

### DIRECTIONS FOR THE USE OF BELTS.

The putting on of belts should be done by a person acquainted with the use of belting, and too much judgment cannot be exercised in this respect, as the wear of the belt depends considerably on the manner in which it is put on; therefore the following suggestions, if practiced, will be of much service to persons in this capacity. The butts to be joined together should be cut perfectly square with the belt, in order that one side of the band may not be drawn tighter than the other. For the joining of belts, good lace-leather, if properly used, being soft and pliable, will always give satisfaction. Where belts run vertically, they should always be drawn moderately tight, or the weight of the belt will not allow it to adhere closely to the lower pulley, but in all other cases the belt should be slack. In many instances the tearing out of lace holes is unjustly attributed to poor belting, when, in reality, the fault lies in having a belt too short, and trying to force it together by lacing, and the more the leather has been stretched while being manufactured, the more liable it is to be complained of. All leather belting should occasionally be greased with the following mixture, or it may become dry and will not adhere to the pulleys: 1 gallon of neat's foot or tanner's oil, 1 gallon of tallow, 12 ounces of resin; dissolve by heating and mix well together. During the winter season an extra quantity of oil should be added to the mixture. To obtain the greatest amount of power from belts the pulleys should be covered with leather; this will allow the belts to be run very slack, and give 25 per cent. more wear. More power can be obtained from using the grain side of a belt to the pulley than from the flesh side, as the belt adheres more closely to the pulley; but there is this about it—the belt will not last half so long, for when the grain, which is very thin, is worn off, the substance of the belt is gone, and it then quickly gives out: so that I would advise the more saving plan of obtaining power by driving with wider belts, and covering the pulleys with leather. Where belts are in very damp places, or exposed to the weather, I would recommend the use of rubber belting; but for ordinary use it will not give the satisfaction which is so generally obtained from using oak leather belting, as it cannot be run on cone pulleys through forks or at half cross, and with fair usage would be worn out while a leather belt was regularly performing the work allotted to it; for when the edge becomes worn, the belt soon gives out.—*Van Riper.*

**SKELETON LEAVES.**—At a recent meeting of the Scientific Committee of the Royal Horticultural Society, Mrs. Cussons, of Southport, exhibited some skeleton leaves, with the following note: "For the dissection of leaves I find the process of maceration too long and tedious, to say nothing of the uncertainty as to the results; I have therefore adopted the use of alkali in saturated solution, the specimens to be introduced while the liquid is heated to boiling point. The time of immersion to be regulated by the character of the various leaves, and the nature of the epidermis to be removed. When the specimen is freed from epidermis and cellular tissue, it must be subjected to the action of chlorine to destroy the colouring matter. The introduction of peroxide of hydrogen serves not only to render the lace-like specimens purer in colour, but preserves it also. In destroying the colouring matter in ferns this also is invaluable; added to the chlorine it gives a solidity to the bleached fronds, and appears to equalize the action of the chlorine. For skeletonising capsules the slow process of maceration by steeping in rain-water is alone available—a moderate heat may be applied to hasten the process, but alkali is useless. The only known flower which can be dissected in the *Hydrangea japonica*. The fibrous nature of the petals renders it easy to skeletonise in the perfect truss in which it grows. Skeletonised leaves and capsules appear to gain in the process a toughness and durability not possessed by them in their natural state."

**SIR W. ARMSTRONG'S** jointed gun has passed through the series of firing tests, and has been adopted for service. The gun unscrews into three parts, and is thus easily transported on the backs of mules. When the pieces are screwed together it forms a powerful long range gun, perfectly gas-tight at the joints.

There is no doubt about the success of the Paris Exposition. Up to July 5th the receipts were \$753,384, or \$3240 more than they were up to July 5th, 1867, though in that year the Exposition opened a month earlier.

A TARGET which indicates instantaneously to the marksman himself the exact result of his shot, has been invented by M. Mantel-Rieter, of Winterthur. He is content at present to use numbered circles, but the system can be easily adapted to any division of the target. The mechanism (which is still kept secret) is placed behind an ordinary target; the shock of the ball produces a mechanical contact, and closes an electric circuit, so that an index at once rises from a table at the side of the marksman. This table is divided, like the target, into numbered concentric circles. Four holes are pierced in each of the zones, in the direction of two diameters at right angles, inclined 45° to the horizon; the small circle in the centre has only one hole. When a ball strikes the target a number is presented automatically on the table, in the hole corresponding to the quarter of the zone touched. At the same time there rises on the right side of the table a small card, bearing the same number, which may be delivered to the marksman. By a simple mechanism the numbers are pushed in again, and the target is ready to indicate a fresh shot. The inventor is constructing a second apparatus, in which the table will indicate not only the numbered zones, but will give a complete image of the target, so that the marksman may judge more certainly as to the point he has struck. All the balls which reach the target are retained in it.

**HUMAN TEMPERATURE IN THE TROPICS.**—We learn from the *Medical Times and Gazette* that Surgeon Major Johnston has made an extensive series of observations in India, on the subject of the normal temperature of the body in the tropics, and has found that, contrary to the general opinion, it is rather lower than the average temperature in the north. In one series of observations he found the mean axillary temperature to be 97.63°, and in another, 97.74°.

AN improved form of Gatling gun was tried recently at a range of 1,000 yards, the canvas target being torn to shreds, whilst many of the bullets passed through the two-inch oak planks at the back. At 800 and 600 yards the bullets struck with marvellous precision, and, according to *Serjt. Mayer*, who was in the marker's retreat, it would have been impossible for a sparrow to have traversed the line of fire in safety.

**THE Medical and Surgical Reporter**, in concluding a criticism of the question of spontaneous generation of the lowest forms of life, asserts that the present state of the controversy proves that there are agencies at work in the evolution of organic forms of which we are as yet ignorant, and that it is altogether premature to swear by the dictum of either party. We must wait and study.

A NOVEL application of the electric light is proposed by Mr. Edison. His plan is to make a diminutive light apparatus, and enclose it in a glass globe of such size as to be easily swallowed! He will connect it with a suitable battery, and he expects to be able to witness the process of digestion, and to see with more or less distinctness the operations of the internal organs.

*Nature*, on behalf of the scientific circles of England, expresses dissatisfaction at the tardiness with which government scientific work is done, at the dilatoriness with which the results are published, and the exorbitant prices charged for such *Pub. Docs.*

THE attempt of the English Government officers to raise the lost *Eurydice* has been unsuccessful. *Iron* charges the failure to the incompetency of the officers in charge, and objects to the employment of "fighting officers as wreckers."

BELGIUM was far behind Holland when the two countries separated. Now, thanks largely to an excellent patent law for the encouragement of inventions, her commerce leads that of Holland by \$50,000,000 per year.

IN a sun kitchen at the Paris show, *Professor Mouchot*, of Tours, has roasted quails in twenty minutes, and in forty-five boiled water. The cooking is done with an apparatus having a strong reflector.