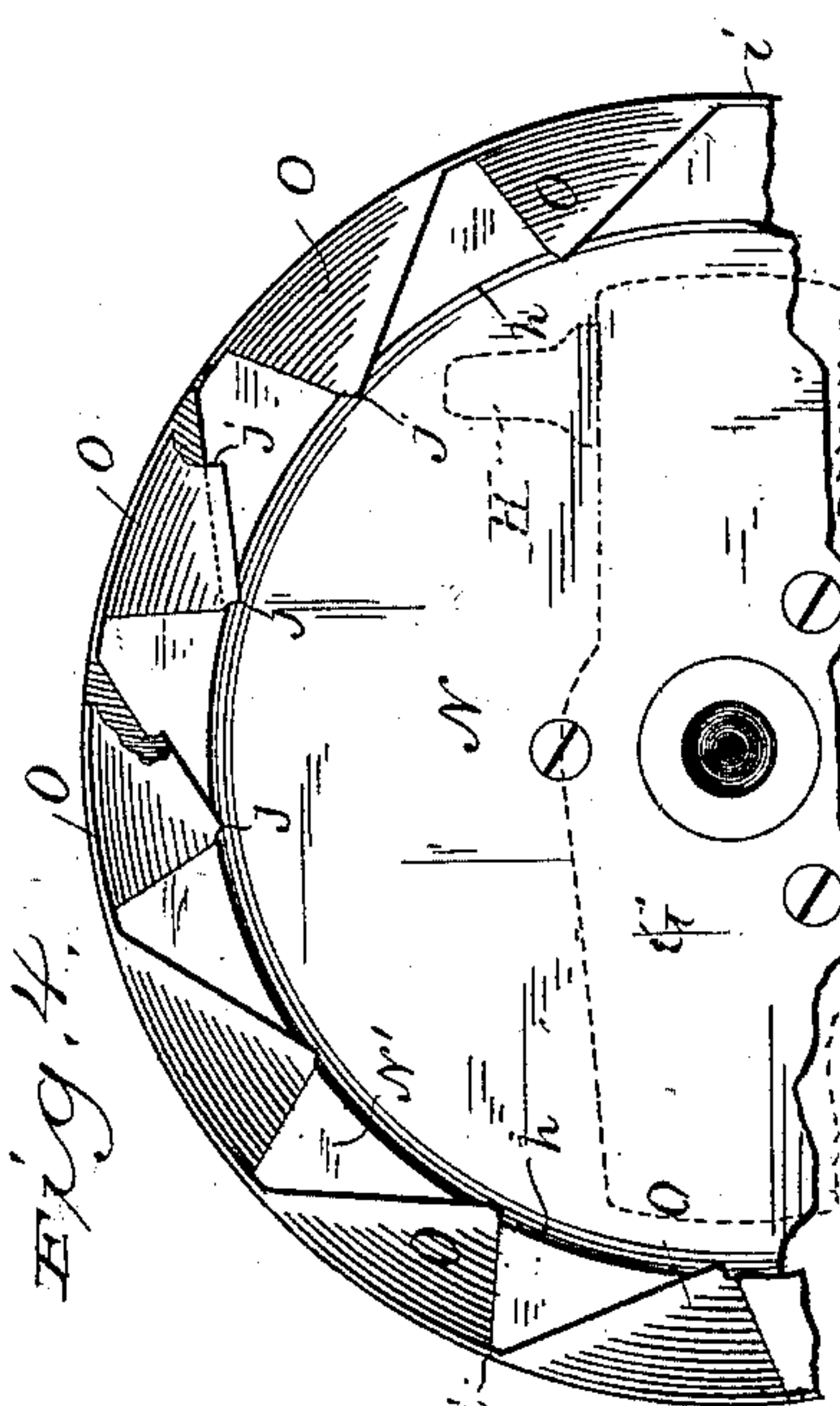
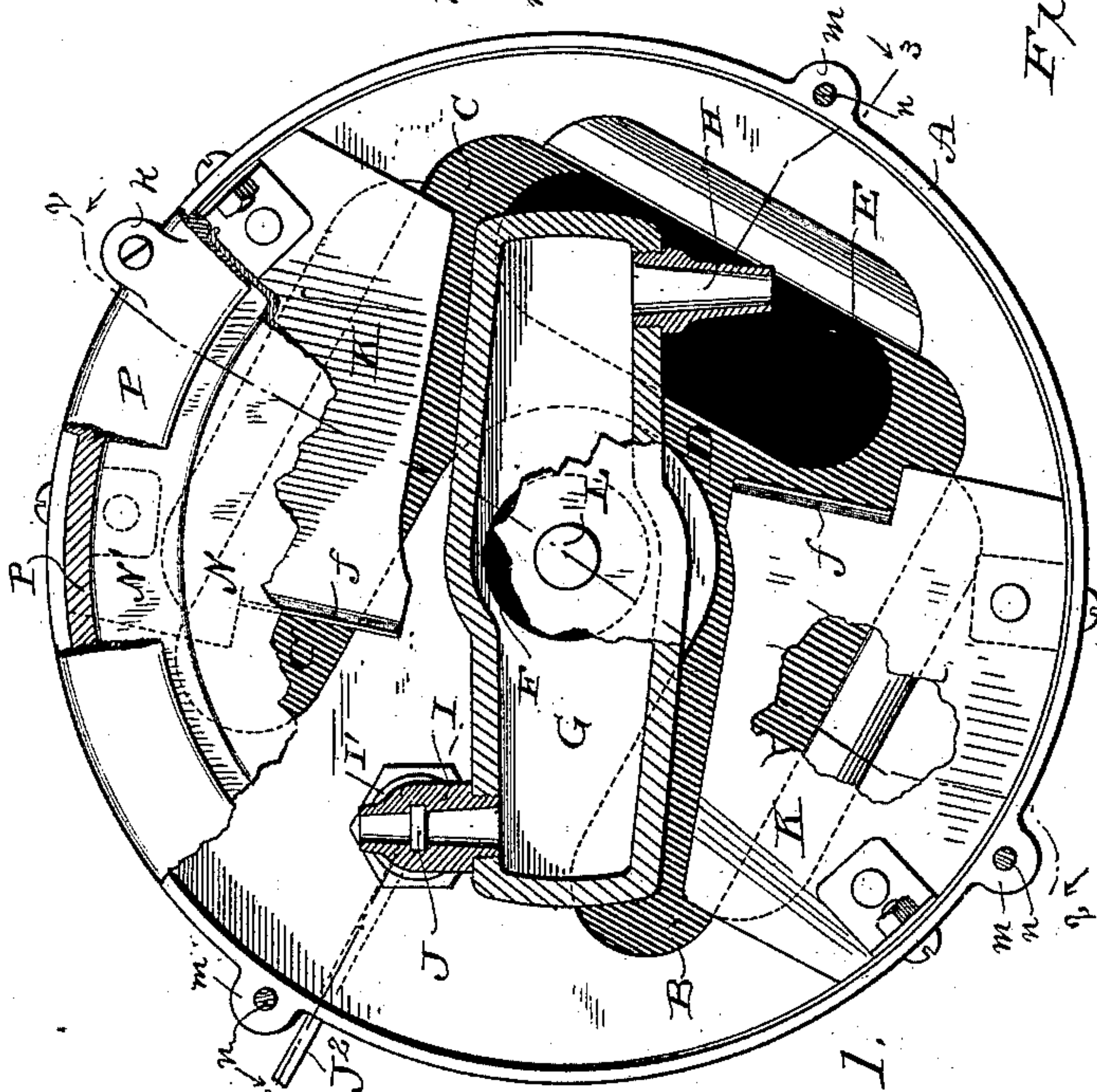
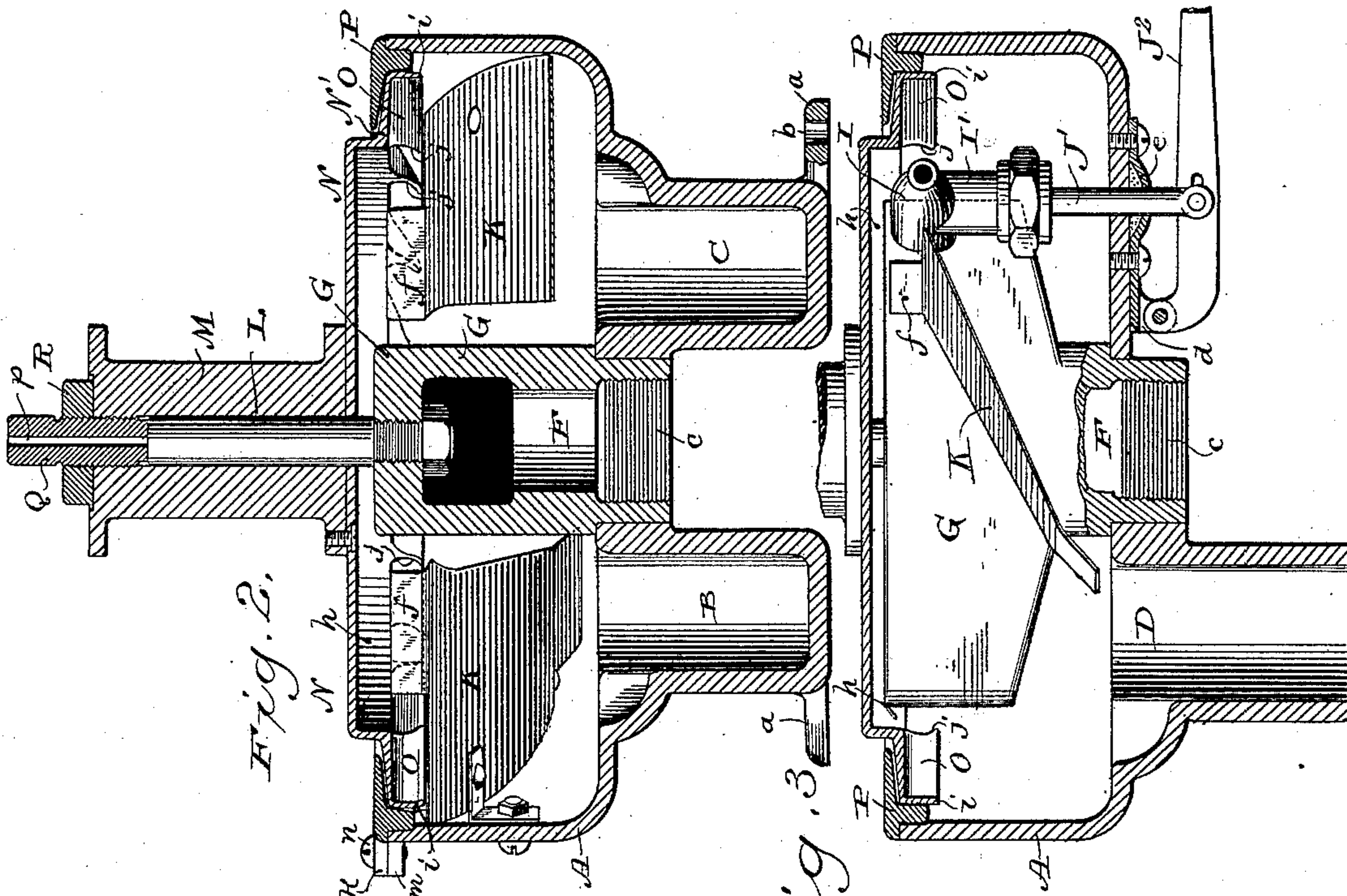


(No Model.)

R. EMERSON.
WATER MOTOR.

No. 392,017.

Patented Oct. 30, 1888.



Witnesses,
Geo. W. Young.
William Ring.

Fig. 1.

Inventor.
Richard Emerson.
By ~~John~~ H. Hurdwood,
Attorneys.

UNITED STATES PATENT OFFICE.

RICHARD EMERSON, OF RACINE, WISCONSIN, ASSIGNOR OF ONE-HALF TO THE
RACINE MALLEABLE AND WROUGHT IRON COMPANY, OF SAME PLACE.

WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 392,017, dated October 30, 1888.

Application filed July 5, 1888. Serial No. 279,012. (No model.)

To all whom it may concern:

Be it known that I, RICHARD EMERSON, of Racine, in the county of Racine, and in the State of Wisconsin, have invented certain new and useful Improvements in Water-Motors; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to water-motors; and it consists in certain peculiarities of construction and combination of parts, to be hereinafter described with reference to the accompanying drawings and subsequently claimed.

In the drawings, Figure 1 represents a plan view of my motor, partly broken away; Fig. 2, a transverse section on line 2-2, Fig. 1; Fig. 3, a similar view on line 3-3, same figure; and Fig. 4, an under side view of the drive-wheel that forms part of the motor.

Referring by letter to the drawings, A represents a circular casing provided with three depending chambers, B, C, and D. The chambers B C are parallel to each other and respectively communicate with the chamber D, the latter being at right angles to the ones first named and provided with a discharge opening, E, as illustrated in Fig. 1. The depending communicating-chambers B, C, and D together form a base for the entire device, and in order that the latter may be made fast to a floor or other suitable support I prefer to provide said base with a series of ears, *a*, that are individually provided with an opening, *b*, for the passage of a bolt or screw, the construction just described being illustrated in Fig. 2.

Between the chambers B C, and adjacent to the chamber D, the casing A is provided with a central opening, in which is rigidly secured the central depending portion, F, of a T-shaped water-chest, G, that extends equally in opposite directions from the center of its depending portion, the latter being provided with screw-threads *c*, for engagement with a service-pipe.

It is necessary that the water-chest G be provided with at least one outlet-opening, and I therefore fit a nozzle, H, in one side of said chest at or near an end thereof. The one nozzle under some circumstances will be sufficient; but I prefer to provide the water-chest G with another nozzle, I, the latter being lo-

cated at the opposite end and on the opposite side of said chest from the nozzle H, as is best illustrated in Fig. 1. I also prefer to provide the nozzle I with a depending portion, I', that serves as a guide for a cut-off, J, the stem J' of the latter being extended down through the bottom of the casing A to connect with a slotted lever, J², that is pivotally secured to ears *d* on the stuffing-box *e* for said stem, and while I have shown the cut-off J in connection with one of the nozzles it is obvious that I may apply the same construction to both nozzles.

Secured to the inside of the casing A, on opposite sides of the water-chest G, are inclined plates K, that extend inward over the chambers B C, and each of these plates has the inner portion of its width at the upper end turned up to form a lip, *f*, as best illustrated in Fig. 3.

Screw-threaded or otherwise rigidly secured to the water-chest G, so as to extend up from the center thereof, is a post, L, that serves as a journal for the hub M of a disk, N, this disk being offset at a certain distance from its center to form a vertical inner recess, *h*, and a horizontal outward extension, N', the latter having its edge provided with a vertically-depending flange, *i*. Upon the under side of the extension N' of the disk N are a series of tangential buckets or floats, O, arranged at regular intervals, said buckets or floats being preferably so constructed that each one thereof presents a curved vertical portion, *j*, and an inwardly-beveled face, as best illustrated by Fig. 4. The disk N is designed to have vertical play on the post L; but this play in an upward direction is limited by means of a flanged ring, P, that fits in close against the rim of the casing A, to form therewith a water-tight joint, this ring being of a width sufficient to nearly or quite overlap the offset extension N' of said disk. The ring P is provided with a series of outwardly-projecting ears, *k*, that register with similar ears, *m*, on the casing A, and bolts or screws *n*, passed through these registering ears, serve to hold said ring down in the position above described. The lips *f* of the plates K extend up toward the recessed portion *h* of the disk N, and that portion of each plate that is next adjacent to said lips,

but not turned up, comes close under the buckets O on the offset extension N' of said disk, this construction and arrangement of parts serving the purpose to be hereinafter more fully described.

Screw-threaded in the hub M of the disk N is a step, Q, that normally rests upon the posts L to support said disk. The step Q is preferably bored out lengthwise to form a port, p, for the introduction of lubricant between the post L and disk-hub M, and, as shown in Fig. 2, I may employ a jam nut, R, for the purpose of holding said step in the position to which it may be adjusted. By adjusting the step Q the disk N is raised or lowered to bring the buckets O to or from the inclined plates, accordingly as may be found necessary or desirable, for the purpose of getting the center line of said buckets in register with the nozzles H I of the water-chest. The disk-hub M is flanged at its ends, and is finished up to serve as a pulley for a belt, (not shown,) whereby power from the motor may be transmitted to the point of utilization; but it is obvious that the hub of the disk need not be necessarily in the form of a pulley, this construction having been shown merely as a matter of convenience, it being readily understood that said disk-hub may be of any desirable length and have a pulley secured thereto at a point more or less remote from the disk proper.

In the operation of my invention water under pressure is let into the chest G, and finds its outlet through the nozzle H against the buckets or floats O on the extension N' of the disk N, thus causing the latter to revolve on the post L. The inclined plate K nearest the nozzle H strips the water from the disk and buckets at the point where the force has been expended to rotate said disk. The waste-water is deflected by said plate into the chamber B of the casing A, and from this chamber flows into the chamber D to pass out through the discharge-opening E of the latter chamber. By stripping the water from the buckets and disk the moment the force has been expended none of this water will be carried on by centrifugal force or pressure, and hence the movement of the disk is not in any wise retarded and all the force of the water is utilized to cause a continued rotation of the disk. The water stripped from the disk has its circular motion arrested by the chambers B C D, that depend from the casing A, and is thus caused to readily flow off through the discharge-opening E in the latter chamber. In case there is a great pressure from the source of supply I actuate the lever J² to draw down the cut-off J, and thus open the nozzle I to distribute this pressure equally on the buckets of the disk. The inclined plate K nearest the nozzle I serves the same purpose of the plate previously described, the only difference being that the water is stripped down into the chamber C of the casing. The pressure of the water against the disk in an upward direction tends to raise said disk, and thereby proportionately

lessen the friction of the step Q on the post L. Consequently there is comparatively little wear between the two parts last named, or resistance to the force. Some water will find its way up around the post L and serve as a lubricant for the disk-hub; but I prefer to introduce a lubricating compound through the port p in the step Q, that bears on said post.

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

1. A water-motor that comprises a casing having three depending and communicating chambers, one of which is transverse to the remaining two and provided with a discharge-opening, a water-chest arranged in the casing and provided with inlet and outlet openings, and a disk, also arranged within said casing and provided with a series of buckets that come in successive opposition to the outlet of the water-chest, substantially as set forth.

2. A water-motor that comprises a casing having three depending and communicating chambers, one of which is transverse to the remaining two, and is also provided with a discharge-opening, inclined plates arranged within the casing to extend inward over two of said chambers, a water-chest arranged in said casing and provided with inlet and outlet openings, a post projecting from the water-chest, and a disk that is loose on the post and provided with a series of buckets that come in successive opposition to the outlet-opening of said water-chest and pass in proximity to the upper edges of said inclined plates, substantially as set forth.

3. A water-motor that comprises a casing having three depending and communicating chambers, one of which is transverse to the remaining two and provided with a discharge-opening, a water-chest arranged in the casing and provided with inlet and outlet openings, a cut-off for the outlet-opening of the water-chest, a post projecting from said water-chest, and a disk loose on the post and provided with a series of buckets that come in successive opposition to said outlet-opening of the water-chest, substantially as set forth.

4. A water-motor that comprises a casing having three depending and communicating chambers, one of which is transverse to the remaining two and provided with a discharge-opening, a water-chest arranged within the casing and provided with an inlet-opening and two outlet-openings, these outlet-openings being at opposite ends and on opposite sides of said water-chest, a cut-off for one of said outlet-openings, a post projecting from the water-chest, and a disk loose on the post and provided with a series of buckets that come in successive opposition to said outlet-openings of the water-chest, substantially as set forth.

5. A water-motor that comprises a casing having three depending and communicating chambers, one of which is transverse to the remaining two and provided with a discharge-opening, a water-chest arranged within the

casing and provided with inlet and outlet openings, a post projecting from the water-chest, a disk loose on the post and provided with a series of buckets arranged to come in
 5 successive opposition to the outlet-opening of said water-chest, inclined plates arranged in said casing to extend over two of the depending chambers and have their upper edges come adjacent to the disk-buckets, and a step ad-
 10 justably arranged in the hub of said disk to have a bearing on the post and provided with an axial port, substantially as set forth.

6. A water-motor comprising a casing having a discharge-opening, a water-chest arranged within the casing and provided with
 15 inlet and outlet openings, a post projecting from the water-chest, a disk loose on the post and provided with an offset extension having a series of buckets arranged thereon to
 20 come in successive opposition to the outlet-opening of said water-chest, and an inclined inwardly-extended plate arranged upon the inside of said casing to have the outer portion of its upper edge adjacent to the disk-buckets
 25 at a point beyond said outlet-opening of the

water-chest, and the inner portion of said edge turned up to form a lip, substantially as set forth.

7. A water-motor comprising the casing A, provided with the depending and communi- 30
 cating chambers B C D, the water-chest G, having the inlet-opening *c* and nozzles H I, the cut-off J, for the nozzle I, the inclined plates K, provided with the lips *f*, the post L, projecting from the water-chest, the disk N, 35
 having the offset extension N', provided with the buckets O, the disk-hub M, the step Q, arranged in said disk-hub to bear upon said post, and the flanged ring P, secured to the rim of the casing to overlap said extension of 40
 the disk, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Racine, in the county of Racine and State of Wisconsin, in the presence of two witnesses.

RICHARD EMERSON.

Witnesses:

A. CARY JUDD,
 N. M. LE PREVOST.