

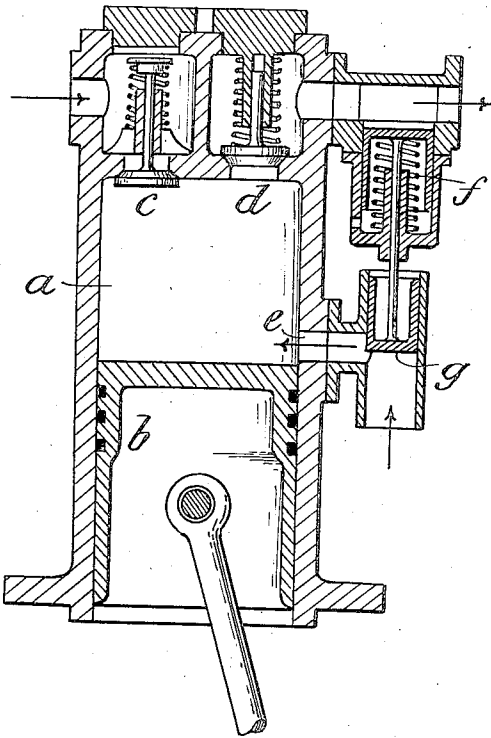
G. BRANDSTETTER & R. FREUND.

AIR PUMP.

APPLICATION FILED SEPT. 15, 1913.

1,126,613.

Patented Jan. 26, 1915



WITNESSES
Philip D. Rollhaus
A. H. Davis

INVENTORS
Georg Brandstetter
Richard Freund
BY *Wm. W. Lee*
ATTORNEYS

UNITED STATES PATENT OFFICE.

GEORG BRANDSTETTER, OF HOHENSTÄDT, AND RICHARD FREUND, OF VIENNA,
AUSTRIA-HUNGARY.

AIR-PUMP.

1,126,613.

Specification of Letters Patent.

Patented Jan. 26, 1915.

Application filed September 15, 1913. Serial No. 789,825.

To all whom it may concern:

Be it known that we, GEORG BRANDSTETTER and RICHARD FREUND, subjects of the Emperor of Austria-Hungary, residing at Hohenstadt, Moravia, and Vienna, both in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Air-Pumps; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

Our invention relates to air pumps designed to furnish vacuum and air under pressure simultaneously and in which it is desired to govern the vacuum and the pressure of air independently.

In such pumps heretofore double acting pumps have been used, vacuum being produced on one side of the piston and air under pressure on the other side. Such pumps are required for instance for such pile feeders of printing presses in which an evacuated tube provided with nozzles raises the uppermost sheet of a pile and feeds it to the press.

For facilitating the raising of the sheet and the drawing forward of the same air under pressure is blown under the raised sheet so that the latter slides so to speak on a layer of air and not on the sheet next below the same. According to the quality of the paper a different suction and blowing is required. For proper operation a pump is necessary which is capable of producing a very high vacuum and of furnishing at the same time a sufficient quantity of air under relatively high pressure. This can in general be realized only by using independent vacuum and compressing pumps.

According to our invention the same result is obtained by a single acting pump or by a double acting pump, one and the same side of the piston of which furnishes vacuum and air under pressure.

The annexed drawing shows diagrammatically by way of example an improved pump embodying our invention.

a is the cylinder, *b* is the piston, *c* is the suction valve, *d* is the valve for air under pressure, *e* is the slot for additional air.

f is a spring actuated plunger, *g* is a slide valve serving for throttling the slot *e*; in-

stead of the slide valve a spring actuated diaphragm or the like may be used.

Assuming the pump is used in connection with a pile feeder the operation is as follows: During the outward stroke of the piston *b* the suction valve *c* is opened by the partial vacuum produced in the cylinder and air is drawn from the feed tube through the pipe connections between the feed tube and the cylinder. Thereby vacuum is produced and the uppermost sheet of the pile is pressed against the nozzles of the feed pipe by the action of the atmosphere.

Immediately before reaching the outer end of its stroke the piston *b* uncovers the slot *e* through which then additional air rushes into the cylinder owing to the partial vacuum existing therein, the suction valve *c* being closed. During the following inward movement of the piston the air is compressed in the cylinder and escapes through the valve *d* into the chamber for compressed air.

By increasing or reducing the width of the slot *e* the quantity and hence also the pressure of the compressed air may be regulated at will. This adjustment of the width of the slot may be effected by hand or automatically. If the pressure becomes too high the spring actuated piston *f* is depressed and the slide *g* connected with it throttles the slot so that a partial vacuum is maintained in the cylinder which results in a reduction of the quantity of additional air drawn into the cylinder and thus also in a reduction of the quantity of compressed air supplied by the pump.

If the pump is provided with mechanically controlled admission and exhaust valves additional air is admitted into the cylinder opening a valve at the proper moment.

Claims:

1. In an air pump the combination of a cylinder, a vacuum chamber and a compression chamber, valves located in one head of the cylinder and adapted to control the communication of the same with the said chambers, a piston adapted to reciprocate within the cylinder, and a port communicating with the atmosphere and located in the cylinder wall and adapted to be uncovered by the piston at the end of its stroke

in which it recedes from said cylinder head, whereby a quantity of atmospheric air is admitted into the cylinder at the end of such stroke and is forced into the compression chamber during the return stroke.

2. In an air pump the combination of a cylinder, a vacuum chamber and a compression chamber, valves located in one head of the cylinder and adapted to control the communication of the same with the said chambers, a piston adapted to reciprocate within the cylinder, a port communicating with the atmosphere and located in the cylinder wall and adapted to be uncovered by the piston at the end of its stroke in which it recedes from said cylinder head, whereby a quantity of atmospheric air is admitted into the cylinder at the end of such stroke and is forced into the compression chamber during the return stroke, and means actuated by the air compressed by the pump for throttling the said port.

3. In an air pump, a cylinder having a port in its wall communicating with the atmosphere, vacuum and compression chambers at one end of the cylinder, valves located in the head of the cylinder and controlling the communication between the cylinder and the said chambers, a piston adapted to reciprocate in the cylinder, the port of the cylinder being located so as to be uncovered by the piston at the end of its outward stroke, a valve for throttling said port, and a spring pressed plunger connected with the valve and adapted to be operated by the air compressed by the pump.

In testimony whereof, we affix our signatures, in presence of two witnesses.

GEORG BRANDSTETTER.
RICHARD FREUND.

Witnesses:

ARTHUR BAUMANN,
AUGUST FUGGER.