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E. J. WRIGHT

2,024,840

PRINTING PLATE AND METHOD OF MAKING THE SAME

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Fig. 1.

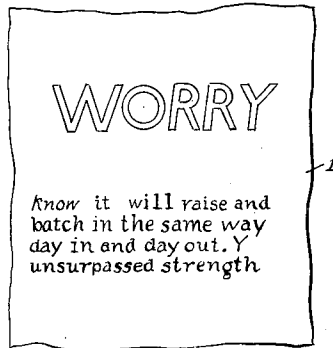


Fig. 2.



Fig. 3.

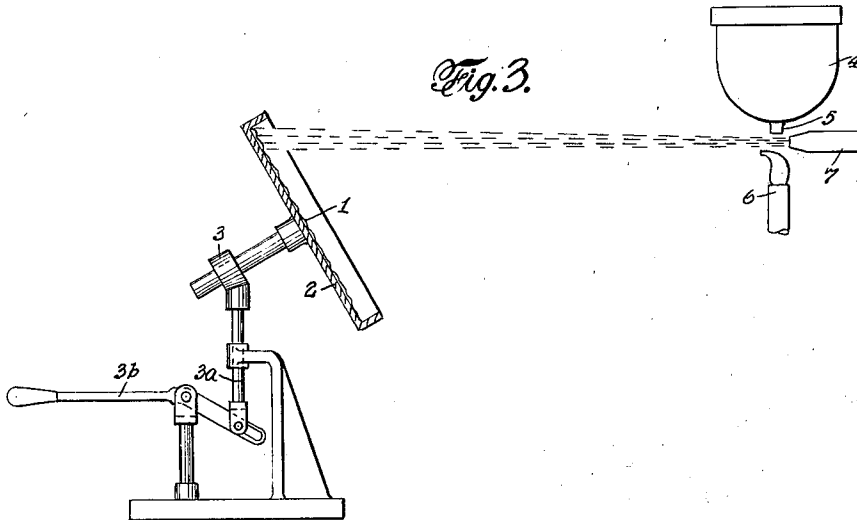
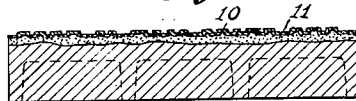


Fig. 4.



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UNITED STATES PATENT OFFICE

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PRINTING PLATE AND METHOD OF
MAKING THE SAME

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Application June 18, 1934, Serial No. 731,050

4 Claims. (Cl. 41—25)

My present invention relates to printing and has for its object to provide a novel method of making printing plates intended to be used in lieu of the present well known stereotypes and electrotypes and the formation of plates which may be made at less cost than those mentioned and which will have long wearing qualities and reproduce details equivalent, if not superior, to the best known printing forms.

My invention has for its further object to procure a form of printing plate that may be manufactured economically with the utmost fidelity to the finest detail existing in the master, be it type set in the first instance, or a fine line half tone reproduction on zinc or copper. To these ends my invention comprehends first making a matrix from the master and spraying thereon a liquid material of suitable composition which possesses the capability of hardening to furnish a sufficiently hard wearing surface for printing. Molten metal composed of the proper alloy at such a temperature and in such quantity that there is formed a comparatively thin shell which becomes the type plate or printing surface is particularly adapted for the purpose but there are now available other non-metallic substances such as phenol condensation products, often generally referred to as "bakelite", with which very excellent results can be obtained according to my invention.

Following the formation of the shell I then apply to it a backing by a continuous spraying of either the same material or another material of cheaper composition to form a body which is stiff enough to be self-sustaining and which can be removed from the matrix without distortion. To this body I supply a suitable backing to afford a support that will give the required height to the type for printing purposes.

To these and other ends my invention consists in further improvements and combinations of parts all as will be more fully set forth in the following specification, the novel features thereof being pointed out particularly in the appended claims.

In the drawing:

Fig. 1 is a face view of a matrix formed from hand set type.

Fig. 2 is a sectional view of the matrix.

Fig. 3 is a diagrammatical illustration showing a matrix mounted in position for rotation and receiving the spray line from a suitable gun or source of supply of liquid material.

Fig. 4 is an enlarged cross-sectional view of the

completed printing plate formed according to my invention.

Similar reference characters in the several figures indicate similar parts.

In carrying out my invention I first produce a matrix such as illustrated in the fragmentary view Fig. 1. This may be made in a variety of ways and any suitable material may be employed which is sufficiently heat resisting to withstand the temperature of the metal sprayed thereon, but as this is applied in such minute particles a high degree of non-friability is not required, if molten metal is the material sprayed, and a wide latitude of materials is available. In other instances I may use papier mâché or I may form the matrix by spraying molten metal, or a phenol condensation product on the master. In the case where the matrix is made of sprayed metal I use a metal of the same characteristic or one which has a higher melting point, and lay it on in sufficient thickness to form a body that may be stripped from the master. I have also determined from practical experience that in the majority of instances satisfactory results may be obtained by using a cold soft lead plate and compressing it under sufficient pressure against the master to impress all of the lines which it is desired to print in sufficient depth to afford the necessary clearness and sharpness to provide clear-cut printing work in the finished plate. In order that the lead plate may not be distorted in handling it I spray its outer or back surface with a sufficient quantity of metal to afford the desired stiffness so that it will be maintained in a perfect plane. However the matrix may be formed I mount it in its complete condition in a suitable frame or holder 2 supported for rotation in an inclined position at about the angle shown in Fig. 3. If desired the matrix holder may be mounted on an inclined bearing 3 and slowly rotated by hand while receiving the application of type metal. In the cases of large matrices provision is made for moving or shifting the position of the journal as the work progresses.

The next step in the process consists in spraying the material which is to comprise the working or printing face, corresponding to the original type faces, onto the matrix. This material which I may vary in composition according to the work to be performed, generally referred to as the number of runs in thousands of copies to be printed, is reduced to a liquid state in a pot 4 which, in the case of metal, is a suitably heated retort. The latter is located a short distance in front of the matrix holder and in its bottom is a discharge nozzle 5 from which a fine stream of material 55

emerges into the path of an air jet emitted from another nozzle 7 located at one side and below the nozzle 5, and pointing in the direction of the matrix. Either air or gas, or a mixture of both, impinges against the descending stream under sufficient pressure to cause said stream to be finely divided, or atomized, and directed against the matrix. When the printing surface is made of metal I consider it important that the metal be deposited at a temperature which permits it to be subdivided into very fine particles which succeed each other at such a rate that they coalesce in intimate contact with the face of the mold or matrix. This temperature may in part be controlled by a Bunsen burner 6 located below the nozzle 5. Care exercised in this particular results in the formation of a thin shell or skin, the contacting face of which takes up or fits into the minutest lines or markings on the matrix. This skin or shell is indicated by 10 in Fig. 4, where it is shown somewhat enlarged, and when desired may be made of a material of special composition to give a hardness that will render long life to the printing surface. In practice I coat the entire face of the matrix in the manner described and when the skin or shell is completed I next give it a backing as indicated by 11 which may vary in thickness according to the size or area of the matrix and in any event is sufficient to add enough rigidity to the shell to maintain its printing face, in the case of flat plates, in a true plane. In the case where a matrix is curved to the contour of the printing drum of a cylinder press, as will be understood, the added material is likewise sufficient to maintain this curvature. In applying this backing I may flow a composition of cheaper material directly on top of the shell, in its inverted position, if the matrix is of large size, but in practice I find that for matrices for book plates of the ordinary size it is not uneconomical to apply the backing on the shell by a continued spraying operation. This may be done quickly after sufficient time has elapsed to allow the shell to become thoroughly hardened by increasing the rate of flow of the material from the pot 4.

When the shell 10 has been strengthened to the required point it may then be separated from the matrix, placed in a casting box and a further backing of metal applied to bring the printing plate as a whole to the required depth of the usual

printing type. In cases where the plates are to be mounted on wooden blocks or supports the backing 11 is then made to the required thickness, the edges trimmed and the rear surface machined to give it a level surface parallel to the printing face.

What I claim is:

1. The method of making impression surfaces consisting in producing a matrix of a printing surface, rotating it in an inclined plane and during rotation spraying its surface with liquid material capable of hardening until a substantial body of type material is built up and subsequently applying a supporting backing to the deposited material.

2. The method of making printing impression surfaces consisting in producing a matrix of a printing surface, rotating it slowly in an inclined plane to expose the sides and bottom of the undercut portions and during rotation spraying a thin deposit of molten metal upon the entire face of the matrix, subsequently building up the thickness of the deposit by continuing the spraying to the point where a self-sustaining body is created and thereafter applying a supporting backing to said body.

3. The method of making printing impression surfaces comprising the setting up of a master, making a matrix of a soft metal by compressing it upon the master, thereafter applying liquid material capable of hardening in a finely divided spray to the rear face of the matrix to stiffen it and similarly spraying the front face of the matrix to form a printing plate and backing the latter with a suitable support.

4. The method of making printing impression surfaces comprising the setting up of a master, applying thereto a sheet of soft lead and compressing it upon the master and thereafter spraying the rear face of the matrix thus formed with molten metal in a sufficient quantity to form a self-sustaining body capable of separation from the master without distortion, subsequently spraying the front face of the matrix with molten metal to form a shell and thereafter applying a backing forming a support for said shell sufficient to permit its removal from the matrix without distortion.

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