(No Model.)

D. A. BRISLIN.

AIR COMPRESSOR.

No. 302,978. Patented Aug. 5, 1884.

Fig. 1.

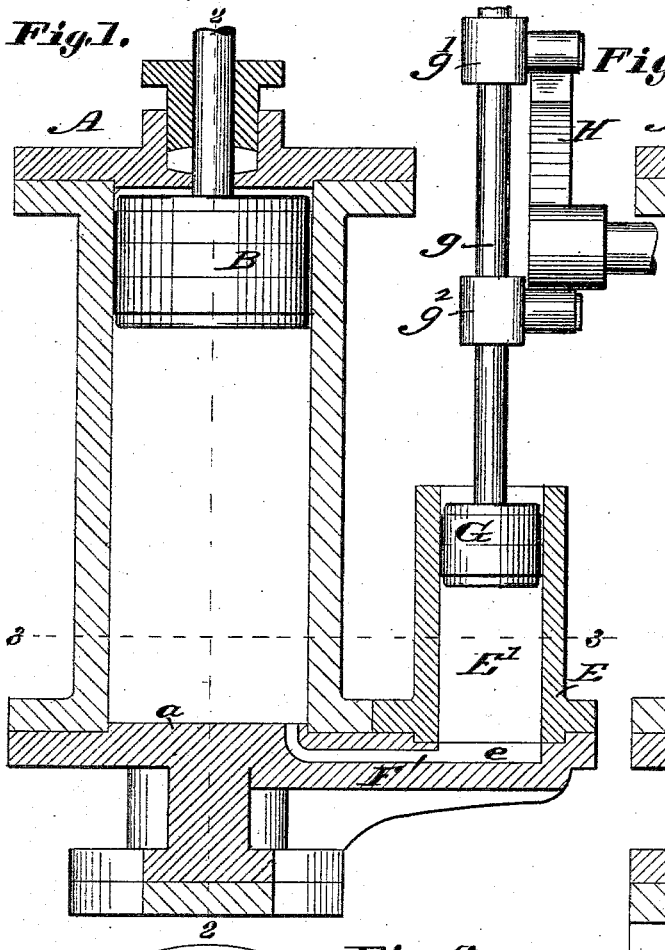


Fig. 2.

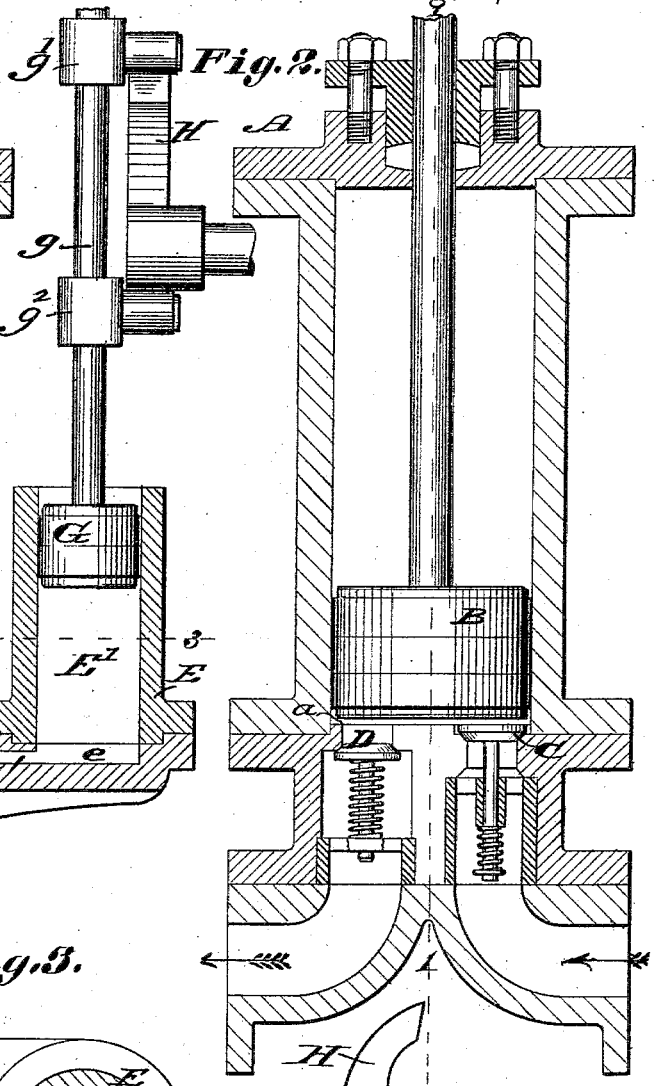


Fig. 3.

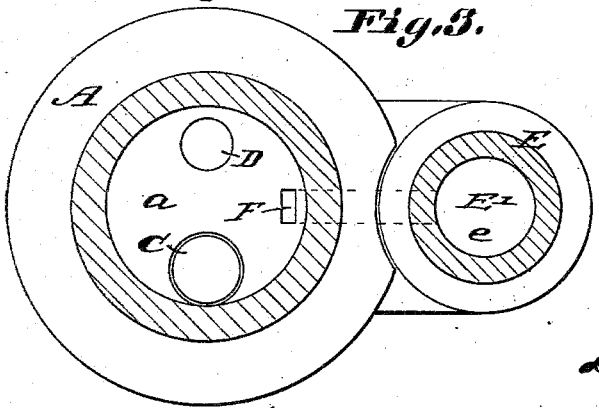
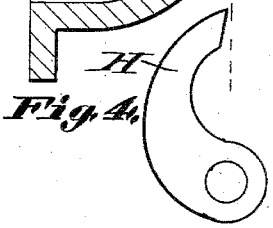


Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID A. BRISLIN, OF ST. LOUIS, MISSOURI.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 302,978, dated August 5, 1884.

Application filed August 29, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID A. BRISLIN, of St. Louis, Missouri, have made a new and useful Improvement in Air-Compressors, of which the following is a full, clear, and exact description, reference being had to the annexed drawings, making part of this specification, in which—

Figure 1 is a longitudinal section of a compressor having the improvement, the piston in the main cylinder, as well as in the auxiliary chamber, being shown raised; Fig. 2, a section on the line 2 2 of Fig. 1, the piston being down; Fig. 3, a section on the line 3 3 of Fig. 1, and Fig. 4 a side elevation of the cam used in operating the piston in the auxiliary chamber.

The same letters denote the same parts.

The aim of this improvement is to obviate the difficulty arising from the compressed gas remaining in the cylinder of a compressor at the end of the stroke of the piston. From the piston in making its stroke not moving fully to the end of the cylinder, there is at the termination of the stroke a body of highly-compressed gas between the piston and cylinder-head. In an ammonia-pump, for instance, the pressure at the end of the stroke is often from one hundred and fifty to two hundred and fifty pounds to the square inch, and in all compressors it exceeds the pressure on the suction or receiving side of the compressor. This residuum of compressed gas materially diminishes the capacity of the cylinder, for on the return-stroke of the piston the gas cannot enter the cylinder until the pressure within the cylinder has fallen to a degree not above that of the entering gas, and this cannot take place until the piston has been withdrawn from the cylinder end sufficiently for the gas within the cylinder to expand into equilibrium with the gas without the cylinder. To the extent to which the piston has to be thus withdrawn is the capacity of the cylinder diminished.

A represents the cylinder of an air or gas compressor.

B represents the piston, C the inlet-valve, and D the outlet-valve, all of the customary form, saving as modified or supplemented by the present improvement.

E represents an auxiliary chamber, connected with the cylinder A by means of the port F. A piston, G, works in the chamber E. Just as the piston B has made its compression-stroke toward the head *a*, the piston G is sharply withdrawn from the port end *e* of the chamber E into the position shown in Fig. 1. This provides a space, *e'*, which is connected by means of the port F with the space between the piston B and head *a*. The pent-up gas at once, and practically before the piston B starts back on its return-stroke, escapes through the port F into the chamber E, and expands therein sufficiently to be in equilibrium with the gas on the suction side of the compressor. The inlet-valve C then opens and admits the gas into the main cylinder A. As in practice the piston G is made to move rapidly, the gas begins to enter the cylinder A much sooner than into the ordinary cylinder, and the cylinder A, in consequence, can be made of much more capacity. On or before the piston B completes its second compression-stroke the piston G makes its second stroke, and forces the gas which has been in the chamber E back into the main cylinder A, and soon as the main cylinder-piston reaches the limit of its compression-stroke the gas escapes from beneath it into the chamber E, thence to be returned to the main cylinder A as the piston B makes the succeeding compression-stroke.

The piston G may be operated in various ways, and I do not desire to be confined to the means shown, which consists as follows: The piston G is attached to the rod *g* having the tappets *g' g'*. A cam, H, upon the shaft *h*, in its rotation encounters the tappets alternately, and thereby effects the desired movement of the piston.

The present improvement is adapted to any of the air, gas, or vapor compressors.

I claim—

1. The combination, with the cylinder A, of the piston B, the valves C D, the port F, the chamber E, the piston G, the rod *g*, tappets *g' g''*, and cam H, substantially as described.

2. The combination, with the cylinder A, of the valves C D, the piston B, the port F, the chamber E, and the piston G, substantially as described.

Witness my hand.

D. A. BRISLIN.

Witnesses:

C. D. MOODY,

S. E. LOGAN.