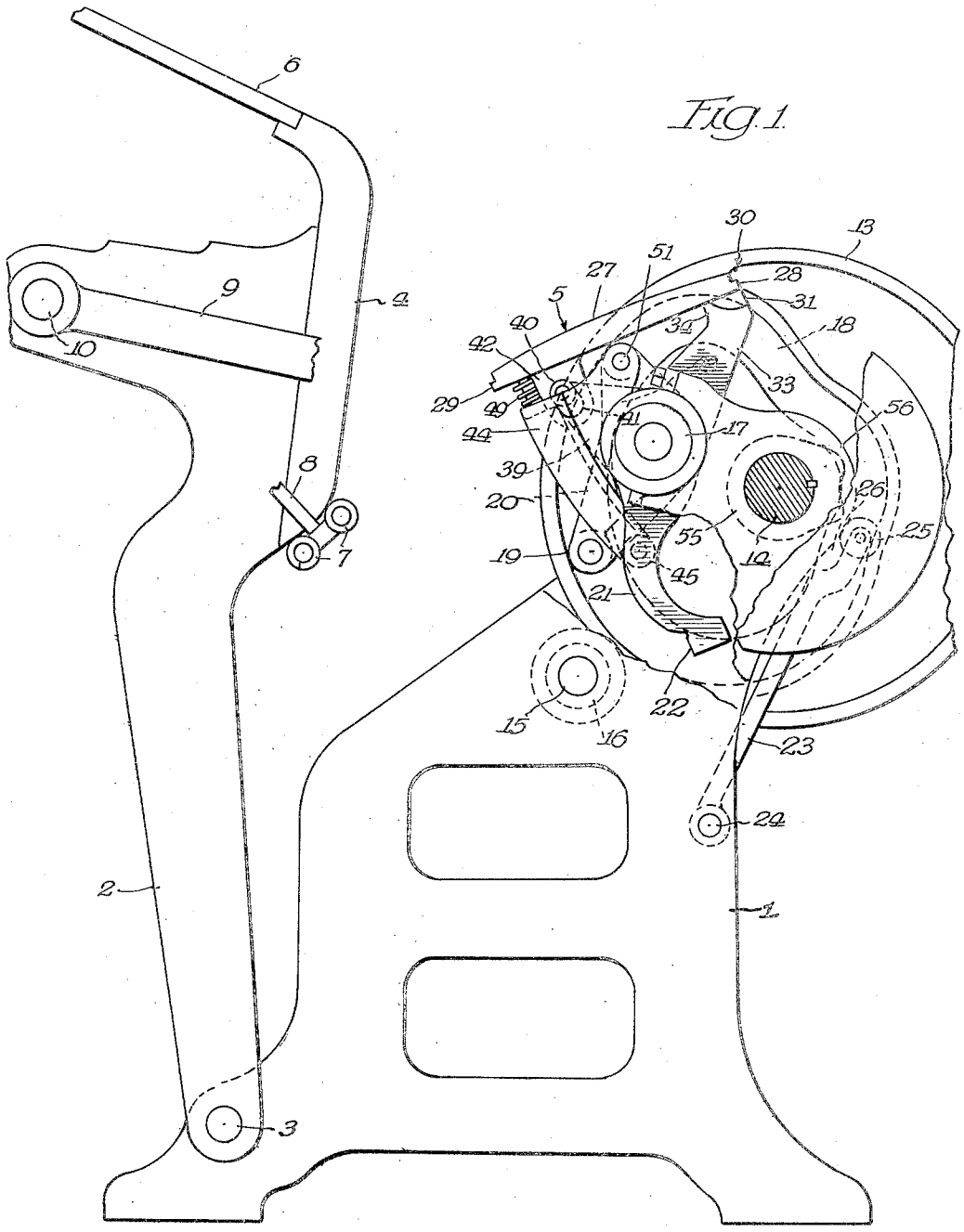
Feb. 14, 1950 C. F. ROOT 2,497,800

PRINTING PRESS HAVING CURVED IMPRESSION SURFACE

Filed March 12, 1947 4 Sheets-Sheet 1

Fig. 1.



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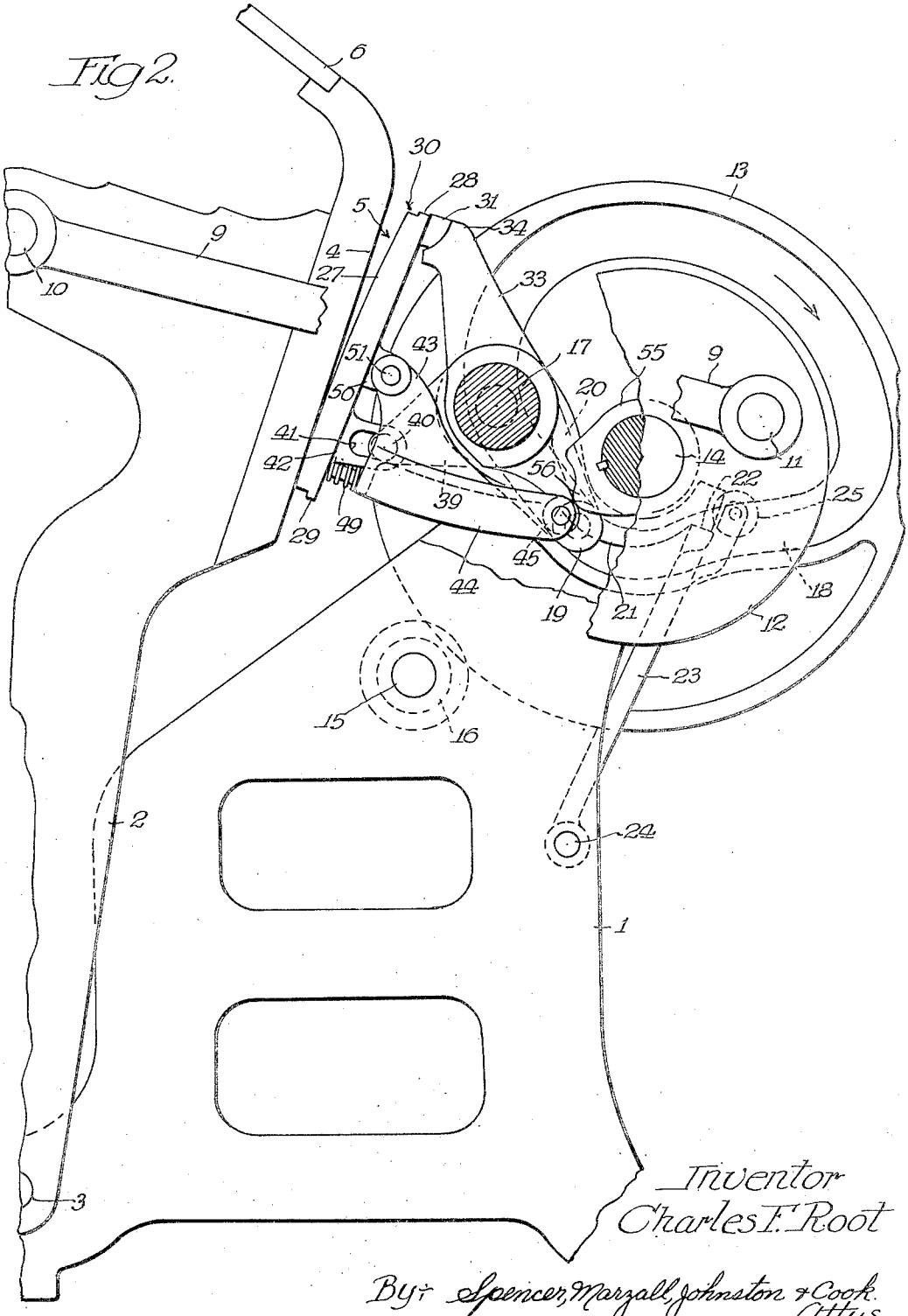
By: Spencer, Marzall, Johnston & Cook.
Attys

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PRINTING PRESS HAVING CURVED IMPRESSION SURFACE

Filed March 12, 1947 4 Sheets-Sheet 2

Fig 2.



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PRINTING PRESS HAVING CURVED IMPRESSION SURFACE

Filed March 12, 1947 4 Sheets-Sheet 3

Fig. 3.

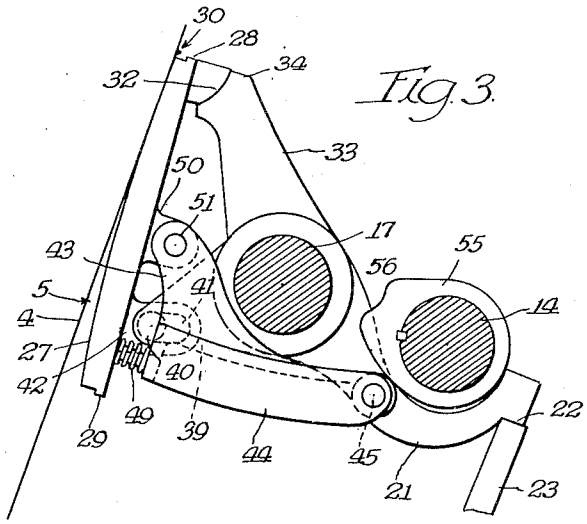


Fig. 7.

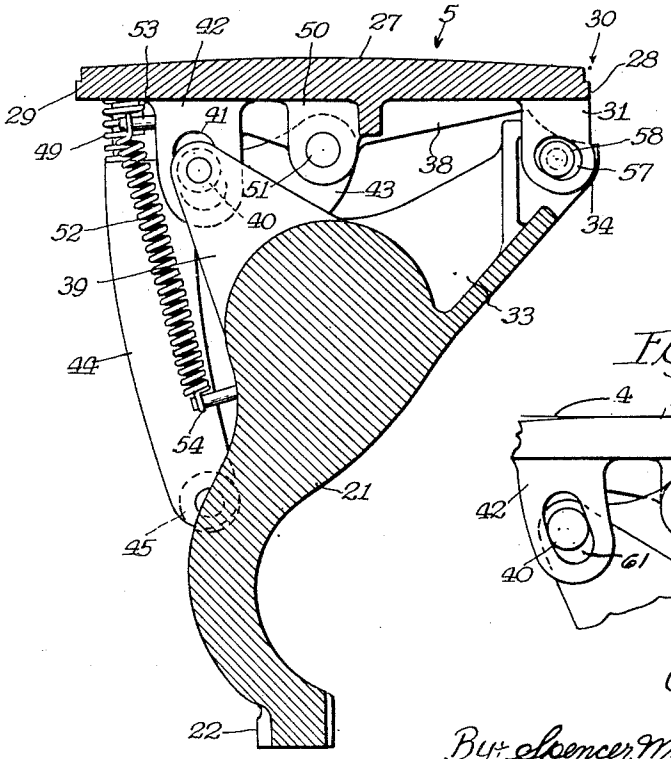


Fig. 8.

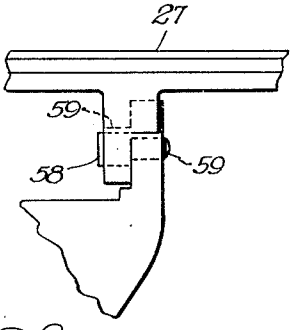
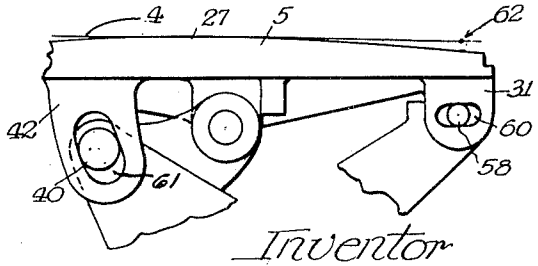


Fig. 9



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PRINTING PRESS HAVING CURVED IMPRESSION SURFACE

Filed March 12, 1947 4 Sheets-Sheet 4

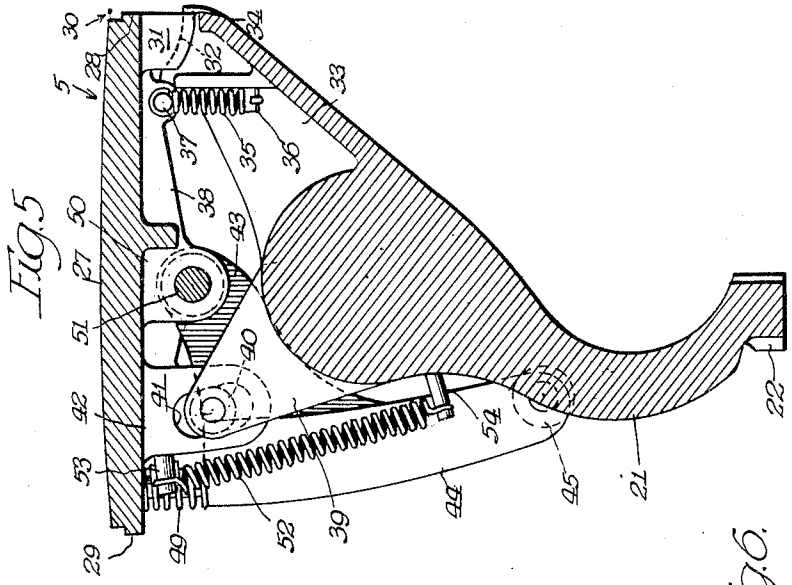


Fig. 5

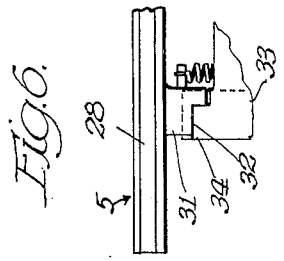


Fig. 6

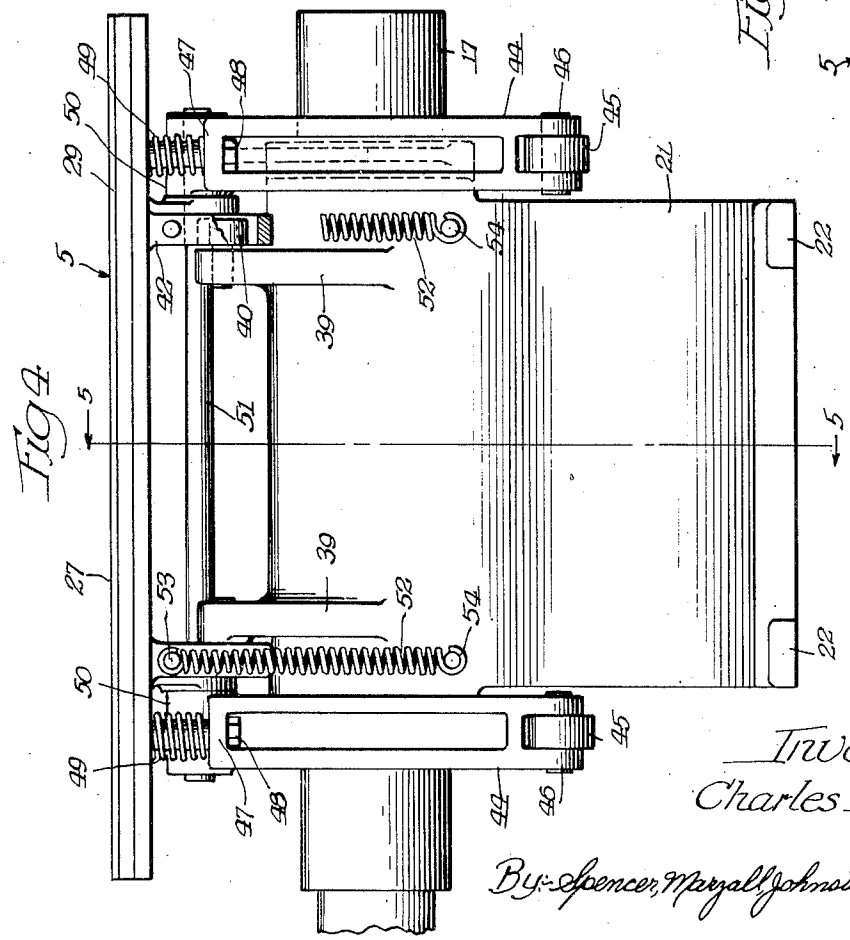


Fig. 4

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Patented Feb. 14, 1950 2,497,800

UNITED STATES PATENT OFFICE

2,497,800

PRINTING PRESS HAVING CURVED IMPRESSION SURFACE

Charles F. Root, Cleveland, Ohio, assignor to Chandler and Price Company, Cleveland, Ohio, a corporation of Ohio

Application March 12, 1947, Serial No. 734,056

6 Claims. (Cl. 101—297)

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This invention relates in general to platen printing presses and more particularly to a press wherein the platen has a curved convex surface.

There have been many attempts in the past to design a practical job press wherein the platen has a curved printing surface, and the advantages of the curved platen press have long been recognized as clearly set forth, for example, in the Clark Patent No. 1,034,083. Perhaps the primary advantages of a curved platen over the well known type of press wherein both the platen and the type bed are flat, is the fact that less pressure is necessary between the platen and bed during the printing operation because of the progressive line contact therebetween. Furthermore, the printed sheet is stripped from the type form as it prints, thus eliminating the stripping difficulties present in a flat platen press.

In my copending application, S. N. 686,383, filed July 26, 1946, I have illustrated a form of curved platen press as applied to a Golding type of press, wherein the platen is shown as being pivoted adjacent one end thereof to an oscillating platen carrier. I have so positioned the various pivotal points therein as to obtain perfect registry between the curved surface of the platen and the type form. The present form of curved platen press, as disclosed herein, is shown as being adapted for use on a printing press commonly known in the trade as a Gordon type, wherein the platen is mounted on a stationary frame and the type form is carried by an oscillating frame. The platen of a Gordon press is ordinarily mounted to rotate or rock about a fixed axis, so that it may assume a substantially horizontal position when the two frames are separated, in order to receive a sheet for printing while the inking rollers are inking the type form. As the frame, on which the type bed and form are mounted, oscillates and moves toward the platen, the platen rotates downwardly to a printing position.

An early attempt was made to provide a Gordon type press with a curved platen, as evidenced by the patent to Waters, No. 1,360,063, wherein an effort to obtain perfect registry between the type form and the curved platen was made by controlling the rolling action of the platen against the type form by the use of pins on the platen received by holes on the edge of the type bed. The present form of my invention contemplates the use of novel mounting means for the platen wherein it may be caused to pivot or roll during the impression period without actually being pivotally mounted. The construction and

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operation are such as to obtain perfect registry between the curved surface of the platen and the type form during the impression period in a simple and efficient manner.

One of the principal objects of the present invention is to provide a platen printing press of the Gordon type wherein the platen member has a curved convex surface thereon and is so mounted as to have a rolling action against the type form during the impression period to thereby produce perfect registry therebetween.

Another object of the invention is to provide a platen printing press having a main stationary frame and an oscillating frame pivotally mounted thereon, wherein the platen has a curved surface and is movably mounted on the stationary frame, while the type form is rigidly mounted on the oscillating frame and is adapted to bear against the curved platen during the impression period to thereby obtain perfect registry therebetween.

A further object is to provide a platen printing press of the curved platen type wherein the curved platen is mounted on an oscillating carrier on a stationary frame, which carrier oscillates between sheet receiving and printing positions. The platen itself is movably mounted on its carrier and moves relative thereto during the impression period, whereupon perfect registry is obtained between the curved surface of the platen and the type form.

Still another and more specific object of the invention is to provide a platen printing press of the curved platen type wherein an oscillatable platen carrier movably supports the curved platen on a stationary frame, and suitable means are provided to move the platen outwardly, relative to its carrier, to initial printing position, and which will either permit or cause the platen to be retracted in such a way that the curved surface thereof will bear against the type form in perfect registry, with complete absence of any blurring of the ink, during the impression period.

A still further and more specific object is to provide in a curved platen printing press novel mounting means for the platen whereby it will be rotated or pivoted about an imaginary axis during the impression period for obtaining perfect registry between the surface of the curved platen and the type form.

Other objects and advantages of the invention will become apparent by reading the following description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a side elevational view of a Gordon

press illustrating the present invention as applied thereto and showing the press in sheet receiving position;

Fig. 2 is a view similar to Fig. 1 but showing the position of the various parts at the beginning of the printing operation;

Fig. 3 is a fragmentary view showing the relationship between the platen and its mounting means and the type form at the end of the printing operation;

Fig. 4 is an under plan view of the curved platen and its mounting means on the rock shaft;

Fig. 5 is a transverse sectional view taken substantially along the plane of line 5—5 of Fig. 4;

Fig. 6 is a fragmentary plan view showing the structure at one corner of the platen;

Fig. 7 is a sectional view similar to Fig. 5 but illustrating a different form of mounting means for the platen;

Fig. 8 is a fragmentary plan view illustrating the construction of the parts at one corner of the structure shown in Fig. 7; and

Fig. 9 is a sectional view similar to Fig. 5 illustrating a still further modified means for mounting the platen.

In curved platen printing, suitable mechanism must be provided to enable a rolling action to occur between the curved surface of the platen and the flat type form. This rolling action must be of a character to prevent any blurring of the ink on the work. Furthermore, the printing is more easily accomplished by rolling the two surfaces upwardly, that is, the printing operation should begin at the lower end of the curved platen and be completed at the upper end thereof. Suitable mechanism must also be provided to prevent the platen and type form from retracing the path through which these surfaces moved during the impression period to thereby prevent a double impression. All of these features which are necessary to the production of a commercially practical machine are in the present invention and are accomplished by means of novel mechanism hereinafter more particularly described.

The particular path through which the platen moves relative to its carrier will depend somewhat on the location of the pivotal point of the oscillating frame. There are generally two contact points between the platen and its carrier. These contact points may or may not act as supports, but they will act as guides for movement of the platen during the impression period. At least one of these contact points should be a pin and slot connection, while the other contact point may constitute a similar structure, or it may be merely arcuate contact surfaces. The important consideration, however, is the relationship between these contact points with each other and with the pivotal point of the oscillating frame carrying the type bed and form. Since the printing operation takes place during movement of the type form, there will be a compound movement of both the type form and platen. The platen must move in such a way as to roll against the type form during impression and produce perfect registry. It will be apparent, therefore, that, while the pin and slot contact points may have a variety of different locations, such locations must still depend upon the position of the pivotal point of the oscillating frame.

Referring now to the drawings and especially to Figs. 1 and 2, the operation of a Gordon press is so well known to those skilled in the art that a detailed description of its operation is believed unnecessary. The general structure, however, includes a stationary frame 1 having spaced sides thereon and an oscillating frame 2 pivotally mounted to the sides of the stationary frame 1 for oscillation about a shaft 3. The oscillating frame carries a type bed and a type form which may be indicated by the numeral 4. The type form is adapted to be oscillated toward and away from the platen, which is generally indicated by the numeral 5. Suitable mechanism causes the oscillation of the frame 2 and, during its movement away from the platen, the type form is inked and the platen in its entirety oscillates to a sheet receiving position as shown in Fig. 1. The oscillating frame 2 carries an inking disc 6 at its upper end adjacent an inking fountain (not shown), and a pair of inking rollers 7 mounted on a frame 8 are caused to move upwardly and receive ink from the fountain during the printing operation, after which the ink thereon is carried over the disc 6 and downwardly across the type form 4 to thereby ink the type form while the sheet is being fed to the platen.

The oscillation of the frame 2 is accomplished by means of a pair of side arms 9, one on each side of the machine, each of which is pivotally mounted to the oscillating frame at 10. One of the arms 9 is pivotally mounted at its other end by means of a pivot 11 to the small head 12 at one side of the machine. The forward end of the other side arm 9 is similarly pivoted to a large gear 13 at the opposite side of the machine. Both the small head 12 and gear 13 are secured to the transversely extending shaft 14, whereupon it will be clear that rotation of the gear 13 will cause a similar rotation of the small head 12 and a longitudinal reciprocation of the side arms 9 to oscillate the frame 2 toward and away from the platen 5.

Any suitable driving means, such as an electric motor (not shown), may be utilized to drive the main shaft 15 on which is mounted a pinion 16 in mesh with the gear 13 to thereby drive the press.

The platen 5 is mounted on a rocker device or an oscillating carrier which includes a rock shaft 17. The inner side of the gear 13 is provided with a cam track 18 adapted to receive the cam roller 19 on the rocker arm 20. The cam track 18 is of such configuration as to cause a rotary reciprocating or oscillating movement of the arm 20 carrying with it a rocking or oscillating movement of the platen and its carrier.

A rocker tail or extension 21 extends forwardly from the rock shaft 17 and terminates in a downwardly facing ledge or ledges 22. These ledges are utilized for the purpose of locking the rocker extension 21 and platen carrier in the position which they assume during the impression period. The locking is effected by means of a rocker lock 23 in the form of a gate pivotally mounted at its lower end by the pivot pins 24, which also carries at its upper end and at one side thereof a cam follower 25. A suitable cam (not shown) on the shaft 14 is designed to move the rocker lock 23 outwardly during movement of the platen to sheet receiving position and to move it inwardly during the impression period, whereupon the upper surface 26 thereof will be wedged beneath the downwardly facing ledges 22 of the rocker lock. Thus the rocker extension and platen carrier integral therewith are held firmly in a stationary position during the impression period.

The foregoing mechanism is old in a Gordon press and the manner in which these parts co-

operate to form a printing impression is very well known to those skilled in the art. The invention herein resides, primarily, in the curved platen and the mounting of such platen in a way to permit perfect registry between the platen and type form during the impression period. This may be accomplished in various ways, having in mind the stationary character of the platen carrier, and that the printing must occur during movement of the type form. One form which the invention may take is illustrated in Figs. 1 to 6, to which reference will now be made.

The curved surface of the platen is indicated by the numeral 27 and is provided with an upper longitudinal edge 28 and a bottom edge 29. Perfect registry between the curved surface of the platen and the type form is obtained by properly moving the platen relative to its carrier during the impression period. In the present instance the platen is designed to be rotated about an imaginary axis. The axis of rotation is termed "imaginary" herein because it does not physically exist as an actual mounting on the platen, although its location can be accurately determined. This axis is indicated by the numeral 30 and is shown by a dot located in space at what would otherwise be the intersection of the curved surface 27 and upper edge 28 if they were to be extended. It will become apparent hereinafter that the location of this axis may be varied considerably and will depend upon other factors.

The printing operation begins when the platen is in its position shown in Fig. 2 and continues during movement of the oscillating frame 2 and type form 4. It will be noted in Fig. 2 that the pivotal points 11 of the side arms 9 are slightly above dead center at the beginning of the impression period. For perfect registry, these pivotal points should be located on dead center at the end of the impression period. During this time that the type form 4 is moving forwardly, the platen 5 and its curved surface 27 will be rotated about its imaginary axis 30 in a counterclockwise direction so that continued movement of the type form 4 will complete the printing operation and the various parts will be in their positions as shown in Fig. 3.

Figs. 4, 5 and 6 illustrate more clearly the construction and arrangement of the various parts as well as the manner in which the platen is mounted on its carrier for movement with respect thereto during the printing operation. The top of the platen or upper edge thereof is provided adjacent each end with a rearwardly extending ear 31 having an arcuate bearing surface 32 thereon. This bearing surface has a radius, the center of which is the imaginary axis 30, about which the platen rotates. The carrier for the platen, which is mounted on or may be made an integral part of the rocker extension 21, includes a pair of spaced upwardly extending arms 33, the ends 34 of which are provided with an arcuate bearing surface complementary to the surface 32 on the ears 31, whereby the ears 31 will bear thereagainst. A pair of coiled tension springs 35 are adapted to normally maintain the two arcuate surfaces of the ears 31 and ends 34 in contact with each other. One end of each spring 35 is secured to a downwardly extending pin 36 on the arm 33 and the other end of each spring is coiled around a pin 37 secured to the rearwardly extending rib 38 on the rear of the platen. As will become more evident hereinafter, during the printing operation, the platen will have a rotative movement about the imaginary axis 30 during which time the platen will be partially guided by relative movement between the two curved surfaces.

A pair of downwardly extending arms 39 are also made a part of the platen carrier. The outer end of each arm 39 is provided with a roller 40 adapted to be received within an arcuate slot 41 in the rearwardly extending ears 42 at the lower part of the platen. The center of curvature of the slots 41 is also the axis 30 whereby the platen may be guided in its rotative movement during the printing operation.

A pair of spaced supports 43 extend outwardly from the rear of the platen 5, each of which at the longitudinal lower edge thereof is channel shaped as at 44. The outer end of each channel member is bifurcated to receive a roller 45 mounted on a pin 46 extending between the sides thereof. The forward end of each channel portion is closed by means of a web 47 which receives a pin or bolt 48. Each pin 48 may extend freely through a web 47 but is secured to the rear side of the platen and has a coiled compression spring 49 around it which bears at one end against the rear of the platen and at its other end against the web 47.

In this form of the invention the platen also has a pair of rearwardly extending ears 50 through which a rod 51 passes. This rod also supports the upwardly extending portion of each of the supports 43. In the ordinary operation of the machine the platen and its supports 43 will move as a single unit. The only time that the springs 47 will come into use is in the event that any unusual or excessive pressure should be built up between the type form and the curved face of the platen. The springs 49 are quite heavy and will withstand the ordinary pressures which are present during the printing operation. If excessive pressure should occur, due to any unforeseen circumstances, then the springs 49 will yield, thus preventing breakage of any parts of the machine. This construction is purely a safety measure and the principle of operation of the machine would be the same and would operate as successfully under normal printing conditions and pressure if the supports 43 were to be made integral with the platen. When such excessive pressures occur and cause the springs 49 to be compressed, the platen 5 and supports 43 will rotate slightly with respect to each other about the rod 51 as a pivotal point. For all practical purposes, however, these supports and the platen may be considered as being integral.

An elongated coiled tension spring 52 is also located at each side of the platen structure for the purpose of urging the platen normally rearwardly to the position which it assumes at the end of the printing operation. These springs are supported at each side by means of the downwardly extending pins 53 secured to the ears 42 at the end of the platen, and the pins 54 extending downwardly from the underside of the rocker extension 21. One end of each spring 52 is coiled around or otherwise secured to a pin 53 and the other end thereof is similarly attached to a pin 54. Thus the platen 5 is normally urged to its extreme final printing position as shown in Fig. 3.

A cam 55 is also located at each side of the machine and is keyed to the shaft 14. Each cam 55 is adapted to be in alignment with a roller 45 mounted on the rear end of a support 43. Each cam 55 is also provided with an enlargement 56 on the periphery thereof which is so po-

sitioned as to contact a roller 45 and cause the platen to pivot or rotate about its imaginary axis 30 at proper times during the operation of the machine.

Since the platen 5 is to assume an initial printing position as illustrated in Fig. 2 when the printing operation begins, and is to rotate in a counter-clockwise direction during the impression period, the cams 55 are so constructed and positioned to effect this movement in timed relation with the operation of the rest of the machine. As the oscillating frame 2 moves toward the platen, the platen and its carrier will be moved as a unit from sheet receiving position to printing position. At this time the cams 55 will bear against the rollers 45 to move the platen to its initial printing position relative to its carrier, which is locked by the rocker lock 23. During this latter movement the platen and its supports 43 will move as a unit relative to the platen carrier consisting of the upper and lower extensions 33 and 39. Also during this movement the rollers 40 will traverse the slots 41 so that they will be positioned at the rear of such slots, and the bearing surfaces 32 at the upper end of the platen will have been moved to their position as shown in Fig. 2. From the position of the various parts as shown in Fig. 2, which is the initial printing position of the platen, the type form continues to move in a downward direction toward the platen, during which time the printing must take place, while the platen moves or rotates about its axis 30 in a counter-clockwise direction to the position shown in Fig. 3. This movement of the platen will occur because of the springs 52 and the pressure of the type form against the platen. The pressure of the type form against the platen will be resisted by the rollers 45 bearing against the cams 55. These cams will permit this movement because of the enlargements 56 having passed the rollers 45, whereupon the rollers 45 will then reach the dwell or concentric portion on the cam and the rollers 40 will have been moved to the forward ends of the slots 41. The resistance of the cams to the movement of the platen builds up the pressure necessary for printing. The springs 52 hold the rollers 40 against the forward ends of the slots 41 and as soon as this position is reached, the printing will have been completed and the platen will begin its movement to sheet receiving position.

It will be evident that the platen and its supporting members will be retained in the final printing position assumed thereby through the tension of the springs 52 until the beginning of the next printing operation when the cams will again move the platen to its initial printing position. This is necessary to prevent the platen from retracing its steps along the type form and possibly producing a double printing impression. For all practical purposes, and as far as the operation of the machine is concerned, the platen could return to its initial printing position at any time after the type form has receded a sufficient distance therefrom to prevent a double impression from occurring. In accordance with the present design, however, the lower end of the platen 5 will be moved outwardly to its initial printing position just prior to its contact with the type form. After the platen begins its movement to sheet receiving position, the rollers 45 will be carried away from the cams 55 and will not contact them again until the platen returns to printing position, at which time the enlargements 56 will immediately move the platen to initial printing position.

Referring now to Figs. 7 and 8, a modified form of structure is illustrated where all of the parts are essentially the same as those just described except the bearing surfaces 32 between the ears 31 and the upper ends of the extensions 33. In the modified structure each of the ears 31 is provided with a slot 57 adapted to receive a roller 58 mounted on a pin 59 extending through the upper end 34 of each extension 33. Similar to the bearing surface 32, the slots 57 are arcuate and have a radius of curvature about the axis 30 as the center. In this form of the invention, coiled springs 35 will be unnecessary because the carrier extensions 33 will be positively connected to the platen through the slots 57 and rollers 58.

In the former embodiment of the invention where the bearing surfaces 32 are present, these surfaces do not perform any actual supporting function, but merely serve to guide the rotative movement of the platen. In the form shown in Figs. 7 and 8, however, the roller and slot construction may serve in part to have a supporting function so that the entire support of the platen is not obtained merely by the slot and roller construction indicated at 41 and 40. The principle of the invention, however, in either case is the same and the rollers 58 will each traverse a slot 57 during movement of the platen 5 between the initial and final printing positions thereof.

It should be further noted that Fig. 7 illustrates the various parts of the platen and its carrier in the relative position which they assume when the center of the curved surface 27 is in contact with the type form. That is to say, the rollers 40 will be in a central position between the ends of the slots 41 and the rollers 58 will likewise be in a central position between the ends of the slots 57.

Fig. 9 represents a still further possible arrangement of the pin and slot connections. In this embodiment of the invention the type form 4 may be in a direct line with the pivotal point of the oscillating frame 2. The two contact points between the platen 5 and its carrier, consisting of the upper and lower extensions 33 and 39, will have a different relative position. The ears 31 may contain a slot 60 which is not arcuate, but may be parallel with a plane tangent to the curved surface 27 of the platen 5 at its center. At the half-way mark of the printing operation, this tangential plane will be coincident with the type form 4, as shown in Fig. 9, and the slots 60 will also be parallel to the type form at this point.

The ears 42 will also have arcuate slots 61 therein, but the center of curvature thereof may be any outside axis, for example, as that indicated at 62, which may also be in the tangential plane above referred to. The other parts of the structure may remain the same.

These three forms of the invention will illustrate the wide choice of locations with respect to the three critical points. That is, the pivotal point of the oscillating frame 2, the lower contact point consisting of the pin and slot connection 40 and 41, or 40 and 61, as well as the upper contact point consisting either of the curved bearing surfaces 32, pin and slot 58 and 57, or pin and slot 58 and 60. The slots 41 and 57, or 61 and 60, may vary relative to each other, but their positions will depend further upon the pivotal point 3 of the oscillating frame 2.

The operation of the machine is such that the cam track 18 will act, through the roller 19

and arm 20, to rotate the entire platen and its carrier to sheet receiving position as shown in Fig. 1. At this time the type form 4 is being inked by the roller 7 and a sheet of paper may be fed onto the curved surface 27 of the platen. The platen and its carrier consisting of the upper and lower extensions 33 and 39 will then be rotated about the rock shaft 17 in a counter-clockwise direction to printing position as shown in Fig. 2. At this time the platen carrier, consisting of the upper extensions 33 and lower extensions 39, will be locked against further movement through the medium of the rocker lock 23 being wedged beneath the rear ends of the rocker extension 21. Just before the type form 4 reaches the position which it assumes at the beginning of the printing operation, the cams 55 will be rotated to their position shown in Fig. 2 where the enlargements 56 thereon are in contact with the rollers 45 to move the lower end of the platen toward the type form. During this movement of the platen, it will be moved above the points 30 or 62 and all such movement will take place relative to the platen carrier which is in locked position. The carrier remains stationary during the printing operation. As soon as the impression has begun, the cams 55 continue to rotate in a clockwise direction, whereupon the pressure of the type form thereagainst will cause the platen to rotate in a counter-clockwise direction. The pressure built up by resistance of the cams 55 will cause the printing impression to take place. The position of the various parts will then be as illustrated in Fig. 3, after which the oscillating frame 2 will begin its movement away from the platen or stationary frame, and the platen will be retained in its final printing position during its return to sheet receiving position by means of the springs 52. The platen may or may not be then returned to its initial printing position. This movement of the platen may take place at any suitable time after removal of the type form from its path. At this point, then, the type form is again inked and the next succeeding sheet of paper may be fed to the platen for another printing operation.

It has been determined that the construction of a curved platen printing press as described and illustrated herein will produce perfect registry between the curved surface of the platen and the type form. The structure eliminates all possibility of smearing and will operate to produce work which is highly satisfactory from a commercial standpoint. A further feature and advantage of the present construction is the fact that only slight changes need to be made in the conventional Gordon press. The structure of the main and oscillating frames may remain identical, the important additions residing in the provision of the rocker extension with integral platen carrier means as illustrated by the extensions 33 and 39, whereby the platen may be movably mounted on the carrier and may be caused to move with respect thereto during the printing operation.

While the drawings and description herein have made particular reference to a printing press wherein a type form is mounted in a type bed, it is generally well known in the art that printing presses of this type are also used for other operations such as cutting, creasing and embossing. In the cutting and creasing use of the machine, cutting edges are substituted for the type form, but they are, nevertheless, held by the type bed. It will therefore be understood as far as the claims are concerned, that the term

"printing press" is used in its broader sense of including the use of the press for work other than printing. It will further be understood that the term "type form" is intended to be used to mean any work form which may be mounted on the type bed for performing work other than printing, such as cutting, creasing and embossing.

Changes may be made in the form, construction and arrangement of parts from those disclosed herein without departing from the spirit of the invention or sacrificing any of the attendant advantages thereof, provided, however, that such changes fall within the scope of the claims appended hereto.

Having thus described my invention what I claim as new and desire to secure by Letters Patent of the United States is:

1. In a platen printing press, a stationary frame, an oscillating frame, means for moving said oscillating frame toward and away from said stationary frame for a printing operation, a type bed on said oscillating frame, a carrier on said stationary frame, upper and lower extensions on said carrier, a curved platen, means for rockably mounting said platen on said carrier for movement within a limited range during printing including slotted members on said platen, rollers on said lower extensions received by said slotted members, an arcuate bearing surface on said upper extensions, and ears on said platen having complementary curved bearing surface and adapted to ride on the arcuate bearing surfaces of said upper extensions, means including said rockable mounting means urging one end of said platen toward its carrier during the printing operation to cause said rollers to traverse the slots in said slotted members, whereby line contact will be obtained between the curved platen and the type form.

2. A platen printing press comprising a stationary frame, an oscillating frame pivotally mounted on said stationary frame, means for moving said oscillating frame toward and away from said stationary frame for a printing operation, a type bed on said oscillating frame, a curved platen, an oscillatable carrier on said stationary frame for supporting said platen, means for oscillating said carrier and platen to sheet receiving and printing positions, means for locking said oscillatable carrier against movement during the printing operation, means on said platen and carrier for rockably mounting said platen on said carrier for movement within a limited range during printing, whereby line contact is obtained between said platen and the type bed during printing, means urging the lower end of said curved platen away from said carrier while said stationary frame and oscillating frame are in non-printing position, means to provide a substantially constant pressure between the curved platen and type bed from the point of initial contact to the point of final contact therebetween during the printing operation, and means to retain said curved platen in the final printing position for a predetermined period of time after completion of the printing operation to prevent double impression.

3. A platen printing press comprising a stationary frame, an oscillating frame pivotally mounted on said stationary frame, means for moving said oscillating frame toward and away from said stationary frame for a printing operation, a type bed on said oscillating frame, a curved platen, an oscillatable carrier on said stationary

frame for supporting said platen, means for oscillating said carrier and platen to sheet receiving and printing positions, means including upper and lower slotted members on said platen and upper and lower extensions on said carrier having rollers thereon received in said slotted members for rockably mounting said platen on said carrier for movement within a limited range during printing, whereby the rollers will traverse said slots and produce line contact between the platen and type form during the printing operation, means urging the lower end of said curved platen away from said carrier while said stationary frame and oscillating frame are in non-printing position, means to provide a substantially constant pressure between the curved platen and type bed from the point of initial contact to the point of final contact therebetween during the printing operation, and means to retain said curved platen in the final printing position for a predetermined period of time after completion of the printing operation to prevent double impression.

4. A platen printing press comprising a stationary frame, an oscillating frame pivotally mounted on said stationary frame, means for moving said oscillating frame toward and away from said stationary frame for a printing operation, a type bed member on said oscillating frame, a curved platen member on said stationary frame, upper and lower guide means on said platen, guide pins on the frame carrying said platen cooperating with said guide means for guidingly and rockably mounting said platen on its frame for movement within a limited range during printing, whereby line contact is obtained between the type bed and platen during printing, means urging the lower end of the platen away from its frame while said stationary frame and oscillating frame are in non-printing position, means to provide a substantially constant pressure between the type bed and platen from the point of initial contact to the point of final contact therebeween during the printing operation, and means to retain said platen in the final printing position for a predetermined period of time during movement of the oscillating frame away from said stationary frame to prevent double impression.

5. A platen printing press comprising a stationary frame, an oscillating frame pivotally mounted on said stationary frame, means for moving said oscillating frame toward and away from said stationary frame for a printing operation, a type bed on said oscillating frame, a curved platen, an oscillatable carrier on said stationary frame for supporting said platen, means for oscillating said carrier and platen to sheet receiving and printing positions, upper and lower

guide means on said platen, guide members on said carrier cooperating with the guide means on said platen for rockably mounting said platen for movement within a limited range during printing, whereby line contact is obtained between the curved platen and type bed during printing, means urging the lower end of said curved platen away from said carrier while said stationary frame and oscillating frame are in non-printing position, means to provide a substantially constant pressure between the curved platen and type bed from the point of initial contact to the point of final contact therebetween during the printing operation, and means to retain said curved platen in the final printing position for a predetermined period of time after completion of the printing operation to prevent double impression.

6. A platen printing press comprising a stationary frame, a second frame movably mounted on said stationary frame, means for moving said second frame toward and away from said stationary frame for a printing operation, a type bed on said second frame, a curved platen, an oscillatable carrier on said stationary frame for supporting said platen, means for oscillating said carrier and platen to sheet receiving and printing positions, means for locking said oscillatable carrier against movement during the printing operation, means on said platen and carrier for rockably mounting said platen on said carrier for movement within a limited range during printing, whereby line contact is obtained between said platen and the type bed during printing, means urging the lower end of said curved platen away from said carrier while said stationary frame and second frame are in non-printing position, means to provide a substantially constant pressure between the curved platen and type bed from the point of initial contact to the point of final contact therebetween during the printing operation, and means to retain said curved platen in the final printing position for a predetermined period of time after completion of the printing operation to prevent double impression.

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