

*Marking Ink.*—Lunar caustic 2 parts; sap green and gum-arabic each 1 part; distilled water. Dissolve.

*The preparation.*—Soda 1 ounce; water 1 pint; sap green  $\frac{1}{2}$  drachm. Dissolve, and wet the linen (where you intend to write) with this mordant, then well dry it.

## Miscellaneous.

### Ship Armor Plates.

*The Sheffield and Rotherham Independent* (English paper) describes the manufacture of armor plates for the war vessels of the British navy as conducted upon a large scale at one of the iron and steel establishments in Sheffield. The plates are made from slabs of bar iron, each  $1\frac{1}{2}$  inches thick, and measuring 30 by 12 inches. Four of these are first laid upon one another and heated to a white heat in a furnace, then rolled into a plate about four feet square. Step by step several plates are now put together, heated and rolled until four plates measuring 10 feet by 4 feet 4 inches and  $2\frac{3}{4}$  inches thick are made; then these four are heated, welded together and rolled, by one final operation making one massive armor plate 20 feet long, 4 feet and 4 inches broad,  $4\frac{1}{2}$  inches thick and weighing 6 tons or 180 lbs. to the square foot. Formerly armor plates were forged by a huge steam hammer, but it has been found that by using iron of different fibres, and rolling it from slabs, so as to have about 132 layers, the plates are tougher than those formed by hammering.

When one of these huge plates are rolled finally it is quite crooked and has to be straightened. To do this it is placed on a long flat iron bed, and two immense rollers—each weighing nine tons—are passed over it, in the same manner as plate glass is made. This levels the plate perfectly, and it is now left to cool. The plates after this are each lifted by a crane into a huge planing table, where they are cut true on the edges to the exact width of four feet, then they are tongued and grooved like pine boards for flooring, and are ready to be bolted to the side of the vessel.

### Electricity for Exploding Gunpowder.

In a recent lecture in London by Professor Abeel, F.R.S., and Director of the chemical establishment of the War Department, he stated that an extensive series of experiments had been made for ascertaining the different forms of electricity which were the most advantageous for exploding gunpowder. The Ruhmkorff coil, by which electricity of high tension is obtained, he considered was the best. What is called the "magnet fuse" has been used very successfully in firing gunpowder with electricity. It consists of two fine copper wires, each covered separately with gutta-percha, then both placed alongside, and bound together with an outer coating. It is then cut into short lengths, exposing the copper wires at the ends. Moistened gunpowder is placed upon the terminals or ends of these fuses when placed in the mine that is charged with powder to be exploded. A spark of inductive electricity sent from a Ruhmkorff coil fires the moist gunpowder at the end of the fuse, and explodes the charge with certainty. This moistened gunpowder is prepared by mixing the fine-grained quality with a dilute alcoholic solution of chloride of calcium. A large supply of such fuses, with prepared gunpowder and a large magnetic apparatus for generating electricity, furnished a portion of the equipment

of the British army during the late China war, and the obstructions to the expedition on the Peiho river were cleared away by electrical discharges.

An improvement in the magnet fuse has lately been made in rendering the priming composition more sensitive by using a mixture of phosphide and sulphide of copper and the chlorate of potash. This priming is put upon the terminals of the copper wire, and it is ignited with the smallest size of magneto-electric machines—such as the 6-inch horseshoe magnet and a rotating armature used in America for medical purposes.

The charges of powder which are used for blasting under water and in mines with electricity, are either inclosed in a tin case or a bag of india-rubber, with the magnetic fuse placed in the middle, and connected with the conducting wire to the magneto-electric machine which develops the sparks. For field and mining operations in military engineering, a magneto-electric machine is more convenient than a galvanic battery, and a very small apparatus, made with Beardslee's American cast iron radial magnets would, we think, answer admirably for such purposes.—*Scientific American.*

### TO INVENTORS AND PATENTEES IN CANADA.

Inventors and Patentees are requested to transmit to the Secretary of the Board short descriptive accounts of their respective inventions, with illustrative wood cuts, for insertion in this Journal. It is essential that the description should be concise and exact. Attention is invited to the continually increasing value which a descriptive public record of all Canadian inventions can scarcely fail to secure: but it must also be borne in mind, that the Editor will exercise his judgment in curtailing descriptions, if too long or not strictly appropriate; and such notices only will be inserted as are likely to be of value to the public.

### TO CORRESPONDENTS.

Correspondents sending communications for insertion are particularly requested to write on one side only of half sheets or slips of paper. All communications relating to Industry and Manufactures will receive careful attention and reply, and it is confidently hoped that this department will become one of the most valuable in the Journal.

### TO MANUFACTURERS & MECHANICS IN CANADA.

Statistics, hints, facts, and even theories are respectfully solicited. Manufacturers and Mechanics can afford useful coöperation by transmitting descriptive accounts of LOCAL INDUSTRY, and suggestions as to the introduction of new branches, or the improvement and extension of old, in the localities where they reside.

### TO PUBLISHERS AND AUTHORS.

Short reviews and notices of books suitable to Mechanics' Institutes will always have a place in the Journal, and the attention of publishers and authors is called to the excellent advertising medium it presents for works suitable to Public Libraries. A copy of a work it is desired should be noticed can be sent to the Secretary of the Board.