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MULTI-STAGE COMPRESSORS
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Fig.1

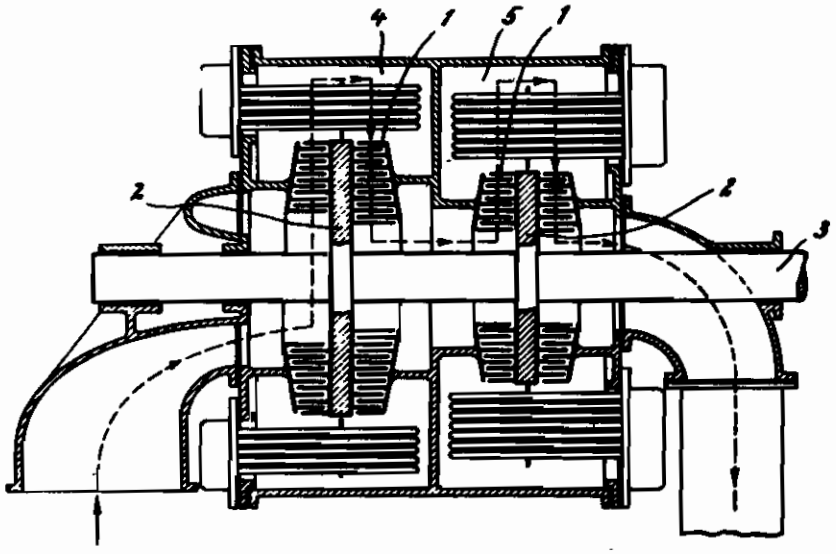
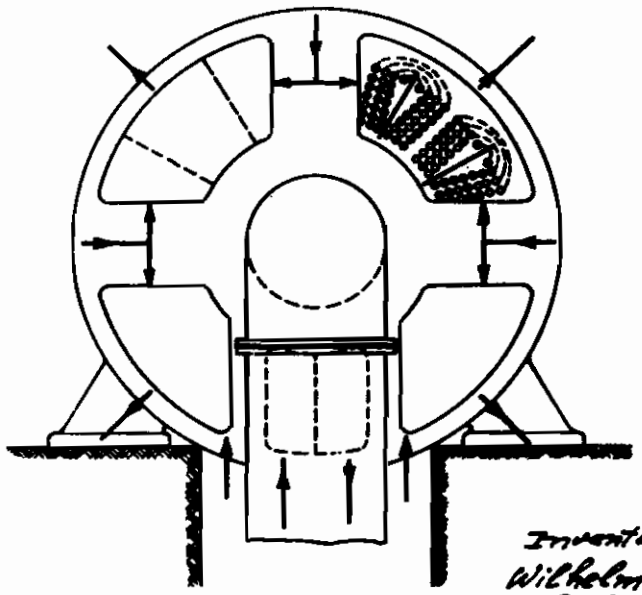


Fig.2



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ALIEN PROPERTY CUSTODIAN

MULTI-STAGE COMPRESSORS

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This invention relates to a turbine-like multi-stage compressor with radial admission of the working fluid, provided with intermediate cooling.

The work of compression in a compressor is, as is well known, the smaller, the more the curve of compression approaches the isothermal curve. The coincidence of the compression curve with the isothermal curve is the more difficult to bring about, the greater the number of stages of the compressor, which is particularly the case in turbine-like compressors with radial admission of the working fluid. Here the number of stages is so great and the dimensions of the blade are so small that the intermediate cooling cannot be practically carried out when employing hollow blades or similar means. There is no other remedy than to provide an intermediate cooling, for instance, between two stages. The object of the invention is therefore to suitably arrange the cooler within the compressor, particularly within a turbine-like multi-stage compressor with radial admission of the working medium and whose blades are subdivided into a plurality of rows of blades which are traversed one after the other by the working fluid. In this case the cooler or coolers of substantially the circular type are arranged in the by-pass space provided between two blade rings.

In the accompanying drawings is shown an embodiment of the invention in diagrammatic form, in which

Fig. 1 shows a longitudinal view and Fig. 2 a lateral view, partly in section.

In this turbine-like compressor with radial admission of the working fluid, the blading is subdivided into a plurality of blade groups 1, arranged on the shaft 3 at both sides of the discs 2 and traversed one after the other by the air to be compressed in the direction as indicated by the arrows. Between these two rows of blades is provided an intermediate cooling, i. e., the intermediate coolers are arranged in the by-pass spaces 4 and 5 between two rows of blades. The great advantage of such an arrangement lies in the fact that the compressed air on its way from one group of blades to the other may flow directly through the cooler without encountering appreciable resistances. A reversal of the compressed air is necessary between two groups of blades so that as the only additional loss there results in the cooler itself the loss due to the resistance to flow. However, the loss may be reduced to a minimum by suitably dimensioning the blades and by a suitable choice of the velocity of flow.

Since in the case of coolers certain damages and pollutions must always be reckoned with, it is preferable to subdivide the cooler into a plurality of individual segments which may be arranged in parallel or series and which may be separately removed without great difficulties in order to clean and to replace the same.

WILHELM WEIMAR.