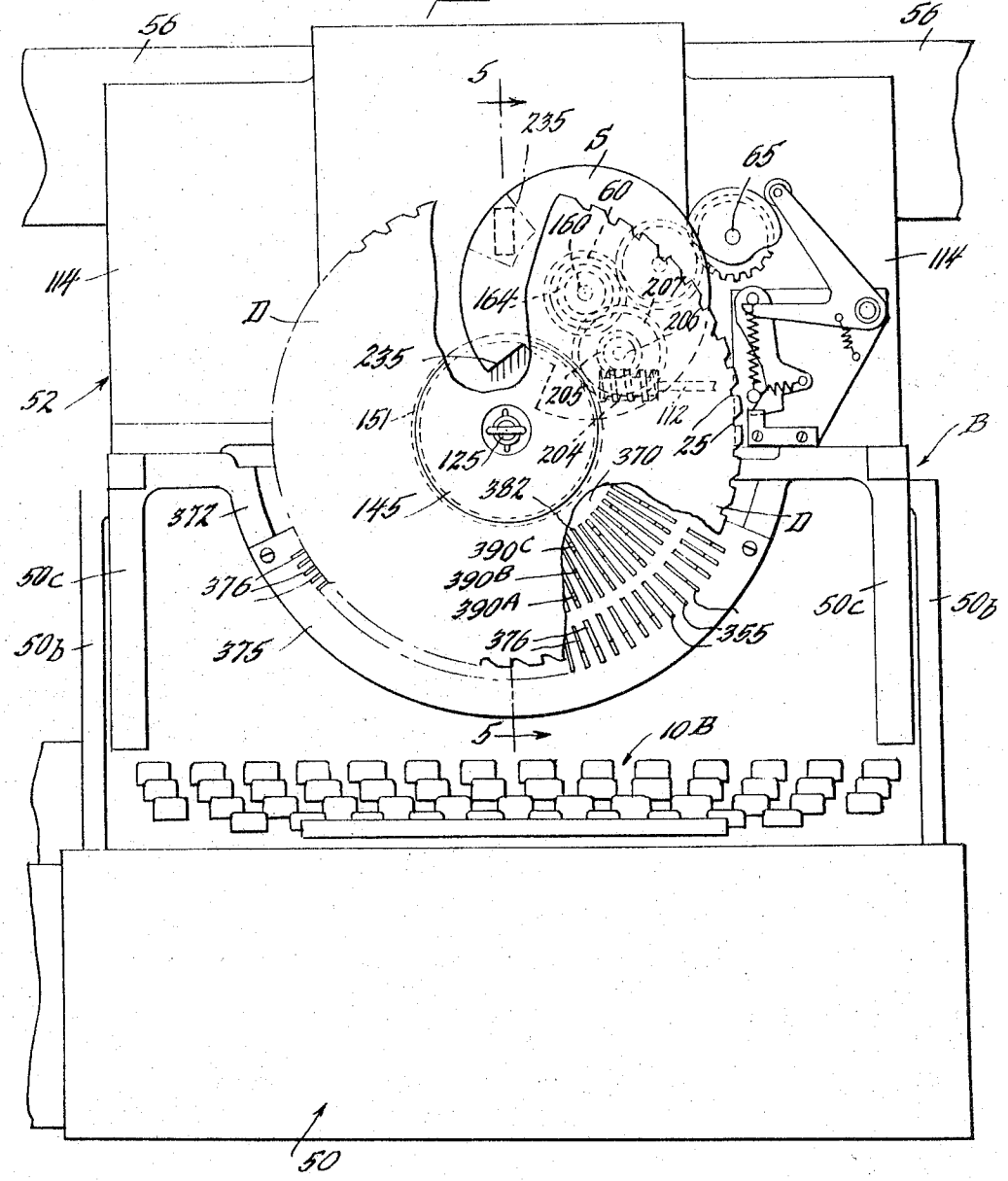
Jan. 10, 1967 G. J. H. SAUSELE 3,296,948

PHOTOGRAPHIC COMPOSING MACHINES

Original Filed June 3, 1964 3 Sheets-Sheet 1

FIG. 1



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PHOTOGRAPHIC COMPOSING MACHINES

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FIG. 2

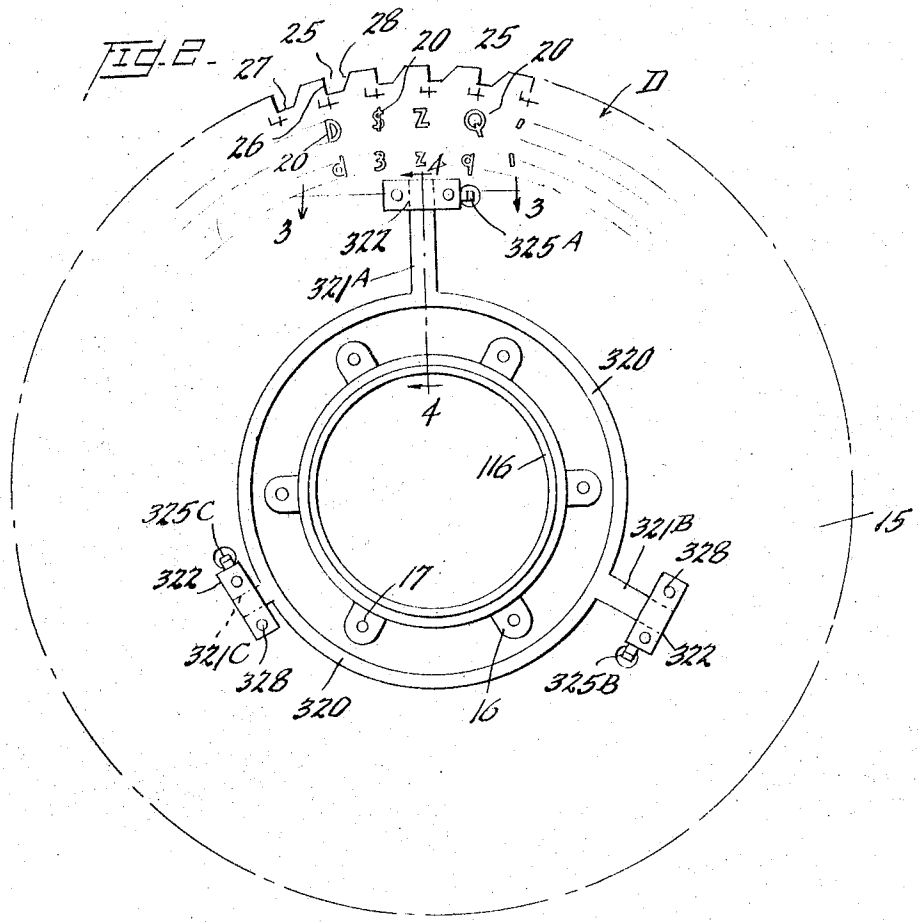


FIG. 3

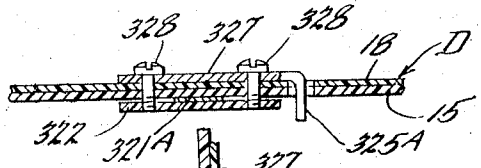
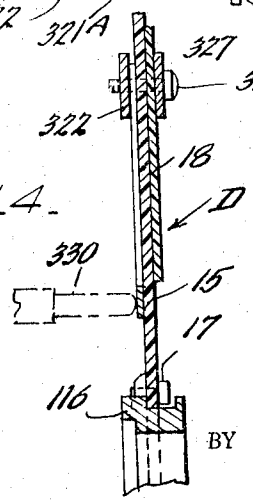


FIG. 4



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FIG. 5

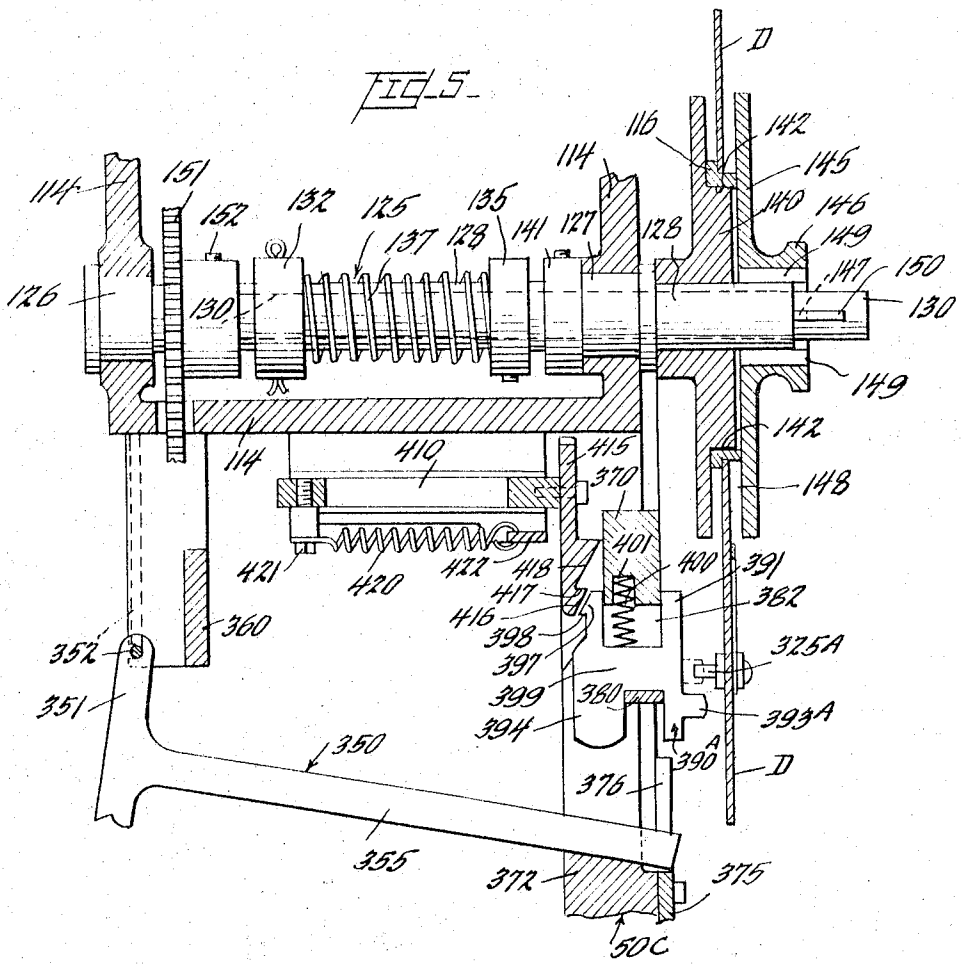


FIG. 6

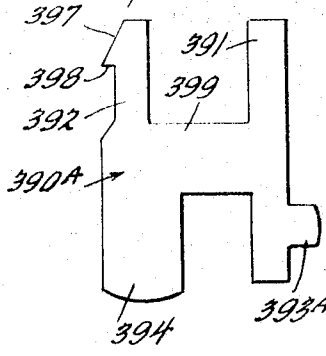


FIG. 7

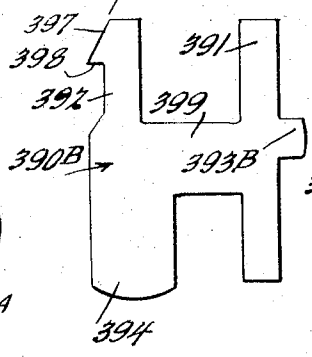
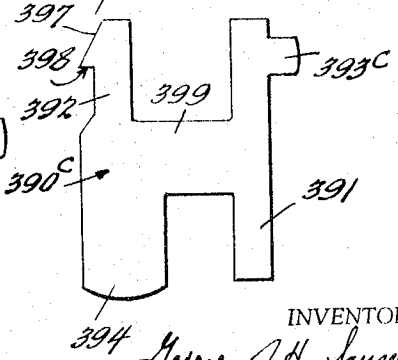


FIG. 8



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United States Patent Office 3,296,948 Patented Jan. 10, 1967

3,296,948

PHOTOGRAPHIC COMPOSING MACHINES

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Original application June 3, 1964, Ser. No. 372,211. Divided and this application Mar. 25, 1966, Ser. No. 537,372

4 Claims. (Cl. 95—4.5)

This application is a division of my co-pending application Serial No. 372,211, filed June 3, 1964 now abandoned.

This invention relates to photo-typesetters and more particularly to such devices in which a rotary master character disc is employed and in which means are provided for stopping the disc momentarily at the point at which the selected character is positioned for projection of the character image upon the receiving medium.

A photo-typeseter of this general nature is disclosed in my United States Patent No. 3,082,670, granted March 23, 1953, and certain master character discs of constructions eminently satisfactory for regular text and relatively small headline composition are disclosed in my Patents 3,011,424 and 3,089,402.

The degree of magnification of the characters as imprinted on the film or other receiving medium in the regular text machines is usually about two to one and the clarity and sharpness of the images are relatively unimpaired. However, considerably greater enlargement of the projected images is necessary for setting display or larger headline composition, and extraordinary care is required to preserve the sharpness of the outlines of the character images and also to maintain the proper positioning of the individual matrix characters with respect to the lens system and the film.

The general object of the present invention, therefore, is to provide a novel and improved device of the class described which is of the same generic nature as the one disclosed in my prior Patent No. 3,082,670, but which is adapted to afford a high degree of accuracy in positioning the master character disc for considerably enlarged display typography but with sharp uniform images of utmost clarity. The desideratum is a display type size of from say 10 to 84 points.

For the attainment of image sharpness and clarity, the best photographic lenses are employed, and a light source of as high an intensity as is compatible with other factors, together with the provision of as large a matrix character size on the master disc as is practical. And for accurate positioning of the selected character matrix with respect to the optical system, the invention provides a novel indexing system as disclosed herein and illustrated in the accompanying drawings.

While the present improvement is applicable to the use of a master disc containing separate sectorial fonts of characters, a particular embodiment of the invention is disclosed herein where the entire alphabet or font of characters is spread over the whole 360° area of the disc.

One of the important novel features of the invention is the arrangement of the stop pins on the disc and the peculiar construction of the cooperating abutment blades for the positioning of the disc for the selection of a character.

Other objects and features of novelty will be apparent from the following specification when read in connection with the accompanying drawings in which one embodiment of the invention is illustrated by way of example.

In the drawings:

FIGURE 1 is a fragmentary view in front elevation of pertinent portions of a typesetter machine embodying

the principles of the invention, certain parts being broken away for better illustration of underlying mechanisms;

FIGURE 2 is a plan view of the rear face of a master character disc for use in the machine;

FIGURE 3 is a fragmentary sectional view taken on line 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary sectional view taken on line 4—4 of FIGURE 2;

FIGURE 5 is a fragmentary vertical sectional view taken substantially on line 5—5 of FIGURE 1 with certain portions of the frame and operating mechanism broken away; and

FIGURES 6, 7 and 8 are views in side elevation of three different forms of stop blades employed in the primary indexing feature for the disc.

Theoretically it might be possible to attain the desired enlargement of the projected image from the ordinary text size character by purely optical means, as by alterations and adjustments in the lens system, but there is a practical limit to the clarity and sharpness of the images and accuracy of position for good alignment, where such high magnification alone is pursued. However, it has been found that an enlargement of the image to approximately 3½ times the size of the matrix character is satisfactory.

This presents a need for compromise between the maintenance of smaller size matrix characters on the disc, and the urge toward enlargement exclusively by optical magnification. On the one hand, it is proposed to provide somewhat larger matrix characters on the disc (although, of course, small characters at least down to 10 point must also be provided on the disc) and to use the whole area of the disc for one font, and to effect the selection of an individual character from the sectors on the disc by modified primary stop means.

The description of the basic structure of the machine logically begins with a reference to FIGURES 1 and 5 of the drawings and during the development of this disclosure, my prior Patent No. 3,082,670 should be referred to with particular emphasis on FIGURES 5, 16, 21, and 23 to 29, inclusive, and to the accompanying descriptive matter in columns 11 and 12 and 15 to 18 of the specification.

Wherever feasible, the same reference characters will be employed in this disclosure as were used in the applicant's prior patent. Thus, the photo-typesetter machine as an entity is designated B and comprises a base frame **50** having certain side frame portions **50***b* which serve to support an inner frame structure **50***c*. A superstructure **52** surmounts the machine and includes a box frame **114** within which much of the novel mechanism pertaining to the present invention is housed. The film carriage, which by means of suitable escapement mechanism is moved step-by-step past the point of projection of the image of a character, is not shown, but it is presumed to be arranged to ride upon the track bar **56** supported as suggested in FIGURE 1 of the drawings.

The photo-typesetter machine B may be actuated and controlled by a coded tape fed thereto or by a keyboard **10B**.

Other features which will be readily recognized as counterparts of similar elements in my prior patent, are the master character plate D which is in the form of a circular disc which is for the most part made opaque but is provided with transparent representations of characters arranged in predetermined order around the entire circumference of the disc. A rotary shutter disc is indicated at S and is provided with a notch **235** which registers with the path of the beam of the transmitted image at appropriate times for impressing the film or other sensitized medium on the carriage.

Now giving principal attention to FIGURE 5 of the drawings and following the corresponding FIGURE 23 of my prior patent, it will be seen that the box frame **114** is provided with bearings **126** and **127** in its rearward and forward walls for the rotative support of the disc shaft assembly **125**. A driving gear **151** having a hub secured to the shaft assembly **125** by means of the screw **152** meshes with a gear **207** which also serves to drive the shutter shaft **160** through the gear **164**. A power shaft **112** carries a worm **204** which drives the worm gear **205** which is carried by the shaft **206** upon which the gear **207** is fixed.

A sleeve **132** is pinned to the control rod **130** of the shaft assembly **125** and provides a seat for the coil spring **137** which surrounds a tubular outer portion **128** of the shaft assembly **125** and whose opposite end is seated against the sleeve or collar **135** pinned only to the outer cylindrical portion **128** of the shaft. Thus, it will be seen that the solid core element **130** of the shaft assembly **125** is urged toward the left with respect to the surrounding hollow tubular portion **128** but may be moved in a right-hand direction against the compression of the spring **137**. The collar **141** serves as a guide sleeve for the shaft assembly and bears against the outer wall of the box frame **114**.

Near the outer end of the shaft assembly **125** a disc supporting member **140** is accurately secured upon the outer shaft portion **128** with a forced fit. The member **140** is disposed adjacent the bearing **127**, and is shouldered as at **142** to receive the hub **116** of the master character disc D.

A clamping plate element **145** having a knob portion **146** centrally thereof is applied around the shaft assembly **125** so that it bears against the outer rim of the disc hub **116** and clamps the disc hub against the circular outward portion of the member **140** with resilient frictional driving pressure. A clearance space **148** is left between the clamping flanged members **140** and **145** and a flat transverse extending key member **150** is carried by the end of the central shaft member **130**, and when this key is in position to seat in the notches **147** on the outer surface of the knob portion **146** of the clamping plate **145** it bears upon the knob to press the plate **145** against the hub **116** of the disc D. In order to release the plate, as for changing the discs, it is only necessary to withdraw the rod portion **130** of the disc shaft a slight distance against the urging of the spring **137** and rotate the plate **145** through an angle of 90° whereupon the key **150** may pass through the slots **149** in the hub of the plate. When the key **150** is positioned so as to bear against the knob **146** of the plate **145**, the pressure of the spring **147** determines the clamping pressure on the disc, and this pressure can be varied by the adjustment of the spring seat sleeve **135** along the outer tubular shaft element **128**.

It will thus be understood that although the drive from the power source to the shaft assembly **125** through the gear **151** is constant, the disc D may be stopped at appropriate points on account of the slippage afforded by the resilient clamping device under the influence of the spring **137**.

The disc D and its appurtenances will now be described in connection with FIGURES 2 to 5 of the drawings. The hub **116** of the disc is grooved to receive the central opening of the disc proper which may be made of suitable transparent plastic material. A series of ears **16** extend radially from the hub **116** and are provided with openings to receive the screws **17** for securing the disc plate **15** to the hub. An annular stiffening plate **18** is preferably provided on one side of the disc for reinforcing purposes.

The plastic material of the main portion **15** of the disc is coated with an opaque substance which is relieved to provide transparent characters **20** arranged in one or more rows near the periphery of the disc and when these transparent portions are aligned with the beam of the optical system, and the shutter is open, the image of the character is projected upon the film or other sensitive medium for reception of the composition.

Now, unlike the disc of my previous patent, certain stop pins are provided which are disposed at varying distances from the center of the disc. It will be recalled that in the earlier patent the fonts of characters were repeated within each 120° sector of the disc and the disc was brought to a stop by the projection of the selected character stop blades with the master character of the nearest font sector in position for projection. In the present development, however, the entire font of characters is distributed around the full 360° circumference of the disc, although they may be divided into sectional groupings of 120° to correspond to the extent of the nest of stop blades indicated in the central portion of FIGURE 1 of the drawings.

Now, in order to properly allocate the particular characters from the full 360° extent of the disc to the group of stop blades which occupy only 120° of angular extent, on the frame of the machine, the stop pins on the disc are each allocated to one of the 120° sectors and these pins disposed at different distances from the center of the disc, and are adapted to be abutted and stopped by stop blades having projections formed at three different positions along their lengths. The particular construction of these blades will be described in connection with FIGURES 6, 7 and 8 of the drawings.

The stop pins are shown clearly in FIGURES 2, 3, 4 and 5, the one nearest the center of the disc being designated **325C**, the one at an intermediate distance from the center designated **325B**, and the pin which is farthest from the center of the disc being designated **325A**. The pins are each provided with flat shank portions **327** and two screws **328** serve to secure the pin assemblies to the disc. These screws pass through openings in the disc proper and their ends are threaded into the small backing or clamping plates **322**.

For making electrical contacts within the controlling circuitry of the system, a thin annular band or conductor ring **320** is applied closely to the rear surface of the disc and this ring has radially projecting arms extending therefrom. The shortest arm or extension is indicated at **321C**, the arm of intermediate length at **321B**, and the longest arm at **321A**. The arm **321A** is associated with the stop pin **325A** and is clamped beneath the corresponding plate **322**. Similarly, the intermediate arm **321B** is clamped beneath the plate **322** of the stop pin **325B**. The shortest arm **321C** is clamped beneath the plate **322** of the stop pin **325C**. Needless to state, the plates **322** as well as the screws **328** are of conducting material to bring the pins **325** into the circuitry with the band or conductor ring **320**. A spring-pressed contact is suggested at **330** in FIGURE 4 and this contact is for the same purpuose as the one similarly designated in my Patent No. 3,082,670.

Finally, in one embodiment of the invention, the periphery of the disc D is provided with a peculiarly shaped notch adjacent each of the points where the characters **20** of the annular series of characters occur. These notches are designated **25** and have radially extending side walls **26**, bottom walls **27** and inclined opposite side walls **28**, all for purposes which are fully set forth in my copending application Serial No. 372,211, of which this application is a division.

Now referring particularly to FIGURES 5 to 8 of the drawings and bearing in mind the disclosure in FIGURES 23 and 29 and columns 16 to 18 of my prior patent, it will be understood how the seeker mechanism and the rudiments of a type key bar installation are connected to the T-shaped levers **350**, one of these levers being provided for each character and key of the typesetter. These levers **350** are pivoted by their shorter arms **321** to a common arcuate pivot wire **352**, the longest arm **355** of each of the levers extending forwardly to enter one of a

series of radially extending slots **376** formed in the face plate **375** secured to the arcuate portion **372** of the forward portion of the framing structure **50C**. Another arcuate member **370** is secured to the lower forward face of the box frame **114**. The arcuate bracket **370** has associated with it a downwardly depending strap element **380** which fits into a groove in the lower edge of the member **370** beneath the portion of the member **370** which is notched at **382** to correspond in number and registry with the slots **376** and the lever arms **355**.

Confined for radial sliding movement within the slots **382** are the stop blade elements indicated generally by **390A**, **390B** and **390C**. The one shown in FIGURE 5 of the drawings is the same as the blade illustrated in FIGURE 6 and is designated **390A**. Each of these blade elements comprises an outer vertical blade portion **391** and an inner vertical blade **392**. The outer blade portion **391** has a short projection thereon which is adapted to be brought into the path of rotation of one or the other of the stop pins **325** of the disc. The rearwardly positioned vertical portion **392** has a rounded lower end **394** which is aligned with the corresponding long arm **355** of the actuating T-lever **350** as clearly shown in FIGURE 5. The upper end of the rear portion **392** is provided with a bevelled spear-head surface **397** and is notched to form an undercut ledge or hook **398**. The forward and rear portions of the blade are joined by a bridge portion **399** which works in one of the slots **392** of the arcuate member **370**.

All of the members **390** are normally urged in a downward direction by means of coil spring such as shown at **40** which may be seated in a socket **401** and has its opposite end bearing downwardly on its blade element.

The means employed for latching the blade elements in their raised or operative positions until another cycle of character projection operation is called for is clearly described in column 17 of my Patent No. 3,082,670 and will be but briefly repeated herein. The slide plate or trolley **410** is guided for horizontal movement within guides supported by the framework and the trolley is urged forwardly by means of the spring **420** which connects a post **421** on the slide **410**, and a bracket **422** secured to an appropriate portion of the fixed framing of the machine.

Bolted to the forward end of the slide **410** is the arcuate segmental latch plate **415** having a lower inclined surface **416** above which is a shoulder **417**, and a further inclined surface **418** which is of somewhat greater forward extent than the lower surface **416**.

It will be understood from the disclosure in the earlier patent how the upward projection of the blades **390** causes the surface **397** thereon to move against the lower inclined surface **416** of the latch plate **415** and then still farther up the inclined plane surface **418** to move the latch plate **415** to its ultimate inward extent to release any previous suspended blades. The head of the blade then drops down so that the hook **397** rests upon the ledge **417** of the latch plate **415** and remains in this operative position until released by the operation for the next character.

The blades **390A** are provided with stop projections **393A** at the lower portion of the outer limb **391**; the blade **390B** has its stop portion **393B** at an intermediate portion along the leg **391**; and the blade **390C** has its stop portion **393C** near the upper end of the limb **391**. It will be readily understood how the different positions of the alternating blades fits in with the three radial positions of the stop pins **325A**, **325B** and **325C** of the disc. For example, in the operation of the blade **390A** as shown in FIGURE 5 the stop portion **395A** will move upwardly, against the urging of the spring **400** until it moves into the path of the stop pin **325A** on the disc, whereupon the disc will be stopped with the selected master character in proper projecting position corresponding to the blade **390A** with which it is associated. It is, of course, understood that the arrangement of the master characters on the disc and in the three sectors corresponds with the positions of the pins **325A**, **325B** and **325C** and follows in accordance with the character represented by the group of blades **390A**, **390B**, and **390C**.

Thus far there have been described the details of the primary indexing device which displays inventive novelty over my earlier embodiment in respect to the selectivity of the blades and stop pins. This device is adapted to function in a similar manner as the arrangement in my Patent 3,082,670 but may, as disclosed herein, be modified for certain purposes whereby the proximity of the blades and the pins is chosen so as to permit a slight overrunning of the disc with respect to a given character, such overrunning being perhaps in the neighborhood of from about ten thousandths to fifteen thousandths of an inch, as fully described in my application Serial No. 372,211.

It is understood that various changes and modifications may be made in the embodiment illustrated and described herein without departing from the scope of the invention as defined by the subjoined claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. Character selecting mechanism for photographic composing machines or the like, comprising a supporting frame, a rotatable master character disc bearing matrix characters around its circumference, said characters arranged upon the disc in a plurality of sectorial groups, friction driving means for continually urging said disc in a forward direction of rotation, stop means for selectively halting the rotation of the disc against the urging of the driving means at substantially the point for the presentation of a selected character to a light beam for image transmission, said stop means comprising a plurality of stop pins projecting from said disc, one pin for each of said sectorial groups of characters, a series of stop abutments movably carried by said frame and selectively projectable into the paths of said stop pins, the stop pins being disposed on said disc at different radial distances from the center thereof, and said stop abutments being projectable to blocking positions located at different radial distances from said center to be abutted only by corresponding pins on the disc, the characters occurring on a given sector of the disc being represented by the stop abutments cooperating with the pin appropriate to the sector in which said characters occur, said projectable stop abutments comprising tabs formed on slidable blades at different distances along the edges of said blades, said blades all being projectable substantially equal distances.

2. A photographic composing machine comprising, in combination, a supporting frame, a light beam source, a master character plate, and a carriage for supporting a medium for the reception of character images transmitted from said plate by means of such light beam; said master character plate being in the form of a rotatable disc bearing matrix characters around its circumference, friction driving means for continually urging said disc in a forward direction of rotation, the matrix characters constituting one complete font of characters distributed around the full circle of the disc but arranged in a plurality of sectorial groups, stop means for selectively halting the rotation of the disc against the urging of the driving means at substantially the point for the presentation of a selected character to the light beam for image transmission, said stop means comprising a plurality of stop pins projecting from said disc, one pin for each of the groups of characters into which the font is divided, a sectorial series of stop abutments movably carried by said frame and selectively projectable into the paths of said stop pins, the stop pins being disposed on said disc at different radial distances from the center thereof and said stop abutments being projectable to blocking positions located at different radial distances from the center of the disc to be abutted only by corresponding pins on the disc, the characters of

the font occurring on a given sector of the disc being represented by the stop abutments cooperating with the pin appropriate to the sector in which such characters occur, means for causing said stop pins and abutments to permit said disc to slight overrun the precise point for presentation of the selected character image; secondary means for indexing the disc for precision positioning thereof; a shutter device, means for driving said shutter device in timed relationship with respect to the process of presenting the matrix character and transmitting its image to said medium, and timing means geared to said driving means for actuating said secondary indexing means to finally position said disc and maintain it in precise position during the open period of said shutter device, said secondary indexing means including a movable element, a fixed accurately positioned arresting abutment, stop abutment surfaces on the disc provided by notches formed in its peripheral edge; the movable element of said secondary indexing means comprising a swingable pawl having a nose adapted to be inserted into the notch which is in closest juxta-position thereto, press against a rearward wall of said notch, and move the disc until a portion of the pawl strikes said arresting abutment.

3. The machine as set forth in claim 2, in which spring means are provided to urge said pawl into engagement with the notch, and said timing means comprises a cam and a follower member contacting said pawl and serving to withdraw it from said notch after the character image has been transmitted.

4. A photographic composing machine comprising, in combination, a supporting frame, a light beam source, a master character plate, and a carriage for supporting a medium for the reception of character images transmitted from said plate by means of such light beam; said master character plate being in the form of a rotatable disc bearing matrix characters around its circumstance, friction driving means for continually urging said disc in a forward direction of rotation, the matrix characters constituting one complete font of characters distributed around the full circle of the disc but arranged in a plurality of sectorial groups, stop means for selectively halting the rotation of the disc against the urging of the driving means at substantially the point for the presentation of a selected character to the light beam for image transmission, said stop means comprising a plurality of stop pins projecting from said disc, one pin for each of the groups of characters into which the font is divided, a sectorial series of stop abutments movably carried by said frame and selectively projectable into the paths of said stop pins, the stop pins being disposed on said disc at different radial distances from the center thereof and said stop abutments being projectable to blocking positions located at different radial distances from the center of the disc to be abutted only by corresponding pins on the disc, the characters of the font occurring on a given sector of the disc being represented by the stop abutments cooperating with the pin appropriate to the sector in which such characters occur, means for causing said stop pins and abutments to permit said disc to slightly overrun the precise point for presentation of the selected character image; secondary means for indexing the disc for precision positioning thereof; a shutter device, means for driving said shutter device in timed relationship with respect to the process of presenting the matrix character and transmitting its image to said medium, and timing means geared to said driving means for actuating said secondary indexing means to finally position said disc and maintain it in precise position during the open period of said shutter device, said secondary indexing means comprising the provision of a series of notches around the peripheral edge of said disc, each notch being appropriate to certain of the characters on the disc, a fixed supporting block disposed near the periphery of said disc and having a slot therein, a floating pawl having a pivot at one end thereof adapted to move in said slot, an accurately fixed arresting abutment surface on said block, a nose on the opposite end of said pawl having a surface thereon adapted to contact one wall of a notch in the disc and also said arresting abutment surface when in operative engaged position, an inclined surface on said nose and a fixed abutment on said block against which said inclined surface bears, spring means urging said pawl in a generally tangential direction with respect to said disc and toward said arresting abutment, and spring means urging the nose of said pawl toward engagement with said notch, and means operable upon said pawl in opposition to both of said spring means to move the pawl pivot along the slot and the inclined surface of said nose along its abutment in order to withdraw the nose in a combined radial and tangential direction from the slot.

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JOHN M. HORAN, *Primary Examiner.*