A WONDERFUL WATCH.

In the accompanying engravings we present the remarkable watch which that able scientist, Mr. Mark Twain, says "knows considerably more than the average voter," and "comes nearer to being a human being than any piece of mechanism I ever saw before." Mr. Twain probably did not have in his mind the modern reaper, which picks up grain, makes it up in bundles, cords it, and ties a knot in the cord, or the Jacquard loom, which weaves portraits, or the talking machine, or the perfecting Hoe and Walter printing presses, all of which are very much more human-like in their performances than this watch, when he ventured the above opinion; so that we cannot fully indorse his thoughtful remark, but it is none the less true that the timepiece is an exceedingly ingenious specimen of horological skill.

We are not going to explain the machinery, because we want to print something else in this issue, and our readers might not enjoy reading about nothing but this watch, as would be the case if we described it in detail. Therefore we give several beautiful engravings of the works, and a general description of what they accomplish. In Fig. 1 is given a view of the face of the timepiece, showing four small dials. There is of course, first, the usual dial for noting the time. Beside the two hands necessary for the latter purpose, are two long hands which point to a graduated scale which, divided in 60 parts and subdivided to fifths of a part, surrounds the circumference of the dial. These two hands normally both point to twelve. Suppose we are timing two horses starting

Fig. 1.

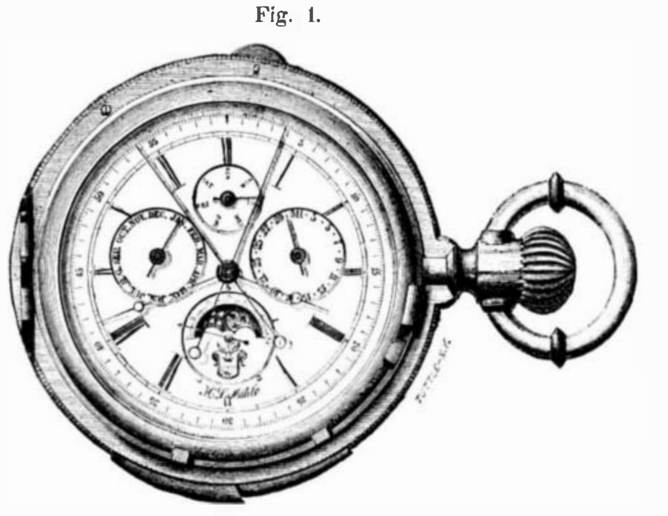
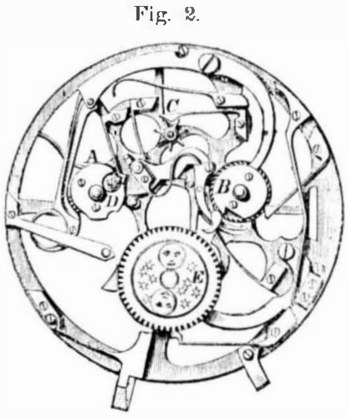
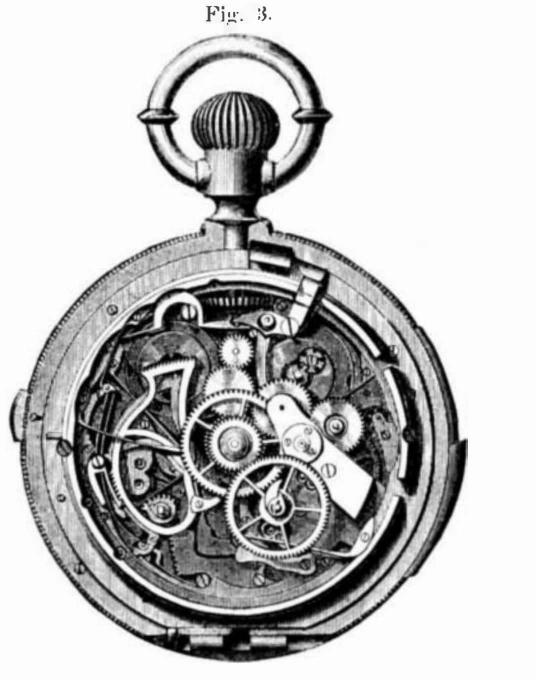


Fig. 2.



MATILE'S WATCH.

Fig. 3.



at different times. The instant the first horse is off, we press a stop on the side; then hand No. 1 starts marking seconds. When the second horse starts, we press the stop again, and hand No. 2 begins its movement in the same direction. At any desired moment the stop is pressed a third time, and

Fig. 4.

both hands are instantly arrested. Finally a fourth pressure on the stop sends the two hands back to twelve. Just under the XII mark is a small dial which shows the day of the week; another dial on the right exhibits the day of the month, another on the left the name of the month, the fourth below has a hand which beats fifths of seconds, and also an open face through which a golden moon on a blue enameled sky can be seen. This moon follows exactly the phases of our satellite; so that the time of new or full moon is instantly seen. The moon besides has a stop of her own, so that she can be set a day or more ahead in adjusting the watch, and another stop serves to regulate the month and day dials. The watch, besides, is a repeater; and on pressing still another stop, it sounds first the hour, then a certain number of times to indicate the quarter, half, or three quarters past, and then the requisite number of separate strokes to tell the minutes elapsed since the quarter. Leap year and February 29 are fully provided for. There is a little wheel, D, Fig. 2, which makes one quarter revolution per year. In four years it completes its turn, and the hand on the February mark of the month dial stays there for one day longer.

Fig. 2 represents the works just beneath the dial plate. A is the wheel for the month hand, B that for the date hand, C that for the week day hand, and E is the moon wheel. Underneath this mechanism, the machinery looks as represented in Fig. 3. The principal portion of the works that operate the repeater device is here. On turning the watch over and opening the back, intricate mechanism is shown, as in Fig. 4, which exhibits the annular bells, the hammers, and the double winding apparatus.

M. H. L. Matile, of Locle, Switzerland, made this remarkable timepiece, and exhibited it at the Centennial. The mechanism is so perfectly and accurately executed that it requires comparatively little power to be exercised by the main train to accomplish all this work, and this without interfering with the notation of exact time. It should be mentioned that a first-class rating and certificate from the observatory of Neufchatel accompanies the watch, setting forth its surprisingly accurate running qualities. We are indebted to Messrs. Mathey, of 119 Fulton street, this city, for our information.

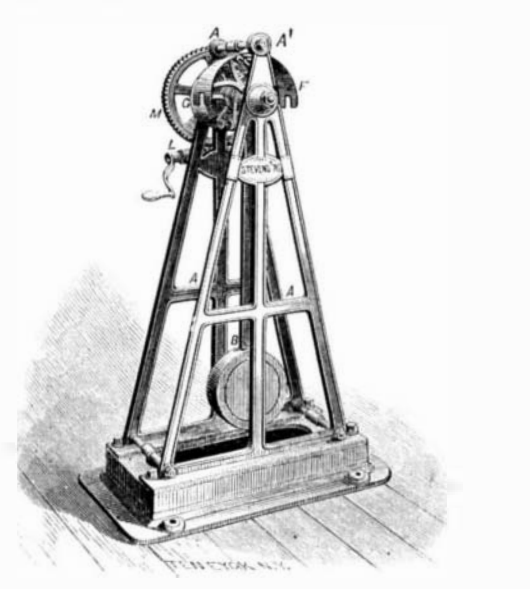
Where to Buy Sportsmen's Tackle, etc.

Mr. W. Holberton, dealer in sportsmen's goods, of 102 Nassau street, this city, has issued a neat little illustrated pamphlet, giving full descriptions of all the novel and ingenious inventions which increase the comforts and lessen the hard work incident to camping out. Particulars are also given relative to the best guns and fishing tackle, and of the numberless appliances which go to make a sportsman's outfit complete. What with portable stoves, portable tents, portable boats, and portable beds, life in the woods need now involve few of the hardships which go to alloy its pleasures; while if the modern hunter grows in destructiveness with the multitudinous devices, invented for his benefit and here illustrated, certainly more piscicultural societies and more game law makers will find renewed fields for their endeavors. We cannot particularize as to the best things noted in Mr. Holberton's catalogue, although there is one "fly book" which will especially commend itself to anglers, and is, we think, one of the best arranged books we have ever seen. A full description is given of the new glass ball trap for pigeon shooters, which is an excellent apparatus, which we—and Mr. Bergh we are sure will cordially join us—can commend to the notice of amateur shots. Persons dealing with Mr. Holberton have the satisfaction of knowing that his advice as to flies, etc., can be relied upon, as he is a practical sportsman himself. The price of the pamphlet is 10 cents.

PROFESSOR R. H. THURSTON'S AUTOGRAPHIC TESTING MACHINE.

We illustrate herewith the latest and most complete form of Professor Thurston's machine for testing the strength, elasticity, ductility, shock-resisting power or resilience, and the homogeneousness of metal. The material is tested by twisting, by which is obtained a great range of distortion, and the most favorable treatment for revealing all the characteristics of the test piece. The latter is placed between two independent jaws, one of which is rotated by means of an arm in the simpler styles, and in the one here illustrated by a worm, L, and gear, M. The force thus applied is transmitted through the test piece to the other jaw, from which depends a weighted arm or pendulum, B. The resistance offered by this pendulum to the force tending to deflect it from the perpendicular, causes that force to react upon the test piece and produce distortion and fracture. The angular position assumed by the pendulum is a measure of that force. A pencil is secured to the pendulum and is moved when the latter is thrust forward in a direction perpendicular to the plane of rotation, by its contact with a guide curve, F, fastened to the frame of the machine. A cylinder, G, is secured to that jaw which is moved by the gear wheel. The cylinder and the pencil have precisely the relative movements of the two ends of the test piece, so that the length of the curve, automatically described by the pencil upon a paper wrapped about the cylinder, becomes a measure of the degree of distortion or of the ductility, and its height measures the resistance offered by the material. The material thus tells its own story, these elements recording themselves simultaneously and continuously from the initial point to the point of final rupture. The diagrams made by the machine show to the eye at a glance the nature of the material tested, and are very characteristic. The strength of the material is measured on the diagram with a pocket rule or a pair of dividers. Any bright boy can make the tests and interpret the diagrams.

These machines offer facilities for a study of the physical properties of the materials of construction, and of the manner in which molecular changes are induced by the various processes of manufacture and of use. They are in constant use for the tests and researches carried on in the Mechanical Laboratory of the Stevens Institute of Technology, and have been supplied to the United States Navy Yard at Washington, to the Russian and Japanese Governments, and to some of our leading railroads, iron manufacturers, and scientific institutions. The apparatus is especially valuable in testing such metals as cast iron, as it measures extensions which other machines cannot detect to the hundred millionth of an inch. It has been used with success in testing car wheel irons, showing their relative value with accuracy. The purchaser of the machine is supplied with tables by which he obtains accurately the percentages of elongation, and with instructions giving the methods of deducing the strength, elasticity, homogeneousness, and other qualities.



The machine illustrated was designed and made entirely by the students of the class of 1876 of the Stevens Institute of Technology, and was exhibited by them at the Centennial Exhibition. It received the award of the judges. The earlier forms received the gold medal, the highest award at the Exhibition of the American Institute, 1874 and 1875, and the medal of the Cincinnati Exhibition of 1875. The machine is manufactured in the workshop of the Mechanical Laboratory of the Stevens Institute of Technology, Hoboken, N. J., and by Messrs. William H. Bailey & Co., of Salford, near Manchester, England.

The Speaking Telephone in New York.

Professor A. Graham Bell recently exhibited his telephone at Chickering Hall, in this city. Wire communication was established with New Brunswick, N. J., a distance of 32 miles. The lecturer in his first discourse explained the laws of sound, and afterwards the members of the audience were afforded opportunities to converse with Mr. Watson at the other end of the line. Small instruments were used, and the sound produced was not generally audible throughout the hall.

Fall of a Court House.

A new court house, nearly completed in Rockford, Ill., recently fell down, killing ten men and wounding fourteen. The dome was 119 feet from the ground, and was supported by iron columns, which in turn rested on a brick wall. The latter was not constructed of sufficient strength to hold up the superincumbent weight. It accordingly gave way, and was followed by the entire dome and roof, leaving little more than the four walls of the edifice standing.