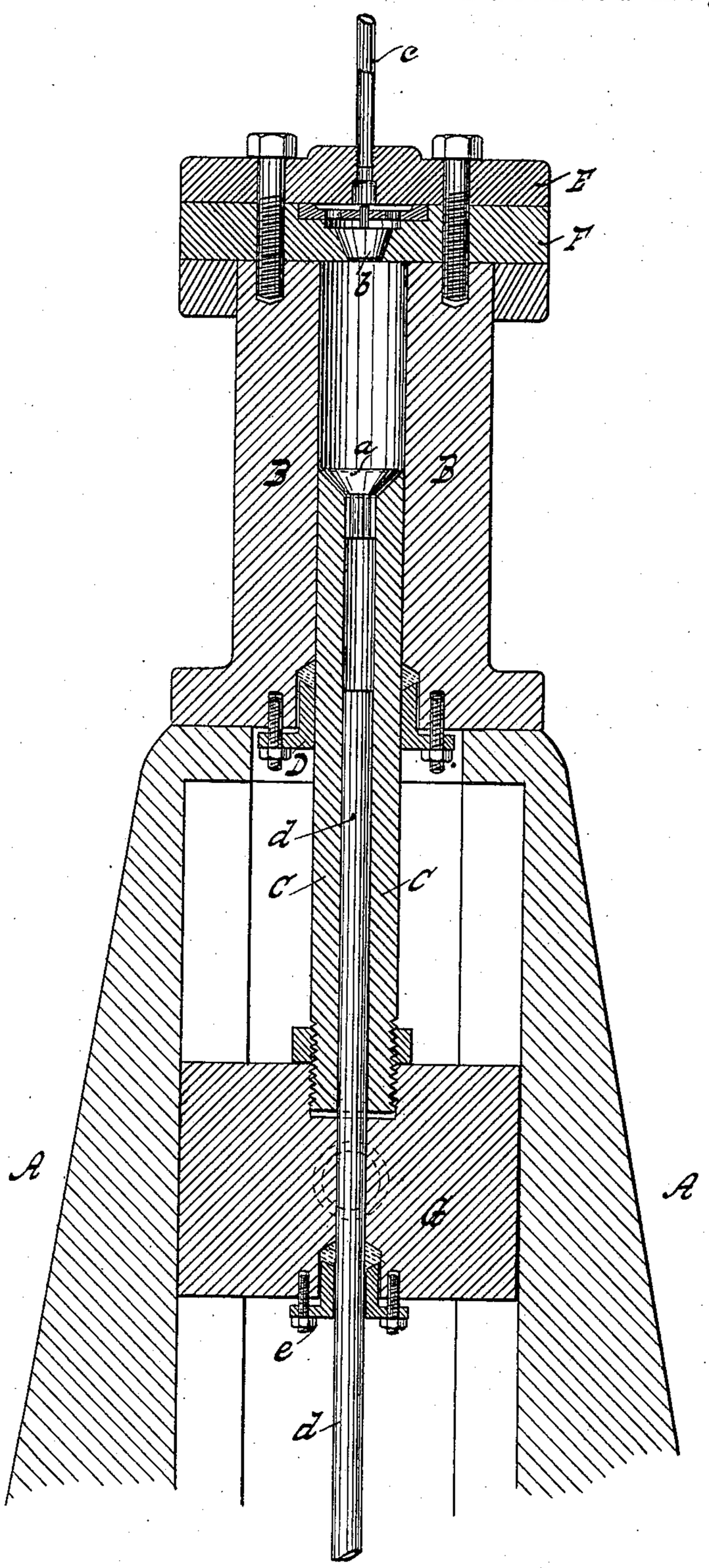
(No Model.)

J. B. STOBAEUS.

GAS COMPRESSOR.

No. 323,751. Patented Aug. 4, 1885.



WITNESSES

A. Faber du Faur Jr.

George W. Connor

INVENTOR

John B. Stobaeus.

By his Attorney

James L. Norris.

UNITED STATES PATENT OFFICE.

JOHN B. STOBAEUS, OF NEWARK, NEW JERSEY.

GAS-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 323,751, dated August 4, 1885.

Application filed March 28, 1885. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. STOBAEUS, a citizen of the United States, and residing at Newark, in the county of Essex and State of New Jersey, have invented new and useful Improvements in Gas-Compressors, of which the following is a specification.

The object of my improvement is to reduce the clearance in gas-compressors to a minimum and to cool the plunger by the cold gas admitted into the cylinder. I obtain these objects by providing the cylinder with a hollow plunger, through which the gas passes into the cylinder, and which exactly fits the bore of the cylinder, the plunger being so adjusted that at the end of its upstroke it leaves no clearance between its upper end and the lower side of the cylinder-head, and being provided with an upwardly-opening valve at its top, while the cylinder-head is likewise provided with an upwardly-opening valve.

In the annexed drawing, A represents part of the frame of the machine; B, a pump-cylinder, secured upon the top of the frame; C, a hollow plunger, which exactly fits the bore of the cylinder, and which carries at its top an upwardly-opening valve, *a*, through which gas is admitted into the cylinder. D is a stuffing-box, through which the plunger passes; E and F, cylinder-heads, of which the lower one, F, contains an upwardly-opening discharge-valve, *b*, while the upper one, E, is provided with the discharge-pipe *c*. The top face of the valve *a*, when closed, is on a level with the top surface of the plunger, and the lower face of the valve *b*, when closed, is in line with the lower face of the cylinder-head F.

G is the cross-head, which is guided in the frame A, and to which reciprocating motion is imparted in the usual manner. The plunger C is screwed into the top of the cross-head G and so adjusted that at the end of the upstroke its top surface just touches the lower side of the cylinder-head F. The cross-head G is perforated in continuation of the bore of the hollow plunger, and a pipe, *d*, passes through the cross-head into the hollow plunger. *e* is a stuffing-box, through which the pipe *d* passes. The pipe *d* is secured to some part of the frame A, and is connected to the gas supply.

During the downward stroke of the plunger the valve *a* is raised, and gas is admitted into the upper part of the cylinder from the pipe *d* and through the bore of the plunger. During the upward stroke the gas in the cylinder is first compressed and then discharged through the valve *b* and pipe *c*.

I do not restrict myself to the means shown in the drawing for introducing gas into the hollow plunger from the outside of the cylinder, since this may be accomplished by other well-known means—such as an elastic pipe, or a jointed pipe connected to the cross-head or to the lower end of the plunger.

By having the valves *a* and *b* located as shown and described, they can be made large, so that they are but slightly lifted by the passage of the gas. Undue heating of the plunger is prevented by the incoming cold gas, which passes through it.

I use, by preference, two cylinders placed upon the same frame, the plunger of one being on the upstroke, while that of the other is on the downstroke.

With this compressor I am enabled to compress cold carbonic acid from atmospheric pressure to eight hundred pounds per square inch, and more, without excessive heating, the compressed gas being liquefied by cooling it in a tank.

What I claim as my invention is--

1. The combination, in a gas-compressor, of a vertically-arranged cylinder having at one end a stuffing-box and at the opposite end a cylinder-head provided with an upwardly-opening valve, a discharge-pipe extending from the cylinder-head, a hollow reciprocating piston closely fitting the bore of the cylinder and having at its inner end an upwardly-opening valve, and a gas-supply pipe extending into and fitting the outer end of the piston, and on which pipe the piston reciprocates, substantially as described.

2. The combination, in a gas-compressor, of a cylinder, B, a hollow plunger, C, closely fitting the bore of the cylinder and provided at its top with an upwardly-opening valve, *a*,

a cylinder-head, F, with an upwardly-opening valve, *b*, a cross-head, G, to which the hollow plunger is adjustably connected, and a gas-supply pipe fixed to the frame of the machine and passing through the cross-head into the hollow plunger, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 26th day of March, 1885.

JOHN B. STOBAEUS.

Witnesses:
A. FABER DU FAUR,
PAUL GERHARDT.