

MECHANICAL CARTOGRAPHIC LETTERING FOR PHOTOMECHANICAL REPRODUCTION

(From an article by MARSISCHKY, published in "Dr. A. Petermanns Mitteilungen", part 1/2, 1930, page 26.)

(See also *Hydrographic Review*, Vol. VII, N° 1, page 180.)

Nowadays, photomechanical methods of chart production tend more and more to replace the older engraving processes. The printing plate, in this method, is prepared directly from the fair sheet. It is by such means that the Brussels Military Cartographic Institute, for instance, has accelerated the preparation of its printing plates for the 1:20,000 map, while retaining the appearance of copper engraving; the fair sheets are drawn on a scale of 1:10,000 and photolithographic prints are prepared therefrom reduced by half. Large corrections are entered on the fair sheet, this being of an appropriate cardboard, and a brush made of glass is used for scratching out.

The drawback of photomechanical methods consists solely in that the fair sheet must be sufficiently perfect for reproduction; the cartographer who draws it must consequently represent graphically all the conventional signs, the nature of the ground and the lettering as perfectly as would a skilful copper engraver. And thus the idea of intrusting purely mechanical appliances with the preparation of those features has been reached.

In the engraving method, this object is attained by employing engraving machines, and, in the photomechanical process, by the use of lettering appliances. It is precisely the lettering which requires a high degree of aptitude from the draughtsman, for the eye perceives any imperfection, slight as it may be.

The number of geographical names inscribed on a chart of ordinary size often represents, if the names were to be written in sequence, the contents of several pages of a printed volume, and it is conceivable that it would be over-nice to draw typographical characters by hand when good printing type is available to compose them.

With regard thereto, one should recall that the appearance of the letters on the chart depends less on the method employed for drawing them, than on the choice of an appropriate form of typographical character.

In fact, most of the mechanical appliances hitherto constructed use printing type. The diversity of letters as to dimensions, inclination (sloping forwards, upright and sloping backward), the use of different kinds of writing, such as roman, italic, block, hair-line, and skeleton, on the other hand, makes an extensive typographical material imperative, which entails a heavy initial outlay which, usually, costs several times more than the apparatus. There is no doubt that, for most of the cartographic writing employed, appropriate type already exists.

The only reason for which charts in printing type have not appeared to be adequate so far is that the necessary care has not been taken in selecting the type.

By casting a glance at the catalogues of type foundries (for example the special catalogue published by the BAUER Foundry of Frankfort on the Main), it is easy to make a selection, and it is, furthermore, obvious that there would be no difficulty in having these letters prepared by competent type cutters. The missing letters of the smallest founts might even be obtained by photographic reduction of existing letters, followed by chemical etching on zinc.

In his book on cartographic lettering (Supplement 1 to the *Mitt. d. Reichsamts f. Landesaufnahme*, Berlin 1925, p. 40), Dr. Hans FISCHER points out that the typographer may compose the desired names in sequence; a brush proof is run off each composition, this is then cut up and the separate names stuck at the proper place on the drawing. But this process is naturally very irksome and, besides, the edges of the name-labels interfere with drawing and their shadows have to be removed from the negative.

By using mechanical lettering, it is no longer necessary, in making corrections, to draw letters by hand which match artistically the style of the original draughtsman.

But the main importance of the method lies in the rapidity of compilation and the release of trained cartographers who can thus devote themselves to that part of chart making which requires mental effort and is in no way mechanical.

The keeping-up-to-date of cartographic documents daily necessitates more and more personnel, in proportion to the development of the economical life of the world, and this consideration may, to a certain extent, justify a reduction in the requirements as to the aesthetic standard of charts. It is, above all, of importance that a chart be *correct* and clear; the aesthetic side is a secondary consideration.

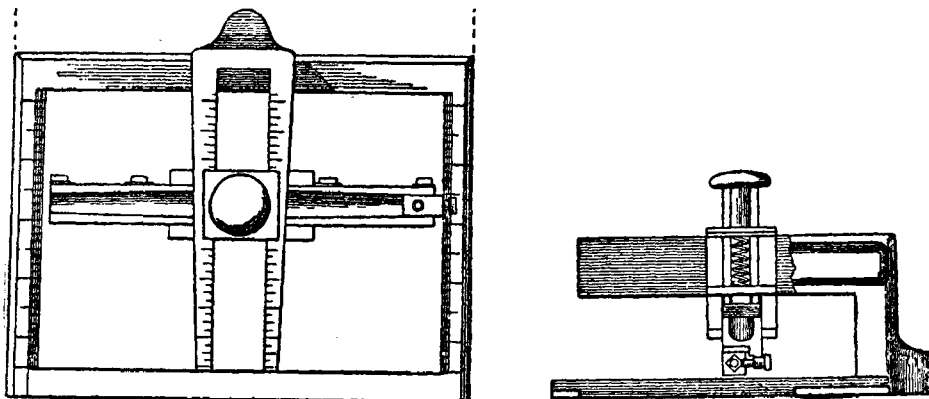
On the other hand, one of the chief difficulties in the employment of typographical characters is the printing of names at the desired place on the drawing, and in being able, when required, to arrange the names not only on a straight line but also on a curved one.

M. R. FLYN LETTER-PUNCHING MACHINE.

Already in 1904, a hand stamping machine, the *Hand Stamp*, had been patented by M. R. FLYN, of Danville, Virginia; with this machine cartographic lettering could be printed on the drawing by means of typographical characters. The construction thereof is very simple and is based on the principle of the autographic signature stamp. The characters are clamped between two springs, are inked with a roller and printed on the paper by pressure on the handle. The shortcomings of this device are immediately obvious: it can be employed for but a single line, and it only takes characters of the same size, for, with smaller characters, the lateral pressure would be insufficient. Besides, the characters are not firmly held, and it must be difficult to align them accurately.

J. D. LODGE PUNCHING MACHINE.

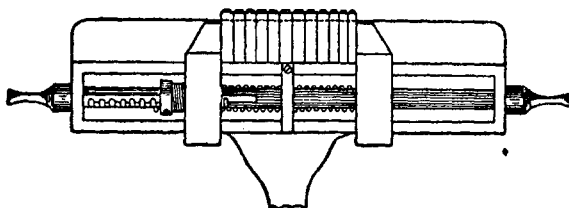
Another hand stamping machine, patented in September 1905, and constructed by J. D. LODGE seems to be of a somewhat better design. A flat horizontal frame carries a rigid metallic arm



ending in the shape of a slide. The essential part of the apparatus, the hand stamp, moves in this slide; this can be shifted backwards and forwards by precise quantities, thanks to divisions on both the frame and the slide. The characters are maintained between two jaws under the pressure device. But, on this account, a check on position at the moment of printing the name becomes impossible, thus greatly lessening the value of the apparatus.

VISIBLE WRITING MACHINES.

Under this heading the Pallet type of lettering apparatus by A. B. GREEK (1916), and a



A. B. GREEK APPARATUS

frame apparatus, the *Elliot Handstamp*, should be mentioned. Both have the great advantage that the characters remain visible during the printing operation, but, on the other hand, they have the common disadvantage that they print the writing in a straight line only and on a single line. Besides the first lacks a pressure spring system; the printing of the name requires heavy pressure and needs a great deal of practice.

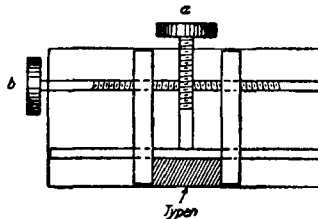
W. M. BLACK AND A. P. MORRIS MACHINE FOR WRITING ON A CURVE.

The firm of W. M. BLACK and A. P. MORRIS of New York, 1910, has placed on the market an apparatus by means of which any kind of name may be printed on a curve. The character-holder is in a steel frame with a pressure device. As the lettering is wedged into the middle of the frame, the adjustment of the name can only be made by means of a sighting device.

(The working speed of these various American machines is 25 names per hour, without regard to dimensions, length of name and the spacing.)

K. WULKOW'S LETTER STAMPING MACHINE.

1. The "Hand stamp for lettering maps and drawings" patented in Germany by K. WULKOW, Berlin-Neukölln, has certain marked advantages over the preceding appliances. The manipulation



is simplified to such an extent that an increased output of 25 per cent is obtained. Moreover, with it names can be printed on several lines in any typographical character, both in straight and curved lines. The method of using the apparatus is as follows:

The characters are put in order of sequence in the stamping apparatus. By tightening a screw, all the characters are brought to the level of the front face, whilst by tightening a second screw, they are pressed on both sides towards the middle of the frame. After having inked the characters, the stamp is turned over and, resting it on its spring feet, it is set at the place where the name is to appear. The front edge of the typographical characters remains visible. If the name has to be on a curve, the appropriate curved form is introduced into the stamp and the characters are pressed against it singly by means of a clamping attachment. The apparatus will work on tracing paper for heliographic printing, and make direct lettering on "alto" printing plates of aluminium, zinc or stone.

2. Another letter-engraving apparatus has been constructed by Dr SPIEWECK and K. WULKOW; like the previous ones, it is based on the use of printing type, but works with drums, mounted so as to revolve, on the rims of which letters in relief have been raised by chemical etching. It is similar to the machine used at the *Norges Geografiske Opmaalning* which has already been described in the *Hydrographic Review*.

The correct spacing of the letters is ensured by the movement of two rulers, and is determined by a special scale. If the operator is acquainted with the rules of cartographic writing, the adjustment may be made by eye alone. The letters may be close to one another or widely spaced as required. The same apparatus may be used for the lettering on the original drawing also, and later corrections may be done on the photogalvanic plate. In this case, the typographical characters are replaced by steel punches which are driven into the copper by light hammer blows. The insertion of very large letters or very heavy type is done first by punching, and then the lines are deepened by engraving.