W. H. RUTAN.

CHAIN-PUMP.

No. 187,733. Patented Feb. 27, 1877.

Fig. 1

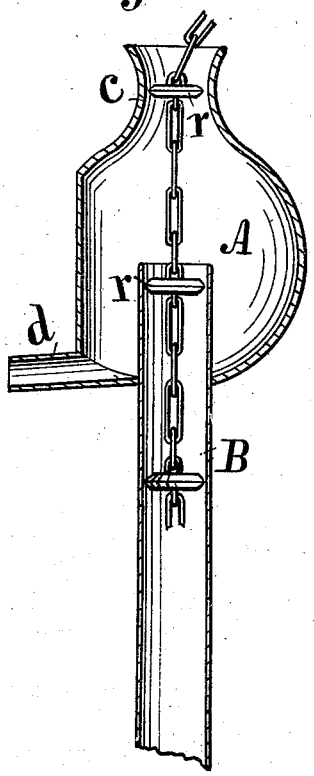


Fig. 2

Fig. 3

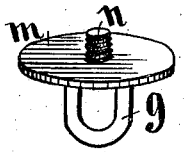
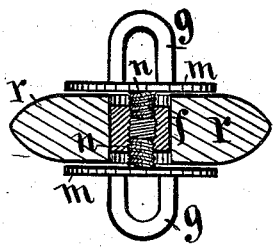


Fig. 4



Witnesses

James Embree.

Inventor

William H. Rutan,

By Thomas G. Orwig,

Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM H. RUTAN, OF DES MOINES, ASSIGNOR TO JOHN C. RUTAN, OF IOWA CITY, IOWA.

IMPROVEMENT IN CHAIN-PUMPS.

Specification forming part of Letters Patent No. **187,733**, dated February 27, 1877; application filed December 26, 1876.

To all whom it may concern:

Be it known that I, WILLIAM H. RUTAN, of Des Moines, in the county of Polk and State of Iowa, have invented an Improved Chain-Pump, of which the following is a specification:

The object of my invention is to prevent chain-pumps from becoming inoperative by freezing; to prevent the waste and annoyance occasioned by water being thrown off the buckets; to cause a continuous and regular flow from the spout, and to prevent buckets or parts of buckets from being misplaced in the chain, and the continuous chain of buckets from being misplaced in the well-tube.

It consists, first, in the manner of forming and combining a globular chamber with the top of a well-tube; second, in inclosing a nut in an elastic disk to receive the screw ends of two flanged loops placed on the opposite sides of the elastic disk, to form a complete expansible and reversible bucket, all as hereinafter fully set forth.

I am aware that a globular enlargement has been formed above the spout of a pump-head, to cause a regular flow; but I claim that my chamber A, having a neck and flaring mouth, *c*, adapting it for a chain-pump, and for being closed by a bucket to prevent freezing, is novel and greatly advantageous.

Figure 1 of my drawing is a vertical central section of a pump-head, and illustrates the construction, application, and operation of my anti-freezing chamber.

A is my globular attachment and chamber, preferably made of glass or galvanized iron, complete in one piece. It may vary in size and configuration, as desired. B is the top end of a well-tube, passed upward through the bottom of the globe A, to terminate near the center of the globe-chamber. It is rigidly secured to the globe in any suitable way to produce a water-tight joint. *c* is a neck and flaring mouth on the top of the globe, corresponding in size with the well-tube. *d* is an eduction-spout at the lower end of the globe, through which the water is discharged from the chamber A in a regular and continuous flow and stream.

The globe A may have a flat face immediately over the spout *d*, to form a front, and to prevent the globe from extending over the spout.

Fig. 2 is a vertical central section of a short tubular-form screw-nut, *f*, designed to be inclosed in an elastic disk, to form an expansible and reversible bucket. Fig. 3 is a perspective view of a flanged loop in an inverted position.

g is the loop, to which the chain-links are attached. *m* is a flange or disk, cast integral with the loop *g*. *n* is a short screw, projecting from the center of the disk *m*, in an opposite direction from the loop *g*, for the purpose of entering the screw-nut *f*, when inclosed in an elastic disk.

Fig. 4 is a vertical central section of my expansible and reversible bucket, formed complete by combining four distinct pieces.

r is the rubber disk, preferably of conoidal form, to present a thin edge to the wall of the well-tube, and to have uniform tapers on its top and bottom. The tubular-form nut *f* is inserted in a hole formed in the center of the disk *r*, and one of the loops, *g*, carrying the flange or disk *m*, and screw *n*, is then connected on each side by turning the screw *n* into the central nut *f*, to form a complete reversible bucket.

The loops *g*, carrying the flanges *m* and screws *n*, are all cast from one and the same pattern, and being, therefore, all alike, they cannot be misplaced.

By turning one of the loops *g*, the elastic disk *r* is readily compressed and expanded laterally, and thereby adjusted to fit the bore of the well-tube.

I am aware that reversible buckets have been used, and that flanged loops have been used to compress a rubber disk; but I claim that my manner of forming a reversible bucket that is exactly alike on both sides, by means of two flanged loops made from one and the same pattern, and a nut embedded in the center of a rubber disk, is a new and valuable improvement.

In the practical operation of my improved pump, a chain of my reversible buckets is placed in the well-tube B, to be operated by a chain-wheel, that is combined with the pump

in any suitable way. As the chain is moved and the buckets pass up from the well and through the tube, they carry water, and successively empty the same over the top of the tube B into the annular space inclosed around the top of the tube by means of the globe A, from which it will flow regularly and continuously through the spout *d* without splashing or wasting, while the buckets are in operation.

When the chain is at rest and one of the buckets *r* is allowed to remain in the throat *c* of the globe A, the globe-chamber surrounding the top of the tube B will be practically closed, and the warm air ascending from the well through the tube will be retained in the globe-chamber A, to prevent the water from freezing on the buckets and in the top of the well tube.

I claim—

1. The globular chamber A, having the throat and mouth *c*, and spout *d*, in combination with the top of a well-tube, B, substantially as and for the purposes shown and described.

2. The combination of the elastic disk *r*, nut *n*, and the two loops *g*, each loop carrying a flange, *m*, and screw *n*, substantially as and for the purposes shown and described.

WILLIAM H. RUTAN.

Witnesses:

WM. PHILLIPS,

W. J. KLINE.