A SIMPLE METHOD OF ETCHING PICTURES.

The desire to draw and sketch is an almost universal one. There is a singular delight in the ability to put on paper that which has pleased the eye or caught the fancy. There have been many processes devised for the purpose of aiding the unskilled to gratify this ambition, probably the oldest and most familiar being the transparent sheet of glass, back of which are placed prepared sketches to be traced. There have been other forms of this same idea, some of which are too elaborate to answer the popular demand. The camera has in a great measure filled this rôle, and its immense popularity gives convincing evidence of the desire of the masses to dabble in the picture-making art. But the camera has its drawbacks, principally in that it is not selective, but accurately registers on the sensitive plate all that is within its field of view. The worker with the pencil and brush, on the other hand, exercises great discrimination in the matter, picking out only the telling features of the view and rejecting everything else from the canvas or pad before him.

Benjamin Hawley, an artist of Philadelphia, is the inventor of a device which has been recently patented, by which works of art can be produced by anyone without any previous tuition or particular aptitude for handling the pencil. The instrument is called the etchograph, and its shape, mode of working and samples of the work done by its use are all shown herewith.

A STUDY MADE WITH THE ETCHOGRAPH.

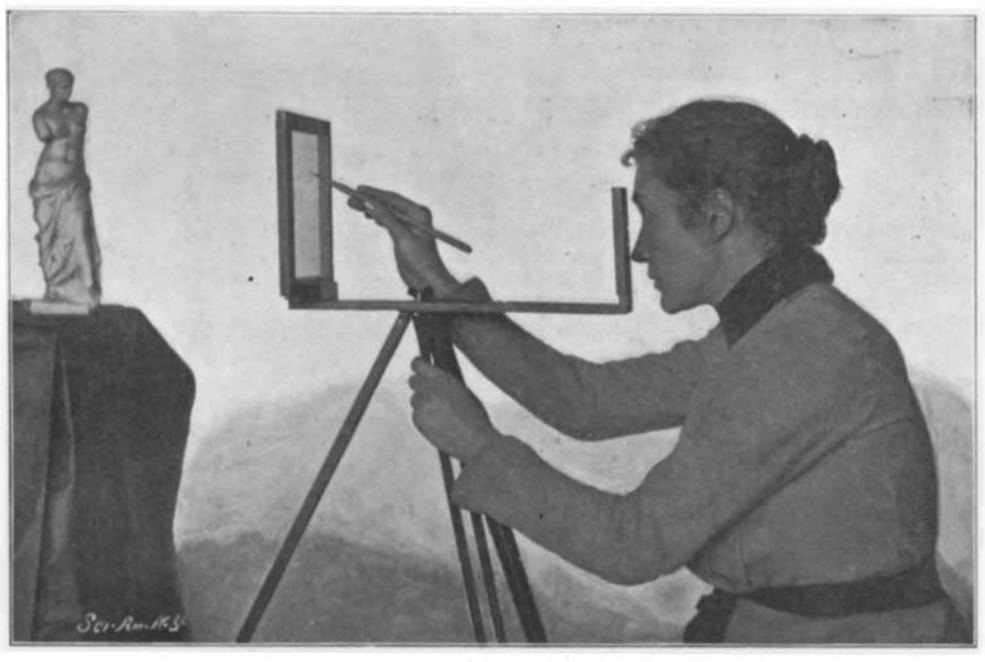
A SCENE ETCHED BY THE HAWLEY METHOD.

On the top plate of a tripod, a support is carried, comprising a longitudinal bar and a lateral bar. At one end the longitudinal bar carries an adjustable frame to receive a glass plate coated with a transparent film of gelatine or collodion; at the other end, the bar is formed with a slot to receive a holder for a vertically adjustable lens. The lateral bar serves as an arm rest. The tripod having been set up in proper position, the engraver looks through the lens, and sharply focuses the image transmitted through the glass plate by sliding the holder in the slot of the longitudinal bar. The reduced image, being apparently projected on the plate, can then be engraved on the prepared surface of the glass.

By this means anyone can make a satisfactory picture without the least knowledge of art or even acquaintance with the use of the pencil; but with the skill which soon comes of practice and observation, some very artistic effects can be obtained. For instance, by allowing a small amount of ink to remain on the plate's surface instead of thoroughly cleansing it, and then by a broad sweep here and there with a wad of cotton, the print made can be given all the appearance of an etching.

The method here offered is also of value to the student just beginning his career of art. It teaches him to see, and greatly simplifies the understanding of perspective. That things are seldom what they seem becomes at once evident to the art student when he makes his first endeavors to make a plane reproduction of solid form. For instance, when an oblong box is viewed in perspective, its long side may appear shorter than its short side, and in the drawing of such a box the line representing the short side may actually be shorter than the line representing the long side. To the beginner such appearances are most confusing, and the labor of learning to see is often so tedious that many are discouraged at the outset. It is evident that with the aid of some such device as this, perspective and form as well are revealed at a glance. Thus it can be made a great help to the beginner. It has received the indorsement of a number of artists for this purpose.

The etchograph is also a valuable assistant to the scientist and student, particularly in botany, zoology or anatomy. With its aid he can reproduce just such parts of the floral specimen as he desires, rejecting all superfluous and confusing details.



THE ETCHOGRAPH IN USE.

An International Exposition will be held at Lille from May to September, 1902. Its character will be of a general nature, but special attention will be given to the subject of the application of alcohol to the purposes of lighting and heating. The office of the exposition company is No. 35 rue National, Lille, France.

THE SANTOS-DUMONT AIRSHIP NO. 7.

BY THE PARIS CORRESPONDENT OF THE SCIENTIFIC AMERICAN.

M. Santos-Dumont is actively engaged in carrying out his projects for the aerostatic park at Monaco, from which point he is to make his experiments, first along the coast and then across to Corsica. At the same time he is superintending the construction of his new balloon which is being built at the Lachambre establishment in Paris. It will be considerably larger than the former, the No. 6, and is especially designed for high speed. Since the last description of the new No. 7, Santos-Dumont has made some important modifications in the dimensions of the balloon proper and the lower beam. As at present designed, the balloon has the form of an elongated ellipsoid having 142 feet on the long axis and 22 feet in the middle diameter, making it 22 feet longer than was intended at first. It is terminated in the front and rear by two cones. Its volume is 1,640 cubic yards, and the surface about 850 square yards, counting the overlaps and seams. The envelope is composed of two thicknesses of French silk joined by varnish in a single layer. The weight of the envelope is estimated at 730 pounds. The balloon is divided into three compartments having each a volume of 546 cubic yards. The two partitions which form the compartments, of unvarnished silk, have a surface of 217 cubic yards and weigh 15 pounds. Santos-Dumont will use the displacement of the guide-rope in the horizontal sense to vary the conditions of equilibrium of the airship, and besides will make use of the interior air-bags, originally designed simply to keep the balloon swelled out, for the same purpose. To effect this, he places near each end of the balloon an interior air-bag or small balloon, and both air-bags are in communication with a blowing or aspirating ventilator-fan. According as the forward or rear air-bag is swelled up by the ventilator the balloon will take a correspondingly inclined position. Besides, air may be removed from one bag and introduced into the other, giving a considerable latitude for the maneuver. This ingenious process, which Santos-Dumont has been able to realize by means of special devices, was indicated by M. Wilfrid de Fonvielle in 1884 at the time of Renard and Krebs' experiments. The two small air-balloons have each a volume of 90 cubic yards. The surface is 154 square yards and weight 66 pounds for the two. Accordingly, the total weight of the envelope will be 796 pounds.

The main beam, or keel, suspended below the balloon by steel wires, will have 93 feet length and will carry two motors of the Buchet pattern (such as are used for automobiles, but of heavier build) giving 40 horse power each, with a total weight for the two of 352 pounds. The motors will be thrown into action by friction clutches in aluminium with an interior steel band to keep them from sticking. The clutches will have a compressed-air device for throwing them on very gradually. In front and rear of the keel will be fixed the two helices, of similar construction but turning in the inverse sense and at different speeds. The center of the beam will be occupied by the aeronaut's car.

Since our Paris correspondent sent us this article, M. Santos-Dumont met with a serious accident to his airship. On February 14 he left Monaco at half past two o'clock in the afternoon. On account of solar radiation, the balloon mounted to a dangerous height. The plucky aeronaut did not lose his presence of mind, but opened the valve of the balloon, which fell into the sea. Fortunately, he was not injured, as assistance was promptly brought by a steam launch. He could be distinctly seen from the shore watching the various parts of the airship. It was thought for a moment that he would be dashed on a reef of sharp rocks. In the meantime the steam launches in the bay were making toward the spot. The motor stopped and the airship descended until M. Santos-Dumont was immersed to the armpits in the water. He was perfectly cool and gave directions to those on the launch, and finally half-clambered and was half-pulled over the gunwale of the boat. It was impossible to save more than the silken envelope of the balloon, and the motor sank. He made this statement: "I am not discouraged. My trip to Cape Martin is only postponed. I will start again as soon as I can get ready. This accident was due to the entanglement of the guide rope with the screw and wires of the balloon. The balloon was not fully inflated when I started. Seeing that an accident was inevitable, I pulled the emergency cord, but pulled it harder than I intended. This made a bigger rent than I wanted. Consequently the airship collapsed too quickly, and for a moment there seemed to be danger of the casing falling on me. But luckily this danger was averted. I shall try again."

Milk Flour in Sweden.

Dr. M. Ekenberg, of Gothenburg, has made a discovery which will be of importance in dairy farming, says Consul R. S. S. Bergh. He claims to have invented an apparatus by which milk can be brought into the form of powder, like flour in appearance, but possessing all the qualities of milk in concentrated form, moisture excepted. It is said that this milk flour is completely soluble in water, and can be used for all purposes for which common milk is employed. The milk flour does not get sour, does not ferment, and in the dry state is not sensitive to changes in the weather. It can be kept and transported in tin cans, barrels, bags, etc. The cost of production Dr. Ekenberg has estimated at about 27 cents per 106 quarts (1 öre per liter), and he thinks that flour made from skimmed milk can be sold for about 13 cents per pound (1 krone per kilogramme). At a recent meeting of the Academy of Agriculture, Dr. Ekenberg exhibited samples of the milk flour, which received favorable comments. It is considered that the invention will be of the greatest importance for the utilization of skimmed milk, which heretofore has largely been wasted, but in the dry form can be transported all over the country without losing any of its original good qualities.

The product mentioned is considered superior to the casein products "proton" and "proteide" now manufactured from milk by the aid of rennet, acid, or lye.