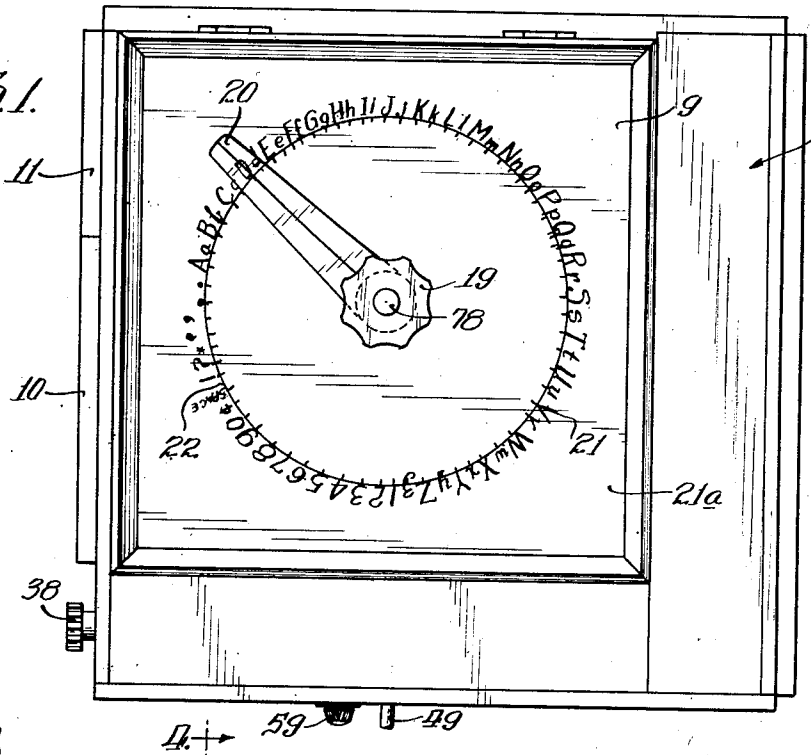
Aug. 18, 1953 R. W. WIRTZ 2,649,036

PHOTOCOMPOSING MECHANISM

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Fig. 1.



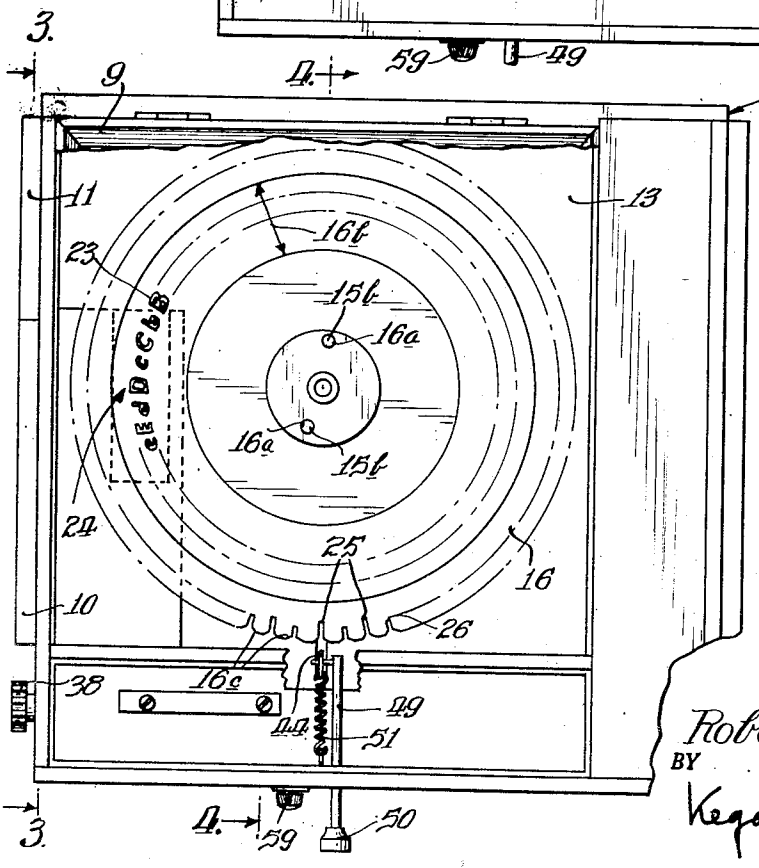


Fig. 2.

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Fig. 3.

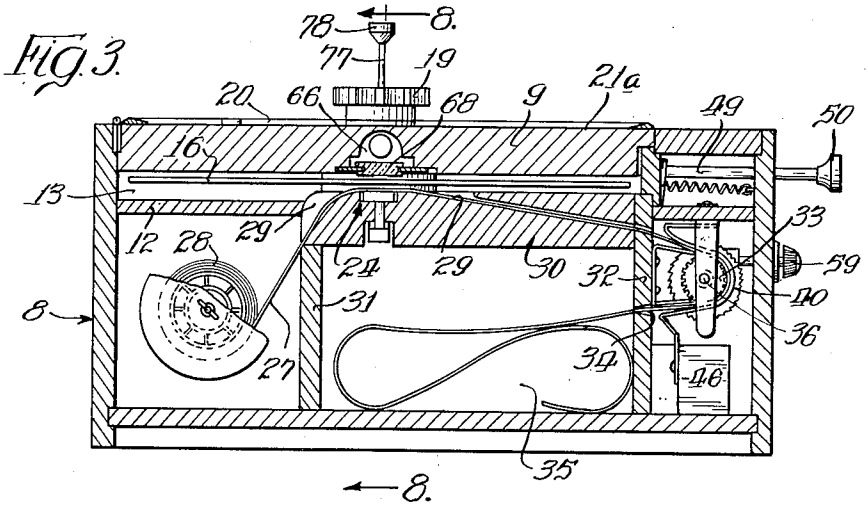
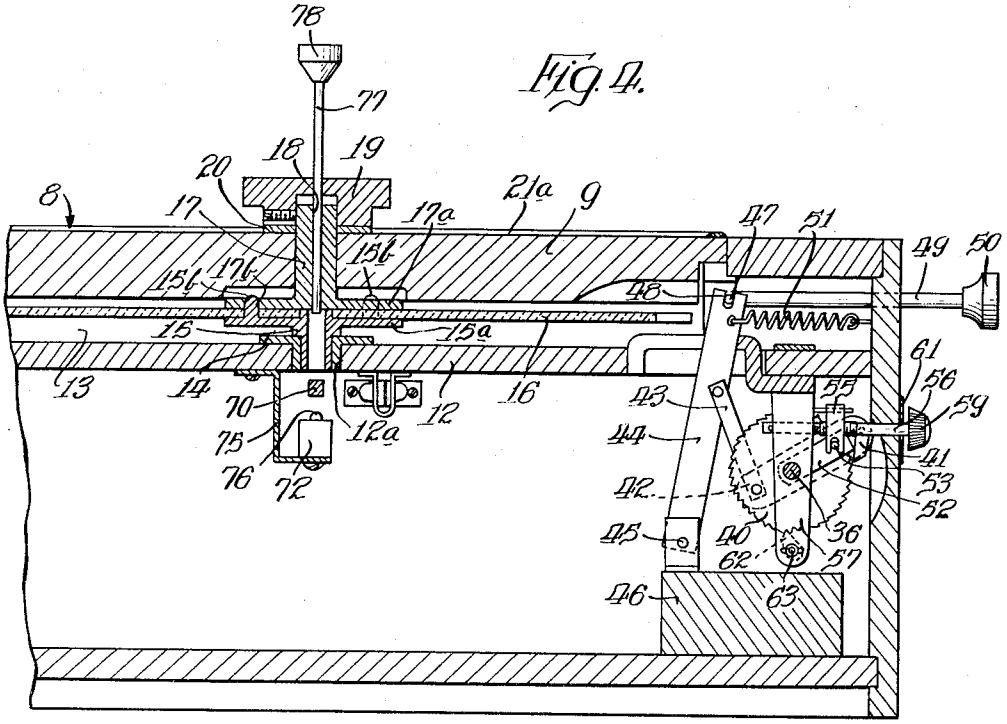


Fig. 4.



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PHOTOCOMPOSING MECHANISM

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Fig. 5.

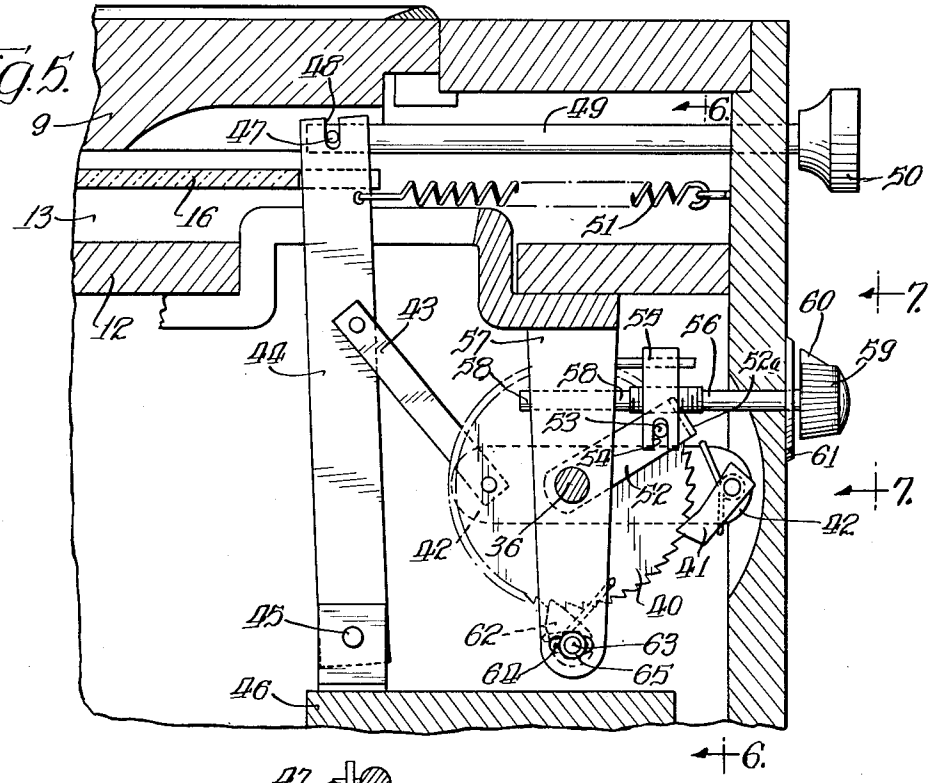


Fig. 6.

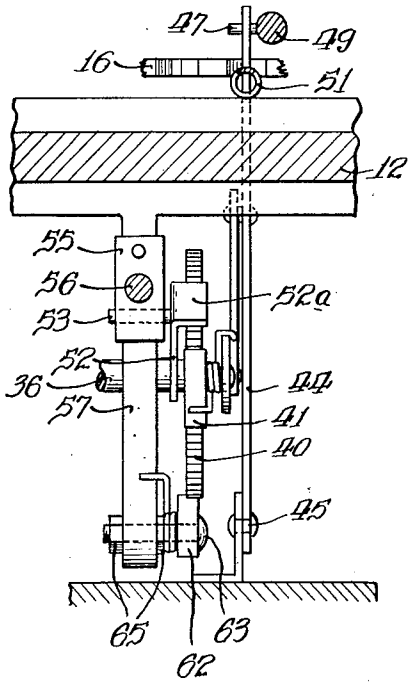
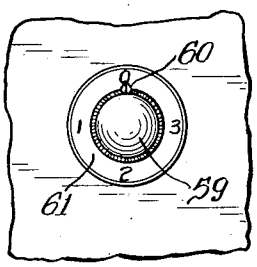


Fig. 7.



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Fig. 9.

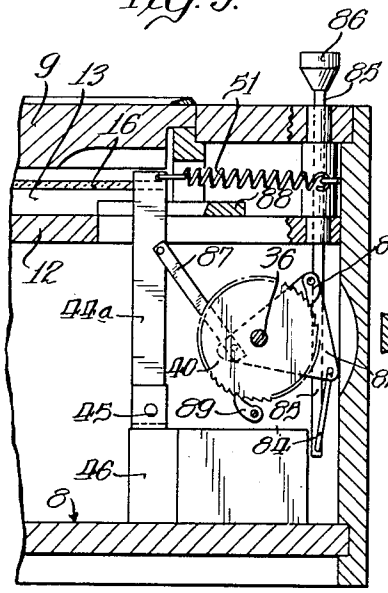


Fig. 8.

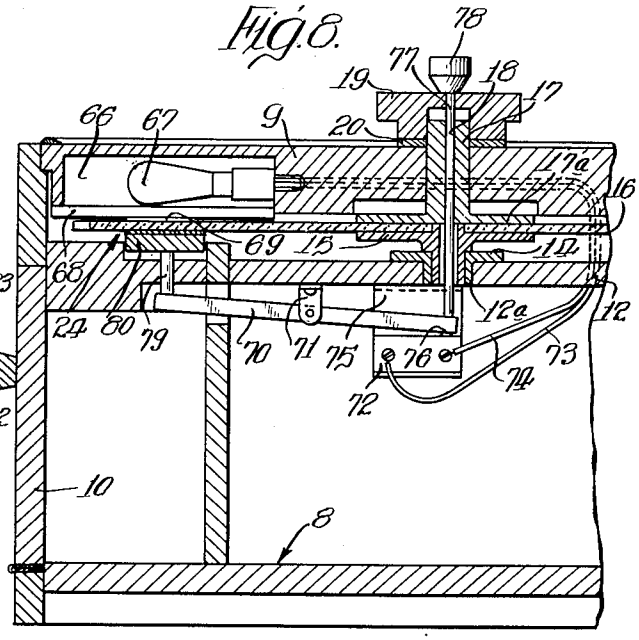
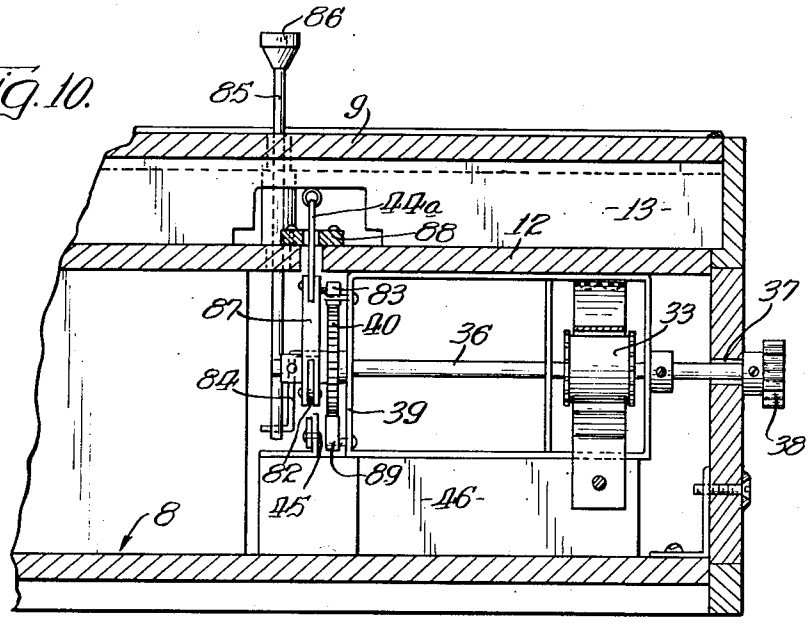


Fig. 10.



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UNITED STATES PATENT OFFICE

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PHOTOCOMPOSING MECHANISM

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Application December 1, 1950, Serial No. 198,596

6 Claims. (Cl. 95—4.5)

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This invention relates to photocomposing mechanism for producing latent images of indicia such as letters, numbers or the like upon a film or sensitized paper and concerns itself primarily with improved means for controlling the spacing of the images on the film and varying the spacing thereof as desired.

This is a continuation in part of my copending application Serial No. 147,827, filed March 6, 1950.

The invention is especially adapted for preparing copy with large size type or characters where proper spacing is necessary and desirable, or advertising layouts, headlines or captions or other special matter. The invention is moreover designed to accomplish these results at about one-tenth the cost of the usual printing techniques heretofore used. The invention is further adapted for a wide scope of use in that the indicia disks from which the images are made can be replaced by others with different indicia.

It is an object of this invention to simplify the construction shown in the above identified application to reduce the cost thereof, to render the same more compact, and to improve the image spacing means to provide proper variations in the spacing of the images.

The invention comprises the novel structure and combination of parts hereinafter described and more particularly pointed out and defined in the appended claims.

In the accompanying drawing which illustrates a preferred form of this invention and in which similar reference numerals refer to similar features in the different views:

Fig. 1 is a top plan view of the device involving this invention;

Fig. 2 is a top plan view with the cover and parts broken away;

Fig. 3 is a sectional view taken upon the line 3—3 of Fig. 2, looking in the direction of the arrows;

Fig. 4 is a fragmentary sectional view taken upon the line 4—4 of Fig. 2, looking in the direction of the arrows;

Fig. 5 is a fragmentary enlarged sectional view taken in the same plane as Fig. 4 illustrating the right hand portion of Fig. 4;

Fig. 6 is a part sectional and part elevational view taken upon the line 6—6 of Fig. 5 looking in the direction of the arrows;

Fig. 7 is an elevational view taken upon the line 7—7 of Fig. 5 looking in the direction of the arrows;

Fig. 8 is a sectional view taken upon the line

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8—8 of Fig. 3 looking in the direction of the arrows, but showing parts in different positions;

Fig. 9 is a fragmentary sectional view of a modified form of a part of the invention; and

Fig. 10 is a fragmentary sectional view of the modified form taken in a plane at substantially right angles to Fig. 9.

In referring now to the drawing, there is shown a substantially rectangular casing 8 which is closed at its top by a hinged cover 9 of any suitable material, and which may have the side doors 10 and 11 for access to the interior thereof. Spaced a short distance downwardly from the top of the casing is a horizontal partition 12 which is suitably secured in the casing and forms a chamber 13 thereabove.

Centrally of the partition 12 there is an aperture 12a in which a hollow bearing 14 is secured. A flanged bearing 15 is journalled in the bearing 14 and the flange 15a of the bearing 15 has upwardly projecting pins 15b, one of which is shown in Fig. 4. These pins 15b are adapted to fit in sockets 16a (Fig. 2) in the indicia carrying disk 16, while the disk is supported upon flange 15a. A bearing 17 journalled in the cover has a flange 17a provided with holes 17b for receiving the pins 15b whereby the cover and flange 17a may be elevated above the disk 16. The bearing 17 has a passage 18 therethrough and a knurled head 19 is secured upon the upper end thereof. To the lower end of the knurled head 19 is secured a pointer 20, best shown in Fig. 1. This pointer rotates with the knurled head 19 and the indicia bearing disk 16. Thus the head 19, bearing 17 and disk 16 rotate as a unit.

The pointer 20 cooperates with a circular indicia indicating scale 21 best shown in Fig. 1 and which comprises a suitable indicia bearing surface or face 21a upon the top of the cover 9. This indicia scale comprises the same indicia as shown on the indicia carrying plate 16, with a space 22 between certain indicia for spacing purposes. The indicia on disk 16 are represented as being in a circular series 23. The arrangement is such that when the pointer is rotated into registry with an indicia on scale 21, the same indicia on disk 16 will have rotated into the exposure station 24. For example, if the pointer has been rotated into registry with the letter D on scale 21, the letter D on disk 16 will be at the exposure station 24.

The indicia carrying disk 16, which is transparent, is preferably made with an opaque band or ring 16b upon one side in which the circular series 23 of indicia are formed, preferably by

photographically reproducing the font of type on the opaque band which band may be an ethyl cellulose film having an emulsion thereon, so as to provide transparent spaces corresponding to the shape of the indicia as shown in Fig. 2. In the periphery of the disk 16, there are spacing slots or notches 25 and 26 with bevelled spacing portions 16c therebetween for guiding a stop member into a slot as will later appear, the slots 25 being of greater depths than the slots 26. These slots continue around the total periphery of the disk 16 and the depths thereof determine the spacing between the characters formed as will later more fully appear. The different slots may all be of different depths depending upon the desired spacing of the finished letters or characters.

A film 27 susceptible of receiving an image and best shown in Fig. 3, is adapted to be fed across the exposure station 24. This film 27 comes from a reel 28 suitably supported adjacent one end of the casing and near a side wall. From the reel 28, the film is led to a guide way 29 formed in a guide block 30 projecting through an opening in the partition 12 and supported by struts 31 and 32. The film emerging from the guide way 29 is trained over a toothed feed roll or sprocket 33 from which it may pass through a guide passage 34 in strut 32 and into the chamber or space 35 beneath the guide block 30.

The film feed sprocket 33 is secured to a shaft 36 which is journalled adjacent its outer end in a wall of the casing as indicated at 37 (Fig. 10 of the modification) and projects through said wall where it is provided with an operating knob 38 outside of the casing. The inner portion of the shaft 36 may be supported by any suitable means such as bracket 39.

The shaft 36 which carries the film driving sprocket 33 is adapted to be intermittently operated by ratchet mechanism shown in Figs. 4, 5 and 6, or by the modified form of mechanism shown in Figs. 9 and 10. In referring to Figs. 4, 5 and 6, there is shown a ratchet wheel 40 fast upon shaft 36. A pawl 41 which drives the ratchet wheel is pivoted upon a lever 42 loosely mounted upon shaft 36 adjacent the ratchet wheel. The lever 42 is pivotally connected by a link 43 with an operated member 44 which is pivoted at its lower end on a pivot 45 upon a support 46. The member 44 extends adjacent the periphery of the disk 16 and thereabove where it is connected by a pin 47 and slot 48 with an operating rod 49 which extends through the side wall of the case and is provided with an operating knob 50. In the present instance, the pin 47 is carried by the rod 49 and the slot 48 is in the top of the member 44 allowing proper pivotal motion for the operated member 44. In the region of the disk, the member 44 is designed to enter a slot 25 or 26 in the disk 16 for arresting further movement of the ratchet wheel and hence the advancement of the film. For when the rod 49 is moved inwardly, it will rotate the ratchet until it is arrested by engaging the bottom of the entered slot. Upon release of the rod 49, a coil spring 51 will return the member 44 and the pawl lever 42 to initial position. This coil spring is connected to the upper part of member 44 and the casing wall.

The operative range of movement of the operated member 44 depends upon the depths of the slots in the disk 16. By varying the depths of the slots, the range of movement of the operated member 44 may be varied for varying the advancement of the film and hence the spacing between images thereon. However, means have been provided for varying the rotation of the ratchet wheel 40 and hence the advancement of the film and the spacing of the images thereon within the range of movement of the operated member. This means consists of mechanism for controlling the engagement of the pawl 41 with the ratchet wheel, which will now be set forth.

An arm 52 (Fig. 5) is loosely mounted upon the shaft 36 adjacent the ratchet wheel 40 and this arm has a right angled top 52a extending over the ratchet wheel 40 and fairly close to the same. The upper portion of the arm 52 has a pin 53 extending therethrough, which pin 53 extends into a bifurcation 54 in an adjustable nut or device 55 which is threaded upon a screw rod 56 which has a smooth portion journalled in the hanger 57 which carries the shaft 36. In order to confine the rod 56 against endwise movement in the supporting hanger 57, pins 58 extend through the same, one upon each side of the support. The rod 56 extends through the wall of the casing where it is provided with an operating knob 59 having a pointer 60 which is designed to move over a scale 61 upon the wall of the casing. This scale may be calibrated in any suitable manner; in the present instance, it is shown as having a zero point at which there will be normal operation without any variation, and a point 2 where there will be a variation in the feeding of the film amounting to a single extra unit. Further adjustment of the pointer will increase the units of variation.

With reference to Fig. 4, in which the parts are shown in initial positions, it will be noted that pawl 41 has been elevated upon the top 52a of the arm 52, which top serves as a shield for the pawl, while in Fig. 6, the pawl 41 is shown in operative position. When the lever 42 is actuated, the pawl 41 will ride off of the shield and engage the ratchet wheel. Hence it will be apparent that the position of the shield will determine just when or at what point the pawl will engage the ratchet wheel. By adjusting the knob 59, the nut 55 will be shifted for raising or lowering the arm 52 and hence varying the position of the shield 52a over the ratchet wheel. If the nut 55 is moved to the right, the arm 52 will be elevated with its shield 52a with the result that the pawl 41 will ride off of the shield 52a sooner for engaging the ratchet wheel sooner and hence effect an increase in the advancement of the film from the normal. Thus it will be seen that the advancement of the film and hence the spacing of the images thereon can be varied within the range of the operated member 44.

In order to prevent reverse rotation of the ratchet wheel, there is provided a holding pawl 62 which is mounted upon an adjustable bolt 63 extending from the lower end of the hanger 57. The bolt 63 extends through an arcuate slot 64 in the hanger for adjustment and is held in adjusted position by the nuts 65. This adjustment is desirable for the initial setting of the ratchet wheel 40.

In referring to Fig. 8, it will be observed that the cover 9 of the casing is provided with a chamber 66 in which an electric light bulb 67 is mounted, the lower end of the chamber 66 being closed by a plate 68 having a light ray transmitting slot 69 which is in registry with the exposure station 24 for producing an image on the film, and which can be removed and replaced by others to vary the light projecting aperture.

Referring to Fig. 8 again, there is shown a lever 70 pivoted intermediate its ends to a bracket 71 fastened to the bottom of the partition 12. One end of this lever extends over an electric switch 72 which is connected to the light bulb 67 by the electric conductors 73 and 74 and which is supported upon a bracket 75 on the partition 12. The switch 72 comprises a movable member 76 best shown in Fig. 8 which is adapted to be engaged by lever 70 when the same is engaged by a push rod 77 extending through the knurled head 19 and the bearings 17, 15 and 14 aforementioned. The upper end of the push rod 77 is provided with an operated head 78 for ease of operation.

The other or left hand end of lever 70 actuates a pin 79 which loosely extends through an aperture in the partition 12 and carries a contact pad 80 at its upper end adapted for pressing the photographic film 27 at the exposure station against the bottom of the disk 16, the film being designed to pass between the pad and the disk. Thus the downward actuation of push rod 77 simultaneously closes the switch 72 for illuminating the light bulb 67 and presses the film against disk 16 through the downward movement of the right end of lever 70 and the upward movement of the left hand end.

Summarizing the different steps in the operation of the mechanism or apparatus, it will be understood that the knob 19 with pointer 20 and disk 16 will first be rotated as a unit until the pointer registers with the selected indicia on the scale 21. When this occurs, the selected indicia which also appears upon disk 16 will have been brought to the exposure station 24. The next step requires an inward push upon the push rod 49 which will advance the film until the stop member 44 is swung into engagement with the end or bottom of the adjacent slot 25 or 26, and is stopped or arrested which will also arrest further feeding movements of the film, so the advance of the film and consequently the spacing of the finished indicia is determined by the depths of the particular slot into which the stop member may be swung. Now, the pin or rod 77 is depressed to close the switch in the circuit to the lamp 67 and to elevate the contact pad 80 for pressing the film against the bottom of the disk 16 at the exposure station 24.

In the event that it is desired to vary the spacing of the images as provided by the range of movement of the operated member 44, it is only necessary to adjust the knob 59 which will vary the timing of the coupling relation between the driven ratchet 40 and the driving pawl 41.

In referring now to Figs. 9 and 10, which illustrate a slightly modified mechanism for operating the ratchet 40, there is shown the film feed shaft 36 with the ratchet 40 fast thereon. In this form of drive, there is a triangular plate lever 82 loosely mounted upon shaft 36 adjacent the ratchet wheel 40. A pawl 83 is pivoted to one apex of lever 82, a link 84 connects another apex of said lever with an operating rod 85 which extends vertically through the top of the casing where it is provided with an operating knob 86. A link 87 connects the other apex of the lever 82 with an operated member 44a pivoted at its lower end to a support 46 as indicated at 45. The operated member 44a is adapted to be swung for engaging the slots in the periphery of the disk 16 for arresting the advancement of the film as in the first form. A coil spring 51 which connects the upper end of the operated member 44a with the casing serves to return the member 44a and

lever 82 to initial position. A bifurcated guide block 88 may be used to guide the upper end of the operated member 44a during its movements. To hold the ratchet wheel against reverse rotation, a holding pawl 89 may be suitably supported in the casing adjacent the lower end of the ratchet wheel 40.

In the operation of the modified driving mechanism, the rod 85 is pushed downwardly for actuating the triangular lever 82 and imparting rotation to the ratchet wheel 40. As the lever 82 is swung during operation, the operated member 44a will swing to the left and engage a notch or slot in the periphery of the disk 16. When the member 82 strikes the bottom of a slot, further rotation of the ratchet wheel will be prevented with the result that the proper spacing of the images upon the film will be obtained.

It will be appreciated, as herein set forth, that a very compact and efficient device has been provided which accurately controls the spacings of the images upon the film through the depths of the stop slots in the indicia disk or through the adjustment of the control of the coupling between the driven mechanism for the film and the driving mechanism thereof.

I am aware that many changes may be made and various details of construction may be modified without departing from the principles of this invention, so I do not propose limiting the patent granted otherwise than necessitated by the appended claims.

I claim:

1. In a photographic composing machine, a box-like cabinet, an exposure station therein, a hinged cover panel comprising a top closure to said cabinet, a flanged turntable bearing vertically pivoted in said cabinet, the turntable portion of said bearing having upstanding locating elements, a disk adapted to be placed horizontally on the turntable portion of said bearing, and having a circular array of character indicia, a central hole and apparatus for receiving said locating elements of said turntable bearing, the peripheral edge of said disk having radially varying abutments each corresponding to one of said character indicia, a feed sprocket mechanism for advancing a photo-sensitive strip past said exposure station, said exposure station being in light projection alignment with said circular array of indicia, a ratchet to drive said feed sprocket mechanism, a pawl to drive said ratchet, a key for actuating said pawl, a link intermediate said key and said advancing mechanism having a portion engageable with said disk abutments whereby to limit the extent of stroke impartable to said pawl, and a member adjustably positionable for determining the initial engagement of said pawl with its said ratchet for further regulating the degree of movement imparted to said strip.

2. A photographic composing machine comprising, a box-like cabinet, a hinged cover panel constituting a top closure to said cabinet, a flanged turntable bearing vertically pivoted in said cabinet and having upstanding locating pins, a disk adapted to be placed horizontally on said turntable bearing flange having a circular array of character indicia, said disk having in addition a central aperture and locating apertures for receiving said pins, the peripheral edge of said disk being provided with radially varying abutments each corresponding with a related one of its said character indicia, a pawl and ratchet feed mechanism for advancing a photo-sensitive

strip past an exposure station in light projection alignment with said circular array of character indicia, a manipulator rotatably journaled in said cover panel and having coupling engagement with said turntable bearing for selectively placing said disk in different positions to align any of its said character indicia with said exposure station, said manipulator having a central aperture, a longitudinally slidable plunger reciprocable within said manipulator central aperture, a lever pivotally mounted in a stationary part of said cabinet rocked by the end of said plunger, a pad pressing a portion of said photo-sensitive strip into close juxtaposition with a selectively placed one of said character indicia, an illuminator for impressing on said pressed portion of said strip the indicia of said selectively placed character, and an electric switch operated by said lever during the subsequent portion of its rocking motion for thereafter energizing said illuminator.

3. A photographic composing machine including, a flanged turntable bearing vertically pivoted and selectively rotatable, said bearing having upstanding locating pins in its flanged portion, a disk adapted to be placed into horizontal position on said turntable bearing flange and having a circular array of character indicia, said disk including a peripheral edge modified by radially varying abutments, each corresponding with the space requirements of a related one of said character indicia, a pawl and ratchet mechanism for feeding incrementally a photo-sensitive strip past an exposure station, said exposure station being in light projection alignment with any selected one of said indicia of said disk circular array, a manipulator having a coupling connection with said turntable bearing and its said upstanding alignment pins for selectively placing said disk so as to register one of its character indicia with said exposure station, said manipulator having a central aperture, a longitudinally slidable plunger reciprocable within said manipulator central aperture, a lever pivotally mounted in a stationary portion of said cabinet, whereby to be rocked by the end of said plunger, a pad for pressing the portion of said photo-sensitive strip into close juxtaposition with a selectively placed one of said character indicia, an illuminator for impressing on said pressed portion of said strip the image of said indicia, and a switch for operating said illuminator actuated by said pivoted lever during the final portion of its said rocked actuation by said plunger.

4. In a device of the character described, a cabinet comprising an enclosure and principal support device, a hinged cover panel pivoted to said cabinet and constituting a topmost closure member to the interior of said cabinet, a flanged turntable bearing vertically pivoted in a support structure interior of said cabinet and having upstanding locating pins, a replaceable disk member adapted to be positioned upon said turntable bearing flange and having apertures registering with locating pins carried by said turntable bearing, the peripheral edge of said disk being radially studded with characteristic abutments each relating to a character indicia of a plurality of characters arranged in a circular array on the surface of said disk, a pawl and ratchet feed mechanism for advancing a photo-sensitive strip past an exposure station in said cabinet, a light projection system in registration with said exposure station and having an illuminating device electrically operative therewithin, a key for actuating said pawl of said strip advancing mechanism, a link intermediate said key and said advancing mechanism having a portion engageable with said peripherally studded abutments of said disk whereby to limit the extent of movement impartable to said pawl by said key, and an adjustable member operative upon said pawl for varying its initial engagement with its said ratchet by adjustably foreshortening its effective actuating stroke, and consequently the degree of movement imparted by said key to said strip advancing mechanism.

5. The combination set forth in claim 4, including a switch for energizing said illuminator, a lever for actuating said switch, a pad for pressing a portion of said strip into close juxtaposition with a selected character indicia of said disk, and a longitudinally slidable plunger extending through said manipulator for rocking said lever to first press said pad against said strip and thereafter to actuate said illuminator switch.

6. In an apparatus for photo composition on strip material, a principal structure affording a light tight inner chamber and having a hinged horizontal cover, a vertical pivot member within said structure comprised of severable flanged components, a disk transparency carried by said pivot member and bearing a circular distribution of character images on a peripheral distribution of radial abutments, a strip advancing mechanism comprising a rotatable feed sprocket having teeth which mesh with feed holes of a photo-sensitive strip and a ratchet wheel having a predetermining number of ratchet teeth for each one of said sprocket teeth, a rockable lever mounted coaxially with said sprocket and ratchet wheel, a spring urged pawl carried by said lever for engaging and advancing said ratchet wheel during the rocking of said lever and for thereby advancing said sprocket, a probe pivotable to engage each of said disk peripheral abutments, means for translating the motion of said probe into corresponding ratchet advancing movement of said lever, and an adjustable cam interceptor for disengaging said pawl from said ratchet wheel during the return movement of said lever as well as for determining during its forward movement the relative point of re-engagement therewith.

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