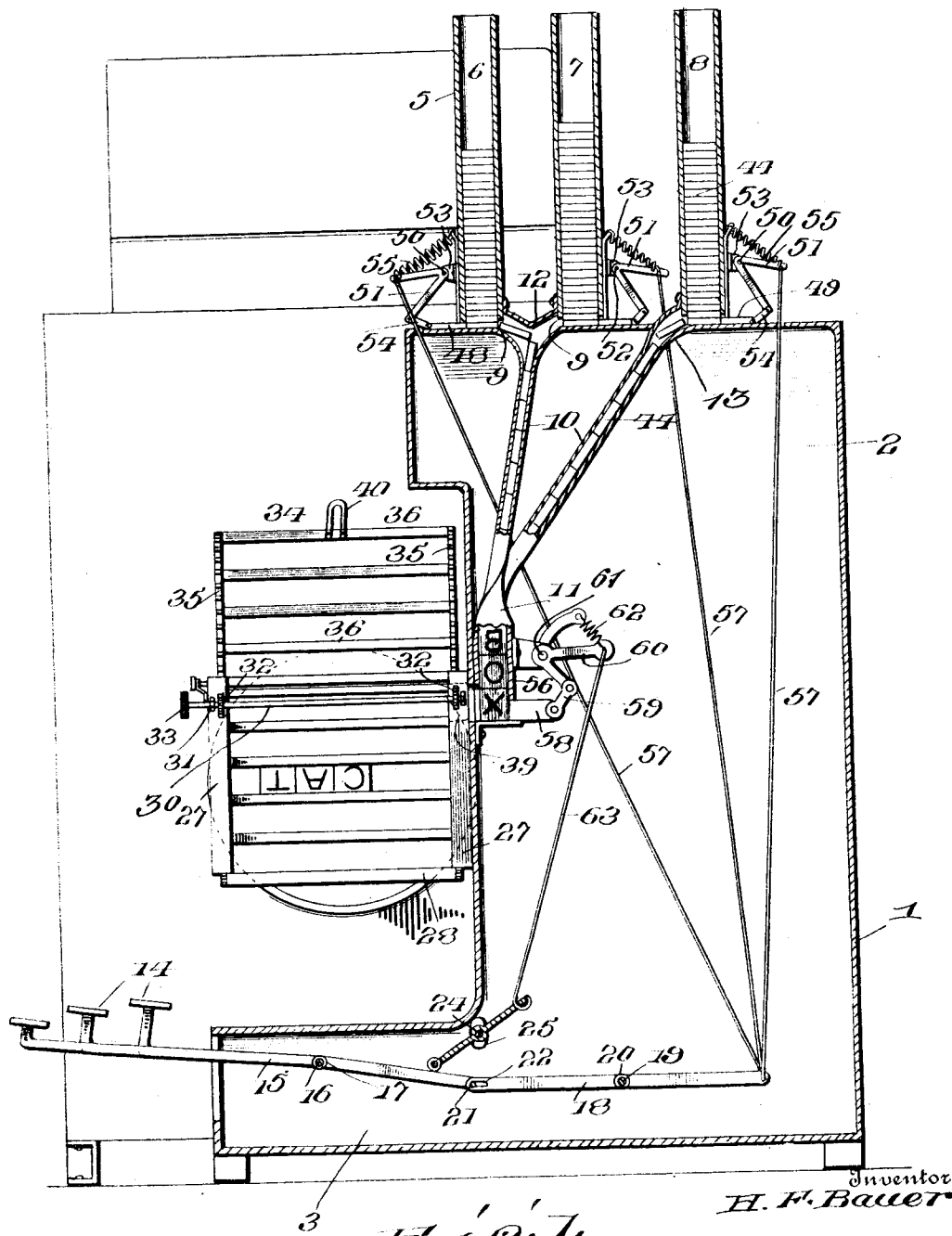


1,049,196.



Witnesses
H. F. M. Quay
A. B. Norton

By *Watson Coleman*
 Attorney

H. F. BAUER.
 DISPLAY APPARATUS.
 APPLICATION FILED DEC. 5, 1911.

Patented Dec. 31, 1912.

4 SHEETS-SHEET 2.

1,049,196.

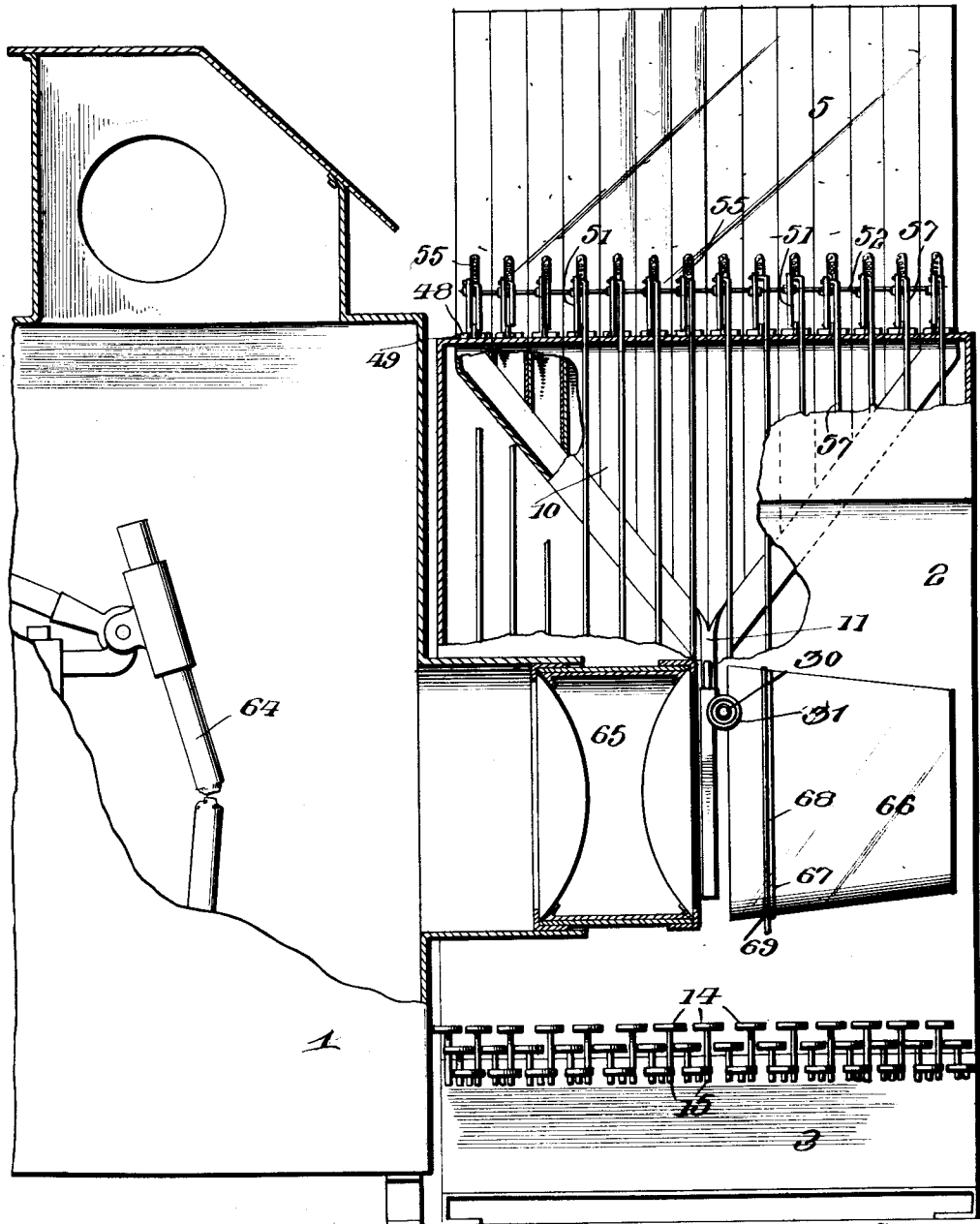


Fig. 2

Inventor
 H. F. Bauer

Witnesses
 H. F. McQuay
 A. B. Norton.

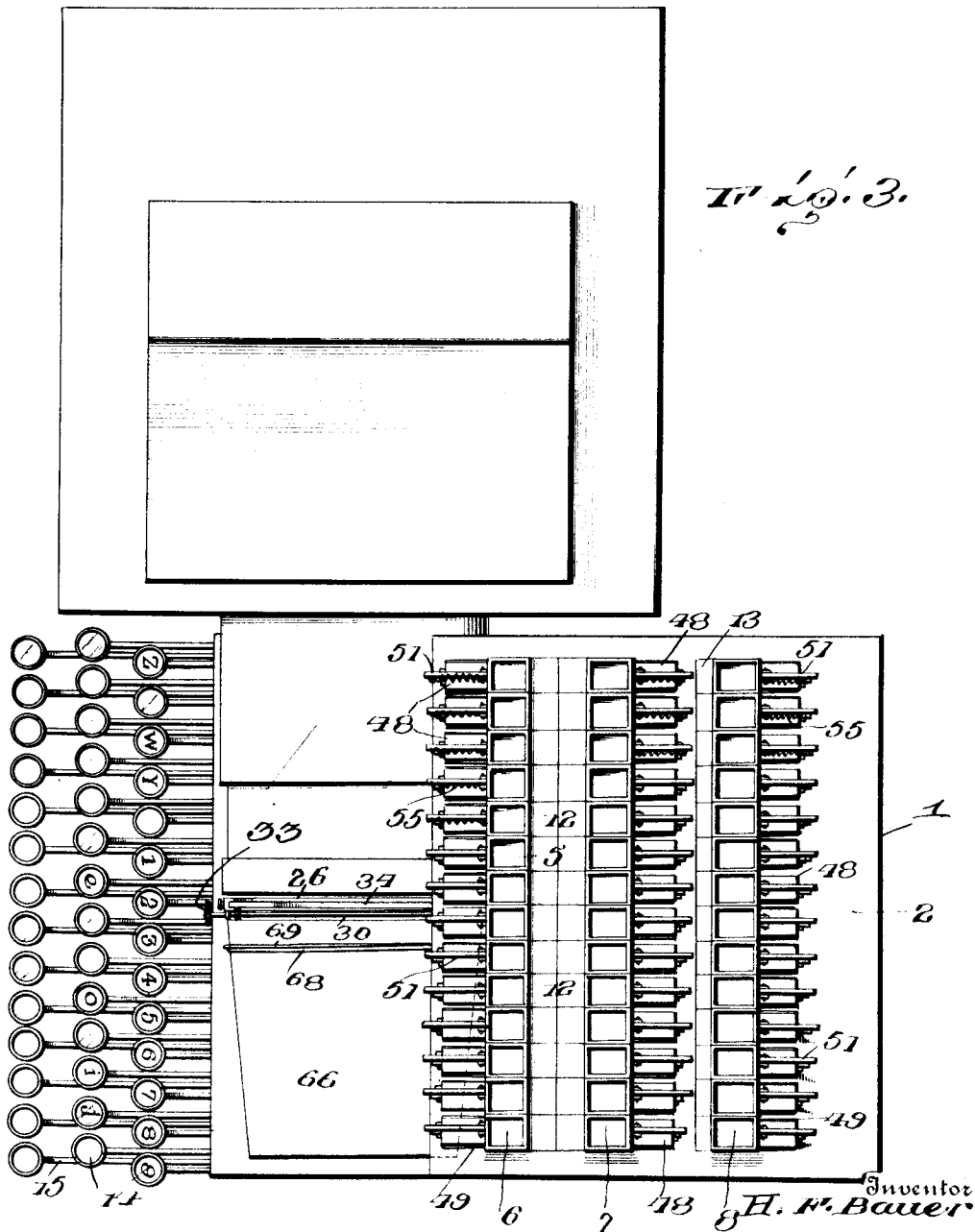
By Watson E. Coleman
 Attorney

H. F. BAUER.
 DISPLAY APPARATUS.
 APPLICATION FILED DEC. 5, 1911.

1,049,196.

Patented Dec. 31, 1912.

4 SHEETS—SHEET 3.



Witnesses
A. L. McQuay
A. B. Norton

Inventor
H. F. Bauer
 By *Watson E. Chisholm*
 Attorney

1,049,196.

4 SHEETS-SHEET 4.



Witnesses
N. S. McQuay
G. B. Norton

Inventor
H. F. Bauer

By Watson E. Coleman
Attorney

UNITED STATES PATENT OFFICE.

HERMAN F. BAUER, OF LONGMONT, COLORADO.

DISPLAY APPARATUS.

1,049,196.

Specification of Letters Patent.

Patented Dec. 31, 1912.

Application filed December 5, 1911. Serial No. 663,991.

To all whom it may concern:

Be it known that I, HERMAN F. BAUER, a citizen of the United States, residing at Longmont, in the county of Boulder and State of Colorado, have invented certain new and useful Improvements in Display Apparatus, of which the following is a specification, reference being had to the accompanying drawings.

This invention is a display apparatus for optically projecting characters, advertisements, baseball scores, titles for films, descriptions of scenes, election returns or any special news, programs or the like and for composing such matter for display, from movable type or type characters, the invention consisting in the construction, combination and arrangement of devices hereinafter described and claimed.

In the accompanying drawings: Figure 1 is an elevation, partly in section, of a display and composing apparatus constructed in accordance with my invention; Fig. 2 is a similar view at right angles to Fig. 1; Fig. 3 is a plan of the same; Fig. 4 is a detail perspective view of the side slide holder and connecting parts; Fig. 5 is a detail elevation of the operating bar; Fig. 6 is a detail sectional view of one of the slide sections in which the matter to be displayed is composed from movable types or display characters, the section being taken on the line 6—6, of Fig. 4; and Figs. 7, 8 and 9 are detail perspective views of display characters or movable types used in connection with my apparatus.

In the embodiment of the invention here shown there is provided a cabinet or supporting frame 1, which comprises a vertical trunk 2 and a horizontal base 3, which projects from the front side of the trunk. On the upper end of the cabinet are the magazines 5, for the type or display characters, which comprise series of vertical compartments, there being one of these compartments for each character or type. The magazine compartments may be of any suitable number according to the number of kinds of type characters and are here shown as disposed in three series, 6, 7 and 8, said series of magazine compartments being spaced apart. The magazine compartments are open at their upper ends and closed at their lower ends and each is provided, at one side, at the bottom, with a discharge opening 9. Conveying tubes 10 lead down-

wardly from the magazine compartments and converge at their lower ends and are connected with a common spout 11. Certain of the tubes are each common to two of the magazine compartments in the series 6, 7 and are connected thereto by intake elbows 12. Other tubes are each connected by an elbow 13 with a discharge opening of only one magazine compartment. The arrangement of the conveying tubes with the magazine compartments and their connections thereto is optional and any suitable number of tubes may be employed.

A series of keys 14, which correspond with the movable display characters or types, have their key bars 15 pivotally mounted on a common pivot shaft 16 which extends through the hollow base of the casing or cabinet, the said key bars being appropriately spaced apart by means of suitable washers 17. Link levers 18 are also provided, which correspond in number with the keys and are pivotally mounted on a common pivot bar 19 and are appropriately spaced apart by means of washers 20. The rear end of each key bar 15 is connected, preferably by a pivot pin 21, to the front end of one of the link levers, the said pivot pins operating in slots 22 with which the link levers are provided. A common operating bar 23 extends from side to side of the casing and has a centrally disposed pivot axis 24; the bearings of which are indicated at 25 in opposite side walls of the casing.

On the side of the cabinet above the base 3 is a medially disposed outwardly projecting slide holder 26 which is open at its upper end and is here shown as comprising a pair of side members 27 and a lower member 28, the side members being provided in their opposing sides with vertical grooves 29. A shaft 30 is mounted in bearings 31 on the side members 27 of the slide holder and is provided with pinions 32 which extend through slots in said side members and is also provided with a milled button or thumb piece 33 whereby the said shaft with its pinions may be readily turned.

A slide 34 for displaying the matter, and in which the matter formed by the display characters or types is composed, is vertically movable in the holder 26 and may be removed therefrom at pleasure. Any suitable number of these slides may be used in connection with the display apparatus. Each slide is of a size and shape adapting it to fit

with its vertical side edges in the grooves 29 of the holder and the slide is provided on one side, at its end, with racks 35 which are engaged by the pinions 32 and, hence, the slide may be raised or lowered, by turning the shaft 30. The slide comprises a series of horizontally disposed members 36, which are disposed one above another and each of the said members is, in effect, a rectangular oblong, open frame provided in its upper and lower sides and also at one end, with grooves 37. One end of each slide member is closed and the other end is open, as at 38, and the open ends 38 of the slide members may be successively disposed opposite an opening 39 in the inner side of the holder, or that side of the holder which bears against and is secured to the casing or cabinet. The slide is provided at its upper end with a suitable handle 40.

The outer end of the slide is provided with sockets 41, one for each slide member, and the holder 26 has a spring-pressed pin 42 which may be engaged with any one of said sockets so as to support the slide at the elevation required to hold the opening 38 or any one of its sections in registry with the opening 39 of the holder.

The font of movable types employed in connection with my apparatus comprises character types 44 such as shown in Figs. 7 and 8 and spacer types 45 such as shown in Fig. 9. Each type comprises an opaque, preferably rectangular body, which may be made of any suitable metal, such for instance as brass and each type has an oppositely beveled tongue 46 on one vertical side and a correspondingly shaped groove 47 on the opposite vertical side to receive the tongue of the next adjacent type, when the types are assembled or set up in the slide, the upper and lower ends of the types engaging the groove 37 in the slides and the tongue and groove connections between the types and preventing light from shining through the joined edges of the types. The characters on the types are openings which extend therethrough and through which the light from the lamp is projected on to the screen, the said types being therefore in the nature of stencils.

Initially the types are disposed in superposed relation in the appropriate magazine compartments corresponding with the keys 14, only types of one character being in each compartment, as will be understood. On one side of each magazine compartment is an ejecting mechanism which I will now describe.

A plunger 48 is movable across the bottom of each magazine compartment and operates in a suitable guide 49 at one side thereof. At a suitable distance above the plunger is a fulcrum or pivot 50 of a bell crank lever 51. The bell crank levers of each series of

magazine compartments are here shown as having a common pivot shaft 52, supported in suitable brackets 53 with which the magazine is provided. The lower arm of each bell crank is connected to the outer end of one of the plungers 48 by means of a link 54, the said link being pivotally connected both to the bell crank arm and to the plunger, the link and its pivots forming, in effect, a double knuckle joint between the bell crank and the plunger. In connection with each bell crank I employ a spring 55 which is connected to the magazine and also to the upper arm of the bell crank. The office of this spring is to normally hold the bell crank in elevated position so as to cause the latter to normally hold the plunger in withdrawn position from its magazine compartment so that the lowermost type in the compartment will lie directly on the bottom of the compartment in line with the plunger and also in line with the discharge opening 9 of the magazine compartment and the upper end of the intake portion of one of the tubes 10. These tubes correspond, cross sectionally, with the type characters in size and shape and hence, each type, when it is forced from the lower end of the magazine compartment by the action of the plunger 48 when the bell crank lever is depressed, is turned from a horizontal position to a vertical position while traversing the curved intake portion 12 or 13, as the case may be, of the tube 10 which leads from said magazine compartment. The spout 11 into which all of the tubes discharge, corresponds with the tubes, cross sectionally, in size and shape and includes a quarter twist so that when the said spout turns each type discharges into it from any one of the tubes and causes the type to be deposited on a guide 56, opposite the opening 39 of the holder and the opening 38 of one member of the slide, and parallel and in line with the grooves in the slide. The plungers 48, with their bell crank levers 50 and springs 55, are, of course, independently operable by the keys 14. Each of said bell crank levers has its upper arm connected by a rod 57 to the rear end of one of the link levers 18 and hence, when any one of the keys 14 is depressed its link lever is turned, as will be understood, and the rod 57 of that link lever operates the type ejecting mechanism of the appropriate magazine compartment and hence one of the types is discharged from the bottom of said compartment and passes through the appropriate tube 10 and also through the spout 11 and is deposited on the guide 56 in position and ready to be placed in one of the members of the slide.

A plunger 58 is provided for moving the types successively from the guide 56 into the slide. This plunger is connected by a link 59 to the lower arm of a bell crank

lever 60. The said bell crank lever is pivotally supported, as at 61, and is connected to a spring 62, which normally holds the said bell crank lever in elevated position so as to cause the latter to normally hold the plunger in retracted position. The bell crank lever 60 has its upper arm connected to a rod 63. The lower end of the said rod is connected to the common operating bar 23, which extends across all of the key bars 15 and hence is actuated when any one of the keys is operated with the result that after a type has been deposited on the guide 56 by the means and in the manner hereinbefore described the said type, by the action of the plunger 58, will be moved into a member of the slide. Hence the work of composing the message, legend, advertisement or the like to be optically projected upon the screen may be readily accomplished. The form thus composed may be used as long as desired and when no longer desirable for use the individual types may be taken out of the slide and distributed back to the appropriate compartments of the magazine, as will be understood.

In connection with my improved apparatus I employ a suitable lamp, which is here shown conventionally in Fig. 2 as an electric arc-lamp 64 and I also employ condenser lenses 65 and a tube or hood 66 which is disposed on the opposite side of the slide from the condenser lenses. This tube or hood is preferably provided with a guide 67 for a colored glass slide 68 whereby characters may be projected in any desired color and I also provide a controlling slide 69, by means of which any portion or the whole of the slide 34 may be covered and the form therein projected on the screen, as will be understood.

The type characters may, if desired, be moved into the slides to compose the required words while being displayed, so that the audience can see the words in process of composition, thus adding greatly to the attractiveness and adding effect to the apparatus.

Having thus described my invention I claim:

1. In a display apparatus, the combination of a lamp, a projecting lens, a frame arranged between the lamp and lens, a magazine separate from the frame and communicating therewith, a plurality of separate stencils arranged in superposed relation to each other in the magazine, and means for directing said stencils successively from the magazine into the frame.

2. In a display apparatus, the combination of a lamp, a projecting lens, a frame having grooves and arranged between the lamp and the lens, a magazine, and means for directing characters from said magazine to the grooves of the frame.

3. In a display apparatus, the combination of a lamp, a projecting lens, a grooved frame, a magazine for movable characters, means to feed characters from the magazine to the grooves of the frame, and means for adjusting the frame so that a character or characters may be directed to any one of the grooves of the frame.

4. In a display apparatus, the combination of a lamp, a projecting lens, a frame arranged between the lamp and lens, a magazine, a discharge tube leading therefrom, means to force movable characters from the magazine into said tube, a guide into which the tube discharges, a frame, and means to force characters from the guide into the frame.

5. In apparatus of the class described, the combination of a magazine having a series of compartments and each provided with an ejecting mechanism for characters in said compartments, a bank of keys, each connected to one of the ejecting mechanisms, a guide, conveying means for the characters ejected from the magazine compartments, said conveying means leading to said guide, a composing element to receive characters from the guide, an ejecting mechanism for the guide, and common means, actuated by all the keys of the bank, for operating the last named ejecting mechanism.

6. In a machine of the class described, the combination of a key-actuated movable character ejecting mechanism, a holder and a composing element carried by the holder and having a plurality of sections, said composing element being movable to dispose any of its sections in operative relation to the character ejecting mechanism.

7. In a projecting display apparatus, the combination of a frame having a section provided with guide grooves and movable characters constructed to engage said guide grooves.

8. In a projecting display apparatus, the combination of a frame having a section provided with guide grooves and movable characters constructed to engage said guide grooves, the said grooves having tongues and grooves at their opposing sides to prevent light from shining through between the said characters.

9. In apparatus of the class described, the combination of a holder, a composing element movable in the holder, means to actuate the composing element, and means to lock the composing element in adjusted position in the holder.

10. In a display apparatus, the combination of a lamp, a projecting lens, a frame mounted between the lamp and lens, a magazine provided with a plurality of compartments, independently movable stencils mounted in said compartments and adapted to be fed by gravity from the magazine to

ward the frame, ejecting mechanism for ejecting the stencils from the magazine, whereby to permit them to drop toward the frame, a guide adapted to support the stencils adjacent the frame and means for automatically transferring the stencils from the guide to the frame upon the actuation of the ejecting mechanism.

11. In a display apparatus, the combination of a lamp, a projecting lens, a stencil holder interposed between the lamp and lens, a guide mounted at one side of the frame, a magazine operatively connected to said guide, means for ejecting stencils from said magazine, means for conveying the stencils to the guide, and means for automatically transferring the stencils from the guide to the holder.

12. In a display apparatus, the combination of a lamp, a projecting lens, a stencil holder interposed between the lamp and lens, a guide mounted at one side of the frame, a magazine operatively connected to said guide, means for ejecting stencils from said magazine, means for conveying the stencils to the guide, and means for automatically transferring the stencils from the guide to the holder upon the actuation of the ejecting means.

13. In a display apparatus, the combination of a lamp, a projecting lens, a holder mounted between the lamp and lens, a guide positioned at one side of said holder, a magazine, stencil-conveying connections between said guide and magazine, means including a bank of keys for ejecting stencils from the magazine, whereby they will be conveyed to the guide, and means for automatically transferring the stencils from the guide to the holder by and upon the actuation of said keys.

14. In a display apparatus, the combination of a lamp, a projecting lens, a holder mounted between the lamp and lens, a guide positioned at one side of said holder, a magazine, stencil-conveying connections between said guide and magazine, means including a bank of keys for ejecting stencils from the magazine, whereby they will be conveyed to the guide, and means for automatically transferring the stencils from the guide to the holder by and upon the actuation of any of said keys.

15. In a display apparatus, the combination of a lamp, a projecting lens, a stencil holder mounted between the lamp and lens and provided at one side with a stencil guide, the holder being provided with a vertically movable frame divided into a number of compartments, means for bringing any of said compartments at will into registry with said guide, a magazine for stencils, means for ejecting the stencils therefrom, means for conveying the stencils to the guide, and means for transferring the stencils from the guide to said compartments.

16. In a display apparatus, the combination of a lamp, a projecting lens, a stencil holder mounted between the lamp and lens and provided with a stencil-holding frame divided into a number of superposed compartments which are formed with said openings leading thereinto, means for vertically adjusting said frame, for the purpose specified, a guide positioned at one side of said holder and adapted to communicate with the openings of the respective compartments, one at a time, a stencil magazine, means for ejecting stencils from the magazine and for conveying said stencils to the guide, and means for automatically transferring the stencils from the guide to said compartments.

17. In a display apparatus, the combination of a lamp, a projecting lens, a stencil holder mounted between the lamp and lens, a guide positioned at one side of said holder, a magazine for stencils, means for ejecting the stencils from the magazine, means for conveying the stencils from the magazine to the guide, said ejecting means including a bank of keys and key bars to which said keys are connected, and means for transferring the stencils from the guide to the holder, said means including a plunger, a pivoted bar extending across all of said key bars and operable upon the depression of any of the keys, and an operative connection between said pivoted bar and said plunger.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

HERMAN F. BAUER.

Witnesses:

R. WHITNAH,
LESTER CAMERON.