

(No Model.)

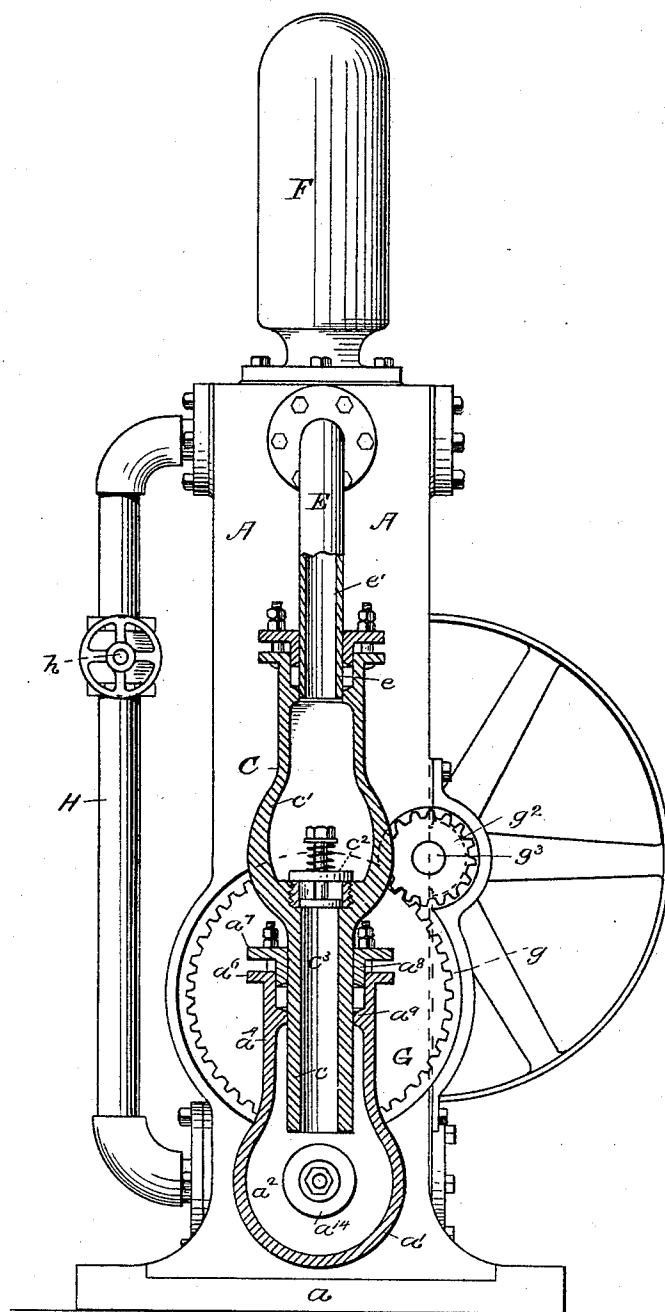
3 Sheets—Sheet 1.

W. O. WEBBER.

PLUNGER PUMP.

No. 391,667.

Patented Oct. 23, 1888.



WITNESSES.

FIG. 1.

INVENTOR.

J. W. Dolan
Fred. B. Dolan.

William O. Webber.
by his attys
Clark & Raymond.

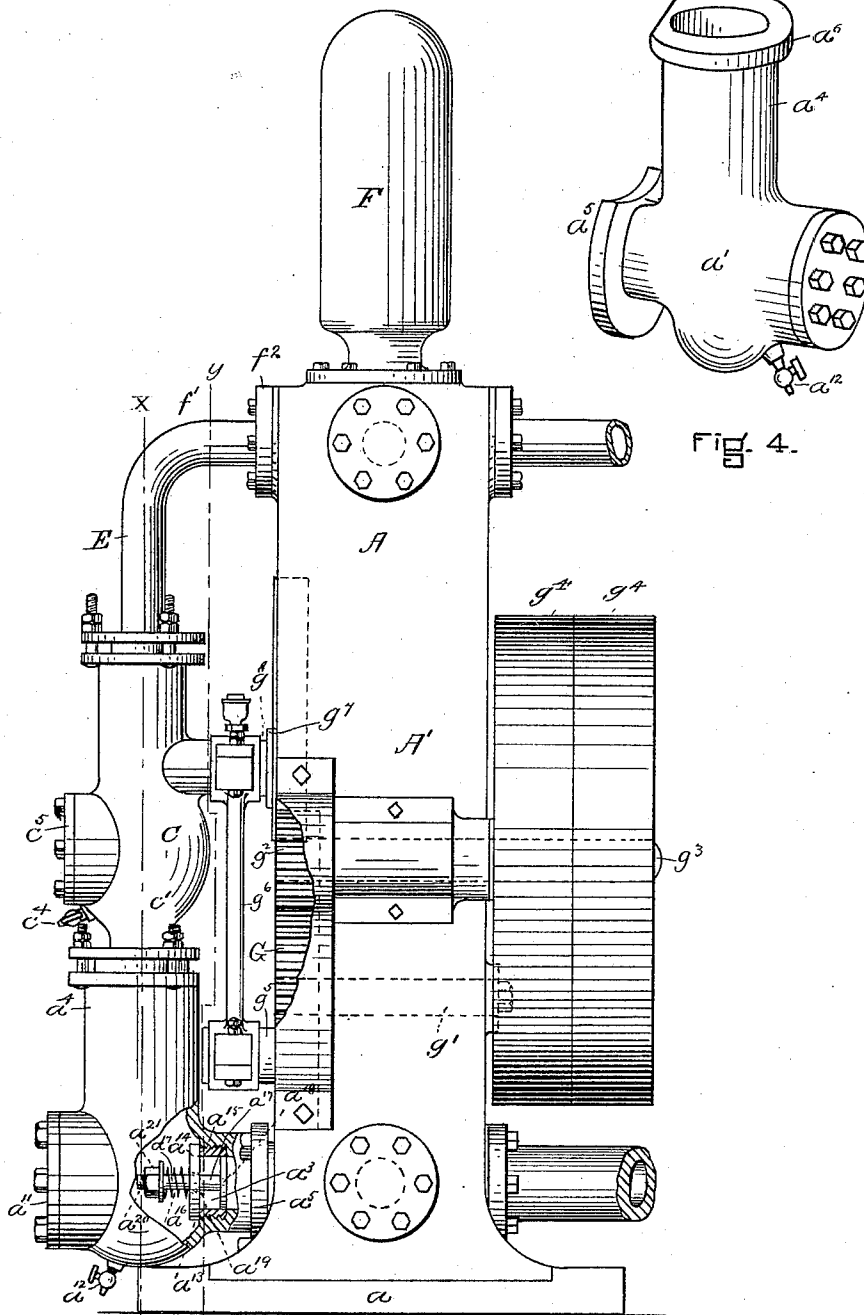
(No Model.)

3 Sheets—Sheet 2.

W. O. WEBBER.
PLUNGER PUMP.

No. 391,667.

Patented Oct. 23, 1888.



WITNESSES.

J. H. Dolan
Fred. B. Dolan.

FIG. 2.

INVENTOR.

William O. Webber,
by his attys
Clark & Raymond.

(No Model.)

3 Sheets—Sheet 3.

W. O. WEBBER.

PLUNGER PUMP.

No. 391,667.

Patented Oct. 23, 1888.

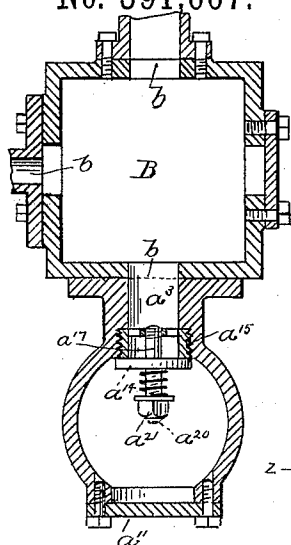


Fig. 5.

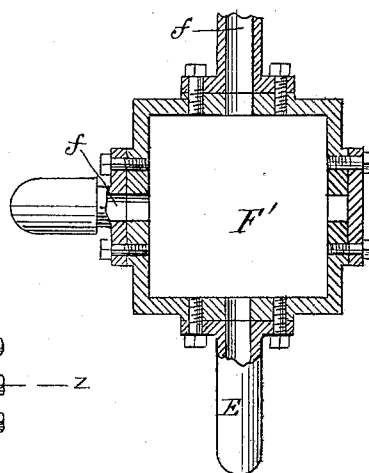


Fig. 6.

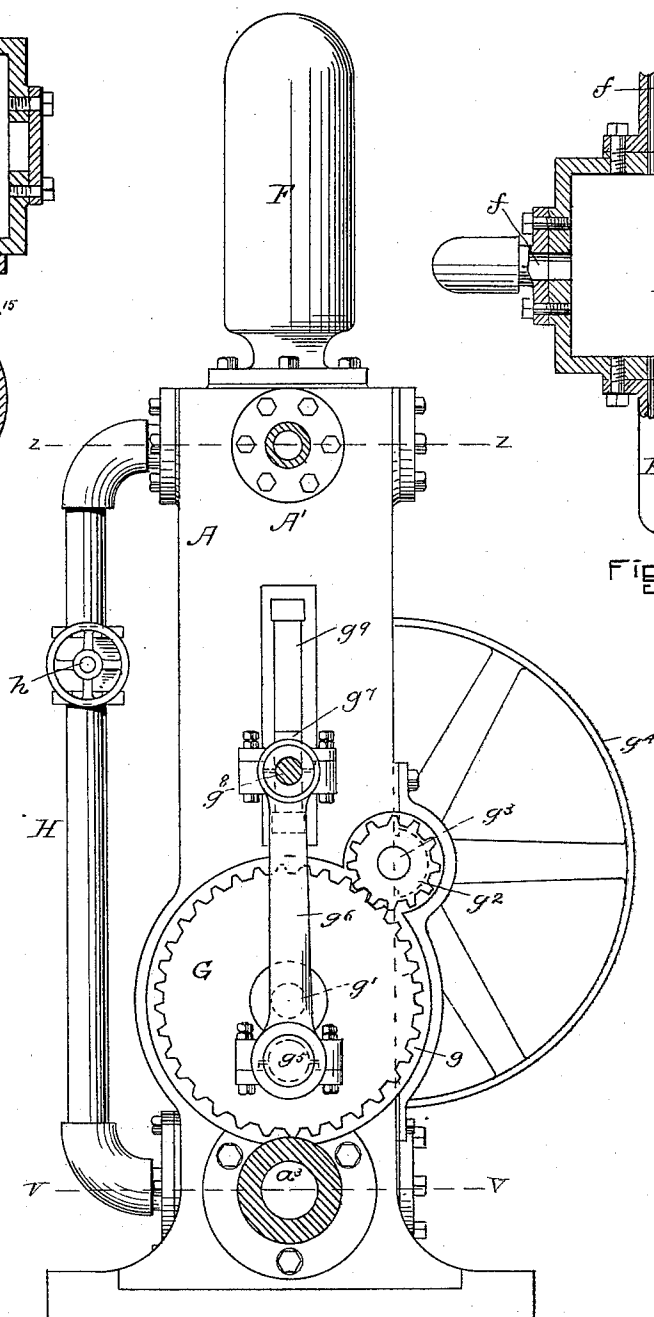


Fig. 3.

WITNESSES.

J. M. Dolan.
Fred. B. Dolan.

INVENTOR.

William O. Webber,
by his atty
Clarke & Raymond.

UNITED STATES PATENT OFFICE.

WILLIAM O. WEBBER, OF LAWRENCE, MASSACHUSETTS.

PLUNGER-PUMP.

SPECIFICATION forming part of Letters Patent No. 391,667, dated October 23, 1888.

Application filed January 2, 1886. Serial No. 187,403. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM O. WEBBER, of Lawrence, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Plunger-Pumps, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention belongs to that class of pumps known as "plunger-pumps;" and it relates to various details of construction, whereby great durability, cheapness of manufacture, economy of floor-space, and other advantages are obtained.

Referring to the drawings, Figure 1 is a view, part in vertical section and part in front elevation, of my improved pump. Fig. 2 is a side elevation, a portion of the frame of the pump and of the casing of the lower barrel being broken out to represent the construction. Fig. 3 is a section upon the line $y y$ of Fig. 2 and an elevation of the parts back of said line. Fig. 4 is a perspective view of the casing of the lower barrel. Fig. 5 is a horizontal section upon the line $v v$ of Fig. 3. Fig. 6 is a horizontal section upon the line $z z$ of Fig. 3.

A is the frame-work of the pump. It is shaped, preferably, as shown in the drawings, and has a comparatively small base, a , and an upwardly-extending post or column, A' . It supports upon one side the principal operative parts of the pump and the devices for actuating them.

a' is the lower or stationary pump-barrel, and it is made, preferably, in the form of a casting shaped substantially as shown in Fig. 4. It has the enlarged cavity or space a^2 , forming what is known as the "barrel," a suction-entrance, a^3 , and an upward cylindrical extension, a^4 . It has the flange a^5 about the suction-entrance, by which it is bolted to the frame or column of the pump, and the flange a^6 about its upper end, to which the flange a^7 of the stuffing-box gland a^8 is bolted. It also has the interior annular flange or shoulder a^9 , forming a part of the stuffing-box, and a large opening, by which access is had to the interior of the barrel without removing it from the frame of the pump, which opening is closed by the

plate a^{11} . It also has the petcock a^{12} , for emptying the barrel, and the suction-valve a^{13} , which may be formed in any suitable way, but which is shown as a disk, a^{14} , held to the valve-seat a^{15} by a spring, a^{16} , arranged to surround the post a^{17} , attached to the cross-bar a^{18} and extending through the hole a^{19} in the valve-disk into the barrel. This post holds the spring a^{16} , and has a screw-thread, a^{20} , and nut a^{21} for varying the degree of its tension.

The lower part or base of the frame or column of the pump has a suction-passage, B, which opens into the lower barrel, and is adapted to be connected with a suction-pipe 65 on either of the three sides of the frame or column at the inlets b , (see Fig. 5,) each of which is adapted to receive the end of a suction-pipe. Arranged in and above the lower barrel is the movable plunger C. This movable plunger 70 has a downwardly-extending cylindrical or tubular section, c , (which extends into the cylindrical section of the lower barrel,) the barrel c' , and a valve, c^2 , which closes the passage or hole c^3 in the cylindrical section c , as hereinafter specified. Any form of valve may be used; but that shown is similar to the one already described.

The barrel c' extends upwardly to surround the cylindrical section c of the stationary plunger E, upon the exterior of which the upper end of the movable plunger and its stuffing-box fit and slide. This stationary plunger E has a passage or hole, c' , connecting the barrel of the movable plunger with the air-chamber F of the pump.

It is obvious from what has been said that the action of the pump is obtained by the movement or reciprocation of the movable plunger C in relation to the lower pump-barrel and the stationary plunger, and that these parts are arranged in relation to each other so that a practically straight hole is provided from the suction to the air-chamber through which the water is forced by the action of the plungers; also that the operative parts are centrally arranged in relation to each other, so that the movable plunger is easily fitted, and is moved or reciprocated with but very slight wear of the contacting parts.

The plunger C has a petcock, c^4 , for exhausting the water therefrom, and a large hole

by which access to its interior is obtained, and which is covered by the plate c^5 , which is bolted to the side of the plunger.

The operation of the pump is practically
 5 this: The movable plunger is moved upward to create a vacuum or partial vacuum or suction in the barrel, the valve c^2 of course being closed. This upward movement of the plunger causes, also, the lower suction-valve, a^{13} , to
 10 be automatically opened, and of course lifts or draws the water through the suction-pipe into the lower barrel. A downward movement of the movable plunger throws its lower cylindrical or tubular section into the lower barrel, and the valve a^{13} having closed, the water
 15 in the chamber is forced by this displacement through the hole or passage in the movable plunger, lifting the valve c^2 into the barrel c' of the movable plunger, filling the same.
 20 Upon the next upward movement of the movable plunger, the valve c^2 having closed, the water contained in the chamber c' is displaced and forced through the passage c' of the stationary plunger E as the movable barrel
 25 is lifted or moved upon the stationary plunger; and it will be seen that as this reciprocation of the movable plunger continues water is being drawn or sucked simultaneous
 30 or moving barrel, so that the action of the pump is practically continuous. It is immaterial, so far as this part of the invention is concerned, how these parts are arranged in relation to each other, or what means are used
 35 for reciprocating the movable plunger. I have shown, however, for reciprocating it a construction which comprises the gear-wheel G, arranged within a recess, g , (see Fig. 1,) of the
 40 frame or column of the pump upon the shaft g' , a pinion; g^2 , which is also within said recess g , and which meshes with the gear G. This pinion is upon the positively-driven shaft g^3 , which extends across the column or frame and carries or supports the pulleys g^4 . The gear
 45 G is connected with the movable plunger C by means of the crank-pin g^5 and the pitman g^6 . The end of the pitman is connected with the plunger, and also with the slide g^7 , by means of the pin g^8 . The slide g^7 is adapted to move in
 50 the vertical ways g^9 in the frame of the pump, and it serves to steady the plunger during its reciprocation; or, in other words, it prevents the twist motion which would otherwise occur if it were not used. The pump may lift the
 55 water from one or more of three sides of the machine. The casing of the air-chamber F is preferably bolted to the top surface of the column or frame, and is connected with the passage or chamber F' in the upper part of the
 60 column or frame, into which the hole or passage of the stationary plunger enters, and which has openings f , through which the water may escape. The stationary plunger is represented as formed at the end of the bent pipe f' , which
 65 has a flange, f^2 , by which it is bolted to the frame of the machine.

The chamber F' is connected with the suc-

tion-chamber B by means of the pipe H, for the purpose of relieving any excess of pressure. This pipe has a valve, h , by which the size of
 70 its passage is regulated.

It is obvious that the area of the passage c^3 of the movable plunger may have any relation desired to the size of the passage c' of the stationary plunger. For a differential pump I
 75 prefer that the area of the passage of the movable plunger be about twice as large as that of the passage of the stationary plunger, although I do not by any means confine myself to this proportion. It will be seen that the arrangement
 80 of the movable and stationary plungers, as herein indicated, insures the movement of water through the chamber in a straight or nearly straight direction, and avoids as much as possible a sinuous course; also, that when the area
 85 of the two plungers is varied the water being pumped is forced through the smaller pipe at an accelerated speed, and that this acceleration takes place at proper intervals; also, that the movable plunger is placed vertically and axially
 90 in relation to the stationary plunger and the lower barrel, and that the stuffing-boxes are thus kept from wearing out of true; also, that by providing the movable plunger with a barrel, and causing it to bear the prescribed relation
 95 to the stationary plunger and lower barrel, the sucking or drafting and the forcing of the water take place at the same instant, thereby maintaining a steady and uniform flow
 100 of water through the pump; also, that the construction of the operating mechanism is simple, cheap, and effective, and is arranged on the column, so that the column acts as a gear-guard to protect the gears from injury; also,
 105 that the suction and delivery chambers in the column are arranged so that the suction or discharge can be taken off from one or more points on three separate sides; also, that the shape of the frame-work and the arrangement
 110 of parts are such that a very small amount of floor-space is necessary for its use.

It will be seen that the lower or stationary plunger or section, a' , of the pump has a chamber, a^2 , which is considerably larger than the
 115 bore of the upper cylindrical section or sleeve, a^4 , and that connection with the suction is provided through the side of this chamber, and that this provides in the pump these desirable features: first, a greater capacity for
 120 receiving and holding water in a comparatively small space; second, a space of sufficient size to receive sediment or foreign matter pumped without interfering with or clogging the action of the pump; third, it provides for a suction-opening, which is so placed
 125 that it cannot be clogged or stopped by the lodging of foreign matter in the valve, and which is of full size or larger than the bore of the cylindrical extension a^4 . It will also be
 130 seen that the movable plunger C has the same elements—namely, a chamber considerably larger than the size of the cylindrical extension therefrom, which provides for the use of a large valve-opening, the holding of a large

quantity of water in a comparatively small space, and the reception of sediment and foreign matter without clogging or interfering with the action of the pump.

5 Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination, in a pump, of the post or column A', having the suction-chamber B in its base provided with two or more inlets, 10 and the delivery-chamber F' in its upper end having two or more outlets, the pipe H, connecting the said chambers B and F', the air-chamber F, connected with the delivery-chamber F', the barrel a', connected with the suction-chamber B, the stationary plunger E, 15 connected with or arranged to open into the delivery-chamber F', the reciprocating plunger C, having the sleeve c', arranged in relation to the barrel a' and the stationary plun-

ger E as specified, and the valves a¹³ c², substantially as described.

2. The combination, in a pump, of the post or column A', having at its base the suction-chamber B and at its top the delivery-chamber F', the relief-pipe H, connecting the said chambers B and F', the lower stationary barrel, a', having a horizontal extension opening into the said chamber B, the upper stationary hollow plunger, E, opening into the said delivery-chamber, the hollow plunger C, arranged in line with the said barrel a' and the plunger E, the valves a¹³ and c², the shaft g³, the pinion g², the gear G, the crank-pin g⁵, the pitman g⁶, and the slide g⁷, guided in ways in 35 the said column A', substantially as set forth.

WILLIAM O. WEBBER.

Witnesses:

F. F. RAYMOND, 2d,
FRED. B. DOLAN.