RECENT INVENTIONS.

Improved Pulley.

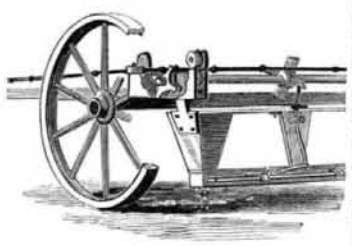
The engraving represents an improved pulley recently patented by Mr. John J. Irvine, of Chattanooga, Tenn. This pulley is provided with a removable section of the rim, which is designed to be taken out at any time for slackening the belt to facilitate the lacing of it when it becomes slack, taking off and putting on the belt when required. A segment of the rim of about a quarter of the circumference is made separately from the rest and fitted to be connected by flanges, bolts, and a key or nuts. In this case the removable section extend along the arm and its branches, the branched arm bein ; constructed separately to facilitate handling, and the arm is jointed to swing around sidewise to allow greater slack to the belt. It will be readily seen that by the slack that will be afforded to the belt by the removal of the section, the belt may be readily drawn together for lacing the ends without the use of clamps. The belt can also be put on and taken off without unlacing it, and may be readily slackened at any time for any purpose. In smaller sizes of pulleys the inventor proposes to cast the removable or adjustable portion of the arm and its branches, when used together, with the removable section, and connect it with the fixed part.

Apparatus for Measuring and Cutting Out Garments.

This is a scientific instrument for the use of tailors and cutters, by which the measure can be taken for the body of a coat or similar garments and readily transferred to paper, without requiring calculations or divisions of any kind, as is usual with most systems now in use. The invention consists in a mechanical instrument which is first placed to find a center, and the different measurements from the center are then taken, so that by afterward applying the instrument upon a sheet of paper, the pattern can be readily marked out, so as to insure a perfect fit upon regular or irregular forms. Figs. 1 and 2 show the application and Fig 3 represents the apparatus in detail as applied to the paper or cloth. This instrument takes the measure on true geometric principles, and the inventor claims that this is the first instrument for the purpose in which these principles have been scientifically applied. Mr. William Abrahart, cor. Woodburn Ave. and Madison Pike, East Walnut Hills, Cincinnati, O., is the patentee of this invention.

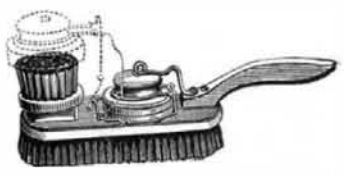
Check Row Corn Planter.

This is a dropping attachment to be applied to any form of check row planting machine, but more especially intended for the class of planters patented by the same inventor July 19, 1881. This attachment will not offer so much resi-tance to the knotted wire or rope staked across the field as those in common use, and will therefore be more durable and more efficient. The attachment is provided with a shaft having at the ends sprocket wheels, for engaging the knotted wire rope, as shown in the cut. The rope is properly guided, so as to insure its engagement with the wheels. At the middle of the shaft there is a cam provided with oppositely inclined blades which reciprocate the dropping plate below the seed boxes. This attachment is easily applied, and will do accurate work. Mr. John K. Voorhees, of Pilla, Iowa, is the patentee of this invention.



Blacking Attachment for Shoe Brushes.

The engraving shows a neat and convenient device for holding an ordinary box of blacking on the back of a shoe brush, so that the blacking and brush will always be found together. The attachment is made by means of links or hinges of wire, which carry at the outer extremity a ring in which is inserted a screw that enters the bottom of the blacking box and holds it rigidly. The handle and the box may be revolved, and the box may be fastened down against the back of the brush by means of the latch attached to the handle, or it may be raised up to apply the blacking to the dauber, as shown in dotted lines. The old box of blacking is readily replaced by a new one. This novel device is very compact, convenient, and cleanly, avoiding the necessity of handling the blacking box. It is inexpensive, readily made, and easily applied. Further information in regard to the invention may be obtained by addressing Mr. E. L. Wood, Eastland, Texas.



Society of Arts Prizes.

The Council of the Society of Arts, London, offers a prize of five guineas for a wooden plant label, saturated with paraffine or some other preparation which would preserve the label, and would be likely to keep the writing upon it legible either with or without the aid of paint, for five years.

They also offer an additional prize of five guineas for the best permanent border label suitable for private gardens, the cost of which should not exceed 4*l.* per thousand.

Specimens bearing a number or motto, and accompanied by a sealed envelope containing the name of the sender, must be sent to the Secretary of the Society, John Street, Adelphi, London, not later than June 1, 1883.

The specimens will be tested, and no award will be made if, in the opinion of the judges, no specimen is deserving.

The Society of Arts also offer the following prizes: A Society gold medal, or 20*l.*, for the best plan for "obviating or diminishing risk to life in the operations of coal mining." A Society gold medal, or 20*l.*, for the best plan for "obviating or diminishing risk to life in the manufacture, storage, and transport of explosives." A prize of 100*l.* for the best essay on "The Utilization of Electricity for Motive Power." Preference is to be given to that essay which, besides setting forth the theory of the subject, contains records with detailed results of actual working of experiment. A Society gold medal, or 20*l.*, for the best invention having for its object the prevention or extinction of fires in theaters or other places of public amusement.

Designs, plans, models, essays, descriptions, inventions, etc., intended to compete for any of the above prizes must be sent to the Secretary on or before October 31, 1883, and the Council may withhold the prizes or award others of less value if they see fit. Any one wishing to compete for any of these prizes can ascertain the exact conditions. The address of the Society is John Street, Adelphi, London.

Animals and Men Who Never See Daylight.

According to the Philadelphia *Record*, seventeen hundred mules employed by the Philadelphia and Reading Coal and Iron Company in connection with mining operations toil under ground daily. At many of the mines the mules do not see the light of day for a year at a time, and very often a mule spends ten years of his life under ground. The effect of daylight upon mules that have been so long in darkness is blinding. In many instances this blindness is permanent, the shock of sudden light being too great for the eyes; but it is the general rule that the mule staggers around in blindness for a few days, always, however, finding his way to the feeding bin, and taking true aim with his heels. At the end of the week eyesight returns, he brays with all the vigor of lung for which his kind is celebrated, elevating his tail as an accompaniment.

There are, in round numbers 2,300 of these animals employed in all capacities by the Reading Coal and Iron and Railroad Companies. Many of them are taken up and down on the cage at the mines daily. An officer of the company said yesterday that, in an economic point of view, they are thirty-three per cent cheaper than horses, but that this is offset by the risk run in employing these animals. No wagon boy has been thoroughly initiated until he has felt the weight of a mule's heel.

In the mining region, where disputes of almost all kinds are settled by fisticuffs, the mule plays an important part in the miner's training for battle. He approaches the mule, which seems to be sleeping, and gives him a fews taps on the rump with his bare knuckles as a reminder that he is wanted to take part in a sparring match. The mule responds, the blows are parried, and the sturdy miner gets in one or two from the shoulder which knock the animal out of time, the latter retiring with backed ears and looking deeply humiliated. A number of gentlemen in this city, prominently identified with the anthracite coal trade, who have been practical miners, relate this as an actual fact.

Plant Labels.

In transplanting spring shoots, as well as in sowing seeds, the gardener often feels the need of a convenient label, that will withstand the rain and not get soiled with the mud. A writer in the German *Diamond* recommends the use of glass tubes, in which the paper labels can be slipped and the tube corked or sealed. The tubes should be eight inches long, and have an interior diameter of half an inch, and be made of quite thick glass. For house plants and conservatories, elegant labels can be made from wider and shorter tubes, open at both ends, one being closed with a cork, from which the label is suspended by a thread or wire passed through the cork, the other end being used to hang the tube on a branch of the tree or shrub.

International Electric Exhibition, Vienna, 1883.

The extent of the Vienna Electric Exhibition may be estimated by the fact that the motive power to be actuated has been fixed in round numbers at 1,000 horses. About 700 of them are calculated to serve for lighting the exhibition buildings and grounds.

Economical Gas Generators and Engines.

The power for the new gas engine works of Messrs. Crossley Bros., Limited, is to be obtained from gas engines driven with generator gas made by the Dowson process. Nearly all the plant for 150 horse power has been put down, consisting of three producers connected with three scrubbers for washing the gas, and a holder for compensating the supply and regulating the pressure. Messrs. Crossley have had a 30 horse power engine working regularly with this gas during about two months, under test conditions. It has been found that the generators took 45 minutes in firing up, and afterward the fuel consumption per 1,000 cubic feet of gas passed into the holder was 13 2 pounds. The *Journal of Gas Lighting* says that the gas consumption of the engine was at the rate of 109 cubic feet per indicated horse power per hour, representing a fuel consumption of 1·4 pounds per horse power per hour. The coal used is small sized anthracite, costing 3s. 6d per ton in truck at the pit. The wages for the fireman for the gas generators are about the same as for a set of steam boilers. Thus the economy of the system consists chiefly in the low rate of fuel consumption. This consideration is important, in connection with the fact that the engines are small; for it will enable different lines of shafting to be driven by separate engines as economically with regard to fuel as by a single large engine of the best construction. Any department may therefore be kept at work independently of others. Against this advantage must be set off, in the case of manufacturers who have to purchase their gas engines, the high price of these machines and the added cost of the gas producing plant.

How Long it Takes to Smell.

Various delicate experiments have been made in order to determine the so-called "reaction time" in sensation—*i. e.*, the time between the moment of excitation of the sense and the moment at which the person indicates by a signal that he has become conscious of the sensation. M. Beaunis, of Nancy, has recently sought to measure the reaction time for smell. He gives (*Comptes Rendus*) a table of the numbers obtained with ten substances; they range from 37 hundredths of a second for ammonia, and 46 for aceticacid, to 63 for mint, and 67 for carbolic acid. In the case of musk, he was unable (notwithstanding repeated attempts) to fix precisely the moment of the smell sensation. The numbers given show that the reaction time for smell is longer than that for touch, sight, and hearing. (In the author's own case, it is shorter than for touch.) Dr. Buccola, of Turin, has recently made experiments on smell, with different apparatus, and gets results which agree in the main with those of M. Beaunis.

Effects of Electricity upon the Nerves and Heart.

Among the curious exhibits at Munich Electrical Exhibition were a series of photographs representing the various changes and contortions produced in the human face by subjecting the different facial nerves of a patient to the action of electricity. These were the experimental photographs made by Professor Von Ziemssen. The expressions of joy, pain, surprise, doubt, disgust, etc., were easily realized, according to the nerve that was touched by the electrode.

Other observations and experiments by Professor Von Ziemssen promise to be of great importance. They institute a comparison between the continuous and the induced current in the stimulation of the important accelerator and depressor nerves which control the heart. He has found that an induced current, so far from stimulating the nerves of the heart, as heretofore believed, is perfectly inoperative, whereas a continuous current from an ordinary battery is of the very greatest activity.

Telegraphy in Europe.

Lecturing on the progress of telegraphy before the Institution of Civil Engineers, Mr. Preece stated that in the British system the three forms of battery used are the Daniell, Leclanche, and bichromate in the proportions respectively, of 87, 56, and 21. If these figures are read as thousands, they represent nearly the actual number of cells of each kind in use. Magneto-electricity is applied for some forms of apparatus, and dynamos are occasionally utilized to supplement batteries. Of A B C instruments there are 4,398; needles, 3,791; Morse printers, 1,330; and 2,000 sounders, an instrument which is gaining ground rapidly in England. Sound reading is almost exclusively adopted in America, but is rarely used on the Continent, although it is the most rapid and accurate. There are 224 Wheatstone's automatic instruments in use, and in England 319 duplex and 13 quadruplex circuits are at work.

Electrical Light of Comets.

According to Huggins, comets emit a characteristic light which indicates, by spectral analysis, the presence of carbon, hydrogen, and nitrogen, elements which are shown by the spectra of acetylene and cyanhydric acid. Berthelot thinks that these results point to an electric origin of the light. He has shown that acetylene is formed immediately and necessarily, whenever carbon and hydrogen come under the influence of the electric arc. When nitrogen is added to acetylene, the electric influence produces cyanhydric acid. It seems scarcely possible to conceive of a continuous combustion in cometary matter, but an electric illumination may be easily understood.—*Ann. de Chim. et de Phys.*