THE ADAPTATION OF MACHINERY TO PHOTOGRAPHY.

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In this age of steam, telegraphs, and photography, when the three most subtle agencies of nature—light, heat, and electricity—have been subdued by man and trained to do his bidding, startling developments and astounding applications in art and science are looked for as an almost daily programme in the great drama. Is it then to be wondered at, that the go-ahead Yankee, in his impatience at the slowness of this "fast" age, should conceive and actually carry out the idea of applying steam power to the production of photographs and should turn them out at a speed which eclipses the boasted rapidity of the "lightning" printing-press?

As an evidence that this may be and even has been accomplished, I have the pleasure of presenting for the inspection of the society, this evening, several specimens, among them a sheet containing about three hundred photographs all printed from one negative, at the rate of *twelve thousand an hour!* As astonishing as this speed may seem, I am assured, and from what I have seen, believe, that it may be greatly increased.

The means by which this is accomplished is, simply, the adaption of machinery to the process of printing by development. This process, though little used of late, has certainly produced some very fine specimens, and prints so produced are generally conceded to have the advantage in permanency over the ordinary prints produced by the direct action of light.

The machine is the invention of Mr. Charles Fontayne, of Cincinnati, Ohio, who has spent several years in perfecting it, and the developing process which he uses therewith. I am assured by him that the process by which these specimens were produced is quite different from any other known. but in what this difference consists I am not informed. A negative is fixed in a box, together with a sheet of prepared paper, and the latter exposed by automatic machinery to the condensed light of the sun passing through the negative. After each exposure the paper is traversed underneath the negative, to present a fresh surface for the succeeding impression. These motions, together with that of clamping the negative into close contact with the paper at the instant of exposure, are all performed by the operator simply turning a crank.

The rapidity, at the several times I witnessed its operation, was two hundred impressions per minute, at which speed the time of exposure was but .03 of a second for each impression. The condensing lens being seven inches in diameter, and the circle of condensed light about one and a half inches, the above exposure is equal to .65 of a second direct exposure to the light of the sun. If, therefore, the machine were to be used for a larger class of pictures, such as book illustrations and stereograms, a condensing lens might be dispensed with, and yet nearly twenty-five hundred impressions be taken in an hour.

This opens a field for photography hitherto impracticable in consequence of the time and expense of printing as ordinarily practiced. The illustrations for a book, having all the exquisite beauty and perfection of the photograph, may be turned out, by the use of this machine, with a rapidity wholly undreamed of, either in plate printing or lithography. The expense of engraving may be dispensed with, and the negative come direct from the artist's hands, drawn upon a prepared glass, from which, in the course of a few hours, the plates for a large edition may be printed, each one a perfect duplicate of the original drawing. As an evidence of the facility with which this may be done, a print produced by the ordinary ammonia-nitrate process, from a rough sketch so prepared, is herewith presented. It will be seen that an ease, freedom, and spirit is given to the drawing which cannot be equaled by any process of engraving, and when the negative is properly prepared by an experienced artist, nothing further could be desired for illustrating ideal subjects; but for the actual, and for reproducing the works of others, of course, the draughtsman would give way to the far more truthful camera.

But besides book illustrations and portraits for visiting cards, and advertising purposes, of which specimens are shown, this machine may be applied to the multiplication of stereograms, which, by its use, may be made so cheaply as to bring them into the humblest family, where by their exquisite beauty and truthfulness they will engender a taste for the beautiful and, in time, entirely eradicate the cheap and disgustingly coarse lithographs, engravings, and water-color daubs, which at present form so large a proportion of the pictures within reach of the poor.

When these new adaptations of photography shall have been fully accomplished, then shall our noble art, which has already done more to develop and elevate the taste of the present generation than any other one instrumentality, take a stand by the side of its great sister art—Printing—and, hand in hand, will they go forth to educate, enoble, and elevate mankind.

The pictures herewith presented possess additional interest to this society, from the fact that they are taken upon ordinary American writing paper, which was not prepared specially for photographic purposes. Mr. Fontayne first used this paper in his experiments on account of its cheapness, and, having become accustomed to it, he now prefers it to any of the foreign photographic papers. In the course of his extended experiments, he has used almost every variety of American paper, including that made from straw, manilla and cane, with varying degrees of success, and he promises at some future time to present the result of these experiments to this society.

THE PROFITS OF THE ROCK OIL BUSINESS.

The artesian wells in the oil regions of Pennsylvania continue to yield their valuable product, and the sinking of new wells is being pushed forward with eagerness and rapidity. Thomas A. Gale, a resident on Oil Creek, has written a book on the subject, which has been published by Sloan & Griffith, of Erie, Pa. It furnishes the following facts in regard to the cost of digging and working the wells:—

The average cost of digging a well 200 feet deep is from $600 to $700. When there is oil enough to pay, a pump and steam engine to work it are wanted, with an oil vat and sheds to cover the whole. All this will make the outlay from $1,000 to $1,500. The cost of some wells, when ready for working, reaches $2,000. A great margin is needed for what are called "accidents" and "bad luck," but what is, in reality, the result of inexperience in a new business. When a good paying well—a "10-barrel well"—is once ready for working, the expense is light. A very small steam engine requires about two cords of wood a day, and three "hands" are all that are necessary. The following is—

A Calculation for a Twenty-barrel Well.

Three men's wages	$3 00
Two cords of wood	3 00
Twenty barrels	30 00
Carting to railroad	20 00
Freight to New York	9 00
Interest, repairs and sinking fund	75
Total	$65 75
Amount of sales, at 40c. per gallon	$320 00
Deduct cost	65 75
Daily profits	$254 25

From a well of moderate pretensions, the oil can be raised, barreled and freighted to New York for about 12½ cents per gallon.

THE "LAST" MANUFACTORY AT RICHMOND.

A manufactory of lasts and boot-trees has lately been been put in operation in Richmond, Va., being the first of the kind ever established there. The proprietors, Wortham & Co., get their persimmon logs from the Chickahominy Swamp, and some of them are of such a size as to yield 500 pairs of lasts. The Richmond *Enquirer* thus describes the manufactory:—"Outside the door of a frame building you will find two men with a cross-cut saw cutting great persimmon logs into lengths of from 12 to 16 inches; these lengths are transferred to the frame building, where they are split into chunks, and these chunks being hewn with an ax into a very rough outline of a last, are put into a drying kiln, out of which they come in ten days, hardened and ready for the lathe. The lathe is worked by steam, and consists of a frame about three feet high, two feet wide, and five or six feet long, and so constructed that one of the dried chunks, being put near one end of a horizontal axle, is shaped by a knife into a form exactly corresponding with a pattern last placed on the other end of the same axle. The chunk, thus shaped, is removed from the lathe; and the heel and the toe being trimmed, it is then filed, polished off, and the last is complete."

JUDICIAL DECISIONS IN THE GREAT SEWING MACHINE WAR.

The following are decisions rendered on a final hearing on pleadings and proofs in five sewing machine cases which were argued in June last, by George G. Sickles and C. A. Seward for the defendants, before Justice Nelson (Judge Smalley sitting with him), at Cooperstown, N. Y. The arguments occupied about two weeks, and the cases have since been held under adviser ent by the court. The testimony was very voluminous, amounting to nearly 2,000 pages in print. The opinions of the court contain all necessary particulars to enable the subject to be understood:—

UNITED STATES CIRCUIT COURT,
SOUTHERN DISTRICT OF NEW YORK.

1. *Orlando B. Potter and Nathaniel Wheeler vs. James G. Wilson and Alexander C. Stockmar.* 2. *The same vs. George B. Sloat and others.* 3. *The same vs. John B. Gibbs.*

[In Equity.]

Nelson, C. J.—These suits are founded upon two reissued patents to A. B. Wilson, for improvements in the feed-motion of a sewing machine. The original patent for the invention was granted 12th November, 1850. It was surrendered, and two re-issues, numbered 345 and 346, were allowed thereon, both bearing date 22d January, 1856; 345 was subsequently surrendered, and re-issued 9th December, 1856, numbered 414.

Previous to the invention of Wilson, as claimed by the plaintiffs, the material to be sewed had been advanced under the needle or sewing apparatus by the hand of the operator, or fixed permanently to a frame, called, in technical language, a "baster-plate," which was advanced with the cloth by a regular progressive motion to the needle through the agency of suitable machinery. By the former process (feeding by hand), the cloth could be turned at will, so that seams of any given curvature could be sewed; but there was no security for regularity of stitch, except the care and skill of the operator. By the latter, the regularity of stitch was attained; but, from the permanent attachment of the cloth to the baster-plate, a seam with curvatures and angles, at the will of the operator, as the sewing progressed, could not be formed. The object of the improvement in question was to remedy these defects, by causing the cloth to be moved automatically under the needle, and the device so arranged as to admit of seams of any curvature, and, at the same time, secure regularity of stitch. This Wilson accomplished by the machinery and process described in the specification of the patent.

Instead of the baster-plate, the cloth was advanced under the needle mechanically, according to the arrangement, by the joint action of two surfaces between which it was held, an intermittent motion being given to at least one of them, which caused the cloth to progress regularly, securing uniformity of stitch, and, at the same time, permitting the material to be turned by hand so as to sew a straight or curved seam.

The claims in the re-issued patents (numbered 346 and 414), which are in controversy in these suits, are all founded upon this feed improvement upon the previous sewing machines.

The utility of the improvement is admitted; indeed, it is apparent that, without it, or some equivalent which would admit of curved seams to be sewed automatically, the sewing machine, now in almost universal use, would have been comparatively very limited in its operation. It is insisted, however, that Wilson was not the first and original inventor, which objection raises the principal question in these cases.

The persons mainly relied upon—and, indeed, the only persons that can be relied upon, according to the proof, with any plausibility—to prove priority of invention, are Wm. H. Akins, of Ithica, and Leander W. Langdon, of Rochester, N. Y.

The proof is very full and satisfactory that the invention of Wilson was so far matured as to admit of sewing curved seams by way of experiment, as far back as 1848. In April, 1849, its peculiarities were noticed in the Berkshire *Culturist*, published at Pittsfield, Mass.; and in November of that year, a more extended notice of it, with full lithographic prints, was given in the SCIENTIFIC AMERICAN, published in New York and Boston.

Akins himself has been examined as a witness in these cases upon the question of priority of his invention, and he does not carry its date further back than the latter part of the year 1850. He had made, previous to this examination, three affidavits on the subject, but in neither of these does he state that his improvement extended back to 1848; the farthest his affidavits carry its date is the Fall of 1849. And over and above this testimony, the clear and decided weight of the proof confirms the date he gives of the invention, when examined as a witness in the cases, namely, the Fall of 1850. One very decisive fact upon this question is not in dispute; and that is, that the first machine made by Akins after the partnership with Felthousen (which commenced in August, 1850), had upon it the feed of the baster-plate, resembling that of the Lerow & Blodgett machine, which was exhibited in Ithica in the winters of 1849 and 1850.

The feed admitting of curved seams was introduced into the second machine made by him in the Fall of