

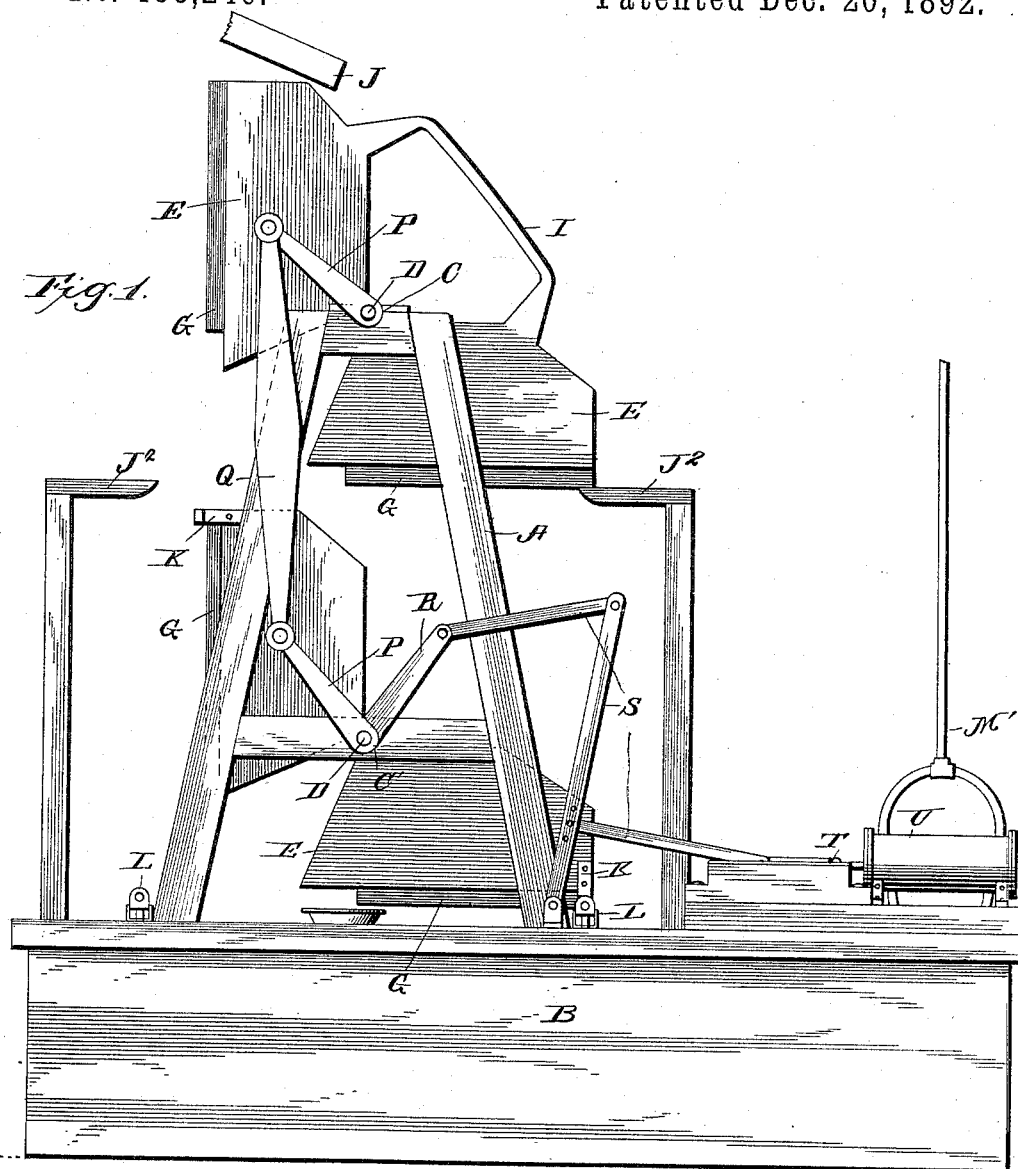
(No Model.)

2 Sheets—Sheet 1.

M. G. LINDSEY.  
HYDRAULIC MOTOR.

No. 488,246.

Patented Dec. 20, 1892.



Witnesses

*E. C. Hurdman.*  
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Inventor

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By *his* Attorneys,

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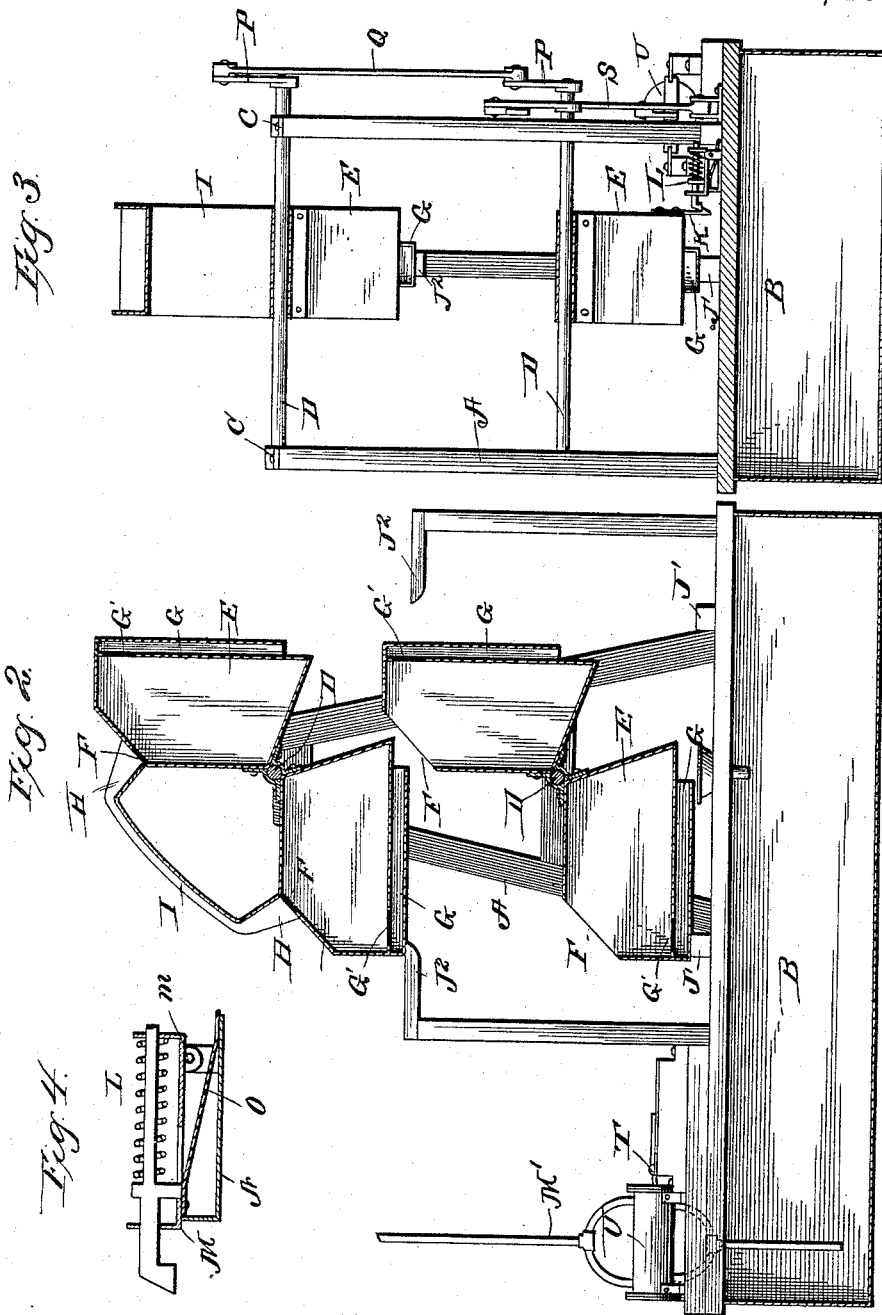
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Inventor

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M. G. Lindsey  
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# UNITED STATES PATENT OFFICE.

MATTHEW G. LINDSEY, OF ANDERSON, SOUTH CAROLINA.

## HYDRAULIC MOTOR.

SPECIFICATION forming part of Letters Patent No. 488,246, dated December 20, 1892.

Application filed July 6, 1892. Serial No. 439,107. (No model.)

*To all whom it may concern:*

Be it known that I, MATTHEW GARVIN LINDSEY, a citizen of the United States, residing at Anderson, in the county of Anderson and State of South Carolina, have invented a new and useful Hydraulic Motor, of which the following is a specification.

This invention relates to hydraulic motors; and it has for its object to provide a motor of this type especially adapted for operating pumps for elevating or conveying purposes.

To this end the main and primary object of the invention is to provide a compound motor, or indirectly a pump, of this character, which will be entirely automatic in its operation and one which will provide an increased power for the purposes specified.

With these and many other objects in view which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

In the accompanying drawings;—Figure 1 is a side elevation of a hydraulic motor constructed in accordance with this invention. Fig. 2 is a vertical longitudinal sectional view of the same. Fig. 3 is a vertical transverse sectional view of the same. Fig. 4 is an enlarged detail sectional view of one of the yielding spring catches.

Referring to the accompanying drawings:—A, A represent opposite frame standards arranged over a suitable water tank B, and provided at their upper ends with the bearings C, and directly below, and immediately located, with the lower bearings C'. Journaled in the bearings C and C', are the oscillating bucket rock shafts D arranged parallel with and one above the other, and operated by the water buckets E secured in pairs to each of said shafts, respectively. The water buckets E are secured in pairs, as stated, to each of the shafts D at direct right angles to each other, so that the upper bucket upon the upper shaft will always be in the same plane to the corresponding lower bucket secured to the same side of the lower shaft. Therefore when one of the upper buckets is in a vertical position receiving water, the corresponding lower bucket upon the lower shaft is in a corresponding position receiving water, while on

the other hand both the upper and lower buckets which are in a horizontal position are both emptying themselves of water.

The buckets E are constructed in a suitable shape having inclosing sides and provided with receiving openings F, arranged at one corner of the same so that when the buckets are in a vertical position, the water is fed to the same through said openings and is held by the buckets until they assume a horizontal position. The buckets are further provided upon one of the inclosing sides thereof with the elongated discharge tubes G, open at one end so as to allow the water to escape from its bucket when such bucket has assumed a horizontal position. Escape openings G', are formed in the corners of each bucket directly opposite the receiving openings thereof and communicating with the closed end of said discharge tubes, so that when the buckets are in their vertical position filling, the said escape openings are at the upper ends of the buckets and therefore allow the same to fill, but which when the buckets assume their horizontal positions allow the water to escape through said discharge tubes. The upper right angularly disposed pair of buckets secured to the upper shaft are further provided with the flared or funnel mouths H, connected with each other by the intermediate walled bridge I, which by connecting the receiving openings of both of the receiving buckets prevents the splashing of the water over the machine when the buckets are shifting from under and over the supply flume or pipe J, connected with a suitable source of supply and so arranged that the delivering end thereof lies always over the flared mouth of the bucket in the vertical filling position. Now it will be observed that while one of the upper buckets is filling, the other upper bucket will be in a horizontal position so that the open end of its discharge tube will project over the receiving opening of the lower bucket in its vertical filling position so that the water from said horizontal upper bucket will flow therein. The lower horizontal bucket will also be discharging, and the open end of its discharge tube will discharge into the tank B from which the water is forced in the manner to be presently described. It will be seen that the water passes from the upper buckets

into the lower buckets, thence to the tank, thereby causing an oscillation of the rock shafts to communicate motion to the devices to be described or any other suitable machinery.

Suitable stops  $J^2$  are arranged in the path of each of the upper buckets so that the same are prevented from passing a true horizontal position, and therefore out of position with relation to the vertical lower bucket into which it is discharging, while below said upper stops are arranged corresponding buffers  $J'$ , suitably located as to be in the path of the lower buckets when the same have reached their horizontal position, and thus relieve the same from undue jar or shock. Secured to each of the lower buckets are the depending flanged retaining arms K, which when the buckets have assumed their horizontal positions and are discharging into the tank B are designed to engage the spring catches L. The said spring catches L are mounted in the catch plates M, pivotally secured at  $m$  to the base plate N, and normally held in a horizontal position by means of the under spring O, secured to the under sides of said plates and bearing against the base plate. As stated when the buckets assume their horizontal position and are discharging into the tank B, the arms K engage the spring catches which hold the bucket in such position until the two vertical buckets have become sufficiently filled to overbalance the tension of the spring O of the catch in engagement, and thereby cause the retaining arm of the horizontal bucket to lift the spring-catch and the spring-actuated catch plate thereof, sufficiently, until it has cleared the outer end of the catch and allows the opposite filled bucket to assume its horizontal position to engage the corresponding opposite catch.

Secured to one end of each of the rock shafts D, are the crank-arms P, connected by the single connecting rod Q which provides for the simultaneous rocking of the upper and lower shafts, and said lower shaft is further provided with a supplemental crank-arm R which by suitable connecting rods and levers S, is connected to the piston rod T, of the force pump U. The said force pump U, takes its water from the tank B and discharges the same through the pipe M to its point of use.

From the foregoing it is thought that the construction, operation and many advantages of the herein described motor are apparent without further description.

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

1. In a hydraulic motor, the frame, upper and lower parallel shafts mounted within said frame, upper and lower pairs of water buckets secured at right angles to each other upon their respective shafts, and provided with oppositely located inlet and discharge openings,

and means for supplying the upper buckets with water substantially as set forth.

2. In a hydraulic motor, simultaneously operating rock shafts arranged parallel with and one above the other, upper and lower pairs of water buckets secured at right angles to each other upon their respective shafts and provided with receiving openings and oppositely arranged discharge tubes, the open ends of the discharge tubes of the upper buckets being designed to project over and feed into the receiving openings of the lower buckets, substantially as set forth.

3. In a hydraulic motor, simultaneously operating rock shafts arranged one above the other, upper and lower pairs of water buckets arranged in corresponding planes with each other and secured to their respective shafts at right angles to each other, the upper buckets being adapted to receive the first charge of water and to alternately discharge into the lower buckets, substantially as set forth.

4. In a hydraulic motor, connected rock shafts arranged one above the other, upper and lower pairs of water buckets secured to said shafts respectively and arranged in corresponding planes with each other upon the same side of their shafts and provided with receiving openings, escape openings arranged oppositely to said receiving openings and discharge tubes covering said escape openings and open at their other ends, the discharge tubes of the upper buckets being adapted to discharge into the receiving openings of the lower buckets, and the discharge tubes of the lower buckets into a suitable tank, substantially as set forth.

5. In a hydraulic motor, simultaneously operating rock shafts arranged one above the other, upper and lower pairs of water buckets secured at right angles to each other upon their respective shafts and provided with receiving openings at one end, and oppositely located discharge tubes discharging from the other end of the buckets, said upper buckets being each further provided with flared mouths inclosing the receiving openings thereof and a walled bridge connecting said mouths, and a supply flume or pipe arranged over said upper buckets, substantially as set forth.

6. In a hydraulic motor, simultaneously operating rock shafts arranged one above the other, upper and lower pairs of right angularly disposed water buckets secured to said shafts and feeding alternately into each other and a suitable tank, stops arranged in the path of the upper buckets to stop and hold the same in a true horizontal position, while discharging into the lower buckets, and corresponding buffers arranged to stop and break the force of the lower buckets upon reaching their horizontal positions, substantially as set forth.

7. In a hydraulic motor, the combination with the upper and lower pairs of oscillating or rocking water buckets feeding continuously into each other and a suitable tank; of

the depending flanged retaining arms secured to each of the lowermost buckets, and the spring actuated and sliding catches pivotally mounted at one end to suitable points of attachment in the path of said retaining arms and adapted to hold the same until released by the over-balancing weight of the filled water buckets said sliding catches being adapted to have their unpivoted ends lifted by the rising bucket until such ends disengage the retaining arms, substantially as set forth.

8. In a hydraulic motor, the combination with the pairs of oscillating water buckets feeding continuously into each other and a suitable tank, of the depending flanged re-

taining arms secured to each of the lower buckets, spring actuated catch plates pivotally mounted at one end to suitable points of attachment, and spring actuated catches moving in said plates and adapted to engage said flanged retaining arms until the catch plates are lifted by the overbalancing weight of the filled water buckets, substantially as set forth.

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

MATTHEW G. LINDSEY.

Witnesses:

L. P. SMITH,  
S. H. PREVOST.