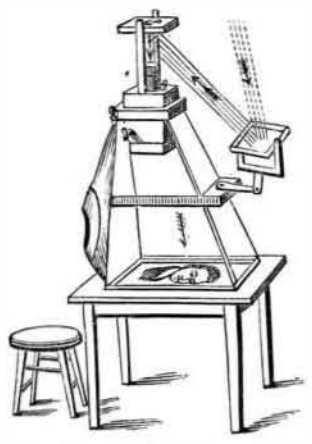
PLATT'S TRACING APPARATUS.

The tracing apparatus shown in the accompanying cut is thus described by Mr. S. L. Platt in the Philadelphia *Photographer:*

A great many photographers cannot afford a solar camera, and an apparatus that would enable them to have some of its advantages will doubtless be of service to them.

The first step is to procure the enlarged sketches of the picture you propose to make. This I do by means of the apparatus which I shall describe below.

As I have said, my invention is for tracing or sketching for crayon or other portraits. It can be used by any one, and for enlarging any object that can be attached to the top, which is to contain the picture, face down. It can be made of any size, from eight by ten to life-size. The lens, the movable front for focusing, clamps for holding the movable top, which is adjusted from inside, and governs the size of the object, and the reflector to throw strong sunlight on the object, will all be seen in the diagram; also the table or stand upon which the paper, or material upon which to draw the image as it is reflected down, is placed. This is a very useful instrument for any gallery, as any card can be enlarged to a perfect eight by ten, or larger, to show the customer how he would appear in a large portrait, which might induce him to have one made. The one I have is intended for a ten inch head, or from that down to eight by ten. It is two feet square at the base, four feet high, fifteen inches wide at the center, with a twelve inch arm to the reflector. The reflector has three movements, or six, counting the backward movements.



PLATT'S TRACING APPARATUS.

The movable box has only two movements, up and down, for governing the size of the reflection. The box is nine inches square, one inside of the other, fastened with a thumbscrew inside of the front curtain. The movable top is raised and lowered from the inside, and fastened by a clamp with a thumb screw in front. The thumb screw is ten inches long, to reach clear across the front. The strip across the center, holding the reflector, is eighteen inches long. The box or framework is covered with soft flannel, and lined with thick yellow paper, so no light gets in save the reflected light. It will be observed that the image is very strong, and has the appearance of a finished picture. The rays falling in at the top make it a very pleasant light to work in, just right for comfort, something like twilight. It takes one to trace by measure, as all portraits do on canvas or cardboard, from two to four hours.

An artist rarely crayons two heads alike from the same picture, and do his best. I can with this make eight sketches with ten inch head in less than an hour, and have them alike every time, for I will not change the focus, and pin the paper each time at the same place. Changing the position of the reflector does not change the reflection, as it leaves the picture every time alike. This is not usually the case with a solar printer. I am a great friend to the solar camera, but I can, by using a condenser, do the same work by this.

Silvering Mirrors.

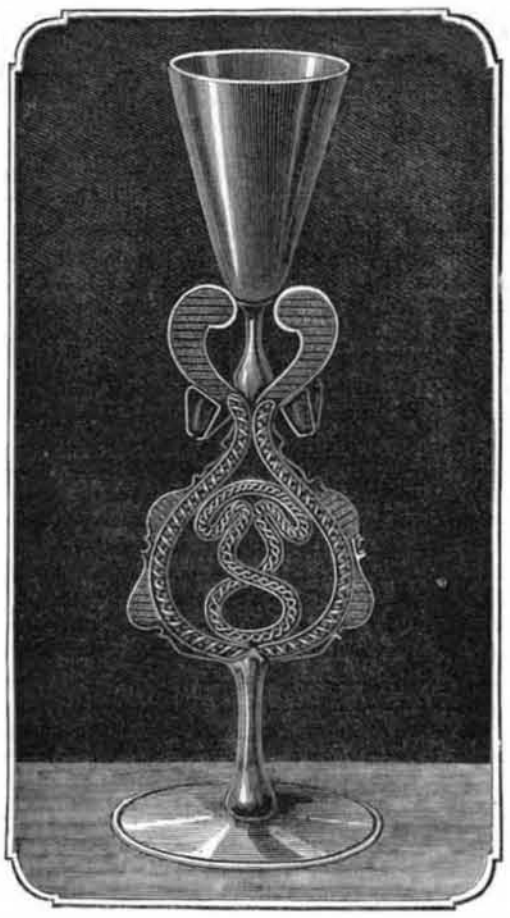
Some time since the Académie des Sciences offered a prize of 2,500f. for a method of satisfactorily and permanently silvering mirrors, and which should save the workmen the danger of exposure to the effect of mercurial vapors. The prize has been awarded to M. Lenoir, whose process is substantially as follows: The glass is first silvered by means of tartaric acid and ammoniacal nitrate of silver, and then exposed to the action of a weak solution of double cyanide of mercury and potassium. When the mercurial solution has spread uniformly over the surface, fine zinc dust is powdered over it, which promptly reduces the quicksilver and permits it to form a white and brilliant silver amalgam, adhering strongly to the glass, and which is affirmed to be free from the yellowish tint of ordinary silvered glass, and not easily affected by sulphurous emanations.

Sugar from Sorghum.

Dr. Collyer, chemist of the Agricultural Department, is confident that one-tenth of the corn acreage of Illinois would suffice to raise all the sugar used in the United States, if devoted to sorghum of the variety best suited to the latitude; this allowing practical results to reach only 50 per cent of those obtained in his most favorable experiments. The cost of the raw sugar, he thinks, should not exceed three cents a pound. The early amber cane is the species best suited to Illinois. Commissioner Le Duc, who has just returned from a tour of inspection in the West, reports that the most promising results have already been obtained. He visited one manufactory in Illinois, where 43,000 pounds of sorghum sugar have been made this season, equal in every respect to the best product of the sugar cane; and this enterprise has been carried on under exceptional difficulties. He visited, or received reports from many other localities to which he had sent sorghum seeds, all speaking in the most favorable terms of the prospects.

ANCIENT GLASSWARE.

Ancient Venetian glassware was of rare beauty, excelling everything ever made previously by any nation. Domenico Anzolo introduced the art of cutting, grinding, and polishing glass. Venetian mirrors especially, although they cannot be compared with the productions of modern times, were highly valued, and for several centuries Venice had a



VENETIAN GLASSWARE.

monoply of them. Imitations of precious stones were made in large quantities, also beads and imitation mother-of-pearl. Necklaces and cameos of the saints were exported in large quantities to Palestine, where they were sold to the pilgrims as amulets for fabulous prices.

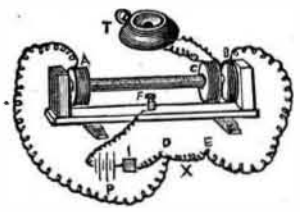
The most celebrated Venetian mirrors that have been preserved are those presented by the republic to the kings Henry III. and Francis I. of France. They are slightly convex, very thick, and set in frames of solid silver, gold, and damascened steel, about 30 inches high, 25 inches wide, and decorated with lilies and palm leaves formed of precious stones and gold. They were regarded as masterpieces of art at their time.

GERMAN GLASSWARE—16TH CENTURY.

Venetian glass was exported to all parts of the world, as far as known at that time. Enterprising merchants even established a regular trade with China, having been encouraged in this business by the celebrated traveler Marco Polo. In consequence, an immense wealth was accumulated, and the fortunes of common workmen in the glass houses were immense. Nevertheless many of them became tired of their golden cage, especially as many enticing offers were made to them by foreign princes. In spite of the rigid enforcement of the laws and the close surveillance under which they were placed, many of them escaped and were gladly welcomed and protected by the governments of the other European nations. Thus we find many Venetian glass makers in Germany toward the end of the 15th century, and from them the Germans learned a great many secrets in regard to the ornamentation and coloring of glass. German glassware, however, kept for a long time an eminently national character. The ornamentation consisted of banners, coats of arms, patriotic devices, and representations of important historical events, engraved with great skill. The principal seat of German glass industry was, and is yet, in Bohemia. In the 17th century the taste changed somewhat, and enameled cut glass came into fashion. Bohemian glass was very clear and colorless, and found a ready market.

MEASURING RESISTANCES.

M. Hospitaliar describes in the *Electrician* a method of measuring resistances, in which he uses a modified form of Hughes' audiometer. Two similar coils, A and B, are connected in a devised circuit with the battery the current of which passes through a vibrating contact. A coil of fine wire, C, is placed between the coils, A and B, and connected to the telephone. This coil slides along a graduated bar, so that its exact position may be easily determined. If, on introducing an inappreciable resistance between the binding screws, D and E, the current in A has the same intensity as in B, the actions of A and B upon C are equal and contrary, so that no sound is heard in the telephone. If a resistance be introduced between A and D, say one ohm, then the actions of A and B upon C are no longer equal, and a sound is heard in the telephone. The movable coil, B, is now adjusted till no sound is heard, and on the graduated scale a mark, 1, is made, indicating that the resistance between D and E is one ohm. Other known resistances are successively introduced and the scale completed, and then the unknown resistance inserted may at once be obtained by reading the scale at the point where sound in the telephone ceases. It is necessary that the battery used should be powerful enough to enable the feeblest sound in the telephone to be heard. The author of this method believes that it will be of great service for measuring the resistances of conductors, of electro-magnets, and telephone coils, because of its extreme simplicity.



The Largest Organ in the World.

The organ for the cathedral at Garden City, Long Island, now under construction by Mr. Hilborne L. Roosevelt, is described by the *Evening Post* as the largest and in several respects one of the most remarkable in the world. It will cost about $40,000, and will be put in place next spring. The main body of the instrument will stand in the chancel, and the organist will sit there. At the west end of the building, in a tower directly behind a large stained glass window, is a room in which a part of the organ will be placed and connected with the chancel by electricity, like the organ built by Mr. Roosevelt in Grace Church, New York. The window will be opened and closed by electricity, controlled by the organist from the chancel, thereby making fine crescendo and diminuendo effects with the organ in the tower. Over the ceiling, about the center of the building, will be placed another part of the instrument called the echo organ, which is to be played from the chancel by electricity. Underneath the chancel, in the chapel situated there, is a part of the organ, which is arranged so that it can be played in the chapel as well as from the chancel. Lastly, the large chimes which hang in the tower will be connected with the chancel by electricity, so that the organist can play them from the keys of the organ. The bellows will be operated by hydraulic engines, and the organist can, by simply turning on the water, have the whole instrument, including the chimes, at his command. Though this will be a mammoth instrument, and notwithstanding the great distance between many of its parts, the pressure necessary to play on the keys will be no greater than is used in playing upon a piano. This is due to the use of electricity, pneumatics, and hydraulics, which combined render it possible and practicable to construct such an instrument.

There will be four vox humanas (similar in construction to the celebrated one in Freiburg); one of these will be in the chancel, one in the tower, another over the ceiling, and a fourth one in the chapel beneath the chancel. All of these will be under the control of the organist in the chancel, and will be capable of crescendo and diminuendo effects. Certainly some beautiful and extraordinary combinations can be produced with their aid. In all there will be one hundred or one hundred and twenty speaking stops, the exact number not yet having been determined upon. The Boston Music Hall organ has eighty-four stops, the Cincinnati organ ninety six, and the largest organ in the world, that in Albert Hall, London, one hundred and eleven. Five hydraulic engines will be needed. Quite a small Gramme magneto machine will furnish all the electricity needed. Where mechanical force is required, as in ringing bells or opening windows, compressed air will be used in an ingenious manner devised by Mr. Roosevelt.