

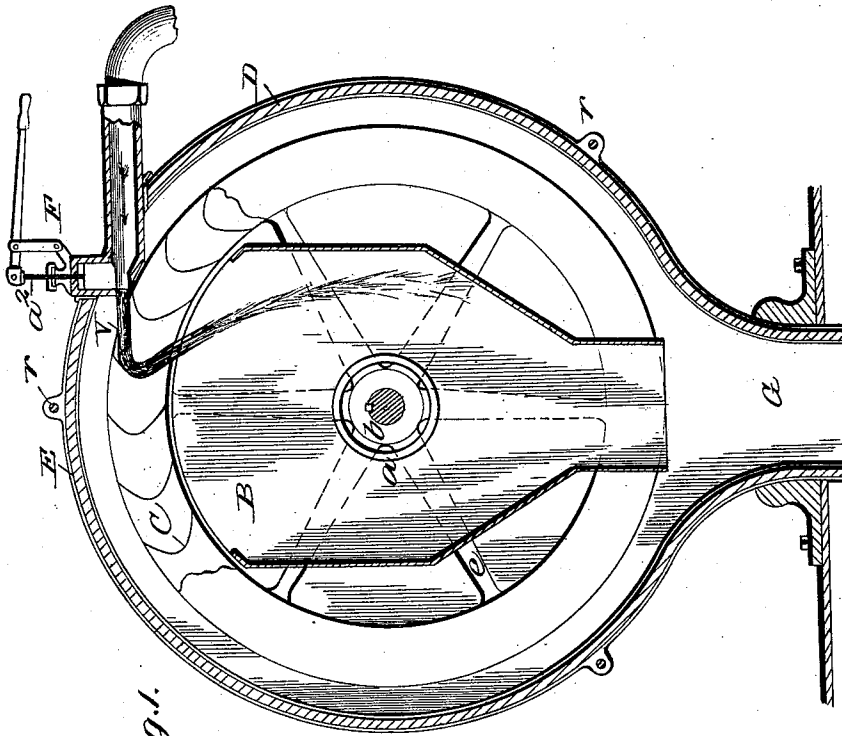
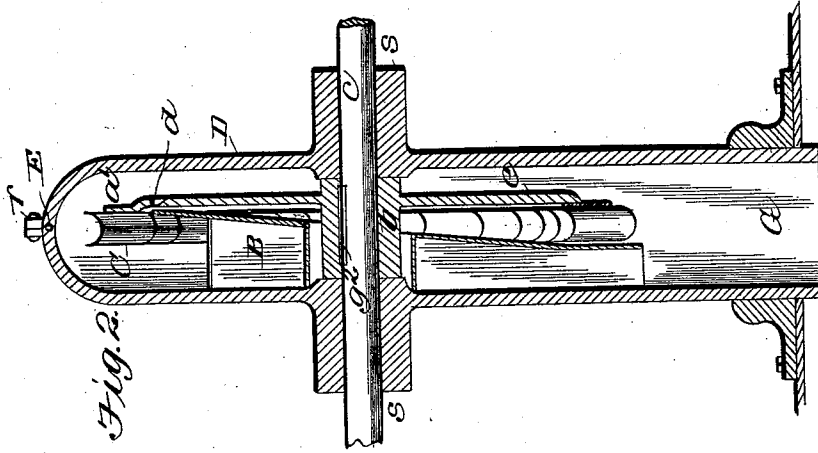
(No Model.)

2 Sheets—Sheet 1.

J. E. LEWIS.  
WATER MOTOR.

No. 523,045.

Patented July 17, 1894.



Witnesses  
 John Smith  
 Simon Messer.

Inventor  
 John E. Lewis  
 By Fred. W. Bond.  
 Attorney

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

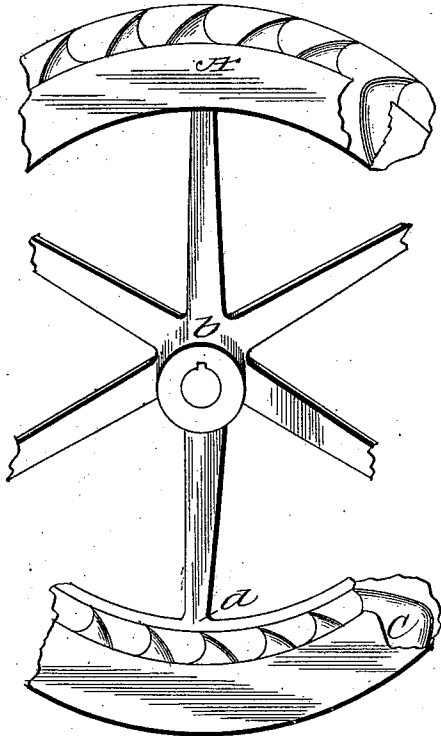


Fig. 4.

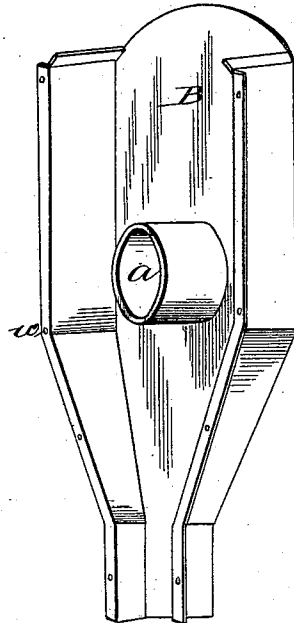


Fig. 5.

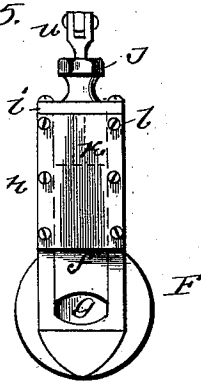


Fig. 6.

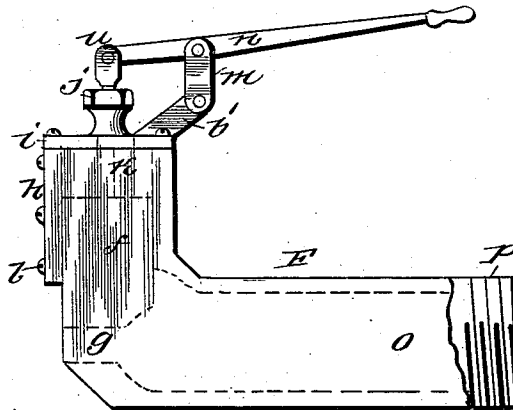
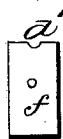


Fig. 7.



Witnesses

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# UNITED STATES PATENT OFFICE.

JOHN E. LEWIS, OF ALLIANCE, OHIO, ASSIGNOR OF ONE-HALF TO LUTHER W. BALLARD, OF SAME PLACE.

## WATER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 523,045, dated July 17, 1894.

Application filed February 28, 1894. Serial No. 501,820. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN E. LEWIS, a citizen of the United States, residing at Alliance, in the county of Stark and State of Ohio, 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 of the same, reference being had to the annexed drawings, making a part of this specification, and to the letters of reference marked thereon, in which—

Figure 1, is a side view of the water wheel, showing a portion of one of the flanges broken away to better illustrate the position and arrangement of the buckets, also showing a vertical section of the casing, and a sectional view of the feed pipe, and its nozzle together with devices for regulating the flow of water. Fig. 2, shows the casing in transverse section, with the wheel and its sustaining shaft supported therein, also showing the position of the water conveyer. Fig. 3, is a detached view of the water wheel proper, showing parts of said wheel broken away. Fig. 4, is a detached view of the water conveyer. Fig. 5, is an end view of the feed pipe, also showing an edge view of the plunger chamber. Fig. 6, is a side view of the feed pipe and nozzle together with the regulating lever, and plunger chamber. Fig. 7, is a top view of the plunger.

The present invention has relation to water motors, and it consists in the different parts and combination of parts hereinafter described, and particularly pointed out in the claims.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

In the accompanying drawings A, represents the water wheel proper, which may be of any desired size, reference being had to the size of the motor designed and calculated to be constructed.

Upon the periphery of the wheel A, are located the buckets C, which buckets are concaved in cross section upon their front faces, and in vertical section are curved, or in other words, they are provided with oppositely curved faces, and are so formed for the purpose hereinafter described.

The water wheel A, is provided with the

annular band  $a'$ , which annular band is extended over to one side of the spokes  $e$ , thereby providing a means for bringing the top or upper end of the water conveyer B entirely to one side of the buckets C, substantially as illustrated in Fig. 2. For the purpose of conveying the dead water to one side of the buckets C, the conveyer B, is inclined so that the back side thereof will clear the buckets. For the purpose of preventing the water from coming in contact with the hub  $b$ , the water conveyer B, is provided with the flange  $a$ , which flange surrounds the hub, as illustrated in Fig. 1.

The casing D is formed in sections or halves, which sections or halves are securely held together by means of the flanges  $r$ , and suitable clamping bolts passed through said flanges.

For the purpose of forming a water tight joint between the sections of the casing D, the meeting faces of the casing sections, are provided with grooves, as illustrated in Fig. 2, which grooves are for the purpose of receiving a freshly painted cord, or other flexible material.

It will be understood, that by providing the grooves and the flexible material E, and saturating the same with paint or like material, that when the same becomes dry a perfect water tight joint will be formed.

The inner end of the nozzle F, is provided with the chamber K, within which chamber, is located the plunger or gate  $f$ , to which plunger or gate is attached the rod  $a^2$ , which rod extends upward through the packing  $j$ , and to the top or upper end of said rod is pivotally attached the regulating lever  $n$ . To the packing chamber or the plate  $i$ , is attached the arm  $b'$ , which arm may be formed integral with the plate  $i$ , and is located substantially as shown in Figs. 1 and 6. To the upper end of the arm  $b'$  is pivotally attached the link  $m$ , which link is pivotally connected to the regulating lever  $n$ . The object and purpose of providing the link  $m$ , is to allow said link to oscillate as the plunger or gate  $f$ , is moved up and down, thereby imparting true reciprocating movements to the plunger or gate  $f$ .

For the purpose of forming the delivery end  $g$  of the nozzle proper without sharp angles,

the under side of said nozzle is concave, and the bottom or lower end of the plunger or gate *f*, is also concave, which construction forms an oval opening for the discharge of the water, by which arrangement, the stream of water is better shaped or formed to strike the bucket C.

It will be understood that the nozzle F, and its opening *g*, should be so adjusted that the stream of water V will strike the vertical center of the bucket, after which, it is shunted downward to the bottom of the bucket. In order to shunt the stream downward, the nozzle F, should be so adjusted, that the stream V, will be inclined slightly downward toward the axle of the wheel proper. It will be understood that by this arrangement, I am enabled to use the entire force of the water as a propelling agency, or power, and at the same time, the weight of the water is used to assist in propelling the wheel during the time the water is passing downward along the vertical centers of the buckets C, to the bottom of said buckets. It will also be understood that by providing the concaved faces on the buckets C, both in vertical and cross-section, thereby reducing atmospheric resistance to the flow of water.

For the purpose of preventing the plunger, or gate *f*, from being automatically changed, said plunger or gate *f*, is provided with the groove *d'*, which groove allows a body of water to enter the chamber K above said plunger or gate *f*, thereby equalizing the water pressure upon said gate or plunger.

For the purpose of providing a means for opening the chamber K, for any desired purpose the plate *h* is removably attached by means of the screws *l*, or their equivalents.

It will be understood that by my peculiar arrangement, I am enabled at all times to provide a head of water in the nozzle F, by which arrangement, a continuous and steady stream of water is forced upon the buckets C.

For the purpose of providing a means for

governing the motor proper, a governor rod may be attached to the operating or controlling lever *n*. This feature is not shown, as it forms no part of the present invention, except to be used in conjunction with the devices for regulating the flow of water.

The outer end of the nozzle F, may be screw-threaded to receive the necessary supply pipe. The water wheel A, is securely attached to its shaft *c*, by means of the feather key *g*<sup>2</sup>, or its equivalent. The water conveyer B, may be provided with the flanges *w*, which flanges are for the purpose of providing a means for attaching said water conveyer to the proper section of the casing D.

The casing sections D, are each provided with flanges *s*, which flanges are for the purpose of forming bearings for the shaft *c*.

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

1. The combination of the wheel A, located within the casing D, and provided upon its periphery with the buckets C, concaved in vertical and cross section, the casing D the water conveyer B, having its top or upper end located directly below the upper buckets, and inclined downward to one side of the lower buckets, substantially as and for the purpose specified.

2. The combination of the water wheel A, the casing D, the inclined water conveyer B fixed to one of the casing sections, and located within the casing, and inclined downward to one side of the water wheel, the flange *a*, fixed to the water conveyer B, and surrounding the shaft of the water wheel, and means for conveying water to the buckets C, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN E. LEWIS.

Witnesses:

THOMAS D. JONES,  
ROBERT AULD.