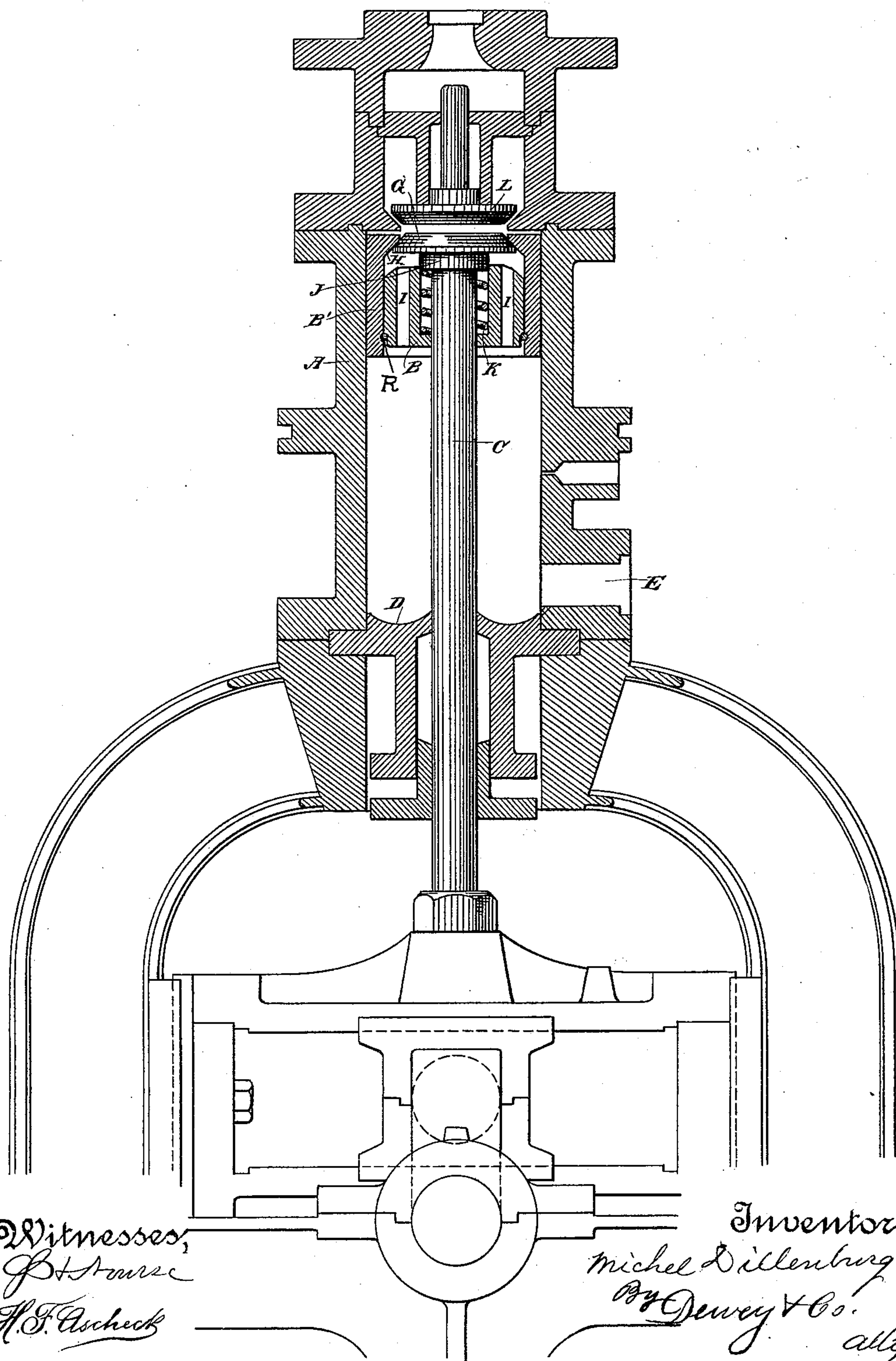


(No Model.)

M. DILLENBURG.
AIR COMPRESSOR.

No. 481,850.

Patented Aug. 30, 1892.



UNITED STATES PATENT OFFICE.

MICHEL DILLENBURG, OF SAN FRANCISCO, CALIFORNIA.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 481,850, dated August 30, 1892.

Application filed April 17, 1891. Serial No. 389,357. (No model.)

To all whom it may concern:

Be it known that I, MICHEL DILLENBURG, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Air-Compressors; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to certain improvements in apparatus for compressing air and other elastic fluids; and it consists of the construction and combination of devices herein-after fully described and claimed.

The figure is a vertical section taken longitudinally through the cylinder, piston, and valve.

A is the compressing-cylinder having the piston B, adapted to reciprocate within it, said piston having suitable packing-rings and means for making a tight joint.

C is the piston-rod, which passes out through a stuffing-box in the lower head D of the cylinder, and E is the inlet-passage, through which the elastic fluid is admitted to the lower part of the cylinder. The piston-rod is connected with a slide and a crank or other means whereby it is caused to reciprocate within the cylinder. The upper end of the piston-rod has formed upon or fixed to it a valve G, the upper periphery of which is beveled or made conical, and it fits a corresponding beveled seat H in the upper part of the piston, closing upwardly. The piston-rod extends through the web of the piston and is movable longitudinally therein. The outer cylindrical sleeve B', which fits the interior of the cylinder, is secured to the web in the following manner: The inner face of this sleeve has a groove or channel turned in it, and the lower end of the web or body is turned down at this point to correspond with the channel. A ring R being placed in this groove or channel, half of it extends into the groove in the sleeve, and the piston-body slips over the inwardly-projecting part of the ring, thus locking the two together, but permitting of their being easily separated when desired. The construction provides against the permanent locking of the web with the sleeve due to any corrosion at the point of locking. By raising the piston-body against the pressure

of the spring until the ring is exposed below its lower end the ring may be removed from the groove in the outer sleeve and the parts separated. The web B is made in the form of a spider or having openings I passing through it from end to end to allow the air to flow through the piston when the latter is drawn down toward the lower end of the cylinder.

Below the valve G at the upper end of the piston-rod is a guiding collar or flange J, which moves and is guided in a central chamber in the web B, this chamber being bored out of sufficient diameter to allow the guide-flange to slip easily in the upper part. By thus closely arranging the collar or flange J within the upper end of the chamber a secure bearing is formed for the upper end of the piston-rod, and as the said rod passes closely through the central opening in the lower end of the piston a similar bearing is formed at this point. Therefore the piston-rod is securely braced and reinforced at the two points noted, which are recognized as the places subjected to the greatest strain. Within this chamber is contained a stout spiral spring K, which presses against the flange J and under ordinary normal conditions forces the valve G upward against the seat H of the outer ring B' of the piston, thus closing this opening.

In the upper end of the cylinder is a valve L, suitably guided and closing upon a seat formed for it in this chamber. When the piston is forced up, the valve G closes, as before described, against the seat H in the piston, and any air which is above the piston is forced out into the chamber above and thence to the reservoir, the pressure of the air opening the valve L to allow it to pass. When the piston-rod C is drawn downward again by the action of the connecting-crank or other moving device, the pressure within the cylinder below the piston will tend to force the piston toward the upper end of the cylinder. The piston-rod being drawn down against this pressure, the guiding-flange J will compress the spring K in the central chamber of the piston and will thus draw the valve G away from the seat H of the piston. This leaves a clear opening through the passages I in the piston and around the valve G between it and the seat H, so that when the piston is drawn

downward the air will flow freely through the piston and pass above the valve and there will be no pressure of air necessary to open the valve, because this operation is mechanically performed by drawing down the piston-rod and valve, as before described. This is of considerable importance where the air or other elastic vapor is at all attenuated. When the piston has reached the bottom of the cylinder and the space above the piston is full of the elastic fluid, the first movement of the piston-rod to return the piston to the upper end of the cylinder will close the valve G against the seat H, and the piston-rod thereafter acts against the valve and through it against the piston, forcing the whole to the upper end of the cylinder and discharging the air or other fluid into the space above the valve L, opening the latter, as before described. In addition to this mechanical opening of the valve, on the downstroke of the piston I am enabled to prevent any damage to the cylinder by reason of the breaking of the valve, because the valve is contained within the chamber at the upper end of the piston and is prevented from escaping from this chamber in case of breakage by reason of the seat H, against which it closes. This seat is of smaller diameter than the valve, and consequently retains it within the piston, so that the apparatus may be stopped and repairs to the valve made without the latter having in any wise damaged other parts of the cylinder.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

An improved air-compressor consisting of a cylinder, a piston-rod, a piston having an exterior sleeve provided with an annular groove around its interior near the bottom and a beveled valve-seat around its interior near its top, said piston having a web whose lower end is smaller than its body, a ring between the web and sleeve and occupying the groove of the latter and the reduced portion of the former and serving as the means for locking the sleeve to the web, but allowing of the ready separation of these parts, said web having a central opening with openings I upon each side thereof, and a central chamber, a spring in said chamber, a valve at the upper end of the piston-rod and a guide-collar on said rod below the valve, said central opening and inner walls of the chamber serving as bearings for the piston-rod and guiding-collar, respectively, and as reinforces for the upper end of the piston-rod, all constructed, combined, and arranged to operate substantially as herein described.

In witness whereof I have hereunto set my hand.

MICHEL DILLENBURG.

Witnesses:

S. H. NOURSE,
J. A. BAYLESS.