

No. 607,717.

Patented July 19, 1898.

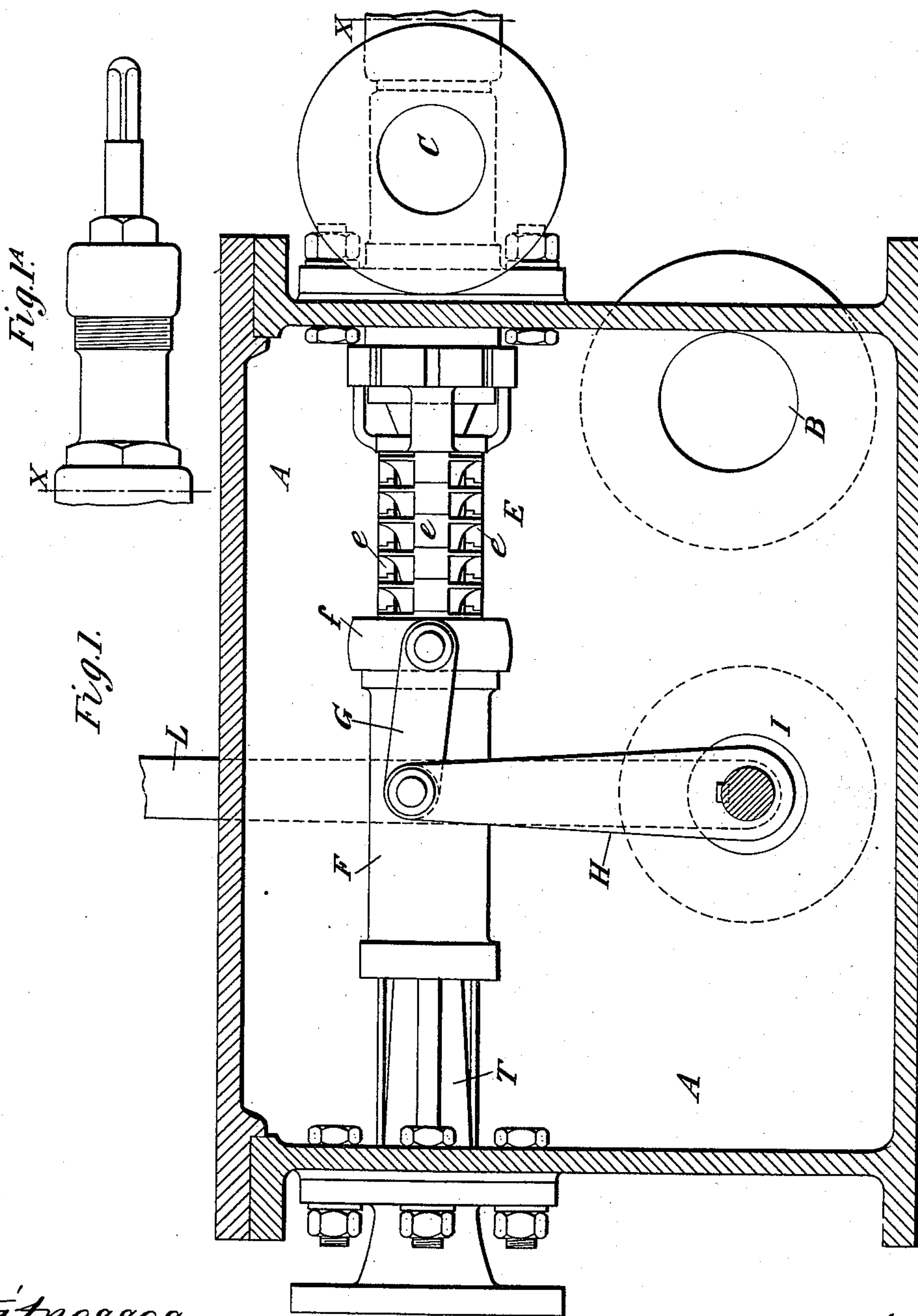
H. VAN HEUMEN.

MEANS FOR REGENERATING STEAM AS A WORKING FLUID.

(No Model.)

(Application filed Dec. 20, 1897.)

2 Sheets—Sheet 1.



Witnesses.
Jas. N. Lea.
Robert Everett.

Inventor.
Hieronimus van Heumen.
By James L. Norris.
Atty.

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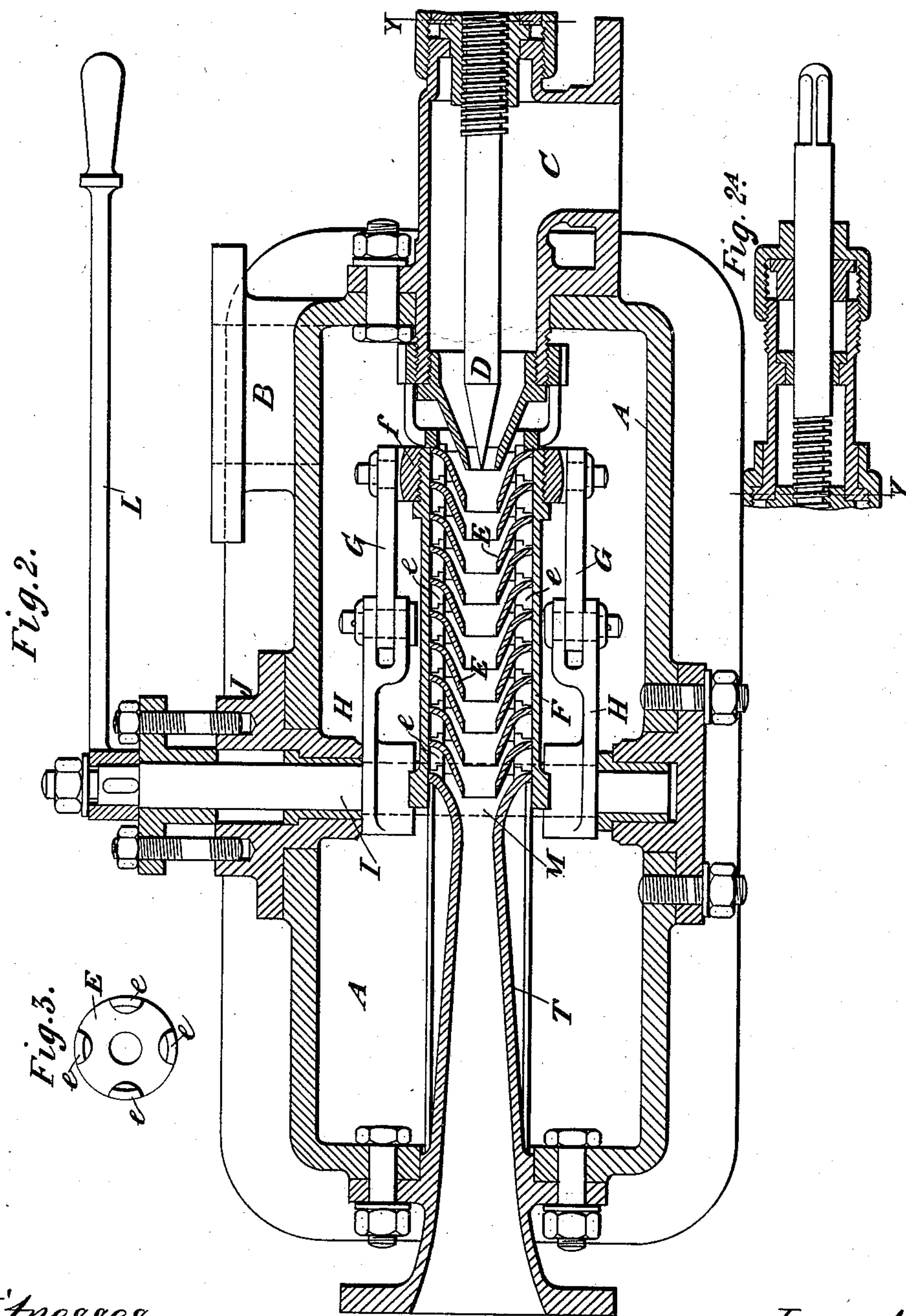
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Witnesses.
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UNITED STATES PATENT OFFICE.

HIERONIMUS VAN HEUMEN, OF HOF VAN DELFT-BY-DELT, NETHERLANDS.

MEANS FOR REGENERATING STEAM AS A WORKING FLUID.

SPECIFICATION forming part of Letters Patent No. 607,717, dated July 19, 1898.

Application filed December 20, 1897. Serial No. 662,627. (No model.)

To all whom it may concern:

Be it known that I, HIERONIMUS VAN HEUMEN, a subject of the Queen of the Netherlands, residing at Hof van Delft-by-Delft, in the Kingdom of the Netherlands, have invented a certain new and useful Means for Regenerating Steam as a Working Fluid, of which the following is a specification.

The object of my invention is to regenerate steam after it has given up a portion of its energy as a working fluid, so as to render it capable of operating again and again. For this purpose I generate steam in any suitable boiler in the usual way, and from this boiler I conduct the two portions of the steam, the one portion going to work an engine and the other portion going to a superheater in which its temperature is considerably raised. The exhaust-steam from the engine at a pressure which may be considerably below that in the boiler is conducted to a recipient provided with an injector and connected by pipes with the superheater and the boiler. The superheated steam issuing at high velocity from the nozzle or nozzles of the injector draws steam from the recipient and drives it toward the boiler with sufficient pressure to effect its return.

Figure 1 of the accompanying drawings is a vertical section, and Fig. 2 is a sectional plan, of the recipient and injector. Fig. 1^A is an elevation of part of Fig. 1 beyond the line X, and Fig. 2^A is a sectional plan of part of Fig. 2 beyond the line Y, these parts being shown separated in order to shorten the drawing. Fig. 3 is an elevation of one of the inlet-pieces of the injector.

A is the recipient vessel, which the waste steam to be regulated enters by the opening B. The superheated steam enters the injector at C, its issue from the nozzle of the injector being regulated by the adjustable conical core D. Beyond the nozzle there are a number of trumpet-mouthed inlets E for the waste steam. Each of the inlet-pieces is made with four projections *e* on each side, these being shouldered, so that the projections of each piece E fit against those of the next piece in order. Outside of the row of inlet-pieces E is a sliding tube F, which in the position shown in Fig. 2 covers and closes all the inlets. A ring *f* at its end is connected by links G to arms H, fixed on a rocking spindle

I, which passes through a stuffing-box J and has fixed on it an external hand-lever L. As this lever is moved the tube F is caused to take various positions, closing all the inlets E, as shown in Fig. 2, or closing half of them, as shown in Fig. 1, or leaving them all or any number of them open. Beyond the row of inlets the injector has a mouth M and taper-tube T of the usual form, so that the velocity of the fluid determined by the injector action of the superheated steam is converted into pressure.

Having thus described the nature of my said invention and the best means I know of carrying the same into practical effect, I claim—

1. In an apparatus for regenerating exhaust-steam, the combination with the steam-chamber into which the exhaust-steam is caused to enter, of an injector located within said steam-chamber and provided with a plurality of inlets for the entrance of exhaust-steam, a sleeve adapted to slide over said injector and arranged to cover the inlet-openings therein as desired, a rotary shaft journaled in the steam-chamber and provided with means for operating it, and a linked connection between said shaft and sleeve whereby the latter is moved during the movement of the shaft.

2. In an apparatus for regenerating exhaust-steam, the combination with the steam-chamber into which the exhaust-steam is caused to enter, of an injector located within said steam-chamber and provided with a plurality of inlets for the entrance of the exhaust-steam, said injector being arranged to convey superheated steam therethrough, a sleeve arranged to slide over said injector and cover the openings therein as desired, a rotary shaft journaled in the steam-chamber, a handle fixed to one end of said shaft, arms projecting outward from said shaft, and link connections between said arms and sleeve, as and for the purpose described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 2d day of December, A. D. 1897.

HIERONIMUS VAN HEUMEN.

Witnesses:

J. D. VOST,
S. LISTOE.