(No Model.) 2 Sheets—Sheet 1.

D. D. SHAW.

PUMP.

No. 489,419. Patented Jan. 3, 1893.

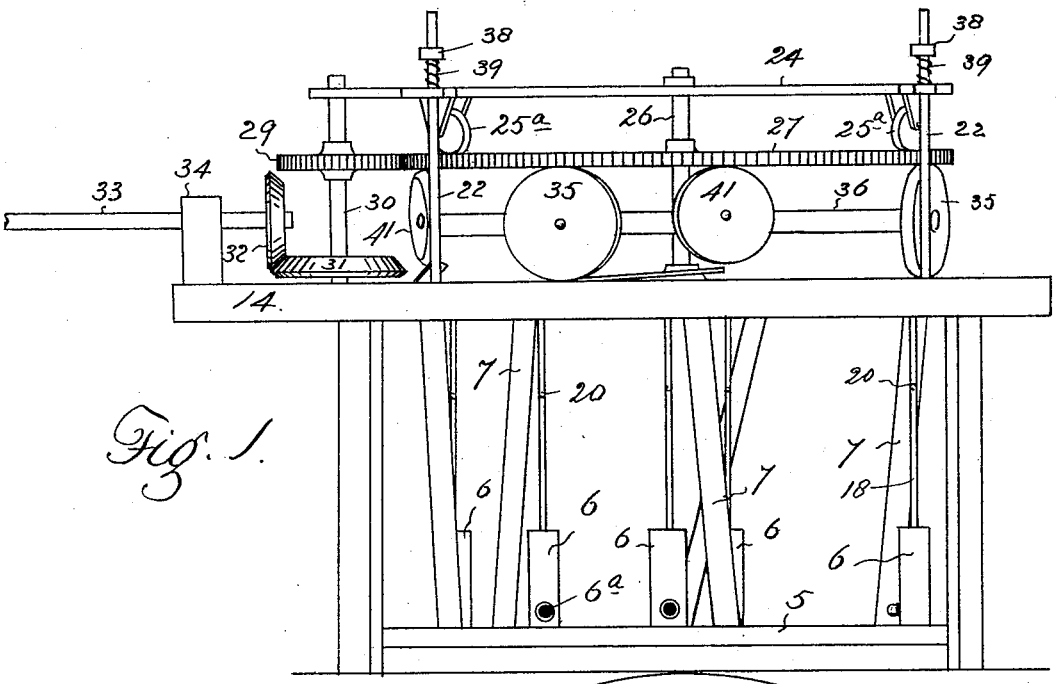


Fig. 1.

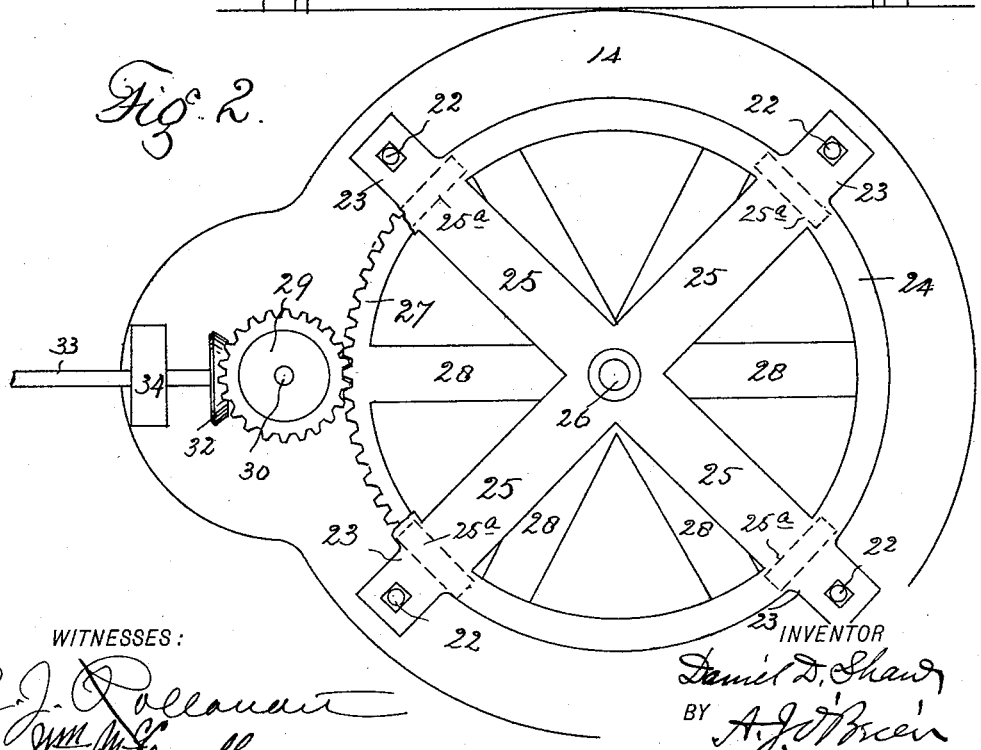


Fig. 2.

WITNESSES:

G. J. Rollmann

Wm. McConnell

INVENTOR

Daniel D. Shaw

BY A. J. O'Brien

ATTORNEY.

(No Model.) 2 Sheets—Sheet 2.

D. D. SHAW.

PUMP.

No. 489,419. Patented Jan. 3, 1893.

Fig. 3.

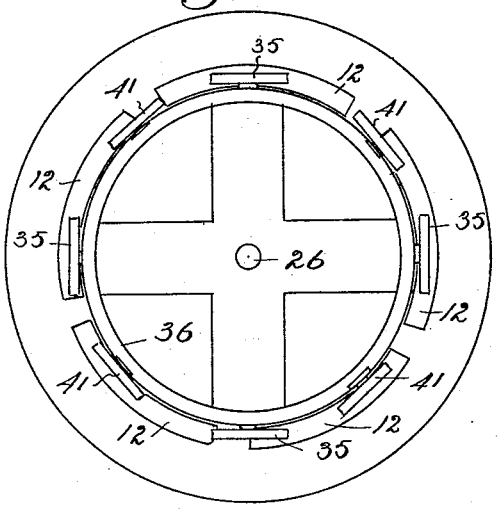
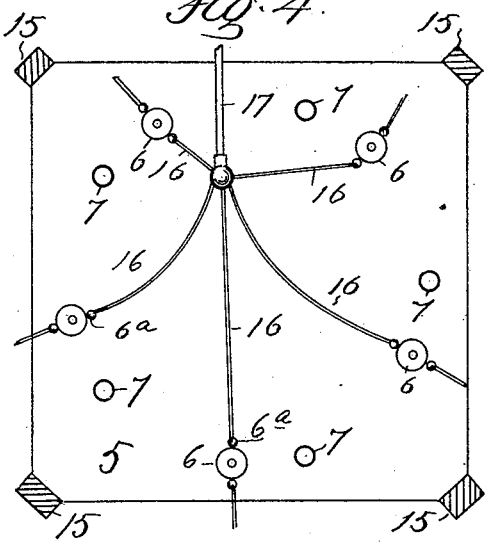


Fig. 4.



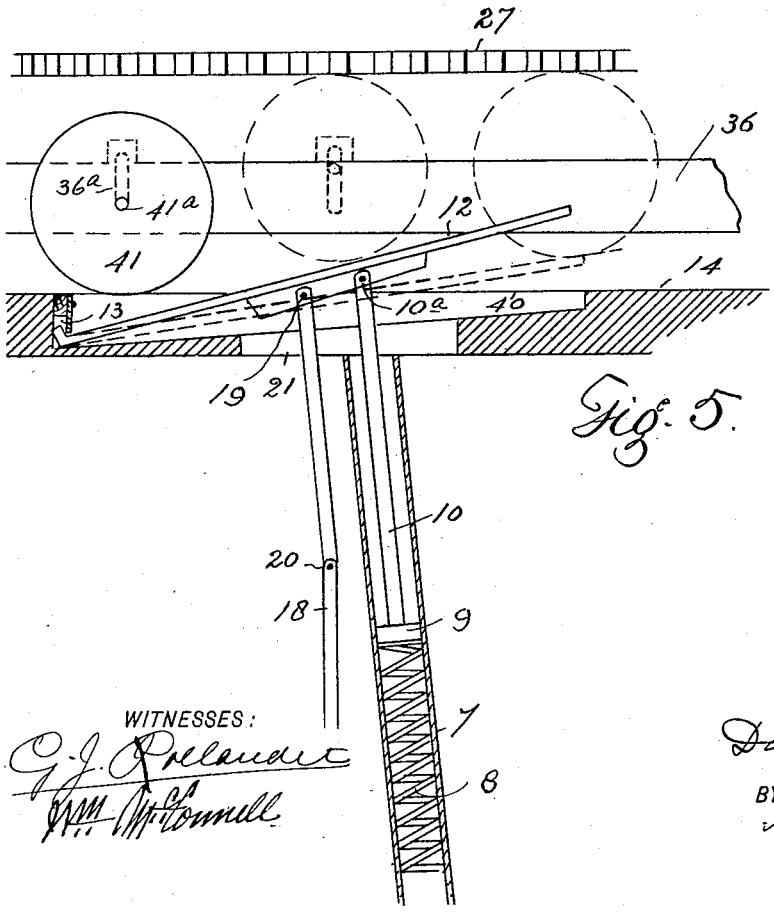


Fig. 5.

WITNESSES:

C. J. Pellandini

Wm. McConnell

INVENTOR

Daniel D. Shaw

BY A. J. Breier

ATTORNEY.

UNITED STATES PATENT OFFICE.

DANIEL D. SHAW, OF DENVER, COLORADO.

PUMP.

SPECIFICATION forming part of Letters Patent No. 489,419, dated January 3, 1893.

Application filed January 6, 1892. Serial No. 417,168. (No model.)

To all whom it may concern:

Be it known that I, DANIEL D. SHAW, a citizen of the United States of America, residing at Denver, in the county of Arapahoe and State of Colorado, have invented certain new and useful Improvements in Pumps; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in pumps and the object of the invention is to provide a device of the class stated which shall be of great capacity and capable of forcing water to any desired height, as for irrigating purposes, the pump being comparatively simple in construction, economical in cost, reliable, durable and efficient in use.

To these ends the invention consists of the features, arrangements and combinations hereinafter described and claimed.

In the accompanying drawings is illustrated an embodiment of my invention.

Figure 1 of the drawings is a side elevation of the machine. Fig. 2 is a top or plan view showing the movable top frame partially broken away to better illustrate the construction beneath. Fig. 3 is a top view of the machine with the adjustable top frame and the gear wheels removed. Fig. 4 is a horizontal section taken through the supporting frame between the upper and lower stationary platforms. Fig. 5 is a fragmentary section on an enlarged scale, taken through the upper stationary platform showing one of the spring supporting arms and the smaller engaging wheel in several positions as indicated by dotted lines.

Similar reference characters indicating corresponding parts or elements in the several views let the numeral 5 designate a stationary base upon which are supported the pump piston chambers 6, and the tubes 7, each tube carrying a coil spring 8, a piston 9 and a rod or stem 10 having its upper extremity pivoted to an arm 12 having one extremity movably secured in a suitable socket 13 formed in the upper stationary platform 14 connected with the base 5 by suitable legs or standards 15. The piston chambers are suitably located and connected with the water supply source and each provided with a valved outlet 6^a from which leads a suitable pipe or conduit 16, all of which conduits connect with a main supply pipe 17 provided with a suitable check valve, whereby the water may be carried or raised to any desired distance. From each piston chamber leads the piston rod or stem suitably connected at 19 with arm 12 and provided with an intermediate joint 20. Rod 18 is located between rod 12 and socket 33. Platform 14 is provided with an opening 21 of suitable size to allow rods 10 and 18 the required movement when arm 12 is actuated.

Suitably secured to the top of platform 14 and supported thereon are the vertical rods 22 passing through suitable apertures formed in the lugs 23 projecting exteriorly from the rim 24 provided with the radial arms 25 and centrally guided and retained in place by the post 26 journaled upon platform 14.

Suitably attached to the rim 24 and depending therefrom are the rollers 25^a engaging the upper surface of the rim of the wheel 27 rigidly secured to post 26, the rim being connected with the hub by radial arms 28. The cogged periphery of wheel 27 is engaged by pinion 29 rigidly secured to a vertical shaft 30 mounted upon platform 14 and carrying the bevel gear 31 near its base, meshing with a suitable gear 32 made fast to a horizontal shaft 33 journaled in a box 34 supported upon platform 14. Motion may be communicated to the wheel 27 by rotating shaft 33 which may be accomplished by the use of any suitable motor.

Wheel 27 is supported from below by the disks 35 which are pivoted upon the periphery of a horizontal wheel 36 secured to post 26 and rotating therewith. Disks 35 are of a diameter equal to the distance between wheel 27 and the platform 14. Rods 22 are provided with coil springs 39 surrounding the same and located above the movable frame 24. Nuts 38 are screwed upon the extremities of the rods to permit any suitable adjustment of the parts located between them and the platform 14. The arms 12 lie in the path of the disks 35 upon the platform 14 which is provided with a recess 40 adapted to receive arms 12 as they are thrust down by the disks

in actuating the piston rods 18. The outer face of rim 36 is also provided with another set of rollers 41 smaller than rollers or disks 35 and provided with pivots 41^a located in vertical slots 36^a formed in the outer face of wheel 36. When these wheels travel upon platform 14 the pivot 41^a is in the bottom of slot 36^a. The normal position of arms 12 when the pump pistons are at their upward limit of movement is inclined to the horizontal about as illustrated in Fig. 5, and projecting above the upper surface of the platform 14 as shown.

From the foregoing description it will be understood that the downward stroke of the pump-piston is accomplished by the downward thrust of arms 12 imparted by the rollers 35 and 41; also that the springs 8 in tubes 7 are simultaneously compressed by the downward movement of the piston 9; and further that the upward or return movement of arms 12 and the pump-pistons is effected by the recoil of springs 8 acting upon the pistons 9, the different sets or pairs of actuating rollers being sufficiently separated to permit any arm 12 to move upward to the normal position before the engagement of the next set of rollers or disks. In describing the action of these disks upon arms 12 I will suppose that the smaller roller or disk 41 is in front or engages the arm first. In order to act to advantage upon arm 12 the disk 41 must not begin to force the same downward until it reaches a point thereon just above where rod 10 is attached for obvious reasons. From the normal position of arm 12 as shown in Fig. 5 it will be observed that roller 41 in traveling upon platform 14 will engage said arm before the point for advantageous action is reached. Hence the pivot 41^a moves upward in slot 36^a until its periphery engages the rim of wheel 27, and the parts are so arranged and connected that when this occurs the disk will be directly above the point where rod 10 is attached. When in this position the disk must begin to thrust the arm downward by virtue of the engagement of wheel 27, whether or not the pivot has reached the highest point in the slot. Then as roller 41 moves downward it carries arm 12 downward to the position shown by dotted lines in Fig. 5 when the disk leaves the arm and falls by gravity to the platform 14 upon which it travels until another arm 12 is reached. The function of disk 41 having been accomplished a partial downward movement of arm 12 is effected, the larger disk 35 engages arm 12 at the instant the smaller disk leaves it and as the larger disk travels forward the downward thrust of the arm is completed, and at the moment this occurs, disk 35 leaves the arm which is suddenly returned to its normal position by the action of spring 8 as heretofore stated.

In case the pump is so located that the water in the supply source covers the piston chambers, the water will of course rise freely in said chambers, and spring 8 will only need sufficient power to overcome the gravity of arms 12 and its attachments. Hence a very weak spring may be employed which will correspondingly diminish the power necessary in compressing the springs, as the pump-pistons are forced downward. Therefore where these conditions exist it is practicable to make use of two sets of pump mechanism with each arm 12, one piston chamber being located on each side of tube 7. It will thus be seen that this construction has great pumping capacity and possesses superior advantages as a water elevator for irrigating or other purposes.

Having thus described my invention what I claim is:—

1. The combination with a pump mechanism, of a stationary platform supported above the piston chambers and provided with arms having one extremity located in a suitable socket and spring mechanism normally supporting the opposite extremity above the stationary platform giving the arm an inclined position, the piston rods or stems being connected with these arms, and a rotating frame carrying rollers adapted to engage the stationary platform, the inclined arms lying in the path of these rollers whereby the movement of the rollers forces the arms downward, substantially as described.

2. The combination with the pump mechanism the stationary frame, the inclined arms connected with the pump pistons, a horizontal frame carrying rollers adapted to engage said arms, a horizontally rotating wheel above said frame and actuating the same by the bearing of its rim upon the rollers and a vertically movable spring actuated frame provided with bearings adapted to engage the rotating wheel and maintain the same in position, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

DANIEL D. SHAW.

Witnesses:
WM. MCCONNELL,
S. PALMER.