

SIMPLE PHOTO-ENLARGING APPARATUS.

With the introduction of gelatine sensitive silver paper, which has the property of being extremely sensitive to light, enlarged life-sized pictures may now be readily made in a few minutes with an artificial light at night. Expensive apparatus and lenses, such as are used in solar printing upon the common albumenized sensitive paper, are dispensed with, and in their place a simple camera or magic lantern with an ordinary lamp may be employed.

Gelatine paper may be obtained already prepared, is used in a dry state, is always ready for use, and will retain its sensitiveness for any length of time, so that it affords the photographer and amateur a ready means for quickly making positive prints, at any time.

Our engravings illustrate two forms of apparatus for exposing upon the sensitive paper. The upper engraving shows a photographic dark room separated by a partition from the exterior room.

Upon a table is placed a board on which a saddle slides back and forth. An upright frame is hinged to the upper side of the saddle, and when in use the frame is held in a vertical position by a flat metal latch as shown. At the upper end and in front of the frame is pivoted a board twice the length of the frame, provided at one end with a large rectangular opening covered with a ground glass, the ground side being set flush with the face of the board. The board revolves edgewise in a vertical plane, and is perfectly balanced. The small engraving shows the position of the board when folded up. Arranged upon the interior side of the partition of the room in front of the focusing board is a camera box made in two parts, the front portion, with the lens attached, sliding over the rear half, which is secured light-tight around a rectangular opening in the partition.

A short focus lens of the portrait combination type, provided with a diaphragm of an inch aperture, produces the best results.

The negative, with the film side toward the lens, is held in the slide in an inverted position, and is slid into the grooved frame upon the exterior side of the partition, as shown. This arrangement allows different sized negatives to be quickly and easily adjusted. On an adjustable shelf, which can be raised or lowered, is located the ground glass, kerosene lamp, and reflector. The center of the lamp flame reflector, negative, and the lens of the camera should be in one focal line.

The ground glass in front of the lamp diffuses the light equally over the negative; an ordinary magic lantern condenser may be used in place of the ground glass, thereby materially decreasing the time of exposure.

Our picture shows the operator in the dark room in the act of obtaining a focus; the room is supposed to be closed to all outside light except that which comes through the lens, and the enlarged image of the negative is seen very distinctly upon the ground glass of the focusing board. The saddle is moved back and forth until the correct focus is obtained, as, for instance, when the hair of the head or the pupil of the eye looks sharp and distinct.

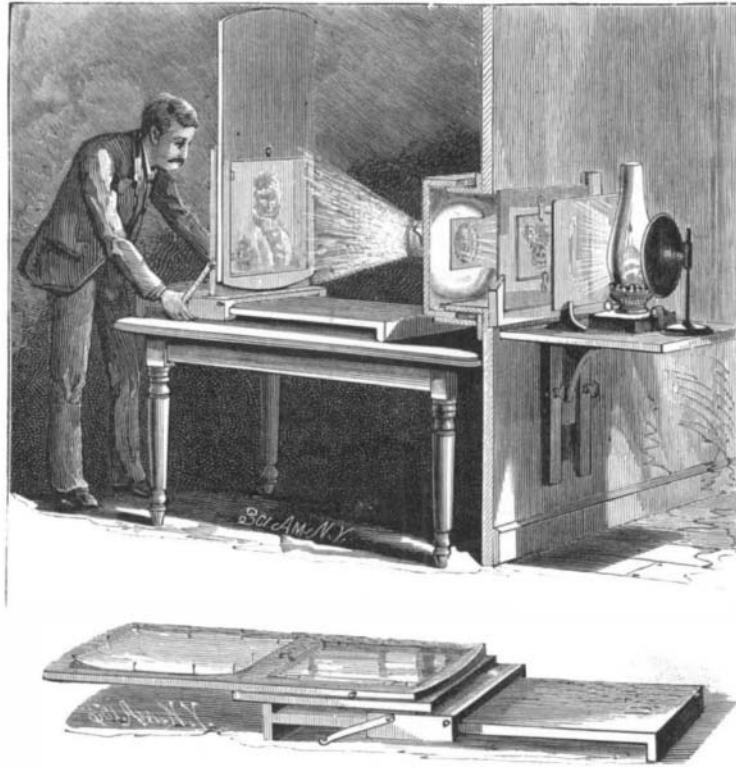
The picture appears very soft, and viewed at a little distance shows a remarkably pleasing, crayon-like effect. The size of the enlarged image may be regulated by varying the distance between the lens and the negative. Our lower engraving illustrates the method of exposing the enlarged negative image upon the sensitive paper, showing how the operation can be carried on in one room. The amateur photographer only needs to provide a board having vertical wings or sides which fit tightly around the sides of the back of his camera, allowing the bed of the same to slide in and out easily. A frame holding the negative is secured to the back of the camera in place of the usual ground glass, the latter is suspended just back of the negative, and at the rear end of the wings is located the lamp with reflector inclosed in a metal box. The arrangement is clearly shown in the small cut.

Holes are made in each side of the lantern box at the top and bottom to admit a free circulation of air, and are protected from the light by interior deflectors. A door at the rear end of the box allows the lamp to be removed. A tin cracker box can be successfully arranged to hold the lamp.

The space at the top between the rear end of the camera and the top of the lantern box is covered by a velvet or other black cloth, to exclude the light. As before stated, the center of the light, negative, and lens should be in one focal line.

Having obtained the correct focus on the ground glass on the focusing board, the operator covers the lens with a cap of ruby glass, turns the ground glass end of the focusing board up, and fastens on the lower portion, in proper position, the sensitive sheet. When the sheet is rightly located the book may be unlatched and the board turned flat, as shown, so that the paper may be more easily pinned to the face of the board; the latter is again raised, secured, and

made ready for the exposure. As a vignetted picture is the most pleasing, and can be easily made, the operator needs to provide before exposure a cardboard having a notched oval aperture which, during the exposure, is held between the lens and focusing screen as shown. Looking upon the screen the dull red enlarged image may now be seen, but the moment the exposure is made by removing the red cap from the lens, the picture becomes suddenly bright and brilliant. The operator then moves the vignetting card to and from the exposed sheet, thereby decreasing and enlarging the vignetting circle. In this way the beautiful soft blending so characteristic of vignetted pictures is easily

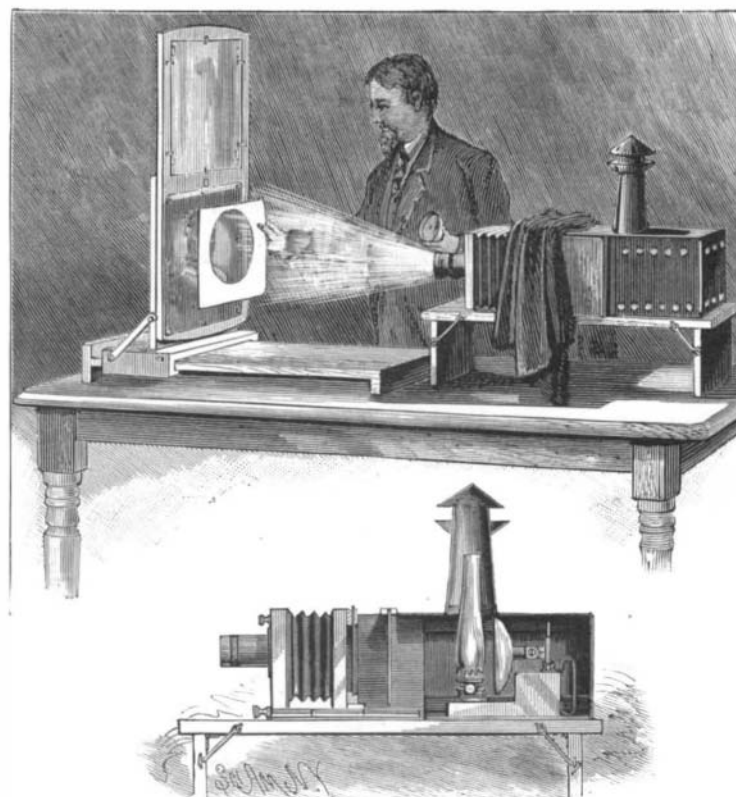
**PHOTO-ENLARGING APPARATUS.—OBTAINING THE FOCUS.**

produced. With a lamp like a No. 3 Leader kerosene burner, giving a flame about $3\frac{1}{2}$ inches wide by $1\frac{1}{2}$ inches high, and of about 26 candle power, an exposure of four minutes has been found sufficient. The exposure may be quickly stopped by replacing on the lens the red cap.

The exposed sheet, with the latent image impressed thereon, should now be removed to a light-tight receptacle, where it may remain ready to be developed at the convenience of the operator.

Full directions in regard to exposure, development, and fixing are sent by the manufacturers of this gelatine paper.

As the process is so simple and the manipulation so cleanly and easy, nothing could be more pleasing, interesting, and instructive to the amateur than to amuse himself by enlarging as described.

**PHOTO-ENLARGING APPARATUS.—MAKING THE EXPOSURE.**

The pictures are permanent, possess a soft, crayon-like appearance, and when finished form a beautiful adornment for one's walls.

Gelatine rapid printing paper is likely, therefore, to come into extensive use, and we predict for it a brilliant future.

SIR JOHN HERSCHEL first produced the tints of the spectrum on a daguerreotype in 1839.

Art Study.

An address was recently delivered by Professor W. Boyd Dawkins, F.R.S., at the distribution of prizes to the students of the Brighton School of Science and Art. In the course of it he said there were two important requisites or corner stones to the proper study of art. The first was that by which a student was enabled to see things. It was absolutely necessary, before anything could be represented properly, that it should be seen properly. He knew from his own experience that it was one of the rarest things in the world for a man really to be able to see a thing properly. But he did not know that a man could learn to see things outside himself properly better than by trying to represent them. A man could not realize the beauty of a figure or a landscape, unless he had attempted to draw them. Until he had a knowledge of the essentials to the production, until he could pick out the salient points in the landscape or figure, he doubted much whether any man could be said to have seen the one or the other. With regard to the second corner stone, the power of representation, he thought there was as great a dearth in that direction as there was in the power of seeing. He believed that many artists who had reached the highest rank in their profession were deficient in the capacity of adequately representing what they saw. He therefore desired to impress upon the minds of the young art students that their first duty was to represent in their art what they actually saw, and what was true.

They must study the conditions and master the surroundings of the picture which they had to represent, and, above all things, try to be true to nature. The Professor then called attention to a number of rough sketches of animals, fishes, etc., arranged at the back of the platform, which, he said, represented the earliest traces of art known in Europe. Pointing to one sketch, that of a reindeer feeding, he said his audience would notice that the outline was wonderfully well done. Its unmistakable contour was clearly defined, and was altogether a piece of true art. When they saw such a figure they were perfectly certain that the individual who drew it represented exactly what he saw. Yet those drawings were originally produced upon fragments of antlers and of bone and little pieces of stone, while the drawing implements those early artists had at their command consisted only of rude splinters of flint. Those drawings also indicated that the young artist should not begin with the brush, painting away with indistinct outlines, but first try to represent objects by bold outlines, which, he believed, was the best way of arriving at a thorough mastery of art.

In conclusion, the Professor stated he would say a few words regarding some other things. He thought there was in this country most unfortunately an antagonism existing between handwork and headwork. In this country there were two distinct lines, if he might so put it. There was one which he might call the professional line, where it was considered a very fine and estimable thing for a man not to work with his hand, but with his head or pen. That antagonism seemed to him most unfortunate, and he thought all students should bear in mind that it was a thing which really ought not to exist. It would not exist if it were not for an intensity of vulgar prejudice. He would say that the old craftsmen of Italy, those men who were the builders of Florence and other great cities, were men who had no prejudice of that kind, and he thought that, if they really wished to do their work in the world, they must get rid of that absurd and ridiculous prejudice as quickly as possible. The work truly done was equally noble, and the man who made a table to the best of his ability was equally great, as far as his work went, with the man who painted a beautiful picture or composed a beautiful piece of music. That consideration led him to another point, and that was—What was to be the end of all this higher education? It seemed to him that if the end of it all was the production of more professional men—more doctors, more lawyers, more clergymen, more professors, and more clerks—the less they had to do with it the better. The professional classes were being overstocked, owing to that vulgar prejudice, and if education was to be of any good it should aim at making a man better fitted to carry on his work in the world than he was before.

His opinion was that the best education was that which would make a man better at his handicraft. If a man had the chance of pushing forward in the world let him do so, but if he tried to get out of his own line of life let him do it at his peril. It appeared to him a most ridiculous thing that a man who knew a great deal of Latin, or geology, or chemistry, should on that account think himself entitled to be supported by the State. The education he had in his mind was that which was not confined to the rich, which belonged not to one class any more than the other, but to all, and which would enable all classes equally to do their work better in the position in which they found themselves.