

THE DUPLIGRAPH.
BY EMILE GUARINI.

The object of the Dupligraph, invented by a young Canadian, of Montreal, at present engineer of the Addressograph, Limited, of London, is the printing of letters in imitation of those written by the typewriter, the address of the person to whom the letter is to be sent changing automatically in each, and the signature of the sender placing itself, or not, at the end of the document, and the whole in one operation.

The parts employed for the printing include a chase containing the body of the letter, a belt carrying the addresses and the word "Mr.," "Messrs.," "Mrs.," etc., and finally the signature, which is placed mechanically after the chase is raised. The signature may, if desired, be printed with a different ink, and be autographic, or not, or be omitted altogether.

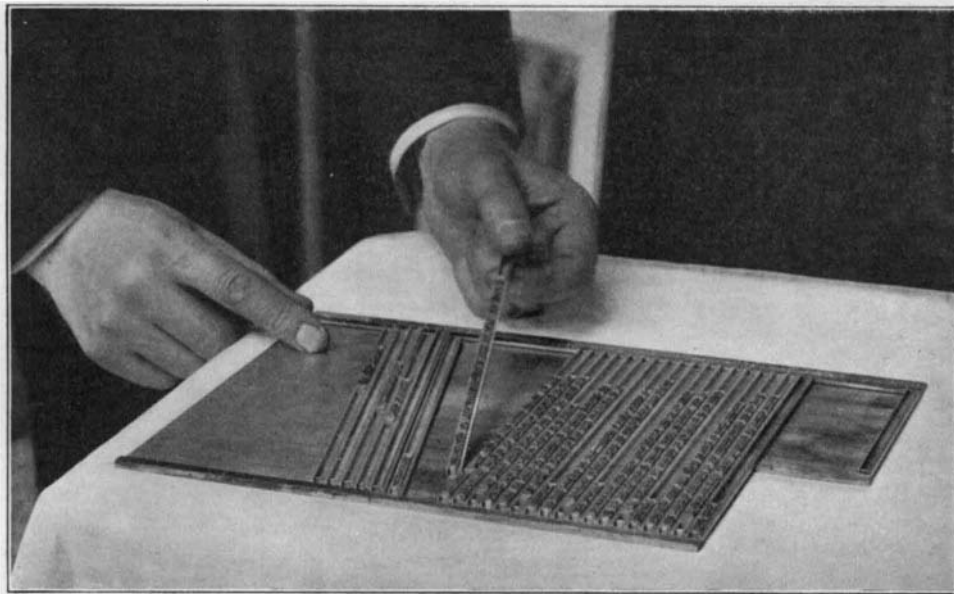
The addresses, which correspond perfectly with the body of the text, since they are printed at the same time and inked with the same roller, are united upon the belt of an Addressograph, a machine well known in America. Upon leaving the machine, the letter is therefore complete. It is possible for each Dupligraph to print 1,000 letters an hour.

We shall not enter into a more detailed description of the machine, since the accompanying engravings show its construction and operation sufficiently well. The lines of types are placed in and removed from the form without any trouble and this permits of rapidly preparing several forms. The form necessitates no other operation for being printed from than that of being slid under the inking rollers, because it fits exactly into the space designed for it. The signature slides in the same way into its support, which may be raised or lowered according to the length of the letter. As for the band of addresses, that is placed upon a channeled and polygonal roller that automatically causes the advance of a new address after each letter has been printed. The mechanism is actuated by an electric motor placed in the foot of the apparatus.

Contrary to what might be thought, at first, the Dupligraph is not a machine designed for printing-

offices, but for commercial houses. It does not necessitate the intervention of a professional typographer, and the modifications to be introduced into the text necessitate no tools nor manual dexterity. The inking is done by special rollers that do away with the inconveniences inherent to inking in the ordinary manner. The corrections and modifications of the text can be effected in a few instants.

The Dupligraph can be used for printing not only circular letters, but also price-lists, memoranda, sheets of instructions, lists, etc. It seems to be particularly



Putting the Type in the Form.

well adapted for the production of prices current, owing to the facility that it presents for the revision and correction of figures when changes occur in the market prices of merchandise.

Upon the whole, the apparatus seems to be destined to render great services in the wholesale trade, and, in general, wherever modifications have to be made in certain parts after each sheet is printed. The use of the Dupligraph can therefore result only in a saving of time and labor, and consequently of money.

The house in which the American flag was born will be reproduced by the Betsy Ross Memorial Association. The original house stands in Philadelphia.

THREE-COLOR PROCESS.

The attempt to print in colors from half-tone plates by means of photographic processes was partially solved by Frederick Ives, of Philadelphia, in 1888. Since that date the process has been improved with gratifying results. The principle upon which it is based is that by a combination of the three primary colors—red, yellow, and blue—almost any shade of color can be produced. Photographic plates that are specially sensitive to color are used. As in the half-tone process, a glass screen is placed in the camera.

Three photographic negatives, each of which is to produce a separate printing plate, are made of the object. In each case a colored glass screen, excluding certain color rays of light, is used in front of the lens. In the production of the plate which is to print the blue ink, a red color screen is employed; to produce the plate for yellow ink, a blue-violet screen is used; and to produce the plate which is to print red ink, a green screen is used.

In printing from these plates great exactness, technically called "register," is required, in order that the colors may be laid on in proper place as the three impressions are consecutively made.

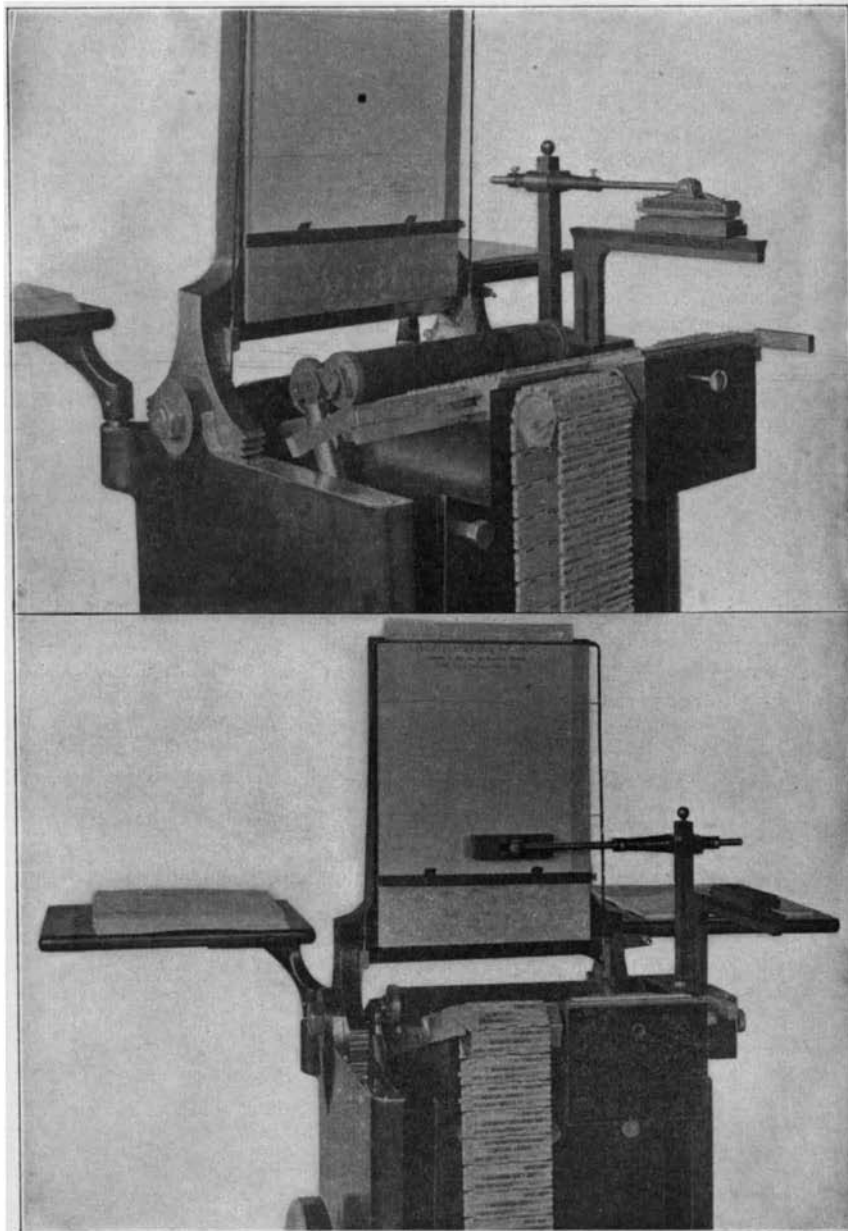
One serious problem which confronted the inventor was the difficulty experienced in so arranging the line screens that the diagonal lines would not form geometric patterns in the finished picture. This was solved by the discovery

that by varying in certain ways the direction of the lines used for the three negatives, the pattern effect could be avoided.

After prolonged tests on the Invalides-Versailles portion of its system the Western Railway Company of France has decided to heat several corridor trains electrically. Each carriage is to be fitted with ten brass foot-warmers, arranged in two groups of five each. These are connected in series across the 550-600-volt supply. Each foot-warmer is 80 centimeters long and 14 centimeters broad. The current consumption per carriage—i. e., for every ten foot-warmers—is stated to be 1,100 watts.



Front View of the Dupligraph.



Inking the Signature Stamp.
Taking an Impression of a Signature.

THE "DUPLIGRAPH."—A DEVICE FOR PRINTING FAC-SIMILE LETTERS, INSERTING NAMES, ADDRESS AND A SIGNATURE.