THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

ISSUED BY
SCIENCE SERVICE
B and 21st Streets
WASHINGTON, D. C.

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SUBSCRIPTION: $5 A YEAR, POSTPAID

Vol. VI. No. 199 Saturday, January 31, 1925

AMERICAN BASEBALLS AND GERMAN BOATS

By Dr. Edwin E. Slosson

Mark Twain counts as one of the great events in human history the moment when the idea shot through the brain of Howe "that for a hundred and twenty generations theeye had been bored through the wrong end of the needle".

Maybe some future author will count that moment equally momentous when the idea shot through the brain of Flettner that the smokestacks of an ocean vessel should not be used to carry off the smoke of the engine for if they were revolved no engine would be needed. His experimental vessel, the "Buckau", looks like an ordinary steamboat with two extrordinarily tall funnels. These are simply smooth cylinders, made of thin sheet steel, ten feet in diameter and sixty feet high. But no sooty, steamy cloud comes out of the top and if you looked down into one of them you would not be choked with sulphurous fumes, and you would see no fiery flares at the bottom. All you would see would be a ten horse-power electric motor, which rotates the cylinder, yet the vessel is propelled with the force of a thousand horse-power engine. She has neither propellersnor paddle-wheels, neither furnace nor fuel, neither yards nor sails. Her only engine is the little Diesel for running the two electric motors inside the cylinders, and all that this needs is a little crude petroleum or tar-oil for its internal combustion.

The propulsive power of the ship is borrowed from the wind and she gets the best of it when the wind is not going her way, but blows abeam instead of aster. She can make headway against the wind only by tacking like a sailboat.

Since the "Buckau" has no boilers she needs not bunkers, since she carries no coal she needs no stokers, and since she hoists no sails she needs no sailors. Even the helmsman can be dispensed with for no rudder is necessary. The ship can be steered by changing the rate and direction of the rotation of the cylinders, and this the captain might control by pressing buttons on the bridge. Reversing the rotors backs the boat. Running one rotor around one way and the other the opposite way turns the boat about as on a pivot. It would seem that such a ship would require no bigger crew than a bicycle. Anyhow the elimination of the boilers and the bunkers and the quarters of the crew should leave a lot of room for cargo and passengers.

The question of how the queer craft would behave in a heavy sea was settled on January 6 when the "Buckau" steamed out of harbor, no, I should say sailed out, no, I should say, rotored out, and made nine knots an hour in spite of, and with the aid of, a twenty-knot wind.

We should have expected the rotor ship to have been an American invention for two reasons; first, because the principle involved is the same as our pitchers employ in putting the curve on a baseball in the national game, and, second, because this force has been thoroughly studied in American laboratcries of aerodynamics. A recent technical paper by Elliot G. Reid of the Langley Memorial Aeornautical Laboratory is devoted to "tests on rotating cylinders" and gives the formulas by which the force can be calculated and photographs showing how air currents behave in passing around a cylinder. If the cylinder is stationary, the wind divides and goes by equally on both sides, producing so effect except a push on the windward side. But if the cylinder is revolving the wind receives different treatment on the two sides. On the side of the cylinder where the rotary motion is in the same directionas the wind, the air is helped along and speeded up by the friction of the surface of the cylinder. Consequently, the air pressure is reduced on this side and a sort of suction is formed. On the side of the cylinder that is turning against the wind, the opposite effect is produced by the friction. That is, the flow of the air current is impeded, the air is compressed and its pressure on the cylinder is increased. The net result of diminishing the pressure on one side and increasing it on the other is to produce a push acting on the cylinder at right angles to the wind, andit is this force that propels the Flettner boat.

The power of this cross-wind force depends upon the velocity of thewind, and hight, and diameter of the cylinder and its speed of rotation. The greater these are the stronger is the power developed. The Langley Laboratory finds that this force appears suddenly when the speed of the surface of the rotating cylinder rises to half that of the wind, and that thereafter the force increases steadily with the speed until the surface is moving twice as fast as the wind or faster. The experiments suggest that if the rotating shaft is made in the shape of a Greek cross instead of a smooth cylinder a greater cross wind force may be produced though it requres more power forrotation. The National Advisory Committee for Aeronautics has been engaged for a year in the investigation of the possibility of aquipping airplanes with totating cylinders so as to utilize this cross force to impert a lift to the machine instead of depending wholly on the angle of the winds.

But neither our baseball fans nor our aviation experts have applied the principle to ship propulsion. So Anton Flettner has a free field and if his inventi works as well as the German papers claim, he may appear before long in one of our ports with the ten-thousand ton sailless ship that he plans to construct for trans-Atlantic trade. It will be as strange an apparition as the submarine that bobbed up at Baltimore loaded with German dyes and drugs during the war, and it will be much more welcome.

ROWING ATHLETE SHOWS HALF STRENGTH OF HORSE

"Strong as a horse", spoken admiringly of a mightly athlete, is not so great an exaggeration as it sounds. Exact studies of the physical exertion put forth by the members of the famous Yale crew of 1924 by Drs. Yandell Henderson and Howard W. Haggard of the department of applied physiology at Yale, show that each man developed, during the period of a race, about one-half horsepower.

Determinations of energy expended were obtained in various ways. The men were exercised individually on rowing-machines with power meters attached; the ratio of oxygen taken in to carbon dioxid given off in breating was determined; the racing shell they used was towed by a power boat with a spring balance set into the towline.