Loss of a Spanish War Ship.

The sad intelligence is announced of the foundering at sea of the splendid armored cruiser of the Spanish navy, the Reina Regente, with loss of some 420 officers and crew. On the 10th of March the ship sailed from Tangier for Cadiz, and sank, it is believed, the following day during the prevalence of a great storm. The tips of her topmasts were found projecting from the water near Gibraltar and the Spanish coast.

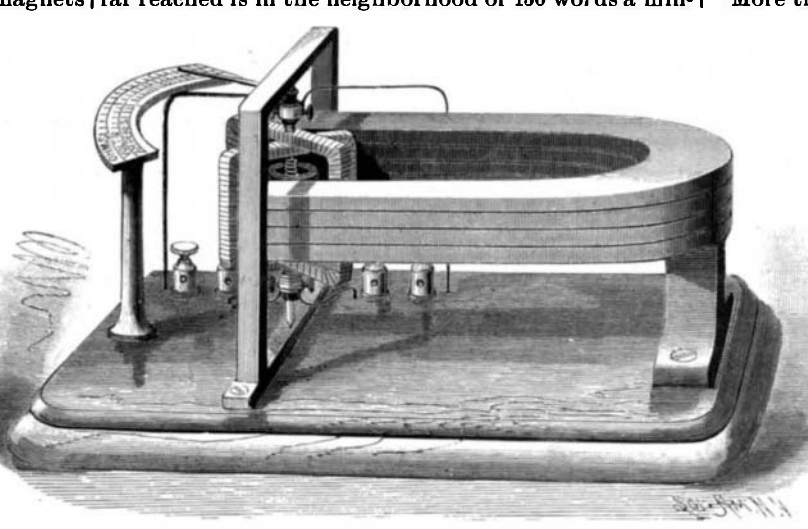
The Reina Regente was built and engined by Messrs. James & George Thomson, of Clydebank, for the Spanish government. The following were her measurements: Length over all, 330 feet, and 307 feet between perpendiculars; breadth, 50½ feet; and her draught was 20 feet; displacement, 5,600 tons when fully equipped.

There was a very minute subdivision in the hull of the ship, there being, in all, 156 water-tight compartments, 83 of which are between the armored deck and the one immediately above it, or between wind and water. Most of these compartments were used as coal bunkers, and appear to have been of no avail in preventing the fatal catastrophe.

The Reina Regente was one of the ships which took part in the grand naval parade in New York harbor in 1893, when she attracted much attention from her graceful lines and formidable appearance.

A COMBINATION ELECTRICAL METER.

The meter shown in the illustration is adapted to measure and indicate with nicety the ohms, volts, amperes, or watts, in measuring an electric current. It has been patented by Mr. Herschel C. Parker, of No. 21 Fort Greene Place, Brooklyn, N. Y. Supported on a suitable base is a permanent magnet, between the poles of which, on a common axis, turn coils wound respectively for high and low resistance, the coils as they turn moving a hand over a segmental graduation indicating ohms, volts, and amperes, and which may be marked to indicate watts. The coils and magnets may, if desired, be differently arranged, but as shown the inner coil is wound for low resistance and the outer one for high resistance, both coils being secured to upper and lower axles on which are insulating collars with binding posts. Two of the binding posts are connected by light flexible wires with the low resistance coil, and by other wires with binding posts on the base, while two other binding posts on the axles are connected with the high resistance coil and with other binding posts on the base, the posts on the base being adapted for connection with the current wires to be measured. The coils turn against the tension of a light spring secured to the coils and to a bracket which supports a core centrally within the coils. The top axle carries the indicating hand, and the current may be brought to the coils, if desired, through the torsion spring. In use as an ohm meter the high resistance coil is joined in parallel with the resistance to be measured, and the low resistance coil is joined in series, the action then being proportional to the ratio of the potential difference to the current, or from Ohm's law, $R = E \div C$. By giving the coils the proper resistance the deflection will be proportional to the ohms in the circuit, the ohms being indicated by the indicator hand on the segmental graduation. For use as an ammeter, the low resistance coil is employed, and for a volt meter the high resistance coil, and the coils are arranged parallel instead of at an angle to each other for use as a watt meter.



PARKER'S ELECTRICAL METER.

The Rubies of Burma.

At a recent meeting of the Royal Society a paper by Mr. C. Barrington Brown and Professor J. W. Judd, F.R.S., was read on "The Rubies of Burma and Associated Minerals: their Mode of Occurrence, Origin, and Metamorphoses." The ruby district of Upper Burma, it was stated, so far as explored, is about 26 miles long and 12 broad, and lies at elevations varying from 4,000 feet to 5,500 feet above the sea level. The principal mining center in this district is Mogok, and the present workings for rubies extend over an area of 45 square miles, old workings, however, being found over an area of 66 square miles. It is also probable that ruby-bearing limestones and the alluvial earths derived from them may be found in portions of the Shan states. It is in the lower clay beds of the river alluvia, and in similar deposits formed in gullies in the hill wash, that the rubies, spinels, and other gems of the district are found. Operations for the obtaining of rubies are carried on in Burma in four different ways. In the alluvia, square pits from 2 feet to 9 feet across, ingeniously timbered with bamboo, are sunk to the ruby earth, the drainage of the pits and the removal of material being effected by baskets attached to balance poles, both made of bamboo. In the hill wash long open trenches are carried from the sides of a gulley. Regular mines are opened in some places, while the limestones are at one or two points quarried.

Speed of Typewriters.

The speed of typewriters is a vexed and much discussed question. A few years ago manufacturers used to get up contests to test the speed of the various machines. The competition grew very keen, and the number of words written in a minute became so high (about 150) that a record was established. Then as the unsuccessful machines were hurt more than the successful ones were benefited, the race was dropped, as the game was not worth the candle. As a matter of fact, the only thing settled by such contests was which concern could produce the most expert operator. The races were contests of skill among the operators, and had little, if anything, to do with the actual merit of the machines. Indeed, the only material difference between the leading machines as regards speed is the size of the keyboard or number of keys operated. Some have more than seventy, or as many keys as there are characters, while others have less than forty, each key actuating several characters that are brought into alignment by shifting mechanism. Naturally, both systems have their adherents, but, owing to the inability of either side to prove any superiority, it may fairly be concluded that no advantage exists.

A truer test than the contests referred to is to set the several machines on a lathe, and construct a cylinder or barrel similar to that of a music box, which shall depress the several keys required to produce words and sentences, and in that way reach the actual limit to which each would respond by increasing the speed of rotations of the barrel. This has actually been done, and the result was so far ahead of what is possible for human capacity to perform with the fingers, that there seems no doubt that even the poorest typewriter will respond far beyond the capabilities of any operator.

Since every machine is capable of more rapidity than the human operator can get out of it, the next point to be considered is the speed an expert operator can keep up for a short space of time. As stated, the limit so far reached is in the neighborhood of 150 words a minute, but it must be understood that this record was made by writing a sentence which had been long practiced. The reason for picking out a particular sentence and practicing it is very simple. The use of letters whose keys are close together, and convenient for alternate action of the hands, greatly assists the speed, and the more a particular sentence is practiced, the more rapidly can it be typewritten. Take the very operator who has shown a speed of, say, 150 words, and get him to write a sentence composed of the same letters, but made up of different words, so that the letters are in a different order, and the speed will fall very materially. The loss may be, perhaps, one-third. It is possible for a comparative novice to practice a well selected sentence and in a short time reach about the same speed as the expert, but in the case of the novice the speed would fall tremendously on new matter. The strain on the eyes and mind increases with the speed, until a point is reached where it cannot be kept up for any length of time, and it is worthy of note that some operators have had the keys blank, without any characters marked, in order to relieve the strain on the eyes.

In considering the speed of the average operator, considerable difficulty is experienced in arriving at any accurate conclusion, owing to the tendency of all operators to put on extra steam when timed or watched. By far the greater part of the work done on typewriters is copying, either from stenographic notes or other manuscript, and a fair average would be below forty words a minute.

There is, of course, some time lost in reading from the copy, when no writing is done, and the practice of a good many operators of continually reading over what they have written to see that it is correct. The time required to correct mistakes has been figured as high as 15 per cent. Another reason for the tremendous fall in speed is probably the strain on the eyes, which are constantly dancing over the characters marked on the keys. This strain should not be underestimated, as the eyes of many operators have been affected by it, and it is further evidenced by the experts, who prefer blank keys, so as to avoid the blurring caused in rapid writing.

It is interesting to note the number of strokes each minute that the hands are capable of, if depressed alternately. More than 700 strokes can be made in a minute, and more than 400 can be performed without undue exertion or effort. Now, taking five strokes to a word (which is about the average), that would mean 80 words a minute comfortably, and after making due allowance for the time occupied in entering the paper and returning the paper carriage after each line, it would still be about double what is done ordinarily on a typewriter. The fault for the loss of speed appears to lie in either the method of operation or the keyboard. If a keyboard could be constructed that could be readily memorized, the eyes would be relieved and the speed increased, especially in copying, when the eyes could be kept on the copy and would not have to keep shifting the eyes from the keys to the copy. Such a keyboard would necessarily have to be compact, and with a very limited number of keys, but for that very reason there would be a gain in limiting the motion of the hands required to select the required key. If, furthermore, such a keyboard could allow an alternate action of the hands without deviation, the speed would be increased without extra exertion. Then concerning the mistakes that occur from depressing the wrong key, and which are realized the instant they are made, but too late to avoid the wrong impression, they could be partially avoided if the printing did not occur till the next depression. That would mean that the machine would always be one letter behind.

It may be that the typewriting machine has reached its highest perfection, but in view of these facts it seems strange that there has been no radical improvement for fifteen years.—N. Y. Sun.

Wood Pulp.

More than 50 per cent of the saw mill owners to-day could make more money to sell their logs to be manufactured into wood pulp and paper than they can possibly expect to secure through sales of the same in the form of manufactured lumber. The wood pulp industry has far outstripped the manufactured lumber industry.

One factor in the pulp and paper business is not always recognized by the owners of spruce forests. When a pulp mill grinds up a million feet of logs into paper product, and the same is sold to the great newspaper corporations and printed upon day after day, that paper practically goes out of existence. Few think of saving a newspaper. The individual newspaper reader throws his paper after reading into the waste basket or kindles a fire with it, or it becomes the property of the old junk dealer, and practically passes out of existence. On the other hand, the piece of lumber which is manufactured goes into a substantial building, which lasts for generations. So that the great consumption of spruce for pulp and paper really amounts to so much raw material taken out of the market forever, and practically wasted so far as any subsequent use to which it may be applied is concerned.—Manuf. Gazette.

Lights and Colors.

It has often been observed that a bright scarlet uniform will, in a good photographic dark room with ruby-glass windows, appear perfectly white. On this subject Herr H. W. Vogel made some interesting communications to the Physical Society of Berlin at a recent meeting. Experimenting with oil lamps provided with pure red, green, and blue color screens, he found that when white light was rigidly excluded, all sense of color disappeared to the observers, and nothing but shades of black and white could be distinguished on objects in the room. He further found that a scale of colors illuminated by red light showed the red pigments as white or gray, which abruptly turned into yellow, and not red, on adding blue light. Hence a color was perceived which was not contained in either of the sources. Red and yellow patches appeared of the same color, so that they could hardly be distinguished. But the difference was at once brought out by adding green instead of blue light. How very much the kind of sensation experienced depends upon the intensity of illumination is easily seen in the case of the region of the spectrum near the G line of Fraunhofer. This region appears violet when its luminosity is feeble, blue when it is stronger, and may even appear bluish-white with strong sunlight, so that the assertion often made that with normal eyes a definite color sensation corresponds to a definite wave length, cannot be upheld. Herr Vogel comes to the conclusion that our opinion as to the color of a pigment is guided by our preception of the absence of certain constituents. Thus a red substance is only recognized as such when light of other colors is admitted, and we perceive its inability to reflect these.

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