

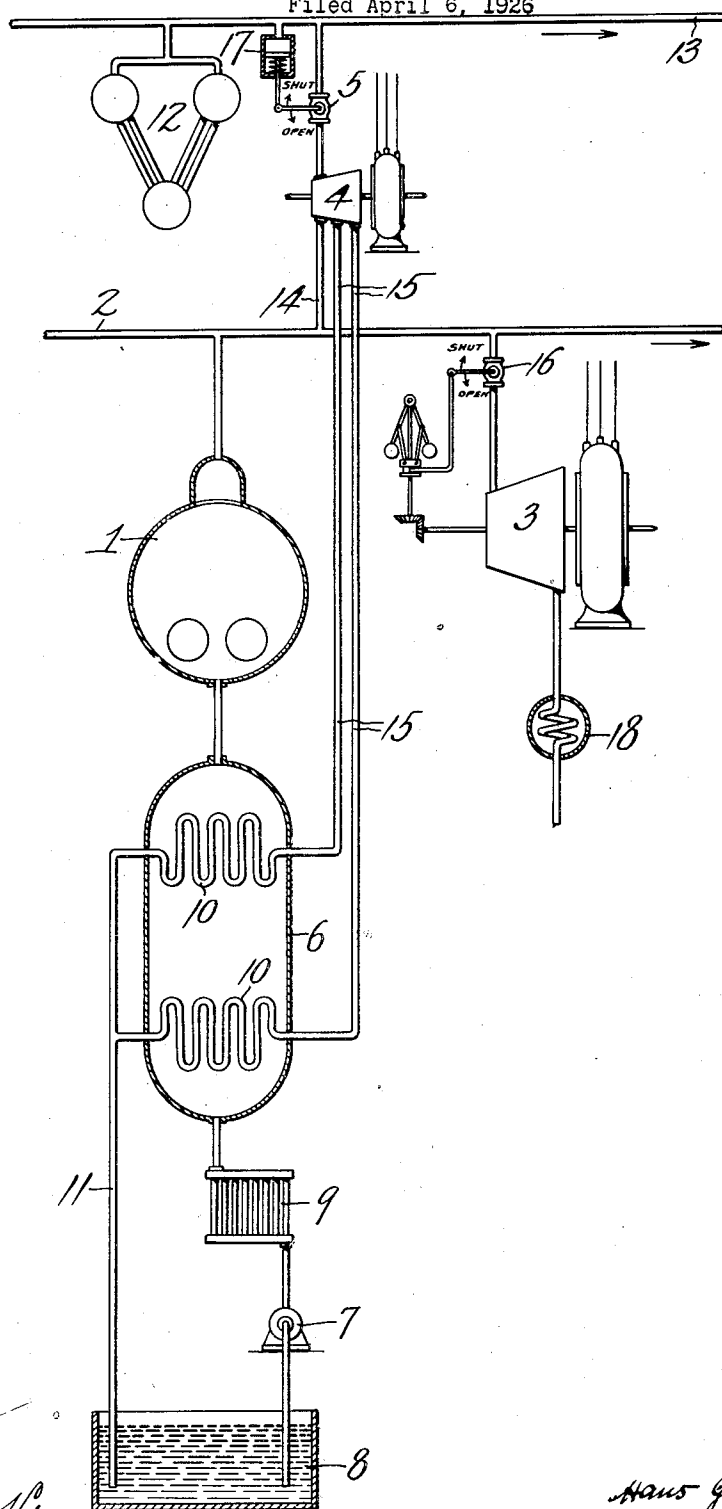
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1,653,560

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SYSTEM OR ARRANGEMENT FOR TAPPING OR BLEEDING STEAM

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WITNESS

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SYSTEM OR ARRANGEMENT FOR TAPPING OR BLEEDING STEAM.

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My invention relates to a system or arrangement for tapping or bleeding steam from a steam engine at a pressure higher than that of the exhaust.

It is well known to tap steam engines at one or more places for the purpose of heating feed water. In new power plants such taps are provided in requisite number upon the engines. In plants in which the engines have not been designed as bleeder engines from the beginning, this is, however, a different matter. Such plants can subsequently be adapted for the tapping or bleeding of the steam by adding to the plant a back-pressure engine with one or more taps.

The subsequent connection of a bleeder engine ahead of the main engine may be effected in a particularly suitable manner, if the existing steam power plant is extended by the addition of a boiler of higher pressure.

According to my invention a tap of the series engine the pressure of which tap corresponds with the pressure of the admission steam of the main engine is then led into the live steam pipe of the main engine and the other taps of the series engine are led to a boiler feed water heater. This additional machine, for instance a turbine, then constitutes a constant normal load on its boiler corresponding with the most favorable steam supply by the boiler of higher pressure and utilizes the surplus steam, available at its several pressure stages in case of low load, for heating the feed water.

An embodiment of my invention is diagrammatically illustrated in the drawing, by way of example.

Referring to the drawing, 1 indicates a boiler which supplies the turbine 3 with steam through the main 2. The steam admission to this main turbine 3 is controlled, according to the load which it carries, by means of the governor actuated admission valve 16. 18 is the condenser for the exhaust steam. Ahead of the turbine 3 is connected a turbine 4 designed for and operating at a higher admission pressure. The admission of the steam into this series turbine 4 is regulated for constant boiler pressure by the valve 5, connected in well-known manner to a pressure responsive device 17 which in turn is connected to the live steam

main 13. The turbine 4 is fed from the high-pressure boiler 12 by the main 13 and is provided with three taps, one of which 14 is connected with the live steam main 2 of the original boiler 1, while the remaining taps 15 lead the bleeder steam into the feed heater 6. The steam is here condensed in the heating coils 10 by the feed water which passes through heater 6 and the condensate flows through the pipe 11 into the feed water tank 8. From this tank the pump 7 conveys the feed water through the economizer 9 into the steam heater 6.

Instead of a steam turbine 4, multiple compound reciprocating engines, which are suitable for tapping, may naturally be employed.

The arrangement according to my invention facilitates the reconstruction of a steam plant for a higher steam pressure. It enables steam plants, which were originally not designed for steam tapping, to utilize the tapped steam for the heating of the boiler feed water.

While I have shown my invention in a preferred form, it is obvious that changes may be made in the embodiment thereof without departing from the principles and spirit of my invention. I desire, therefore, that the appended claims shall be accorded the broadest construction, when read in the light of the prior art.

I claim as my invention:—

1. In a steam power plant a main engine and a normal steam supply therefor, a multi-stage back pressure auxiliary engine, operating at a pressure higher than the operating pressure of the main engine and having taps at its several stages for bleeding steam therefrom, and a high pressure boiler for supplying steam to said auxiliary engine, a pipe leading from that tap of said engine, whose steam pressure corresponds substantially to the admission pressure of said main engine, into the supply main of said main engine, a steam feed-water heater for heating the feed water required for said plant and steam connections between said heater and the remaining taps of said engine.

2. In a steam power plant a main engine and a normal steam supply therefor, a multi-stage back pressure auxiliary engine, operating at a pressure higher than the operating pressure of the main engine and having taps

at its several stages for bleeding steam therefrom, and a high pressure boiler for supplying steam to said auxiliary engine, a pipe leading from that tap of said engine, whose steam pressure corresponds substantially to the admission pressure of said main engine, into the supply main of said main engine, a steam feed-water heater for heating the feed water required for said plant and steam connections between said heater and the remaining taps of said engine and means for regulating the steam admission to said main engine in dependence from its load, and means for regulating the steam admission to said auxiliary engine only in accordance with the pressure in the live steam supply line to said auxiliary engine.

3. In a steam power plant a main engine

and a normal steam supply therefor, a multi-stage back pressure auxiliary engine, operating at a pressure higher than the operating pressure of the main engine and having taps at its several stages for bleeding steam therefrom, and a high pressure boiler for supplying steam to said auxiliary engine, a pipe leading from an interstage of said engine of adequate pressure to the normal steam supply connections of said main engine for supplementing the normal steam supply of the latter, and a steam feed-water heater for heating the feed water required for said plant connected to the taps of the remaining stages of said auxiliary engine to use the available surplus steam from said taps for feed-water heating.

In testimony whereof I affix my signature.
HANS GLEICHMANN.