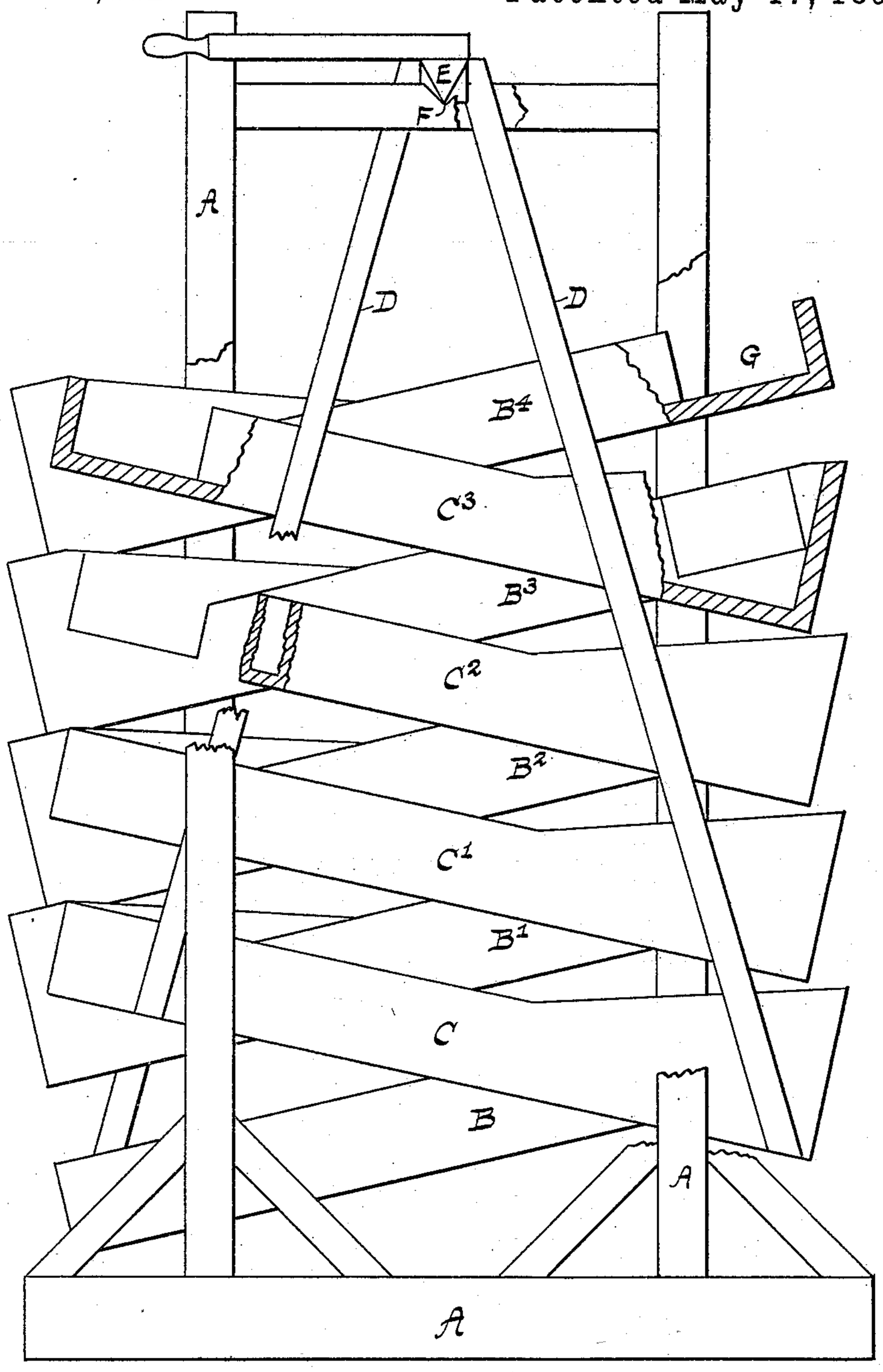
(No Model.) 2 Sheets—Sheet 1.

A. J. VANCE.

WATER LIFTING MACHINE.

No. 604,242. Patented May 17, 1898.



Witnesses
J. Landering -
K. W. Edwards.

Fig. 1.

Inventor.
A. J. Vance.

Power Publishing Co.
per C. W. Ch. Jr.
Attorney

(No Model.) 2 Sheets—Sheet 2.

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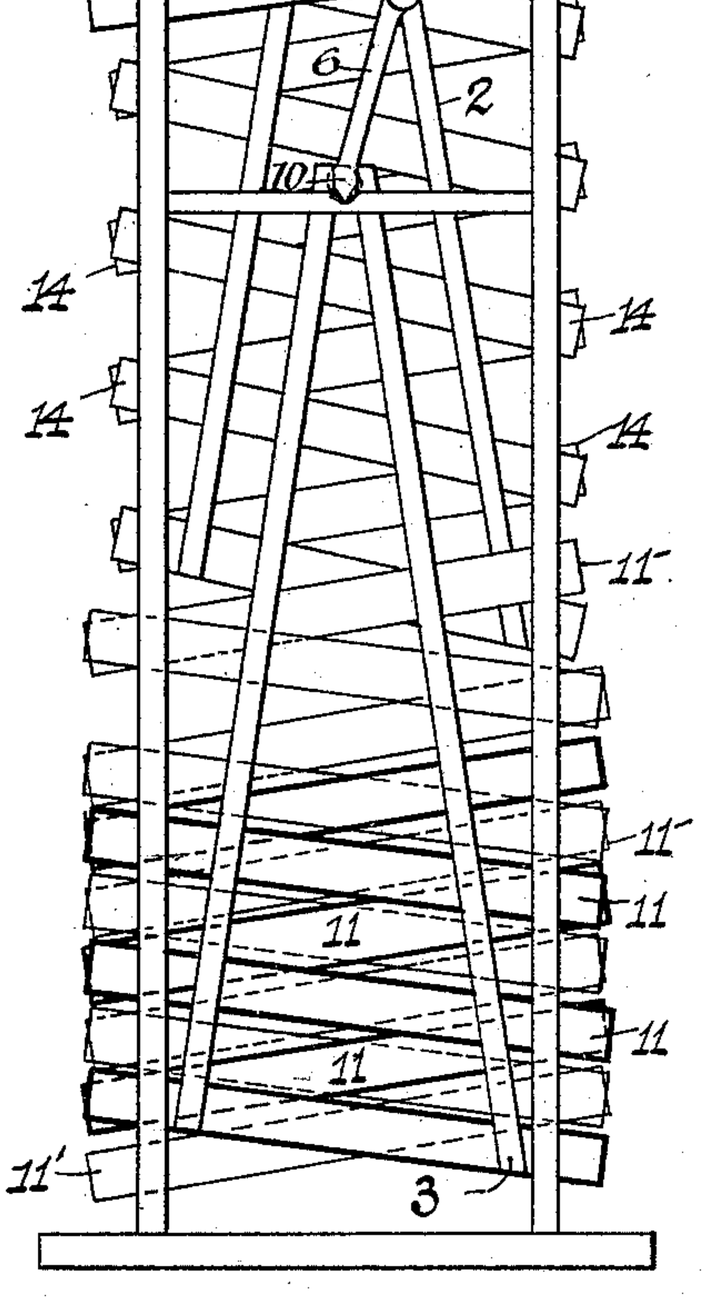

Fig. 2.

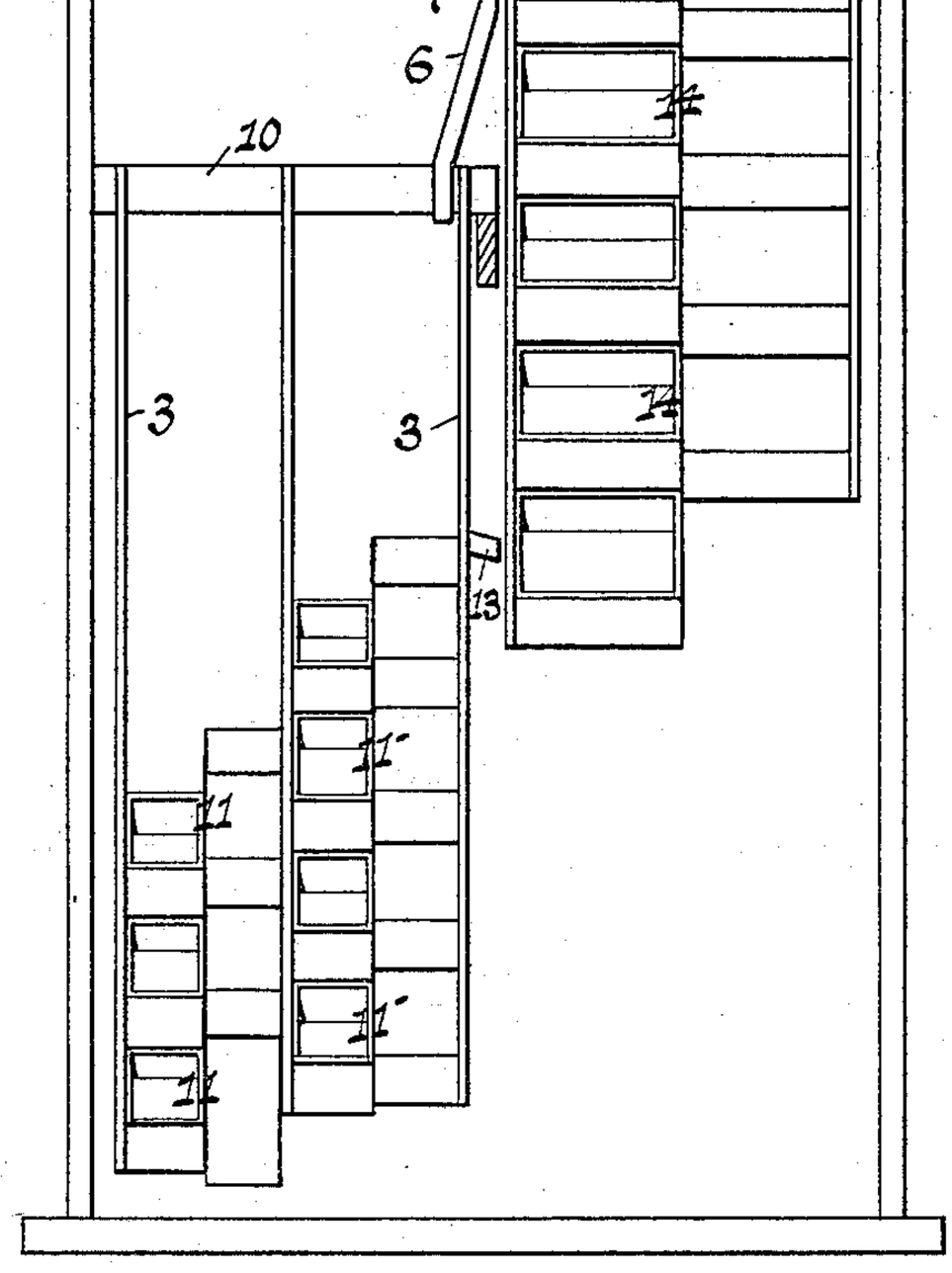

Fig 3

Witnesses
J. Landsing
K. W. Edwards.

Inventor
A. J. Vance.

Power Publishing Co.
per C. W. Ch. Jr.
Attorney.

UNITED STATES PATENT OFFICE.

ALPHEUS J. VANCE, OF GRAND JUNCTION, COLORADO.

WATER-LIFTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 604,242, dated May 17, 1898.

Application filed October 28, 1896. Serial No. 610,290. (No model.)

To all whom it may concern:

Be it known that I, ALPHEUS J. VANCE, a citizen of the United States, and a resident of Grand Junction, in the county of Mesa and State of Colorado, have invented certain new and useful Improvements in Water-Lifting Machines, of which the following is a specification.

My invention relates to a device for raising water to any height that may be desired. The distance to which it may be lifted is limited only by the size of the machine which it is desired to construct.

In order that the construction of the machine may be understood accurately, the accompanying drawings are added.

Figure 1 is a front elevation with parts broken away here and there, so as to bring to view the interior construction. Fig. 2 is a front elevation of the device, involving an extension of the invention to larger purposes and on a grander scale. The figure is more in the nature of a diagram than a representation of all the details, for these are clearly indicated in Fig. 1, while Fig. 2 shows an additional element in outline. Fig. 3 is a view similar to that in Fig. 2, only taken at a direction of ninety degrees to the latter. It shows parts not clearly located in Fig. 2. For example, A shows definitely that the second and third sets of troughs are on different pendulums from the first set. Some parts indicated fully in Fig. 2 are partially omitted in Fig. 3. For example, the troughs are not represented entirely, but only as to their ends.

A is a tower or framework. Suspended from the top of the same in a pendulum-like manner are troughs B, B′, B^2, B^3, and B^4, all substantially parallel to each other and all definitely inclined to the horizontal position when the pendulum is standing vertically. There is another series of troughs C C′ C^2 C^3 similarly parallel to each other and inclined, but the inclination is in the opposite direction. The two series of troughs are secured together in such a manner that the upper ends of the troughs B B′ B^2 B^3 B^4 are at the lower ends of the troughs C C′ C^2 C^3. The sides of the troughs are broken away to such an extent that there is a passage-way between the upper ends of the troughs B B′ B^2 B^3 B^4 and the lower ends of the troughs C C′ C^2 C^3. Further than this the upper ends of the troughs C C′ C^2 C^3 are connected to the lower ends of the troughs B B′ B^2 B^3 B^4, and passage-ways are formed at the ends thus connected. Passage-ways in all cases are provided, so that the water may flow from one series of troughs to the other during operation, as hereinafter set forth. The troughs are thus rigidly secured together and in turn are fastened to the pendulum, which is lettered D, and formed of rods which extend from the troughs upward to the rocking shaft E, whose fulcrum is at F, upon the cross-beams attached to the frame A.

In practice the machine is so placed that the greater portion and the lower open end of the lowest trough B is immersed in water. Power is applied to the crank. For example, inasmuch as no steam or water wheel is shown in the drawings, one's hand may be taken as an example of the moving power. The handle is so operated back and forth that the pendulum D swings back and forth, carrying with it the series of troughs. The final result is the passage of water at the upper open end through the notch G in the farther side of the trough B^4 or whatever trough is the highest. Lower troughs of course may be tapped to any height. A slight vibration of the pendulum would not be sufficient to accomplish this result, for the water would merely run part the way up the trough B and back again. The swinging should take place to such an extent that the upper end of the trough B, considered in the normal condition, should become the lower end. This is accomplished by inclining the pendulum until the trough B inclines in a direction opposite to that assumed in the normal condition represented in the figure. The water therefore passes from the first trough B into the next trough C, and as the pendulum is maintained swinging the water, for similar reasons, passes to the trough B′, then to the trough C, then B^2, and then to C^2, &c., to the top. As a brief period of time is necessarily occupied for water to move from one portion to another a greater proportion of the water is elevated, if the motion is made intermittent, by stopping the pendulum at each highest position reached by the pendulum.

It is evident that the invention may be

modified without departing from the spirit of my invention. For example, the number of series of troughs may be multiplied either by adding more and more at the top or by adding more and more at the sides. Further, I do not limit myself to any particular kind of engine or machine for operating or communicating motion to the pendulum.

Referring particularly to Figs. 2 and 3, it will be noticed that there are three distinct swinging sets of troughs supported on suspended arms or pendulums 1 2 3. Motion is communicated to the top one, for example, through the lever 4, and motion is communicated from the pendulum 1 to the pendulum 2 by the connecting-rod 5 and from the pendulum 2 to the pendulum 3 by the connecting-rod 6. The rod 5 has a slotted portion 5′, in which is located a pin 7, fastened to the pendulum 1. The other end of the rod 5 is secured to the rocking shaft 9 of the pendulum 2. Likewise the rod 6 has a slotted end 6′, in which is located a pin 7′, fastened to the pendulum 2. The other end of the rod 6 is rigidly secured to the rocking shaft 10 of the pendulum 3. In view of this construction motion which is communicated to the handle 4 is transmitted to all the sets of troughs, so that they swing back and forth. The lower set of troughs of the pendulum 3 is divided into two subsets 11 and 11′. The set 11 is the first to take up the water, as described in reference to Fig. 1, and this set is adapted to take water only on one stroke. The set 11′ takes water on the opposite stroke, and, finally, the water is fed from the spout 13 into the next higher set 14, whereby the water is raised to the top of the said set, whence it may be emptied into the next higher set 15 at a spout, which is shown on the farther side of the apparatus, except in Fig. 3.

I claim as my invention—

A water-lifting machine consisting of the combination of a swinging pendulum having a series of troughs in which the troughs are placed one above the other, in parallel directions and at a given angle to a horizontal plane, a second series of troughs similarly arranged, but inclined in an opposite direction at about the same angle, the troughs of one series communicating by passage-ways at their ends, with the troughs of the other series, a second set of series of troughs located at a higher level, and communicating by a waterway, other similar sets of series of troughs, and connecting-rods between the pendulums for communicating motion from the top pendulum to the lowest, the several series of troughs being respectively on different pendulums.

Signed at Victor, in the county of El Paso and State of Colorado, this 19th day of October, A. D. 1896.

ALF. J. VANCE. [L. S.]

Witnesses:
JOHN W. HOFF,
E. M. JOHNSON.