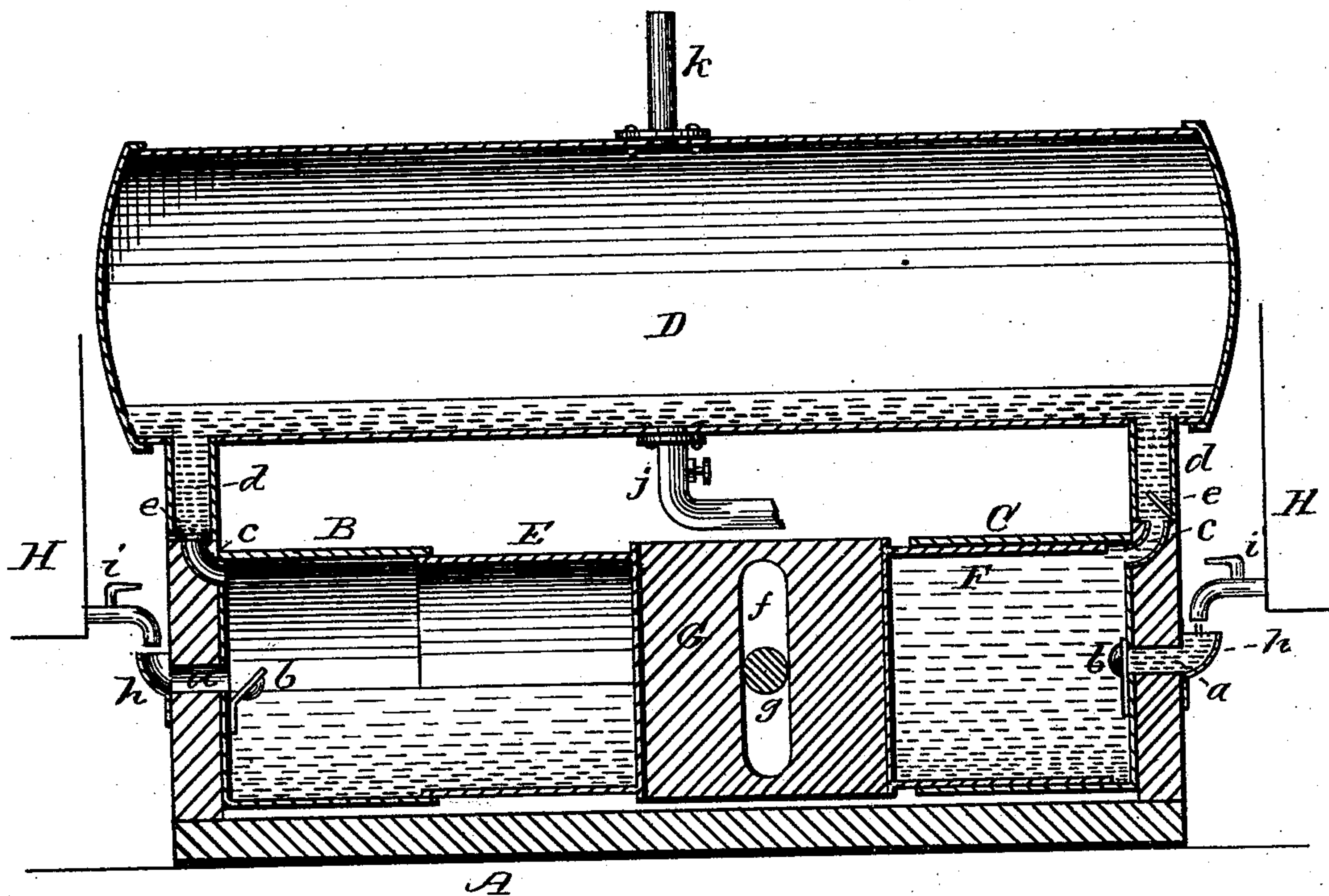


M. B. HARVEY.  
Air-Compressor.

No. 211,570.

Patented Jan. 21, 1879.



WITNESSES

Nat. E. Oliphant  
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# UNITED STATES PATENT OFFICE.

MOSES B. HARVEY, OF LEAVENWORTH, KANSAS.

## IMPROVEMENT IN AIR-COMPRESSORS.

Specification forming part of Letters Patent No. **211,570**, dated January 21, 1879; application filed December 4, 1878.

*To all whom it may concern:*

Be it known that I, MOSES B. HARVEY, of Leavenworth, in the county of Leavenworth and State of Kansas, have invented a new and valuable Improvement in Air-Compressors; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making a part of this specification, and to the letters and figures of reference marked thereon.

The drawing is a representation of a longitudinal vertical section of my invention.

This invention has relation to air-compressors; and has for its object to construct a device of the character named that will be simple in its parts and effective in its operation.

In compressing air to be used as a motive power, the difficulties heretofore experienced have been the accumulation of heat unevenly, whereby one part of the machine expands and allows the air to escape, while the other portion of the machine contracts or tightens and produces a great amount of friction, and consequently imperfect work. The valves, particularly when becoming heated to any great extent, warp, twist out of shape, fit imperfectly, and cease to do their work properly, whereby only a small percentage of power spent is realized in the shape of compressed air. It is, therefore, the purpose of this invention to remedy the above-mentioned evils, and to construct a compressor that will require comparatively little power to operate it, and one in which its valves at each stroke are overspread with water, thereby being kept wet, cool, and tight, and lubricated, and dispensing with the usual piston-heads, which, by becoming heated, work unevenly, heating other parts of the machinery, as well as retaining or accumulating heat that cannot be carried off.

The invention, therefore, consists in the novel arrangement of the compressor and its operating parts, as will be hereinafter described, and subsequently pointed out in the claim.

In the accompanying drawing, A represents the outer casing, of any suitable material, to the ends of which are rigidly secured cylinders B C. Through each end of the cas-

ing A is an opening, *a*, which registers with a similar opening in the end of the cylinders B C, said opening being closed by valves *b*, opening inward, to receive air into the cylinders, as will be hereinafter described. Above the casing A is a reservoir, D, in which the compressed air is stored, and which communicates with the cylinders B C through passages *c* and short pipes *d*. Above the passages *c* are suitable valves *e*, opening upward, to allow the compressed air to enter the reservoir at every alternate stroke of the hollow cylindrical pistons E F. These pistons fit nicely within the stationary cylinders B C, and at their inner ends are rigidly connected to a head, G, having a slot, *f*, through which passes a crank-arm, *g*, for operating the pistons E F.

Any other suitable means may be employed for operating the pistons, and the usual fly wheel or wheels may be connected thereto, as found desirable; and although I have shown the cylinders as being separate, but rigidly connected to the outer casing, A, it is evident that the casing may form a part of the cylinders B C.

Any of these modifications of my compressor may be made without departing from the gist or essence of my invention, as the same principle is involved in adopting any of the modifications enumerated.

One of the openings *a* may be provided with a trough, *h*, placed around the lower part of said opening in such a manner as to hold a proper amount of water, so that when the valve *b* opens the water will be admitted with the air.

Placed a suitable distance from the end of the compressor is a water tank or reservoir, H, of any suitable form or construction, and of sufficient size to hold the desired quantity of water. The tank H is provided with a suitable faucet, *i*, extending out therefrom sufficiently to be over the trough *h* and supply the same with water in quantities as the faucet is regulated. When one water-tank only is used for both ends of the compressor the water will be required to be conducted through pipes; but I prefer two tanks, one arranged at each end of the compressor.

At the under side of the reservoir D is an



opening, to which is secured a cock, *j*, connecting with suitable pipes or other means, by which the water is drawn off from the reservoir as it accumulates and conveyed in any direction desired. A pipe is secured to the upper part of the reservoir, as illustrated at *k*, by which the compressed air, as it is required, is conveyed to the place desired.

The operation of the compressor will be readily understood from the following description: The cylinders and pistons, when closed within each other, are supposed to be filled with the required amount of water for operating the compressor. The water, in a small stream, passes out of the tank *H*, through the faucet *i*, into the funnel *h*, and there accumulates, while the opening *a* is closed by the valve *b* of cylinder *B*. As the piston *E* is drawn out of the cylinder *B* on its backward stroke, the valve within the cylinder *B* is forced open. The air and accumulated water in the funnel pass into the cylinder, and when the piston *E* makes its forward stroke or closes within the cylinder *B* the amount of water thus received has been forced to find exit, and has followed the air caught and lodged above the valve *e* in pipe *d*, and when so much has been placed there as will properly fill the reservoir *D* the same may be allowed to escape through cock *j* and suitable pipes, as pre-

viously described. The value of the small stream of water allowed to pass from the tank *H* into the machine will be readily understood, serving, as it does, to keep it in good working order, lubricating and keeping cool the valves and other portions of the compressor, as well as keeping a full supply in the cylinders at all times, and at the same time insures a fresh supply over the valves *e e*, and carries off heat from any heated portion of the machine, and settles at the lowest point in the tank or reservoir *D*, and is afterward conveyed off by suitable pipes.

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

The combination, with condensing air-reservoir *D*, pipes *d*, and valves *e*, of the cylinders *B C*, valves *b*, and pistons *E F*, the passages or openings *a* being provided with funnels, by which water may be introduced into the cylinders, substantially as and for the purpose specified.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

MOSES B. HARVEY.

Witnesses:

FRANK BIRD,  
HERMAN WOLTZEN.