

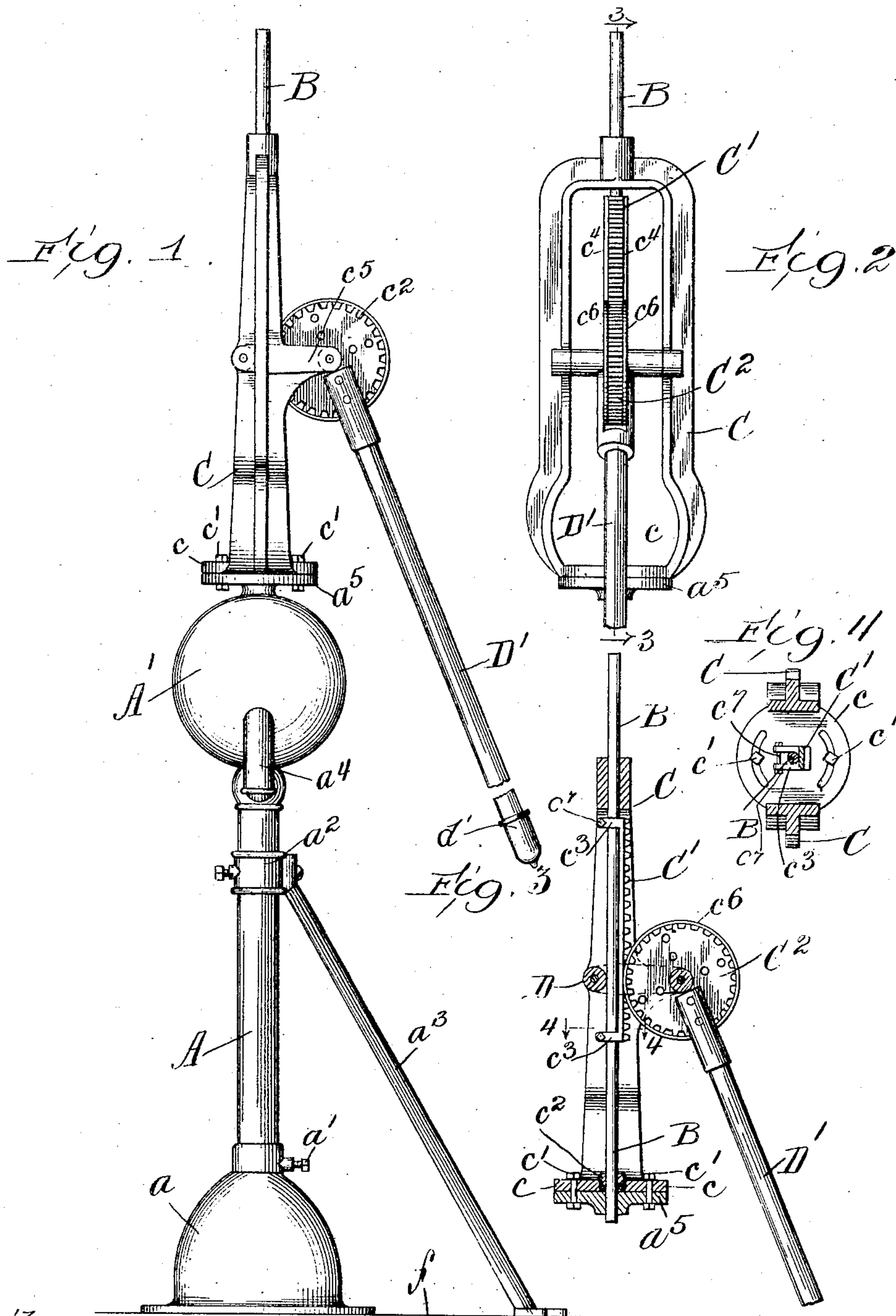
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C. F. MAYER.
OPERATING MEANS FOR PUMPS.

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NO MODEL.



Witnesses:
Ray White
Harry Rolerhut

Inventor:
Christian E. Mayer,
By Charles W. Hill, Atty.

UNITED STATES PATENT OFFICE.

CHRISTIAN F. MAYER, OF MILLERSVILLE, PENNSYLVANIA, ASSIGNOR TO
PENNSYLVANIA PNEUMATIC PUMP COMPANY, OF DAVENPORT, IOWA,
A CORPORATION OF ARIZONA TERRITORY.

OPERATING MEANS FOR PUMPS.

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To all whom it may concern:

Be it known that I, CHRISTIAN F. MAYER, a citizen of the United States, and a resident of Millersville, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Operating Means for Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to improvements in operating means for pumps and is shown more particularly in relation with a suction and force pump. Heretofore while hand-actuated means for the operation of pumps have assumed many forms it has usually occurred that the effective force has varied at different parts of the stroke. It has also frequently occurred that the wear and the lost motion due from wear of the parts has frequently seriously affected the utility of pump-operating means.

I am aware that pumps have been heretofore operated by means of a rack-bar and toothed segment; but in the prior constructions adequate provision has not been made for adjustment and to compensate for the wear of the mechanism. The object of this invention is to provide a construction admitting adjustment of the pump to any desired height and affording a one-piece unitary pump-head thereon, through which reciprocates the pump-rod, and to provide adjustable means on said pump-head coacting with complementary means upon the pump-rod for operating the pump, and so constructed as to enable the operating means to be quickly adjusted to compensate for the wear due to operation.

The invention consists in the matters hereinafter described and more fully pointed out and defined in the appended claims.

Figure 1 is a pump provided with a pump-head and operating means embodying my invention, showing the latter in side elevation. Fig. 2 is a front elevation, partly broken, of

the pump-head and operating means. Fig. 3 is a section taken on line 3 3 of Fig. 2. Fig. 4 is a section taken on line 4 4 of Fig. 3.

As shown in said drawings, A indicates the pump-tube or pipe, which may extend to any desired depth, either into an open well or a drive-well, as preferred, and, as shown, comprises a metallic tube or pipe of the usual kind or any kind. Said pipe is sunk to any desired depth and the upper end thereof cut and threaded to afford a desired height above the ground or platform *f*. The base portion *a* is slipped over the pipe and secured in place with a set-screw *a'* and bolted or screwed to the platform. Adjustably secured on said pipe is a collar or sleeve *a''*, with which is connected a brace *a'''* of the usual or any desired kind, which extends diagonally from said pipe and at its lower end is likewise secured to the platform. An air-chamber *A'*, provided with a spout *a''''*, has threaded connection with the upper end of said pipe and may be provided with any interior valve mechanism (not shown) of the usual or any desired type to enable said pump to be used as a lift-pump or force-pump, as preferred. Said air-chamber *A'* is provided on its upper side and concentric with the axis thereof with a flanged base *a''''''*, and extending upwardly through the pipe *A* of the air-chamber *A'* and axially through the base-flange *a''''''* is a pump-rod *B*. Secured on said flange-base *a''''''* is a pump-head *C*, comprising a one-piece open casting having at the lower end a flat face through which on opposite sides thereof are provided segmentally-slotted apertures, as shown in Fig. 4, adapted to receive bolts *c'*, engaged in said base-flange *a''''''*, whereby said pump-head can be adjusted with respect to the spout *a''''* to any desired position. The pump-rod *B* also extends through said pump-head, which is provided at its top with an aperture to afford a bearing for the upper end thereof and is provided centrally in its base *c* with a threaded aperture adapted to receive the follower-nut *c''*, adapted to jam packing of any suitable kind or material upon the base-flange *a''''*, affording a gland for the pump-

rod. Said pump-rod B is provided intermediate the base c and the top of said pump-head with a rack-bar C' , rigidly secured thereon, but adjustable as to height, and provided
 5 at each end with a clamping-yoke c^3 , which engages the rod B and the ends of which are drawn firmly together by means of a bolt c^7 extending therethrough, as shown more fully in Fig. 4. The face of said rack-bar is planed on
 10 each side of the rack to afford a straight-edged face c^4 on each side thereof, beyond which the teeth project, and a pinion C^2 is journaled in laterally-extended arms c^5 of each pump-head and meshes with said rack-bar, as shown in
 15 Figs. 2 and 3, and is provided at its periphery, at each side of the teeth thereof, with a plain band c^6 , which tracks upon the plane lateral portion of said rack-bar and serves as a guide therefor and to force the pump-rod at the
 20 rear of said rack-bar against a roller D, journaled on said pump-head, and between which and the pinion the pump-rod reciprocates. Said pinion C^2 , as shown, is operated by a lever or handle D' , provided with a counter-
 25 weight d' at its extremity. As shown, said handle at its upper end is slotted and engages over the pinion and is secured thereto by bolts which extend through registering apertures in said handle and said pinion. For
 30 the purpose of compensating for wear should such occur said pinion is provided in different radial lines with a plurality of apertures in any of which said handle may be engaged, so that should one portion of the pinion become worn through use it is only neces-
 35 sary to remove the handle therefrom, adjust the pinion to bring a different wearing-surface in engagement with the rack, and again secure the handle by means of bolts passing
 40 through suitable apertures to said pinion. In a like manner the rack-bar may be adjusted vertically on the pump-rod by releasing the bolts c^7 , which secure the rack, and sliding said rack up or down the required distance.
 45 If preferred, also, a pinion corresponding with the pinion C^2 may be substituted for the roller D and a handle connected therewith, as before described. When so constructed, a rack-bar is provided on each side of the pump-
 50 rod, and the pump may be actuated by either or both of said pinions. When operated singly, however, the inner bolt from the pinion not in use may be removed from the handle not operated, thus permitting the said handle to
 55 depend upon the pinion.

The operation is as follows: The pump-head may be adjusted to any desired height when first installed by cutting the tube A to the desired height above the platform, securing the
 60 pump-head thereon, as before described. Should it be desired at any time to reduce the height of the pump, the said pump-head and air-chamber may be removed and a portion cut from the upper end of the pipe, the upper
 65 end threaded and the pump-head again re-

turned to positions, thus enabling the construction to be arranged at any suitable height for convenient operation.

From the construction described the pump-head C is capable of adjustment by releasing
 70 the bolts c^7 and rotating the pump-head partly upon the base-flange a^5 and again securing the bolts into engagement therewith. It is thus possible to arrange said head to afford the
 75 most convenient position for the operator when pumping. Inasmuch as the pinion C^2 bears positively with its lateral rims or bands c^6 against the plane track c^4 of the rack, the teeth of the pinion and rack though intermeshing do not receive as much wear as would
 80 otherwise be the case. The rack-bar and the pump-rod being supported on the rear side from said pinion, the pump-rod is reciprocated vertically at all times, with the upper and lower bearings and the bearing afforded
 85 between the pinion and roller D in perfect alinement. The counterweight on the handle of course is designed in part to balance the weight of the pump-rod and the column of water supported thereon and greatly reduces
 90 the labor of pumping. It is also evident that inasmuch as the bands c^6 are engaged on each side the pinion at the periphery of the teeth the notches intermediate the teeth open
 95 through the pinion below said band, thus affording ready escape of moisture and preventing the pinion filling with ice in cold weather.

Obviously many details of construction may be varied without departing from the principles of this invention.

I claim as my invention—

1. In a lifting and force pump, a one-piece pump-head adjustably secured thereon, a pump-rod extended therethrough, a rack-bar
 105 adjustably engaged on said rod, a bearing-face on each side of said rack-bar, a pinion journaled on said head in position to engage said rack-bar, a peripheral band on both sides of said piston extending beyond the teeth
 110 thereof adapted to bear on the bearing-faces of said rack-bar and means for changing the point of contact of said pinion on said rack-bar comprising a plurality of sets of radially-disposed apertures through said pinion and a
 115 handle adapted to engage any of said sets of apertures.

2. In a pump of the class described, a one-piece pump-head adapted to be adjustably secured upon a pump or the like, a pump-rod
 120 having upper and lower bearings in said pump-head and reciprocating therethrough, a rack-bar adjustably secured on said pump-rod within the pump-head, lateral plane faces on said rack-bar between which the teeth project, a pinion rotatively journaled on said
 125 pump-head and intermeshing with the rack-bar, a band on one or both sides of said pinion bearing against the plane faces of the rack-bar and through which the meshes of the pinion open, said pinion having a plurality of
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radially-disposed apertures therein and a handle or operating-lever adapted to be rigidly engaged to said pinion by means of bolts extending to any of said radial apertures and a
5 counterweight on the end of said lever.

3. A combination of a pump of an integral pump-head secured thereon by means affording partial rotation of the same with respect to the pump, a pump-rod reciprocating there-
10 through and having bearings in the upper and lower end of said pump-head, a stuffing-box in the lower of said bearings, a rack-bar, clamping means at each end thereof adapted to adjustably engage the same to the pump-
15 rod, a plane bearing-surface on each side of said rack-bar for approximately the entire length thereof and beyond which the teeth project, a pinion having a bearing-face on each side thereof projecting beyond the teeth
20 of the pinion, the teeth of said rack-bar inter-

meshing with those of said pinion while the bearing-faces thereon engage on the plane faces of the rack-bar, a handle adapted to be secured on said pinion at any one of a number of radially-disposed positions thereby adapt- 25 ing the pinion to be shifted in the event of wear, a roller disposed behind the pump-rod against which the same is forced by said pinion and a counterweight on the end of the pump-handle adapted to compensate the 30 weight of the pump-rod and supported column of water.

In witness whereof I have hereunto subscribed my name in the presence of two subscribing witnesses.

CHRISTIAN F. MAYER.

Witnesses:

CHAS. E. LONG,
GEO. W. ASPER.