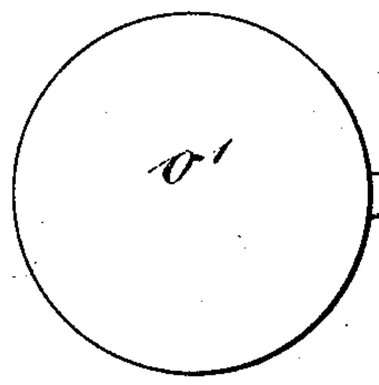
(No Model.)

T. W. BLEACH.

PUMP.

No. 512,534. Patented Jan. 9, 1894.

Fig 1



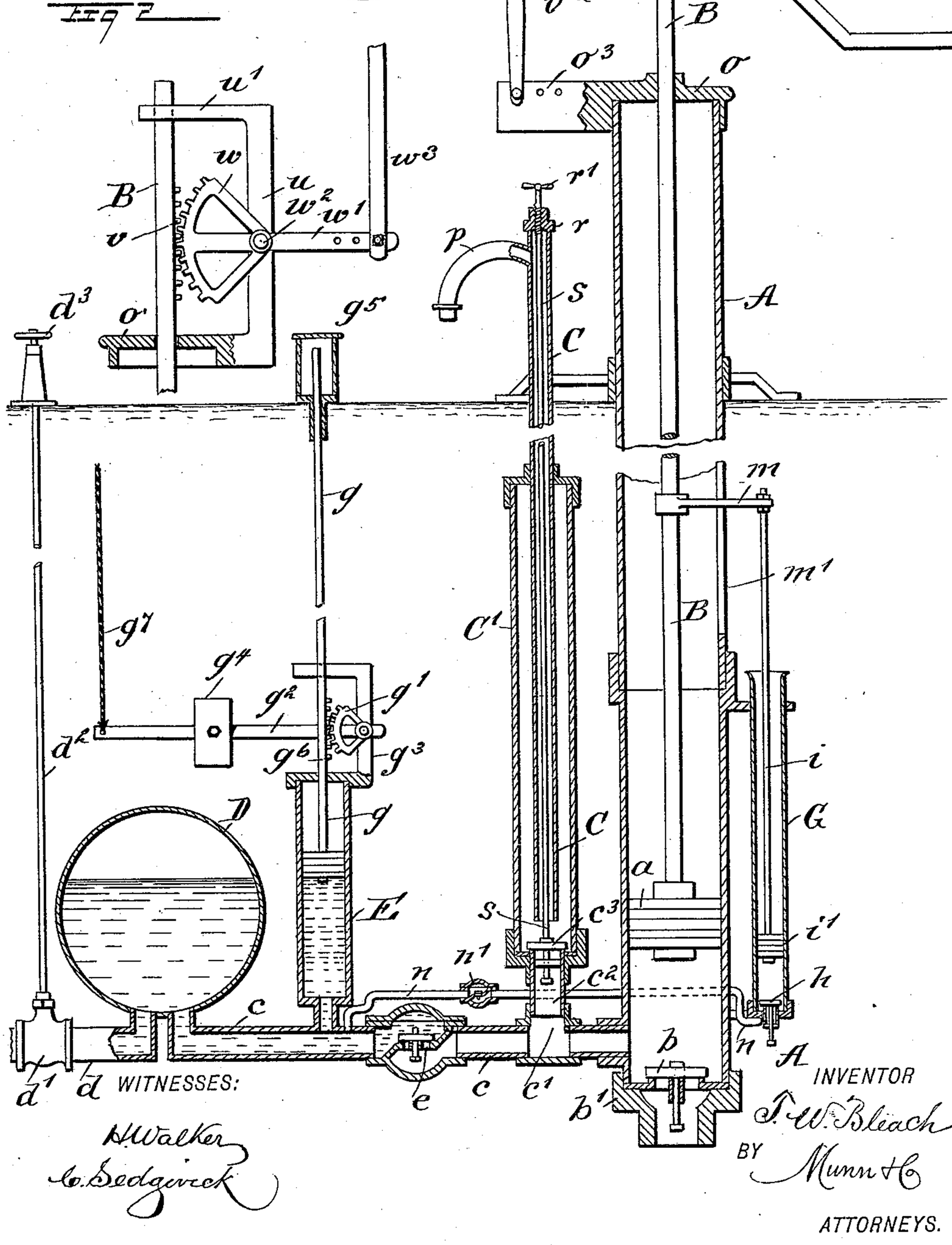


Fig 2

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PUMP.

SPECIFICATION forming part of Letters Patent No. 512,534, dated January 9, 1894.

Application filed January 31, 1893. Serial No. 460,324. (No model.)

To all whom it may concern:

Be it known that I, THEODORE W. BLEACH, of Kearney, in the county of Clay and State of Missouri, have invented a new and useful Improvement in Pumps, of which the following is a full, clear, and exact description.

The object of this invention is to produce a combined air and water pump, that are adapted for simultaneous operation by a single actuator, and which will together discharge into a sealed receptacle, producing air pressure on a water body in the receptacle, and thus affording power to raise water through a pipe connected to the receptacle and discharge it at an elevated point.

A further object is to provide a convenient and inexpensive pumping apparatus, which will afford means to restore water under pressure of confined air in a sealed receptacle, provide a gravity controlled pressure equalizer for said receptacle so as to adapt it for a regular discharge of water at an elevated point through a proper conduit, and also to combine with such a device an air cushioned water discharge pipe, that will afford an elevated water supply as needed, while the combined air and water pumping apparatus is in operation.

To these ends, my invention consists in the peculiar construction and combination of parts, as is hereinafter described and claimed.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a side view in section, broken away intermediately, of the combined air and water pump, and other essential features partly in section; and Fig. 2 is a side view broken away above and below, of an attachment for the water pump which is adapted to transmit motion from a source of power.

The water pump barrel A, may be made of any preferred length within practical limits, and of a diameter suited to the capacity desired for the pump, which may be placed in a well or be sunk in the ground, upright in position, with a portion projected above the surface of the ground as indicated in the drawings.

Within the pump barrel A, a pump rod B, and plunger head *a*, are introduced, the length of the rod being so proportioned to that of the barrel A, that a proper space will be afforded between the plunger head and the lower end of the pump barrel in which a foot valve *b* of ordinary form is located, there being a valve box *b'* secured to the pump barrel so as to incase its lower end and afford means for the attachment of a pipe extension below the barrel if this is required to reach a water supply below the foot valve.

Between the plunger head *a* and foot valve *b*, an outlet is formed on the pump barrel A for the connection of a lateral water discharge pipe therewith, said branch pipe *c* having an outlet *c'* near the pump barrel, which is designed to connect the branch pipe with the lower end of an upright hydrant, which will be further explained. A sufficient length is provided for the branch pipe *c*, and at its end farthest from the pump barrel A, a connection of this pipe is made with a sealed water receptacle D, which may be of any desired capacity, and be located below the surface of the ground as represented, or above it if preferred. Preferably the pipe *c* is attached to the water chamber D, at the lower side, and near to the pipe named a water pipe *d*, is secured to the chamber, so as to tap it and convey its fluid contents to any desired point. A stop valve *d'* in the outlet pipe *d* is provided, to control the flow of water, which valve has a stem d^2, extended to the surface of the ground, and it may have a hand wheel d^3, or other equivalent device for manipulation to open or close the said valve.

In the branch pipe *c* a check valve *e* is introduced, which valve lies between the outlet *c'*, and water chamber D, and serves to prevent a back flow of water into the pump barrel A.

Near the chamber D, an upright cylindrical receiver E, is secured on the branch pipe *c*, having an open connection with the latter; which receiver is furnished with a plunger head, and rod *g*; the latter extending through the capped upper end of the part E, has a toothed rack g^6 formed on its side above the receiver, so as to allow a toothed sector *g'*, to mesh with the rack, said sector being affixed to the side of an arm g^2, near one end of the

latter, and both pivoted to an upright standard g^3, by a bolt that passes through a perforation formed in the arm and sector at the radial center of the latter. The plunger rod g, passes loosely through a lateral limb of the standard g^3, and is in this manner sustained in a vertical plane free to reciprocate.

On the arm g^2, a weight g^4, is adjustably secured by a set screw or other means, so that it may be set at any desired point on the arm, and from the free end of the latter, a rope or chain g^7, is upwardly extended for an attachment to windmill mechanism, or other power that operates the pump.

The pump barrel A, affords support for an air pump barrel G, that is secured thereto in a parallel plane, as indicated in Fig. 1. The air pump having the usual air inlet valve h, at its base, is furnished with a piston head i' on a rod i, the latter being affixed at its upper end to an arm m, which is secured at its inner end upon the pump rod B, and projects at a right angle thereto through a longitudinal slot m' in the pump barrel A, of a proper length to permit the attachment of its outer end to the air pump rod, that is thereby adapted to reciprocate in the barrel G, when the water pump rod is similarly moved. There is a laterally-extending pipe n, connected by one end to the lower end of the air pump barrel G, near the valve h, in its base, which pipe is extended toward the receiver E, and taps the branch pipe c, between the receiver and the check valve e, a check valve n', that is placed in the pipe n, serving to prevent back flow of air that has been forced by the pump through the check valve.

The top of the pump barrel A, is furnished with a close cap o, through which the pump rod B loosely extends, and if the apparatus is to be worked by hand power, there is a counterweighted handle lever B', provided, which is pivoted near its longitudinal center to the upper end of the pump rod, one end of the lever being adapted for manipulation and the other end connected to a counterbalance weight o'. The handle lever B' is supported to vibrate by a movable post o^2, that is adjustably secured at its upper end to the lever by a transverse removable bolt, that is inserted through a hole in the post where it has lapped contact with the lever, and also through any one of a series of spaced perforations in the latter, which may be opposite the hole in the post. In a like manner, the lower end of the post o^2, is secured upon the bracket arm o^3, which projects from the cap plate o, directly below the lever and in an opposite direction from the handle portion of the lever B', a series of holes being formed in the bracket arm to allow the end of the post to be bolted thereto at different points.

By provision of the means for changing the position of the post o^2, the effect of the counterweight o', may be regulated to suit the requirements of the service.

The upright hydrant which is attached to the branch pipe outlet c' consists in part of a cylindrical chamber C', of proper length, and greater diameter than the hydrant stock C, which is concentrically held within said chamber by a secured engagement of the stock within a center hole formed for its reception in the cap of the chamber. The lower end of the chamber C', is also capped and centrally apertured for the reception of a thimble c^2, which also enters the outlet c' and connects the chamber with the branch pipe c.

A valve c^3 is placed over the thimble c^2, in the chamber C', and adapted to reciprocate vertically, the lower end of the hydrant stock C, being suitably removed from the valve mentioned, to permit the latter to have a proper action.

A sufficient length is given to the hydrant stock C, so that its upper portion will be projected above the surface of the ground in which a part of the stock and the chamber C' are embedded, a discharge spout p, that projects from the stock near its top, affording an exit passage for water that may be forced upwardly within the latter.

The upper end of the hydrant stock C is capped, and a central threaded perforation formed in said cap r, for the reception of the threaded upper end portion of a key rod s, that extends downwardly through the hydrant stock and near to the valve c^3 so that the vertical adjustment of the key rod by its rotation manually effected at the upper end by a cross handle r', will cause the lower end of the rod s, to impinge on the valve c^3, or be removed from it to permit the valve to rise from its seat.

The pump barrel A, having a connection established between its lower end and an adequate water supply, the operation is as follows: Vibration of the handle lever B', will raise water above the foot valve b, and discharge it at every stroke into the branch pipe c, through the check valve e, and thence into the chamber D, the valve d' being normally closed. Every stroke of the plunger rod B, will cause the air pump rod i to be similarly actuated and produce a flow of air through the pipe n, into the branch pipe c, and thence into the chamber D, the air naturally rising to the top portion of the chamber. After a considerable air pressure has been produced within the chamber D, and water in proper quantity stored below said air column, the rod g, of the receiver E, will be forced upwardly, and as it is preferably extended above the surface of the ground within an inclosing box g^5 that may be opened for inspection, it will be seen that the height of the rod will indicate the level of the water stored in the chamber D. As water which is stored in the chamber D, diminishes in quantity by abstraction through the pipe d and valve d', the weight g^4, and arm it is secured upon, will drop accordingly, and maintain a pressure upon the water remain-

ing in the chamber, the position of the weight regulating the amount of pressure in an obvious manner.

The provision of the flexible connection g^7 at the free end of the lever or arm g^2, which is upwardly extended to join driving mechanism for the pump, will automatically regulate the speed or entirely stop such machinery when the arm vibrates downwardly at its outer end, and the tank D is empty, or the water therein falls below a predetermined level.

The hydrant C is adapted to discharge water only when the water pump is in service. The surrounding chamber C′, that contains a volume of air above the water that enters it through the nipple c^2, when the rod s, is adjusted to permit an elevation of the valve c^3, becomes an air chamber, the contained air cushion adapting the hydrant to discharge a steady stream of water through the spout p, when the handle piece r' is manipulated to effect such a result.

It is contemplated to utilize the power afforded by a windmill to work the pump in some cases, and to this end there is a special detail of construction provided, see Fig. 2, comprising an upright post u, which is projected from the cap plate o, having a lateral limb u', on it, that is perforated at a proper point to permit the pump rod B, to pass freely through it.

The portion of the pump rod that is between the limb u', and cap plate o is furnished with a toothed rack v, into which the teeth of a gear segment w, are made to mesh, the latter named part having an arm w', projected centrally from it.

A pivotal attachment of the segment w, on the side of the upright post u, is produced at w^2, which is the radial center of the segment, so that a vertical vibration of the arm w', will produce a reciprocation of the pump rod B.

A series of spaced holes is formed in the arm w', near its outer end, to permit the pivoted adjustable connection with the arm, of a depending pitman w^3, that is shown broken, but is intended to have a sufficient upward extension to allow its upper end to be pivoted to windmill mechanism of any approved type, that is adapted to reciprocate the pitman as the wind wheel (not shown) rotates, so that when the windmill is in operation, the water and air pumps will be actuated, and water under air pressure introduced within the storage chamber D, for simultaneous or subsequent use.

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

1. The combination with a water pump, of an air pump alongside of the water pump barrel and having its piston connected with the pump rod, a valved pipe leading from the water pump barrel, an air tight receptacle connected with the pipe, a receiver connected with the said pipe between the receptacle and water pump barrel, a plunger in the receiver and having its rod projecting out through the top of the same, and a second valved pipe leading from the air pump barrel and connected with the first named pipe between its valve and the receiver, substantially as described.

2. The combination with a water pump, and an air pump alongside of the water pump barrel and having its piston connected with the pump rod, of a valved pipe leading from the water pump barrel, an air tight receptacle connected with the said pipe, and provided with an outlet pipe, a valve in said outlet pipe and provided with a valve stem extending to the surface of the ground, a receiver connected with the pipe that leads to the pump barrel between the receptacle and the said pump barrel, a plunger in the receiver and having its rod projecting out through the top of the same and extending to the surface of the ground, and a second valved pipe leading from the air pump barrel and connected with the first named valved pipe between its valve and the receiver, substantially as described.

3. The combination with a water pump, and an air pump alongside of the same and having its piston rod connected with the pump rod, of a laterally extending outlet pipe leading from the water pump barrel and provided with a check valve, a hydrant connected with said outlet pipe between its valve and the pump barrel, an air tight receptacle connected with the said pipe, a valved water pipe connected with said receptacle, a receiver connected with the outlet pipe between its valve and the receptacle, a plunger in the receiver and having its rod projecting through the top of the same into an inclosing box, and a pipe leading from the air pump barrel and connected with the outlet pipe between its valve and the receiver, said pipe being provided with a check valve, substantially as herein shown and described.

THEODORE W. BLEACH.

Witnesses:
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H. MÜLLER.