

W. D. SEAL.

AIR-COMPRESSING APPARATUS.

No. 174,860.

Patented March 14, 1876.

Fig. 2.

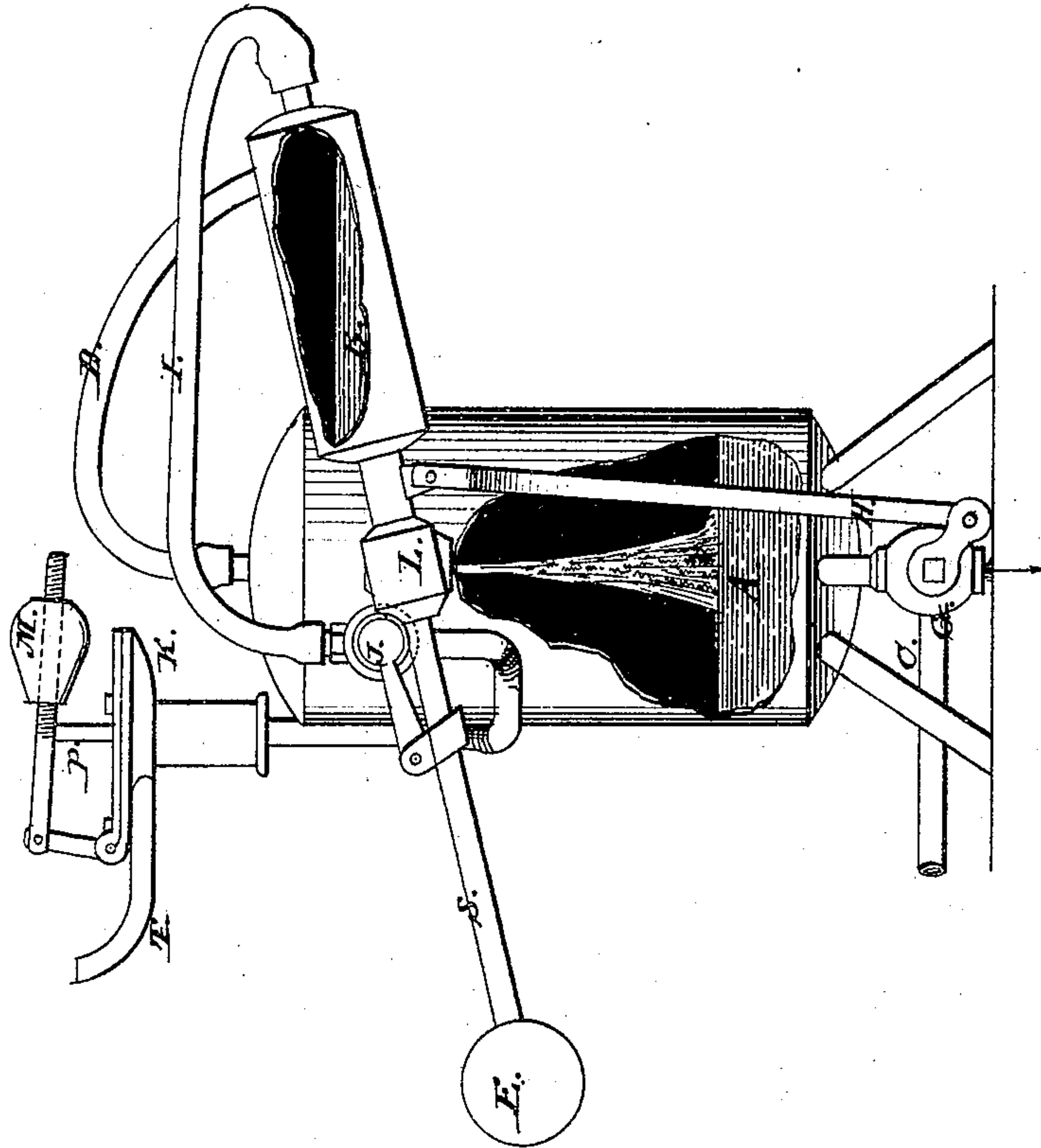
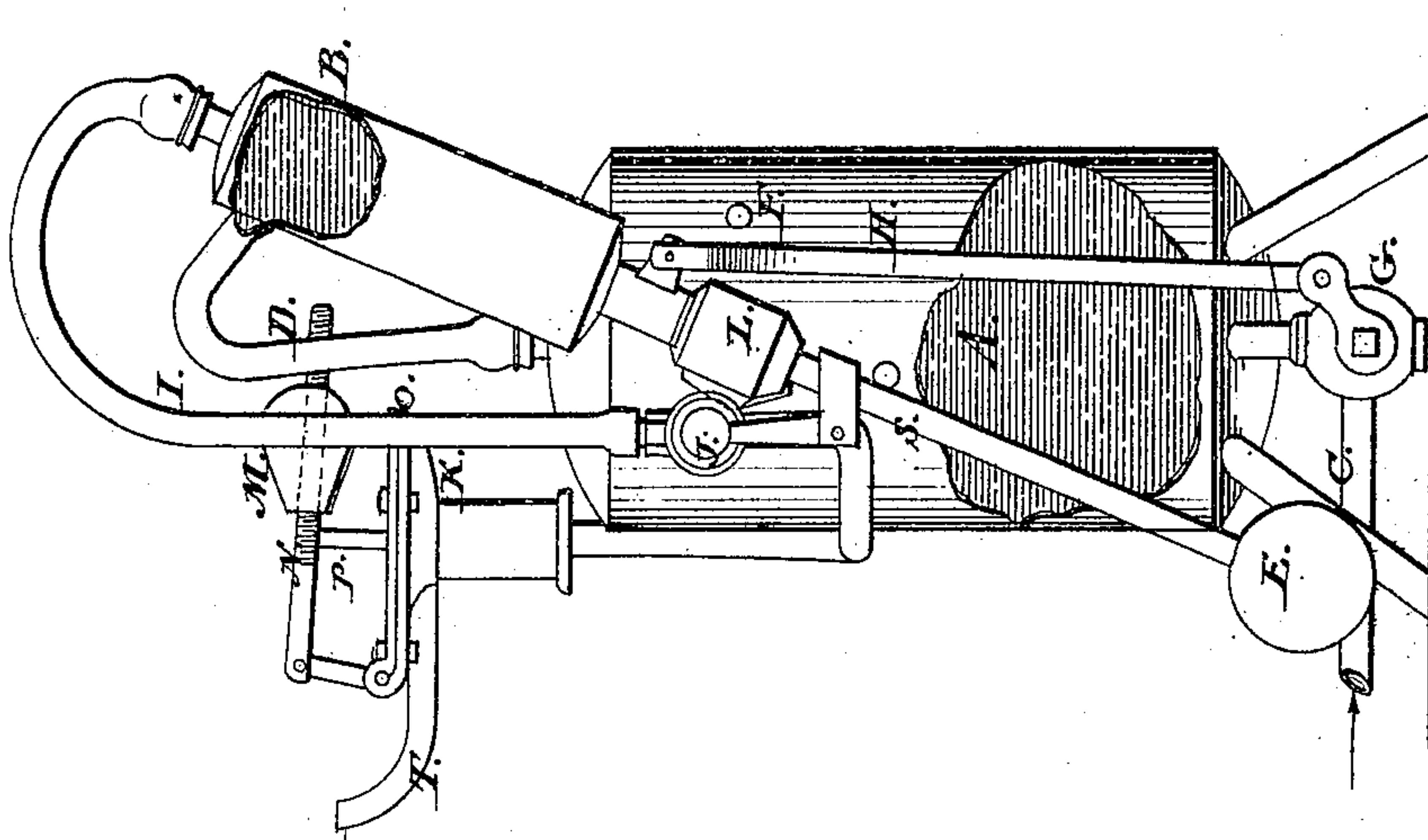


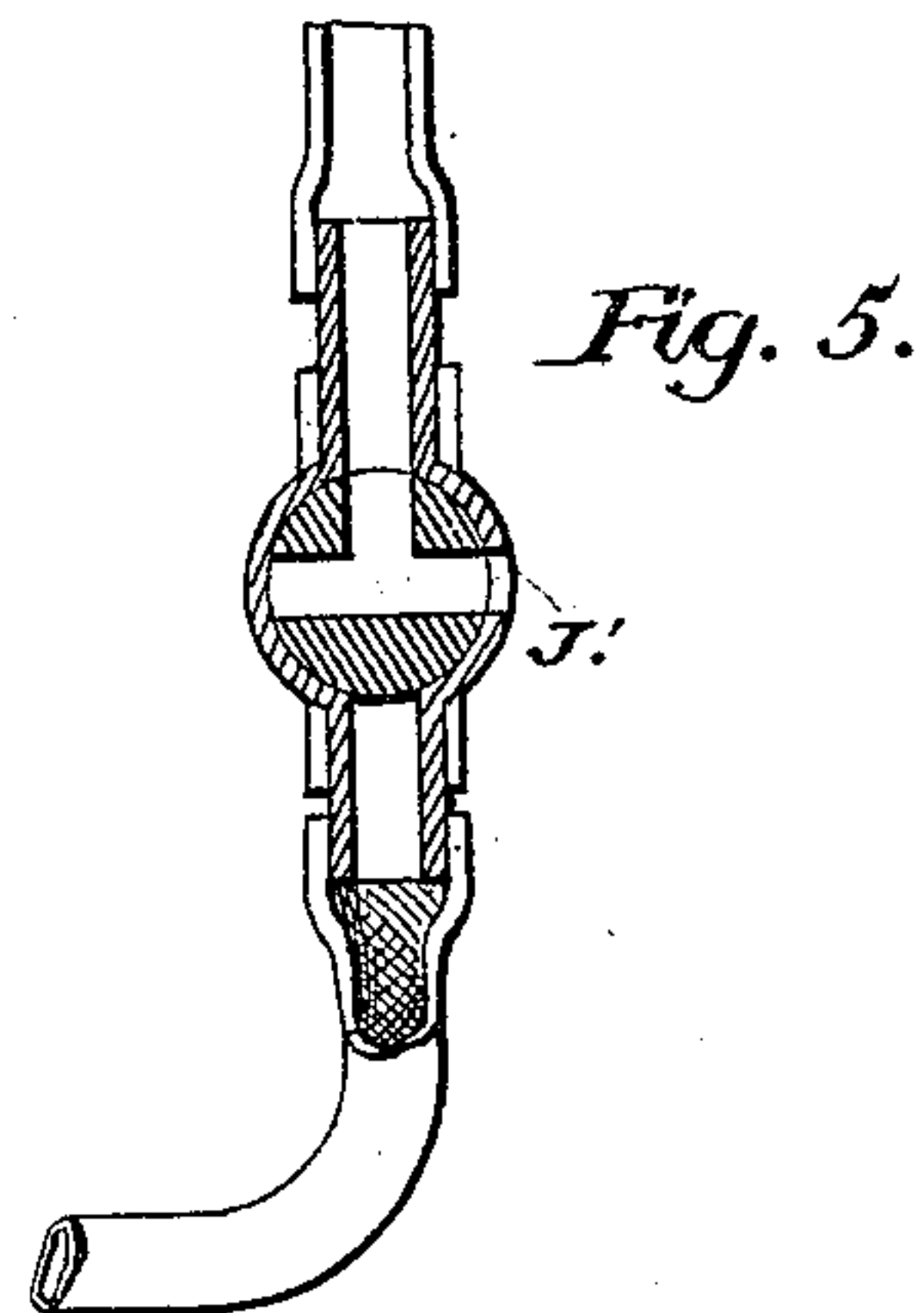
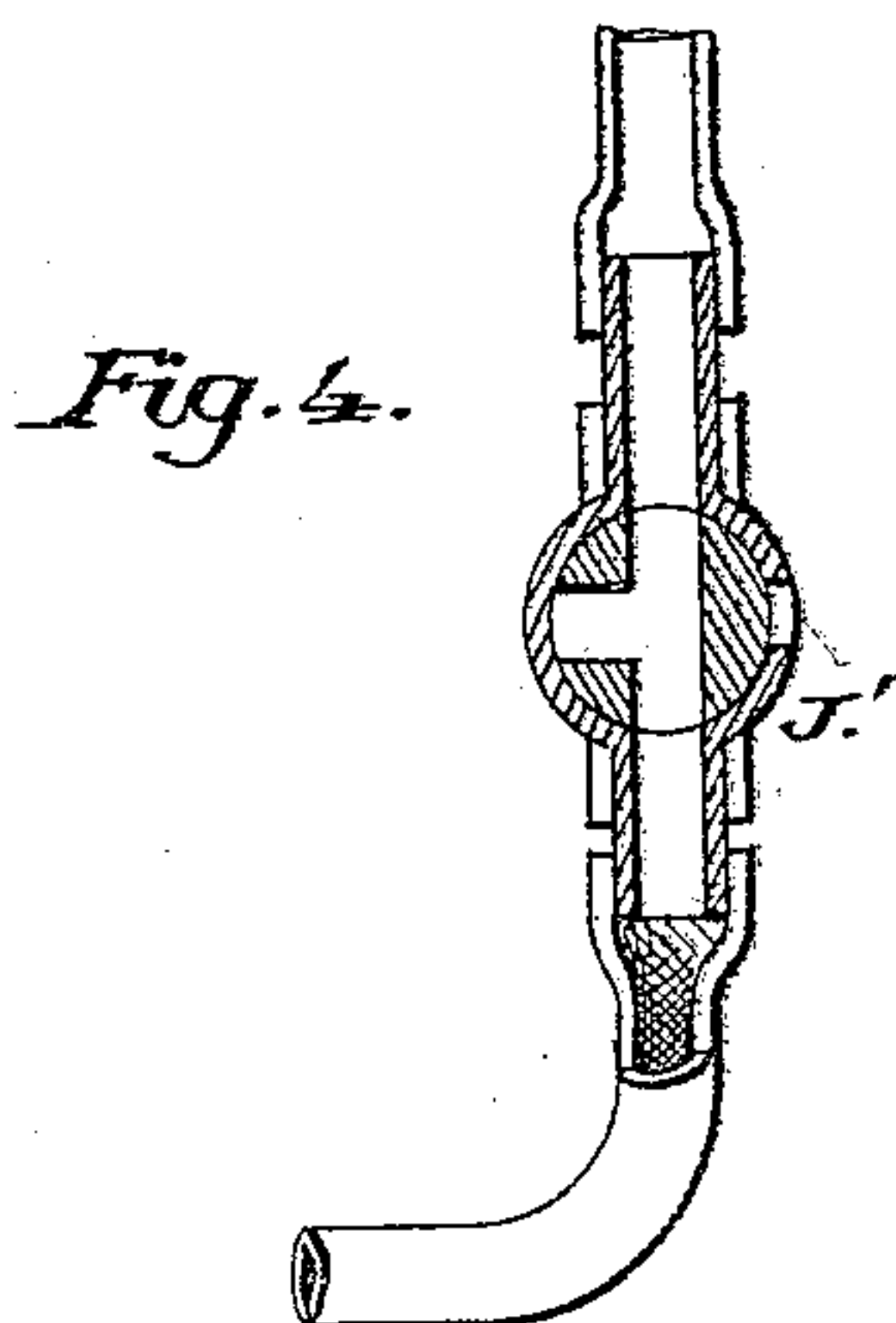
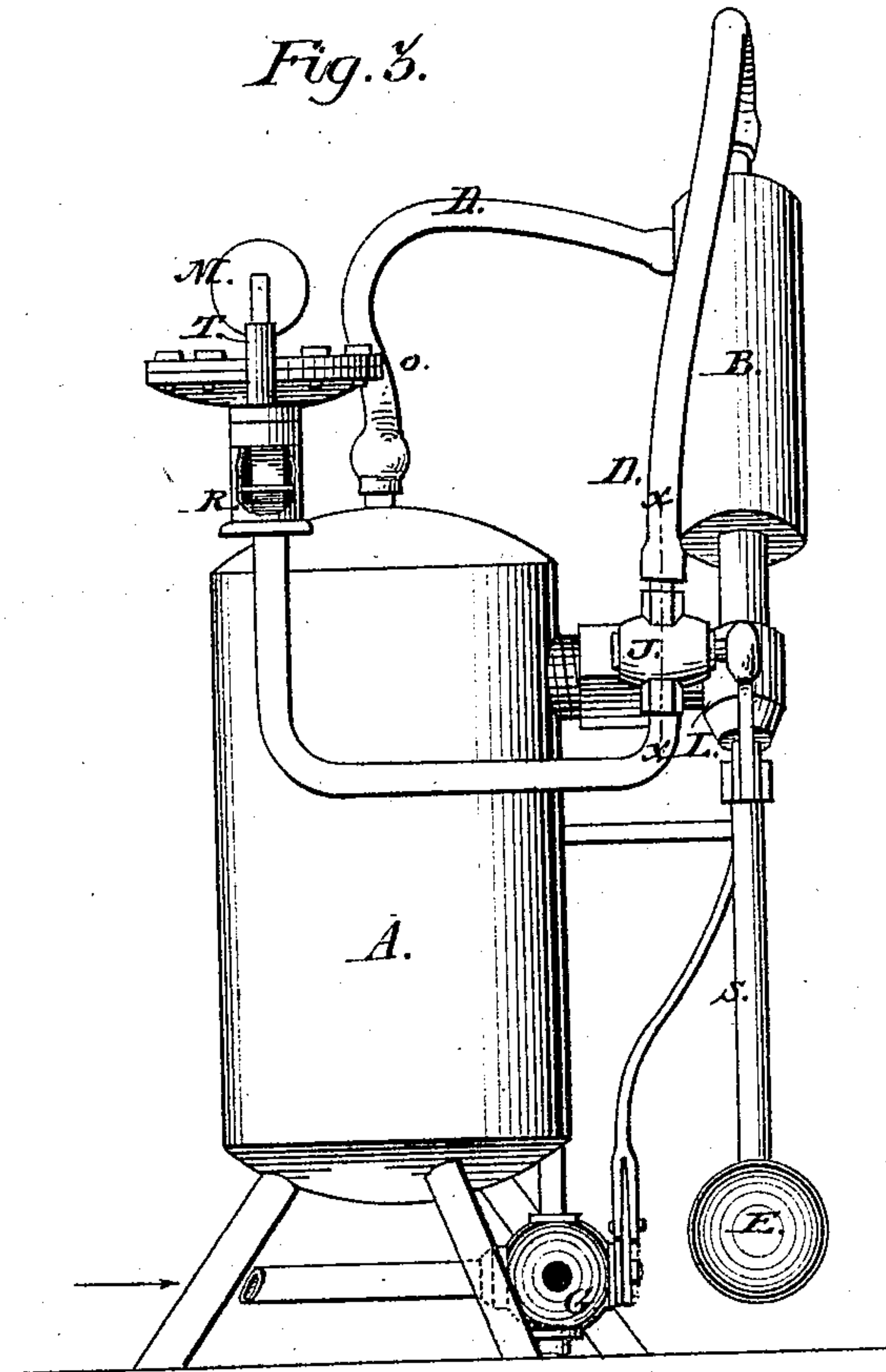
Fig. 1.



Witnesses:
J. B. Robinson,
Geo. W. Wood

Inventor:
Wm. D. Seal,
by his Atty.
Jas. H. Hutton.

W. D. SEAL.
AIR-COMPRESSING APPARATUS.
Patented March 14, 1876.
No. 174,860.



Witnesses:
J. C. Robinson,
Geo. W. Wood.

Inventor:
Wm D. Seal,
by his Atty.
Geo. S. Matthews.

UNITED STATES PATENT OFFICE.

WILLIAM D. SEAL, OF WASHINGTON, DISTRICT OF COLUMBIA.

IMPROVEMENT IN AIR-COMPRESSING APPARATUS.

Specification forming part of Letters Patent No. **174,860**, dated March 14, 1876; application filed February 23, 1876.

To all whom it may concern:

Be it known that I, WILLIAM D. SEAL, of Washington city, in the District of Columbia, have invented a certain new and useful invention, which I term an "Automatic Hydraulic Air-Compressing Apparatus," designed more particularly for forcing ale, beer, or other liquids from cellars or vaults, which invention is fully set forth and described in the following specification, reference being had to the accompanying drawing.

The object of my invention is to automatically compress air by means of hydraulic pressure, which creates a source of power either directly upon the surface of liquids or upon suitable pistons.

To carry out the objects of my invention I have two air-tight chambers of cylindrical form, but of different size, the largest one being stationary and the other movable, or suspended on a pivoted lever, connected by flexible tubes and suitable swivel-joint. I cause a stream of water to flow into the large chamber, the air being compressed in this chamber by the rising of the water, thence to the smaller chamber.

The accompanying drawing represents my invention, in which Figure 1 is a side elevation of the apparatus with part of chambers broken away. Fig. 2 is a side elevation, showing the upper chamber overcome by gravity, and in the act of discharging its contents, by way of hollow pivot L, to the lower chamber. Fig. 3 is an elevation at right angles to the plane of Fig. 1. Figs. 4 and 5 are sectional views of cock J, showing its two ways in the two positions.

The operation is as follows: I cause a stream of water to enter the lower part of the large chamber A, Fig. 1, through supply-pipe C, the water rising in chamber A, and, gradually compressing the air in said chamber, continues to rise, and passes through the hollow pivot L to chamber B, thereby forcing the compressed air through flexible tube I, thence through regulator-valve K, to surface of liquids. When the chamber B is nearly full, as shown in Fig. 1, the accumulated weight of water overcomes the gravity of weight E, thereby dropping the chamber B to the rest F, as shown in Fig. 2. When

in this position it causes cock G to open by means of the rod H, which allows the water to pass off into a sewer or other convenient place, and at the same time shuts off the supply of water at pipe C, and closes cock J and opens vent J', chamber A emptying first, as the outlet of cock G is four times as large as the opening from chamber B through hollow pivot L. Chamber B remains in this position until nearly all the water has run out; then, owing to the weight E, attached to lever S, it takes the position as shown in Fig. 1, thus allowing the flow of water through supply-pipe C. I prevent the compressed air from returning to the chambers by cock J, Fig. 2, which is operated by arm of lever S. As chamber B drops it shuts off the compressed air on the valve side, also opens the vent J', Fig. 5, in cock J, which admits a fresh supply of air to chambers A and B. As the water descends, air is supplied to chamber B through vent J' in cock J, thence through flexible tube I. Chamber A is supplied through flexible tube D.

A union-joint at J is the fulcrum of lever S and chamber B, which is hollow, and connecting through from the lower part of chamber B to chamber A. The union-joint is kept tight by means of any suitable packing.

The self-regulator valve K, as shown in Fig. 1, is to regulate the amount of pressure desired by running in or out of the weight M on lever N. When the pressure desired is maintained it forces up the flexible diaphragm O, thereby carrying up the valve-rod P, thus closing valve R; then the water is checked by the air arriving at the same pressure as the fountain-head, which remains so until the pressure is exhausted by drawing the liquids, the compressed air being forced through pipe T, thence to the surface of liquids, as several barrels may be acted on simultaneously by a single pipe connected with each of them.

I do not deem it absolutely essential to use the large chamber, as the small chamber, with a pipe connecting with cock G to pivot L, would answer the same purpose. My reasons for using the large chamber are, that chamber A being about ten times the capacity of chamber B, the apparatus operates once, whereas it would operate ten times if the

large chamber were dispensed with, thus saving wear of parts subject to friction.

I do not claim, broadly, compressing air by the rising of water in an air-tight vessel; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of the air-compressing stationary chamber A, connecting with the moveable chamber B by means of the hollow union-joint at J, and flexible tubes I and D, substantially as set forth.

2. In combination with the air-compressing chambers A and B, the lever S, weight E, and hollow pivot L, all combined and arranged substantially as set forth.

3. In combination with the air-compressing chambers A and B, the hollow union-joint encircling pivot L, substantially as set forth.

4. In an automatic air-compressing apparatus, the cocks J and G, connected substantially as shown, and operated by means of the movable air-compressing chamber B and the weight E, as described.

5. The cock J and vent J', connected with the lever S, as shown, and operated by the movement of said lever on its pivot L by means of the movable air-compressing chamber B and the weight E, as described.

6. The regulator-valve K, cock J, vent J', flexible tube I, and movable air-compressing chamber B, combined and operating together substantially as described.

7. The combination of the self-regulator valve K, weight M, lever N, flexible diaphragm O, valve-rod P, and valve R, in connection with the movable air-compressing chamber B, all arranged, combined, and operating together substantially as set forth.

In testimony whereof I have hereunto subscribed my name.

WM. D. SEAL.

Witnesses:

JOS. S. STETTINIUS,
A. V. ROBINSON.