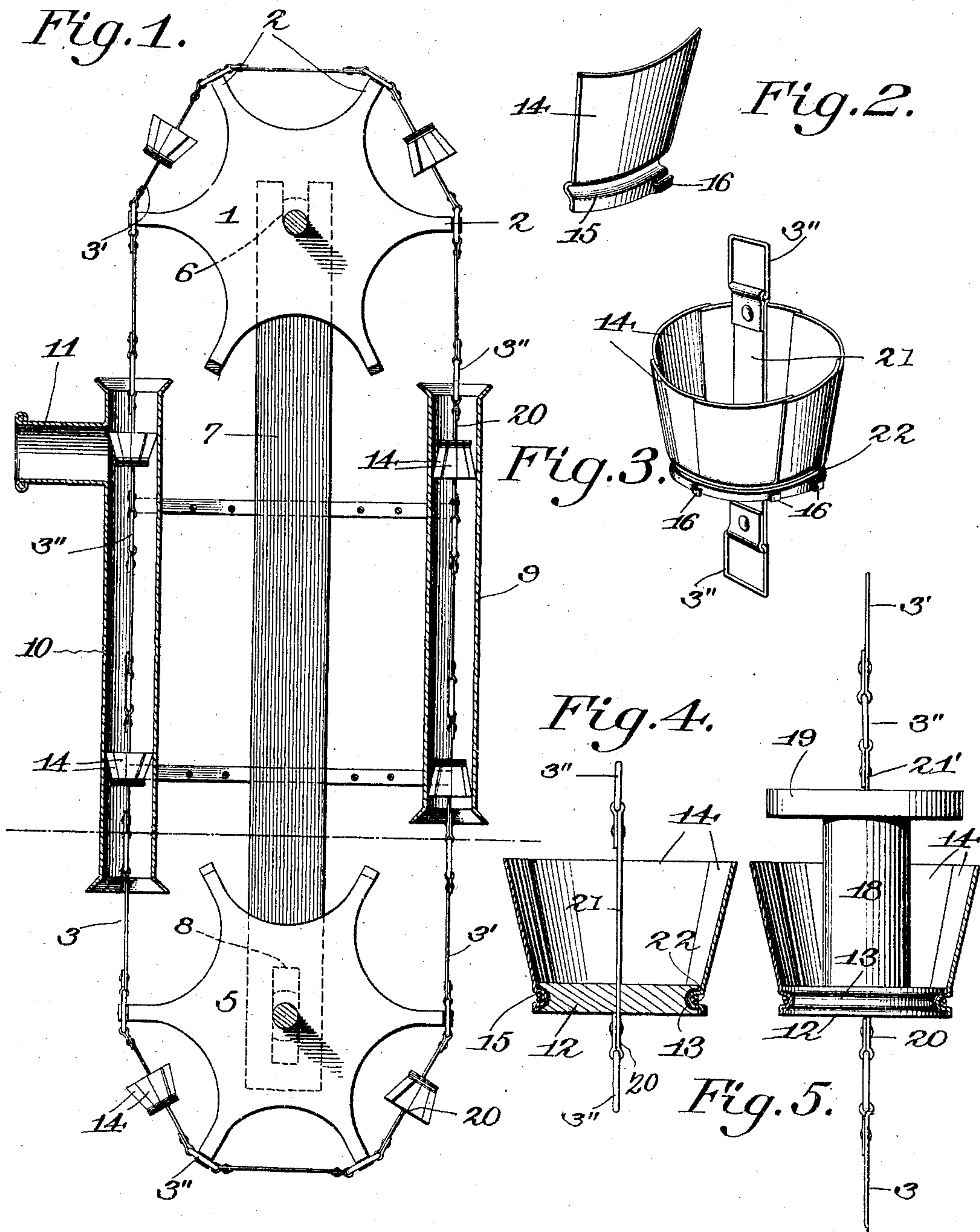


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T. H. McDONALD.  
WATER ELEVATOR.

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Witnesses  
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# UNITED STATES PATENT OFFICE.

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## WATER-ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 780,373, dated January 17, 1905.

Application filed May 24, 1904. Serial No. 209,530.

*To all whom it may concern:*

Be it known that I, THOMAS HARVEY McDONALD, a citizen of the United States, residing at Elkgrove, in the county of Sacramento and State of California, have invented a new and useful Water-Elevator, of which the following is a specification.

This invention relates generally to water-elevators, although it is adapted to be used with other kinds of elevators, and particularly to the buckets used thereon.

The objects of the invention are to improve the construction, increase the efficiency, strength, and durability, and lessen the cost of the elevator-buckets. These objects are attained by the form of bucket hereinafter described in detail, with reference to the accompanying drawings, forming part of this specification, wherein—

Figure 1 is a side elevation, partly in section, of a water-elevator provided with buckets constructed in accordance with the invention. Fig. 2 is a detail view of one of the segmental sections which form the wall of the bucket. Figs. 3 and 4 are detail views of a bucket constructed in accordance with the invention. Fig. 5 is a section of a modified construction.

Like reference characters indicate like parts in the different views.

The numeral 1 indicates a wheel which is constructed with radially-extending spokes or cogs 2, adapted to engage an endless chain 3, upon which the buckets 4 are suspended at suitable distances apart. The endless chain 3 is preferably made of metallic strips or sections 3' and links 3'', the sections 3' being bent around the links 3'' and fastened thereto in any suitable manner, as by rivets. The radial spokes or cogs 2 of the wheel 1 engage in the links 3'' of the endless chain, and thereby cause the chain to move with the wheel. It will be understood that the wheel 1 may be rotated in any desired manner, as by a crank, band-wheel, or the like. (Not shown.) At the lower end of the elevator a second wheel, 5, similar in construction and function to the wheel 1, may be provided. The wheel 1 preferably is journaled at 6 in a support 7, as shown, and the journal of the lower wheel 5 preferably engages an elongated vertical slot 8 in the

lower end of the support 7. This manner of mounting the lower wheel 5 permits a certain amount of adjustment or play between the two wheels and regulates the tension of the endless chain 3. Motion of course is transmitted to the lower wheel 5 by the upper wheel 1 through the chain 3.

On one side of the wheels 1 and 5 the chain 3, with the buckets 4 thereon, passes down through a shaft or casing 9, and on the other side said chain and buckets pass up through a casing 10. The casing 10 when the device is used as a water-elevator is formed with an outlet pipe or spout 11.

The buckets of the invention are constructed in the following manner: A round base-piece 12, adapted to serve as the bottom of the bucket, is formed with a groove 13 around the periphery thereof, said base-piece or bottom being preferably made of iron, although any other suitable material may be employed for this purpose. The side wall of the bucket is formed by a plurality of segmental sections 14, each of which is curved slightly on the segment of a circle. The upper end of each section 14 is slightly broader than the lower end thereof, so that when all the sections are assembled the circular wall of the bucket formed thereby flares outwardly toward its upper end, as shown. Each section 14 at its lower end is formed with an inwardly-extending groove 15, that produces a rib on the opposite side thereof. On one of the lower corners of each section 14 a tongue 16 is formed by making an inwardly-extending slit from the side of the section. In assembling the bucket the sections 14 are fitted together in such manner that each section underlaps the section on one side thereof and overlaps the section on the other side. Each overlapping section is fitted into the slit which forms the tongue 16 on the adjacent section. The tongue 16 therefore fits over the adjacent section and prevents the wall formed by the sections from collapsing by maintaining the sections in proper relation to each other. When the sections are all properly assembled, the ribs thereon, formed by the grooves 15, fit loosely into the groove 13 of the base portion or bottom 12, and the segmental grooves 15 in the sections 14 form a



continuous circular groove into which a wire or other suitable binding 22 is placed to hold the segmental sections of the bucket together. By reason of the fact that the circular wall of the bucket fits loosely into the annular groove in the bottom piece 12 each of the segmental sections is permitted to have a small amount of play or give upon the bottom piece 12, and in this manner the circular wall of the bucket is able to expand or contract in passing through the casings 9 and 10. Furthermore, when the bucket is filled the circular wall thereof descends and rests upon the lowest portion of the groove in the bottom piece, whereby the bucket is prevented from leaking.

When the elevator on which the buckets are used is intended to work in dirt or other coarse or mixed material, the bucket is formed with a core 18, attached to the bottom 12 thereof, as shown in Fig. 5. Upon the upper end of the core 18 is placed a disk 19, which may be of about the same diameter as the bottom 12 or, if desired, a trifle larger. The disk 19, which is elevated above the rim of the bucket, acts as a guard to prevent any large lumps of material from becoming jammed in the bucket and choking the casing 10, only fine material being permitted to enter the bucket. The side wall of the bucket is the same in both forms of the invention.

For attaching the bucket to the endless chain 3 a link 20 is fastened in any suitable manner to the under surface of the bottom 12, another link, 21, being attached to the upper surface thereof. The metallic strips 3' of the endless chain are attached to the links of the bucket. In the form of bucket having the core 18 and disk 19 the upper disk 21' is attached to the disk 19, as shown.

A bucket constructed in accordance with this invention is possessed of the quality of resilience—that is to say, the bucket when in use is capable of expanding or contracting to a certain degree whenever necessary to fit closely into the casings 9 and 10 or for any other reason. In order to secure this desirable quality of resilience, it is not necessary that the sections 14, by which the side wall of the bucket is formed, be made of resilient material. On the contrary, this material may be non-resilient, as the resiliency of the bucket is produced by the relative movement or play of the segmental sections upon each other at their upper portions and upon the base-piece at their lower ends.

The bucket of the invention is strong, durable, and thoroughly efficient in operation. Furthermore, it is inexpensive in construction.

Having thus described the invention, what I claim is—

1. An elevator-bucket comprising a bottom and a plurality of loosely-assembled lapped segmental sections forming a wall capable of expansion and contraction.

2. An elevator-bucket comprising a bottom and a plurality of loosely-assembled lapped segmental sections forming a flared circular wall.

3. An elevator-bucket comprising a bottom and a plurality of segmental sections forming a flared circular wall capable of expansion and contraction, each section underlapping the section on one side and overlapping the section of the other side.

4. An elevator-bucket comprising a bottom and a plurality of overlapped segmental sections forming a circular wall, each section having a tongue fitting over the next adjacent section.

5. An elevator-bucket comprising a bottom and a plurality of overlapped segmental sections forming a circular wall capable of expansion and contraction, each section having a tongue fitting over the next adjacent section.

6. An elevator-bucket comprising a grooved bottom, and a plurality of grooved segmental lapped sections forming a circular wall, and an assembling device disposed within the grooves of the sections.

7. An elevator-bucket comprising a grooved bottom, and a plurality of grooved segmental sections forming a circular wall, each section having a tongue fitting over the next adjacent section, and an assembling device disposed within the grooves of the sections.

8. An elevator-bucket comprising a bottom, a core thereon having a disk at its upper end, and a wall surrounding the bottom and the lower portion of the core.

9. An elevator-bucket comprising a bottom, a core thereon having a disk at its upper end, and a flared wall surrounding the bottom and the lower portion of the core.

10. An elevator-bucket comprising a bottom, a core thereon having a disk at its upper end and a sectional wall loosely assembled with the bottom.

11. An elevator-bucket comprising a bottom, a link on the upper surface thereof, a link on the lower surface thereof, a plurality of segmental sections forming around the bottom a circular wall capable of expansion and contraction, and means for holding the sections loosely assembled with the bottom.

12. An elevator-bucket comprising a grooved bottom, and a plurality of segmental sections having tongues loosely fitting the groove in the bottom and forming a circular wall capable of expansion and contraction, and means for holding the sections assembled with the bottom.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

THOMAS HARVEY McDONALD.

Witnesses:

C. E. SCHUMERT,

THOMAS J. HESSON.