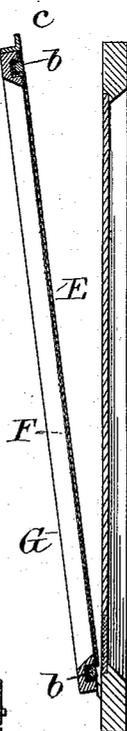
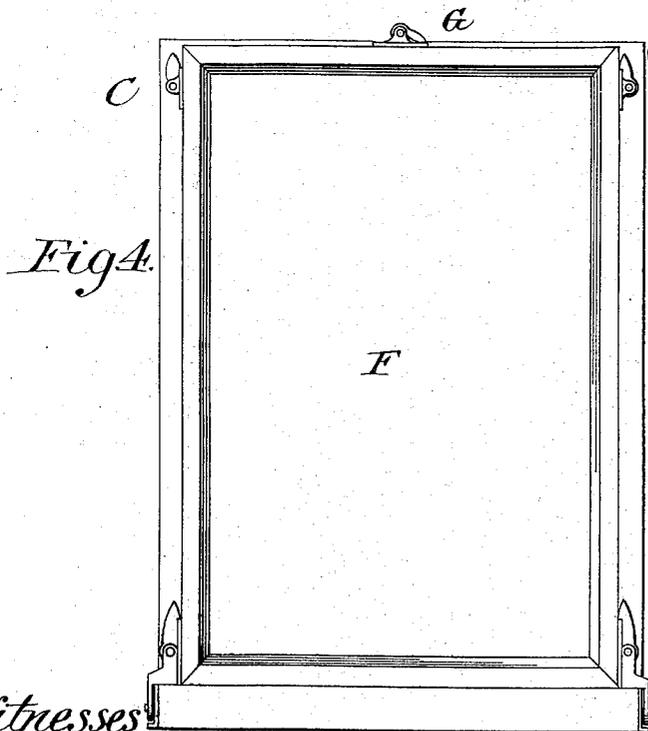
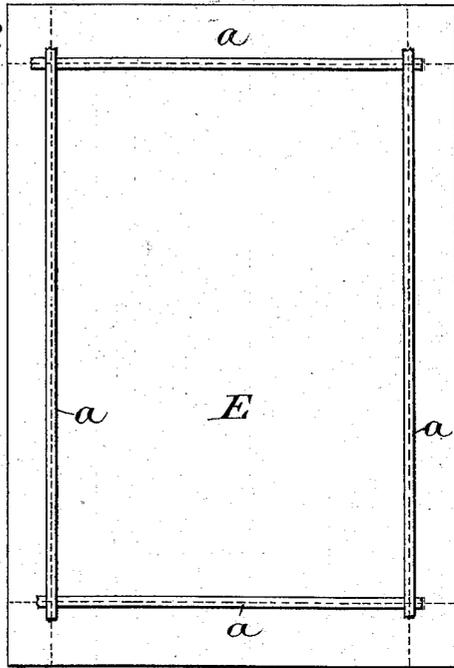
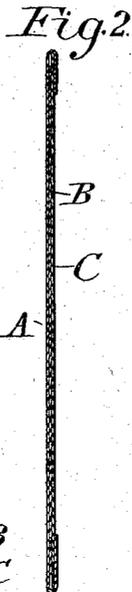
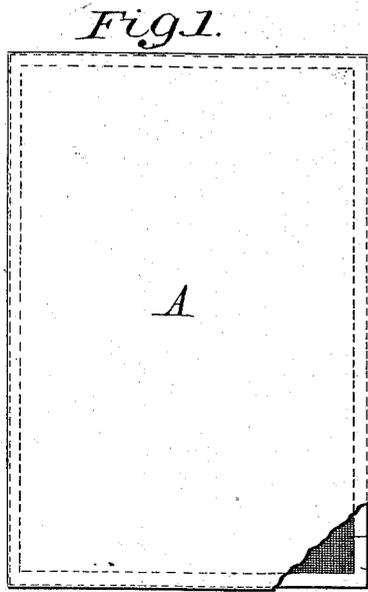


(No Model.)

A. B. DICK.
DUPLICATING STENCIL.

No. 562,590.

Patented June 23, 1896.



Witnesses:
Honris A. Clark.
John R. Taylor.

Inventor:
Albert B. Dick
by his attorneys
Dyer & Seely.

UNITED STATES PATENT OFFICE.

ALBERT B. DICK, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE A. B. DICK COMPANY, OF SAME PLACE.

DUPLICATING-STENCIL.

SPECIFICATION forming part of Letters Patent No. 562,590, dated June 23, 1896.

Application filed December 27, 1887. Serial No. 259,171. (No model.)

To all whom it may concern:

Be it known that I, ALBERT B. DICK, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Means for Producing Duplicating-Stencils and Printing Therefrom, of which the following is a specification.

My object is to enable the production upon any ordinary type-writing machine of a stencil from which a large number of copies can be printed, which copies will accurately resemble ordinary type-written matter.

My object is further to provide simple and efficient means for accomplishing this end; to produce a stencil from which a large number of copies can be printed without permitting the ink to pass therethrough, except to form the letters of the type-written matter; to provide a protection for the stencil in printing, and generally to make the apparatus convenient and efficient both in the preparation of the stencil and in the printing therefrom.

In an application for patent already filed by me (Serial No. 252,003) is described the process of preparing my duplicating-stencil. That process is based upon the principle that if a coated sheet of open material, such as thin porous paper, is covered on either or each side by a sheet of fine open-mesh fabric, such as silk bolting-cloth, the striking of the type of a type-writer upon the superimposed sheets will force the coating of the paper into the meshes of the fabric and cause the coating to adhere to the fabric upon the lines formed by the faces of the types, so that when the sheets are separated the fabric sheet will carry away with it accurate representations of the type in the coating, and will leave the fiber of the paper exposed and unprotected by the coating wherever it has been struck by the type. The stencil which is thus formed will permit the passage of ink through the openings or interstices between the fibers of the paper where the same are left exposed, but will prevent the ink from passing through other parts of the sheet, and thus, by mounting the stencil in a frame, as will be well understood, and thoroughly inking one side of it with an inking-roller, du-

plicates of the type-written matter can be printed upon the sheets placed beneath the stencil.

The invention of this application relates particularly to the character of the coating employed on the open stencil-sheet base and to an elastic protecting film therefor.

For preparing the stencil-sheet from which the stencil is made, I prefer to employ a thin tough paper, which at the same time is very open. I have found that for this purpose the Japanese paper known as "yoshino" in Japan, or "dental paper" in the United States, is highly efficient, but other thin papers of equivalent openness might be employed. This paper may be coated with paraffin in the ordinary way of coating paper with paraffin for other purposes, but I have found that when this alone is done the coating is tenacious and does not readily break when struck by the type; but by adding to the paraffin a material which makes the coating friable this objection is overcome. For this purpose I have found that lard or lard-oil is an efficient material.

When I employ paraffin as the main ingredient of the coating, I mix the paraffin and lard or lard-oil preferably in the proportion of seven parts of paraffin to one part of lard or lard-oil, whereby the paraffin is shortened. The paper is coated with this mixture after the manner of the usual paraffin process. The resulting coating is sufficiently tenacious to allow all ordinary handling of the paper, but is at the same time so friable that the type in striking the surface will break into and force the coating into the meshes of the silk bolting-cloth or other covering or backing sheet on sharply-defined lines, so that in printing the copies compare favorably in sharpness of the outline with the letters with original type-writing.

Another feature of the preferred construction of my stencil-plate is to protect the coating on one side of the sheet by means of a thin coating of elastic varnish. A great variety of elastic varnishes may be employed, but I find that a mixture of gun-cotton and ether forms a good varnish, and is preferable on account of its transparency and the ease with which it can be put upon the sheet. This protect-

ing varnish is readily broken by the type and does not detract from the ease with which the stencil is formed, and at the same time it protects the coating from the action of the ink and prevents the ink from passing through the sheets at any points where the wax coating may be defective or have become so by use. Without this coating of varnish it will sometimes be found that the copies have ink-spots upon them, which are produced by the ink passing through the wax coating where it is defective.

For preparing the stencil, I employ in connection with the waxed sheet a sheet of fine open-mesh fabric, such as silk bolting-cloth, and also a sheet of moderately stiff oiled paper, the latter to furnish a firm backing for the fabric sheet. The fabric sheet and oiled backing are of the usual size of paper for type-writing machines, while the waxed stencil-sheet may be made larger, although it is not necessarily so. To place the sheets together for reception by the type-writer, I first lay the stencil-sheet with its varnished face down, and then upon the top of this I place the sheet of fabric and upon the fabric the sheet of oiled backing. The extending margins of the stencil-sheet are then folded over the backing both at the sides and at the top and bottom and are smoothed down flat, so that they will stay in position. The superimposed sheets are now arranged in a type-writer, as would be an ordinary letter-sheet with the face of the stencil underneath, so as to receive the impression from the type. The type-writer is then manipulated as usual, the keys being struck with a firm even stroke. Before the type-writer is used, however, the inking-ribbon is removed and the type thoroughly cleaned, so that they will present sharp faces and will not be clogged with ink or other accumulations. After the entire matter to be copied has been impressed upon the stencil-sheet, the superimposed sheets are removed from the type-writer, the margins of the stencil-sheet are unfolded, the oiled backing is first removed from the fabric sheet, and then the fabric sheet is removed from the stencil-sheet by lifting it carefully from one corner.

The fabric sheet will carry away with it, adhering to its surface, the representation of the type-written matter in the wax coating which it removes from the stencil-sheet, leaving the fiber of the stencil-sheet exposed and left unprotected by the wax-like coating on the lines which have been impressed by the type. The fibers of the paper of the stencil-sheet are left exposed so that ink can pass between them. This stencil-sheet may be secured in a frame and its varnished side covered with ink by a roller, after which, by placing sheets of paper successively beneath the stencil, duplicates of the type-written matter can be obtained by pressing the stencil with a roller upon the sheet beneath. I prefer, however, to protect the face of the stencil-sheet by

placing over it a sheet of thin porous paper, such as that which forms the body of the stencil-sheet, and secure the stencil-sheet and the protecting-sheet in the printing-frame together. The inking-roller is then run over the protecting-sheet until its pores are thoroughly filled with ink as well as the exposed portions of the stencil-sheet beneath, when by additional rolling duplicates of the type-written matter can be produced. The protecting-sheet protects the face of the stencil from mechanical injury and has also an advantage in protecting the stencil from the action of the ink. Before securing the stencil-sheet and protecting-sheet in the printing-frame I cover the creases which were made in the stencil-sheet by folding it over the oiled backing with strips of waxed paper gummed on one side. These strips are pasted over the creases before mentioned and prevent any ink from passing through the stencil on the line of the creases, which it would otherwise do, since the wax-like coating of the stencil is broken where the sheet is creased. This necessity for covering the creases with strips of course only arises from the fact that the stencil-sheet is larger than the oiled backing and the fabric sheet. If all the sheets were of the same size, there would be no necessity of creasing the stencil-sheet and the gummed strips before referred to would not be required. Before using the fabric sheet again the adhering wax-like matter upon its surface is removed by means of benzene or any other suitable solvent.

In the accompanying drawings, forming a part hereof, Figure 1 is a plan view of the superimposed sheets ready to be placed in the type-writer with the stencil-sheet broken away at one corner. Fig. 2 is a section through the superimposed sheets, the thickness of course being exaggerated. Fig. 3 is a face view of the paper-stencil; Fig. 4, a top view of the printing-frame with the stencil and protecting sheets secured therein, and Fig. 5 the vertical section through the printing-frame.

A is the stencil-sheet, prepared with the wax-like coating and covered with varnish on one side, as already described. B is the sheet of fine open-mesh fabric, such as silk bolting cloth. C is the backing of oiled paper. These sheets are placed together, as shown in Figs. 1 and 2, and as previously described, and are then placed in a type-writing machine and the subject-matter to be copied is impressed upon them. They are then removed from the type-writer and are separated, as already explained, when the stencil-sheet A becomes the stencil E. This stencil, after having the creases produced by folding covered with gummed strips of waxed paper *a*, has its face covered with a porous protecting-sheet F, and these two sheets are then secured at their edges in the printing-frame G by means of the holding-frame *b* and suitable catches *c*. The protecting-sheet F is then

filled with ink by an ink-roller, and by placing a sheet of paper upon a suitable bed under the printing-frame the stencil can be lowered upon the bed and by passing the inking-roller over the protecting-sheet ink will be forced through the stencil and the type-written matter will be impressed upon the sheet beneath. The printing-frame is then raised and other sheets placed beneath it successively and the roller passed over the protecting-sheet, adding additional ink from time to time, as required, until as many copies of the type-written matter are produced as are desired.

Although I have described herein the process of producing a stencil and desirable combinations of extractor-sheets with the stencil-sheet, I do not claim herein such processes or combinations, the same forming the subject of my application, Serial No. 252,003, filed October 11, 1887.

What I claim is—

1. A stencil-sheet or duplicating-stencil of open material provided with a coating having a shortening material as an ingredient, substantially as set forth.

2. A stencil-sheet or duplicating-stencil of

open material provided with a coating of wax mixed with a shortening material, substantially as set forth.

3. A stencil-sheet or duplicating-stencil consisting of open material coated with a mixture of paraffin and lard-oil, substantially as set forth.

4. A stencil-sheet or duplicating-stencil having a wax-like coating and provided with an additional ink-proof elastic coating, substantially as set forth.

5. A stencil-sheet or duplicating-stencil consisting of open material having a wax-like coating and also coated with an elastic varnish, substantially as set forth.

6. The combination with a sheet of open material coated or impregnated with an ink-proof substance such as paraffin, of a protective covering for such ink-proof substance composed of a solution of gun-cotton and ether, substantially as set forth.

This specification signed and witnessed this 22d day of December, 1887.

ALBERT B. DICK.

Witnesses:

ROBERT W. PARKER,
GUST PETERSON.