

T. Evans,
Pump Piston,
No 31,794, *Patented Mar. 26, 1861*

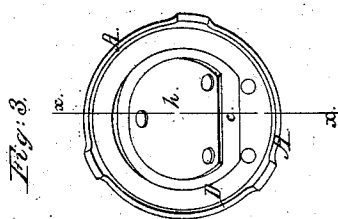


Fig. 2.

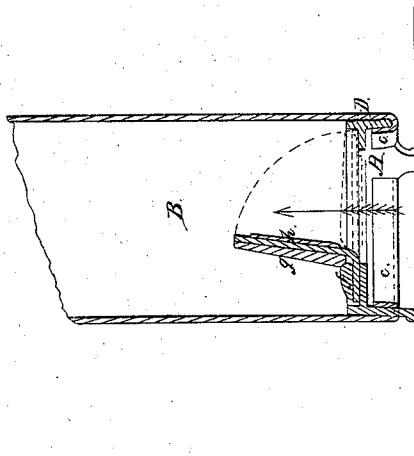
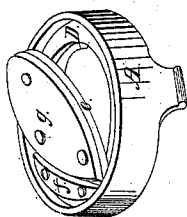


Fig. 1.



Witnesses;
L. B. Batcheller,
S. J. Ellis.

Inventor,
T. Evans,
By his attorney,
J. H. Brown.

UNITED STATES PATENT OFFICE.

THOMAS EVANS, OF WATKINS, NEW YORK.

VALVE.

Specification of Letters Patent No. 31,794, dated March 26, 1861.

To all whom it may concern:

Be it known that I, THOMAS EVANS, of Watkins, in the county of Schuyler and State of New York, have invented a new and useful Improvement in Valves of Boat-Pumps; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

10 Figure 1, is a perspective view of the valve detached from the pump, and partly open. Fig. 2, is a vertical section of the lower portion of a pump barrel, and also of the valve, on the line $x x$ of Fig. 3. Fig. 3, is a view
15 of the reverse or lower side of the valve.

Similar letters refer to corresponding parts in all of the figures.

My improvement relates particularly to valves used at the bottom of boat pumps, which are usually made of tin, or other sheet metal. Such valves have heretofore consisted of wooden plugs, driven into the bottom of the pump cylinder or barrel, having an aperture through the center thereof,
25 and a leathern flap-valve for closing it.

The requirements of pumps of this class are, the largest possible capacity for admitting water, and a quick action, or recoil, of the valve when the piston commences its
30 return stroke.

It is the object of my invention to supply these qualities, and thus produce an article of superior usefulness, as well as durability.

I construct a ring of malleable or cast
35 iron, A, Figs. 1, and 3, of the diameter of the pump barrel, or a little smaller so as to enter the same, and for convenience it should be a little tapering, being smaller at the top. It is provided with three projections (or
40 more if thought necessary) at the bottom, which serve to keep the barrel of the pump elevated far enough from the bottom of the reservoir to permit the water to enter the pump. It is secured in the barrel B by
45 bending or up-turning a flange c , as shown in Fig. 2. The ring is provided with a horizontal ledge or flange D, upon its inner side to which the flap valve is secured, one side of the ledge being made a little
50 wider for that purpose, and which forms the seat upon which it closes.

The valve is formed of a disk of rubber,

or other elastic material, e , having a piece of metal, f , placed over the wider portion of the flange and riveted thereto, the rivets
55 passing through the rubber and thereby securing it so as to form the hinge of the valve. The acting portion of the valve is loaded with another piece of metal g covering its whole surface except a space which
60 is left at the hinge or joint to admit of the elastic action of the rubber. A piece of tin or other smooth sheet metal h is placed beneath, and the three parts are riveted together firmly.

The top of the valve weight g is somewhat convex but is rather thicker at the edge next the joint which is rounded off, as is also the corresponding part of the piece f , so that the two, when brought together by the action of
70 the valve, present to each other a small amount of surface in contact, and hence produce but little friction.

The operation is as follows: As the piston is drawn up and the water rushes in to fill
75 the vacuum the valve is opened until the two edges of f and g strike together, as in Fig. 2, when the pressure of the inflowing volume of water acting against the broad smooth lower surface of the valve, stretches
80 the hinge portion of the rubber until the valve has opened to its greatest area. When the stroke of the piston is changed to the downward motion the valve closes at the first impulse with a quick, resilient action
85 produced by the contraction of the rubber, aided by the cam-like edges of f and g , and the weight of the latter. Owing to the suddenness of this action no appreciable amount of water is lost by flowing back through the
90 valve opening. The thinness of construction which the metal admits of makes it quite as light as wood when saturated with water, and enables the area to be double in
95 size.

The lower metal plate, h , serves the important purpose (in addition to the security of fastening the parts together which is obtained by riveting upon it instead of on the rubber) of protecting the rubber from wear-
100 ing from sand, gravel, &c. which would soon render it imperfect as packing as well as of preventing the retarding friction of the soft rubber against the water.

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

1. The combination and arrangement of the elastic hinge *e*, and parts *f g*, or their
5 equivalents, with the metallic rim A, substantially as set forth.

2. In combination therewith, the metallic

counter-lining *h*, of the flap, substantially as described.

THOMAS EVANS.

Witnesses:

ARCHIBALD ROBBINS,
GEORGE I. WARREN.