A. W. H. GRIEPE.

AIR AND GAS COMPRESSOR.

APPLICATION FILED JAN. 24, 1914.

1,225,805.

Patented May 15, 1917.

2 SHEETS—SHEET 1.

Fig. 1.

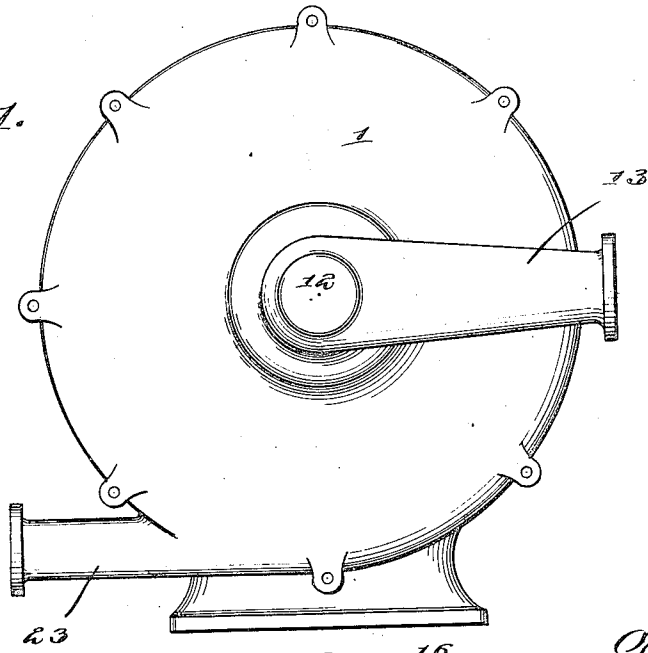
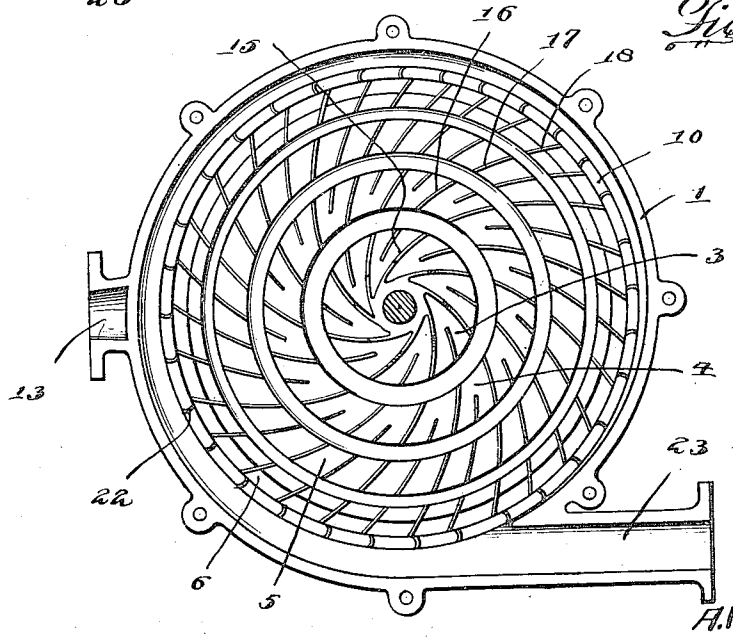


Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

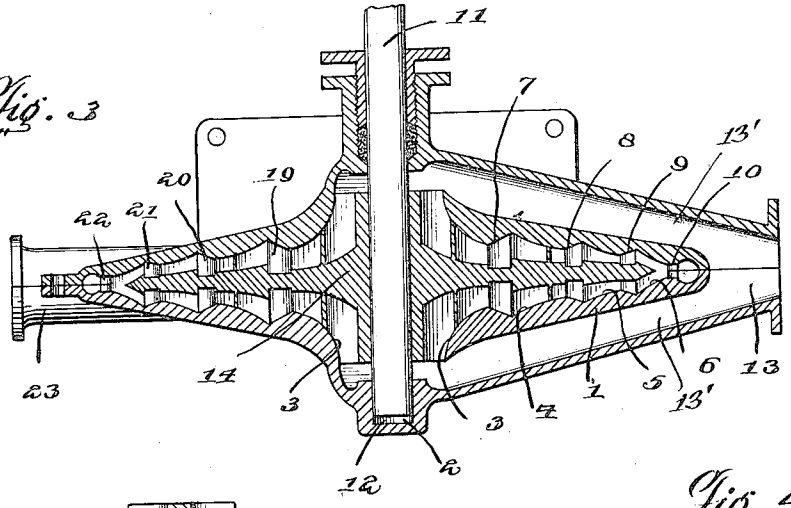


Fig. 4.

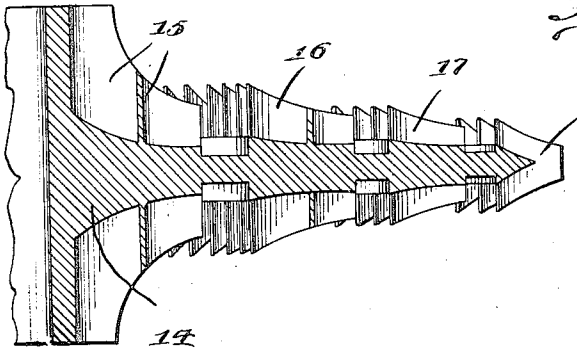
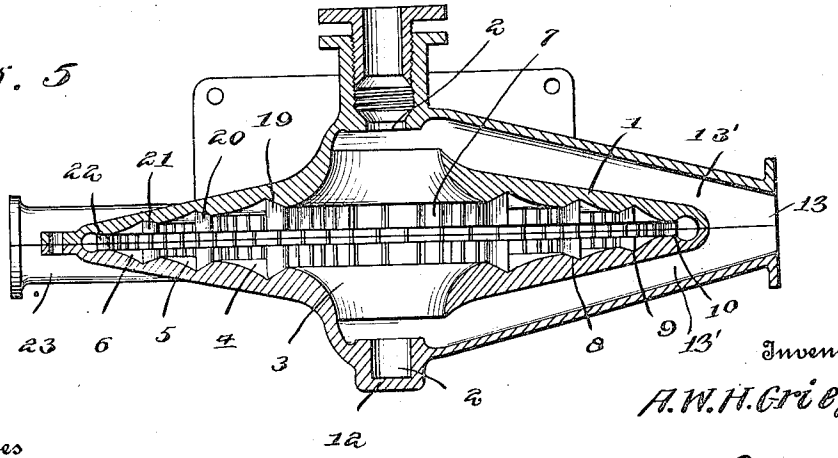


Fig. 5.



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UNITED STATES PATENT OFFICE.

AUGUSTUS W. H. GRIEPE, OF NEW YORK, N. Y., ASSIGNOR TO TURBO COMPANY, A CORPORATION OF NEW JERSEY.

AIR AND GAS COMPRESSOR.

1,225,805. Specification of Letters Patent. Patented May 15, 1917.

Application filed January 24, 1914. Serial No. 814,135.

To all whom it may concern:

Be it known that I, AUGUSTUS W. H. GRIEPE, a citizen of the United States, residing at New York, in the county of Bronx and State of New York, have invented new and useful Improvements in Air and Gas Compressors, of which the following is a specification.

The invention relates to a compressor designed particularly for gaseous fluids, comprehending a compressor of the rotary type including a plurality of receiving compartments successively decreased in size from the inlet toward the outlet end of the compressor, whereby the volume of a predetermined quantity of air is gradually reduced and hence compressed.

The main object of the present invention is the provision of a compressor of this type divided into a plurality of alternately arranged chambers providing what may be termed velocity increasing chambers, wherein the gas driving means are arranged, and receiving or pressure augmenting chambers within which the volume of gas is successively stored or trapped between the velocity increasing means, the successive velocity increasing chambers and pressure augmenting chambers being respectively of reduced capacities from the inlet to the outlet of the compressor.

The invention in the preferred form of details will be described in the following specification, reference being had particularly to the accompanying drawings, in which:—

Figure 1 is a view in elevation of the improved compressor.

Fig. 2 is a vertical central section of the same.

Fig. 3 is a transverse section.

Fig. 4 is a section of the rotor element.

Fig. 5 is a section of the casing with the rotor element removed.

In carrying out the present invention, I provide a casing 1 of approximately circular form, which is of gradually decreasing interior dimensions toward the circumferential edge. The casing 1 is provided with a transverse central bore 2. From the bore 2 the interior of the casing is formed to provide a series of circumferential or annular chambers, there being four such chambers in the present instance and indicated at 3, 4, 5, and 6. The chambers are concentric with each other and with the central bore, and the side walls of the casing forming the side boundaries of the respective chambers are curved from their inner edges toward their outer edges so that the inner or entrance end of each chamber is of greater dimension transversely of the casing than the outer or exit end of the chamber. Between the respective chambers 3 and 4, 4 and 5, and 5 and 6, and immediately beyond the chamber 6, all of which chambers will be hereinafter termed the velocity increasing chambers, I arrange annular spaces indicated respectively as 7, 8, 9, and 10, the side walls of which are formed by inclining the adjacent portions of the casing wall outwardly from the central bore of the casing toward the periphery thereof, so that the entrance or inner end of each of the said spaces is of less width transversely of the casing than the outer or exit end thereof. As previously stated, the spaces 7, 8, 9, and 10 are arranged respectively beyond the velocity increasing chambers 3, 4, 5, and 6, so that each of said chambers is provided at what may be termed its exit end with a space which may be hereinafter termed a pressure augmenting chamber. As the velocity increasing chambers are of progressively reduced size radially of the casing, the pressure augmenting chambers are similarly of progressively reduced size, as clearly indicated in Fig. 3 of the drawings.

Mounted in the bore 2 of the casing is a shaft 11, bearings being provided therefor as at 12, the casing being formed with a single admission throat 13 having branches 13′ which diverge toward the center of the casing where they communicate with the pressure augmenting and velocity increasing chambers of the series of least diameter. Arranged upon the shaft is an annular rotative element 14, which extends throughout all of the velocity increasing and pressure augmenting chambers having the thickness materially less than the diameter or transverse dimension of any of said chambers. On the shaft 11 and disk 14 are mounted blades 15 operating within the chamber 3, blades 16 operating within the chamber 4, blades 17 operating within the chamber 5, and blades 18 operating within the chamber 6. These blades rotate in unison and are curved with respect to the radial, so that their directive force is outwardly of the particular chamber

in which they are located. The side edges of the blades are shaped to conform to the respective side walls of the chambers, and preferably operate immediately adjacent said side walls, whereby to direct the current outwardly and centrally, as will be apparent from Figs. 2 and 3 of the drawings. In each of the pressure augmenting chambers are arranged fixed diffusion vanes, as 19, in the chamber 7, 20 in chamber 8, 21 in chamber 9, and 22 in chamber 10, said vanes being inclined reversely to the rotating blades. These vanes, which are in the form of stationary blades, operate to interrupt the continuity of the pressure augmenting chamber so as to provide what may be more or less accurately termed a dead air space between the velocity increasing chambers in so far as any power acting means therein is concerned. The casing is provided with a tangential discharge passage 23 having communication with the outer chamber, 10.

The operation of the device will be fully apparent from the above description, taken in connection with the drawings, it being noted that the velocity increasing chambers and pressure augmenting chambers successively decrease in cubical contents radially of the casing toward the circumferential edge thereof, so that the power means continually forces the admitted volume of gases into a more confined space, with the effect of increasing the pressure on such quantity of gas by reducing the volume.

The vanes 19, 20, 21 and 22 are, as will be noted, formed so that the direction of the flow of the gas or fluid is changed or reversed from its direction under the blades of the rotor, thereby materially increasing the pressure effect and insuring a uniform effect, in so far as compression is concerned, from the apparatus.

What is claimed is:—

A fluid compressor having a plurality of concentric series of velocity increasing chambers the entrances of which are of greater transverse dimensions than the exits, and like series of pressure augmenting chambers the entrances of which are of less transverse dimensions than the exits, each series of velocity increasing chambers and each series of pressure augmenting chambers progressively decreasing in radial width, size and capacity from the center toward the outer periphery of the casing, the casing being provided with a single admission throat at the periphery thereof and branches leading therefrom divergently inward to the center of the casing where they communicate directly with the pressure augmenting and velocity increasing chambers of the series of least diameter.

In testimony whereof I affix my signature in presence of two witnesses.

AUGUSTUS W. H. GRIEPE.

Witnesses:

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