No. 784,591. PATENTED MAR. 14, 1905.

N. A. PALMER.

FLUID MOTOR.

APPLICATION FILED JUNE 16, 1904.

2 SHEETS—SHEET 1.

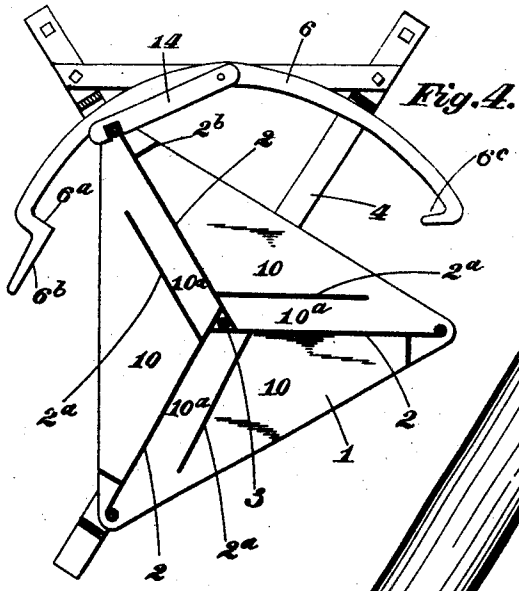

Fig. 4.

Fig. 1.

Witnesses

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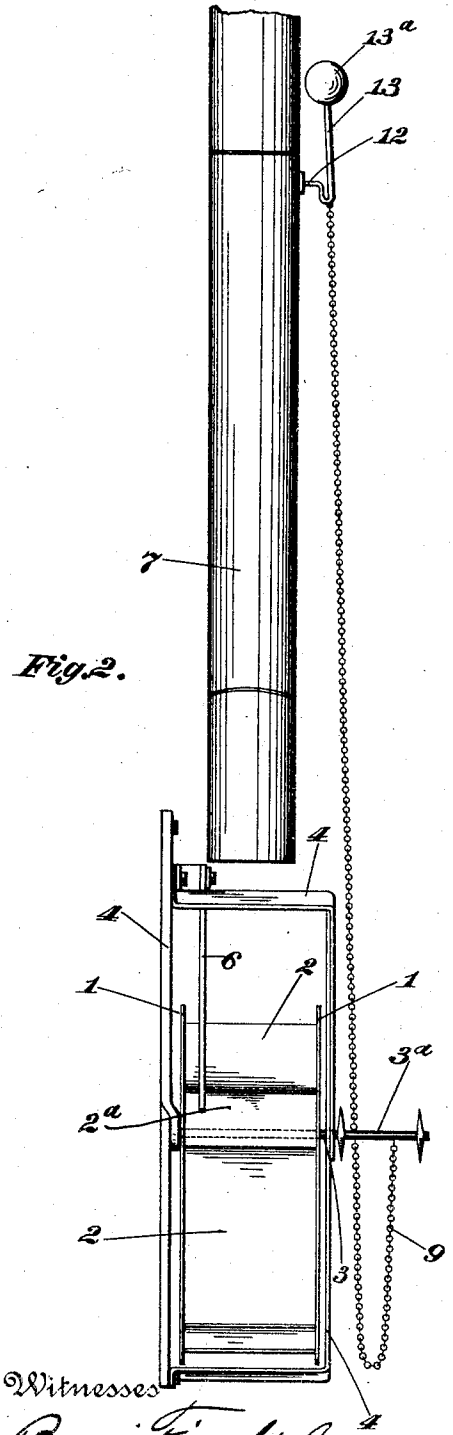

Fig. 2.

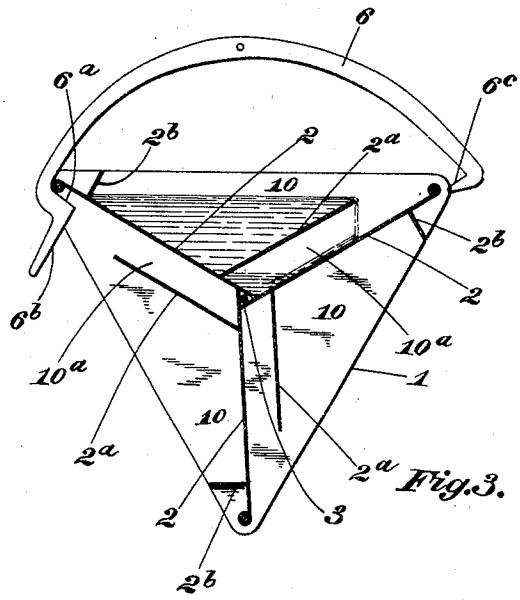

Fig. 3.

Witnesses

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No. 784,591. Patented March 14, 1905.

UNITED STATES PATENT OFFICE.

NORMAN A. PALMER, OF PLAIN CITY, OHIO.

FLUID-MOTOR.

SPECIFICATION forming part of Letters Patent No. 784,591, dated March 14, 1905.

Application filed June 16, 1904. Serial No. 212,915.

To all whom it may concern:

Be it known that I, NORMAN A. PALMER, a citizen of the United States, residing at Plain City, in the county of Madison and State of Ohio, have invented certain new and useful Improvements in Fluid-Motors; and I do hereby 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.

The object of this invention is to provide an improved motor adapted to be operated intermittently by the flow of a fluid—for example, water—the motor being particularly useful for actuating a valve diverting or cutting off the flow of the operating fluid after a predetermined number of operations.

The invention consists not only in the improved construction of the motor, but also in the combination of a motor and improved means operated by such motor for actuating a valve hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a front elevation of the motor and a rain-water cut-off apparatus containing a valve or cut-off. Fig. 2 is a side or edge elevation of the same. Fig. 3 is a sectional view on the plane x x, Fig. 2, showing the motor-bucket and also the latching-lever. Fig. 4 is a similar sectional view showing the bucket locked.

Like characters of reference where they occur in the several views designate corresponding parts.

3 designates a shaft that is secured in the axis of the wheel and journaled near the sides of the wheel in a suitable supporting-frame 4. Extending from each of the partitions 2 at the side of small capacity of the chamber and from a line parallel to the axis of the wheel and toward the side of larger capacity to a point within the rim is a partition 2^a, dividing the main chamber into a main bucket or pocket 10 and a supplemental or overflow bucket or pocket 10^a, and from each of the partitions 2 near its outer edge at the side of smaller capacity to the rim of the motor-wheel extends a partition 2^b to limit the accumulation of the operating fluid at the side opposite the overflow-bucket, and so further diminish the capacity of that side. This partition can in some cases be omitted.

Pivoted on the supporting-frame 4 above the bucket is a yoke-like latch-lever 6 or detent device having at its left-hand end a latching-shoulder 6^a and below such shoulder a cam edge 6^b and at its right-hand end an arresting-shoulder 6^c. The lever 6 is heavier at its left-hand end or so as to be held down at that end.

7 designates a conductor for the motor-operating fluid. This is shown to be the waste branch of a rain-water down-spout 8 and to have its discharging end arranged above the motor, so as to discharge into the main pocket or receptacle 10 thereof.

Where it is desired to operate a valve or cut-off in a rain-water pipe, the shaft 3 of the motor can be provided with a spool 3^a fixed thereto, to which is attached a chain 9. 7^a designates the branch of the down-spout that discharges into the cistern. At the junction of the pipes 7 and 7^a with the main spout 8 an ordinary pivoted cut-off valve (not shown) is provided; but on the spindle 12 of this valve I fix a bent lever 13, having on its upper arm a weight 13^a, to which the other end of the chain 9 is shown to be attached, the chain passing around the extremity of the lower arm of the lever 13 to give direction and purchase to the pull on the chain for shifting the cut-off. The weight 13^a will of course hold the valve in one position or the other until positively shifted. The chain 9 of course will be of sufficient length to require such operation of the motor as will permit the unclean water to run off the roof before the cut-off is shifted to divert the water into the cistern. 4 designates a lock to engage the wheel, as seen in Fig. 4, when it is not to be operated.

The operation of the motor is as follows: The water flowing through the branch 7 first fills the main receptacle or pocket 10 and then overflows into and fills the supplemental pocket 10^a. After the water has risen sufficiently in the supplemental pocket 10^a the preponderance of weight is on the right-hand side of the supporting-shaft 3, thus imparting a rotary movement to the wheel; but the wheel is only turned through about one hun-

dred and twenty degrees, because the stop 6^c is by the action of the outer edge of the partition 2 next below on the cam 6^b thrown down into the path of movement of the edge of the partition previously resting on the shoulder 6^a, thus arresting the movement. The blow of this last-named partition against the stop 6^c imparts a slight rebounding movement to the wheel; but because the lever 6 is heavier at its left-hand end it drops at that side in time to catch and support the wheel in substantially the position seen in Figs. 1 and 3, when upon the continued flow of the water the operation is repeated. This intermitting rotary motion of the wheel when used in connection with a rain-water cut-off, as shown, will of course wind up the chain on the spool 3^a, and thus after the slack is wound up operate the cut-off. If the slack of the chain be preliminarily properly wound onto the spool, the rotary motion will first unwind the slack and then wind it up. By this process the time between the beginning and the ending of the operation of the wheel, and consequently the extent of the preliminary washing of the roof, can be varied, or by this process a chain having a given slack will allow a preliminary washing of the same duration, assuming that the flow is uniform, as a chain of twice the slack will allow where it is simply wound up by the operation of the motor.

It will be observed that it is the quantity of water acting on the motor rather than time of flow that chiefly determines when the cut-off shall be operated.

Modifications of the construction herein particularly shown and described can of course be made without departing from the gist of the invention and the scope of my claims.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with a fluid-conductor, a motor-wheel to be operated by the flow of the fluid therefrom, comprising three or more adjoined chambers rotarily mounted so as to be brought successively into the path of said flow, each chamber having a main bucket and a bucket to receive overflow from the main bucket, the overflow-bucket upon receiving a predetermined quantity of fluid adapted to alter the center of gravity of the wheel and its contained fluid and bring the main bucket of another chamber into position to receive the operating fluid.

2. In a fluid-motor, a rotary motor-wheel comprising an axial shaft and sides, partitions dividing the space between the sides into three or more chambers, and a partition dividing each of said chambers into a main bucket and a bucket to receive overflow from the main bucket, substantially as described.

3. In a fluid-motor, a rotary wheel comprising an axial shaft and sides, partitions dividing the space between the sides into chambers, and a partition dividing each of said chambers into a main bucket and a bucket to receive overflow from the main bucket, combined with means for supporting the motor-wheel stationarily while a main bucket is being filled and arresting the movement of the wheel when another main bucket is brought into position to be filled.

4. In a fluid-motor, a motor-wheel comprising an axial shaft and sides, partitions dividing the space between the sides into chambers, said partitions being symmetrically arranged with respect to said shaft and a partition dividing each of said chambers into a main and an overflow bucket, combined with a rocking lever having a shoulder or hook at one end adapted to support the wheel while the buckets are being filled and a shoulder or hook at its other end adapted to catch and limit the movement of the wheel when rotated by the fluid.

5. In a fluid-motor, a rotary wheel comprising an axial shaft and sides, partitions dividing the space between the sides into chambers, a partition dividing each of said chambers into a main bucket and a bucket to receive overflow from the main bucket and a partition in each chamber for limiting the accumulation of the fluid in the chamber at the end opposite the overflow-bucket.

6. In combination with a fluid-motor, a winding-shaft operated by said motor, a conductor for the motor-operating fluid, a valve or cut-off axially supported in said conductor, a weighted arm projecting upward from the axis of the valve and adapted to be shifted from one side to the other of the vertical plane of the axis of said valve to hold the valve in position by gravity, an arm extending laterally from the axis of said valve and a chain or cord connected with the weighted arm and passing over the laterally-extending arm and with the winding-shaft of the motor.

7. In a fluid-motor, a rotarily-mounted motor-wheel comprising three or more adjoined chambers adapted to be brought intermittingly and successively under the flow of the operating fluid, each chamber having a main bucket and a bucket to receive overflow from the main bucket to alter the center of gravity of the wheel and its contained fluid, combined with a rocking lever having a shoulder or hook at one end adapted to support the wheel while the buckets are receiving the operating fluid and a shoulder or hook at its other end adapted to catch and limit the movement of the wheel when rotated by the fluid, the bucket-supporting end of said lever being normally depressed.

8. In a fluid-motor, a rotarily-mounted motor-wheel comprising three or more adjoined chambers adapted to be brought intermittingly and successively under the flow of the operating fluid, each chamber having a main

bucket and a bucket to receive overflow from the main bucket to alter the center of gravity of the wheel and its contained fluid, combined with a rocking lever having at one end a cam edge 6^b adapted to be struck by a partition to throw the opposite end of said rocking lever into the path of the preceding partition and a shoulder or hook 6^a adapted to support the wheel while the buckets are receiving the operating fluid and at its other end a shoulder or hook 6^c adapted to arrest the wheel when rotated by the fluid, the bucket-supporting end of said lever being normally depressed.

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

NORMAN A. PALMER.

Witnesses:
OLIN J. ROSS,
GEORGE M. FINCKEL.