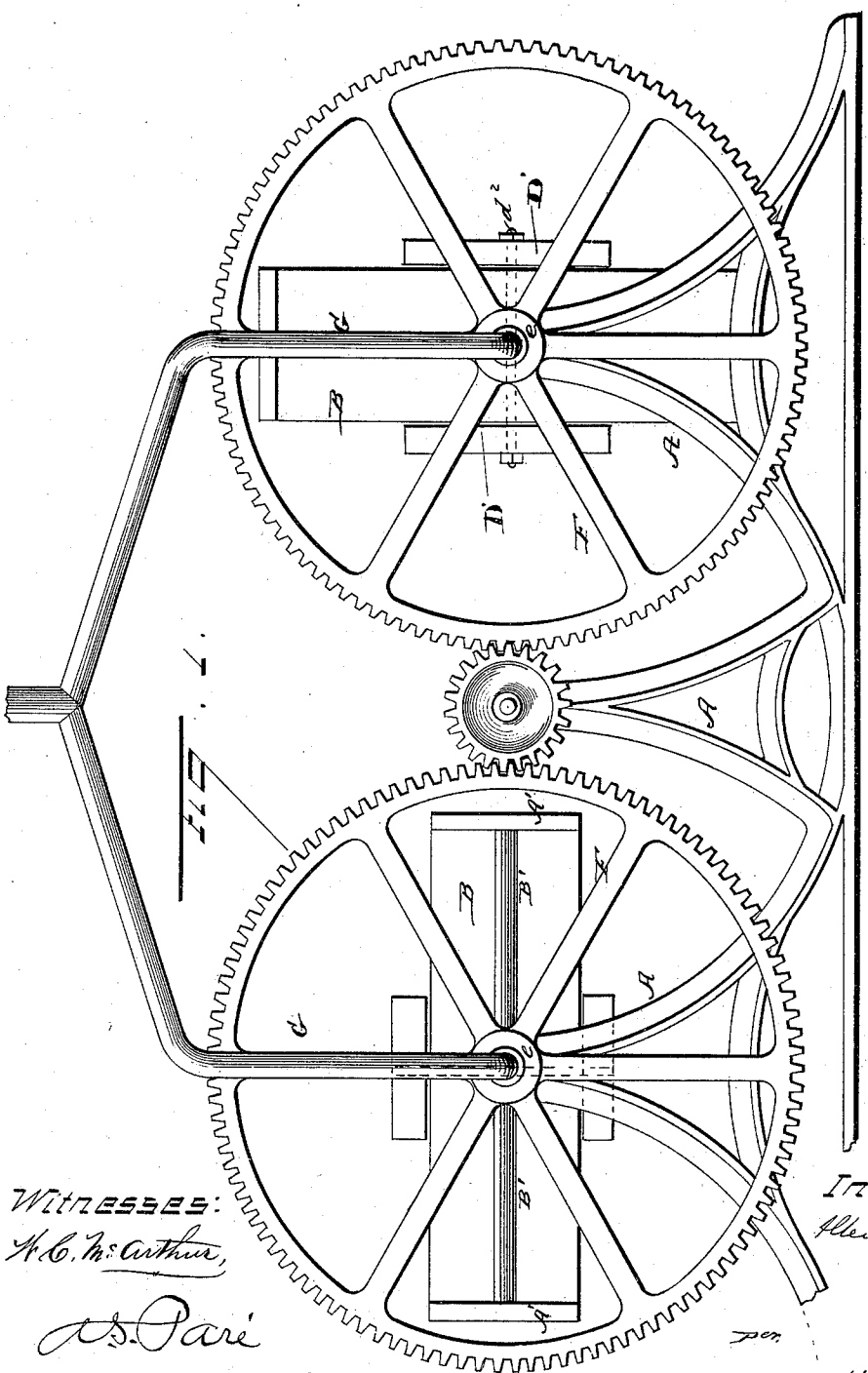
(No Model.) 2 Sheets—Sheet 1.

A. ANNIBALE.

PUMP.

No. 316,434. Patented Apr. 28, 1885.



Witnesses:
H. C. McArthur,
W. S. Paré

Inventor.
Alessandro Annibale
per
H. Harrison
Attorney.

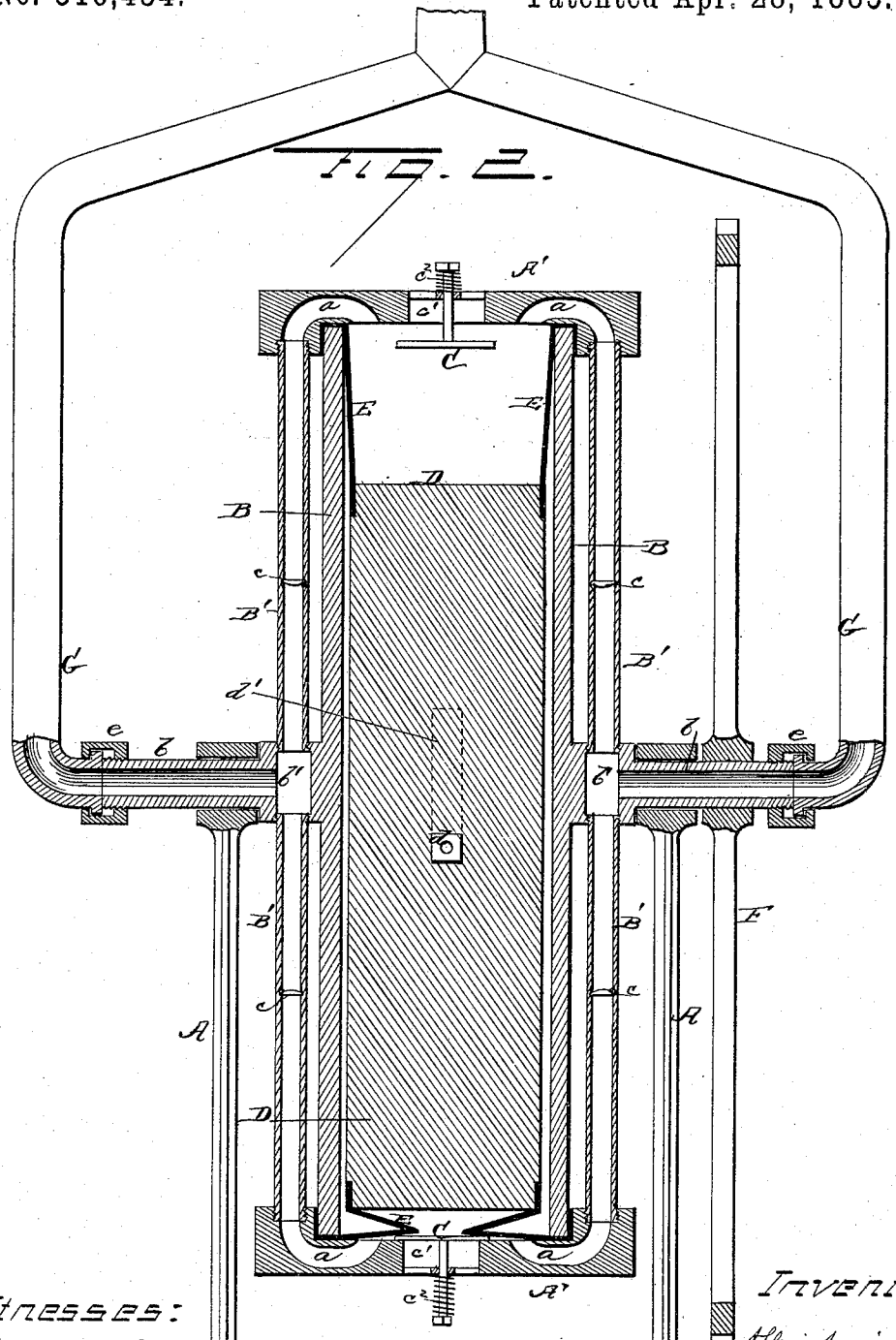
N. PETERS. Photo-Lithographer, Washington, D. C.

(No Model.) 2 Sheets—Sheet 2.

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Inventor.
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H. Harrison
Attorney.

N. PETERS. Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

ALLEVI ANNIBALE, OF CHICAGO, ILLINOIS.

PUMP.

SPECIFICATION forming part of Letters Patent No. 316,434, dated April 28, 1885.

Application filed April 10, 1884. (No model.)

To all whom it may concern:

Be it known that I, ALLEVI ANNIBALE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Gravitating Pumps, of which the following is a specification, to wit:

This invention relates to an improvement in gravitating pumps; and it consists in certain peculiarities of the construction and arrangement of the same, substantially as will be hereinafter more fully described and claimed, whereby the power of the pump is increased.

In order to enable others skilled in the art to which my invention appertains to make and use the same, I will now proceed to describe its construction and operation, referring to the accompanying drawings, in which—

Figure 1 is a side view of a pump such as I will describe, and Fig. 2 is a vertical transverse section of the same.

A represents the supporting-frame of my pump, in which is journaled the pump-casing B. This casing is of any desired form and size, and the trunnions *b b* are cast or formed with it. These trunnions *b* are formed with a chamber, *b'*, which is by pipes B' connected with cored passages *a a* in the ends or caps A' of the casing, as shown in Fig. 2. Each pipe B' is provided with a valve, *c*, opening toward the chambered trunnions; and the caps A' are each formed with an opening, *c'*, for the admission of water, which opening is closed by a valve, C, opening inward and having a spring, c^2, upon its stem to balance its weight and aid in closing it.

Within the casing B is placed a heavy piston or plunger, D, which is somewhat smaller in cross-section and shorter than the casing, in order that as the latter revolves the weighted piston will fall freely from end to end of the casing. To the ends of the piston are secured the inner ends of a bag, E, of any suitable flexible water-proof material, as leather, canvas, or rubber, the outer ends of which are firmly secured between the ends of the casing and its caps. The piston D is formed upon each side with a projecting pin or arm, *d*, which passes through and works in a slot, *d'*, in the adjacent side of the casing, and shown by dotted lines in Fig. 2. Upon these arms or pins *d* are hung any suitable weights, D', secured by a bolt, d^2, passing through the piston, and which may be increased or diminished at pleasure to increase or diminish the power of the pump, as will be readily understood.

The hollow trunnions *b* extend upon each side beyond the journals in which they are supported, and upon one side is provided with a gear-wheel, F, by which power is applied from any desired motor to operate the pump. To the outer ends of the trunnions are secured by proper couplings *e* the ends of the escape-pipes G, which are carried up over the machine and united, for convenience in directing the flow in any direction.

In the construction of this pump for heavy work, I prefer to journal in the frame A two or more of the revolving casings B, arranged, as in Fig. 1, to balance each other, one being always at right angles to the other, and their pipes G connected to a common outlet. All the casings are connected together by means of their gears F, either with or without the interposition of an idler, as in Fig. 1, and operated from the same power.

The operation of this pump is obvious. Power being applied and the casing revolved, it is evident that when wholly submerged in water, when the casing reaches an angle of forty-five degrees the weighted piston begins to descend and the valve at the upper end is then opened by the pressure of the water, which rushes in to fill the bag E. As the pump continues to revolve, the end containing water is passed down till it in turn reaches the angle below the horizontal, and the descent of the piston collapses the bag and forces the water through the tubes B', the hollow trunnions *b*, and pipes E. This is continued as long as the pump is in motion, and, as the weights hung upon the piston can at any time be changed, any desired force may be applied to the water without in any way changing the pump and without materially increasing the power applied to operate it.

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

1. In a gravitating pump, a revolving casing provided with inlet and outlet passages for the water, and having its sides slotted, in combination with a gravitating piston placed

therein, and having arms projecting through and moving in the slotted casing, and removable weights secured upon said arms, substantially as and for the purpose set forth.

2. In a gravitating pump, a revolving casing having its ends or caps formed with cored passages for the inlet and outlet of water, and formed with slotted sides, and hollow trunnions connected by pipes with the outlet passages of the caps, in combination with the piston provided with weighted arms working in the slots in the casing, the flexible water-proof bags connecting the adjacent ends of the piston and casing, and the escape-pipes connected to the ends of the hollow trunnions, substantially as shown and described.

3. In a gravitating pump, two or more casings, B B, having hollow trunnions *b*, journaled in the main frame and connected by pipes B′ with the cored caps A′ upon the ends of the casing, in combination with the pistons D, flexible bags E, gears F, and pipes G, secured to the trunnions by couplings *e*, allowing of the free revolutions of the pump, substantially as shown and described.

4. The casing B, provided with means, substantially as shown, for the inlet and outlet of water, and having its sides provided with slots *d*′, in combination with the piston D, cast with arms *d*, working in these slots, and the weights D′, secured upon the arms outside the casing by a bolt, d^2, substantially as and for the purpose set forth.

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

ALLEVI ANNIBALE.

Witnesses:

W. C. McARTHUR,

WILLIAM DALY,

M. G. WUERTHOFF.