in M passes by way of the pipes Q and N to the condenser O where it is condensed and flows back into the converter M.

The liquid after passing through the various compartments of the converter M finally overflows through the pipe R to the cooler S where it is cooled by contact with the cooling coils T, through which cold water, brine, or cold carbon tetrachlorid or other cooling liquid is circulated. The temperature of the cooling liquid, rate of flow, and surface of the coils is so regulated

that the mixture finally overflows by the overflow pipe U at about atmospheric temperature. From U the liquid flows into the receiver V, whence it is pumped by the pump W to the reservoir A to begin its round anew.

As the mount of carbon tetrachlorid and sulfur chlorid accumulates, a portion overflows by the overflow pipe X into a stock tank Y. Carbon tetrachlorid of a very pure form is readily separated from the stock tank mixture. The sulfur chlorid after separation is marketed as such or otherwise utilized.

The inventor is William F. Doerflinger, of New York, New York.

991,357. Process of Producing Nitric Oxid from Mixtures of Nitrogen and Oxygen and Apparatus Therefor.

This invention comprises a process wherein a mixture comprising nitrogen and oxygen, is heated to a reacting temperature, is thereafter permitted to expand without material re-

duction in temperature, additional heat being supplied during such expansion, and is finally cooled; and it also comprises apparatus suitable for carrying out the process comprising a

reaction furnace, an expansion chamber in communication with said furnace, means for permitting expansion of hot gases from said furnace into said reaction chamber without cooling during such expansion, special heating means being provided if desired, and means for cooling the hot expanded gases.

In applying the process to the manufacture of nitrogen oxides where gaseous mixtures containing nitrogen and oxygen are subjected to the action of an electric arc, an arc is formed and the gases introduced into it at approximately normal pressure. After treatment in the arc, the intensely hot gases are permitted to expand into a chamber in which a partial vacuum is maintained, without material reduction in their temperature. Reduction in the temperature of the hot gases may be prevented either by supplying additional heat to the gases during the expansion, or by throttling their flow into the expansion chamber. The pressure in the expansion chamber should be relatively low, and for the best results should not be over 400 mm. of mercury.

The inventor is Harry Pauling, of Gelsenkirchen, Germany, assignor to Salpetersaure-Industrie-Gesellschaft, Gesellschaft Mit Beschränkter Haftung, of Gelsenkirchen, Germany.

993,017. Apparatus for Obtaining Nitrogen from Air.

This apparatus is defined in the patent as comprising a furnace of considerable area in proportion to its height and having a top and bottom both sloping downward from the inlet to the outlet of the furnace, means for supplying sulfur and air to the inlet end of said furnace, a conduit at the outlet end of said furnace for the resulting gases, means for removing from said

gases the excess of sulfur and the sulfurous acid, a suction pump at the advance end of the conduit for drawing the air into the furnace and the gases from said furnace, and means for confining the nitrogen, substantially as described.

The inventor is Charles Blagburn, of San Francisco, California, assignor to himself, trustee.