

J. STUMPF.
CONDENSING ENGINE.
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993,280.

Patented May 23, 1911

Fig. 2.

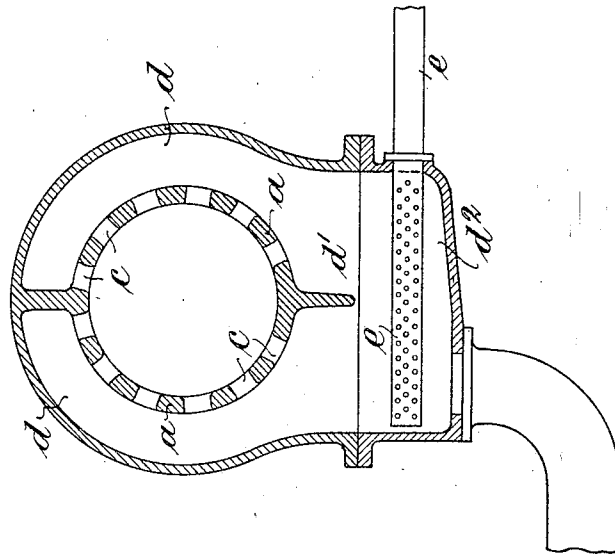
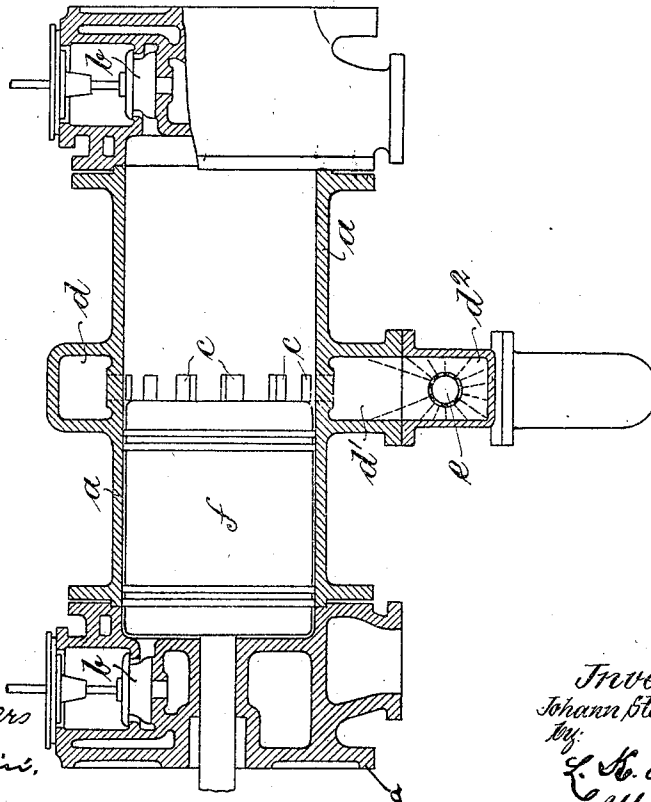


Fig. 1.



Witnesses:
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UNITED STATES PATENT OFFICE.

JOHANN STUMPF, OF BERLIN, GERMANY.

CONDENSING-ENGINE.

993,280.

Specification of Letters Patent.

Patented May 23, 1911.

Application filed February 15, 1910. Serial No. 544,921.

To all whom it may concern:

Be it known that I, JOHANN STUMPF, a subject of the King of Prussia, German Emperor, and resident of 33 Kurfürstendamm, Berlin, in the German Empire, have invented certain new and useful Improvements Relating to Condensing-Engines, of which the following is a specification.

This invention relates to condensing engines of the type in which the exhaust is controlled by the piston covering and uncovering ports in the cylinder wall at the end of its stroke.

This invention relates to condensing steam engines of the uni-directional flow type that is engines in which steam is admitted at one end of the cylinder and is exhausted through ports uncovered by the piston at the end of its travel. The steam in passing from the inlet to the exhaust does not return on its path and hence the name "uni-directional" flow steam engine.

In my co-pending application Ser. No. 511,126, I have described a uni-directional flow steam engine in which there is a heating jacket on the cylinder disposed about the inlet end, an unjacketed part nearer the exhaust and a cooling jacket about the exhaust ports. With this arrangement the cylinder itself near the exhaust ports exerts a certain condensing action on the steam layers near these ports. This condensing action facilitates the exhaust of the steam from the cylinder which must be very efficient in uni-directional flow engines if the clearance space is to be retained within the reasonable limits necessary for efficiency.

According to the present invention this effective exhaust of the steam from the cylinder in the short period for which the ports are opened is effected by arranging the condensing chamber about the cylinder and communicating directly therewith through the wide exhaust ports usual in uni-directional flow engines. In this way not only is the cooling action about the exhaust ports increased but there is no intermission in the condensation such as would occur if the

condenser were at some short distance from the cylinder. By means of this invention condensation starts within the working cylinder near the exhaust ports and this is rendered practicable by means of the scavenging action described in my co-pending application Ser. No. 427,767.

Referring to the drawings which illustrate one convenient form of this invention by way of example, Figure 1 is a longitudinal section and Fig. 2 is a cross section of one practicable construction of uni-directional flow condensing engine.

Steam enters the cylinder *a* from a hollow cover *a'* through the inlet *b*, the working steam being supplied to the cover by the inlet *a''*. This steam is cut off and expands thereby propelling the piston *f* forward (or backward) until at and near the end of its stroke the piston uncovers the ring of wide ports *c*. The steam never returns on its path from the inlet *b* to the exhaust *c*, hence the term uni-directional flow. The exhaust ports *c* being arranged all around the cylinder form a very wide exhaust passage and those ports communicate directly through the cylinder walls with the condenser chamber *d* which is arranged as an annulus around the cylinder in the immediate neighborhood of the exhaust ports *c*. To the lower flanged part *d'* of the chamber *d* there is fixed the box *d''* in which, in the form shown the spraying pipe *e* of a spray condenser, is arranged. The flow of steam through the ports *c* is facilitated by rounding off the corners of said ports as shown.

By means of this invention the suction action through the ports *c* is sufficient to exhaust the cylinder to a high degree even in the very short period available for this operation in high speed engines of the uni-directional flow type.

What I claim is:—

1. In a steam engine, the combination with a cylinder having an inlet port at one end, exhaust ports at some distance from that end, and an external circumferential chamber covering said exhaust ports, of a piston

controlling said exhaust ports as it reciprocates, and means for cooling said chamber.

2. In a steam engine, the combination with a cylinder having an inlet port at each end, exhaust ports near its middle, and an external circumferential chamber covering the exhaust ports, of a piston controlling the exhaust ports as it reciprocates, and means

for supplying a cooling agent in said chamber.

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

JOHANN STUMPF.

Witnesses:

FERDINAND RIESE,
WOLDEMAR HAUPT.