I. AVERY.

CHAIN-PUMP BUCKET.

No. 192,049. Patented June 19, 1877

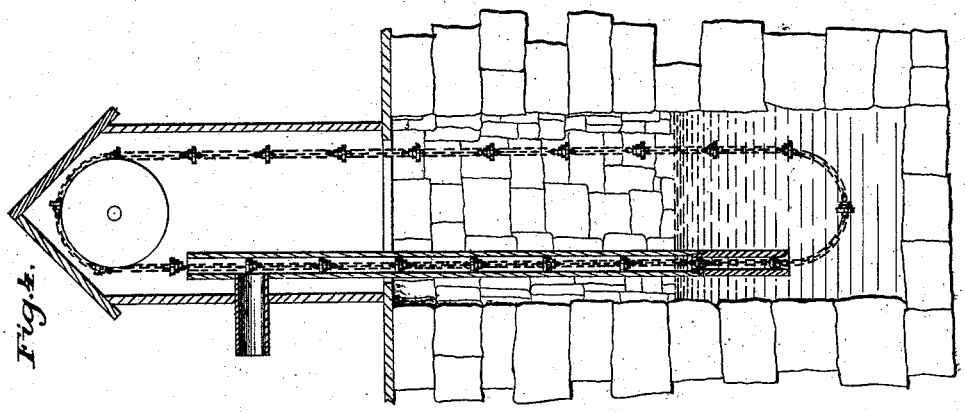

Fig. 4.

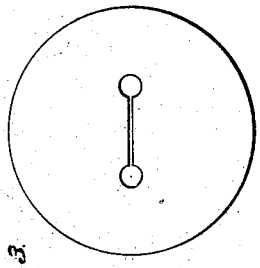

Fig. 3

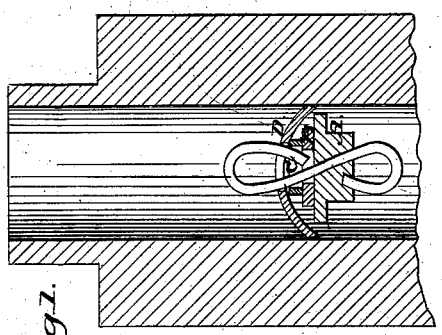

Fig. 1.

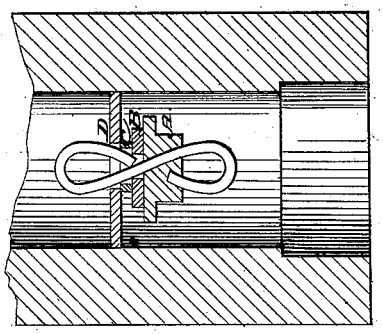

Fig. 2.

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IRA AVERY, OF TUNKHANNOCK, PENNSYLVANIA.

IMPROVEMENT IN CHAIN-PUMP BUCKETS.

Specification forming part of Letters Patent No. **192,049**, dated June 19, 1877; application filed March 15, 1877.

To all whom it may concern:

Be it known that I, IRA AVERY, of Tunkhannock, in the county of Wyoming and State of Pennsylvania, have invented new and useful Improvements in Chain-Pumps with elastic rubber valves or buckets, which improvements are fully set forth in the accompanying drawings.

The object of my improvements is to reduce the amount of friction caused by the contact of the valve or bucket with the inside of the tubing while working; and at the same time to save from escaping or falling back so large a percentage of the water as is otherwise unavoidable in these pumps, as heretofore known.

These ends are obtained, first, by the use of circular pieces of elastic sheet-rubber, and laying them, one or more, upon disks or buttons like to, or the same as, those used in the old-fashioned chain-pump. These disks or buttons should be about one-fourth inch less in diameter than the diameter of the bore of the tubing to be used at the lower or first joint. The rule is to have three circular leaves or layers of rubber of different sizes, cut from sheets the thickness of one-eighth inch, more or less. The first—to be laid upon the disk or button, which may be properly styled the valve-seat—is somewhat less in diameter than it, (the valve-seat.) The second leaf is smaller, and to be laid upon the first. The third leaf is about one-fourth inch larger than the diameter of the bore of the tubing to be used, and is laid over the first two and the valve-seat. These circular pieces have two holes punched through them of about the size of the wire composing the links around which the buttons or valve-seats are cast, one hole each side of the center.

By cutting the part between the punch-holes, the leaves of sheet-rubber are easily slipped over the link, laid upon the button or valve-seat as above stated, when we have the valve or bucket complete, and ready to be attached to the chain. It will now be readily seen that when the bucket or valve is working it takes the form of a mushroom; the upper surface, being thus rounded, permits the water to perform the work of lubricator between the valve and tubing. It will be further readily seen that, when the tubing and the valve or bucket become worn, by taking away the under leaves of rubber, the broad one, by being allowed to lie flat upon the button or valve-seat, becomes broader, thus again filling the tubing. One other advantage gained by this form of valve or bucket is that in case the crank slips out of the hand when drawing water, the bucket (upper leaf being flexible) is turned with its edge upward, and receives no harm; and for the same reason the water may, if desired, whether in cold or hot weather, be allowed to go back into the well.

The other or second part of my invention is to have two sizes of tubing connected together when more than one joint is needed; the first or lower joint, being of smaller bore, forms the pump part, and what is above, being of larger bore, serves merely as a conductor. If a pump of one and a half inch capacity is wanted I select a smooth, straight-grained joint, which is easily polished inside. The joints needed above, being at least one-fourth inch larger bore, need not be smoothed out, nor is it necessary to use any choice or costly lumber. So, if glass or metal is used for the tubing, or a part of it, the first or lower joint only needs to be smooth. The length of the first or lower joint being ascertained, the distance between valves or buckets is also determined, as it is necessary that one shall not pass out before the next one enters.

The circular pieces of rubber are cut out of the sheets by steel bands, having one sharp edge like a ti: ner's punch.

In the accompanying drawings, Figure 1 represents the lower joint of the tubing with the valve when in operation, A being the link and button or valve-seat, and B C D being the several leaves or layers of rubber. Fig. 2 shows the appearance of the valve or bucket when passed above the smaller joint of tubing into the larger ones above, letters A B C D referring to the same parts as in Fig. 1. Fig. 3 shows the form of the leaves or layers of rubber, which, in combination with link and button or valve-seat, form the valve or bucket. Fig. 4 represents a sectional view of tubing, chain, and valves or buckets.

I am aware that two patents to F. A. Leav

ens, numbered, respectively, 173,479 and 182,-454, mention the combining of two sizes of tubing, the lower section being small as the bucket, and the upper ones being larger, so as to give room for the accumulation of ice without impeding the buckets.

What I claim as new and my invention, and desire to secure by Letters Patent, is—

1. A chain-pump bucket composed of a link of common pump chain, with a broad zinc disk or valve-seat cast around the middle part thereof, a thin disk of rubber, slightly broader than the diameter of the tubing to be used, slipped over the upper end of said link and laid upon the zinc disk, or upon other thin rubber disks of smaller diameter, no two of said disks being of the same size, as and for the purposes substantially specified.

2. The combining of tubing of two sizes of bore, (the difference being about one-eighth of an inch in the diameter,) so that there shall be no appreciable friction between the bucket and the tubing that is above the first or lower section, and that the additional amount of water to be raised by reason of such slight enlargement shall also be unappreciable in amount, substantially as set forth.

IRA AVERY.

Witnesses:
B. W. LEWIS,
FELIX ANSART.