

(No Model.)

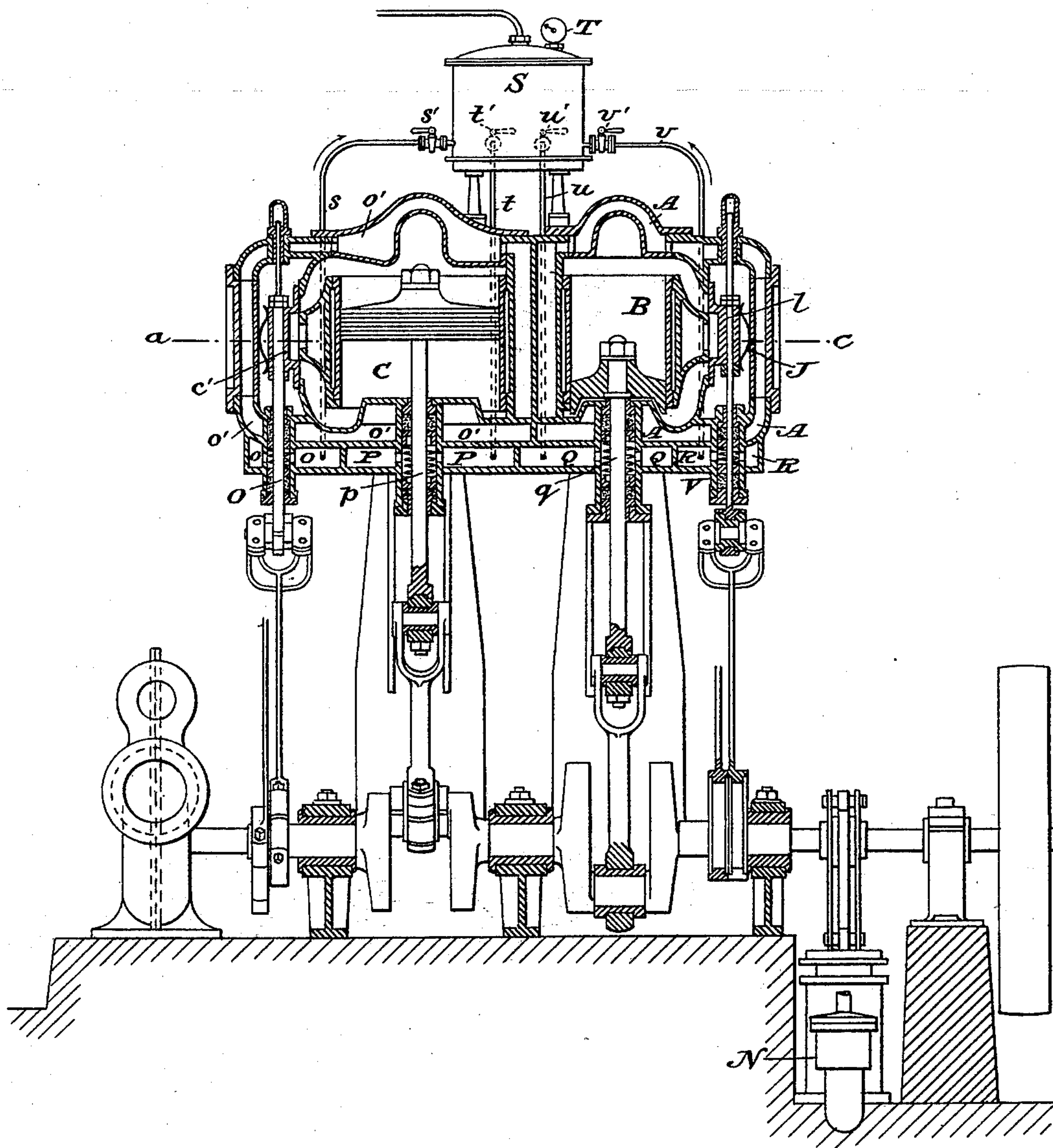
3 Sheets—Sheet 1.

P. DE SUSINI.
ETHER MOTOR.

No. 509,406.

Patented Nov. 28, 1893.

Fig. 1.



WITNESSES:

E. B. Bolton
E. H. Sturtevant

INVENTOR

Paul de Susini

BY

Heurich & Co.
ATTORNEYS

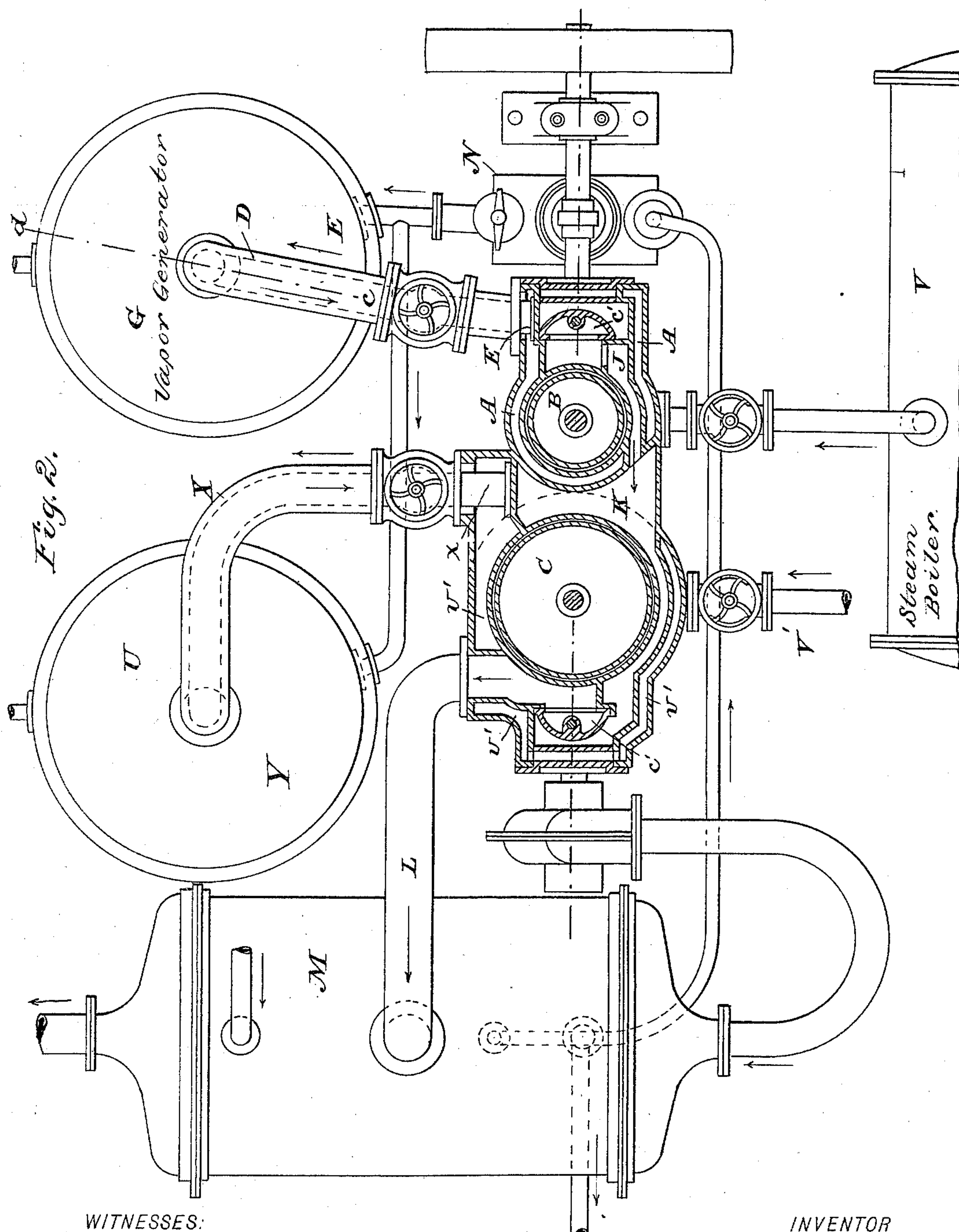
(No Model.)

3 Sheets—Sheet 2.

P. DE SUSINI.
ETHER MOTOR.

No. 509,406.

Patented Nov. 28, 1893.



WITNESSES:

E. B. Bolton
E. H. Sturtevant

INVENTOR

Paul de Susini
BY *Richard H. Richards*

ATTORNEYS

(No Model.)

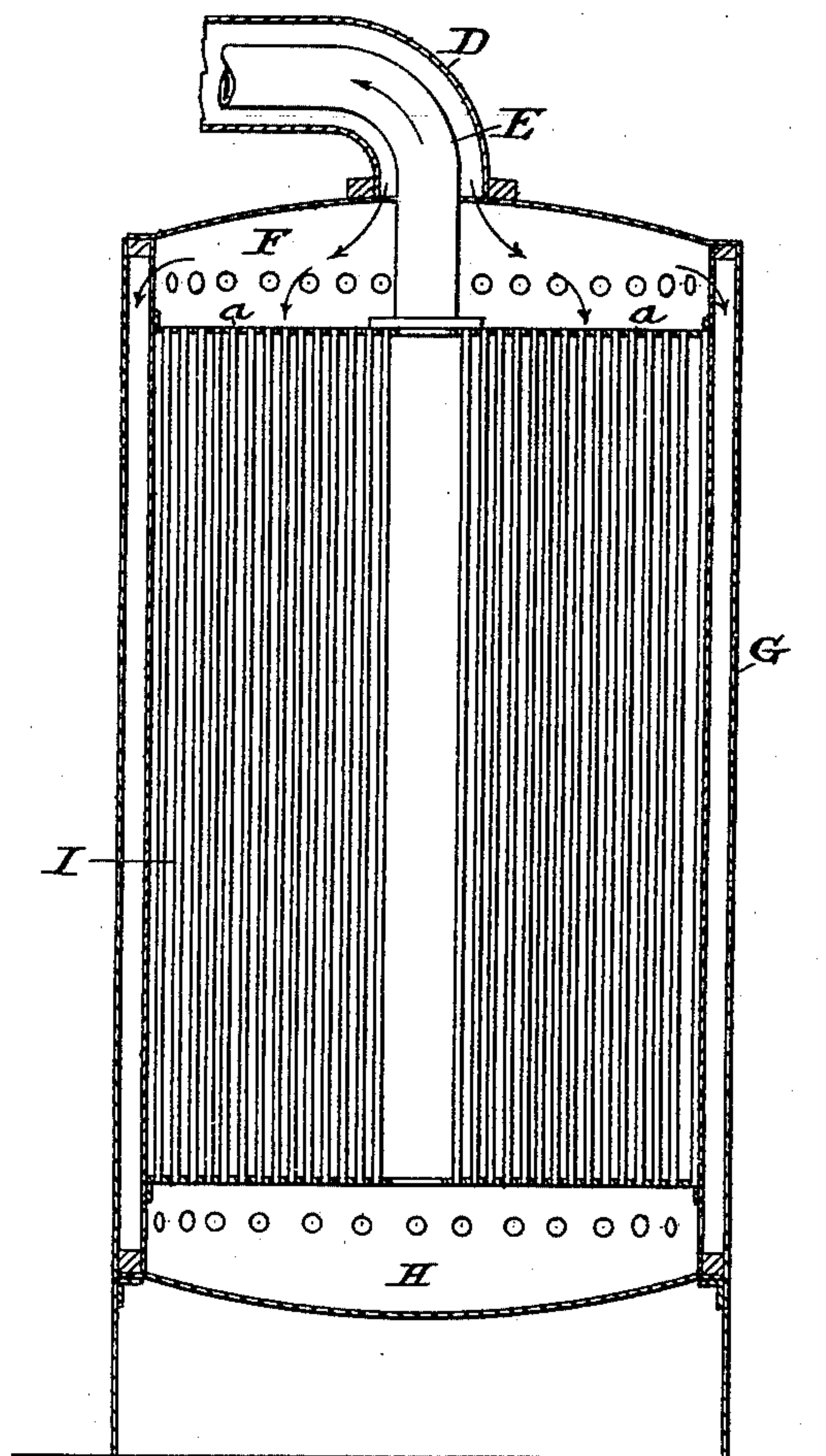
3 Sheets—Sheet 3.

P. DE SUSINI.
ETHER MOTOR.

No. 509,406.

Patented Nov. 28, 1893.

Fig. 3.



WITNESSES:

E. B. Botton

E. H. Sturtevant

INVENTOR

Paul de Susini

BY

Richard R. [Signature]

ATTORNEYS

UNITED STATES PATENT OFFICE.

PAUL DE SUSINI, OF PARIS, FRANCE.

ETHER-MOTOR.

SPECIFICATION forming part of Letters Patent No. 509,406, dated November 28, 1893.

Application filed December 7, 1892. Serial No. 454,320. (No model.)

To all whom it may concern:

Be it known that I, PAUL DE SUSINI, a citizen of the French Republic, residing at Paris, France, have invented certain new and useful Improvements in Ether-Motors, of which the following is a specification.

The object of my present invention is to provide a vapor motor apparatus in which the generator will be supplied with steam from a distant point in order to avoid explosions; to provide for the heating of the cylinder jacket by the steam in its passage to the generator; to prevent the condensation of the ether in its passage from the generator to the cylinder by passing the ether pipe through the steam pipe; to combine in the apparatus a second cylinder the piston of which is operated from the exhaust of the first cylinder and the fresh vapor commingled with said exhaust and supplied from a second generator.

My invention also includes other features hereinafter pointed out.

Reference is made to my application for Letters Patent of the United States, Serial No. 455,668, filed December 19, 1892, as showing some of the features disclosed herein.

In the accompanying drawings—Figure 1 is a sectional view of the cylinders and attached parts of my vapor engine. Fig. 2 is a plan view of the entire apparatus partly in section. Fig. 3 is a sectional view of the vapor generator.

A steam boiler of any kind V. heated by the hot gases which are wasted through the funnel of an ordinary steam motor discharges its steam to the jacket A. of the small cylinder B. of my apparatus. After having circulated through the jacket A of the cylinder B the steam passes the conducting pipe D, into the superior space F. of the vapor generator G, passes through the tubes *a* and enters the inferior chamber H and then into and up the jacket I. of the generator G. The space between F. H. and the jacket I contains the ether which must vaporize; this space is traversed by all the tubes *a* through which the steam circulates which steam condenses at the contact with the tubes, these having cooled off by the effect of the liquid ether. The steam thus gives up all its heat to the ether which vaporizes. The steam supply may be regulated by a suitable valve or valves in the

steam pipe. The ether vapor thus formed passes through the conducting pipe E to the slide valve *c* of the small cylinder B, and after having worked with a first expansion passes through the conducting pipe J into the space K. to the slide valve *c'* of the large cylinder C combining in the space K with the ether vapor produced in the generator U. by the escaping steam which comes from the steam motor. This escaping steam passing through a conducting pipe V', circulates in the jacket *v'* of the large cylinder C and passes out afterward through a pipe X surrounding the feed pipe *x*. of ether vapor, and then into the superior space Y of a vapor generator similar to the generator G. described above. The ether vapor thus formed passes through the conducting pipe *x* to the distribution slide *c* of the large cylinder C combining with the exhaust vapor of the small cylinder B. The above mentioned combination acts then by expansion in the large cylinder C and escapes by the pipe L to the condenser M, which condenser is regulated by water or humid air. The liquid ether produced by the condensation is taken up by a feed pump of any kind N. and is brought back into the generator G and into the generator U to be vaporized again for further use. Reservoirs, O, P, Q, R, of glycerine or of any other lubricating matter, which will not combine with ether, are connected with the stuffing boxes *o, p, q, r*, of the cylinders and of the slide valves in order to lubricate automatically the sliding rods of the latter and to retain at their passage the ether vapor which might accidentally escape. The reservoirs O. P. Q. R. are connected by conducting pipes, *s, t, u, v*, provided with cocks *s', t', u', v'*, with a receiver S which is used to feed the reservoirs and to retain the ether vapors which might possibly escape, while indicating to the engineer the stuffing box from which they escape, by means of a manometer T. which can be connected with either of the reservoirs, O. P. Q. R., by the cocks *s', t', u', v'*. Suitable chests are provided for the slide valves to work in.

It will be seen that by reason of drawing the steam supply from the boiler V which may be located in the smoke flue or chimney of any suitable steam boiler or engine furnace the waste products of combustion are not

only utilized but the generator connected therewith by piping can be located at such a distance as to avoid all liability of explosions which might take place were the generator and its heating furnace arranged together.

I claim—

1. In combination the cylinder and piston, the vapor generator, the pipe connection between the same and the cylinder for supplying vapor thereto, and the steam pipe leading from the steam supply to the vapor pipe, inclosing the same and extending along said pipe to the generator whereby the steam will act first on the vapor pipe and then on the generator substantially as described.

2. In combination the cylinder and piston, the steam jacket about the same, the steam pipe leading from a steam supply to the steam jacket, the vapor generator, the steam pipe leading from the steam jacket to the generator, and the vapor pipe leading from the generator back through the steam pipe to the valve chest, whereby the steam will first act on the cylinder then on the vapor pipe and then on the generator substantially as described.

3. In combination the piston and cylinder, the generator comprising a central chamber

for the liquid ether and a steam jacket about the same, the steam pipe connecting with the steam jacket and the vapor pipe leading from the ether chamber through the steam jacket and the steam pipe to the cylinder and piston, substantially as described.

4. In combination the piston and cylinder, the generator comprising a central chamber with flues α running vertically through the same, the upper and lower chambers F. H. the side conduit I connected with the upper and lower chambers, the steam pipe connecting with the upper chamber and the vapor pipe extending from the ether chamber through the steam pipe, substantially as described.

5. In combination the cylinder B with its piston, the second cylinder C with its piston, the connection K between the cylinders, the generator G connected with the cylinder B and the generator U connected with the space K between the cylinders, substantially as described.

In witness whereof I have hereunto set my hand in presence of two witnesses.

PAUL DE SUSINI.

Witnesses:

CH. DIGEORY,
G. MAIX.