

“THE UNIVERSAL TURBINE”

Nagula V.A., Karabarin D.I.

Scientific supervisor – Associate professor Grishina G.V.

Siberian Federal University

Having studied a material, the desires and possibilities have decided to construct, the turbine. But the turbine which would work both from a water and from a wind, and in the course of work on it the idea of use a rainfall and force of muscles in need of charging of accumulators has come. After three months of work, we represent our turbine universal. A lot of time has left on considering, drawings, searches of details and their adjustment. And as it has been told above, studying the various power equipments, have paid attention that the majority of ways of reception of electric energy is reduced to transformation of energy of heat, waters, a wind, burning down fuel, etc. through system the turbine – the generator. If to consider our desire to frame an incorporated design for this purpose the turbine working from a wind and water. In the course of work we have decided to provide possibility of work of our turbine from a rainfall, can be not so often, but suddenly cloudy days will be tightened – has put such equipment under a rain stream falling with a roof or has built a water header, let develops the electric power for small needs – charging of accumulators. And work possibility manually can be useful. In a work basis laws hydro – aerodynamics, in particular, Daniil Bernulli's law – movement of liquids and gases into the pipes. Through different sections of a pipe for identical time intervals identical volumes of a liquid or gas as the liquid (gas) doesn't collect anywhere move. Dependence between three physical sizes following – occurs to reduction (augmentation) of the area of cross-section section of a pipe reduction (augmentation) of pressure by a liquid (gas) and the most remarkable, there is an augmentation (reduction) of rate of passage of a liquid (gas). For a basis of the case of the turbine took the case from the old, thrown computers – a convenient material for creativity. Have collected the turbine with eight lobes from aluminum plates and have placed in the case, having put on it an axis, on the same axis one of pressing reducing valve gear wheels fastened. For uniformity of rotation of the turbine a shaft have put on a flywheel.

Important value has a pressing reducing valve transferring rotation of the turbine to the generator. In their our case was two 1: 9 and 1: 18 that allowed to receive on each turn of the turbine to 162 generator turns. Considering that in different cases frequency of rotation of the turbine was different, on the average 1 turn for 10-12 second, frequency of rotation of the generator makes from 162 to 194 turns for the same time. Generators variable and a direct current, electric motors of tape recorders, video recorders were used. Were defined in what direction water will arrive, and have established at height of 30 mm an inlet opening in the form of a pipe. A similar aperture cut out from the case opposite side at height 100 mm and also have established a pipe which will leave water. Tests in flowing water have shown good results

Then have established an inlet opening for entering of falling water in the form of a rainfall on the turbine and from the opposite side an aperture for a water drain. Also tests have been conducted. Because the basic work has had on the extremity of October the middle of November ambient temperature there was – 30 - 40 degrees, check of working capacity of the turbine passed in house conditions. As was it is told the turbine should be universal - decided to collect the device rotating the turbine from a wind, that is wind-driven generator lobes, but not a kind of lobes of a propeller, and rotor lobes, I rotate around a vertical axis. Such blades

it is more convenient – they begin rotation at height 1 - 1,5 meters and don't depend on a wind direction. Lobes – four bent surfaces clamped perpendicularly to each other are fixed on the same shaft, as the water turbine. Lobes fasten from a flywheel in a special muff and are fixed. For fastness of lobes the skeleton in which top part the bearing fastened has been collected. Thus the case turns over on 90 degrees. The initial idea of the equipment of lobes was at a vertical locating of the case. But have decided not to complicate system. The handle is inserted into the same muff, allowing to rotate the turbine, and accordingly and the generator manually. The case is established on legs which can serve as turbine fastening at the equipment in water. The turbine starts to work at its immersing in water to 10 centimeters. For increase of frequency of rotation of the turbine from a wind have solved use A. Habibrahmanov offer which in article «the Rotor will twirl faster» has suggested to establish attachments in the form of the symmetric shields covering convex lobes from a wind. But for our turbine the similar device would lead to design complicating, therefore we have decided to change fastening of attachments and to make their independent from each other. Thus we pursued a dual purpose, in – first one attachment covered the concave lobe from a wind, in the second, the second attachment established perpendicularly working lobe framed similarity of a pipe with other parallel blade that leads to additional augmentation of rate of rotation of the turbine – the generator. Basically, it is possible to establish four boards in pairs perpendicular to each other and not to worry about their resetting. Wind-driven generator tests have been spent, results have shown correctness of our ideas.

The conclusion

As a result of several months of work we have constructed the turbine capable to rotate generators of low power of various types. In our case it is generators for a bicycle, a small lamp, etc. Considering that modern electron devices such as radio receivers, light-emitting diode lighters, cameras and others – power saving up 3-4 W, at a strain 3-6 In and a current strength to 0,15 And it is quite enough power. In a design basis principles are put: convenience, universality, uniqueness. The basic energy sources are water, a wind, rain deposits, muscular force. We have offered the device in the form of the independent shields allowing to increase efficiency turbines at its work from a wind. Rate of rotation of such turbine depends on rate of flowing water, power and height of falling of a stream of water, from rate of a wind. Such equipment can be used on a summer residence, on fishing, on a haymaking, at long campaigns, in ecological camps, for charging of accumulators of various devices.