

(No Model.)

J. SANDS.
MOTOR.

No. 469,306.

Patented Feb. 23, 1892.

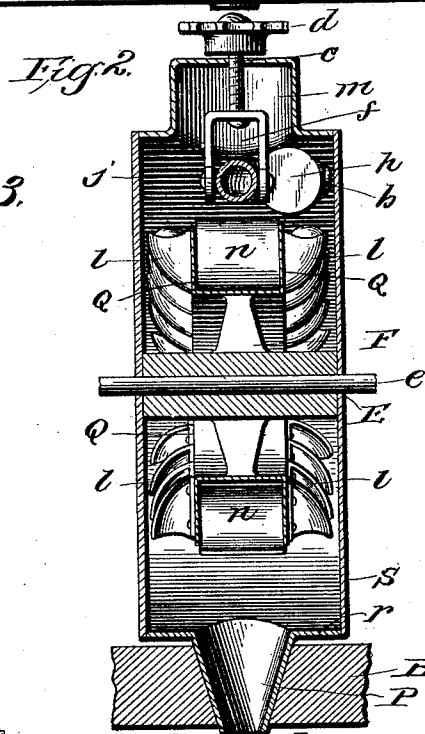
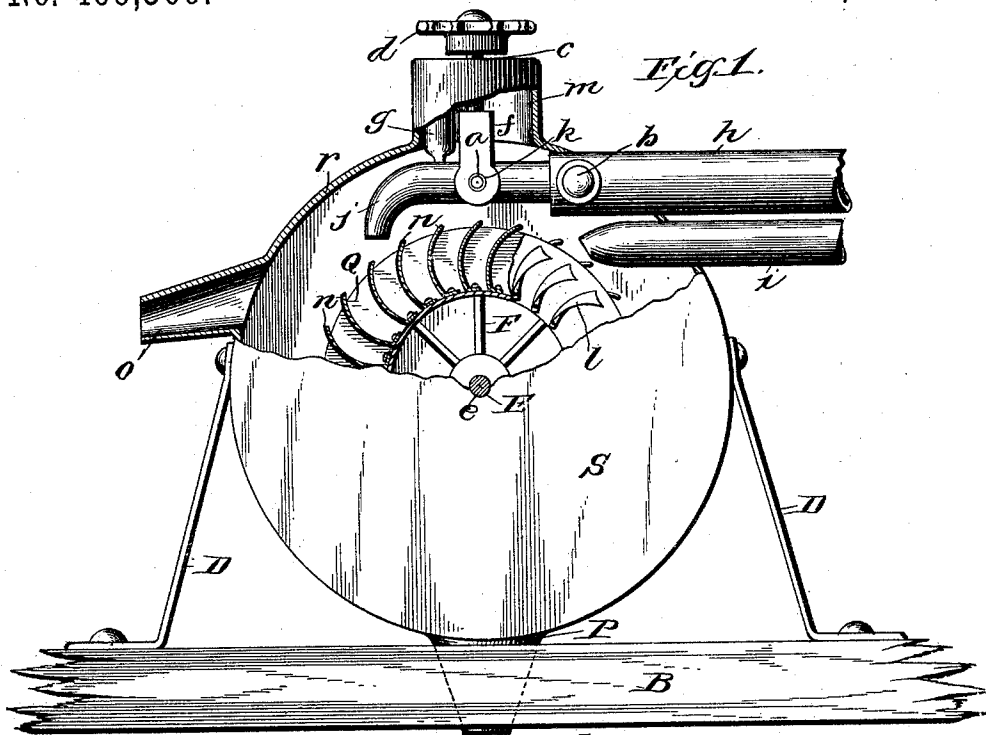
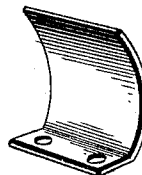


Fig. 3.



Fig. 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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MOTOR.

SPECIFICATION forming part of Letters Patent No. 469,306, dated February 23, 1892.

Application filed October 7, 1891. Serial No. 408,035. (No model.)

To all whom it may concern:

Be it known that I, JOHN SANDS, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a new and useful Motor, of which the following is a specification.

This invention relates to motors, and to that particular class known as "hydraulic motors," and are operated upon the principle of the overshot wheel.

The objects of my invention are to provide a motor of cheap and simple construction, said motor to be operated by water, steam, hot or cold air, the same being employed either singly or conjointly, as desired, and, furthermore, to provide means for adjusting the hydraulic discharge so as to properly act upon the motor-wheel.

Other objects and advantages of the invention will appear in the following description, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is an elevation, partially in section, of a motor constructed in accordance with my invention. Fig. 2 is a transverse vertical section of the same. Fig. 3 is a detail in perspective of one of the pneumatic buckets. Fig. 4 is a similar view of one of the hydraulic buckets.

Like letters of reference indicate like parts in all the figures of the drawings.

Upon a suitable base B is mounted a circular casing S, resembling somewhat the shape of an ordinary blower-case, said casing being supported by inclined standards D, bolted to the casing and base and provided at its lower side with a water-discharge *p* and near its upper side with a horizontal steam and air discharge O, said discharges being formed in the rim *r* of the casing. In the heads of the casing concentric bearing-openings E are formed, and in the same is journaled the transverse power-shaft *e*, which latter may be provided with one or a series of pulleys, cogs, or other power-transmitting devices, as will be evident. Within the casing a wheel F is mounted upon the shaft *e* and adapted to rotate therewith. The periphery of the wheel is provided with a pair of annular radial flanges Q, and to the outer sides of the same V-shaped pneumatic

buckets *l* are secured at intervals, said buckets being both transversely and longitudinally curved, as shown, so that their outer flared ends are tangentially disposed with relation to the wheel. Secured to the rim of the wheel, between the flanges Q, are longitudinally-curved buckets *n*.

h designates a water-supply pipe which extends into the casing near the upper side of the same and has pivotally connected with its inner end, as at *b*, a discharge-nozzle *j*. This nozzle terminates beyond the rim of the wheel and over the path traversed by the buckets after the same have passed beyond the vertical center of the wheel and is provided at opposite sides with outwardly-disposed trunnions *a*.

g represents an air-chamber mounted upon the hydraulic discharge-pipe *j*, said air-chamber extending upwardly into a dome *m*, with which the casing is provided. The dome *m* has at its center a threaded perforation, in which a screw *c* is mounted. This screw is provided above the dome with a milled head *d*, while its lower end within the dome loosely connects with the upper end of an inverted-U-shaped stirrup *f*, the ends of which have perforations *k* for pivotally engaging with the trunnions *a* of the hydraulic discharge *j*.

Below the hydraulic pipe *h* and about on a level with the buckets *l* and at each side of said pipe and in line with the buckets there is inserted into the casing a hot or cold air or steam pipe *i*, the inner end of which is contracted and adapted to force hot or cold air or steam against the buckets *l*.

In operation the pipe *h* is connected with any suitable source of water-supply, while the pipes *i* are connected to any suitable source of steam, hot or cold water supply, the water, air, or steam being forced under pressure against their respective series of buckets, and the latter, being acted upon on the same principle as an overshot water-wheel, may be driven with great rapidity and power. Through the medium of the milled head *d*, the screw *c*, and hanger *f* the discharge-nozzle *j* of the pipe *h* may be raised and lowered, so as to adjust the same to the discharge of the water at the most advantageous portion of

the buckets. This vertical discharge is advantageous for the reason that not only is the force but the weight of the water is utilized, which would not be the case in a horizontal discharge.

It will be obvious that the motor may be run by water alone or by steam or air alone, the latter being hot or cold, or all may be combined for this purpose.

Having described my invention, what I claim is—

1. In a motor of the class described, the combination, with the casing having a water-discharge and bearings and provided upon its upper side with a dome, of an axle journaled in the casing, a hydraulic wheel mounted on the axle, a water-discharge pipe extending into the casing, a discharge-nozzle contracted and pivotally connected to the pipe and provided with opposite trunnions and an air-chamber, an inverted-U-shaped hanger perforated at its ends for engaging the trunnions, and a threaded screw connected with the hanger, passed between the perforations in the dome, and terminating above the same in a head, substantially as specified.

2. In a motor of the class described, the combination, with the motor-casing having

bearings and a water-discharge, of the hydraulic wheel, an axle for the same, a water-supply pipe terminating in the casing, a contracted L-shaped nozzle pivoted to the pipe, and means for adjusting the same, substantially as specified.

3. In a motor of the class described, the combination, with the casing having the air and water discharges, the axle journaled in the casing, the wheel mounted on the axle and having two parallel peripheral flanges, pneumatic buckets connected to the outer sides of the flanges, and hydraulic buckets located between the same, of a water-supply pipe passing into the casing over the central series of buckets, and opposite pneumatic pipes reduced at their inner ends and terminating in line with said pneumatic buckets and horizontally opposite the same, substantially as specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN SANDS.

Witnesses:

B. T. TOTTEN,

JOHN WALLACE.