2, with a portion of each of the hemispherical sides broken away.

Reference may be had to my aforementioned patent, where required, for a full understanding of the present invention.

This engine works in a vertical position. A cylindrical valve or gage, A, is placed in the inlet-pipe B within the casing C of the engine contiguous to the entrance of the wave-line chute D, for the purpose of adjusting the proper force of water required, and to regulate the capacity of the inlet to that of the wave-line chute slot or aperture *a*, which is adjustable in width, to vary the volume of water as required. The valve is adjusted vertically by the screw-rod *b* and the hand-wheel *c* shown; and it is obvious that it will cut off more or less and correspondingly lessen the force of the volume of water discharged through the chute in a given time, according as its adjustment is lower or higher. Being placed in the relation shown to the wave-line chute D, the inlet stream of water is not divided or reduced in volume while in the supply-tube or at a point removed or comparatively distant from the chute and wheel, but is allowed to enter the casing C through a passage of undiminished size, and hence, upon a well-understood principle, it acts on the wheel E with greater force and effect than it would otherwise do.

A mechanical advantage of the location of the valve A is that its socket or casing *d* may be cast in one piece with the stationary part of the chute, and the upper portion of such socket, which projects above or through the periphery of the casing C, serves as a means for attaching both the same and the chute to the casing and holding them rigidly in the desired position.

In some instances I propose to construct the chute with two or more inlet pipes or passages in place of one. In such case the two or more pipes will converge at the point where the valve is located, and enter the chute at different points. The effect of the downward adjustment of the valve will then be to first cut off the water from the upper pipe, and next from the second pipe.

I employ in this invention two discharge-passages, *f f*, arranged parallel in the casing C of the engine. These passages serve to distribute the water over a greater width of wheel than is practicable with a single chute, such as is illustrated in my previous patent. The partition *f′* separates the two discharge-openings *f f* from each other; or, rather, the partition divides the chute or main passage, of which the openings *f f* are the outlets.

Another improvement lies in the provision of an enlargement, *e*, at the bottom of the discharge-openings *f f* of the chute D, as shown in Fig. 3.

In my former invention the wave-line aperture of the chute is gradually diminished in width from top to bottom, and hence the volume of water discharged through it upon the wheel varies proportionately at different points until at the bottom it is reduced to a small thin jet having little force.

I have found by experiment that if the aperture *f* is enlarged or widened at the bottom a better effect is produced, since a stronger current will then flow along the back side of the chute or passage, and furnish an increased and more uniform supply to the discharge-aperture *f* at points intermediate of the valve and enlarged opening *e*, and will also in some degree prevent the rebounding or revulsion of the flow of water in the chute. The hemispherical side *g* of the globe or case C, I now make hollow, as shown in Fig. 2, and apply a thin metal detachable plate or disk, F, to the face or inner side of each such hemispherical portion. These disks F are, of course, perforated to receive the shaft G of the wheel or rotary piston E, and arranged flush with the flat edge of the annular portion of the sides of the casing. At the lower edge of each disk F, adjacent to the discharge-passage, is an air-hole, *h*, and in the upper side of each hemispherical part *g* is a similar opening, *i*. Thus the air has free admission to the spaces between the disks F and spherical outer sides of the casing C, and tends to prevent the water "throwing up" at the point of junction *k* of the chute and draft-pipe H. In other words, the pressure of the air at *h* tends to prevent suction, so that the water will have less tendency to follow the wheel beyond the point *k*, and hence the discharge will be freer and more swift or forcible, thereby effecting a more rapid rotation of the wheel with a given amount of water entering the casing in a given time.

I show in Fig. 1 the gearing which I employ for transmitting power from the wheel-shaft to any machinery to be driven. It consists of the small gear I, keyed on the shaft, and the large gear K and pulley L, fixed side by side on a counter-shaft, M. This allows the requisite leverage and enables me to use a pulley having a diameter near or greater than that of wheel E.

What I claim is—

1. In a hydraulic engine, the wave-line chute at its last extremity sitting closer to wheel than at inlet-point, in order to compress force of water, as and for the purpose specified.

2. In a hydraulic engine, the combination of the cylindrical valve and its socket or casing with the wave-line chute, inlet-pipe, and case of the wheel, the valve and socket being arranged with relation to the chute and within the wheel-case, and the socket attached to the latter, all as shown and described, for the purpose specified.

3. In a hydraulic engine, the wave-line chute having the discharge-aperture *f*, enlarged at the bottom, as shown and described.

4. In a hydraulic engine, the combination, with the wheel and case, of air inlets or openings through the sides of the case for admitting air at or near the junction of the chute and discharge or draft pipe, as and for the purpose specified.

5. In a hydraulic engine, the combination, with the hollow hemispherical sides of the wheel-case, of the disks forming the inner sides of the case, as shown and described.

JAMES TALLEY, JR.

Witnesses:
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