(No Model.)

E. KÖRTING.

WATER JET CONDENSER.

No. 456,828. Patented July 28, 1891.

Fig. 1.

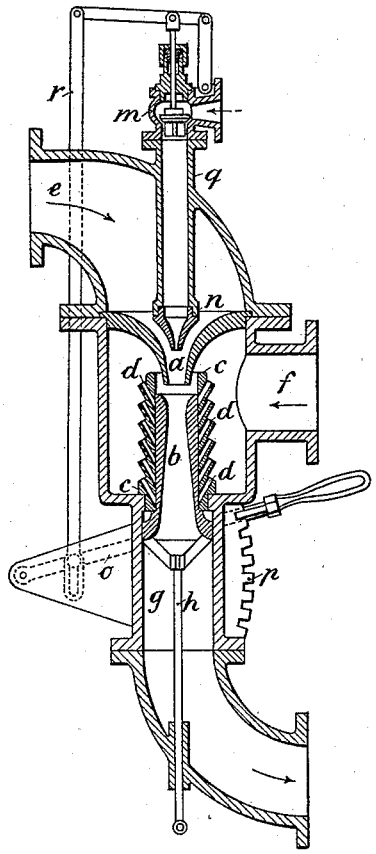
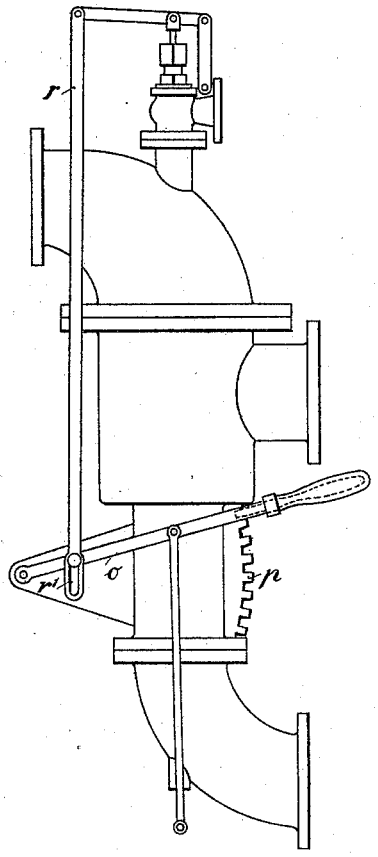


Fig. 2.



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UNITED STATES PATENT OFFICE.

ERNST KÖRTING, OF HANOVER, GERMANY.

WATER-JET CONDENSER.

SPECIFICATION forming part of Letters Patent No. 456,828, dated July 28, 1891.

Application filed April 3, 1891. Serial No. 387,533. (No model.)

To all whom it may concern:

Be it known that I, ERNST KÖRTING, a subject of the King of Prussia, residing at Hanover, Kingdom of Prussia, Germany, have invented new and useful Improvements in Water-Jet Condensers, whereof the following is a specification.

My invention relates to condensers in which the condensation of steam is brought about by a jet of water passing from a supply-nozzle through the steam into a receiving-nozzle; and its object is to render the operative capacity of the condenser variable without that the degree of vacuum produced by the condenser is materially influenced by such variation. For this purpose I make the receiving-nozzle movable lengthwise and provide the same with a mechanism for shifting it, so that the distance of its inlet end from the water-jet nozzle may be reduced or increased. By these means the operative length of the water-jet, and consequently the extent of its surface, which acts as the steam-condensing medium, may be varied in accordance with the quantity of steam to be condensed. Moreover, I combine with the said movable receiving-nozzle a tubular channel to be called "condensing-tube," surrounding the former and having a plurality of passages or transverse slits distributed upon its length and serving to admit the steam thereinto, the receiving-nozzle operating relatively to the said condensing-tube as slide-valve to close the steam-passages thereof in succession in the measure as it is shifted toward the water-jet nozzle, and vice versa. By the latter means the aggregate section of the steam-currents and the surface of the condensing-jet are always brought into the proper proportion to each other. The said passages or slits are preferably arranged to form short channels inclined from their inlet end toward the outlet end of the receiving-nozzle.

The receiving-nozzle may be shifted by hand through the medium of a lever, a rack and pinion, a screw, or other suitable device, and if the condenser is to be applied to a steam-engine working with varying power the nozzle may be so connected to the governor of the engine that it will be shifted toward or away from the water-jet nozzle, according as the power of the engine diminishes or increases.

If for starting the condenser an auxiliary jet of fluid induced under pressure should be required, it is advantageous to connect the valve controlling the admission of the said fluid with the mechanism for operating the receiving-nozzle in such manner that the valve will be opened when the receiving-nozzle is at or near the end of its instroke and that the valve will be caused to close immediately after the nozzle has commenced to be drawn outward.

In the annexed drawings, Figure 1 is a sectional view, and Fig. 2 the outside elevation, of a water-jet condenser comprising my improvements.

e is the water-induction pipe; *f*, the steam-pipe; *g*, the water-eduction pipe; *a*, the water-jet nozzle arranged to receive water from the pipe *e*, and *b* the receiving-nozzle, which fits with its lower end in the pipe *g* and is capable of sliding therein.

c is the condensing-tube fitting on the nozzle *b* and having the inclined steam passages or channels *d* distributed lengthwise upon the tube. The nozzle *b* has at its lower end a cross-piece, to which is fixed the rod *h*, passing outward through a sleeve in the wall of pipe *g*, and whereby the nozzle can be shifted. The rod *h* is connected to a hand-lever *o*, having a catch arranged to engage with the notches of a sector *p*, in view of locking the lever in any desired position.

n is the nozzle for an auxiliary jet of fluid, the same being directed into the nozzle *a* and forming the end of the supply-pipe *q*, while *m* is the valve whereby the current of fluid in pipe *q* is controlled. The stem of this valve is connected by a lever and a rod *r* to the hand-lever *o*, the said rod being paired with a pin in lever *o* by means of an elongated eye *r'*, in order that the valve be opened only when the lever and nozzle *b* are near the upper end of their course.

I claim as my invention—

1. In a water-jet condenser, the combination, with the steam-pipe *f*, the water-induction pipe *e*, and the water-eduction pipe *g*, of the water-jet nozzle *a*, fixed to pipe *e*, the condensing-tube *c*, having the steam-passages *d*,

the receiving-nozzle *b*, communicating with pipe *g* and movable lengthwise in the tube *c*, and means for shifting the nozzle *b*, substantially as described.

2. In a water-jet condenser, the combination, with the steam-pipe *f*, the water-induction pipe *e*, and the water-eduction pipe *g*, of the water-jet nozzle *a*, fixed to pipe *e*, the receiving-nozzle *b*, communicating with pipe *g* and movable lengthwise, means for shifting the nozzle *b*, the auxiliary nozzle *n*, directed into nozzle *a*, the pipe *q* for supplying a fluid to nozzle *n*, valve *m*, placed in pipe *q*, and a connection between the said valve and the receiving-nozzle *b*, whereby the valve is opened when nozzle *b* is pushed toward the nozzle *a*, substantially as specified.

In testimony thereof I have hereunto set my hand in the presence of two subscribing witnesses.

ERNST KÖRTING.

Witnesses:
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