ROTARY PRESS FOR PRINTING IN COLORS.

A few months ago, when describing Mr. Domery's rotary press for printing several colors simultaneously, we expressed the hope that this would soon be rendered complete, we scarcely suspected that before the end of the year we should see this phenomenon (we might almost say prodigy) of a rotary machine striking off more than a million copies of a journal illustrated with the most diverse superpositions and mixtures of colors, and that, too, without the least admixture and under extraordinary operating conditions. This improvement marks a new page in the history of rotary presses, which we shall sketch in a few lines.

We shall merely speak by way of parenthesis of the first experiments made by Nicholson and Hoe and afterward by Kinsley. The presses devised by these inventors were comparatively crude. The first machine that gave really good results was brought out at Paris in 1867. This was constructed by Mr. Worms, of Argenteuil. At the same epoch, Mr, Derriey sent to the Paris Universal Exposition a machine that attracted much attention by the simplicity and perfect working of its mechanism. Again, another manufacturer, Mr. Marinoni, in January, 1868, installed in the offices of the *Petit Journal* (which at this period was beginning to obtain a large circulation) four rotary presses which were capable, all together, of printing 36,000 copies per hour—a feat that was considered phenomenal at this epoch. From that period, improvements have rapidly succeeded each other, and the presses now employed for the printing of daily papers easily strike off 30,000 copies per hour. Our engraving (Fig. 1) represents a rotary press in operation.

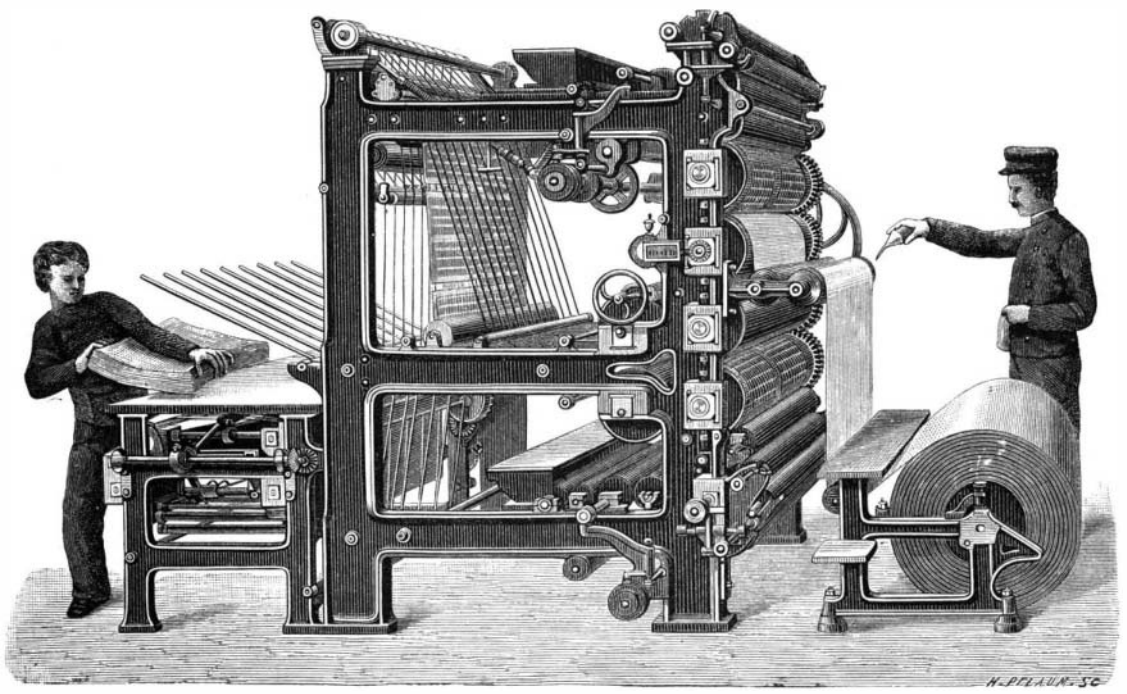

Fig. 1.—ROTARY PRESS FOR PRINTING IN COLORS.

In order that the new machine may be well understood, we give a diagram (Fig. 2) that permits of following the movement of the paper upon the different cylinders, from the starting point of the white paper roller (figured to the right) up to the reception of the printed journal, cut and folded, upon the table to the left. The paper coming from the roller passes under the cylinder, *a*, called the blanket, which presses it against the stereotype plate cylinder, A, which is inked by means of the small rollers shown in the engraving, and prints the recto of the sheet. Thence the paper passes over a second blanket, *b*, which presses it successively against the cylinders, B and C, and gives an impression of the plate upon the verso, and then over the blanket, *c*, and the cylinders, D and E, which continue and finish the impression upon the verso. Then the paper passes between the cutting cylinders, *m* and *n*, whose function is explained in the name. The forward end of the cut sheet is driven toward the folding cylinders, which give it successively two folds and allow it to fall afterward upon the receiving table.

Between the blankets, *b* and *c*, the paper traverses a wide space without being supported. In order to prevent it from undulating, there is arranged in the vicinity of the blanket, *c*, a roller, *r*, that carries balls, *s*, which press against the margins of the impression. As the velocity at the circumference of this roller is so regulated as to slightly exceed that of the printing cylinders, and consequently that of the paper, it results that the latter, far from undulating, will always be somewhat taut, thus securing an exact registering.

From what precedes, it will be seen that the sheet has been printed on the recto by the cylinder, A, and then on the verso by the cylinders, B, C, D, and E, each of which may have been capable of printing a different color, since each is provided with a special inking apparatus.

That is the arrangement adopted, for example, for printing the illustrated supplement of the *Petit Journal*. The recto is entirely reserved for the text, and the verso for the colors. But it is evident that it would be possible to modify this arrangement, and to print in colors on the recto also. It would suffice, in the place of the cylinder, A, to install an apparatus of the nature of the verso cylinders. The press may be arranged for printing two copies broadwise. These copies will then be separated by the cutting disk, which is figured at the top of the last cylinder to the left. It is possible, too, with this press, to obtain a 16 page copy formed of two parts of 8 pages, superposed and folded together with two folds. To this effect, there is arranged above the roller, *r*, a cutting disk, which separates the 8 page parts, one of which descends between the small roller and the balls shown under the cylinders, E and C, while the other entirely covers the cylinder, C, and afterward passes over an arrangement of rods upon which we shall not dwell for fear of complicating our description. On leaving these rods, the band passes successively over two small rollers and finally reaches the cutting cylinders, where it is superposed exactly over the other band. Both descend between the folders after being cut at the same instant. They first receive their first fold, and then their second, and reach the table in the form of a 16 page copy. Still other combinations may be made according to the number of pages that the circumference of the cylinder accommodates. We shall pass them by in silence for fear of tiring our readers. We shall merely allude, in conclusion, to the arrangement that permits of successively printing two colors that are capable of being superposed, with a single stereotype cylinder and a single blanket cylinder. To this effect, there are employed rollers of a width corresponding to a copy—the width of the cylinders being doubled. The band of paper, after being printed, in passing between the cylinders, *a* and A, on their first half, passes over a system of rods (shown to the right of the figure) like the one already mentioned. Thence it returns in passing over two small rollers and engages with the other half of the cylinders, where it receives a second impression upon the same side. It suffices, therefore, in order to obtain two different colors, to divide the inking roller corresponding to the cylinder, A, into two parts.

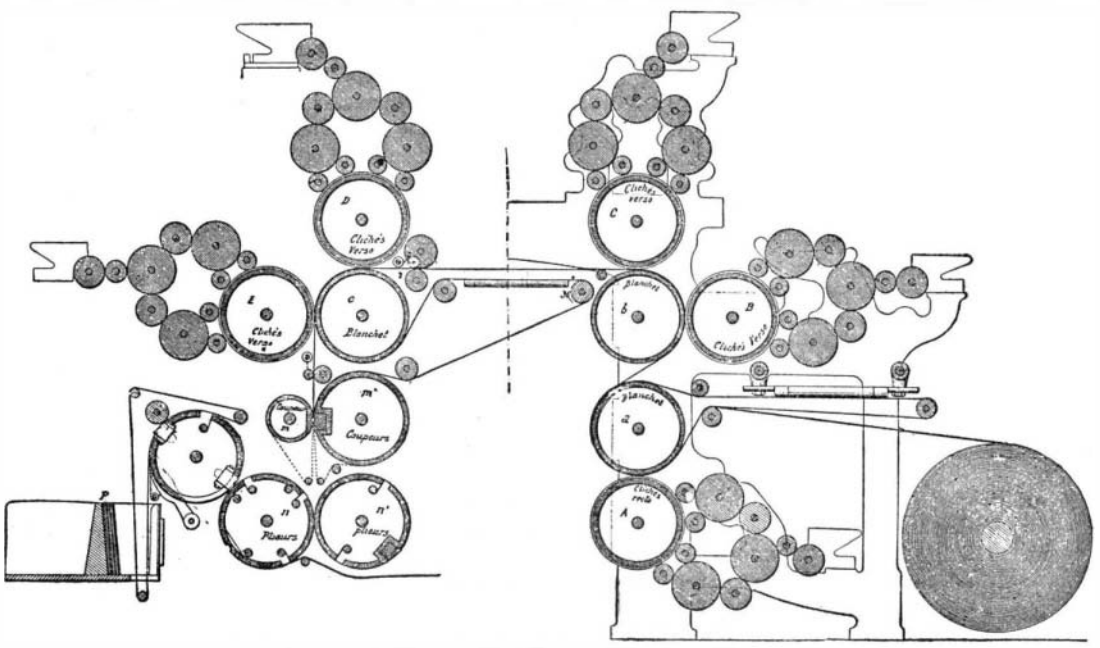

Fig. 2.—DIAGRAM OF THE MECHANISM.

The great difficulty of this system of printing in colors has always been the question of impasting and the quick drying of the colors. The first part of the problem has been solved in the press just described by a special arrangement of the printing plates. Without entering into long details upon a patent which is as yet not made public, we can say that this arrangement consists in striating the plates. The drying of the colors is a more difficult question, at least as regards bright tints. But at the point that has been reached, it may be foreseen that all difficulties will soon be overcome. However this may be, the press, as now being constructed, is capable of rapidly printing a journal illustrated in colors, and a progress is here made that is a new success for rotary presses, and that solves one of the most interesting problems in printing—that of the cheap striking off of illustrated journals.

—*Les Inventions Nouvelles.*

Photo. Transfer.

Place the chromate paper containing the photo. for ten minutes between two sheets of paper which have been saturated in a 1-5 solution of nitric acid in water. Upon the zinc plate place a piece of paper which had been previously soaked in nitric acid, and pull through the hand press, which will cause a slight etching of the surface of the zinc plate. The sheet of paper is taken off and all traces of nitrate of zinc are carefully removed from the zinc plate by means of a blotter.

The photo. is then transferred upon the plate, gummed over, etc. It is then rubbed in with ink, which has to be thinned with olive oil, and when all details appear sufficiently strong, the plate is etched with a preparation made by adding a small quantity of phosphoric acid to a gum solution. When a drop of such a preparation placed upon a polished zinc plate discolors the same and affects its purity, then it is of sufficient strength.

—*Lithographic Art Journal.*

Alternating Currents of High Frequency.

It has more than once been suggested that if we could but construct an alternating machine capable of giving us a frequency of alternations approximating to that of light, we should be able to obtain luminous effects without the accompaniment of heat, and thus obtain an ideal method of illumination. Unfortunately, the limits of the strength of materials, and of the mechanical and electrical means at our disposal, have thus far made the realization of this suggestion impossible. Recent experiments have shown, however, that even with a frequency of alternation far below that assigned to the light-producing waves, important luminous phenomena are observed, and in a recent article Mr. Nikola Tesla gives the results of some remarkable experiments effected with an alternating current of 20,000 reversals per second. In these the condenser action of lamps and conductors is very forcibly brought out, and points to the fact that the condenser will play an important part in the methods of distribution of light in the future, if not, indeed, of power. Referring to the same subject, Prof. Elihu Thomson gives results of experiments made in the same direction, which cannot fail to draw attention again to this subject, and which, taken in connection with the recent inaugural address of Prof. Crookes, illustrate forcibly the tendency of modern work in the attempt to obtain light without heat. Prof. Thomson also contributes a valuable note on the physiological effects of alternate currents of high efficiency, in which it is shown that at very high rates the current is less dangerous than at the lower rates now in vogue.—*Electrical Engineer.*

Stockings of Human Hair.

The Anthropological Department of the Smithsonian Institution has received from Dr. Macgowan a pair of stockings manufactured from human hair. They are worn by fishermen over cotton stockings (being too rough for the naked skin) and under straw shoes as protection against moisture. Hair unsuitable for textile purposes is collected from barbers' shops and sent to a part of the province for manuring rice fields, which, it would seem, are deficient in silica.