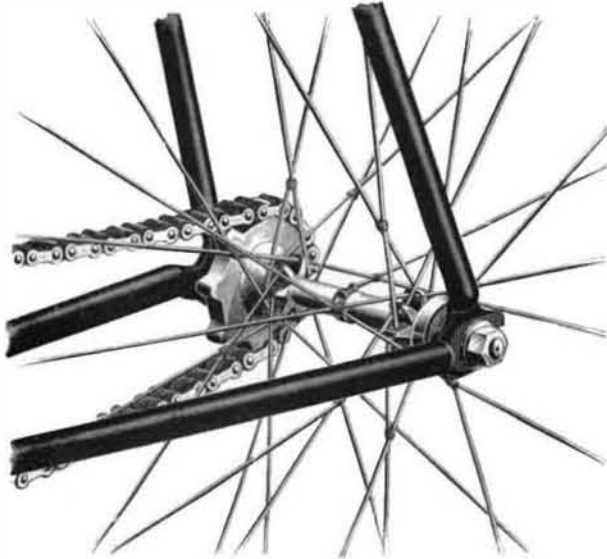


THE VICTOR BICYCLE.

The Victor bicycle, made by the Overman Wheel Company, of Chicopee Falls, Mass., is a typical American wheel. All of its parts, including the saddle and tires, are made in one factory, giving it an almost unique status. During and since the days of the old ordinary or high wheel, the Victor has maintained its position in the front ranks of American wheels. In the product of the Overman Company for the present year many novelties are included. Among others may be particularly mentioned a detachable sprocket, enabling a change of gear to be made with little trouble;



REAR WHEEL AND CHAIN TIGHTENING ADJUSTMENT.

a narrow tread; the method of attaching the spokes to the hubs, by which straight spokes are secured, although tangent; the peculiar method of attaching the crank to the crank axle; the hand hole inner tube tire, are but a few of the characteristic features of the wheel. For the ensuing year eight wheels have been made, five road wheels with different classes of frames, the racing wheel, and two lady's drop frame wheels, termed the "Victoria."

One novel feature is that the rear wheel and the crank axle can be reversed. This brings the chain to bear upon the other sides of the sprocket wheel teeth,



SECTION OF REAR WHEEL HUB.

thus virtually supplying the machine with new sprockets.

One of our illustrations shows the rear wheel, chain-tightening adjustment, and spoke attachment, and another shows the rear wheel axle, which presents the dust-proof features of the bearing to the reader, and shows also the projections or lugs to which the spokes are attached. The spokes are drawn down in the centers from wire, being left of the original size at the ends, so as to secure a greater strength at these critical points. The Victor people have devised an ingenious dynamometer, which we also illustrate, by



THE VICTOR CYCLE DYNAMOMETER.

which may be shown the power exerted on the cranks by the rider. This has enabled the company to test the forms and sizes of the sprockets, which really seems a step in the way of accurate designing, instead of the almost guesswork followed heretofore by most makers. The dynamometer makes a record on a piece

of paper in a series of waves from the area bounded by which the power exerted can be calculated, indicator-card fashion. Some most interesting and unexpected results have followed from the use of this, and the Victor wheel, as placed upon the market, embodies the results of absolutely quantitative experiment.

A New Process for Armor Plates.

An interesting test of a 17-inch armor plate which had been reduced to a thickness of 14 inches after being carbonized occurred at the Indian Head proving ground on February 21, with a 10-inch rifle, using armor-piercing projectiles which were fired at velocities that would have penetrated ordinary plates of much greater thickness. The managers of the Carnegie Company conceived the idea that the resistance of a Harveyized plate might be increased by reheating and rolling subsequent to the surface carbonization process. The texture of the plate is thus toughened and its internal strains are minimized. This was tried and the plate was then sprayed with ice water to secure the advantages of chill hardening. The 17 inch plate which had been reduced to 14 inches in thickness was attached to the usual wooden backing, and was attacked with a 10 inch gun under the same conditions that govern the trials of 14 inch plates. The first shot fired was a Carpenter projectile propelled by 217 pounds of brown prismatic powder. The velocity was 1,859 feet per second. Its point went in about seven inches and was completely "upset," to use the technical term. The projectile was shattered. The great armor plate, which was 15 feet long, 8 feet 6 inches wide and weighed 33 tons, remained practically uninjured, not the slightest crack being developed. The second shot fired was a 500 pound Carpenter projectile propelled by 225 pounds of powder, developing a velocity of 1,940 feet per second. It crumbled to pieces, leaving a disfiguring hole, but the plate did not show any crack, even where it had been presumably weakened by the former shot. The 12 inch gun was then wheeled into position and a Sterling projectile was fired with a charge of 420 pounds of powder, the velocity being 1,858 feet per second and the striking energy being 20,370 foot tons. It bored a hole through the plate, but even this shot failed to develop a radial fracture. No other test was considered necessary, as this was the ordeal to which 17 inch plates are subjected, and the 14 inch plate had resisted cracking better than the 17 inch plates which had been furnished to the Indiana, Oregon, and Massachusetts.

Important results are sure to follow this test, for as John G. A. Leishman, President of the Carnegie Steel Company, says: "The making of armor plates is in its infancy. . . . The qualities of steel are so peculiar and subtle that any change in the process of handling it in its manufacture may lead to great changes in the result." It is evident that hundreds of tons of weight may be saved without sacrific-

ing the efficiency of the battle ship, and the weight of the two inches of armor saved means increased speed or greater coal endurance and added guns. Of course it is too early at present to say whether the government will order all future plates treated by this process or not, but Captain Sampson, Chief of Ordnance, said that this shot (the 12 inch) would have easily penetrated twenty inches of steel and fully twenty-eight of iron. So there is every reason to believe the government will be favorably disposed to the new process.

Burns from Extreme Cold.

At the last meeting of the Swiss Society of Natural Sciences, at Lausanne, M. Raoul Pictet gave some particulars concerning cold burns experienced by himself and assistants during his investigations of the lowest temperature attainable. There are two degrees of burns. In one case the skin reddens at first and turns blue the following day, and subsequently the area of the spot expands until it becomes nearly double its original dimensions. The "burn," which is usually not healed until five or six weeks after its occurrence, is accompanied by a very painful itching on the affected spot and the surrounding tissues. When the burning is more serious, produced by longer contact with the cold body, a burn of the second degree is experienced. In this case the skin is rapidly detached, and all parts reached by the cold behave like foreign bodies. A long and stubborn suppuration sets in, which does not seem to accelerate the reconstitution of the tissues. The wounds are malignant, and scar very slowly in a manner entirely different from burns produced by fire.

On one occasion, when M. Pictet was suffering from a severe burn due to a drop of liquid air, he accidentally scorched the same hand very seriously. The scorched portion was healed in ten or twelve days, but the

wound produced by the cold burn was open for upward of six months. In order to try the effect of radiation in dry cold air, M. Pictet held his bare arm up to the elbow in a refrigerating vessel maintained at 105°, when a sensation of a peculiarly distinct character was felt over the whole skin and throughout the muscles. At first this sensation was not disagreeable, but gradually it became decidedly so, and after three or four minutes the skin turned blue and the pain became more intense and deep seated. On withdrawing the arm from the refrigerator at the end of ten minutes, a strong reaction was experienced, accompanied by a superficial inflammation of the skin.

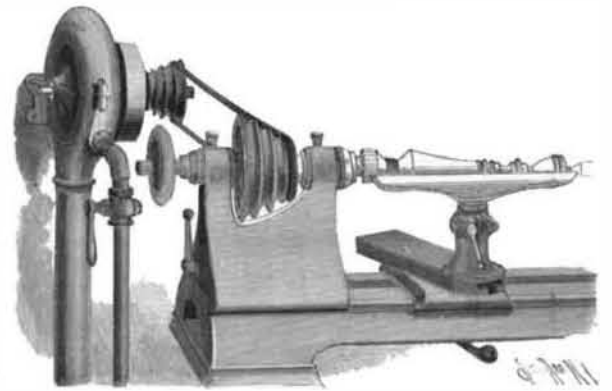
THE WEED WATER MOTOR.

These motors belong to the class of tangential or impulse wheels, and power is developed by a jet of water under pressure impinging on a bucket of proper shape to receive and retard the stream until its force is spent, the water being then discharged into the outlet of the casing. The manufacturers, Messrs. A. J. Weed & Company, Nos. 106 and 108 Liberty Street, New York City, have given much time and study to the attain-



THE WEED WATER MOTOR.

ment of the proper shape and proportion of the working parts to make the most effective motor. The motors are especially adapted for the use of dentists, jewelers, and amateurs who desire a light power for small lathes, polishing wheels, scroll saws, sewing machines, etc., and special small countershafts designed for these motors are furnished where it is desired to use the power at a distance from the water supply. The motor is well made, the bearings being adjustable, so that all wear can be taken up without disturbing any other part of the motor, and with proper care the machine will last for years. A flywheel on the shaft forms part of the driving pulley, and insures a smooth and steady speed under quite a variation of load. The driving pulley is arranged for either flat or round belt as may be desired. Where the motor is intended for permanent use it should be con-



WATER MOTOR RUNNING LATHE.

nected up with lead or iron pipe with a stopcock, but for occasional service pressure hose may be used and attached to the regular faucet at will, by the use of an improved adjustable connection.

Skunk Oil.

An Iowa correspondent of an exchange gives the following information concerning the origin of skunk oil: "As I live in a district where the skunk is only too well known, perhaps I may be able to answer your correspondent's question about the origin of skunk oil, commonly sold in the drug stores around us as a remedy for rheumatism. Skunks lie in their holes during the winter, never appearing above ground, excepting on very fine days. Before retiring underground, they become well loaded with fat. When killed by drowning them, by filling up their holes with water, they are dug out without producing any offensive odor. The 'stink bag' is removed, the skin is secured, and then the fat is taken out and treated just as the fat of the hog is treated in making lard. The preparation of skunk oil is a profitable industry during the winter months. A German family living at Esterville, in Iowa, twenty miles from my residence, do a considerable business in its preparation every year."