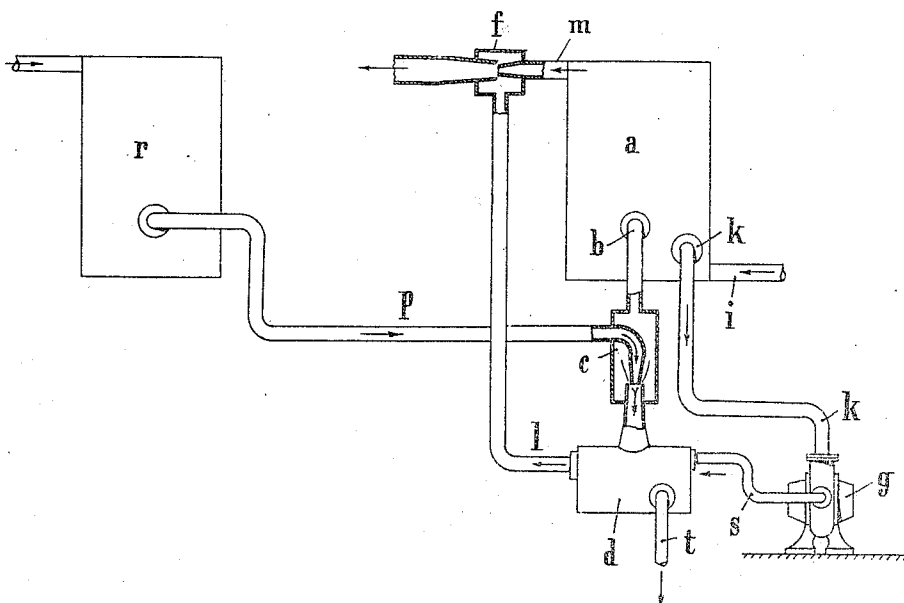


E. JOSSE & W. GENSECKE.
 MEANS FOR REMOVING AIR AND NON-CONDENSED STEAM FROM VACUUM APPARATUS,
 CONDENSERS, AND THE LIKE.
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1,046,303.

Patented Dec. 3, 1912.



Witnesses:

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UNITED STATES PATENT OFFICE.

EMIL JOSSE AND WILHELM GENSECKE, OF CHARLOTTENBURG, GERMANY.

MEANS FOR REMOVING AIR AND NON-CONDENSED STEAM FROM VACUUM APPARATUS, CONDENSERS, AND THE LIKE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that we, EMIL JOSSE and WILHELM GENSECKE, citizens of the Empire of Germany, and residing at Charlottenburg, near Berlin, Germany, have invented certain new and useful Improvements in Means for Removing Air and Non-Condensed Steam from Vacuum Apparatus, Condensers, and the Like, of which the following is a specification.

Our invention relates to apparatus for removing the air and uncondensed steam from vacuum-apparatus, condensers and the like. It has heretofore been proposed to employ water-ejectors for this purpose. Such ejectors have, however, a very low efficiency, and moreover, with a given vacuum and number of revolutions they can remove only a certain predetermined quantity of air. If this quantity increases for any reason the vacuum is reduced. It is therefore necessary to make the ejector large enough to deal with the maximum quantity of air to be removed, but this results in a waste of energy when the quantity of air is normal.

A primary object of our invention is to obviate this defect, and to this end we insert between the condenser and the air-pump operated by the water-ejector a steam ejector apparatus, in which the quantity of steam can be so adjusted that the air present in the condenser at any time is removed with certainty.

The accompanying drawings, forming a part of this application, illustrate diagrammatically one embodiment of our invention, parts being broken away for clearness.

Referring to the drawings, *a* designates the surface condenser or vacuum-apparatus. The cooling water required for this apparatus enters at *i* and leaves at *m*. The water of condensation is withdrawn through the pipe *k* by the pump *g*. The air and uncondensed steam passing through the pipe *b* first come to the steam ejector *c*, where they obtain their first increase of pressure. In the example, the steam for operating this latter ejector is supplied by a pipe *p* from any suitable steam-engine or exchange of heat apparatus *r*. After the first accession of pressure the steam and gases pass into an

intermediate chamber *d*, where a separation of the steam takes place owing to condensation; this being preferably effected by the water pumped from the main condenser being sent by the pump *g* through the pipe *s* into the apparatus *d*. Owing to the condensation of steam in the chamber *d* the water serving as the cooling medium is heated, so that when it leaves this chamber, say through the pipe *t*, its temperature is higher than when issuing from the main condenser. If, therefore, this water of condensation is to be used again, for example, as boiler feed-water, a distinct economy is effected. The still uncondensed steam and the air which are separated in the chamber *d* from the steam just referred to, are conveyed farther by means of an ejector *f*, e. g. a water-jet air-pump, operated by the cooling water of the surface condenser.

Instead of the water of condensation and air being taken separately from the main condenser, they may be taken together direct to the steam-ejector and thence into the intermediate chamber, whence the water of condensation may be removed by a pump in the usual manner, while the necessary access of pressure is given to the air and uncondensed steam by means of a water-jet air-pump, as above described.

We claim:—

1. In combination with a condenser provided with a conduit for the removal of air and uncondensed vapor, steam jet apparatus in said conduit for withdrawing and initially compressing the air and vapor, a cooling device in the path of such ejected air and vapor for partially condensing the intermixed steam from said steam jet apparatus, and a water-jet apparatus operated by the cooling water of the condenser for further compressing such initially compressed air and vapor and condensing the intermixed steam from said steam jet apparatus.

2. In combination with a condenser provided with a conduit for the removal of air and uncondensed vapor, steam jet apparatus in said conduit for withdrawing and initially compressing the air and vapor, means for subjecting such ejected air and vapor to the cooling action of the water of con-

densation of the condenser for partially con-
densing the intermixed steam from said
steam jet apparatus, and a water-jet appara-
tus operated by the cooling water of the
5 condenser for further compressing such ini-
tially compressed air and vapor and con-
densing the intermixed steam from said
steam jet apparatus.

In testimony whereof, we affix our signa-
tures in the presence of two witnesses.

EMIL JOSSE.

WILHELM GENSECKE.

Witnesses:

HENRY HASPER,

WOLDEMAR HAUPT.