(No Model.)

M. HARROLD.

COMBINED SUCTION AND FORCE PUMP.

No. 344,445. Patented June 29, 1886.

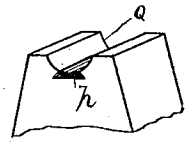
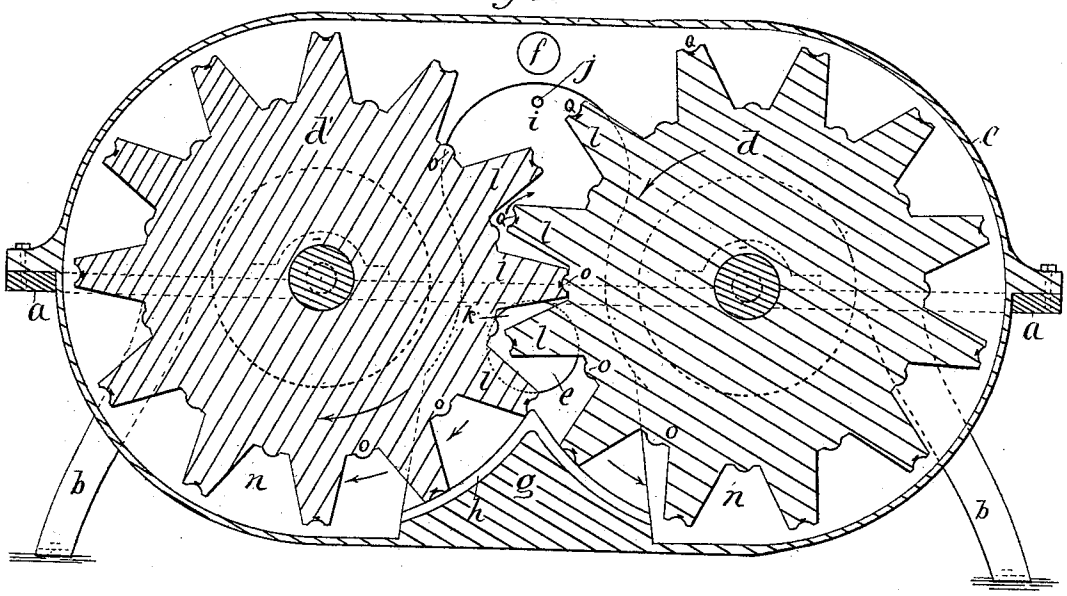


Fig 2

Fig 1



Attest

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UNITED STATES PATENT OFFICE.

MAHLON HARROLD, OF DENVER, COLORADO.

COMBINED SUCTION AND FORCE PUMP.

SPECIFICATION forming part of Letters Patent No. 344,445, dated June 29, 1886.

Application filed December 14, 1885. Serial No. 185,563. (No model.)

To all whom it may concern:

Be it known that I, MAHLON HARROLD, a citizen of the United States, residing at Denver, in the county of Arapahoe and State of Colorado, have invented a new and useful Combined Suction and Force Pump (for Water) and Air-Compressor, of which the following is a specification.

My invention relates to improvements in combined suction and force pumps and air-compressors in which revolving wheels, cylinders, or rollers having projections from their surfaces suck in and force a discharge of air or water; and the objects of my improvements are, first, to provide an inexpensive, light, simple, and effective pump and air-compressor, which will occupy only a small space, without valves, springs, or other complicated or troublesome arrangements. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the entire machine. Fig. 2 is a perspective view of the outer end of one of the lugs, showing the packing as it rests in the dovetail forming the bottom of the circular groove.

Similar letters refer to similar parts throughout the several views.

The plate *a*, Fig. 1, (shown partially by dotted lines,) its legs or standards *b b*, secured to the under side of the plate *a*, constitute the frame-work of the machine.

c is an air-tight case, in which the revolving rolls *d* and *d'* work in the direction shown by the arrows, and which is provided with supply-port *e* and exhaust-port *f*. At the bottom of this case *c* is formed the cone-shaped bed *g*, on which lies the packing *h*, which is held in its place by metal packing-plates *i*, which are in turn held in position by a bolt, *j*, which enters the case *c*. The packing-plate on the side having the ports has an opening of the same size as the supply port or ports through which the air or water, as the case may be, is admitted.

The object of the packing-plate is to form a packing against the side of the revolving rollers, preventing the compressed air or water in the space *n* from rushing sidewise into the space *k*. Into this space *k* (which would be a vacuum if the supply-port were closed) is sucked the air or water, as the faces of the lugs *l* are separated from each other by their revolution until the top of the packing *h* on the cone-shaped bed *g* is reached by the outer end of the lugs *l*. Then the air or water carried in the space is conveyed to a point where it is discharged into the space *n*. This discharge being continuous while the machine is in motion forces the air or water through the discharge-port *f*. When the lugs *l* and the projection *o*, which is a suitable portion of a circle for the purpose, meet at the horizontal center, the packing *p*, which is composed of leather, is compressed by the projection *o*, so as to form an air-tight joint when in this position. (Shown in Fig. 1.) There is a second object in the projections *o*, which is to make the lugs *l* close accurately in passing the center. The air or water is kept above the horizontal center by the closing of the lugs *l* in connection with the circular projections *o*. The rolls *d* and *d'* are supported and revolved by the shafts d^2 and d^3, which move in suitable boxings on the frame *a*. The openings in the case through which the shafts pass are protected by suitable packings to prevent the escape of air or water. On the end or ends of these shafts are placed the driving pulleys or gears. The rolls *d* and *d'*, with their projections, should not be mistaken for cog-wheels, for the reason that cogs may be any desired length of projection, while the projections on the rolls *d* and *d'* can only be one-third of a circle. The circular grooves *g* on the lugs *l* must also be one-third of a circle, and in no case does one of the rolls drive the other, nor must there be any friction between them that will wear either, except that caused by the passing of the lugs *l* over the projection *o*. I find by this exactness that the machine which I have had in operation for some time works with perfect satisfaction.

I am aware that prior to my invention of this machine rolls with projections have been used for the purpose, as in my invention for

which I made an application for Letters Patent on or about May 11, 1885. Therefore I do not claim them, broadly; but

What I do claim, and desire to secure by Letters Patent, is—

In a combined suction and force pump (for water) and air-compressor, the combination of the case *c*, with its cone-shaped bed *g*, packing *h*, ports *e* and *f*, shafts d^2 and d^3, with the revolving rolls *d* and *d'*, with their projections *o* and lugs *l*, packing *p*, and metal packing-plates *i*, substantially as described and shown, and for the purpose set forth.

MAHLON HARROLD.

Witnesses:
CHAS. A. COLBY,
R. GOULD.