

M. VON RECKLINGHAUSEN.  
MECHANICAL MERCURY SEALED VACUUM PUMP.  
APPLICATION FILED NOV. 20, 1903.

911,610.

Patented Feb. 9, 1909.

Fig. 1

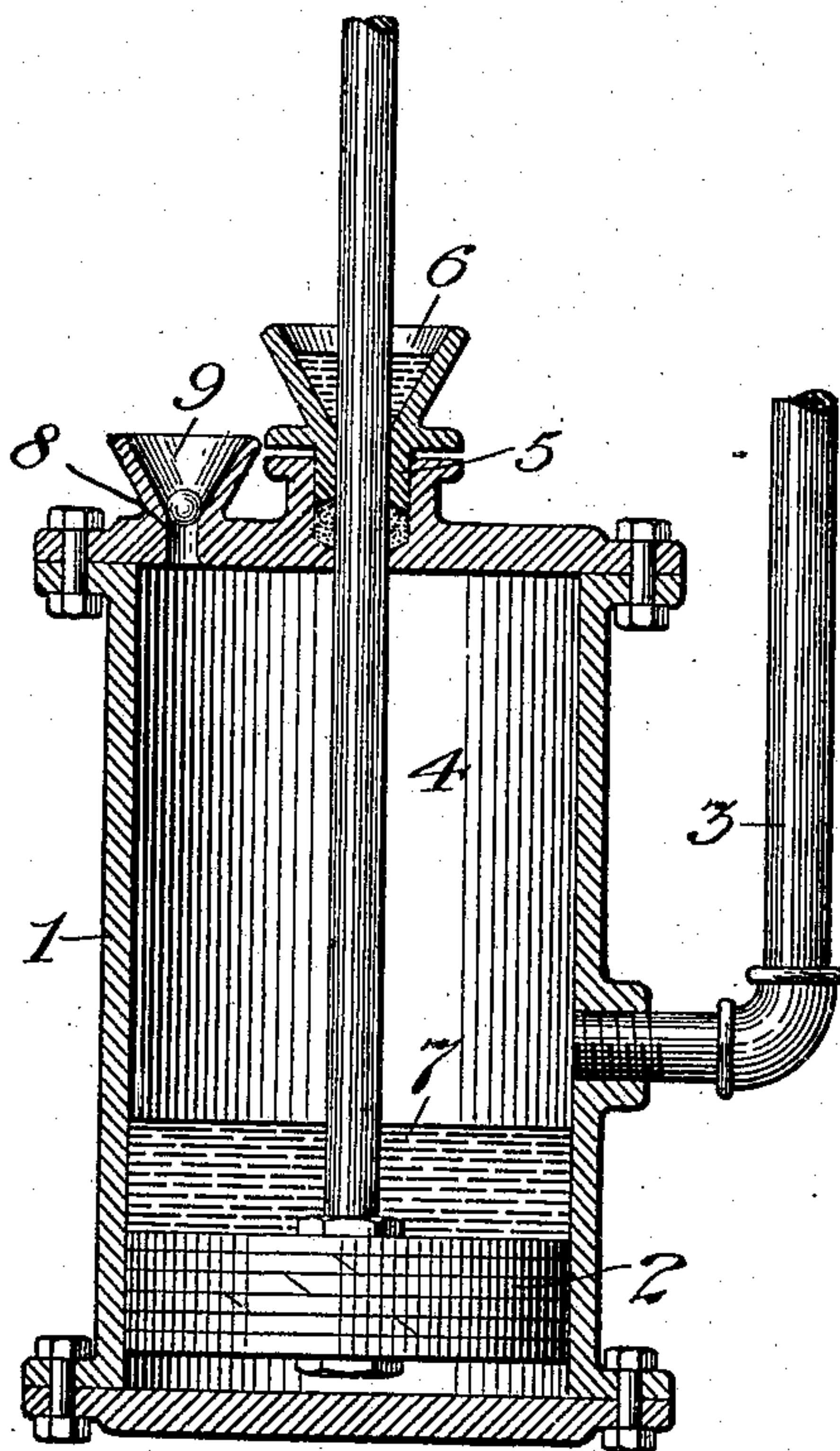
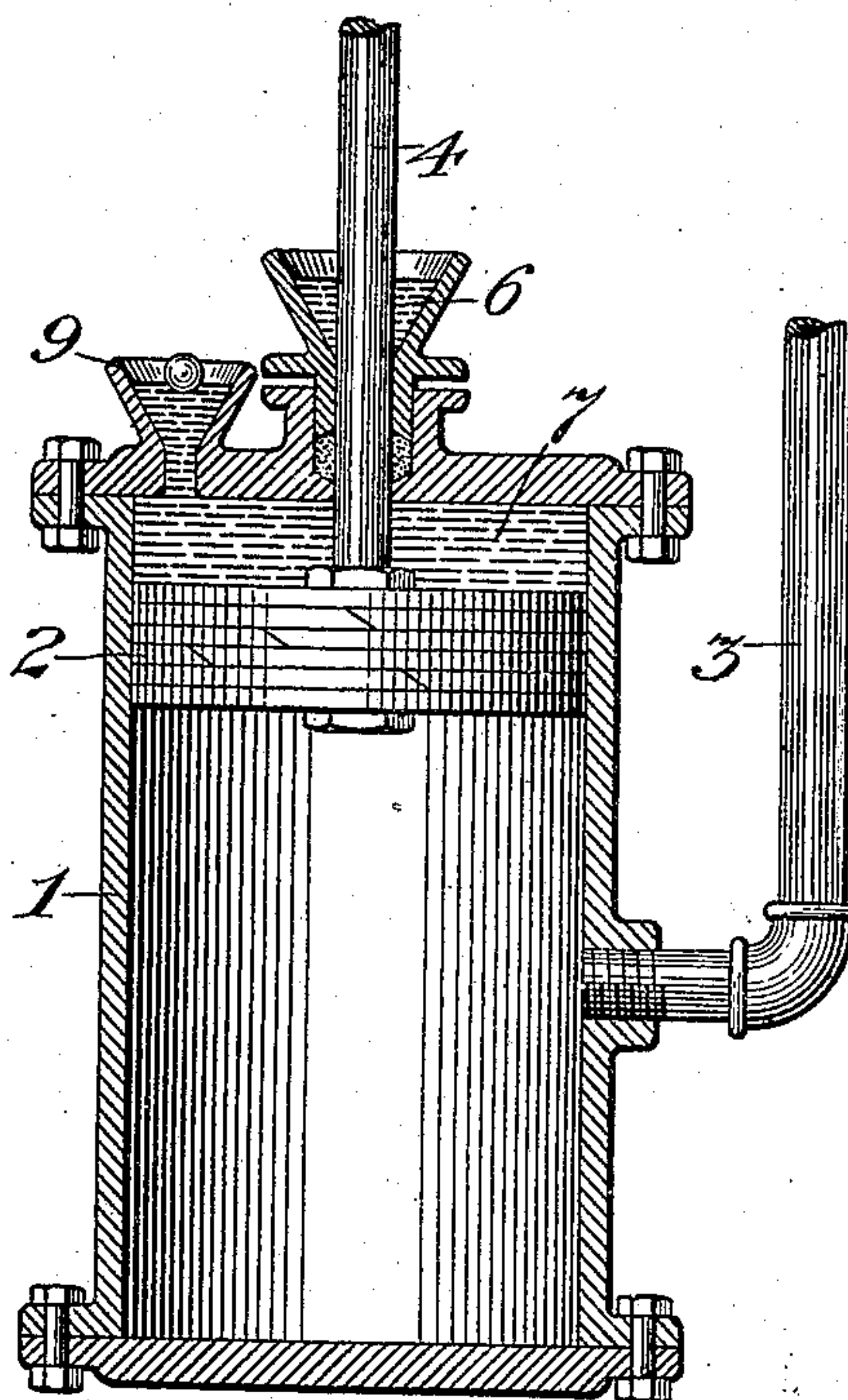


Fig. 2



Witnesses  
Chas. Clagett  
Thos. J. Brown

Inventor  
Max von Recklinghausen  
By his Attorney  
Charles A. Fenn



# UNITED STATES PATENT OFFICE.

MAX VON RECKLINGHAUSEN, OF NEW YORK, N. Y., ASSIGNOR TO COOPER HEWITT ELECTRIC COMPANY, A CORPORATION OF NEW YORK.

## MECHANICAL MERCURY-SEALED VACUUM-PUMP.

No. 911,610.

Specification of Letters Patent.

Patented Feb. 9, 1909.

Application filed November 20, 1903. Serial No. 181,954.

*To all whom it may concern:*

Be it known that I, MAX VON RECKLINGHAUSEN, a subject of the Emperor of Germany, and resident of New York, county of New York, State of New York, have invented certain new and useful Improvements in Mechanical Mercury-Sealed Vacuum-Pumps, of which the following is a specification.

10 Certain mechanical vacuum pumps, the moving parts of which, in the ordinary vertical pumps, are represented by pistons, are sealed by a layer of oil, which co-acts with the piston to remove the air, whether it appears in bubbles or in any other form. If it is desired to avoid the use of oil one may utilize mercury for the same general purpose, but in such cases it is found that the air sticks in thin layers to the walls of the cylinder or to the surface of the pistons and is not wholly removed or swept out by the operation of the moving parts even when supplemented by the use of mercury. This is largely due to the fact that the material of which the cylinder is made is usually some form of iron or steel, with which the mercury does not readily amalgamate. I have found that if the cylinder and the moving parts be composed of copper or some material with which the mercury amalgamates readily on the surface the difficulty is overcome and the pumping action is rendered more efficient up to the point where the air is completely removed for all practical purposes in pumping work.

35 The present invention relates, therefore, to an improved pump in which the cylinder and the moving parts, one or both, in a mechanical mercury-sealed vacuum pump, are made of a substance or material with which the mercury readily amalgamates on the surface.

I have illustrated the invention in the accompanying drawing in which—

Figures 1 and 2 represent very simple forms of mercury-sealed vacuum pumps embodying my invention, the piston being shown in different positions in the two figures of the drawing.

In the drawing, 1 is the pump cylinder, and 2 the piston. At 3 is shown an inlet pipe leading from the chamber which is to

be pumped free of air. The piston rod, 4, passes at 5 through a stuffing box, which is sealed at the top with mercury, as shown at 6, and the piston itself is covered with mercury as appears at 7. A valve is shown at 8 the same consisting of a ball operating in combination with a suitable seat and having suitable play inside the cup, 9. When the piston rises into the position illustrated in Fig. 2 this valve will be lifted and the mercury will pass in through the seat and the air above the piston will be forced out through the valve. When the piston descends to the position illustrated in Fig. 1, the mercury will fall entirely or partially out of the cup 9 and the valve 8 will be seated to prevent the influx of air at that point. The pump cylinder 1 and the piston 2 may be made of copper or other substance or material with which mercury readily amalgamates.

The pump here shown is simply given by way of example or illustration, the principle of the invention being applicable to any form of mercury-sealed pump.

I claim as my invention:—

1. A mechanical mercury-sealed vacuum pump, the cylinder and piston of which are composed of a material readily amalgamable with mercury on the surface, in combination with mercury as a sealing fluid, said mercury wetting the surface of said cylinder and piston.

2. A mechanical mercury-sealed vacuum pump, the piston of which is composed of copper, in combination with mercury as a sealing fluid, said mercury wetting the surface of said piston.

3. A mechanical mercury-sealed vacuum pump, the piston and piston rod of which are composed of a material readily amalgamable with mercury on the surface, in combination with mercury as a sealing fluid, said mercury wetting said piston and piston rod.

Signed at New York, in the county of New York and State of New York, this eleventh day of November, A. D. 1903.

MAX VON RECKLINGHAUSEN.

Witnesses:

WM. H. CAPEL,

GEORGE H. STOCKBRIDGE.