

THE WINDGENERATOR OF ELECTRIC POWER WITH INERTIA ACCUMULATER WHICH WAS CONSTRUCTED BY A.G.UFIMTZEV.

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Abstract

This paper presents the description of few inventions, which develops very old dream of people to use the wind energy for economy. One Russian inventor offered one interesting idea to use the inertia accumulator, which allows to realize this dream with help of wind motor.

Keywords: inertia accumulator, windmotor, transmission, rotating object, and bearings.

Introduction

Anatoly Ufimtzev, the talented inventor and constructor, was born on November 26, 1880 in Kursk, which is the old town of Russia [1,2].

Ufimtzev had the idea to conquer the energy of a wind. A lot of scientists attempted to do it, but Ufimtzev decided this problem cardinally. He created the kinetic inertia accumulator, which give equal electrical energy. The similar accumulator hadn't been yet. The accumulator provided even incandescence of a thousand lamps in the presence of the special commission. Ufimtzev offered the new term "anemofication", which means a switch on the extensive use of the wind energy. The invention of the accumulator gives the possibility for exploitation in the economy of the country. The windmotor was made with help of the famous aerodynamician V. P. Vetchinkin, as a result of it, Ufimtzev's motor come out twice as lighter then the lightest windmotor from earlier known motors. The Kursk windelectrical station stood out owing to a simplicity in the service and demonstrated excellent operating qualities [3].

Description of inventions

Patents defend basic developments by Ufimtzev [4,5,6]. There are: the patent N 2290 which was announced on November 11, 1918 and issued on February 28, 1927; the patent N 1457 was announced on January 14, 1924 and issued on July 31, 1926; N 10092 was announced on October 24, 1929 and issued on September 30, 1930

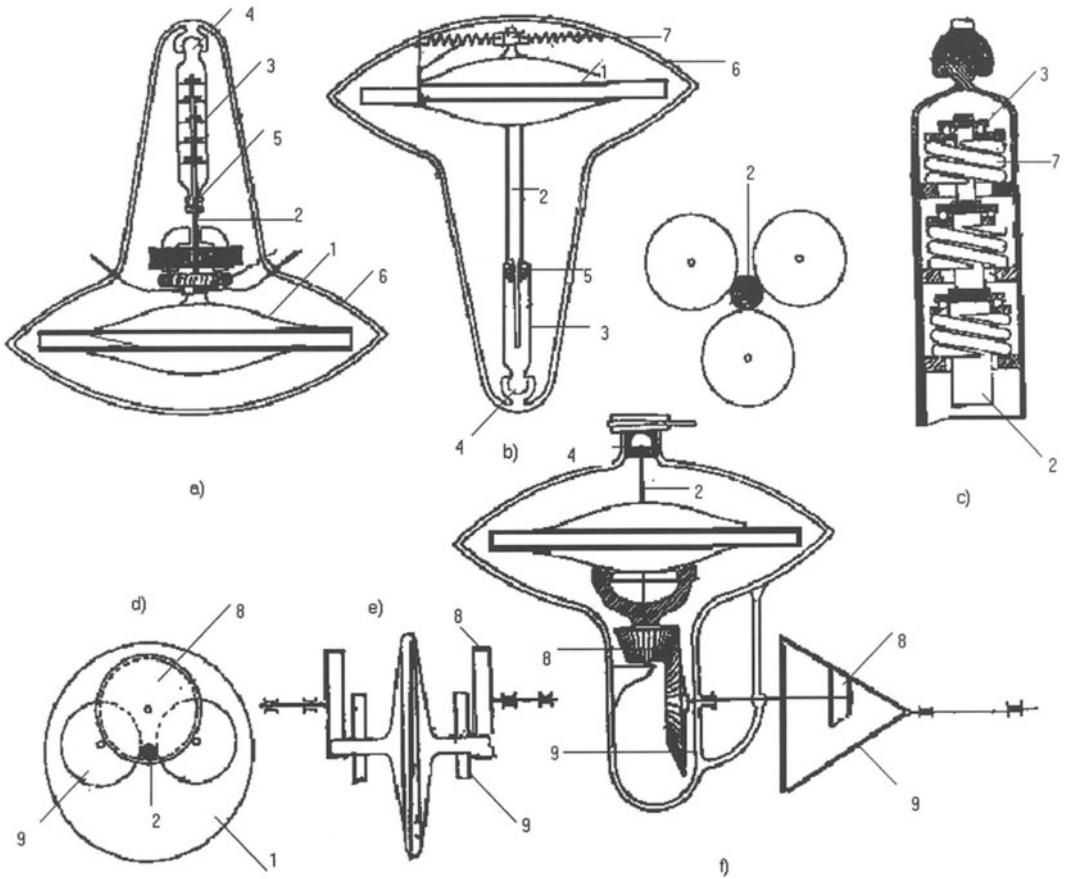


Fig.1. Layouts of inertia accumulator.

- 1 – rotating object; 2 – axle of rotation; 3 – bearings; 4 – spherical fulcrum;
 5 – case; 6 – casing; 7 – spring; 8, 9 – gearing.

It was on November 11, 1918, that Ufimtzev offered the accumulator for accumulation of the wind energy. The accumulator represented the object with a big mass, which quickly rotated in the rarefied medium. This medium was needed for the decrease of losses of energy from the resistance.

The fig.1 presents the accumulators various constructions. On the fig.1a presents the accumulator with the vertical axle and the electric transmission of energy; fig. 1b – the accumulator with the lower fulcrum; fig. 1c – the vertical section of the casing with some spring bearings; fig.1d – the chart of the disposition of roller bearings attached to the horizontal axle; fig 1e – the chart of the disposition of disk supports with the horizontal axle and fig.1f – the accumulator with the mechanical transmission of energy.

Right exploitation of the wind energy is possible only when the energy is accumulating, under conditions of the work of electric transmission the accumulation of energy is made in the following manner. The wind wheel rotates a dynamo-machine, which gives a direct current irrespectiv of a changing frequency of revolutions and sends the current to the dynamomotor of the inertia accumulator.

In this accumulator the energy stores in the form the kinetic energy of the rotating object and then the energy in the form of electric power of the dynamomotor is used. The dynamomotor takes the rotation from the inertia accumulator.

Necessary to decrease the losses of the energy from resistance of the environment, the friction in a supports and the vibration. It gives that the energy of the inertia accumulator is preserved for a long time.

The accumulator of the prolonged operation (fig.1) consists of the rotating object 1 on the vertical or horizontal axle 2. The object is represented the disk with even resistance in an either point. The vertical axle 2 of the disk is hung on one or some ball bearings 3 with spiral springs 7. Springs lean on circular projections of the cylindrical case, in which all bearings are allocated.

Bearings decrease the friction owing to the allocation of the weight of the disk 1 among all bearings. The case 5 is hung on the casing 6 with help of the universal hinge. The casing 6 contains all the system in the rarefied medium. The case 5 is separated from the other space with help of the hydraulic bolt, because the pressure of vapor of oil for bearings don't give the possibility to rarefy air in the space of the casing 6. The hydraulic bolt contains either the mercury or the alloy of the sodium and the potassium and does not hinder the free rotation of axle 2. The pumping out the air from cameras is separately. The pumping out may replaced the filling some light gas, for example a hydrogen, under conditions of the atmospheric pressure.

The armature 8, 9 of the dynamomotor is fastened to the axle 2 for the transmission of the energy in the accumulator and from it. The dynamomotor can keep up the tension on the contact level, when the frequency of revolution is changing in some time. This property is attained, if parts of electromagnets are turned automatically. The reversibility of dynamo-machine enables either to rotate the disk (the accumulation of energy) or to form the current due to this accumulation. The motor may be placed outside the casing on the axle 2, if the axle is put out, or on the another axle, which have to connect the gear with the axle 2. The disk 1 of the accumulator may be placed above (fig.1e), in that case the axle 2 is the supporting part, bearings are placed below. The bearing 1 is fixed to the casing with help of springs for the maintenance of the upper edge of the axle 2.

When the energy is stored for a short time, possibly the axle 2 is stood in roller and ball bearings in the disk supports horizontally.

Disk supports are represented wheels 8, 9 with sides, on which the end of the axle 2 lies on the internal side. Wheels are fixed with help of axles of auxiliary wheels.

The inertia accumulator (fig. 1f) have the mechanical transmission. This transmission is used in the accumulation of the energy for the motion (trams, cars, airplanes). The vertical axle 2 holds the disk 1, which is attached by conical gear 8, 9 and next external gearing. The upper end of axle is hung on the box with help of roller bearings 4, which are located in the casing 6.

Then A.G. Ufimtzev developed the construction of the windelectrical generation with the heightened effectiveness. He establishes a fact, that when the energy is transmitted from the windgenerator to the dynamo-machine, big problems arose in consequence of a huge difference between quantities of revolutions of these two mechanisms.

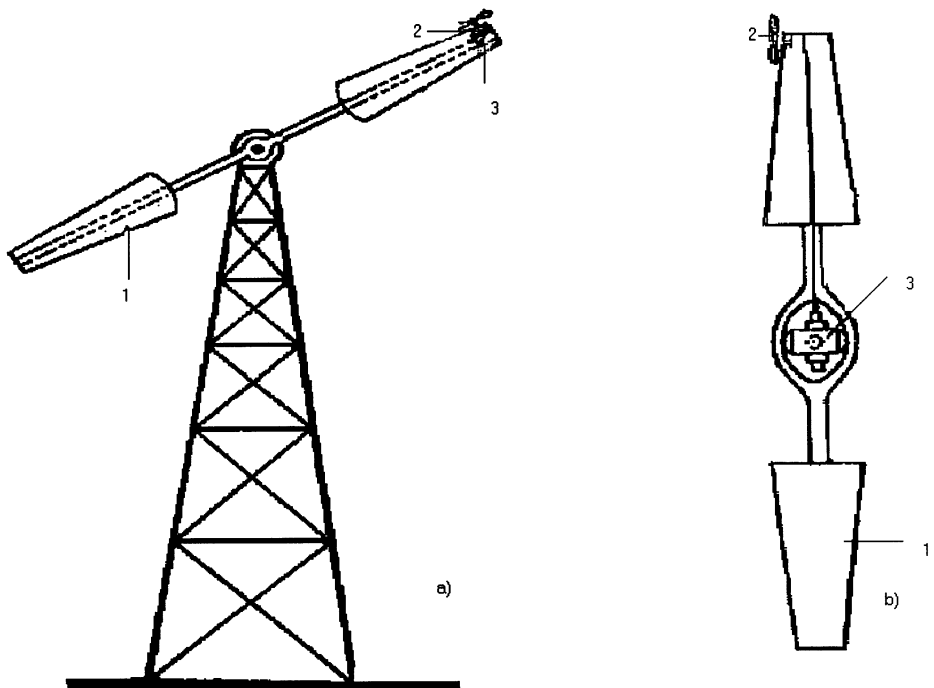


Fig.2. Layouts of transmission of energy

a) dynamo motor is on the end of wing; b) dynamo motor is on the center on the propeller
1 - propeller; 2 - small wind motor; 3 - dynamo machine.

In the suggesting transmission of energy, the energy for the dynamo is taken on by the small windmotor, which is fastened to the wing of the windmotor and is connected with the axle of the dynamo. The small windmotor can take on bigger energy and gives bigger angular velocity when the windmotor is the propeller on accounts of the peripheral velocity on the end of the wing is very high.

The suggesting windelectrical generator (fig.2) is the windmotor a with the dynamo-machine 3 and the propeller 2, that is locate on the axle of the dynamo.

The gear (fig. 2b) in the windelectrical is modified because the transmission from the propeller 2 to the dynamo 3 is made with help of the coupls of cogwheels and the electrical generator doesn't connect with strokes of the motor.

The mechanism for an alignment of a work at the windelectrical station which shows on the fig.3 was suggested by A.G.Ufimtzev and was announce in a form of patent on March 15, 1925. The patent was issued in June 29 1929.

The development is represented in the following manner: Windgenerator is fastened on the tower and transmits the motion to the generator of electrical power mechanically. The generator is connected with the buffer inertia accumulator 1, which stores the energy by the use of the quickly rotated object with a big mass in the rarefied medium for the decrease of losses of the energy from the resistance. This part of the mechanism gives the possibility of the alignment of the unevenness during some time.

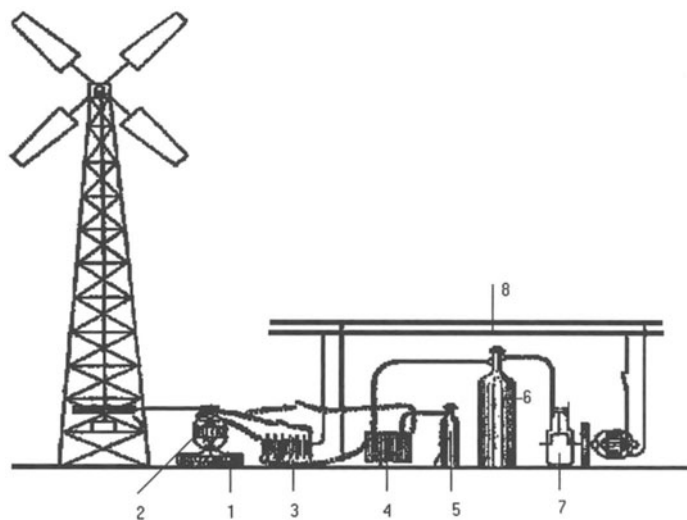


Fig.3. Layout of wind electrical station

1-entia accumulator; 2-generator; 3-line of consumption; 4-electrical storage battery; 5-electrolyser.

The generator 2 directs the current to the line of the consumption 3 and the surplus – to the electrical storage battery 4 with help of it the mechanism aligns temporary overloading.

When the storage battery is charged the current is directed to the electrolyser 5, where water is decomposed of the hydrogen and the oxygen. The oxygen does on sale from the gathering cistern, but the hydrogen from it is used for the power supply of the reserve motor. This motor is connected with the auxiliary generator mechanically, that is turned on parallel of the main generator and produces the electrical energy without the wind.

Resume

The inventions which was described in this paper allowed to do one of first windelectrical station. It has been worked in Kursk for a long time. This station showed that the A.G.Ufimtzev's ideas are right and people have to use in economy windenergy, because this energy is very cheap and ecological. I think it was very interesting and practical idea which was developed at our time in many country.

Ufimtzev A.G. (1880-1936)- he was the author of more than 22 inventions.

The most interesting:

- 1896- electrical method of printing was invented;
- 1900- a project of engine without valves was developed;-
- 1909 - the engine without valves was manufactured;
- 1918- inertia-kinetic accumulator was invented;
- 1924- wind electrical generator was suggested;
- 1927- wind electrical station was invented.

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