

(No Model.)

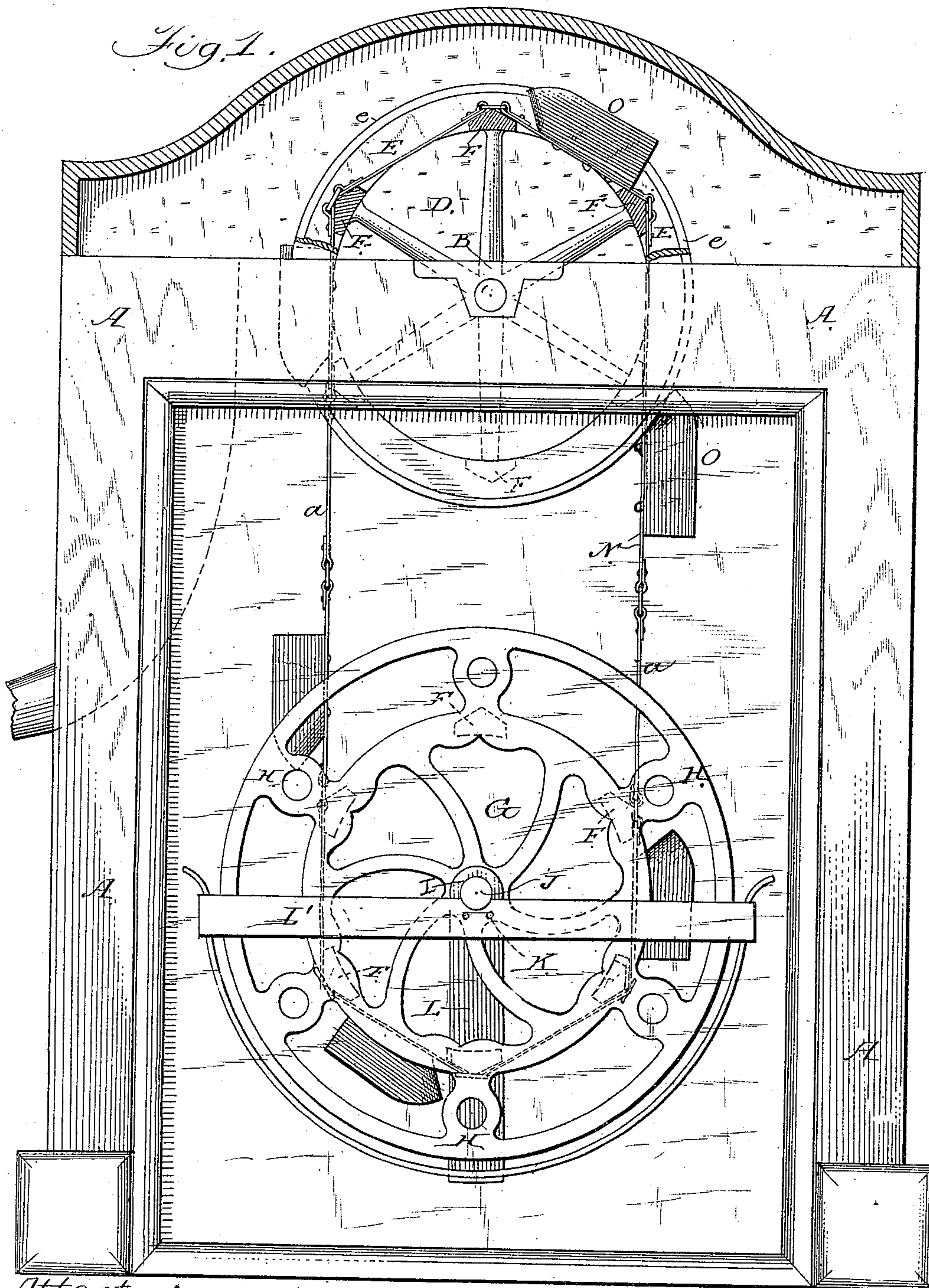
2 Sheets—Sheet 1.

R. P. ZIMMERMAN.

APPARATUS FOR ELEVATING AND PURIFYING WATER.

No. 249,138.

Patented Nov. 1, 1881.



Attest:

Walter Fowler
Rich^d H. Brown

Inventor;

Richard P. Zimmerman
by Hugh H. Gordon
his Atty.

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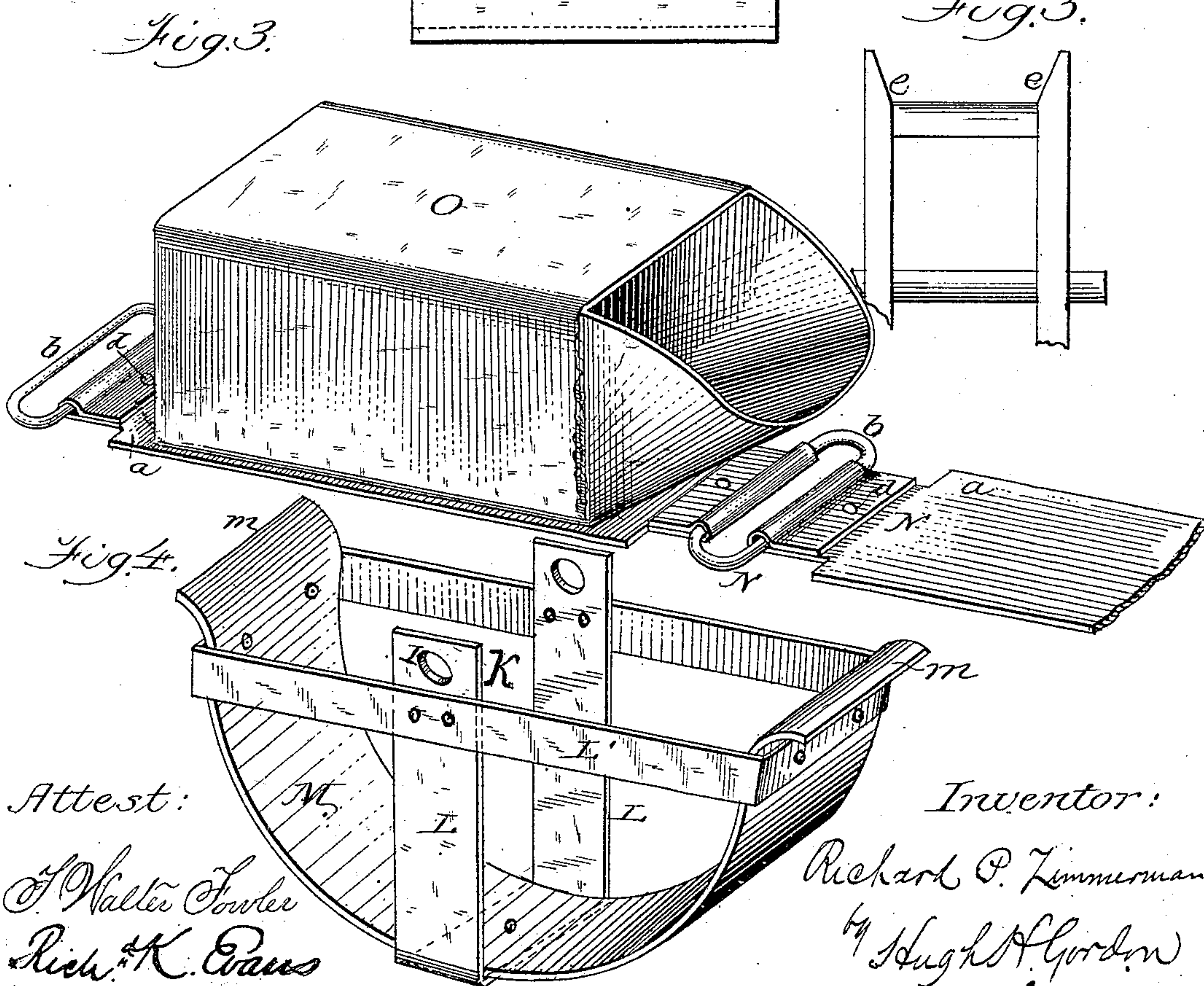
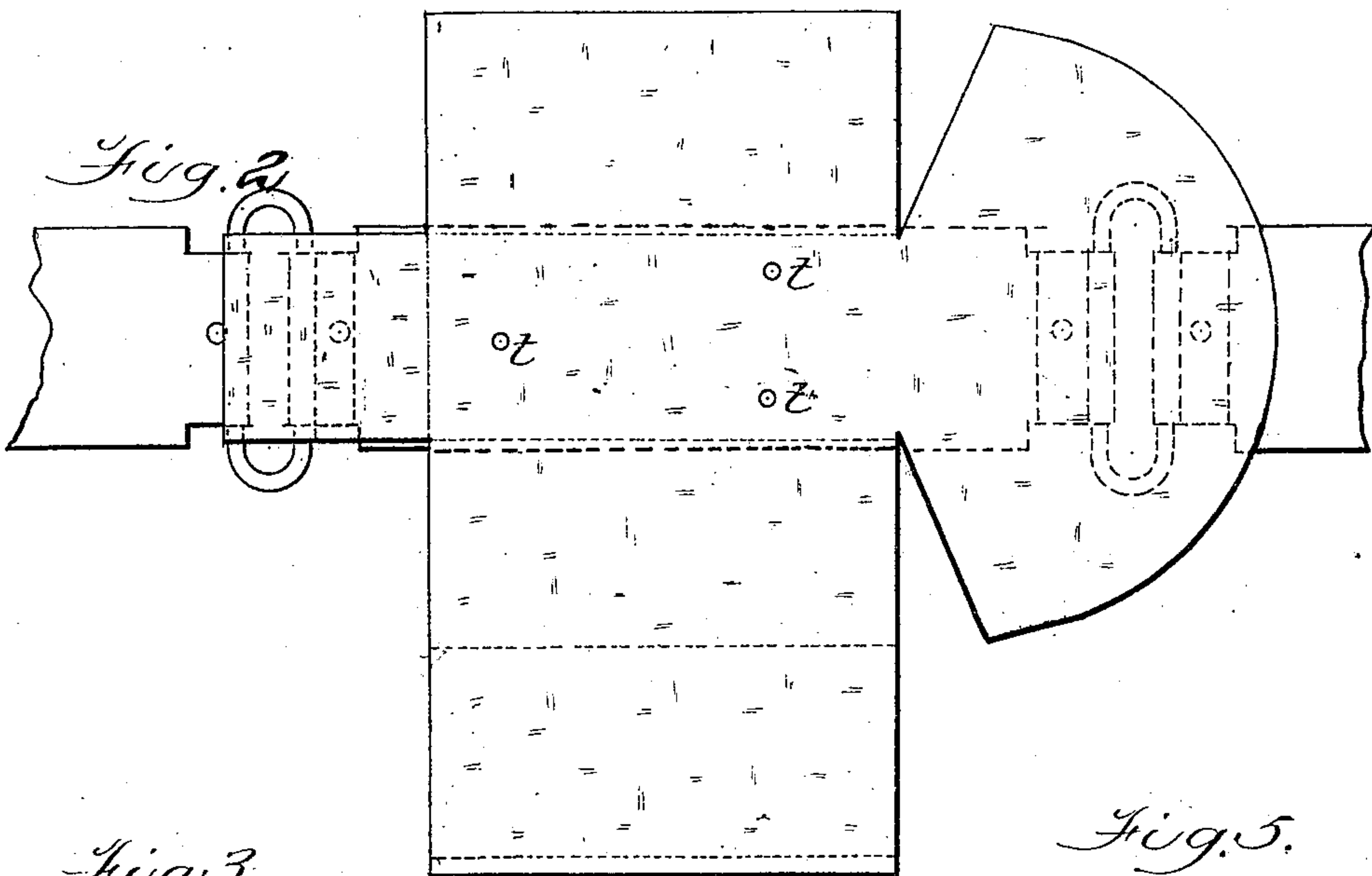
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UNITED STATES PATENT OFFICE.

RICHARD P. ZIMMERMAN, OF ATLANTA, GEORGIA.

APPARATUS FOR ELEVATING AND PURIFYING WATER.

SPECIFICATION forming part of Letters Patent No. 249,138, dated November 1, 1881.

Application filed October 12, 1881. (No model.)

To all whom it may concern:

Be it known that I, RICHARD P. ZIMMERMAN, a citizen of the United States, and residing in Atlanta, in the county of Fulton and State of Georgia, have invented a new and useful Apparatus for Elevating and Purifying Water, of which the following is a specification.

My invention relates to improvements in machinery for elevating and purifying water.

10 The object of these improvements is to secure strength, durability, and facility of operation in machines to be used for the above-mentioned purpose, and also (by an accurate adjustment of the bearings or lugs for the chain)
15 to secure a reduction and almost entire elimination of the wearing friction, which is incident to the use of machines of like character. I attain these objects by the mechanism illustrated in the accompanying drawings, in
20 which—

Figure 1 represents a vertical section of the entire machine. Fig. 2 represents the body of the bucket cut into a solid piece and riveted upon the chain before being formed. Fig. 3 represents the bucket riveted upon the chain and
25 formed complete, ready for use, and also shows the solid plate of chain, with ends cut, folded through link-coupling, and fastened with rivets, as hereinafter described. Fig. 4 represents the
30 protector or shield, which is suspended from the axis of lower wheel, as hereinafter shown. Fig. 5 is a detail to be referred to.

Similar letters in these specifications and drawings refer to similar parts throughout the
35 several figures or views.

In Fig. 1 the case or curb A A A A constitutes the frame-work of the machine, with upper horizontal piece, in which is placed the bearing B, in which bearing the axle or shaft C
40 works.

The upper double-flanged wheel, D, is made by connecting the two side wheels, E E, (having the widening or flaring flanges *e e*,) by the shaft or axle C, and by the lugs F F F. These
45 lugs—six in number—are peculiarly shaped for supporting the chain of the elevator. They are placed equidistant from each other, and are so shaped that the adjacent sides of two lugs are sloped so as to be in same plane, and thus allow the chain to rest upon them flatly and without strain. Another important object attained

in these lugs is, that they are made in such a way that in casting them the taper, or “draw,” (as the molders call it,) is made on the under surface of the lug, which leaves the bearing-
55 faces and apex or crests of the lugs level, or rather parallel to the axis or shaft C, and not sloping to one side. By being so constructed the chain runs smoothly and evenly upon them, the weight is equally distributed, and there is
60 no tendency of the chain to work to one side and wear against the side wheels, E E, nor to mount the flanges *e e*. However, the construction of the side wheels, E E, is such that the widening or flaring flanges *e e* render it im-
65 possible for the chain to mount the sides or be thrown out of position, which would be liable at any moment to occur in a wheel with lugs not so adjusted and flanges not so constructed.

The lower double-flanged wheel, G, is constructed upon the same principle as the upper
70 wheel, the lugs in both being the same in size and position. The outer circumference of the lower wheel is, however, greater, having wider flanges H H of open net-work, thereby securing
75 lightness and at the same time efficacy in holding the chain in position, and preventing the wheel itself falling out of position. The lower double-flanged wheel, G, has, however, no middle or connecting fixed shaft, as in upper wheel, but has projecting hubs I I, through
80 which hubs passes the rod or axle J. From the ends of this rod is suspended the shield K, (see Fig. 4,) which is used to prevent the lower wheel being thrown out of its position when
85 suspended in the chain and the machine is in rapid motion. The frame-work of the shield is made of wrought or malleable cast-iron bands, (or other suitable material.) These bands L and L' are in form rectangular parallelograms, and
90 are fastened together at right angles to each other. The band L, which hangs perpendicularly from the shaft J, which passes through the hubs I I, passes around the bottom of the wheel. The horizontal band L' passes around the wheel
95 at right angles to the perpendicular band L, and is fastened to the band L a few inches below the hubs I I. In the bottom or inside of this frame of the shield is fastened a flat semicircular plate, M, with ends *m m* curving
100 outward, which is designed to prevent the chain or buckets catching against the shield.

The chain N, Figs. 1 and 3, is made of solid plates *a a*, of galvanized iron or other suitable material, connected together by oblong links *b b*. The ends of the plates are cut on the sides, passed through these links, folded back over the link, and riveted upon the body of the plate at *d*, thus giving a chain of extraordinary strength and durability with flexible joints at the links *b b*, which correspond in their distance apart exactly to the distance between the crests of the lugs in the upper and lower wheels. The center of each link falls directly over the crest of each lug, and by this accurate adjustment substantially all wearing friction is overcome.

The bucket O is made of light galvanized iron or other suitable material. The entire body of the bucket (except the bottom) is usually made of one piece. The whole bucket (bottom included) could by this design be made in one piece, as shown in Fig. 2; but, for sake of economy of material, a separate piece for the bottom may be used. The lip of the bucket is oval or curved in shape, thus discharging the water from the bucket in a solid stream. These buckets are fastened upon each alternate plate or section of the chain by means of three rivets, T T T, more or less, at option, which make it almost impossible for the bucket to be torn or knocked from the chain.

My device is intended for domestic use in wells, cisterns, &c., and for elevating water into tanks for railroads, and public buildings and works.

I claim as my invention and desire to secure by Letters Patent the following:

1. In a chain-pump or elevator, the upper double wheel having flaring flanges *ee*, in com-

bination with the lugs F, having their faces inclined from the crests, so that the adjacent upper surfaces of the several lugs are in the same plane, and the bearing-faces and crests of the lugs are in lines parallel to the shaft of the wheel, substantially as shown and described.

2. The chain-section consisting of the plate *a* and oblong links *b*, the flexible joints between the plates and links formed by riveting the reduced and lapped ends of the plates over or around the links, in combination with the bucket-blank riveted to the plate, substantially as and for the purpose set forth.

3. The chain for chain-pumps or elevators, consisting of the plates *a* and oblong links *b*, the flexible joints between the links and plates being formed by riveting the reduced and lapped ends of the plates over or around the links, in combination with the buckets O, formed of substantially a single piece of metal, and riveted to the plates *a* in advance of being shaped or completed, substantially as shown and described.

4. In a chain-pump or elevator, the open-work lower double wheel, G, provided with lugs F, in combination with the suspended shield, consisting of the bands L and L', substantially as set forth.

5. In a chain-pump or elevator, the open-work lower wheel, G, provided with lugs F, in combination with the suspended shield and semicircular plate M, substantially as shown and described.

RICHARD P. ZIMMERMAN.

Witnesses:

HUGH H. GORDON,
J. G. ZACHRY.