

J. O. KAFADER.
 SUCTION WATER MOTOR.
 APPLICATION FILED JULY 25, 1911.

1,033,595.

Patented July 23, 1912.

2 SHEETS—SHEET 1.

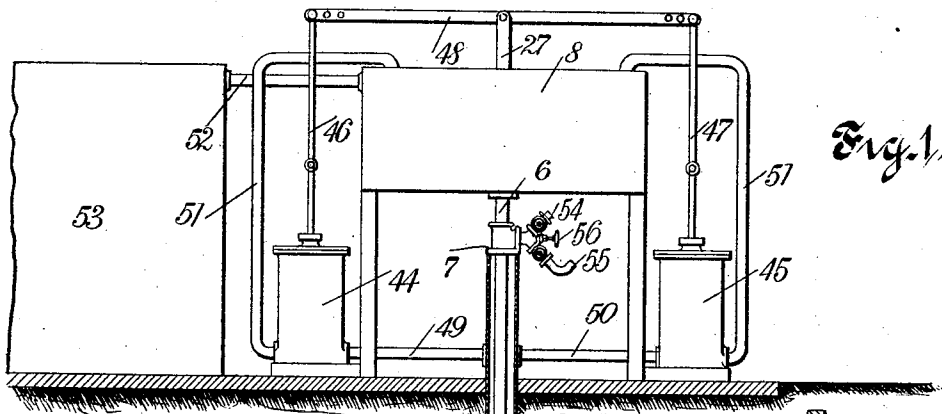


Fig. 1.

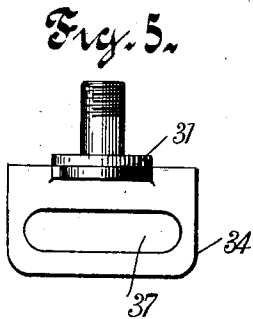


Fig. 5.

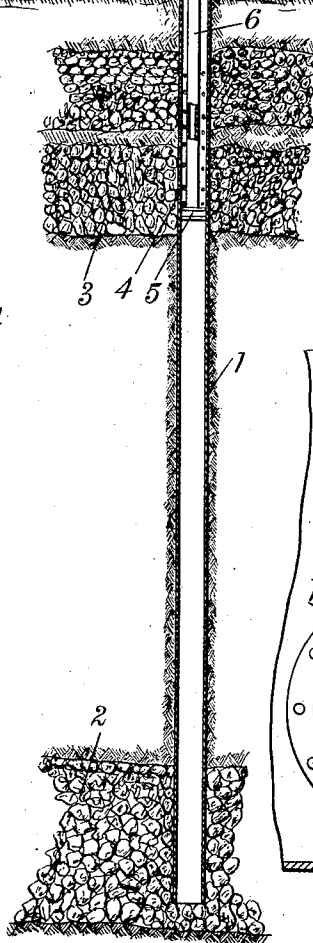
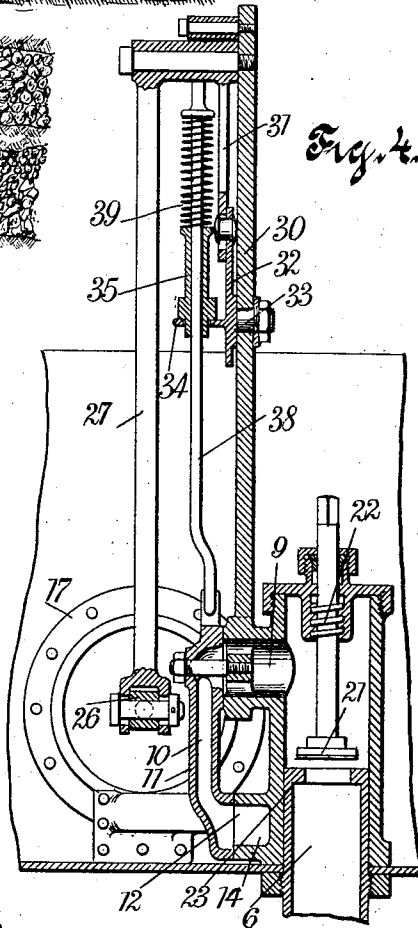


Fig. 4.



WITNESSES

Benedict J. J. J.
A. Whiting.

INVENTOR
 James O. Kafader
 BY *M. M. M.*
 ATTORNEYS

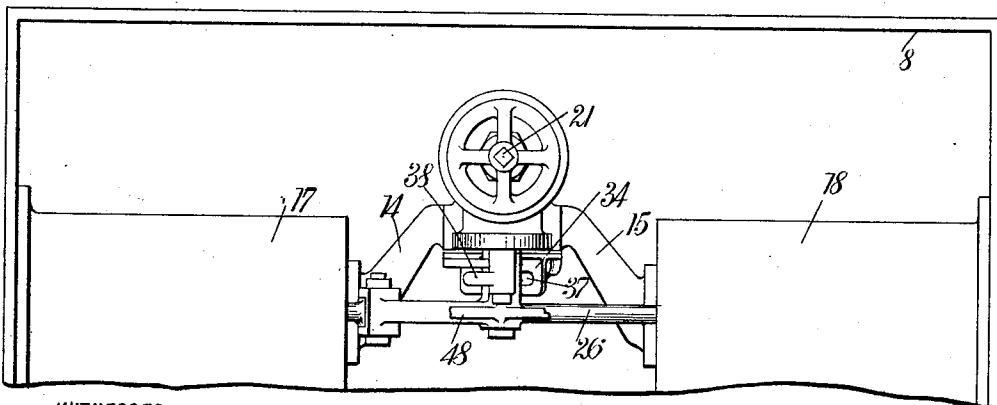
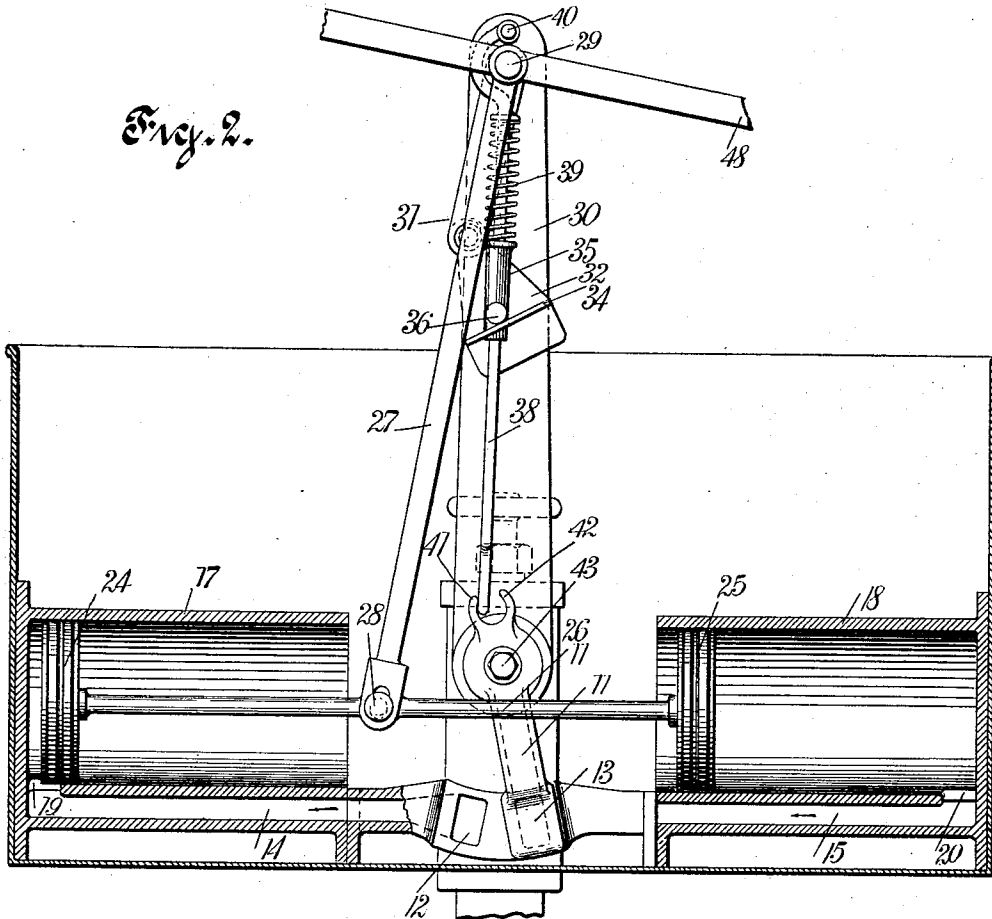
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2 SHEETS—SHEET 2.

Fig. 2.



WITNESSES
James O. Kafader
H. Whiting.

Fig. 3.

INVENTOR
James O. Kafader
 BY *Mum Co.*
 ATTORNEYS

UNITED STATES PATENT OFFICE.

JAMES OLIVER KAFADER, OF FORT BIDWELL, CALIFORNIA.

SUCTION WATER-MOTOR.

1,033,595.

Specification of Letters Patent.

Patented July 23, 1912.

Application filed July 25, 1911. Serial No. 640,398.

To all whom it may concern:

Be it known that I, JAMES O. KAFADER, a citizen of the United States, and a resident of Fort Bidwell, in the county of Modoc and State of California, have invented a new and Improved Suction Water-Motor, of which the following is a full, clear, and exact description.

This invention relates to a new and improved motor which utilizes the difference in height of water contained in a receptacle and two strata of the earth to generate power.

An object of this invention is to provide a new and improved motor, wherein the difference in height between two strata of the earth is utilized to create a suction adapted to aid in the operation of a motor, which in turn pumps water from the upper stratum, which is partly utilized, and any excess therefrom stored for other use.

A further object of this invention is to provide a suction water motor which will be simple in construction, comparatively inexpensive to manufacture, strong, durable, easily operated, and utilizing a natural force to generate power.

These and further objects, together with the construction and combination of parts, will be more fully described hereinafter and particularly set forth in the claims.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the views, and in which—

Figure 1 is a view in elevation, partly in section to show the underlying structure; Fig. 2 is an enlarged sectional view of the upper portion of the motor; Fig. 3 is a fragmentary top plan view; Fig. 4 is a vertical transverse section taken at right-angles to the view shown in Fig. 2; and Fig. 5 is a detail top plan view of a portion of the mechanism.

Referring more particularly to the separate parts of this invention as embodied in the form shown in the drawings, 1 indicates a substantially vertically-extending pipe, which is open at its bottom end and extends

into a lower stratum 2, and extends through, adjacent its upper end, an upper stratum 3.

Communication is had between the interior and the exterior of the pipe 1 at the location of the upper stratum 3, by means of apertures 4 located in the pipe at suitable intervals. Communication between the upper and lower ends of the pipe 1 is cut off by means of a stop 5, which prevents the water in the stratum 3 from flowing directly through the pipe into the stratum 2. Communication, however, may be had with the lower part of the pipe 1 through the stop 5 by means of an inner pipe 6, which extends a portion of the distance of the pipe 1, and has an outlet through the stop 5. The pipe 6 extends through a closed joint, indicated at 7, to the outside of the pipe 1 in such a manner as to make an air-tight fit. This extension of the pipe 6 projects up into a tank 8 a suitable distance, where, as will be seen by reference to Fig. 4, it is provided with a passage 9. Communicating with the passage 9, there is provided a passage in a swinging connector 11, which at its opposite end is adapted to be alternately brought into register with a pair of openings 12 and 13 communicating by passages 14 and 15 with the head ends of cylinders 17 and 18, respectively, by means of ports 19 and 20. It will be further noted by reference to Fig. 4 that the passage 19 may be cut off from the interior of the pipe 6 by means of a valve 21, which is adjustably mounted on the pipe 6 by means of a screw-threaded connection 22, and may be moved to a greater or less proximity to its seat, indicated at 23.

The cylinders 17 and 18 form part of a motor, and have pistons 24 and 25, which are adapted to reciprocate therein and are preferably rigidly connected together by means of a rod 26, so that they move in unison with each other. The motion of the pistons 24 and 25 may be transmitted by means of a lever 27, which has a pin-and-slot connection 28 with the rod 26 to a shaft 29 mounted on a support 30 of any suitable character. The shaft 29 has also secured thereto an arm 31, which is pivotally con-

nected at its opposite end to a stop 32, which is shown in the form of an arm pivotally connected to the support 30, as at 33, and provided with a slotted plate 34, in which is slidably mounted a sleeve 35. The sleeve 35 is provided with lugs 36, so that it cannot pass through the slot 37 indicated in the plate 34, and yet permits a relative movement of the stop 32 with respect to the sleeve 35. The sleeve 35 is slidably mounted on a rod 38, and normally held in intimate contact with the plate 34 by means of a spring 39, which is likewise mounted on the rod 38, the latter being pivotally mounted on its upper end, as at 40, on the support 30. The lower end of the rod 38 fits loosely between projecting lugs 41 and 42 provided on the connector 11. It will be noted that the connector 11 is pivotally connected to the pipe 6, so that one port or opening therein will always extend in register with the passage 9. This may be done by passing the pivot bolt 43 directly in line with the passage 9 and through the inlet port of the passage 10 in the connector 11.

It will be seen that the lever 27, moved by the pistons 24 and 25, will make almost a complete stroke before the plate 34 is inclined to a sufficient angle to permit the sleeve 35 to slide in the slot 37, and thus permit the movement of the rod 38. The purpose of this is to give a sudden throw of the connector 11 at the end of the stroke of the pistons 24 and 25. The motion of the pistons 24 and 25, which is transmitted to the shaft 29, may be used to actuate the pistons of a pair of pumps 44 and 45, through the intermediary of links 46 and 47 and a lever 48 secured to the shaft 29. The intakes of the pumps 44 and 45, represented by the pipes 49 and 50, communicate with the interior of the upper end of the pipe 1, and are adapted to convey the water drawn from the upper stratum 3 to the intake side of the pumps 44 and 45. The water pumped by these pumps is conveyed by means of pipes 51 to the tank 8, where any surplus over that required to actuate the motor may be taken off by a pipe 52 and stored in a receptacle 53, to be used in any suitable manner, either for generating power or in irrigating or the like.

The operation of the device will be readily understood when taken in connection with the above description. The device is started with the tank 8 full of water, so that there is a pressure on the pistons 24 and 25, due to the height of water in the tank. If we assume the pistons in the position occupied in Fig. 2, the full force of the water will be exerted on the outer side of the piston 25, and there will be no pressure on the inner side of the piston 25, so that it will tend to move toward the right. During this mo-

tion toward the right, water will come in through the opening 12 back of the piston 24 and aid in its movement. When the pistons 24 and 25 approach the extreme limit of stroke toward the right, the stop 32 will have swung from the position indicated in Fig. 2 to its opposite position, so that the plate 34 inclines downwardly to the right, permitting the spring 39 to expand under the accumulated tension which has been placed thereon during the motion of the stop 32 to the right, so that it will snap the connector 11 from its position in Fig. 2 in connection with the port 13 and the passage 15 to a position over the port or opening 12, in connection with the passage 14. The head of water on the inner face of the piston 24 will then be cut off, and the water accumulated in the cylinder 17 may pass out through the opening 12 and the passage 10 into the pipe 6, where it can flow down the pipe 6 and the pipe 1 to the lower stratum 2. This action will create a suction, which will tend to draw the piston 24 back to its original position, which action is aided by the head of water on the inner face of the piston 25, which now comes in through the inlet or opening 13 and the passage 15. This operation is continued, so that when the pistons 24 and 25 reach the limit of their stroke toward the left, the connector 11 will be snapped over into coöperative juxtaposition with the opening 13, so that the rear side of the piston 25 will be connected with the suction, and the rear side of the piston 24 will be connected with the head of water in the tank 8. The water back of the piston 25 will then flow out into the pipe 1, and by its suction will aid in the propulsion of the motor. It is, of course, to be noted that the pipe 1 being of a considerable height, and the action of the motor comparatively quick, there will be a continuous flow of water down through the pipe 1, which will exert a considerable negative head on the piston connected in working relation with this head at the particular moment. Of course, it is further to be understood that if the suction is not sufficient in the beginning, the piston can be operated manually a few times, until sufficient water has passed into the pipe 1 to create a negative or suction head. The action of the motor is transmitted as above described, to the pumps 44 and 45, which draw up water from the stratum 3, which is located at a considerable distance above the stratum 2, and supply the same to the tank 8, where a portion of it may be used to operate the motor, and the remainder may be conveyed to the storing tank 53, where it can be used for other purposes. In starting the device, the pipe 1 should be filled with water and all air excluded. One way of doing this is to con-

nect the nipple 54 with an air exhaust pump and the nipple 55 with a water supply. This will replace the air in the pump with water, thereby filling the system. The water and air nipples are then shut off by a valve 56.

While I have shown one embodiment of my invention, I do not wish to be limited to the specific details thereof but desire to be protected in various changes, alterations and modifications which may come within the scope of the appended claims.

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

1. The combination with a pipe extending through an upper stratum in the earth to a lower stratum, of a stop in said pipe, a motor located above said lower stratum, and a pipe forming a means of communication between said motor and the lower portion of said pipe, below said stop, whereby water passing from said motor down through said first-mentioned pipe to said lower stratum will exert a negative pressure or suction on said motor.

2. The combination with a pipe extending through an upper stratum in the earth to a lower stratum, of a stop in said pipe, a motor located above said lower stratum, a pipe forming a means of communication between said motor and the lower portion of said pipe, below said stop, whereby water passing from said motor down through said first-mentioned pipe to said lower stratum will exert a negative pressure or suction on said motor, and means for supplying water under a head to said motor.

3. The combination with a pipe extending through an upper stratum in the earth to a lower stratum, of a stop in said pipe, a motor located above said lower stratum, a pipe forming a means of communication between said motor and the lower portion of said pipe, below said stop, whereby water passing from said motor down through said first-mentioned pipe to said lower stratum will exert a negative pressure or suction on said motor, said first-mentioned pipe communicating with said upper and lower strata respectively above and below said stop, and a pump actuated by said motor, for drawing water from said upper stratum.

4. The combination with a pipe extending through an upper stratum in the earth to a lower stratum, of a stop in said pipe, a motor located above said lower stratum, a pipe forming a means of communication between said motor and the lower portion of said pipe, below said stop, whereby water passing from said motor down through said first-mentioned pipe to said lower stratum will exert a negative pressure or suction on said motor, said first-mentioned pipe com-

municating with said upper and lower strata respectively above and below said stop, a pump actuated by said motor, for drawing water from said upper stratum, a tank for supplying water under a head to said motor, and means for conveying the water from said pump to said tank.

5. The combination with a pipe extending through an upper stratum in the earth to a lower stratum, of a stop in said pipe, a motor located above said lower stratum, a pipe forming a means of communication between said motor and the lower portion of said pipe, below said stop, whereby water passing from said motor down through said first-mentioned pipe to said lower stratum will exert a negative pressure or suction on said motor, said first-mentioned pipe communicating with said upper and lower strata respectively above and below said stop, a pump actuated by said motor, for drawing water from said upper stratum, a tank for supplying water under a head to said motor, means for conveying the water from said pump to said tank, and a tank for storing the surplus water from said first-mentioned tank.

6. The combination with a tank, of a pair of cylinders located in said tank, a pair of connected pistons adapted to reciprocate in said cylinders, each of said cylinders having a port therein, a pipe of considerable vertical extension adapted to create a negative pressure or suction on said cylinders, passages communicating with said ports and having openings therein, a pivotally-mounted connector having a passage therethrough, adapted to alternately connect each of said first-mentioned passages with the interior of said pipe, and a snap-throw connected to said pistons and adapted to accumulate its force during the movement of said pistons and snap said connector from one position to the other at the ends of the stroke of said pistons.

7. The combination with a tank, of a pair of cylinders located in said tank, a pair of connected pistons adapted to reciprocate in said cylinders, each of said cylinders having a port therein, a pipe of considerable vertical extension adapted to create a negative pressure or suction on said cylinders, passages communicating with said ports and having openings therein, a pivotally-mounted connector having a passage therethrough, adapted to alternately connect each of said first-mentioned passages with the interior of said pipe, a lever connected to said pistons, a shaft driven by said lever, an arm secured to said shaft, an arm pivotally engaging said first-mentioned arm and having a slotted plate thereon, a sleeve normally supported by said plate and extending through the slot in said plate, a spring engaging said

sleeve and tending to force said sleeve into intimate contact with said plate, and a pivotally-mounted rod extending through said sleeve, and adapted to be actuated by the accumulated force of said spring, so that it will in turn shift said actuator from one position to the other and back again at the ends of the stroke of said pistons.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES OLIVER KAFADER.

Witnesses:

LEANDER A. BOWEN,
B. F. McCOMBS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
