E. HOYT.

Chain-Pump Bucket.

No. 218,746. Patented Aug. 19, 1879.

FIG. 1.

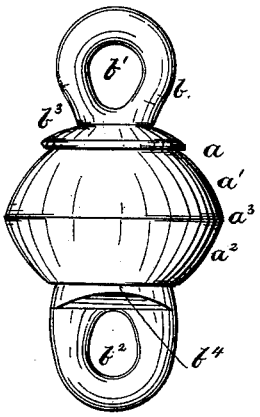


FIG. 2.

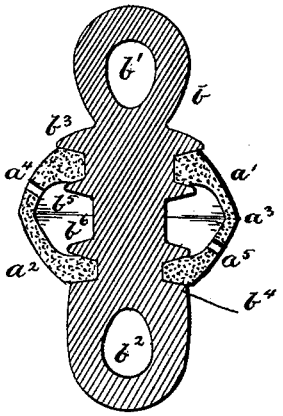


FIG. 3.

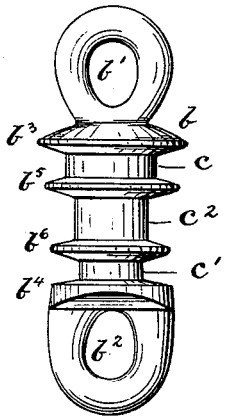


FIG. 4.

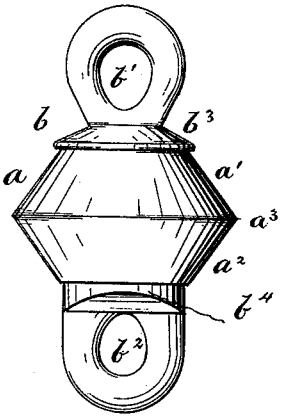
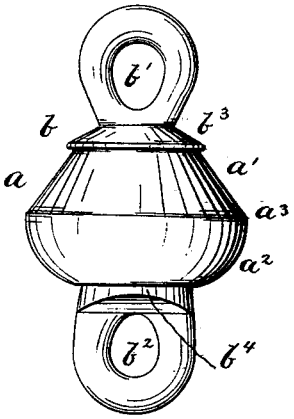


FIG. 5.



WITNESSES

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UNITED STATES PATENT OFFICE

EDWIN HOYT, OF STAMFORD, CONNECTICUT, ASSIGNOR OF ONE-HALF HIS RIGHT TO THEODORE HOYT, OF SAME PLACE.

IMPROVEMENT IN CHAIN-PUMP BUCKETS.

Specification forming part of Letters Patent No. **218,746**, dated August 19, 1879; application filed December 19, 1878.

To all whom it may concern:

Be it known that I, EDWIN HOYT, of Stamford, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Chain-Pump Buckets; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it pertains to make and use 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 has for its object to furnish a chain-pump bucket possessing superior qualities in elasticity and capability of adaptation to the bore of the tubing, and which may be reversed, if desired, without injury to its form or construction.

It consists in a hollow elastic shell or bucket made in one piece and oblate spheroidal in form, the outer or convex surfaces of the opposite ends or hemispheres of which unite and form a thin horizontal circumferential edge around its center on the line between said hemispheres, as will be hereinafter explained.

In the drawings, Figure 1 is an elevation, and Fig. 2 is a vertical section of the same. Fig. 3 is an elevation of the link. Fig. 4 is a modification, and Fig. 5 shows the form the bucket takes when under the pressure of a column of water.

a is the elastic hollow bucket, the upper and lower hemispheres, a^1 a^2, of which are made cup or bowl shaped, equal in size and similar in form, with sides slightly convex, the surfaces of which unite and form a thin circumferential edge, a^3, around its horizontal or equatorial center, which edge projects or stands outward at right angles to the vertical diameter of said shell and fits snugly, making a substantial packing against the sides of the bore of the tubing, so that the bucket may be moved up or down in said tube, as may be desired. The said edge readily adapts itself to motion in either direction.

The wall of the shell *a* is made thin at its center, a^3, and gradually increases in thickness toward both the ends, in which are the openings to receive the link. This gives the proper elasticity, so that the shell will readily adapt itself to the pump-tube, whether it is moved directly or reversely, and at the same time a strong collar is provided, which gives a firm hold around the link, and prevents the shell from slipping or springing out of place. It is provided with openings (one slightly larger than the other) in its upper and lower ends, so that it may be easily sprung onto the link *b*. It is also provided with small drip-openings a^4 a^5, which permit the water to pass through it and fall in the tube or bore of the pump, thus preventing freezing. These drip-openings may be dispensed with in localities where the water is not liable to freeze.

b is the link, provided with eyes b^1 b^2 for connecting purposes. It is provided with the two end or outside collars or flanges, b^3 b^4, which serve as outer bearings for the ends of and cover the end openings in the bucket when the latter is sprung thereon. It is also provided with the two inner collars or flanges, b^5 b^6, arranged near to the collars b^3 b^4, which remain inside and hold the ends of the bucket, and prevent the latter from slipping longitudinally on the stem of said link.

The stem of the link is made slightly larger in diameter between the collars b^3 b^5 than between the collars b^4 b^6. The larger diameter, *c*, fills the larger opening in the end of the bucket *a*, while the smaller diameter, c^1, fills the smaller opening in said bucket. The intermediate space or diameter, c^2, between the inner collars, b^5 b^6, gives ample space for the passage of the water through the bucket. The bucket is sprung onto the link by passing the larger opening over the eye b^2, and over the collars b^4, b^6, and b^5, while the other opening is passed over the eye b^2 and collar b^4. The bucket will then be held firmly on the link, as shown in Figs. 2 and 1.

In the operation of the bucket, the weight of the column of water being raised depresses the upper hemisphere, a^1, and distends or bulges out the lower hemisphere, a^2, of the elastic shell, as shown in Fig. 5, without shortening the diameter, thus keeping the bore of the pump entirely closed. When the hemi-

spheres of the shell *a* are compressed into the form shown in Fig. 5, the strength or lifting-power of the bucket is increased over what it would be were the parts to remain in the position shown in Fig. 1, and it becomes equal in strength to what it would be were it made of solid rubber or other material, while at the same time it possesses all the elasticity and capability of adaptation to the bore of pump that is possessed by the ordinary hollow elastic shell.

In Fig. 4 is shown a slight modification in the form of the bucket *a*, in which the sides a^1 a^2 are straight, terminating at their central junction in the thin edge a^3. I do not prefer this form, though it will give very good satisfaction in its operation. It is too rigid, lacking that perfect flexibility and capability of automatic adaptation to the bore of the pump that is possessed by the shell first hereinbefore described, and shown in Figs. 1, 2, and 5.

I am aware that elastic hollow buckets made in two pieces of unequal size, having their edges rabbeted together or made in one piece with unequal hemispheres, united so as to form a lip or edge on the larger, which projects over the smaller hemisphere, have been in use, and are not new, and I do not claim such devices as my invention.

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

The hollow reversible and elastic spheroidal shell *a*, having its walls made thin at its central or equatorial line, and gradually increased in thickness toward the points of attachment to the link, and having its outer surfaces so graduated as to unite in a common point and form a single circumferential projecting rim or lip, a^3, surrounding it on its central or equatorial line, substantially as and for the purposes set forth.

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

EDWIN HOYT.

Witnesses:
JONATHAN S. SEARLES,
EDWARD A. LEEDS.