Oct. 14, 1941. L. BERNHARD 2,259,238

TYPESETTING

Filed March 29, 1940 2 Sheets-Sheet 1

Fig. 1.

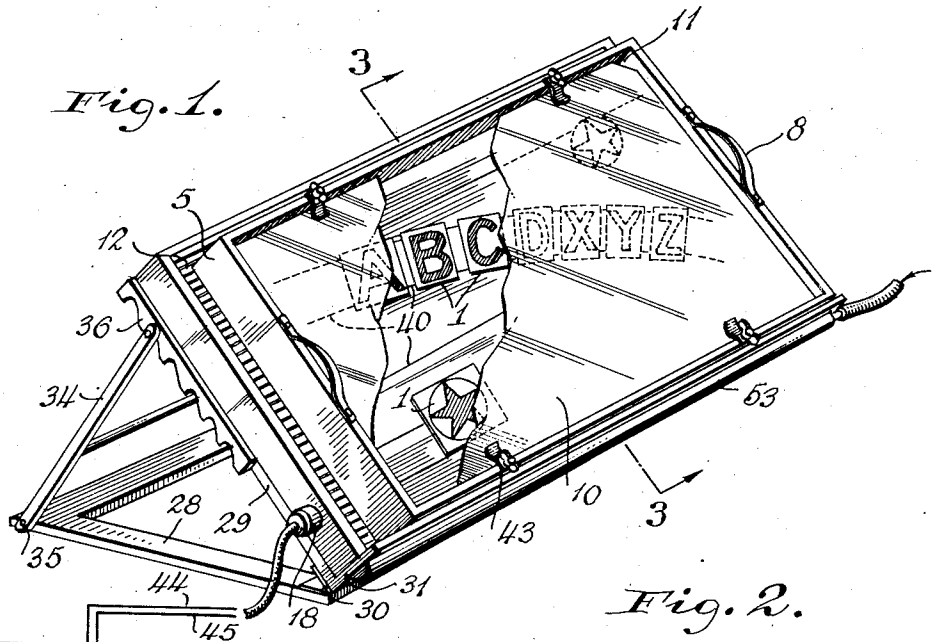

Fig. 2.

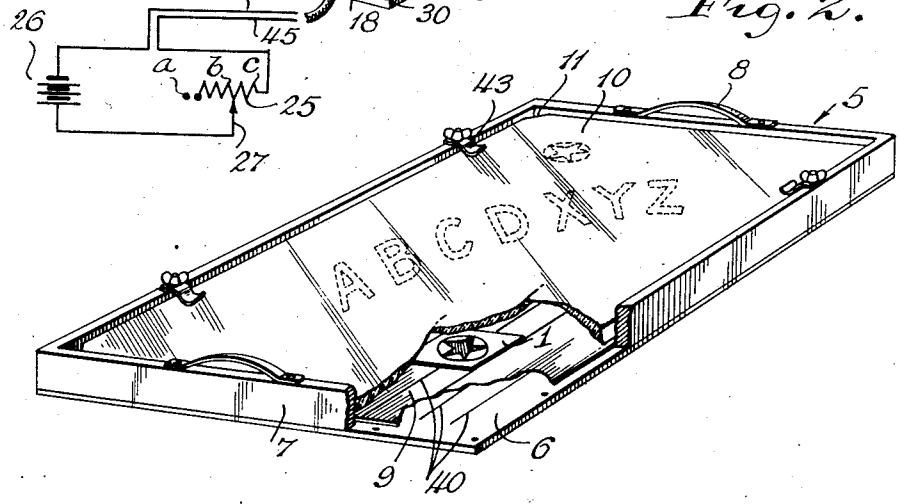

Fig. 3.

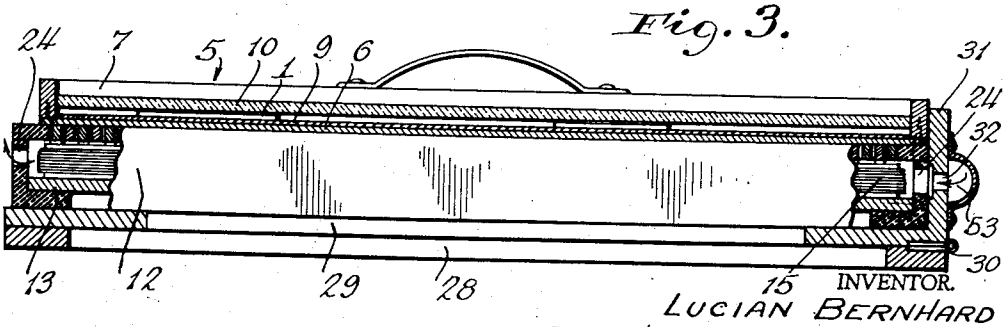

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Fig. 4.

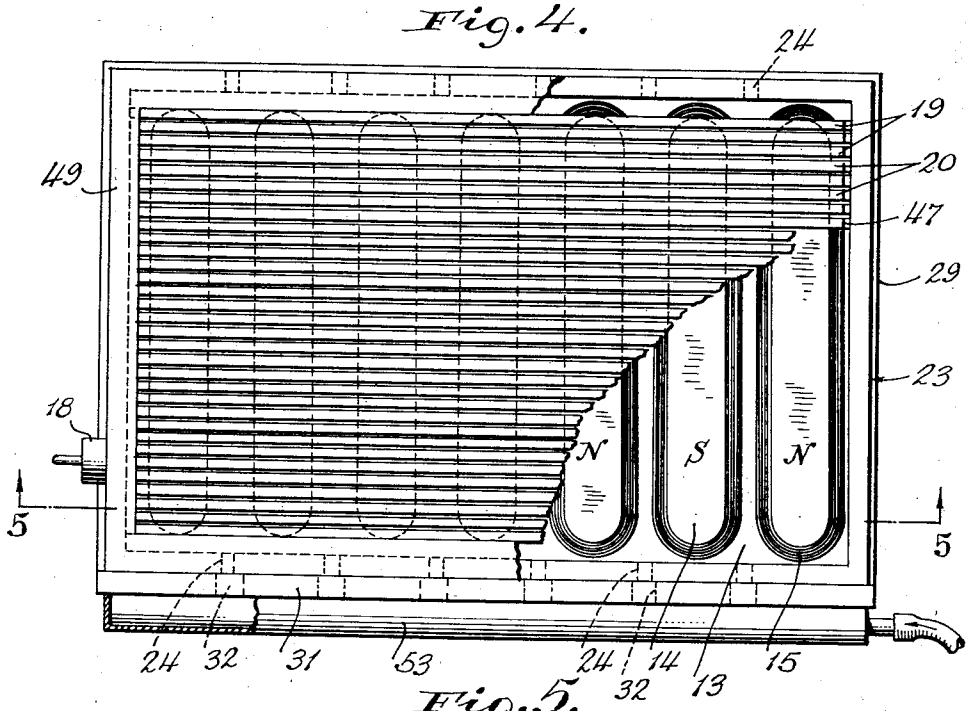


Fig. 5.

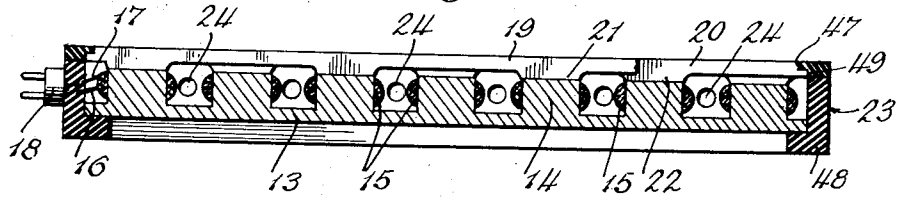
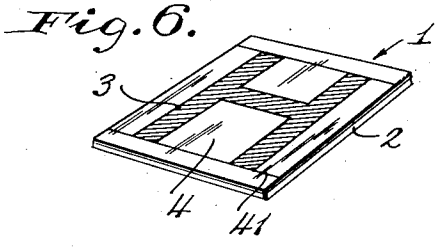


Fig. 6.



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Patented Oct. 14, 1941

2,259,238

UNITED STATES PATENT OFFICE

2,259,238

TYPESETTING

Lucian Bernhard, New York, N. Y.

Application March 29, 1940, Serial No. 326,547

6 Claims. (Cl. 95—85)

The invention relates to the setting of types of characters. It contemplates to provide a simple and inexpensive means for arranging characters in a desired relation to each other, and for holding them in such relationship preparatory to taking photographic pictures thereof which may be used for advertising purposes or otherwise. The characters under consideration may be of any configuration and may include all or only several of the various kinds applied in commercial graphic art: viz., letters, ciphers, ornamental elements, pictorial matter, etc. For this reason, I wish the term "character" wherever occurring in the following specification and the appended claims, to be understood in the broad sense hereinbefore defined.

The invention has for a further object the provision of magnetic means for holding magnetizable types on a movable support during the setting, and mechanical means for holding the types in their relationship on said support when the latter, with the types thereon, is withdrawn from the effect of the magnetic-field or when said magnetic-field is destroyed.

The invention essentially consists of a device which comprises a tray-like support of magnetizable or non-magnetizable material, a magnet, and magnetizable types. The support has a rigid bottom plate through which the magnetic force may act on such types which are arranged on the tray. In addition thereto, a removable transparent cover plate is provided to hold the types on the tray in their position when the tray is removed from the magnet for the purpose of photographing the types in their set arrangement.

Further objects and details of my invention will be apparent from the hereinafter description and the accompanying drawings illustrating an embodiment thereof by way of example. In the drawings:

Fig. 1 is a perspective view of an apparatus comprising the novel means and being applicable in the carrying through of my novel method.

Fig. 2 is a perspective view of the support separated from the other parts shown in Fig. 1.

Fig. 3 is a cross-section along line 3—3 in Fig. 1.

Fig. 4 is a top elevation, parts being broken away, of an electro-magnet shown in Fig. 1.

Fig. 5 is a cross-section along line 5—5 of Fig. 4; Fig. 6 is a perspective view of one of the types.

Referring now to the drawings, a set of types 1 are prepared by providing thereon, characters including letters, ciphers, ornamental elements, etc. The individual type consists of a thin piece 2 of magnetizable material such as iron, to whose top surface a character 3 in obverse position is applied either directly by any suitable process, such as drawing, painting, printing, lithographing, and the like, or with the aid of an auxiliary means such as a piece 4 of paper, cardboard, rubber, and the like on which the character is shown, and which is bonded by suitable means to the top side of the magnetizable metal piece. The types may be somewhat larger than the characters thereon, that is to say they need not necessarily be cut out so as to follow the contours of their characters, unless it is intended to arrange the characters so in relation to each other, that they engage one another without any space therebetween. The background of a character on a type, i. e. the top surface of the pertaining metal piece 2 or of the auxiliary layer 4, if such layer is used, is preferably the reverse of the character as to the light value with respect to the photo-chemical effect in photography. Hence, if the character is white, the background should be black or a red showing substantially black in the photographic reproduction. If, on the other hand, the character is in black, the background may be white or light blue. In the event that a colored photograph is to be taken, the background may be selected according to the desired color effect.

In order to arrange the characters in a desired manner, I use a substantially plane support which may have the form of a tray 5 consisting of a bottom 6 and upwardly projecting side rails 7. Grips 8 may be provided in order to facilitate the manipulation of the tray. The tray, and more particularly its bottom 6 may be of a magnetizable or non-magnetizable material. If a magnetizable material is used such as a sheet of iron or steel with or without external plating, it is advisable so to select it that any remanent magnetism occurring therein is not too strong and long-lasting. A strong remanent magnetism would be inconvenient when the tray is to be removed from the electro-magnet after the current to the latter has been switched off. On the other hand, a certain remanent magnetism might be of help in addition to the means hereinafter described for holding the characters when the tray is removed from the electro-magnet. Suitable non-magnetizable materials of the tray are e. g. plywood, artificial resins having the character of substances known by their trademark names as "Bakelite" or "Formica," and metals such as brass or aluminum. The bottom plate should be as thin as possible in order to offer least resistance to a magnetic-force acting therethrough; on the other hand it should be

sufficiently strong so that it does not warp, because any warping of the tray plate may be the cause for lack of sharpness of the photograph taken of the characters. The top face of the tray plate 6 should be light, if the characters are dark; it should be dark if the characters to be placed thereon are light. It may be colored for color-photography. Furthermore, it may be provided with guide lines 40, straight or curved as the case may be, and such guide lines may be red on a black tray surface or light blue on a white background and of such a shade that they will not show in the photographic picture. Similarly, the types may have guiding marks, such as lines 41 which may be brought in registry with the lines 40 in order to facilitate the desired arrangement of the types. In order to make the same tray useful for a great variety of types and arrangements of types, it is advisable to provide a set of interchangeable thin cover sheets 9 for the tray plate, e. g. of paper or thin cardboard. The individual sheets of said set then may differ in color and be provided also with the aforementioned guide lines, i. e. there may be e. g. a black sheet with red horizontal lines, and a white sheet with light blue horizontal lines; similarly, a black and a white sheet with curved lines of a predetermined curvature, etc.; furthermore, the set may contain colored sheets for use when colored pictures are to be taken. Thus the cover sheets serve in each case as appropriate background for the character display on the tray.

Means are provided whereby the types, in their desired relationship, may be held on the tray when the latter is moved from one place to another one. Such means are preferably of a transparent substance, e. g. a sheet of a cellulose material, pressed down on the types. In the most simple and preferred form it consists of a glass plate 10 fitting in between the side walls 7 of tray 5. This plate will in general be sufficiently heavy to hold the individual types immovably pressed against the tray bottom. The plate may be recessed at 11 so as to facilitate the removal of the plate from the tray. Additional means as, e. g. releasable clamps 43 may be provided in order to increase the force with which the transparent sheet or plate 10 bears on the types 1.

Other means are provided whereby the types are prevented from undesirable and unintentional shifting while they are arranged on said tray in relation to each other. This means consists of a magnetic plate on which said tray may be placed during the arrangement of the types. The magnetic plate may be either a permanent magnet or, preferably an electro-magnet 12. Although various kinds of electro-magnetic plates are known in the art, they generally have this drawback that the magnetic forces are concentrated in a plurality of relatively widely spaced spots rather than evenly distributed over the entire plate surface. This is to be avoided because the thin type pieces used in carrying through my invention may warp when not evenly attracted, and small types may not be attracted at all when positioned where insufficient or no magnetic forces are active. In order to overcome this drawback, I prefer to use an electro-magnetic plate in which there is a great number of pole pieces in very close relation to each other. Such magnetic plate may comprise a steel base 13 with a number of elongated coil cores 14 in parallel arrangement across the base. An insulated wire or wires 15 are wound about the cores in alternate directions so as to create alternately north and south poles on the top of the cores when an electric current is passed through the wiring; the ends 16 and 17 of the wire may be connected to a socket 18 secured to the device and into which the leads 44 and 45 from a current source 26 may be plugged. Two kinds of pole pieces 19 and 20 are provided which consist of thin strips of steel with a flat upper surface. The lower surface of the one set of pole piece strips 19 has as many projections 21 on its lower surface as there are cores 14 with north pole tops, and the projections of each strip 19 are so arranged that they will respectively contact all the cores with north pole tops and thus connect the latter when such strip 19 is placed on top of and across the cores. Similarly, the strips 20 are provided with lower projections 22 adapted to connect all the south pole tops of the cores. The strips are placed on top of the cores in an alternating arrangement and slightly spaced from each other. In this manner the top surface of the electro-magnet is formed by a large number of narrow pole strips running from the one edge of the plate to the opposite edge and alternating with respect to their polarity. The pole strips 19 and 20 may be held in position by means of a frame 23 of non-magnetic material, which consists of an upper part 47 and a lower part 48 secured to each other, e. g. by brass screws 49. The hollow spaces between the frame 23, the wiring 15, the base 13 and the pole strips 19 and 20 may be filled with an insulating substance, such as an asphalt. However, it may happen that the heat becomes annoying which develops during the operation of the electro-magnet. In that event, it is advisable to pass a cooling agent, such as air, through any free spaces left by the wiring between each two adjacent cores rather than to apply the aforementioned filler. For this purpose, holes 24 may be provided in the side walls of the frame 23 for the entrance and exit of the cooling agent supplied from a suitable source not shown. Although I have hereinbefore described a particular type of electro-magnet, I desire it to be understood that any other suitable type of magnetic-plate may be used provided it offers sufficient magnetic force all over its surface.

For reasons to be explained hereinafter, it is also advisable to make the magnetic force variable so that the magnetic plate may be run with either full or reduced force. For this purpose, a variable resistance 25 is provided in the circuit for the electro-magnet 12 in Fig. 1 wherein 26 is a current source and 27 a controlling member. It will be apparent that the magnet plate 12 will be fully energized when member 27 contacts at *c*, partly energized, when the member 27 contacts at *b*, and not energized with the member at *a*.

In view of the kind of work for which the device according to the invention is destined, means are provided whereby plate 12 and tray 5 may be inclined according to the incident light. For this purpose, the magnetic plate 12 may be mounted on an easel-like structure comprising a base 28 to which a supporting frame 29 is hinged at 30. Frame 29 has a projecting flange or rail 31 sufficiently wide to receive thereon not only the side wall of the magnetic plate, but also the tray 5 when the latter is applied to the plate. Flange 31 may be provided with holes 32 in registry with the holes 24 respectively in the side wall of the magnetic plate and a manifold 53 may be connected thereto in order to feed cooling air to the apparatus. A strut 34 is hinged to the base 28

at 35 so that by altering the point of engagement of strut 34 with a rack 36 provided on supporting frame 29, the magnetic plate 12 and tray 5 may be more or less inclined.

The described apparatus may be operated in the following manner: A suitable background paper 9, if used in the particular case, is selected and put on the tray 5 placed on the magnetic plate 12. Then, the plate with the tray thereon is adjusted as to their inclination and the current may be switched on. Thereafter, the types required for the display and prepared as hereinbefore described are taken from the stock, put on the background paper of the tray, and shifted into the desired position. If no background paper is used the types are placed directly on the bottom plate 6 of the tray. In shifting the types and thus finding their most attractive relative position, it may happen that the magnetic force is either too strong so that the types cannot be easily moved, or too weak so that the types do not securely stay in their position or even fall down if the tray is inclined. This may be adjusted by varying the current until the magnetic force has the desired strength. When the display is completed, full current may be switched in, in order to prevent the types from being moved by any non-intentional manipulation. Thereafter, the glass cover plate 10 will be put on the tray on top of the characters, and the clamps 43 may be applied. Thereby, the types will be mechanically held in their predetermined relationship. Then the current to the magnetic plate may be switched off, and the tray may be taken to the photographic apparatus, whereupon the character display may be photographed through the glass cover 10.

I am aware of the fact that various modifications of the apparatus described may be applied by those skilled in the art without departing from the essence of my invention which, therefore, shall be limited only by the scope of the appended claims.

I claim:

1. A device for setting and holding types to be photographed, comprising individual types including magnetizable sheet metal with characters thereon, a tray-like support including a rigid bottom plate so as to receive said types on said bottom plate, a magnet having a top pole surface substantially corresponding to said bottom plate as to shape and size and adapted to receive thereon said support whereby the magnetic force will act through said bottom plate during the setting of the types thereon when the support is positioned on said magnet, and a removable transparent cover plate fitting on top of the bottom plate of said support so as to bear on the types thereon and to prevent them by friction from shifting during the removal of said support with the types in set arrangement from said magnet.

2. A device as claimed in claim 1 further comprising a stand for said magnet, said stand being adjustable so as to hold said magnet with its pole surface in a desired inclined position, and including means for holding said support in operative position in relation to said magnet when said surface is inclined.

3. A device as claimed in claim 1 further comprising a set of differently lined and interchangeable sheets adapted to be placed on the bottom plate of said tray-like support so as to serve as background for characters displayed thereon.

4. A device as claimed in claim 1, comprising means for varying the magnetic force acting through the bottom plate of the support on the types thereon.

5. A device as claimed in claim 1 in which the bottom plate of the support consists of a magnetizable material with low remanent magnetism.

6. A device as claimed in claim 1 in which the bottom plate of said support consists of a sheet of a non-magnetizable material sufficiently thin to permit the force of the magnet to act on the types through the bottom plate of the support.

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