May 9, 1939. L. WENCZLER 2,158,039

PHOTOGRAPHIC TYPE-COMPOSING MACHINE

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Fig. 1.

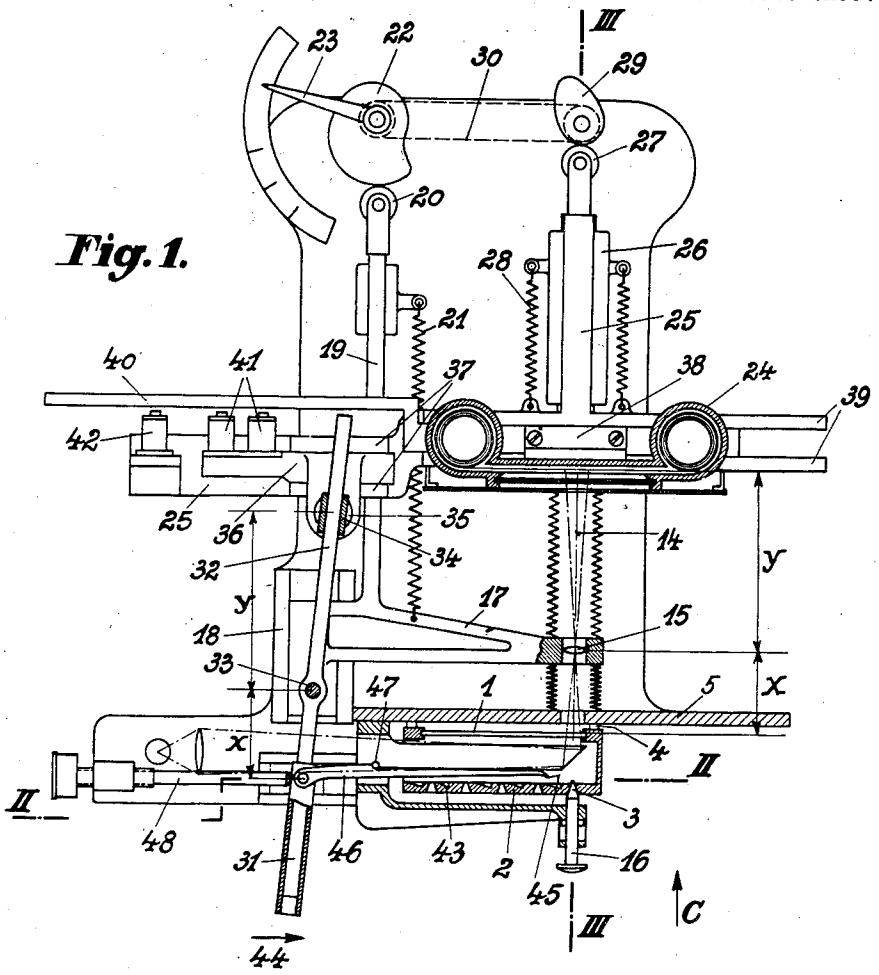
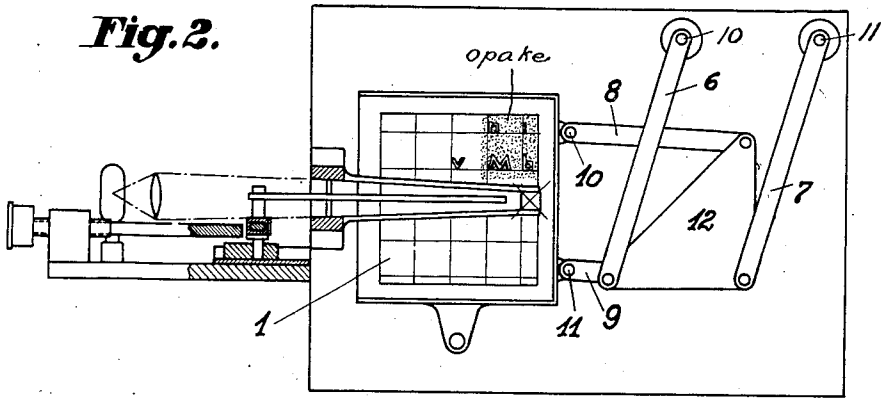


Fig. 2.



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Fig. 3.

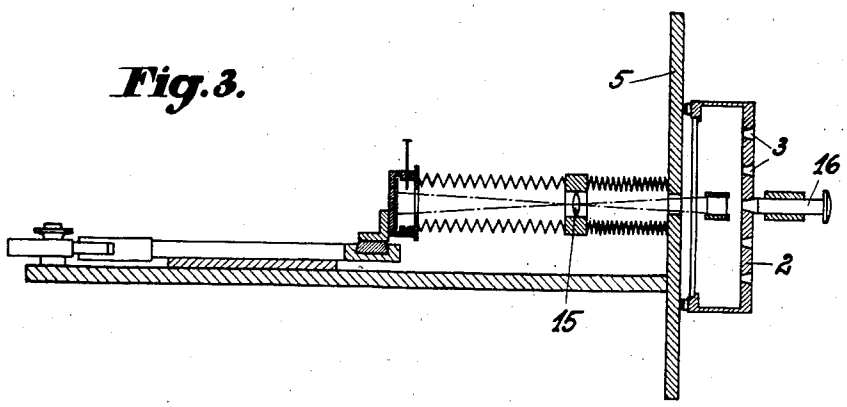
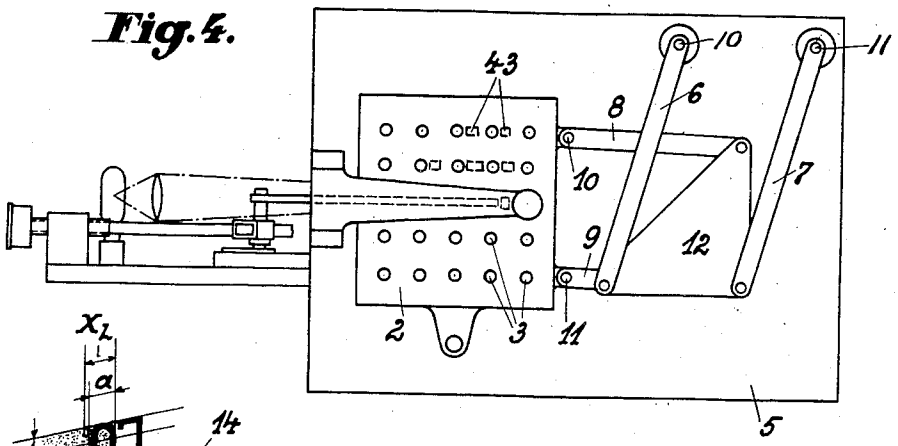


Fig. 4.



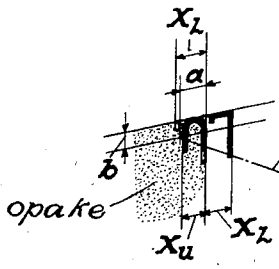
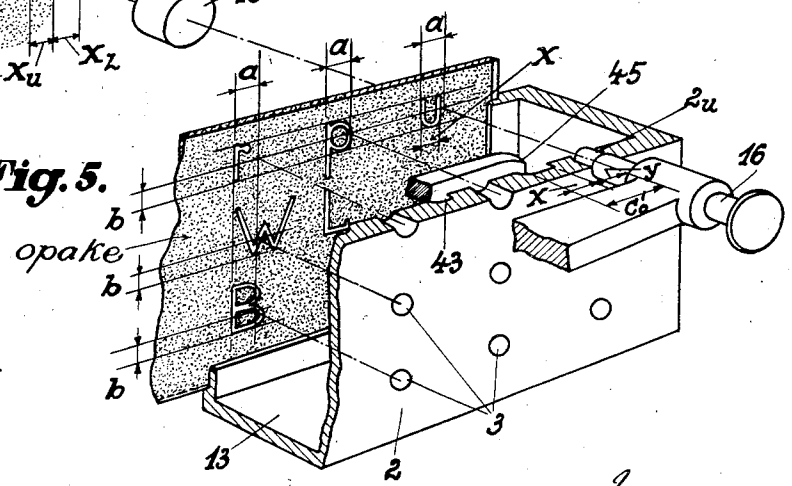


Fig. 5.



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Fig. 6.

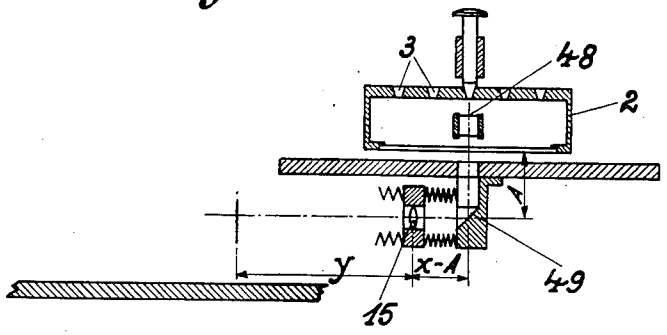
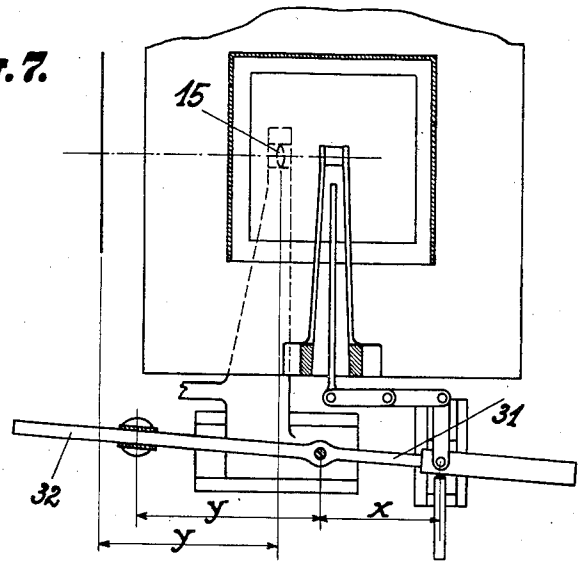


Fig. 7.



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Patented May 9, 1939 2,158,039

UNITED STATES PATENT OFFICE

2,158,039

PHOTOGRAPHIC TYPE-COMPOSING MACHINE

Lajos Wenczler, Augsburg, Germany, assignor to Uhertype Aktiengesellschaft of Kubli House, Glarus, Kanton Glarus, Switzerland, a corporation of Switzerland

Application December 5, 1936, Serial No. 114,440
In Germany December 9, 1935

4 Claims. (Cl. 95—4.5)

My invention relates to improvements in or relating to photographic type setting or composing machines.

Photographic type setting machines are known in which there is a groove, stop or other control element provided for each character contained on the matrix table or the photographic support by means of which the movement of the film box feeding device is controlled. Further arrangements of this kind have been proposed in which on the use of a photographic matrix and a control support an alteration of the optical reproduction ratio is possible. In these arrangements the stroke of the control lever determined by the control support is transmitted through the medium of a double-armed lever to the film slide, on the one hand the fulcrum of the double-armed lever rigidly connected with the objective, and on the other hand the engaging point of the lever at the film box being, with the various optical adjustments, so displaced that the transmission ratio of the double-armed lever corresponds to the optical transmission ratio at the time.

It is the object of this invention to provide for such a photographic type setting or composing machine a matrix plate of small dimensions which allows of a completely accurate and simple adjustment of the individual characters into the optical axis and a suitable control of the film box.

To this end, according to the invention, the characters to be exposed are arranged adjacent and over one another in a chequered manner and are brought into the optical axis by movement of the matrix plate such that the side edges of the table maintain their direction. For the purpose of the positioning, the matrix plate is securely connected to and moved together with a second plate in which are arranged fixing holes such that the position and distance of the individual fixing holes from one another correspond to the position and distance of the characters from one another, a pin or the like which is inserted into the hole appertaining to the respective characters serving for retaining the various characters in the exposure position.

In order that the invention may be fully understood I will now describe two embodiments thereof by way of example by reference to the accompanying drawings, in which:

Fig. 1 is a view of the whole machine partly in plan and partly in section through the optical axis.

Fig. 2 is a section on the line II—II of Fig. 1.

Fig. 3 is a section on the line III—III of Fig. 1.

Fig. 4 is a front elevation taken in the direction of the arrow C of Fig. 1.

Fig. 5 is a perspective view of the matrix and perforated plate, and

Fig. 6 and 7 are views of a modified arrangement.

The characters are arranged above and adjacent one another in a chequered manner on the transparent rectangular matrix plate 1, which is securely connected to and simultaneously moved with the fixing plate 2, which contains the perforations or holes 3. The matrix plate 1 slides with the members 4 on the machine plate 5 and is controlled by a parallel motion linkage which is illustrated by the two pairs of levers 6, 7 and 8, 9 in Fig. 2. The two parallel levers 6 and 7 are pivoted at the points 10 and 11 to the machine plate 5 and are both pivotally connected to the movable plate 12. On this plate 12 are pivoted two parallel levers 8 and 9 which are pivoted with their two other ends to the box 13, one side of which constitutes the fixing plate 2. The matrix table 1 and the fixing plate 2 can, owing to this parallel motion linkage, be moved in such a manner that their edges maintain their direction. The individual characters of the matrix plate can, in this way, be brought to that position which they are to occupy relative to the optical axis during the type setting. Each character is arranged on the matrix plate with its line and one side at a constant distance with respect to the axis of the hole appertaining thereto, which is indicated in the drawings, Fig. 5 by *b* and *a* respectively. The holes 3 in the fixing plate 2 are likewise arranged in a chequered manner and they agree as regards their mutual positions wholly with the position of the characters on the matrix plate 1, so that a hole 3 on the fixing plate appertains to each character on the matrix plate 1. The holes 3 are so arranged that when a character on the plate 1 is brought into the position for composing, the corresponding hole 3 on fixing plate 2 is likewise disposed entirely or at least approximately in the optical axis 14. This coincidence of the characters and the fixing holes 3 is suitably produced in that on preparing the matrix plate the individual characters thereon are positioned with the help of the already previously prepared perforated plate.

If, now, on using the photographic type setting machine a character is adjusted as is shown, for example, in Fig. 5 in respect to the character or the letter *u*, then a pin 16 arranged on the machine frame is inserted into the respective

hole 2*u* so that the position of the letter *u* is thus quite accurately fixed.

The object 15 is carried by the objective carrier 17 (Fig. 1), which is displaceable in the slide guide 18 parallel to the optical axis 14 and indeed such that the objective carrier 17 is pressed on to the control cam 22 by means of the pressure rod 19 and the roller 20 arranged on the end thereof through the medium of the tension spring 21, so that on a rotation of the adjusting lever 23 the objective carrier 17 is displaced corresponding to the desired projection ratio $x:y$.

In the same manner the film box is also secured to the film box holder 25 which is displaceable in the rail guide 26 parallel to the objective axis, and with the roller 27 arranged on the end thereof is pressed by the tension spring 28 on to a second cam 29. Both cams 22 and 29 can either each be displaced by a hand lever along a separate scale with corresponding divisions or graduations, or they can be positively connected together as shown in Fig. 1, for example by a chain 30, so that on the adjustment of the lever arm 23 both the objective 15 and also the film box 24 are brought to the settings adjusted for the time being and are brought into the position corresponding to the focal length of the objective.

On the slide of the objective carrier 17 is pivotally carried on a pin 33, outside the principal plane of the objective 15, the two-arm adjusting lever 31, 32, the said pin 33 forming the fulcrum for the movement of the said lever. Arm 32 of the lever carries at its free end a sleeve 34, which is connected by a pin 35 to the adjusting slide 36, which slides in the guide 37 which is secured also to the film box holder 25 and can be displaced together with the latter by means of the cam 29. The film box 24 is arranged on the slide 38 and is displaceable in the rail guide 39 of the film box holder 25 at right angles to the axis of the objective by means of the iron bar 40 connected thereto, which slides past the electromagnets 41. The holding magnet 42 is secured to the film box holder 25 so that the iron bar 40 connected to the film box slides freely in front of the two groups of magnets if none of them is energized.

When, now, the apparatus is to be adjusted to a definite character or letter, the fixing pin 16 is first withdrawn from the hole 3 of the fixing plate 2 in which it happens to be inserted, and the plate 2 is then moved in such a manner that the pin 16 can be inserted into the hole 3 appertaining to the character to be adjusted. In order that the film box 24 can be adjusted to the correct breadth of the character the plate 2 is provided with grooves or recesses 43 by the length of which the width of the character is determined, which corresponds to the adjusting hole appertaining to the groove. If, then, the adjusting lever 31, 32 is swung in the direction of the arrow 44 (Fig. 1), the nose 45 of the lever 46 pivoted to said adjusting lever slides behind the plate 2; in this way a stop or shoulder, on lever 46 strikes against a pin 47 whereby the nose 45 is forced into the respective groove and strikes the end thereof so that in this way the movement of the adjusting lever 46 is limited. Since at the end of the movement of adjusting lever 31 the carrier magnets 41 are energized, while at the same time the positioning magnet 42 is deenergized, the subsequent movement of lever 31, counter to the direction of arrow 44 is, transmitted in the ratio $x:y$ to the adjusting slide 36 and by reason of the fact that the electromagnets take with them the iron bar 40 connected with the film-box 24 to the film-box itself. At the end of this movement, the carrier magnets 41 again become deenergized, while at the same time the positioning magnet 42 is energized with the result that by means of the iron bar 40 the film-box 24 is held fast.

In the arrangement according to Figs. 1–5, the matrix plate and the two other adjustable parts of the machine, namely the objective and the light sensitive film, lie in parallel planes. This is very inconvenient in practice as in this case the matrix plate must be displaced in the vertical direction. An arrangement in which the matrix plate lies perpendicularly with respect to the two other moveable parts and is consequently carried horizontally and can be displaced in a horizontal plane, is illustrated in Figs. 6 and 7. In this arrangement the axis of the character to be exposed does not coincide with the axis of the objective 15 but the light ray coming from the matrix plate 1 is guided at an angle through a light deflecting means, for example a prism 49, to the objective 15 and from there straight out again to the light sensitive film. In order that the projection ratio $x:y$ may remain the same as previously, the path of the light ray 48 through the prism 49 to the matrix plate 1 (Fig. 6) must again be $(x—A)+A=x$. The projection ratio corresponds also in this case always to the ratio of the lever arm $x:y$ of the adjusting lever 31, 32, so that in this case also the character breadths are transmitted in a magnification corresponding to the optical ratio to the movement of the film roll.

I claim:

1. A photographic type-setting machine, comprising in combination with the machine frame and a film-box movable therein, a movable matrix-plate having the characters to be exposed arranged thereon checkerboard fashion and disposed at an angle relative to the sensitized film in said film-box, a fixing plate having perforations corresponding in number and position to the characters on said matrix-plate, the fixing plate and the matrix plate being secured together in parallel planes and movable as a unit in directions parallel to said planes, a means cooperating with the perforations in said fixing plate for holding the latter and said matrix-plate in fixed position with one of the characters on said matrix-plate placed in the optical axis, a source of light, and means adapted to deflect the light rays so as to cause it to strike first said matrix-plate and then the sensitized film.

2. A photographic typesetting machine comprising in combination a machine frame, a movable matrix plate having the characters to be exposed arranged thereon checkerboard fashion, a fixing plate rigidly connected with said matrix plate, the said two plates being disposed in parallel planes and movable as a unit in directions parallel to said planes, the said fixing plates having perforations corresponding in number and position to the characters on said matrix plate, a separate perforation being provided for each individual character whereby upon a character reaching a definite position relative to the optical axis the corresponding perforation in said fixing plate is moved into fixing position, a stationary fixing pin adapted to engage the perforations in said fixing plate so as to hold each character securely in the exposing position.

3. A photographic typesetting machine, comprising a machine frame, a movable matrix plate having arranged thereon checkerboard fashion

the characters to be exposed, a fixing plate rigidly connected with said matrix plate, the said two plates being disposed spaced apart in different planes and being movable as a unit parallel to said planes, the said fixing plate having perforations corresponding in number and position to the characters provided on said matrix plate, a separate perforation being provided for each individual character whereby upon any one character reaching a definite position relative to the optical axis the corresponding perforation in said fixing plate is moved into the fixing position, a stationary fixing pin adapted to engage the perforations in said fixing plate so as to securely hold the character in the exposing position.

4. A photographic type-setting machine, comprising in combination a machine frame, a movable matrix plate having arranged thereon checkerboard fashion the characters to be exposed, a fixing plate rigidly connected with said matrix-plate, the said two plates being disposed spaced apart in different planes and being movable as a unit parallel to these planes, the said fixing plate having perforations corresponding in number and position to the characters provided on said matrix plate, a separate perforation being provided for each individual character whereby upon any one character reaching a definite position relative to the optical axis the corresponding perforation in the fixing plate is moved into the fixing position, a stationary fixing pin adapted to engage the perforations in said fixing plate whereby the desired character is securely held in the exposing position, and a light deflecting means disposed between said two plates and adapted to deflect at a right angle the light rays entering between the said two plates parallel thereto so as to illuminate the character to be exposed.

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