(No Model.) 2 Sheets—Sheet 1.

R. MERIMAN.

PRINTING.

No. 417,736. Patented Dec. 24, 1889.

Fig. 1.

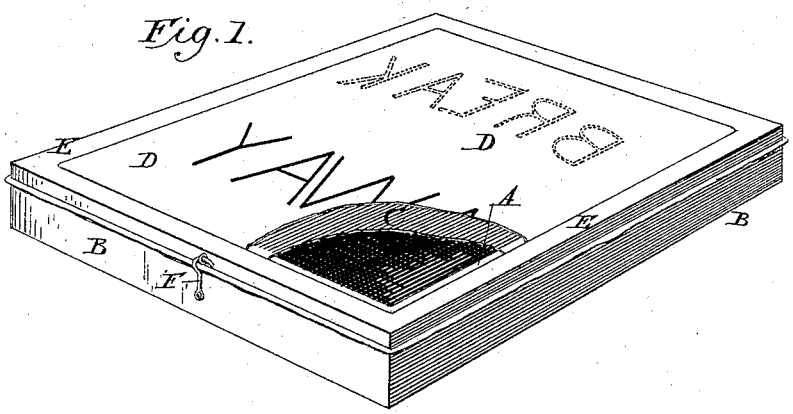


Fig. 2.

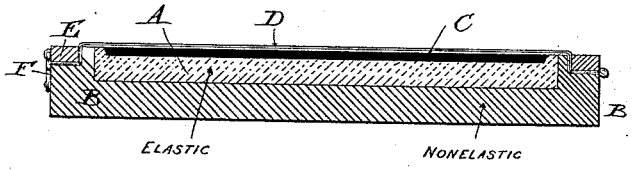
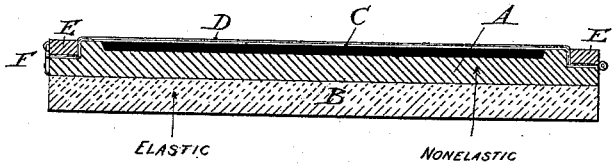


Fig. 3.



Attest:

Sidney R. Hollingsworth

Horace A. Dodge

Inventor:

Rae Meriman

Dodger Sons,

Attys.

(No Model.) 2 Sheets—Sheet 2.

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PRINTING.

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Fig. 4.

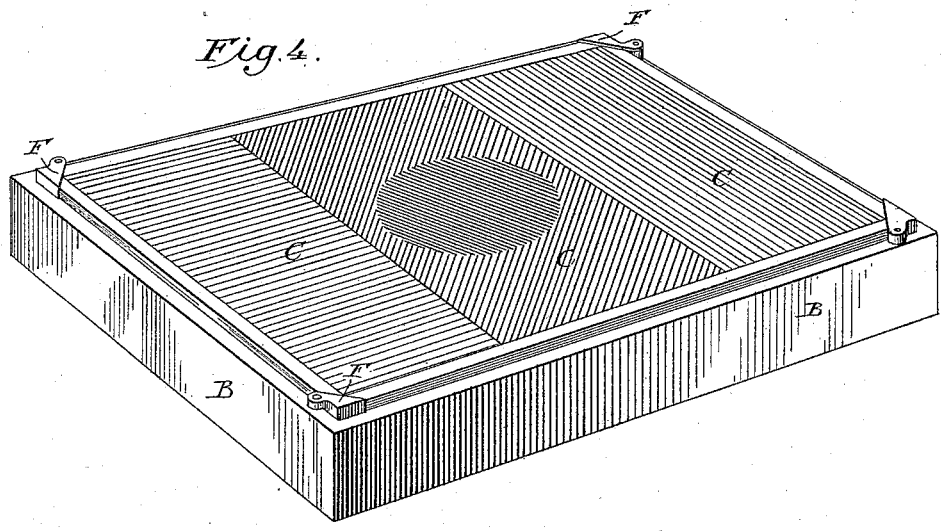


Fig. 5.

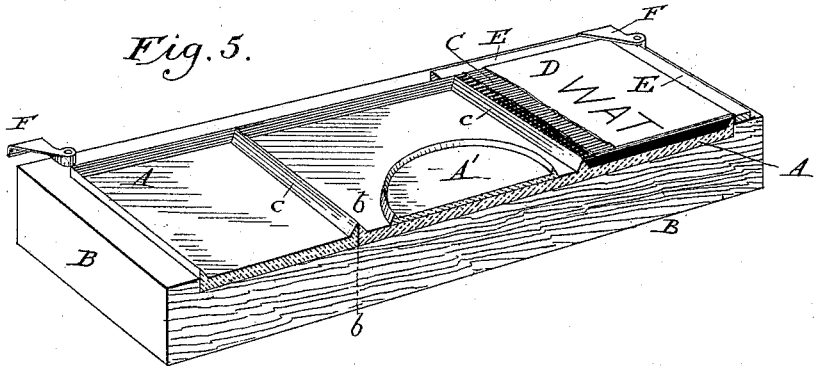
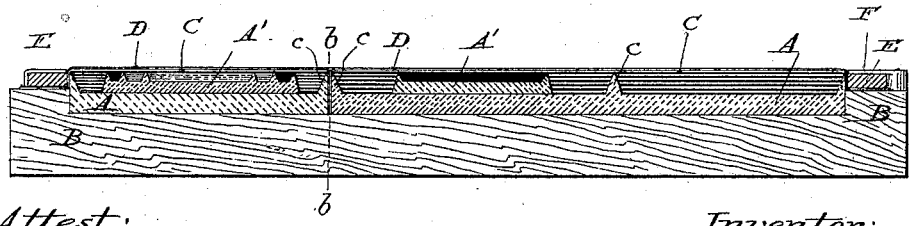


Fig. 6.



Attest:

Sidney P. Hollingsworth

Horace A. Dodge.

Inventor:

Rae Meriman

Dodger Sons, Attys.

UNITED STATES PATENT OFFICE.

RALPH MERIMAN, OF CHICAGO, ILLINOIS, ASSIGNOR OF ONE-FOURTH TO EDWIN E. WISE, OF SAME PLACE.

PRINTING.

SPECIFICATION forming part of Letters Patent No. 417,736, dated December 24, 1889.

Application filed October 22, 1888. Serial No. 288,754. (No model.)

To all whom it may concern:

Be it known that I, RALPH MERIMAN, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Printing, of which the following is a specification.

My invention consists in a novel means for reproducing drawings, maps, prints, manuscripts, and designs of various sorts, the peculiarities of which will be hereinafter explained.

Referring to the accompanying drawings, Figure 1 is a perspective view of the "form" ready to be put into a press, a portion being broken away to make the construction more clear; Fig. 2, a cross-section through the same; Fig. 3, a similar section illustrating a slight modification; Fig. 4, a perspective view of a pad constructed on the same plan as those of the preceding figures, but divided into compartments or sections designed for different colors; Figs. 5 and 6, sectional views of the same.

The method of printing to which the present invention relates involves the use of a sheet of thin material having the design produced in it by means of perforations, incisions, or removal of those portions of the body of the sheet corresponding to the lines of the design.

The object in view is the easy, quick, and efficient use of the prepared sheet without injury thereto and without the necessity of inking afresh for each impression. I attain these results by means of an ink-pad of novel construction to which the prepared sheet is applied and with which it constitutes what may properly be termed the "printing-form."

The construction may be best explained upon referring to the drawings, in which—

A indicates an ink-reservoir in the form of a plate or block with a shallow recess in one face; B, a backing therefor; C, a pervious or absorbent covering-sheet stretched taut across the open face of the reservoir; D, the perforated printing-sheet, and E a frame or clamping device for securing the printing and covering sheets in place, the printing-sheet outside of or over the covering-sheet.

In the practical application of my invention it is immaterial how the printing-sheet is produced, provided only that it possess the properties of permitting ink to pass through the design and preventing its passage elsewhere. It is to be understood, however, that a sheet of this general character is a necessary part of the printing apparatus. In other applications I have set forth improved methods of producing such sheets; but inasmuch as the present improvements may be utilized with any such printing-sheet it is not necessary to describe such new methods herein.

It is desirable, and in fact, though not absolutely essential, it is quite important, that the form as a whole be yielding and capable of adapting itself to the sheet or surface which is to receive the imprint therefrom. This result I secure through the aid of an elastic cushion, which may be either the ink-reservoir itself or an elastic backing applied thereto.

In Figs. 2, 5, and 6 I have represented the reservoir A as made of elastic material, printing-roller composition being admirably suited to the purpose because of its cheapness, its ability to withstand the action of the ink, the ease with which it may be molded, and its permanent elasticity; but rubber or like elastic material may be used. With such elastic reservoir the backing B may be non-elastic.

In Fig. 3 I have shown a non-elastic reservoir A, which may be conveniently made of type-metal, hard rubber, sheet metal, wood, papier-maché, or, in fact, of any material not injuriously affected by printers' ink. When such non-elastic reservoir is employed, the backing B should be elastic or yielding, and may be of rubber, felt, or other material possessing the requisite degree of elasticity, as indicated in said Fig. 3.

The ink-reservoir A is filled flush to the edge with printing-ink or other suitable ink in a free state—that is, without any absorbing or holding body other than the reservoir. Then the absorbent cover-sheet C is stretched smoothly across the top or face of the reservoir over the ink, and upon this is laid the design-sheet D, the two sheets C and D being clamped in place by a frame E, which in turn is hinged and secured in position by a hook

or held by clamps, these equivalent fastenings being shown at F in Figs. 1 to 5; or the sheets may be secured in any other convenient way, either jointly or separately, and the frame E, if used, may be secured by screws or equivalent well-known fastenings. The design having been produced as a "positive" or "direct" in the design-sheet, the upper face is placed in contact with the cover-sheet C of the pad and adheres thereto by reason of the sticky character of the ink, the small points and edges bounding the perforated lines being thus held down and prevented from being displaced in printing—a difficulty attendant upon the use of a printing-roller with the perforated sheet as heretofore more generally practiced. As a consequence of this change and the use of the flat form in a press of the bed-and-platen pattern the life or usefulness of the sheet is greatly prolonged—a result further insured by the yielding of the form.

In speaking of the covering-sheet C as "absorbent" I mean that it shall possess the property of becoming thoroughly saturated and impregnated with the ink in every fiber instead of merely holding the ink in the interstices or meshes of the fabric. While measurably good results may be secured with a covering that is not an absorbent in the sense explained, far better results are attainable when a covering of fine linen or like absorbent material is used. I have found that with such a covering-sheet, and with the design-sheet placed directly upon the same, I can use printers' ink just as it is taken from the can without thinning or other preparation, and that the form so prepared and placed in a press of any kind—bed-and-platen, reciprocating, or cylinder press—will give sharp well-defined impressions with neither lack nor surplus of ink, the finest results being best attained, however, with a bed-and-platen press.

The elasticity of the form due to the cushioning of the reservoir, either in the formation of the reservoir itself or through the backing applied thereto, causes the printing-face to adapt itself nicely to the surface to be printed upon, and an even impression results. The necessity of accurate "making ready" by bringing the face of the form and of the platen into exact parallelism is thus rendered unnecessary, and consequently much time and skill hitherto essential becomes needless.

In some cases both the ink-reservoir and its backing may be elastic.

For convenience of manipulation I preferably hinge the clamping-frame to the backing or to the reservoir; but this is optional, and in fact the frame is often omitted.

The perforated printing-sheet may in some cases be applied directly to the ink-surface, though I prefer the pervious facing, because of the greater strength and durability thus secured. So, too, while I prefer to make the cushion a part of the ink-reservoir, it may be made separate therefrom and applied to the tympan of the press, while the reservoir is carried by a separate frame.

It is desirable in many instances to be able to print different parts of a sheet or form in different colors—an object readily attained with the aid of my present invention by simply subdividing the reservoir or ink-receptacle into compartments, each of which will be supplied with ink suited to a corresponding portion of the design to be printed. Such subdivision is illustrated in Figs. 4, 5, and 6, the construction of the pad or of the form being in all other respects the same as above set forth in connection with Figs. 1, 2, and 3. In said Figs. 4, 5, and 6, A indicates the ink-reservoir, which may be made in one piece or in separate sections, as preferred.

In practice I prefer to make one main reservoir as large as the intended form with raised side walls *a*, extending entirely around it, though it may be divided into sections on the meeting or dividing lines of the different colors or on any of said lines, as indicated by *b b*, Figs. 5 and 6. The dividing-walls *c* of the compartments should be beveled to produce fine sharp edges, as indicated in Figs. 4 and 6, so that the ink of each compartment may join closely with that of the next in the pervious covering-sheet C, which is stretched over the face of the reservoir A.

When it is desired to print designs in a variety of colors, the reservoir will be formed with compartments corresponding in number with the number of independent color-sections in the print, and this may be done either by molding the reservoir with the necessary divisions or by placing within the boundary-walls of a main reservoir independent reservoirs A′, which may be secured in position in any convenient manner.

In practice I prefer to make the reservoirs for color-printing of composition such as used for printers' rollers, the same as for printing in one color only, and if made of this the supplemental reservoirs A′ will adhere sufficiently to the main reservoir to prevent shifting about or change of position.

Upon the covering-sheet C is placed the design-sheet D, the ink of the pad causing it to adhere closely thereto, though it may be further secured by a clamping-frame E, held in place by any suitable fastenings, as hooks or corner-clamps F, Figs. 1, 2, 3, 4, and 5.

Any desired form may be given to the compartments of the reservoir and each supplied with ink of any color called for by the design.

The division of the reservoir into compartments is advantageous even when but one color is to be printed, in that it overcomes any tendency of the ink to flow down to one side of the reservoir when the form is turned up edgewise for printing—a tendency not marked, because of the shallow depth of the ink and its consistency, yet liable to develop in very warm weather.

Each compartment may have a covering-sheet of its own, as shown in Fig. 6, where the

sections on opposite sides of the lines *b b* are represented as provided each with a cover of its own. This will in many cases be desirable, because it avoids the use of a new covering-sheet with each change in color or in the arrangement of colors; hence in speaking of a covering or covering-sheet extending over the compartments I mean to include either one continuous sheet or a covering composed of separate sections, each covering one or more of the compartments.

It is particularly to be noted that under my construction free ink is used—that is to say, a body of ink is placed immediately back of the perforated design-sheet and the ink passes to and through the printing-lines without the intervention of any ink-holder or containing-body—the covering-sheet employed being made exceedingly thin and employed merely for the purpose of preserving a uniform plane surface, but being incapable of containing any considerable body or quantity of ink. In other words, the ink is delivered directly to the back of the printing-sheet in a free and fluid state. By this plan I am enabled to secure far better results than are possible through the use of absorbent pads or thick containing-pads of absorbent material, and for many classes of work the printing-form herein described is eminently serviceable where the other construction—that is to say, the ink-reservoir comprising thick absorbent pads or sheets—is entirely useless, while for other classes of work I have found the pads serviceable and in some cases preferable over the reservoir herein described.

By making the reservoir in separable sections I am enabled to speedily and easily vary or modify the arrangement of the color portions and to cheaply make various combinations which otherwise could only be made at considerable expense.

Having thus described my invention, what I claim is—

1. A printing-form consisting of an ink-reservoir containing free ink, a pervious covering applied thereto over the surface of the ink, and a printing-sheet having a pervious design produced in it applied directly to the covering-sheet, the reservoir being capable of yielding to pressure upon the printing-face.

2. The herein-described printing-form, consisting of ink-reservoir A, containing free ink, elastic backing B, covering-sheet C, design-sheet D, clamping-frame E, and fastenings for securing said frame in place.

3. An inking-pad consisting of a reservoir containing free ink and a sheet of fine linen stretched over said reservoir in contact with the ink contained therein throughout the surface of the latter.

4. A printing-form consisting of an ink-containing reservoir divided into compartments, a pervious covering extending over the face of the reservoir and in contact with the ink at all points, and a perforated design-sheet applied to said covering-sheet.

5. An ink-pad for use in printing, consisting of an ink-reservoir divided into compartments and provided with free ink, and a thin pervious covering applied thereto and serving to produce a uniform surface, but incapable of holding a considerable quantity of ink, substantially as set forth.

6. A printing-form consisting of an ink-reservoir having separate ink-compartments, a thin pervious covering extending over the reservoir and serving to maintain a uniform inking-surface, but permitting the free passage of ink, and a design-sheet applied to said covering and having the design produced in pervious lines.

7. A pad for printing, consisting of an ink-reservoir composed of separable ink-compartments containing free ink and a thin pervious covering extending over said compartments.

8. In combination with main reservoir A, supplemental reservoir A′, placed within reservoir A, substantially as and for the purpose specified.

9. The herein-described form for printing, consisting of a reservoir A, divided into compartments, a pervious covering C, applied thereto, a perforated design-sheet applied to said covering, a clamping-frame E, and fastenings for said frame.

In witness whereof I hereunto set my hand in the presence of two witnesses.

RALPH MERIMAN.

Witnesses:
CHAS. R. CALKINS,
EDWARD SWEENEY.