

A Great German Telescope.

The Berlin Industrial Exhibition opens May 1, 1896, and in connection with it the Astronomical Observatory of Grunewald will be transferred to Treptow near Berlin. One of the features of the exhibition will be photographs of old instruments, models of telescopes, reproductions of astronomical drawings and kindred subjects. As the largest refractor hitherto erected in Germany has only been one of 18 inches aperture, it is gratifying to note that one is now being constructed having an aperture of 28 inches.

The mounting is so arranged as to receive two objectives, of which one is designed for direct visual, the other for spectroscopic and photographic observations. For this reason the latter will be a double objective of short focal length, 20 to 23 feet, and large aperture, $43\frac{1}{2}$ inches, which for the present will be exhibited in an unfinished condition, as the means for the purchase and polishing of the enormous lenses, which have been very successfully cast by Dr. Schott, can only be raised during the exhibition. The rough disks of glass for the lenses of the telescope have been furnished by Dr. Schott and Genossen of Jena, while the polishing has been executed by Messrs. C. A. Steinhilf of Munich. The mounting of the instrument was intrusted to the Berlin Maschinenbau Anstalt C. Hoppe, "who was assisted" by the firm of G. Meissner, Berlin, in the execution of the minute mechanical portions. The other objective, on the contrary, is completed, and has an aperture of $27\frac{1}{2}$ inches and a focal length of 68 feet.

Instead of the usual dome, the telescope is provided with a cylindrical protective envelope, which together with the tube is mounted on a rigid box, which can be rotated round the declination axis. The polar axis is placed in the interior of the pier; attached thereto, and therefore revolving round it, is a kind of bell, which incloses the observer's seat; the above mentioned box revolves with the bell round the polar axis. The observer sits in the prolongation of the polar axis, in such a manner that his head is in the turning point of the whole telescope, so that he can easily follow its movements by slightly turning his head. The counterpoises for the tube extend at either end of the box; besides which there is attached a second bell, which serves to relieve the polar axis, and for this purpose runs on two antifriction rollers fixed to the pier.

AN IMPROVED SORTING MACHINE.

The illustration represents a machine adapted to sort into different sizes not only potatoes and other vegetables and fruit, but a great variety of different substances, the size, strength and other details of the machine being varied accordingly. A patent was recently granted for the improvement to C. G. Poulson, Jr., deceased, of Linwood, Pa., of whose estate C. G. Poulson, Sr., is administrator. Within the box body of the machine is an inclined screening or separating table, mounted to have end motion, the table consisting of slats or bars, which are diamond-shaped in

**POULSON'S POTATO SORTING MACHINE.**

cross section, and wider apart at the tail than at the head of the table. Beneath the table are hoppers adapted to receive the different sized material passed through the bars at the narrower and wider spaces. The sorting table swings freely on hangers and is moved by turning a crank, on the shaft of which are cams, the table being moved against spiral springs which force the table against a buffer four times for each revolution of the crank shaft. Material shoveled into the machine at the top, as shown in the illustra-

tion, feeds automatically to the proper sized openings between the slats, when it instantly drops into the spouts, to be conveyed into bags or baskets, or any desired receptacle.

A SAFETY HAT FOR MINERS.

A hat designed to withstand blows of falling material, such as pieces of coal, rock, etc., and which is thoroughly ventilated and fits easily on the head of the wearer, is shown in the accompanying illustration, and has been patented by James McNamara and Frederick W. Pepler, of Calumet, Mich. The shell and brim of the hat are formed of a single piece of sheet metal, and inside the shell is a lining or inner

**PEPLER & McNAMARA'S MINER'S SAFETY HAT.**

shell of suitable textile material, to the edge of which is attached a leather head band. The inner shell and band are somewhat smaller than the exterior shell, and air holes provide for a circulation of air. The band and inner shell are secured to the outer shell by a series of spring clips, the spring of which allows the band or lining to conform to the head. On the front of the hat is a socket plate to receive the hanger of a miner's lamp. The hat is very durable, is waterproof, will not absorb grease from candles or oil, and the lining may at any time be taken out without ripping or tearing it.

Practical Disinfection of Rooms.

The frequency with which second and third cases of scarlet fever appear in houses that have been disinfected by the inspectors of sanitary authorities, says the Lancet, causes grave doubts as to the efficiency of the procedure usually adopted, despite its official sanction. Stripping the walls, lime washing walls and ceilings, and scrubbing woodwork and floor boards with soap and water are indeed effectual enough, and to these when thoroughly done we are disposed to ascribe any successful results rather than to the more technical process of so-called disinfection by sulphur fumes, which is little better than a superstitious rite or incantation shorn of the religious character it had in the mind of Ulysses when he "fumigated" the halls desecrated by the massacre of his wife's suitors after removing the corpses and washing away the blood with a promptness that precluded all thought of other than moral pollution. But in the light of bacteriological experiments dry sulphurous acid fumes, whether generated by burning sulphur or carbonic sulphide, or, as has of late become the fashion, by opening cylinders of the compressed gas, are for all practical purposes useless. The gas would act as a fairly powerful germicide on articles or fabrics previously saturated with water, but its bleaching action precludes its employment in this way with colored materials, carpets, or curtains, and it is as what is called an "aerial disinfectant" that it holds its ground in popular esteem. But aerial disinfection is an absurdity; no one wants to purify the foul air, which is easily enough removed by simple ventilation. In disinfecting a room the true aim is to kill the germs contained in the dust on ledges or in the crevices between the boards, or adhering to the walls and other surfaces, and the dry gas is powerless for this, which is best attained by a sublimate solution of the strength of 1 part in 1,000, or by lime (not white) washing, provided the lime be fresh burnt and caustic; the carbonate or chalk used in white-washing under the name of whitening, and into which lime is converted by long exposure to the air, being inert. The series of experiments on the infection and disinfection by various means of wall papers, distempers, and other wall surfaces conducted by Dr. Cronberg, under the direction of the late Prof. Uffelmann, at Rostock, showed that subsequent scrapings were invariably and almost instantaneously sterilized by washing or spraying with the sublimate solution, and equally so by lime wash after the lapse of twelve to twenty-four hours. The danger of corrosive sublimate is, we believe, exaggerated, for the smallest fatal dose for an adult being probably three to five grains—equal to at least a quarter of a pint of the solution—accidental poisoning with the solution is practically not probable, and as a further safeguard it might be colored with indigo or "laundry blue." Carbolic acid, which

is sold without restraint and is in universal use, is more dangerous on that account, and is, indeed, frequently employed with suicidal intent and with fatal effects. In France, Germany, and Italy sublimate has nearly superseded all other disinfectants and its neglect in this country is inexplicable. As to carpets, curtains, bedding, and clothing, all that is capable of being washed should be plunged in a copper of boiling water for a quarter of an hour and such articles as would be spoiled by this treatment should be disinfected by steam.

How to Find Negatives.

Much time is lost and patience expended in what is very often a futile search for some particular negative. Perhaps an hour, or even more, is wasted by hunting through two or three hundred of one's photographic successes and failures. To obviate this expenditure of time, we would like to suggest a method of indexing that the writer has found very useful.

The pecuniary outlay for the necessary materials is trifling, and is covered by a few pence. Two note books, indexed, are all that one requires. The one contains a numerical, the other an alphabetical, index.

Empty plate boxes are used for storage purposes. Every box should have a gummed label affixed upon the side of the box, each label bearing its own distinctive number. Plate boxes when filled may be kept ranged on a shelf like so many books. A system of double indexing is used.

The numbers 1, 2, 3, etc., refer to the boxes; under the alphabetical headings are found the titles or subjects of the various pictures. A concrete example will perhaps make my explanation more lucid.

One wishes to find a negative exposed, let us say, in Guernsey. Reference to the letter G in the alphabetical index shows one that Mail-boat Approaching Guernsey 6:30 A. M. is stored in box 12. By adopting this method much time and temper is saved.—The British Journal Almanac.

A DURABLE AND EFFICIENT WINDMILL.

The illustration represents a windmill of substantial construction, with thoroughly braced and rigid fans or blades, and powerful gear mechanism for transmitting power from the windwheel to a shaft from which the power may be taken. The improvement has been patented by W. McD. Rowan, of Garden City, Kansas. Secured to the timbers of the tower is a platform supporting a hollow post having an annular flange supporting the main gear wheel, whose hub fits over the flange and rests on ball bearings. This gear wheel has vertical and beveled teeth, the latter engaging a bevel pinion on the horizontal shaft carrying the windwheel, the bearing of this shaft being secured to the upper end of a vertical hollow shaft projecting down through

**ROWAN'S WINDMILL.**

the hollow post. A curved brace extends from this bearing to the bearing of the hinged tail or vane, which may be moved to throw the wheel out of the wind by means of a cord or cable passing over suitable guide pulleys and down through the tower. The vertical teeth on the main gear wheel mesh with a gear wheel on the upper end of a vertical shaft which has at its lower end a bevel gear meshing with a similar gear on a horizontal shaft carrying a pulley from which power may be taken in the usual way.