March 12, 1940. B. K. MURCHISON 2,193,565

PRINTING MACHINE

Filed April 18, 1939 2 Sheets-Sheet 1

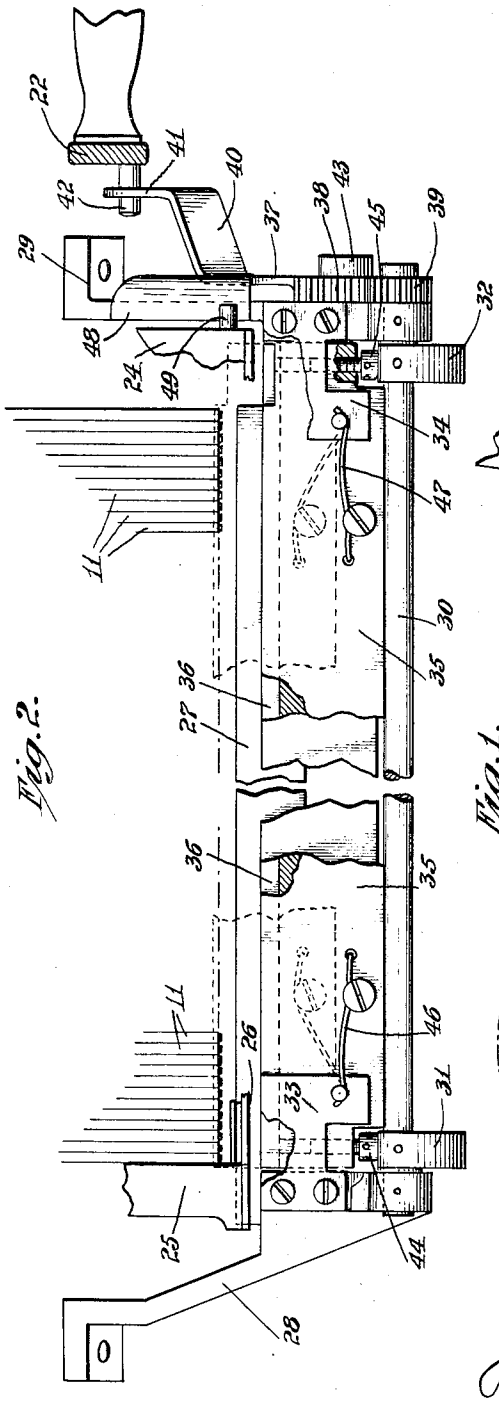


Fig. 2.

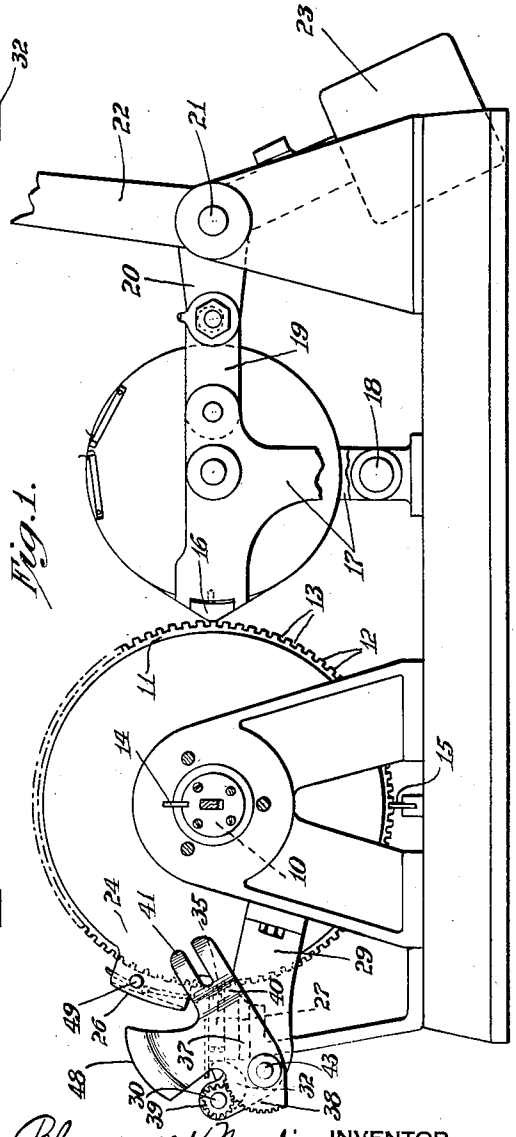


Fig. 1.

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Filed April 18, 1939 2 Sheets-Sheet 2

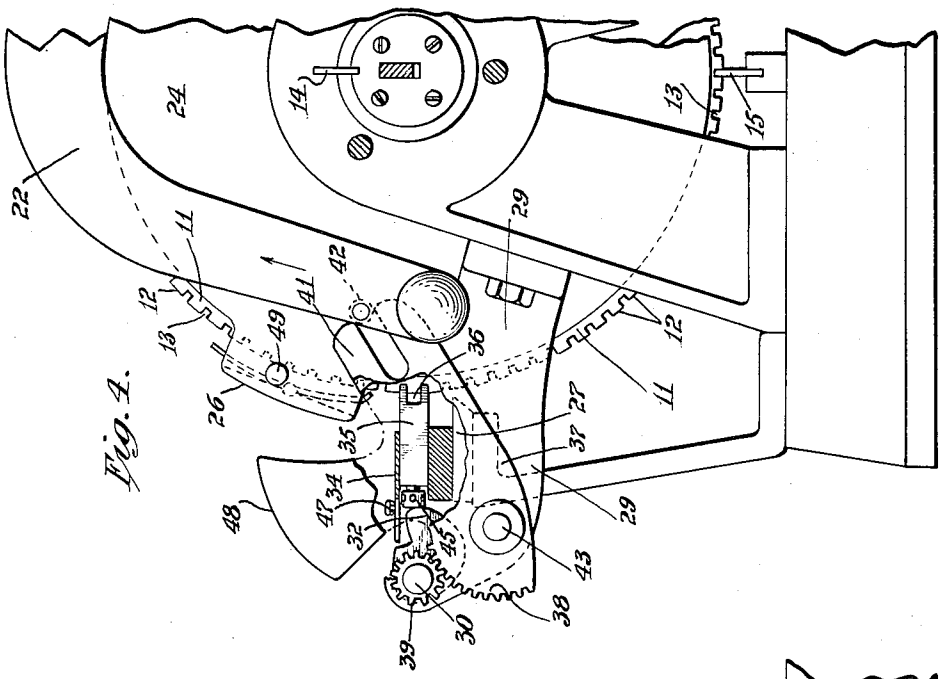


Fig. 4.

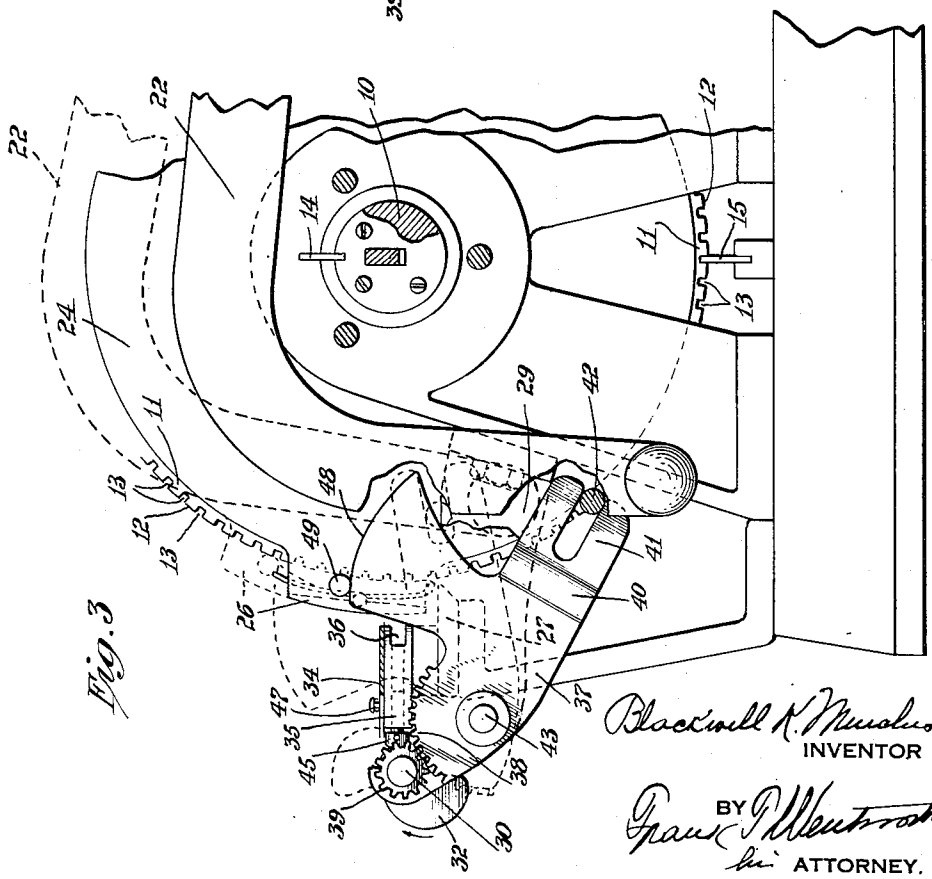


Fig. 3

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Patented Mar. 12, 1940 2,193,565

UNITED STATES PATENT OFFICE

2,193,565

PRINTING MACHINE

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Application April 18, 1939, Serial No. 268,516

20 Claims. (Cl. 101—95)

The invention relates to printing machines, and more particularly to the mechanism for making an impression in a machine of the type in which the impression platen has movement towards and from the printing characters in making an impression from a single line of type.

In a machine of the type to which the invention relates as disclosed in Letters Patent No. 2,145,271 granted to me under date of January 31, 1939, the printing characters are carried by a series of discs mounted upon a single shaft. The various types are brought into the printing position by the turning of said shaft. Each disc is locked in the printing position following the setting of a type thereon, so that with the setting of successive type carrying discs, the shaft has movement in relation to those discs which are already set.

Associated with the type carrying discs is an impression platen, and an adjacent paper feed cylinder, means being provided for moving said platen and the associated cylinder towards and from said shaft to move said platen into and out of engagement with the printing characters after a full line of type has been set.

With a machine of the type above referred to, a printed page is completed by successive impressions of single lines of printed matter, a printing plate ordinarily being produced from this page by photo-engraving or other methods when a considerable number of copies of the printed matter is required. Other duplicating methods may be used when only a small number of copies is required.

Because of the operating conditions in and about such a machine, and because of the making of a full printed page by succeeding line impressions, a clean sharp impression of every character in every line is essential for high quality work, since a poor impression of any line would require the resetting of the entire page.

In the operation of the machine, free turning movement of the shaft in relation to set discs is essential, but great difficulty has been experienced in providing each of the several discs with a bearing opening for receiving the setting shaft sufficiently accurate to ensure an accurate centering of all of the discs in relation to the shaft. Furthermore, after prolonged operation of the machine, irregular wear may occur between the various bearings and the shafts, and even in the production of the machine, some tolerance is necessary to ensure free movement of the shaft in relation to the discs during the setting operation, or vice versa during the distributing operation, and such tolerance may permit very slight radial movement of the discs by the impression platen when an impression is being made. This movement will be greater as to any disc in the event of wear upon the bearing of that disc.

Because of the above conditions, some type of a line may be "low" as compared with other types in the line, and the impressions of different letters may have different strengths, since, in order to make a clean impression from "low" letters, excessive pressure is required as to other letters. This will impair the sharpness of the impression of such other or "high" letters.

I have found that little difficulty is experienced in securing a uniform outside diameter in each of the several type carrying discs, and a uniform depth of the recesses of each disc forming the type carrying portions.

In the mechanism of the invention, by relying upon the outside circumference of the disc, I have been able to bring any printing character which is in the printing position upon the same plane as all other printing characters, irrespective of any irregularity in the bearing openings in different discs or any looseness between a disc and the shaft carrying same. With the mechanism of the invention, any possible springing of the shaft when making an impression is also prevented.

I secure the above results by providing a movable, backing bar positioned substantially diametrically opposite the line of engagement of the impression platen with the types in the printing position, which backing bar is normally disengaged from all of the discs but is automatically brought and held in engagement with the discs in a predetermined accurately calibrated position prior to the engagement of the impression platen with any of the discs. This backing bar also functions as a supplemental alining device for all of the discs.

If all of the printing characters are thus brought and maintained in an identical plane, less pressure is required in making a clean sharp impression, and likelihood of the mashing out of type is practically eliminated.

The mechanism of the invention is so constructed that it will be automatically actuated through the same mechanism used for imparting movement to the impression platen of the printing couple when making an impression, and will be automatically restored to and maintained in its position out of engagement with the various discs when the impression platen is restored to its normal non-printing position.

Means are provided for accurately defining the quantity of movement of the backing bar when it is being brought into engagement with the discs, and when a type distributing mechanism, such as that described in my aforesaid Letters Patent, is used, I provide in the actuating means for the backing bar, means which will displace this type distributing mechanism during the operative movement of the backing bar while permitting the normal functioning of this distributing mech-

anism when the members of the printing couple and the backing bar are in their normally inoperative positions.

The invention consists primarily in a printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means for imparting movement to said impression platen to make an impression, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, and a mechanism operative to engage said bar with said discs prior to the making of an impression and to disengage it from said discs following the making of an impression; and in such other novel features of construction and combination of parts as are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings:

Fig. 1 is an end view of the printing couple of a printing machine embodying the invention, the backing bar mechanism and the portion of the distributing mechanism acting upon the type carrying discs, the various parts being in their position when making an impression, all other mechanisms of the machine being omitted;

Fig. 2 is a longitudinally condensed fragmentary plan view showing the backing bar and its actuating mechanism in detail;

Fig. 3 is a fragmentary end view of the type carrying disc mechanism and the type distributing mechanism, the various parts being positioned to permit the turning of the various discs in setting a line of type, this view being upon a larger scale than Fig. 1; and

Fig. 4 is a view similar to that shown in Fig. 3 with the backing bar and the actuating means therefor in their position when said bar is engaged with the various discs.

Like numerals refer to like parts throughout the several views.

Since the present invention relates only to those mechanisms of the machine which are operative when making an impression, I have shown in the accompanying drawings only those parts of the machine incidental to the making of such an impression, and have omitted all other parts of the machine including the disc actuating mechanism, the justifying mechanism, the inking mechanism, the paper feed mechanism, the type cleaning mechanism, the details of the distributing mechanism, the various actuating mechanisms for these parts, and the various adjustments therefor, such not being necessary to an understanding of the present invention.

The printing machine of the invention includes a main shaft **10** having mounted thereon a plurality of co-axial, independently and differentially rotatable closely abutting discs **11**, each having a sequence of raised portions **12** about the surface thereof formed by recesses **13**, and printing characters upon all raised portions excepting the one adjacent the impression platen upon unset discs, and those adjacent a high tooth used during the distributing operation.

Carried by the shaft **10** is a setting bar **14** of the construction shown in my aforesaid Letters Patent, movable longitudinally of the shaft **10**. Said setting bar is engaged with all unset discs but is adapted to be disengaged from each disc as it is set. This setting bar engages keyways, not shown in the drawings, in the various discs. The setting bar constitutes actuating means carried by and rotatable with the shaft, common to all of said discs but adapted to be made inoperative as to each disc after it has been set.

Upon the bed of the machine is a locking bar **15** movable longitudinally of the shaft **10** simultaneously with the setting bar **14**, so that as the setting bar moves out of engagement with each disc, the locking bar is engaged with that disc. In this manner, the setting bar is engaged with all unset discs while the locking bar is engaged with all set discs.

The discs **11** constitute the type carrying member of a printing couple, the other member of which includes an impression platen bar **16** carried by an oscillator frame **17** pivoted at **18** and actuated by means of a link **19** acted upon by a crank **20** of a shaft **21** having an actuating handle **22**. A counterweight **23** is carried by the shaft **21**, the moving inertia of which weight assists the operator when imparting movement to the platen bar by means of the handle **22** when making an impression.

When setting the various discs, the platen **16** is positioned well away from said discs, so as to permit a free turning movement thereof.

The detailed construction of the various parts herein referred to is as shown in my aforesaid Letters Patent.

After the making of each impression, it is necessary to impart turning movement to the various discs to restore them to their normal position with a low platen having no printing character positioned in the printing line or at zero position. The construction of said distributing mechanism is immaterial to the present invention, but a portion thereof is shown in the drawings because in the machine of my present invention, as in the machine of my aforesaid Letters Patent, the actuating device for this distributing mechanism is so positioned as to interfere with the backing bar structure.

This distributing mechanism includes therein end plates **24** and **25** positioned at opposite ends of the machine and idly mounted in relation to, but concentric with, the shaft **10**. These end plates carry a member **26** normally disengaged from, but adapted to be engaged with and turn the various discs **11**, and also a stop bar **27** for ensuring all of the discs being brought to the proper zero position upon the actuation of the distributing mechanism.

In the machine of said Letters Patent, and in the present machine, the bar **27** and the mechanism **26** are both positioned substantially diametrically opposite the point of engagement of the platen **16** with the printing characters upon the various discs **11**, so that it is essential, when actuating the backing bar, to displace said member **26** by slight turning movement of the end plates **24—25** in order to provide clearance for movement of the locking bar into and out of engagement with the various discs. By modifying the machine structure so as to normally position these parts at some other point of the periphery of the various discs, provision for the movement of the end plates **24—25** will be unnecessary, but in the machine as constructed, such shifting of this mechanism would be impossible without changing the entire arrangement of the printing characters upon each disc

and upon the various mechanisms used in determining the operative moment of the discs in setting type.

To avoid the necessity for such reconstruction of the machine, means are provided, as stated, for imparting sufficient movement to the actuating means of the distributing mechanism to provide the necessary clearance for movement of the backing bar.

Mounted upon the frame of the machine at opposite ends of the bank of discs, are bearing brackets 28 and 29 having mounted therein a shaft 30 having secured thereto cams 31 and 32 adjacent opposite ends of the shaft. Also carried by said brackets are two pairs of bearing plates 33 and 34, between which is slidably mounted a locking bar 35.

This bar, as shown more particularly in Fig. 1 of the drawings, is positioned substantially diametrically opposite the impression platen 16 in relation to the various discs 11, so that when this locking bar is in position, the pressure exerted by the platen is absorbed by said backing bar 35 instead of by the shaft 10. With this construction, any looseness between any disc and the shaft 10 is compensated for, the bar 35, when engaging all of the discs, bringing all of the printing characters in the printing line into the same plane.

Said backing bar, as shown more particularly in Figs. 3 and 4, is provided with a forked edge 36 adapted to straddle any raised portion 12 and engage the bottom of the two adjacent recesses 13 forming such raised portion. This will occur irrespective of the printing character which may at the time be in the printing position.

Mounted on one of the bearing brackets as 29 is a rocking lever 37, one arm of which carries a segmental rack 38 engageable with a gear wheel 39 upon the cam shaft 30. This lever arm 37 is offset at 40, and the end thereof is provided with a fork 41 engageable by a stud 42 carried by and movable with the operating handle 22. The lever 37 is pivoted to the bracket 29 at 43.

Carried adjacent opposite ends of the backing bar 35 are contact studs 44 and 45 engageable by the cams 31 and 32 respectively. These contact studs are secured to said bar by means of a micrometrical screw threaded connection so as to permit minute adjustment in the operative effect of the cams when engaging said bar 35 with the various discs 11. These contact studs are used not only to permit adjustment in the parts when assembling a machine, but to take up wear after prolonged use of the machine.

It is essential that the backing bar engage all of the discs and impart such movement to any discs which are out of alinement with other discs, as to position and hold all discs firmly in position with the printing characters in the same vertical plane so as to ensure the engagement of the platen 16 with all of these printing characters with the same amount of pressure exerted by said platen. When the bar 35 is engaged with the discs, movement of any disc with the platen bar is prevented, and any low setting of a printing character in a line of type is likewise prevented.

If there be any tendency of a disc to drop downwardly, which is not overcome by the locking bar 15, due to possible wear upon this bar, the forked end 41 will prevent such dropping of the discs. Hence, the backing bar also serves to prevent loss of alinement of the printing characters positioned in the printing line.

Secured to the bearing plates 33 and 34 respectively are springs 46 and 47 acting upon the backing bar 36 adjacent the opposite ends thereof, movement of this bar into engagement with the discs being against the tension of these springs so that with reverse movement of the cams, the contact studs 44 and 45 will follow the contour of the cams and the backing bar will be disengaged from the discs preparatory to the making of the succeeding impression.

It will be noted, particularly by reference to Fig. 3, that the mechanism 26 is positioned in the line of movement of the backing bar toward the discs 11, so that before this bar can be engaged with said discs, it is essential that this mechanism be displaced to afford the necessary clearance for movement of said bar. To accomplish this, I provide the lever 37 with a cam 48 engageable with a stud 49 carried by the end plate 24 having a lifting action upon said end plate and upon the parts carried thereby in the path of movement of the bar 35. This cam is so formed as to impart a rapid lifting movement of the mechanism 26 as a result of the rocking of the lever 37, accompanied by a lifting action by the cam surface itself due to turning movement of the cam.

The cam 48 is of a length and so proportioned in relation to the cams 31 and 32 as to ensure a complete movement of the mechanism 26 above the plane of movement of the bar 35 before said bar has had sufficient movement to engage said mechanism.

Since the end plates 24—25 supporting the mechanism 26 will remain in any position about the periphery of the discs 11 to which they may be brought, no means need be provided for maintaining these parts out of the path of movement of the bar 35. Even though they should accidentally descend, they would merely engage the top of said bar and rest thereon during its movement without interfering therewith. If such should occur, however, it would be necessary to raise the mechanism 26 to permit a return movement of the cam 48.

The operation of the herein described machine is substantially as follows:

The mechanisms used for actuating the various discs in setting a line of type, in justifying each line of type before the making of an impression therefrom and for restoring the various discs to their normal zero position after the making of an impression, known as the distributing operation, are immaterial to the present invention, as are the particular inking mechanism employed and the type cleaning mechanism. One form of such mechanisms is disclosed in my aforesaid Letters Patent.

To an understanding of the invention in the machine of this application, an understanding of the construction of the members of the printing couple and of the actuating means therefore in making an impression and the conditions in the machine resulting from this construction is necessary.

In a machine of the type to which the invention relates, the various type carrying members are idly mounted upon the main shaft in closely abutting relation. When starting the setting of each line of type, all of the discs are connected with the shaft by the setting bar, but after each disc is set, the setting bar is disengaged therefrom, the shaft turning idly in relation to all discs which have been set during the setting of succeeding discs.

While each line of types is being justified prior to the making of an impression, most of the discs have movement imparted thereto longitudinally of the shaft, and discs carrying the letters at the end of one word and at the beginning of the next word are spaced apart. Consequently, when setting a line of type, the shaft must have free turning movement in relation to set discs, and in justifying the line of type the discs must have free movement longitudinally or axially of the shaft. To permit ease in the operation of the machine, there must be sufficient tolerance between the shaft and the discs to permit this free movement, and wear of the discs or the shaft will increase this variance in the diameter of the shaft and the bearing opening in the various discs.

When making an impression, the face of the types upon each disc must be brought into the same plane parallel with the face of the impression platen, and if any disc is permitted to recede beyond the printing line in relation to the other discs under the pressure from the platen, an imperfect impression of that letter upon the paper will result. Even with great nicety in manufacturing methods, the bearing openings in different discs may vary to an extent to have the above result when making an impression without regard to subsequent wear of parts as to different discs due to variable movement of these discs in the setting of different printing characters.

In setting a line of type, the operation will be as in the machine of my aforesaid Letters Patent, the setting bar, upon the completion of the setting of all discs necessary in a line to be printed, is disengaged from such discs, said bar remaining in engagement with all unset discs. The locking bar will be engaged with all discs which have been actuated to set letters, but disengaged from all unset discs.

The operating lever handle 22, during the setting of the various discs, will be in the position shown in Fig. 3, the stud 42 carried by this lever in the fork of the arm 41 holding and locking the backing bar 35 in position well away from the periphery of the various discs.

When an impression is to be made, the handle 22 is raised. During the initial upward movement of the stud 42 carried by said handle, the lever 37 will be rocked about its pivot 43, imparting a rapid turning movement to the cam shaft 30 and the cams 31 and 32 carried thereby. This will occur prior to any substantial movement of the frame 17 and of the impression platen 16 toward the discs 11.

While the cams 31 and 32 always engage the bearing studs 44 and 45, the rise of these cams is so gradual that the upward movement of the lever 37 and the turning movement of the cam 48 will raise the actuating member 26 of the distributing mechanism to bring its lower portion above the plane of movement of the bar 35 before said bar has received any substantial movement. Hence, space is provided below this mechanism 26 for the passage of the backing bar 35 into engagement with the various discs 11.

The forked edge 36 of the backing bar straddles a raised portion 12 on every disc 11 diametrically opposite a raised portion 12 positioned in the printing line, and by engagement with the bottom of the recesses forming the platen will force any disc which is out of alinement with other discs toward the impression platen, thus bringing all discs into alinement and holding them in this position. The quantity of movement of the various discs by the backing bar, if any, is very small, merely taking up sufficient play between the bearings of the various discs and the shaft to ensure all of the printing characters adjacent the impression platen being positioned a uniform distance from the bar 35 when making an impression. This bar 35 prevents any movement of any disc from pressure applied thereto by the impression platen beyond the plane occupied by all other types.

If any disc be displaced toward the impression platen bar 16, it will be moved toward the backing bar 35 as it is engaged by said bar 16, but said backing bar will limit the quantity of this movement so that at the time of the making of the impression, all printing characters engaged by the impression platen bar will be so positioned as to have the faces thereof in the same plane. Consequently, when making an impression, the position of the printing character in the printing line upon each disc is determined by the backing bar 35 and not by the shaft 10. In this manner, the shaft 10 is relieved from all strains from the impression bar transmitted through the various discs, since all discs upon which pressure is exerted by the impression platen bar are confined between this bar and said backing bar at diametrically opposite points. There can be no slight turning of any disc during the making of the impression resulting in the absence of alinement in the imprint.

Irrespective of looseness of any of the discs in relation to the shaft 10, when an impression is being made every disc set in the printing position will be engaged by the impression platen bar 16 and the backing bar 35, the portion of these two bars engaging the discs being parallel with each other and spaced an equal distance apart as to every portion thereof.

The backing bar is brought into its operative relation to the various discs prior to the engagement of the impression platen bar 16 with any disc, thus ensuring all discs being in alinement at the time of the making of the impression, without regard to clearance between any disc and the shaft 10. With the use of the backing bar acting upon the periphery of each disc, great accuracy in the position of each disc can be secured, since discs all having true outside dimensions can readily be produced, and this portion of the discs is subject to no wear, as a result of the operation of the machine, which will vary the original outside dimensions of the discs.

The forked edge 36 of the backing bar has a channel sufficiently deep to avoid engagement of the bottom thereof with a printing character upon any raised portion 12.

With the mode of operation above described, adequate tolerance between the shaft 10 and the bearing of the various discs may be provided, and wear at this point will have no effect on the making of clean sharp impressions from a line of set type or any loss of alinement of the different characters in this line.

With upward movement of the handle 22, the stud 42 upon this handle will rock the lever 37 to the position shown in Fig. 4 of the drawings, the stud 42 passing from the fork 41 with continued movement of the handle 22, leaving the parts in the position shown in Fig. 4 with the backing bar 35 engaged with the various discs. After the impression has been made, a return movement is imparted to the handle 22, which movement will, during its initial stages, move the

impression platen bar 16 away from the discs 11 while the backing bar 35 is still engaged with the various discs. Toward the end of the return movement of said handle, the stud 42 re-enters the fork 41 and imparts a reverse movement to the rocking lever 37. This movement of the lever turns the shaft 30 and the cams 31 and 32 to a position to permit movement of the backing bar 35 by the springs 46 and 47 until this bar is in the position, as shown in Fig. 3, out of the path of movement of the distributing mechanism 26.

The contact studs 44 and 45 are always in engagement with the cams 31 and 32. By using adjustable contact studs as described, said studs may be so set as to ensure the desired parallel relation between the backing bar 35 and the impression platen bar 16, great nicety being possible in this adjustment. Furthermore, in the event of wear upon the cams 31 and 32 or said contact studs, or upon the shaft 30, or any slight inaccuracy in these parts, said studs may be independently and differentially adjusted to secure a proper setting of the bar 35 in relation to the bar 16.

During the setting operation of the various discs, the backing bar 35 is positioned well away from the various discs, and accidental movement of the rocking lever 37 is prevented by the stud 42 upon the handle 22. The cam 48 is so formed as to permit the normal functioning of the distributing mechanism 26, as is the entire actuating mechanism for the backing bar.

By providing gearing between the lever 37 and the shaft 30, and by operating said lever by the operating handle 22 for actuating the impression mechanism, a proper timing in the setting of the backing bar in relation to the making of the impression is assured. This actuation of the lever 37 by the handle 22 also ensures the disengagement of the backing bar from the various discs following the making of each impression and prior to the distributing operation and the setting of the next line of type.

The details of construction shown in the accompanying drawings resulted from the application of the present invention to a particular construction and arrangement of the parts of the machine to which they were applied, and with variations in the structure of such machine, variation in such details may be necessary to adapt the invention to changes in the design of other parts of the machine.

It is, therefore, not my intention to limit the invention to the precise details of construction shown in the accompanying drawings, it being apparent that such may be varied without departing from the spirit and scope of the invention.

Having described the invention, what I claim as new and desire to have protected by Letters Patent, is:

1. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means for imparting movement to said impression platen to make an impression, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, and a mechanism operative to engage said bar with said discs prior to the making of an impression and to disengage it from said discs following the making of an impression.

2. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means for imparting movement to said impression platen to make an impression, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, and a mechanism operative to engage said bar with said discs prior to the making of an impression and to disengage it from said discs following the making of an impression.

3. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a shaft, means carried thereby and operative upon said bar for engaging it with said discs, a rocking lever, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

4. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means for imparting movement to said impression platen to make an impression, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, and a mechanism operative to engage said bar with said discs against the tension of said spring prior to the making of an impression and to disengage it from said discs following the making of an impression.

5. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types

upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, means carried thereby and operative upon said bar for engaging it with said discs against the tension of said spring, a rocking lever, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

6. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said bar for engaging it with said discs against the tension of said spring, a rocking lever, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

7. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a shaft, means carried thereby and operative upon said bar for engaging it with said discs, a rocking lever having a forked arm, a stud carried by said operating handle adapted to enter said fork, to be normally engaged therewith, and to be disengaged therefrom with initial movement of said handle for operating said platen, and gearing connecting said lever with said shaft.

8. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said bar for engaging it with said discs against the tension of said spring, a rocking lever having a forked arm, a stud carried by said operating handle adapted to enter said fork, to be normally engaged therewith, and to be disengaged therefrom with initial movement of said handle for operating said platen, and gearing connecting said lever with said shaft.

9. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, means carried thereby and operative upon said bar for engaging it with said discs against the tension of said spring, a rocking lever, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

10. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said bar for engaging it with said discs against the tension of said spring, a rocking lever having a forked arm, and a stud carried by said operating handle adapted to enter said fork, to be normally engaged therewith, and to be disengaged therefrom with initial movement of said handle for operating said platen, and gearing connecting said lever with said shaft.

11. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a plurality of contact studs ad-

justably mounted upon said bar, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said contact studs for engaging said bar with said discs against the tension of said spring, a rocking lever, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

12. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a plurality of contact studs adjustably mounted upon said bar, a spring acting upon said bar, a shaft, cams carried thereby and operative upon said contact studs for engaging said bar with said discs against the tension of said spring, a rocking lever, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

13. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a plurality of contact studs adjustably mounted upon said bar, a spring acting upon said bar, a shaft, cams carried thereby and operative upon said contact studs for engaging said bar with said discs against the tension of said spring, a rocking lever having a forked arm, a stud carried by said operating handle adapted to enter said fork, to be normally engaged therewith, and to be disengaged therefrom with initial movement of said handle for operating said platen, and gearing connecting said lever with said shaft.

14. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means for imparting movement to said impression platen to make an impression, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a mechanism operative to engage said bar with said discs prior to the making of an impression and to disengage it from said discs following the making of an impression, and means carried by said last named mechanism and operative upon said distributing mechanism to move it out of the path of the backing bar prior to the actuation of the bar so as to permit the bar to be engaged with said discs.

15. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, means carried thereby and operative upon said bar for engaging it with said discs against the tension of said spring, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a stud carried by said mechanism, a rocking lever, a cam carried thereby engageable with said stud, whereby said distributing mechanism is moved out of the path of the backing bar prior to the actuation of the bar so as to permit the bar to be engaged with said discs, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

16. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said bar for engaging it with said discs against the tension of said spring, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a stud carried by said mechanism, a rocking lever, a cam carried thereby engageable with said stud, whereby said distributing mechanism is moved

out of the path of the backing bar prior to the actuation of the bar so as to permit the bar to be engaged with said discs, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

17. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable type carrying discs, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar engageable with said discs at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, means carried thereby and operative upon said bar for engaging it with said discs against the tension of said spring, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a stud carried by said mechanism, a rocking lever having a forked arm, a cam carried thereby engageable with said stud, whereby said distributing mechanism is moved out of the path of the backing bar prior to the actuation of the bar so as to permit the bar to be engaged with said discs, gearing connecting said lever with said shaft, and a stud carried by said operating handle adapted to enter said forked arm, to be normally engaged therewith, and to be disengaged therefrom with initial movement of said handle for operating said platen.

18. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means for imparting movement to said impression platen to make an impression, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a mechanism operative to engage said bar with said discs prior to the making of an impression and to disengage it from said discs following the making of an impression, and means carried by said last named mechanism and operative upon said distributing mechanism to move it out of the path of the backing bar prior to the actuation of the bar so as to permit the bar to be engaged with said discs.

19. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said bar for engaging it with said discs against the tension of said spring, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a stud carried by said mechanism, a rocking lever, a cam carried thereby engageable with said stud, whereby said distributing mechanism is moved out of the path of the backing bar prior to the actuating of the bar so as to permit the bar to be engaged with said discs, gearing connecting said lever with said shaft, and actuating connections between said lever and said platen actuating handle, whereby said bar will be engaged with said discs prior to the engagement of said platen with the types upon the discs when said handle is operated to make an impression.

20. A printing machine embodying therein a printing couple comprising a shaft having mounted thereon a plurality of co-axial, independently and differentially rotatable discs each having a plurality of peripheral raised portions spaced apart by recesses and each carrying a type member, actuating means carried by and rotatable with said shaft and common to all of said discs, said means being adapted to be made inoperative as to each type carrying disc after it has been set, and an impression platen, means having an operating handle for engaging said platen with types upon said discs, a backing bar having a forked edge adapted to enter the recesses upon opposite sides of a raised portion and engage the disc at a point substantially diametrically opposite to the point of engagement of said platen with said discs, a spring acting upon said bar, a shaft, a plurality of cams carried by said shaft operative upon said bar for engaging it with said discs against the tension of said spring, a distributing mechanism movable about the axis of said discs and positioned between said backing bar and said discs when disengaged therefrom, a stud carried by said mechanism, a rocking lever having a forked arm, a cam carried thereby engageable with said stud, whereby said distributing mechanism is moved out of the path of the backing bar prior to the actuation of the bar so as to permit the bar to be engaged with said discs, gearing connecting said lever with said shaft, and a stud carried by said operating handle adapted to enter said forked arm, to be normally engaged therewith, and to be disengaged therefrom with initial movement of said handle for operating said platen.

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