E. BURGIN.

AIR-PUMP.

No. 191,927. Patented June 12, 1877.

Fig. 1

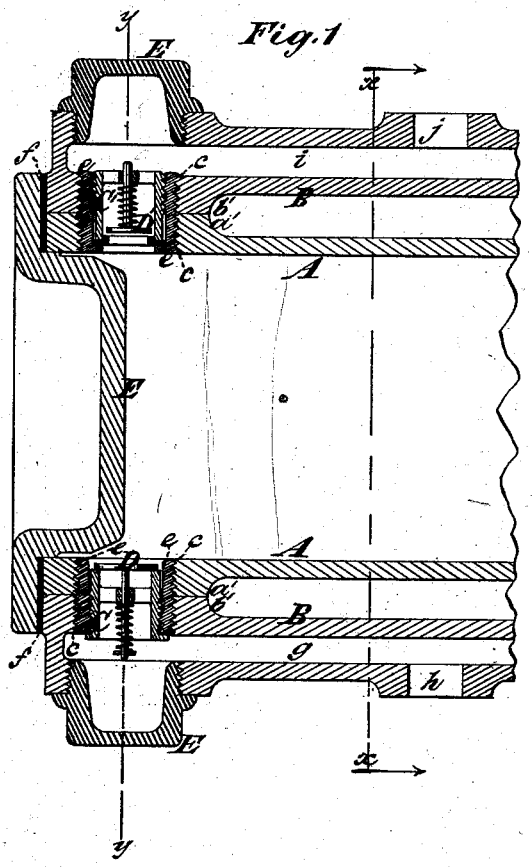


Fig. 2

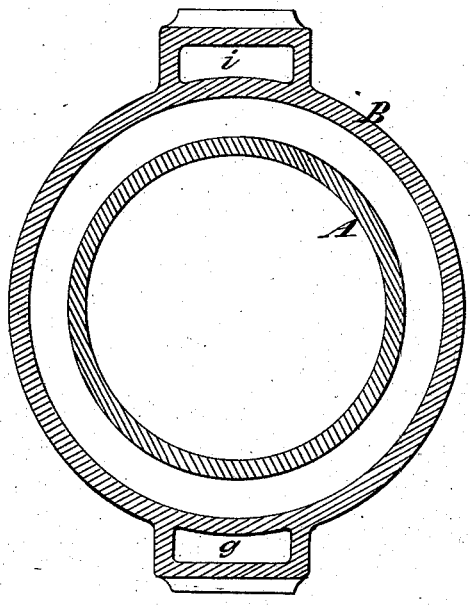


Fig. 3

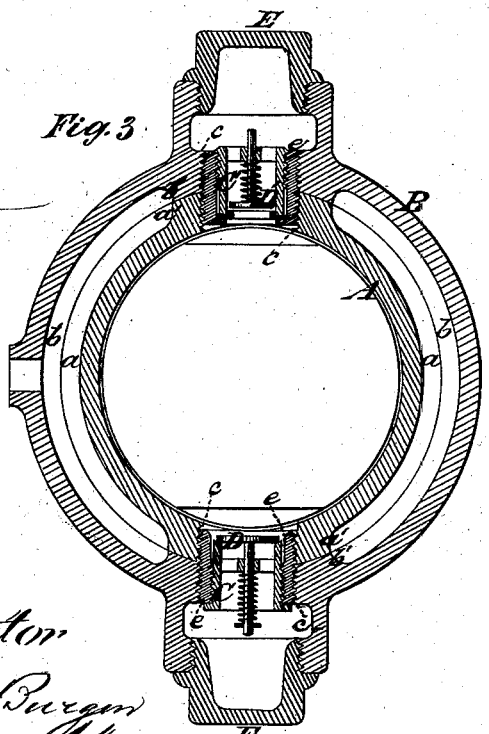
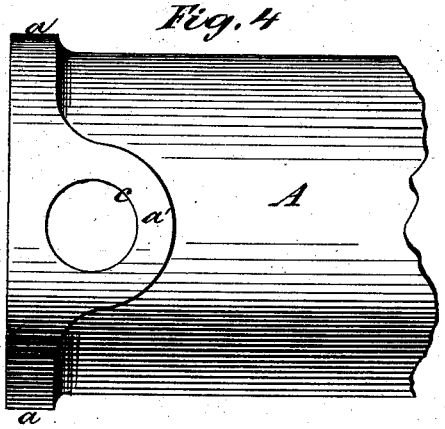


Fig. 4



Witnesses:
Michael Ryan
Fred. Haynes

Inventor
Emil Burgin
by his Attorneys
Brown & Allen

UNITED STATES PATENT OFFICE.

EMIL BÜRGIN, OF NEW YORK, N. Y.

IMPROVEMENT IN AIR-PUMPS.

Specification forming part of Letters Patent No. **191,927**, dated June 12, 1877; application filed May 7, 1877.

To all whom it may concern:

Be it known that I, EMIL BÜRGIN, of the city of New York, in the State of New York, have invented certain new and useful Improvements in Air-Pumps; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawing, forming part of this specification.

This invention, though more especially intended for air-compressors, may be wholly or in part applicable to other air-pumps.

This invention consists in combining with the cylinder and jacket of an air-pump sockets for the reception of the valve-boxes, said sockets being inserted into the sides of, and forming a tight joint between, the cylinder and jacket, whereby leakage between the cylinder and air-passages and the separate casting of the water-jacket is effectually prevented.

A feature of the invention relates to the water-jacketing of the cylinders of air-compressors, in which the valves are applied to work toward and from the bore or periphery of the cylinder. In pumps of small size it is difficult to cast the jacket with the cylinder, and the cylinder and the jacket have to be made of two separate castings, the former being fitted into the latter. This feature of the invention consists in means of providing for the insertion of the valves into the sides of such cylinders, whereby leakage between the cylinder and air-passages and the separate casting of the water-jacket is effectually prevented.

In the accompanying drawing, Figure 1 represents a central longitudinal section of one end of the cylinder of an air-pump, illustrating both features of the invention. Fig. 2 is a transverse section on the plane indicated by the line *x x* in Fig. 1. Fig. 3 is a transverse section in the plane indicated by the line *y y* in Fig. 1. Fig. 4 is an outside longitudinal view of the end of the cylinder without the jacket.

A is the cylinder. B is the jacket. C C′ are the valve-boxes, and D D′ are the valves arranged in the sides of the cylinder. E is the cylinder-head.

The cylinder has cast upon its exterior, close to each end, a band, *a*, and the jacket has cast with it, close to each end, a corresponding internal band, *b*. The band *b* is bored internally and the band *a* turned externally to fit the band *b* tightly, and the said bands *a* and *b* are extended at certain intervals to form corresponding bosses *a′* and *b′*, to surround the corresponding circular openings *c*, which are provided in the cylinder and jacket for the reception of the valve-boxes. These openings *c* are bored radially or laterally through the cylinder and jacket after the former has been inserted into its place in the latter, and sockets *e e* are inserted into the said openings. These sockets may be screwed into the said openings, or otherwise so fitted tightly and permanently thereinto as to prevent the possibility of any leakage between the cylinder and jacket around the said openings. The flanges of the cylinder-heads abut against the ends of the cylinder and jacket, with an interposed gasket or packing-ring, *f*, which prevents any leakage at the ends of the cylinder and jacket. The jacket has cast upon it a longitudinal inlet-passage, *g*, forming communication between the inlet-pipe opening *h* and the inlet-valve box or boxes C at both ends of the cylinder, and has also cast upon it a longitudinal outlet-passage, *i*, forming communication between the outlet-pipe opening *j* and the outlet-valve boxes C′ at both ends of the cylinder.

The valve-boxes C C′ are screwed, or otherwise so inserted, into the sockets *e e* as to provide for the removal of the said boxes whenever necessary. The valves, which are of the puppet kind, and close against seats in the said boxes, open and close by movements radial to the cylinder, or directly toward and from the center and bore thereof. Removable bonnets E E are fitted to suitable openings provided in the passages *g* and *i* opposite the valve-boxes, such openings being large enough to provide for the insertion through them of the sockets *e e*, and for the insertion and removal of the valve-boxes and valves whenever necessary.

Two or more inlet-valves and two or more outlet-valves may be applied in this way at either end of the cylinder, so that a very large aggregate area of valve-opening may be obtained. If the valves were applied in this

way without the sockets *e e*, it would be very difficult to provide for the removal of the valve-boxes and valves, and yet preserve a tight joint between the cylinder and jacket around the said boxes; but the sockets *e e*, never requiring to be removed after they have been once inserted, may be inserted so tightly, with suitable cement, as to obviate all possibility of leakage between the cylinder and jacket around the valve-boxes.

What I claim as my invention is—

The combination, with the cylinder and jacket of an air-pump, of sockets *c c* for the reception of the valve-boxes, inserted into and forming a tight joint between the cylinder and jacket, substantially as herein described.

EMIL BÜRGIN.

Witnesses:

HENRY T. BROWN,

FRED. HAYNES.