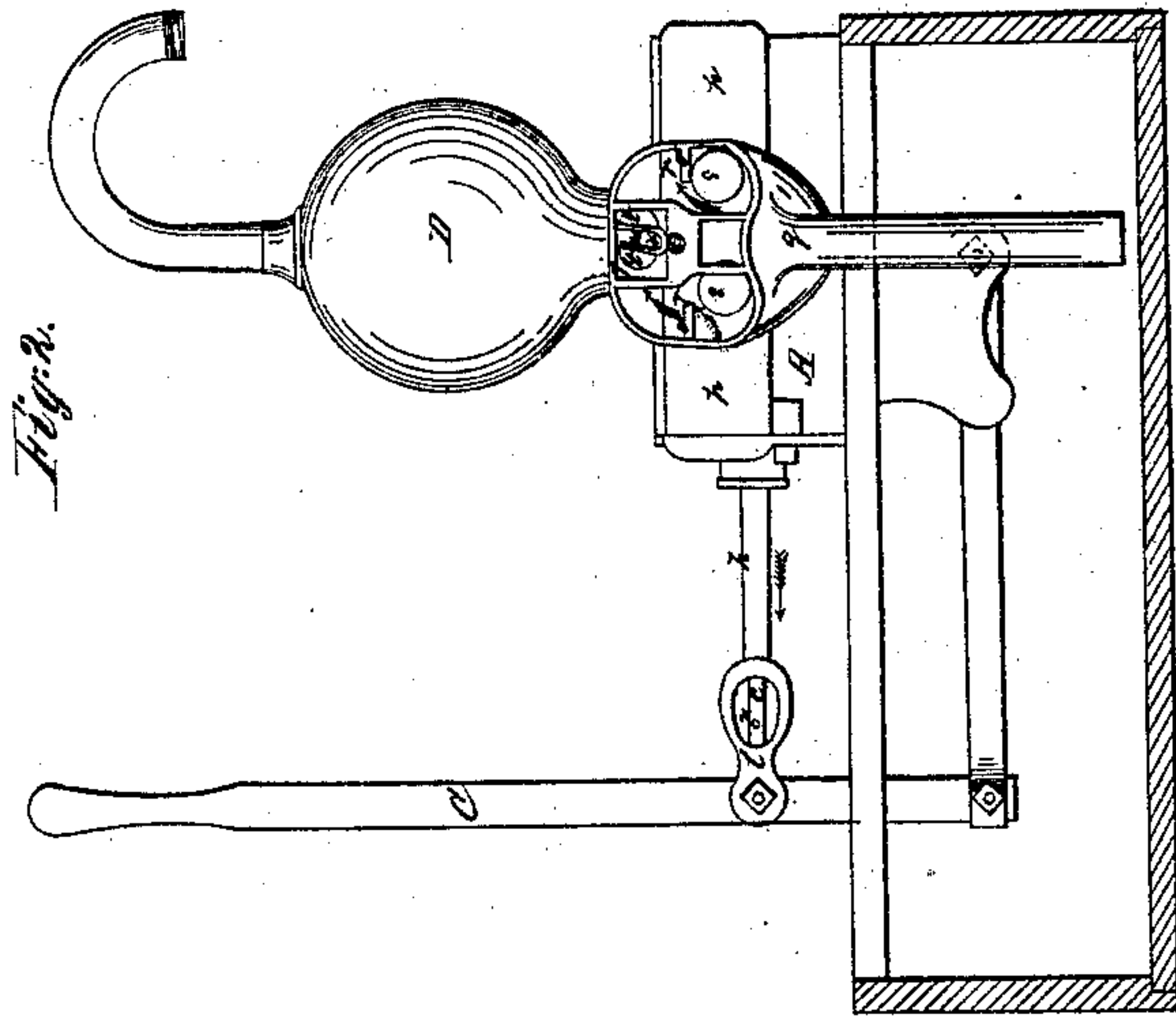
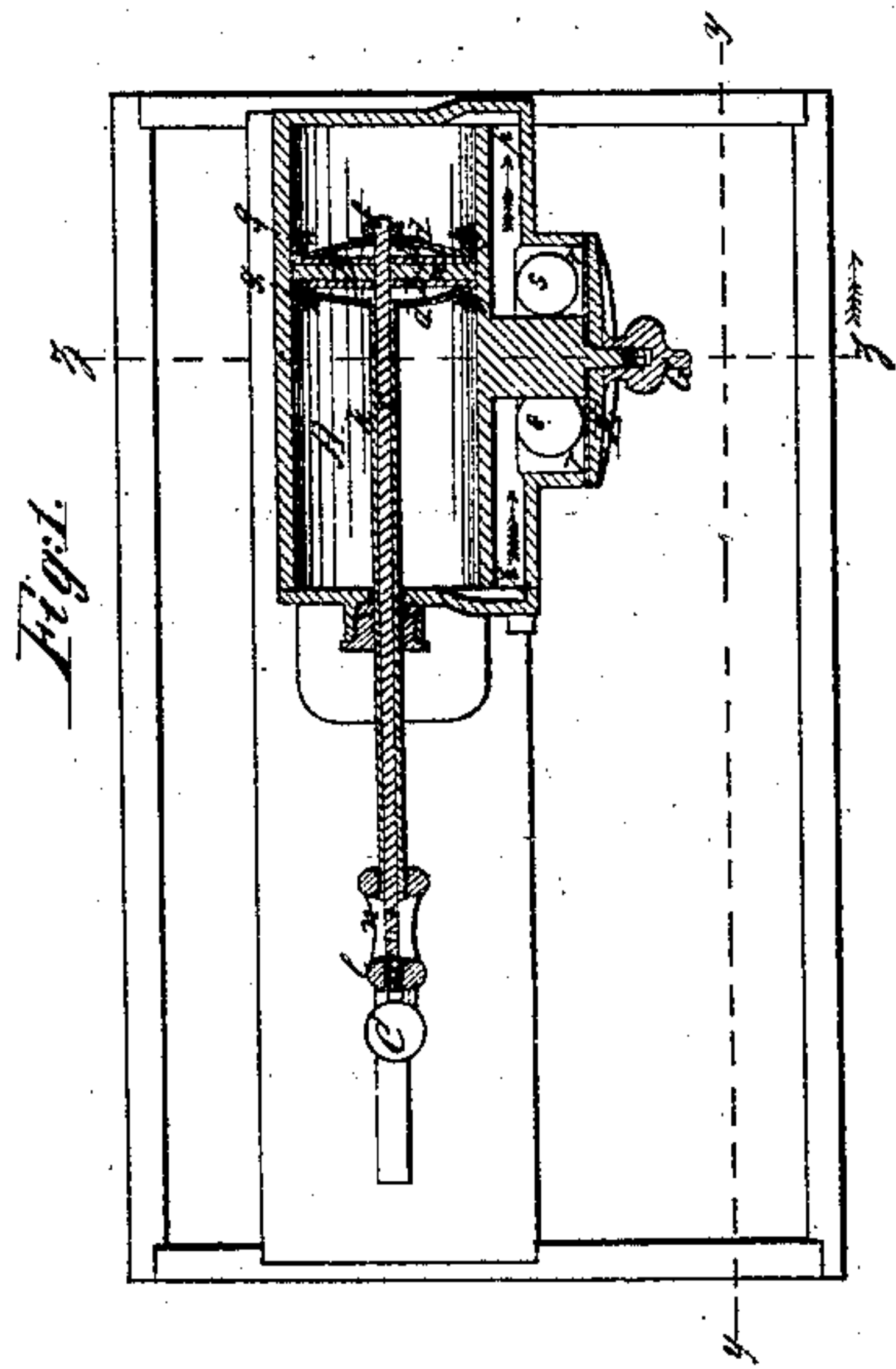
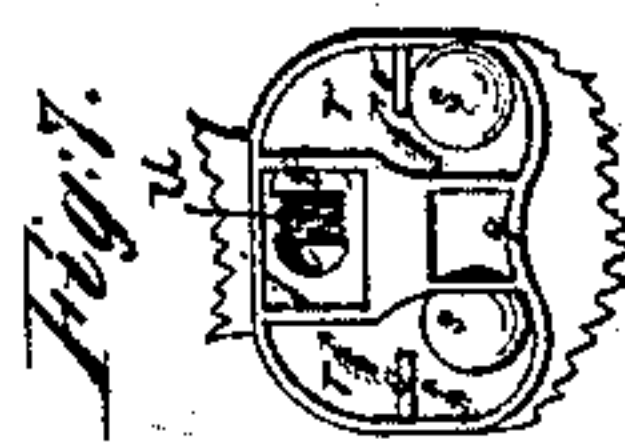
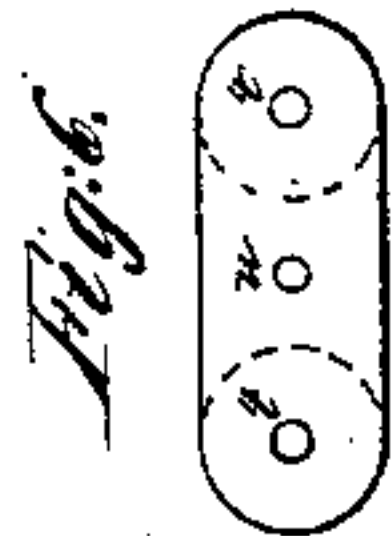
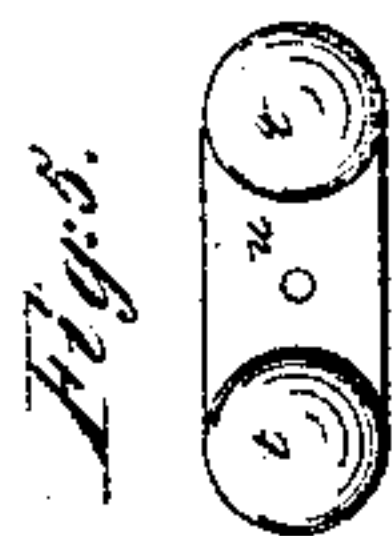
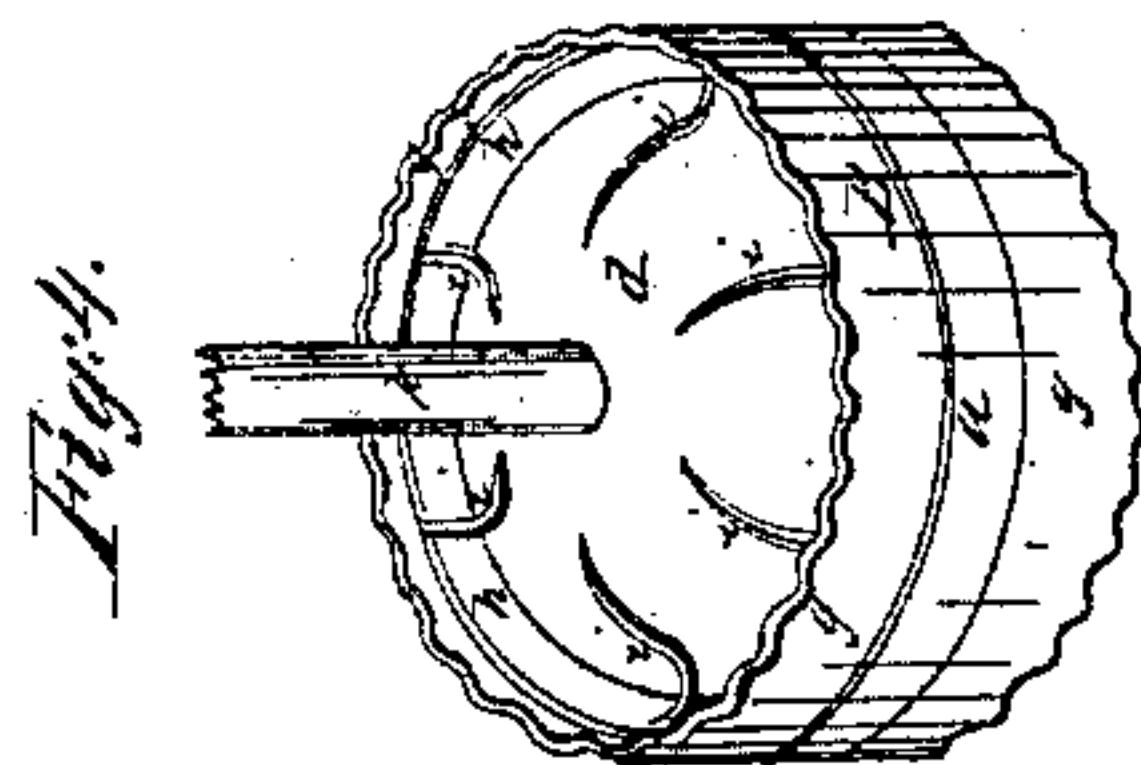
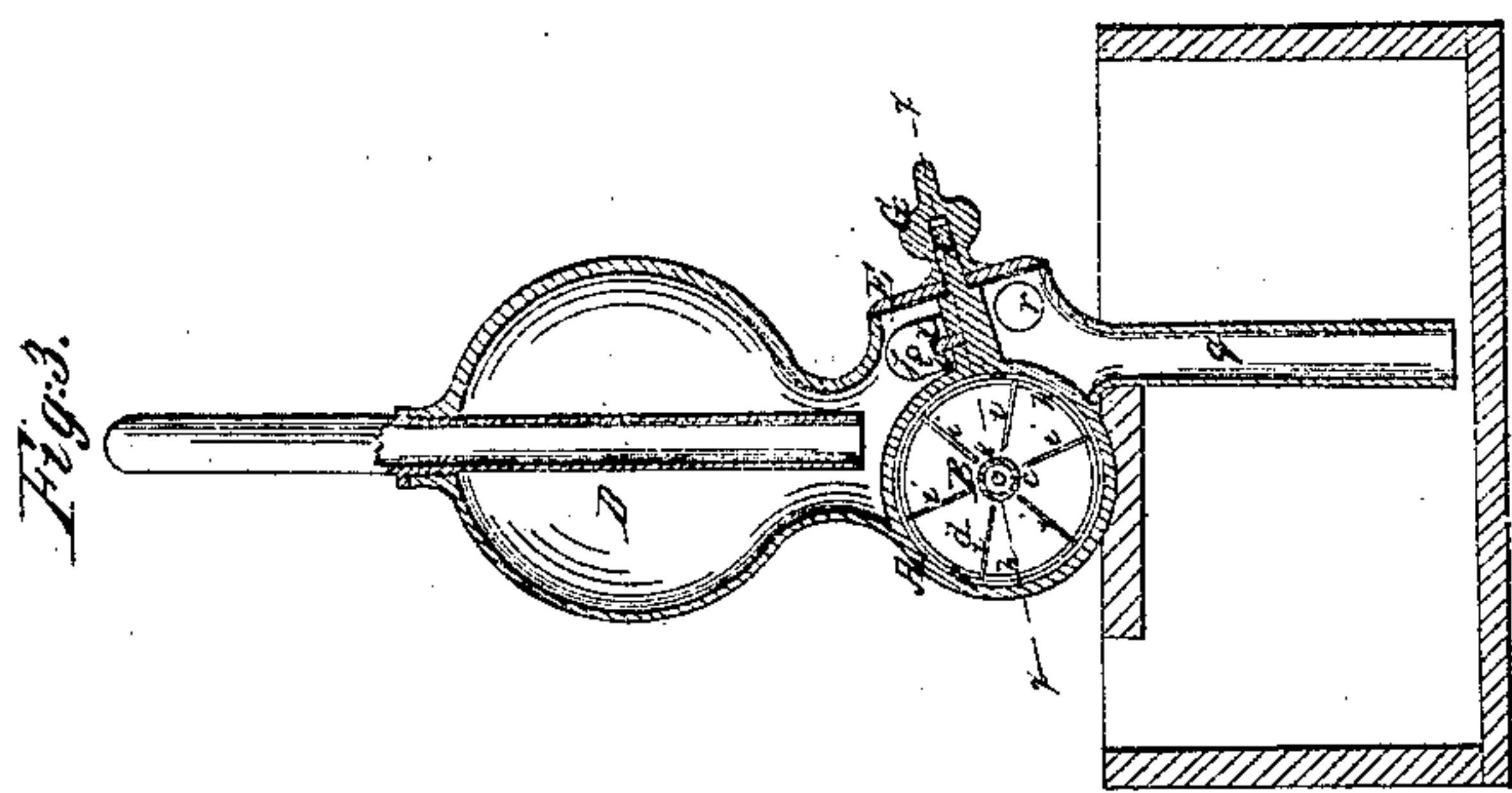


O. W. Preston Jr.

Force Pump,

N<sup>o</sup> 22,201.

Patented Nov. 30, 1858.





# UNITED STATES PATENT OFFICE.

O. W. PRESTON, JR., OF CORNING, NEW YORK.

## PUMP.

Specification of Letters Patent No. 22,201, dated November 30, 1858.

*To all whom it may concern:*

Be it known that I, OLIVER W. PRESTON, Jr., of Corning, in the county of Steuben and State of New York, have invented a new and Improved Force-Pump; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification, Figure 1 being a section thereof in the plane indicated by the line  $x x$ , Fig. 3; Fig. 2, a longitudinal vertical section in the plane indicated by the line  $y y$ , Fig. 1; Fig. 3, a transverse vertical section in the plane indicated by the line  $z z$ , Fig. 1; Fig. 4, a view in perspective of the piston; Figs. 5 and 6, views of the improved valve; Fig. 7, a view exhibiting a modification of the construction of said valve.

Like letters designate corresponding parts in all the figures.

The pump cylinder A, and its ports  $p, p$ , are of ordinary construction. The induction pipe  $q$ , is closed and opened alternately, to the two valve chambers  $r, r$ , by ball valves  $s, s$ , of india-rubber, or other suitable material, which are actuated by the motion of the water. Projecting pins  $o, o$ , may be employed to prevent the valves  $s, s$ , rising out of their proper positions in the chambers.

For closing the eduction passage into the air chamber D, a valve is employed, of peculiar construction, to operate in a single chamber  $j$ , for both ports of the pump. This valve is made in two parts  $t t$ , which may be the halves of a ball valve; and these parts are connected by an elastic strip, or band,  $u$ , of the proper length to allow the valve halves  $t, t$ , to reach from one valve seat to the other. This band may be made of india-rubber, or any material which will preserve its substance and elasticity in the water. Its elastic force should be only sufficient, by its tendency to straighten, to keep the valve halves gently separated and pressed against both valve-seats, except when water is driven through one of the seats, and then to offer as little resistance as possible to the flow thereof. To keep the valve halves in place, a screw, or fastening pin,  $v$ , may pass down through the elastic connecting band  $u$ , into the bottom of the valve chamber. The pin or screw  $v$ , is merely used to keep the valves in place, at the same time allowing the elasticity of one side to act in connection with that of the other. The advantage of

this improved valve, is, that I am enabled to employ essentially a single eduction valve, in a single chamber, for both ports, thereby occupying less space for the valves, and securing economy in construction. At the same time, I avoid the great objection to the use of a single eduction valve, instead of two, heretofore experienced, viz., that while the valve is shifting from one valve seat to the other, there is a free flow of water, in them, through both valve seats, from one port to the other, and consequently so much loss of water pumped at each stroke of the piston takes place. But with this improved valve, the moment each stroke of the piston, and consequently the flow of water, ceases, the elastic connecting band  $u$ , forces the valve half  $t$ , which, during the previous piston stroke has been forced inward from its seat, immediately back to the seat; so that when the next stroke commences, both valve halves are completely closed, and no such escape of water follows. At the same time, the pressure of the valve halves against their valve seats, is so slight, that no resistance, of practical importance, is offered to the working of the pump.

The valve chambers  $r, r$ , and  $j$ , are all closed by a single plate E, secured by a single nut G, screwed upon the screw-pin  $e$ ; whereby a ready and easy inspection of the valves is afforded, whenever any of the valves may become disarranged.

The piston B, of the pump, is constructed in an improved manner, whereby, in addition to its efficient action and durability, the advantage of enabling it to be tightened at any time, from the outside, without opening the cylinder, is gained. It is composed of a central disk  $a$ , of metal, on each side of which is a disk, or ring, of leather, or other suitable material for packing; and outside of each of these, a tightening plate  $d$ . These plates  $d, d$ , are made dishing, their concave surfaces being placed inward toward the packing disks, or rings, as represented. They are also cleft with a sufficient number of radial slits  $i, i$ , extending from near the center to the circumference, and dividing the projecting rim  $h$ , which presses against the projecting edge, or rim,  $g$ , of the packing. Thus, by forcing the plates  $d, d$ , inward, so as to diminish their degree of concavity, their diameter is increased, the radial slits  $i, i$ , allowing the



free expansion of the circumference for that purpose; and consequently the packing will be compressed, and the piston tightened. In order to apply this pressure against the plates *d, d*, readily, and from the outside, I make the piston-rod, of two parts:—a hollow rod, or tube, *k*, secured to the nearer plate *d*, and a central rod *c*, within said hollow rod *k*, and (extending freely through the piston) secured to the farther plate *d*. These rods are respectively attached to a block *l*, pivoted to the handle *C*, by which the pump is worked; and the inner rod *c*, is thus attached by a screw *m*; so that by turning the rod with a lever inserted in holes *n*, therein, or otherwise, the distance between the points of attachment of the two rods *c, k*, to their respective disks *d, d*, may be lessened at pleasure, and thereby the piston tightened as desired.

I do not claim the application of springs to valves, except in the use of single springs in connection with double valves acting

alternately to close double eduction-ports of pumps; therefore

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

1. The employment of the elastic band *u*, or its equivalent, serving to close the valves *t, t*, and also as a means to keep said valves in place, substantially in the manner and for the purposes herein specified.

2. I also claim the construction of the piston *B*, with the concave cleft plates *d, d*, in combination with the packing disks or rings *b, b*, and double adjusting piston-rod *c, k*, all arranged substantially as, and for the purpose, herein set forth, at the same time, disclaiming all other modes designed to effect similar purposes not substantially equivalent thereto.

OLIVER W. PRESTON, JR.

Witnesses:

J. F. TOMLINSON,  
E. W. ROSS.