

it was at least made several years before the Gruber watch, which bears the date of 1511.

The accompanying engraving shows the cylindrical shape of the watch. (Mr. Friedrich, Superintendent of the National Museum, at Nuremberg, has always expressed it as his opinion that the round watches, called Nuremberg eggs, are by no means the oldest style.) It is six centimeters in diameter and two in thickness. The dial is divided into twelve hours. Above each figure there is a small knot; the one over the XII. being pointed, to aid in telling the time in the night. All the works are of iron, and seem such as a locksmith would make with the tools at his command.



The train has no barrel, its place being taken by four iron pins set in a circle in the plate, between which the spring is wound, the end being fastened to one of the plate pillars. The spring looks as if it might have been taken out of a door-lock, it is so heavy and awkwardly finished. There is no fusee. The contrivance shown in Fig. 2 is meant to regulate the action of the clumsy spring. It is an eccentric mounted on the barrel wheel arbor, against which presses a small roller at the end of a curved spring. When the watch is wound the eccentric is turned from left to right in such a way that when fully wound the spring is pressed back as far as possible, and thus exerts its greatest pressure upon the eccentric when the

main spring is wound taut. Then as the main spring unwinds, this pressure, although constantly diminishing in strength as the eccentric turns, still has sufficient power to control and moderate the excessive strain of the roughly made main spring. When at last the spring is nearly unwound, the pressure of the regulating spring is no longer felt at all. This mechanism, although rough is quite ingenious, and is beyond a doubt the work of a locksmith. The balance is missing, but a hole in the plate shows that it must have been very small. It was regulated by means of a movable lever. The bronze case and the dial were originally smooth finished, the engraving being the work of a later period. The number of teeth and wheels are: Centre wheel, forty-five teeth; main wheel, twenty-four; barrel wheel, sixty-three; third wheel, forty teeth, and fourth wheel, thirty-five. Pinions are all 7 and 5 leaved. The watch once wound would run forty hours, with 22,680 vibrations an hour.—*Exchange.*

HOW TO USE A WATCH.

Having obtained a serviceable article, says a watchmaker, you should, in order to produce satisfactory results, follow these rules: Wind up your watch every day at the same hour. Avoid putting it on a marble slab, or near anything excessively cold. The sudden transmission from heat to cold contracting the metal may sometimes cause the mainspring to break. Indeed, the cold coagulates the oil, and the wheels and pivots working less freely, affect the regularity of the timekeeper. In laying aside your watch be sure that it rests on its case. By suspending it free, the action of the balance may cause oscillation, which may considerably interfere with its going. If you would keep your watch clean, you must be quite sure that the case fits firmly, and never put it in any pocket but one made of leather. These pockets, which are lined with cloth, cotton, or calico, give by the constant friction a certain quantity of fluff, which enters most watches, even those the cases of which shut firmly. A skillful watchmaker one day thus reasoned with a customer: "You complained," said he, "that your watch gains a minute a month. Well, then, you will congratulate yourself when you hear me. You are aware that in your watch the balance, which is the regulator, makes five oscillations every second, which is 432,000 a day; so that your watch, exposed to all the vicissitudes which heat and cold occasion it, the varying weight of the air, and the shaking to which it is subjected, has not varied more than a minute in a month, or two seconds in a day. It has only acquired with each vibration of the balance a variation of the 216,000th part of a second. Judge, then, what must be the extreme perfection of the mechanism of this watch."

ARTIFICIAL DIAMONDS.—The following formula for preparing paste comes to us highly recommended. Take pure silica, one hundred parts; red oxide of lead, one hundred and fifty parts; potash, calcined, thirty parts; borax, calcined, ten parts; arsenious acid, one part. This, it is claimed, will produce a paste of great brilliancy and refractive and dispersive powers, also a specific gravity similar to that of the diamond. It fuses at a moderate heat, and acquires the greatest brilliancy when remelted and kept for two or three days in a fused state in order to expel the super-abundant alkali and perfect the refining process. This paste is used not only to produce fictitious diamonds, but other imitation gems of which this paste forms the basis.