

C. H. HALL.
 Improvement in Steam Vacuum-Pumps.
 No. 131,543. Patented Sep. 24, 1872.

Fig. 1.

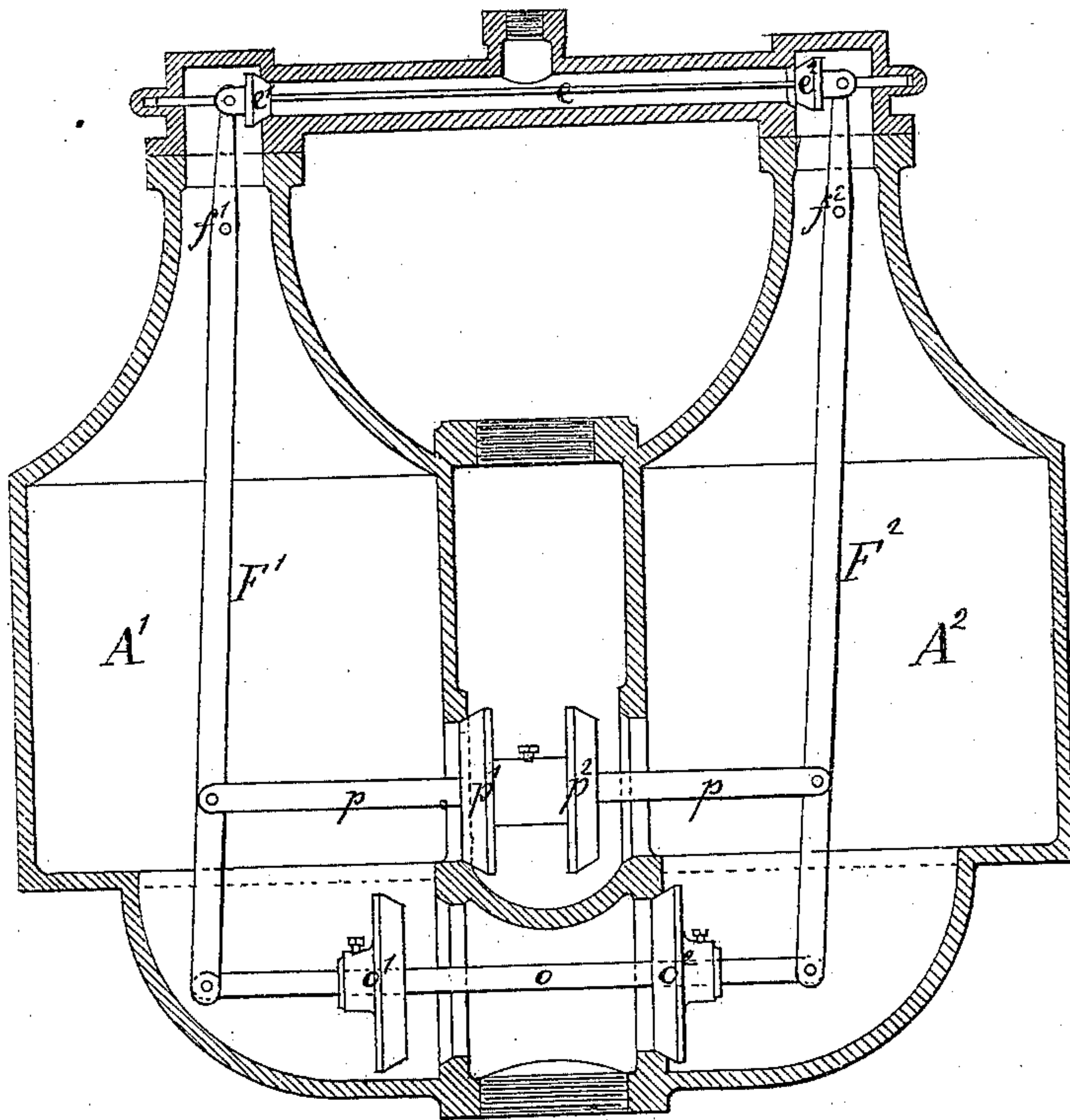
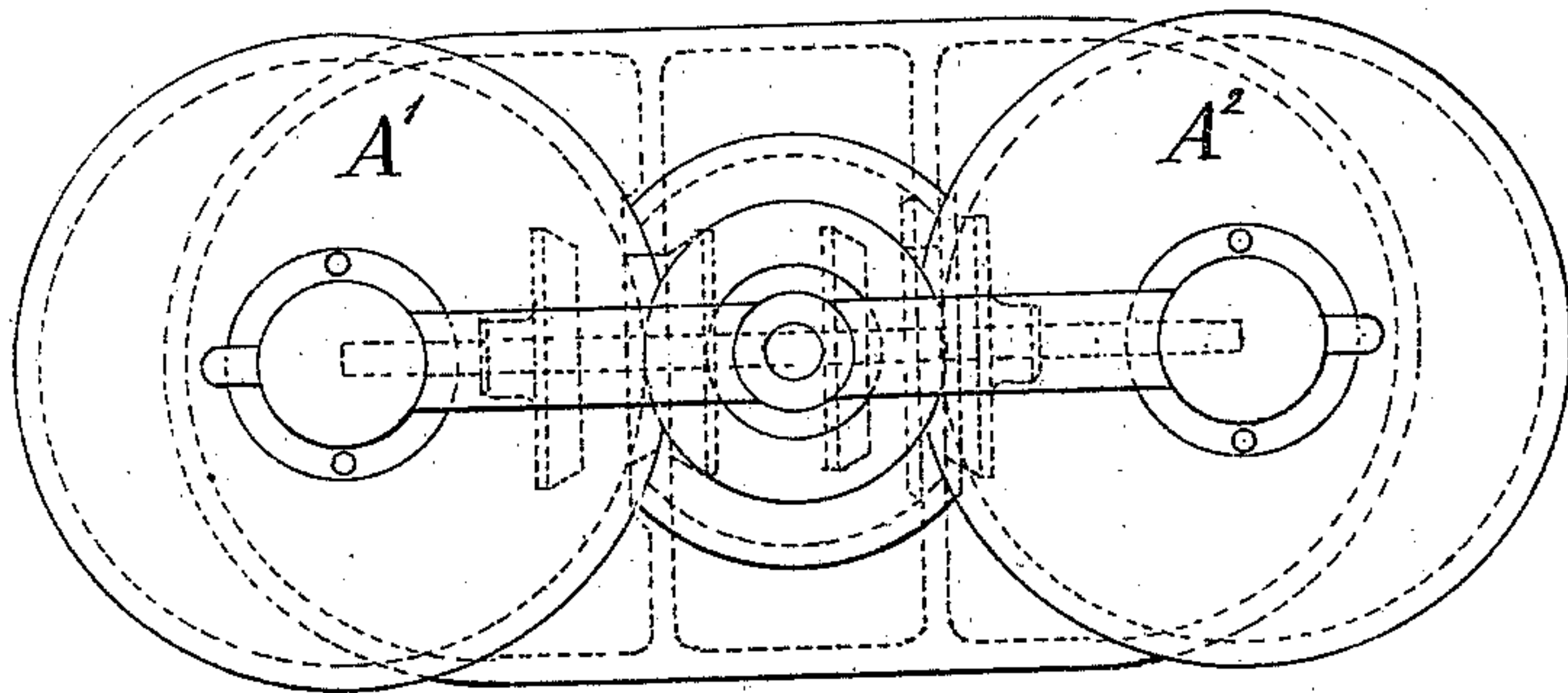


Fig. 2.



Witnesses;

Arnold Hermann.
 W. E. Dey

Inventor.

C. H. Hall
 by his attorney, J. S. Sedgwick

UNITED STATES PATENT OFFICE.

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

IMPROVEMENT IN STEAM VACUUM-PUMPS.

Specification forming part of Letters Patent No. 131,543, dated September 24, 1872.

CASE C¹.

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:

The invention relates to that class of pumping apparatus in which the steam is admitted into the same chamber or chambers with the water, and presses upon the surface thereof. The working parts are small relatively to the capacity for pumping, and the apparatus constitutes an efficient pumping means, operating rapidly and reliably. I employ strong chambers provided with valves for admitting water and holding it against its return, and also with valves for allowing it to be expelled through another pipe to be conducted to an elevated reservoir, or to such other point as may be desired, and the operations of being filled with water and being discharged succeed each other by reason of a change of position of the steam valve or valves, governing the admission of steam from a boiler or steam-generator, which may be situated at a distance. There are two equal chambers in each set of the apparatus, the two filling and emptying alternately. The chamber which is filling with water should complete its filling before its mate is emptied, and the change of the steam-valves is effected automatically on the completion of the emptying of the discharging-chamber.

The following is a full and exact description of what I consider the best means of carrying into effect one form of the invention. The accompanying drawing forms a part of this specification.

Figures 1 and 2 represent this form, in which all the valves are connected by levers and rods so as to open and close together. The motion, either of the return water which has been expelled from a chamber, or of the water inducted from the suction-pipe, or both these motions,

are available to operate the steam-valves. Fig. 1 is a central vertical section, and Fig. 2 is a plan view.

The steam-valves $e^1 e^2$ are connected together by a rod, e , and are also each connected to levers which swing in the interiors of the chambers. The lever F^1 turns on the fixed pivot f^1 , and the lever F^2 on the fixed pivot f^2 . The lower end of each lever is connected to a rod, o , which carries the two water-induction valves $o^1 o^2$. At a higher level is connected the rod p , which carries the water-delivery valves $p^1 p^2$. At the termination of the emptying of a chamber the partial vacuum formed when a volume of steam is discharged into the delivery-passage causes the shifting of the positions of all the valves.

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 non-conductor 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:

In combination with two chambers and suitable water induction and eduction means, and provisions for receiving steam intermittently into each, I claim the connection of all the valves together so that all be compelled to operate simultaneously and certainly, 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.