UNITED STATES PATENT OFFICE.

CARLO ANDREUCCI, OF ROME, ITALY.

PRODUCTION OF NITROGEN FROM THE AIR.

1,272,181. Specification of Letters Patent. Patented July 9, 1918.

No Drawing. Application filed November 6, 1917. Serial No. 200,593.

To all whom it may concern:

Be it known that I, CARLO ANDREUCCI, a subject of the King of Italy, and resident at Rome, Italy, (whose post-office address is No. 172 via Nazionale,) have invented certain new and useful Improvements in or Relating to the Production of Nitrogen from the Air, of which the following is a specification.

The present invention relates to a process for the obtention, in a continuous manner, of atmospheric nitrogen from air and hydrogen introduced into a suitable chamber, in substantially their combining proportions, and then igniting and exploding said mixture of air and hydrogen while within the chamber. The resulting product, containing the atmospheric nitrogen, is then drawn off or led off, for treatment in any suitable way, especially for obtention of substantially pure nitrogen.

In practice, the chamber may be the combustion-chamber of an internal combustion engine (for instance, petroleum, producer-gas, lighting-gas or Diesel engine), provided with a suitable means for ignition of the mixture of air and of hydrogen. I have attained good results with an apparatus comprising an internal combustion-chamber having inlet ports, one from the atmosphere, and the other from a tank or other source of hydrogen, there also being means for throttling the said inlet openings, separately if desired, to regulate the supply of the air and of the hydrogen so as to bring about substantially their combining proportions in the mixture, and to prevent, under the control of a Watt indicator, the explosive pressures from being too great.

For igniting the mixture, I may use an electrical sparking device, or, in place thereof, any suitable means of ignition, such as a small flame, an incandescent tube, or the like.

The combustion-chamber is also provided with means (a port, pipe or other means) for leading off or drawing off the product (after ignition and explosion of the mixture of air and hydrogen), and treated to separate impurities and to recover the nitrogen.

The pressure due to explosion of the mixture of air and of hydrogen, may be utilized to operate any mechanism in a usual way. As a result, in addition to obtaining nitrogen, I also provide a prime mover which may be used for any purpose.

I have heretofore successfully practised the present process by bringing about, by means of an electric spark, the explosion of successive charges each of, substantially, 1000 liters of air (which contain 209 liters of oxygen) with, substantially, 418 liters of hydrogen, in the combustion-chamber of an internal combustion engine, provided with a device for electric ignition. The proportions given may be determined or regulated by operation of the throttling means for the inlet openings, one for air and the other from a source of hydrogen.

The product resulting from ignition and explosion of the mixture of air and of hydrogen in the specified proportions is led or drawn off, and is the following: viz., about 336 grams of water and 778.3 liters of almost pure nitrogen, mixed with impurities of the air, and which are afterward eliminated by chemical means or other suitable treatment.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:

1. A process for continuously obtaining atmospheric nitrogen, consisting in separately supplying successive charges each of air and hydrogen, in substantially the proportions of 1,000 liters of air to 418 liters of hydrogen, into a chamber, igniting and exploding each charge while within the chamber, and removing the product of each explosion upon occurrence thereof, and collecting the nitrogen released from the successive explosion-products.

2. A process for obtaining atmospheric nitrogen in an internal combustion engine, the combustion chamber of which is provided

with inlet openings for air and hydrogen, which comprises regulating the proportions of air and hydrogen by means of said inlet openings, igniting and exploding the successive charges of the air and hydrogen while within the chamber, and collecting the nitrogen released from the successive explosion products.

In testimony whereof I have hereunto signed my name in the presence of two witnesses.

CARLO ANDREUCCI.

Witnesses:
MARIO S. ANTREYELA,
GIOVANNI BARTOLUZZI.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."