April 19, 1932. M. M. LEFTWICH 1,854,552

METHOD OF SETTING RULES FOR PRINTING

Filed April 7, 1930

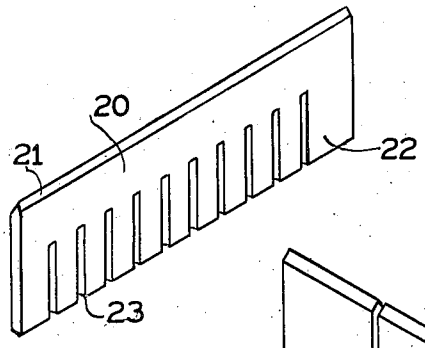


FIG. 1.

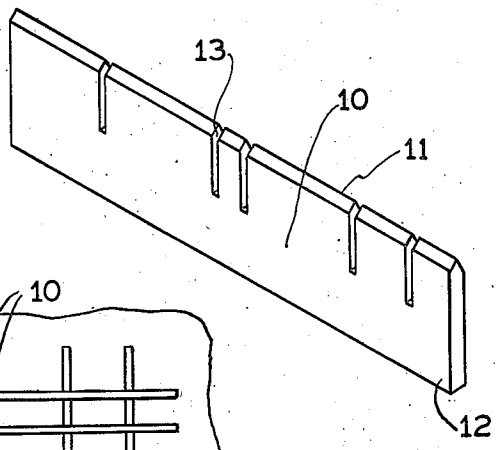


FIG. 2.

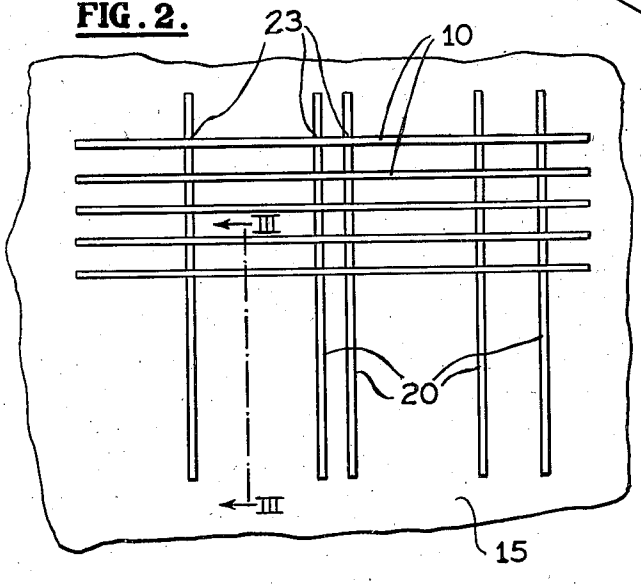
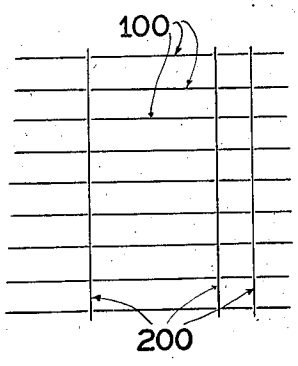


FIG. 4.



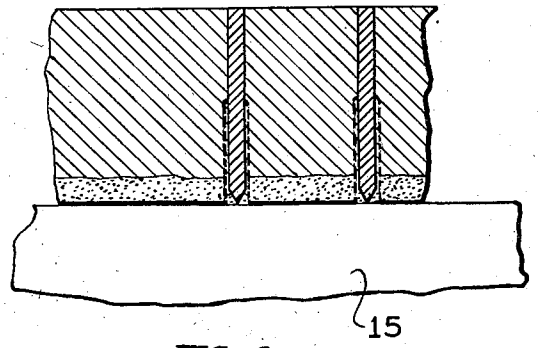


FIG. 3.

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METHOD OF SETTING RULES FOR PRINTING

Application filed April 7, 1930. Serial No. 442,233.

This invention relates to printing plates for printing designs made of thin lines, and more specifically to printing straight lines either horizontal or vertical of the sheet, or both.

The objects of this invention are to produce a printing plate for printing a line or a plurality thereof on a sheet whereof the usual form is that of a plurality of lines spatially related in both horizontal and vertical directions of the sheet, such as sheets for bills, financial statements, ledgers, and the like; which plates may be made of materials not now used for this purpose; which may be quickly made with the spaces between the lines of any predetermined value; which plates are made without the use of molds; in which the body of the plates is entirely nonmetallic, the only metal used being the printing edges, which plates, therefore, require only thin metal strips for forming the line-printing elements; which avoid the necessity of melting metal parts or of applying temperatures in manufacture differing from normal room temperatures; which plates may be made more rapidly and with less manufacturing equipment than is now possible for production of plates which make similar imprints on sheets, and the production of which plates is far less costly than that of any other type or character of plates for making similar imprints now known to applicant.

Other objects will appear as this description proceeds.

Briefly, this invention includes the use of thin strips, preferably of metal, one edge whereof has the exact thickness required for the thickness of the lines to be printed, and the width of the strip being substantially equal to the thickness of the plate. These strips are set edgewise on a planar surface, being spaced as desired, and the plate is made by pouring in, around and between the strips some substance which is initially plastic and which later hardens or sets, thereby anchoring the strips in the desired position with their printing edges all in one plane and having the desired thickness. Wherever the printing strips cross each other, they are slotted as is usual from opposite edges toward the middle of the strip width, which character of construction is well-known.

The plastic self-hardening substance which anchors the strips and with them makes the complete plate, must, of course, be thinner from the back to the front than the width of the strip, so that no portion of this hardened material may touch the paper and make an imprint thereon. Different methods may be used to limit the thickness of the hard material, as later set forth herein.

With the foregoing and other objects in view, the invention consists in the novel and useful formation, construction, interrelation and combination of parts, members and features, as well as mode and methods of use thereof, and steps and performances taken and had, all as hereinafter described, shown in the drawings, and finally pointed out in claims.

In the drawings:—

Fig. 1 shows an isometric perspective view of two line-printing strips notched for assembly in directions transverse to each other for making a printing plate having both horizontal and transverse lines.

Fig. 2 is a plan view showing the rear surfaces of a plurality of horizontal and vertical strips interlocked together and placed on a flat assembly support or plate.

Fig. 3 is a fragmentary vertical cross-sectional view taken along line III—III of Fig. 2 and drawn to an enlarged scale.

Fig. 4 shows a typical form illustrative of the character of the imprint made from the line-printing plates.

In Fig. 1 "10" and "20" each designate a single strip having thin beveled printing edges "11" and "21" respectively and rear or butt edges "12" and "22" respectively. Slots or notches "13" are made in strip "10" from the printing edge toward the middle, while in strip "20" notches "23" are made from the butt edge toward the middle, as indicated. Obviously, the notches in strip "10" interlock with those in strip "20", there being a strip similar to strip "10" for each of the notches "23" in strip "20" and there being a strip similar to "20" for each of the notches "13"

in strip "10". As is customary in such interlocking notches, the sum of the depths of any two cooperating notches equals or exceeds the width of the strip.

In making up a printing plate, the strips are laid together as shown in Fig. 2 on a planar surface "15". If the butt edges of the strips lie against the assembly surface "15", a plastic material may be poured in between the strips and around them and in an amount sufficient to nearly reach the top of the thin printing edges of the strips, but insufficient to project as high above the assembly surface "15" as the thickness of the strips, or the strips may be laid together with their printing edges downward against the assembly surface "15" and a thin layer of some easily removable and cheap material may be poured or placed between and around the strips against the surface "15" as indicated at "14" in Fig. 3. On top of this layer "14" of material first placed or poured on to surface "15", the plastic substance "16" which subsequently hardens is poured filling up the interstices between the several strips. When this second material "16" hardens, the entire unit is lifted from assembly surface "15" and the removable layer "14" is shaken or pulled out leaving the printing edges of the strips "10" and "20" projecting beneath the surface of the plate "16".

There are, of course, many fillers to fulfil the purpose of "14" which is simply to prevent the hardened substance constituting the plate from reaching a thickness equal to the width of the strips or bars, such as sand, chalk, powdered charcoal, sawdust, or any finely divided substance which may be simply shaken out, or wax, paraffine and the like which may be pulled out from the openings formed by the intersecting bars, or the limiting layer "14" may be entirely omitted, the hardening substance poured in, and the upper surface thereof merely spooned or scooped off while it is still soft. The substance of which the plate is made and indicated by the numeral "16" in Fig. 3, is preferably an earthen substance which is cheap, light in weight, easily mixed, and preferably rapidly hardening and also has the characteristic of taking a set or becoming hard at printing-room temperatures. Preferably it does not shrink when it hardens, but holds tightly to the strips and anchors them in position. As examples of such substances are artificial stone compositions, which are chiefly of cement or plaster of Paris, or a mixture of the two, or other similar earthen self-hardening material. Obviously such materials are far less costly than metals, require no heat application at any time, either when mixing, placing or hardening, and weigh much less than metals, so that there is a considerable money saving in using such materials, as well as that of the cost of making molds for pouring metals, and the cost of melting and pouring as well as that required for equipment for melting and pouring metals, and when a number of such plates is stored away, the investment and the weight to be supported on shelves or in any other manner are both much less than for metal plates.

Having described my invention in connection with illustrative embodiments, forms and arrangements of parts, it will be understood that many variants thereof are possible to those skilled in the art, and my invention, in its broader aspects, is not limited to the particular construction or application herein shown and described, as changes in size, proportions, configurations, arrangements, assemblage, interaction, juxtaposition and mechanical relations, as well as additions, omissions, substitutions, combinations and alterations of forms, parts, members, features, and in the kind and order of operations and successive steps, may be made without departing from the broad spirit of this invention.

What I claim is:

1. The method of setting rules for a set of parallel lines crossing another set of parallel lines comprising the following steps; taking the rules for printing one of the sets of lines and bunching them together with their printing edges in a single plane; notching all of the aforesaid rules from their printing edges at desired points; taking the other set of rules and bunching them together with their back edges in a single plane; notching all of the last mentioned rules from their back edges at the desired points; said depths of the notches in the two sets of rules totaling approximately the depth of the rules; placing the last mentioned rules in spaced parallel relationship with their printing edges upon a horizontal flat surface; separating the other set of rules in spaced parallel relationship and at right angles to the first mentioned set of rules; the printing edges of the last mentioned rules being faced downwardly whereby interlocking of the rules will occur; sprinkling a granular substance down into the interstices of the grid work of the rules; inserting hardening means above the granular substance; allowing the same to harden; and then lifting the grid of rules from its supporting surface.

2. The method of setting intersecting rules for printing comprising, notching one rule from its printing edge to a point about halfway therethrough, notching the other rule from its back edge to its halfway point, fitting these notches together so that the printing edges of both rules are in substantially the same plane, resting the printing edges upon a smooth flat surface so that the printing edges are in exactly the same plane, sprinkling a granular substance down into the several rules, forcing a hardening plastic down upon the granular substance and

around the several rules, permitting the same to harden, and then lifting the several rules and shaking the granular substance from therebetween.

3. The method of producing a plate for making a linear imprint, including providing a thin metallic strip of a predetermined length and width, said width being substantially equal to the plate thickness, one edge of said strip being of the thickness required to print a line of the desired thickness, placing an edge of said strip on a surface, pouring a plastic substance adapted to harden around said strip and limiting the thickness of said substance so that it is less than the width of said strip.

4. The method of producing a plate for making a linear imprint, including the provision of a thin metallic strip of a predetermined length and width, said width being substantially equal to the plate thickness, one edge of said strip being beveled to the thickness required to print a line of the desired thickness, placing an edge of said strip on a surface, placing a thin layer of removable material on said surface around said strip, then placing a second layer of a plastic self-hardening earthen substance on said first layer around said strip until the upper surface of said second layer is approximately flush with the upper edge of said strip and finally removing said first layer after hardening of said second layer, thereby leaving a portion of said strip extending beyond the surface of said second hardened layer.

5. The method of producing a plate for making a plurality of linear imprints, including the provision of a plurality of thin metallic strips all of corresponding predetermined width and each to a predetermined length, one edge of each of said strips being beveled to the thickness required to print a line of the desired thickness, placing said strips edgewise on a surface in predetermined spatial relationship, then placing a layer of a plastic self-hardening earthen substance between and around said strips, the thickness of said layer of the plastic substance being made less than the width of a strip.

6. The method of producing a plate for imprinting a plurality of longitudinal and transverse lines whereof some intersect others, comprising the following steps: the provision of a metallic printing strip for each of said lines to be printed, all of said strips being made of identical width, each strip being beveled to the thickness of and made as long as the line to be imprinted thereby; notching the strips at points of intersection so that the strips may interlock, the cooperating notch depths being sufficient for the strip edges to lie in the same plane; assembling said strips on a surface; placing a thin layer of removable material on said surface around the strips and in the interstices therebetween; placing a layer of plastic self-hardening material made of an earthen substance mixed with a liquid, on said first-named layer around said strips and in the interstices therebetween; and removing said movable layer after said self-hardening layer has set.

7. A printing plate, including a metallic printing member, and a backing by which said plate is held in position and composed of a substance other than that of the said printing member, said holding substance being initially plastic and subsequently self-hardened, both of said physical conditions occurring at normal external work-room temperatures.

8. A plate for printing lines comprising a plurality of metal printing elements, each having a thickness at one edge of proper dimension to print lines of the desired width, said elements being anchored in position edgewise into the plate, said plate being formed of a nonmetallic heat-resistant earthen substance initially plastic and self-hardening and adapted to be placed in position around said metallic strips while plastic and subsequently to harden, said conditions of the substance occurring in normal work-room temperatures.

9. A plate for printing linear imprints, comprising a plurality of thin metallic strips set edgewise, one edge whereof is of the required thickness to print a desired line, said strips being placed at predetermined distances apart and anchored together by a plastic earthen substance adapted to harden and which substance has a thickness less than the width of said metallic strips.

10. A plate for linear imprints composed of a flat metallic strip having one edge of appropriate thickness for making said imprint, another similar metallic strip placed at an angle to said first strip, each of said strips being notched at their intersection so that the two may interlock and the edges of said strips may lie in the same plane, a backing plate into which said strips are anchored, composed of a plastic self-hardening material, the printing edges of said strips projecting beyond the plane of said backing, thus constituting a unitary printing plate.

11. A nonmetallic printing plate for linear imprints, composed of an earthen substance which has changed from a plastic to a hard material, and printing strips set edgewise in said substance while plastic, the printing edges of said strips projecting beyond the surface of said hardened substance.

12. Means for printing linear designs, comprising a plurality of metallic strips whereof one edge forms the printing means, a backing plate into which said strips are set edgewise, said backing plate being thinner than the width of said printing strips, so that one surface of the said backing plate lies in a plane above that of the plane of the printing

edges of said strips, said backing plate being of a nonmetallic initially plastic self-hardening substance.

13. A line printing plate, including a plurality of thin metal strips whereof the edges form the printing surfaces, the strips being set edgewise to the surface of and extending through the plate, said plate being made of an initially plastic substance which is assembled with said printing strips while soft, said substance subsequently hardening, thereby forming the plate and the anchorage of said printing strips, the plane of the edges of said strips projecting beyond that of the said plate.

14. A printing plate made of an earthen substance which is initially plastic and subsequently hardens, said change occurring at normal atmospheric temperatures, the design to be printed being formed of thin strip material shaped to desired form and the edges thereof being the portions which contact with the surface to be printed, said strip designs being mounted in said plate when said substance is plastic, becoming subsequently anchored therein when said substance hardens.

In testimony whereof I affix my signature.

MORRIS M. LEFTWICH.