C. H. HALL.

Improvement in Steam Vacuum-Pumps.

No. 131,537. Patented Sep. 24, 1872.

Fig:1,

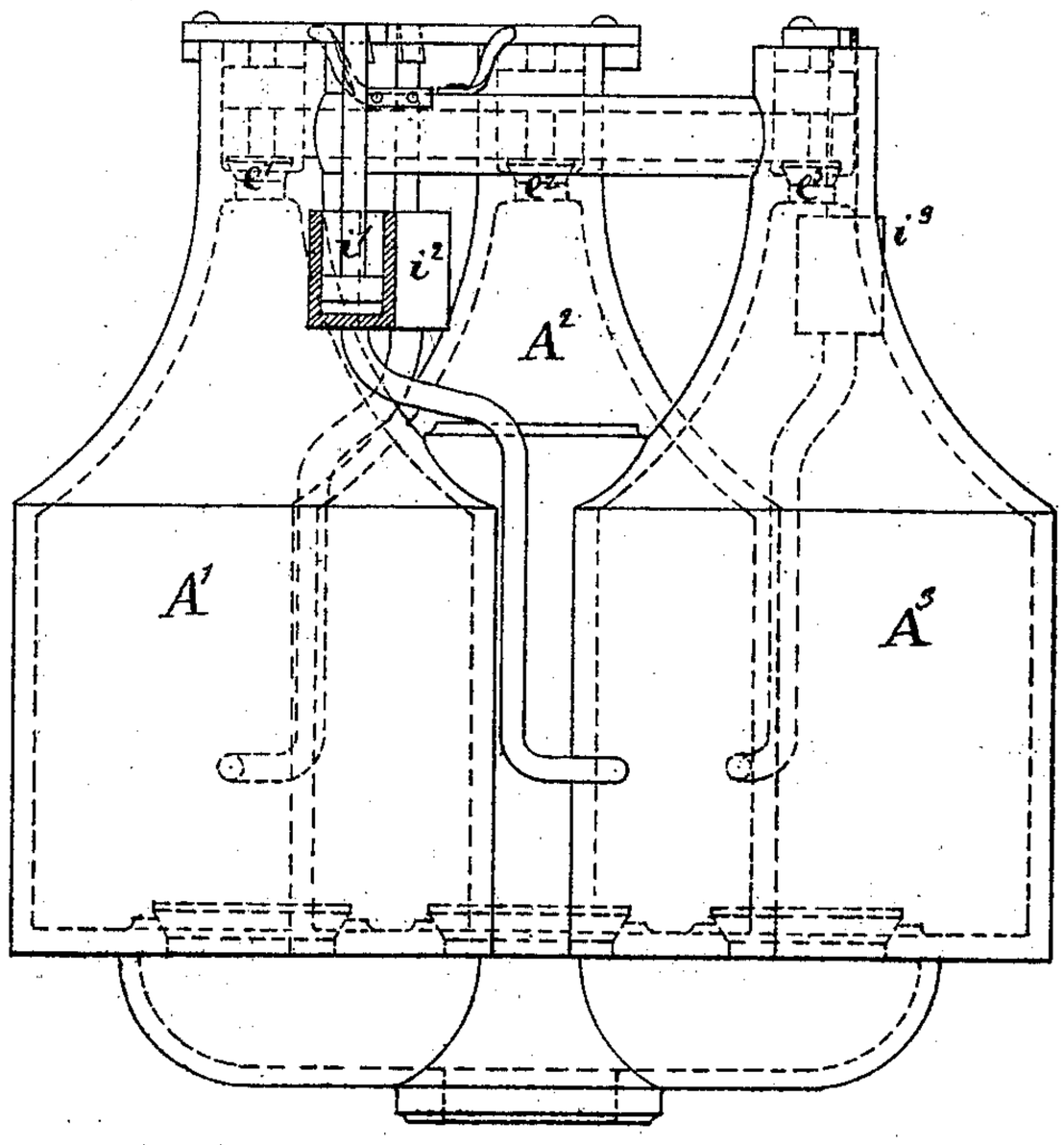
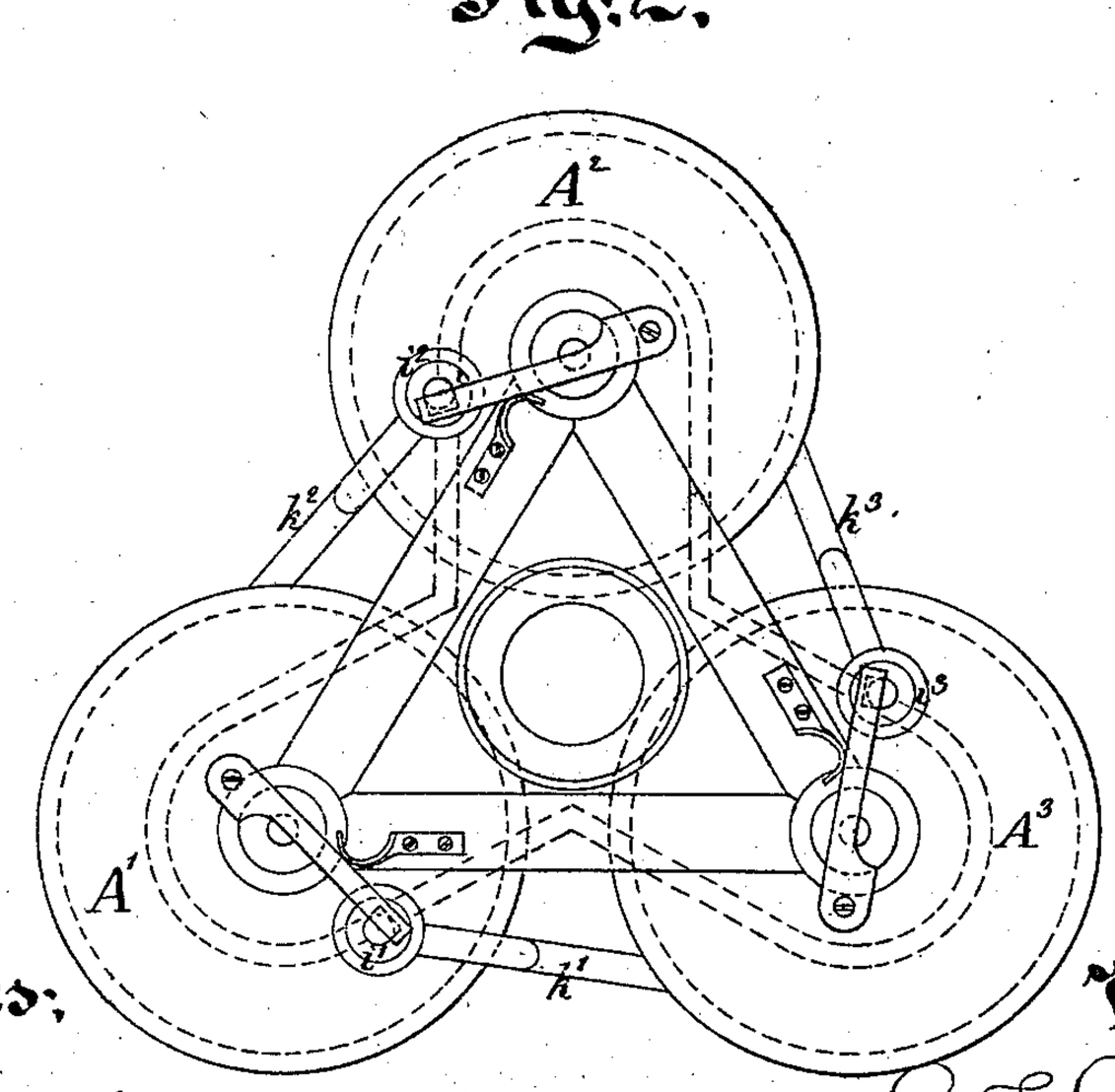


Fig:2.



Witnesses;

Arnold Bonnaud.

W. C. Dey

Inventor;

C. H. Hall

by his attorney J. D. Stetson

UNITED STATES PATENT OFFICE.

CHARLES H. HALL, OF NEW YORK, N. Y.

IMPROVEMENT IN STEAM VACUUM-PUMPS.

Specification forming part of Letters Patent No. **131,537**, dated September 24, 1872.

CASE W.

To all whom it may concern:

Be it known that I, CHARLES H. HALL, of New York city, in the State of New York, have invented a certain Improvement in Steam Pumping Apparatus, of which the following is a specification:

To distinguish this from other inventions of my own, which are somewhat analogous, I will designate this particular invention by the letter W.

In this construction three chambers are employed instead of one or two, and the three serve intermittently, the discharge of water from each chamber affording the means at the proper time of initiating the commencement of the discharge of the water from its neighbor on one side. Thus the emptying proceeds around in succession.

The following is a description of what I consider the best means of carrying out the invention. The accompanying drawing forms a part of this specification.

Figure 1 is a side elevation partly in section, and Fig. 2 a plan view.

Similar letters of reference indicate like parts in both figures.

The arrangement of the chambers and the construction and arrangement of the valves for receiving and delivering the water are very plainly indicated in the drawing. So also are the several steam-valves and the controlling mechanism connected with each. The three steam-valves are indicated, respectively, e^1 e^2 e^3. The pipes through which the expansion by heat is made to act on the liberating devices i^1 i^2 i^3 are connected as follows: The pipe which serves as a medium for liberating and permitting the opening of the valve e^1 is marked k^1, and leads to the chamber A^3. The pipe which performs a corresponding service for the valve e^2 is marked k^2, and leads to the chamber A^1; and the pipe which performs the corresponding service for the valve e^3 is marked k^3, and leads to the chamber A^2.

A larger number of chambers and corresponding mechanism may be employed, if desired; but I consider three to be sufficient for all ordinary situations. The employment of more chambers allows more time for the filling operation, and makes it easier to insure a perfectly-continuous current in the discharge.

I have found by experiment that the loss of steam is slight when worked in this manner in uncoated vessels of metal; but I propose in ordinary practice to coat the interior of each chamber with japan varnish, or with red lead and oil, or with a solution of rubber or the like to serve as a durable nonconductor of heat. I can make the chambers and the several connections of lead, to pump acids, or of glass or other material for any special uses requiring such.

What I claim as my invention is as follows:

1. The within-described series of three or more chambers, each having suitable water induction and eduction means, with provisions for admitting steam intermittently into each in succession, as specified.

2. Also, the specific arrangement of the pipes k^1 k^2 k^3 and valve-liberating mechanism relatively to the chambers A^1 A^2 A^3 with their several water and steam valves and pipes, as herein specified.

In testimony whereof I have hereunto set my hand this 18th day of May, 1872, in the presence of two subscribing witnesses.

C. H. HALL.

Witnesses:

ARNOLD HÖRMANN,

W. C. DEY.