

Oct. 14, 1952

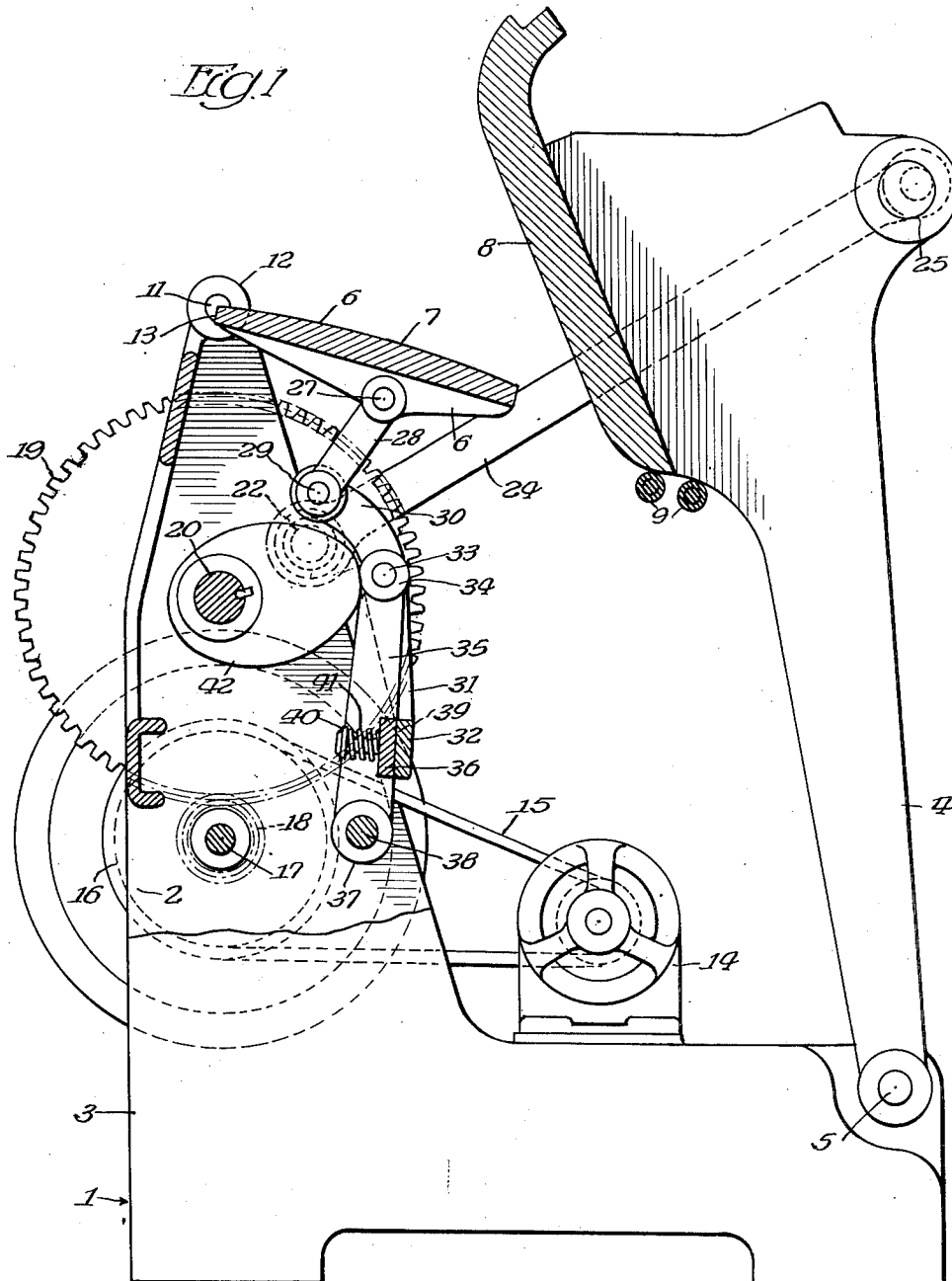
W. C. RUPP

2,613,599

OSCILLATING BED AND PLATEN PRESS

Filed Aug. 23, 1946

4 Sheets-Sheet 1



Inventor:
William C. Rupp

By: Spencer, Marshall, Johnston & Cook
Attys

Oct. 14, 1952

W. C. RUPP

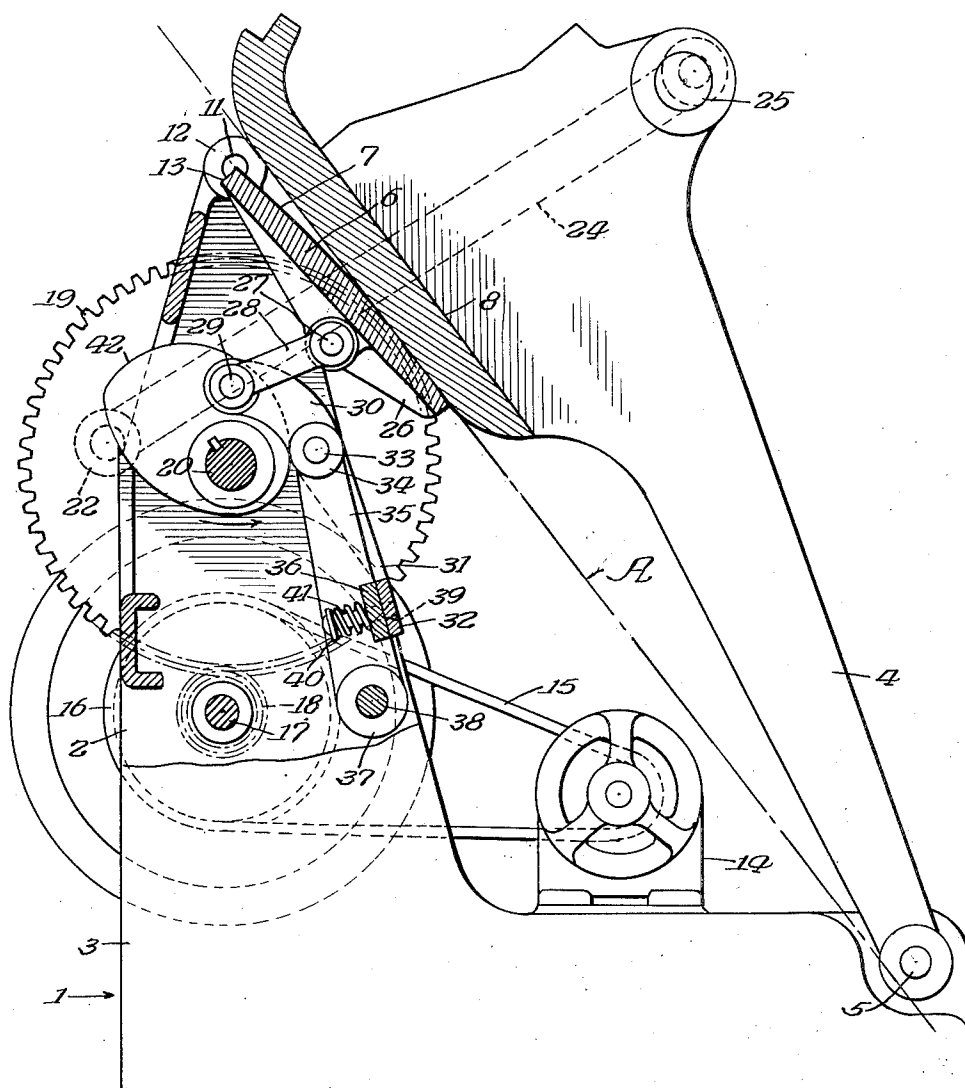
2,613,599

OSCILLATING BED AND PLATEN PRESS

Filed Aug. 23, 1946

4 Sheets-Sheet 2

Fig. 2



Inventor
William C. Rupp

By: Spencer, Marshall, Johnston & Cook attys

Oct. 14, 1952

W. C. RUPP

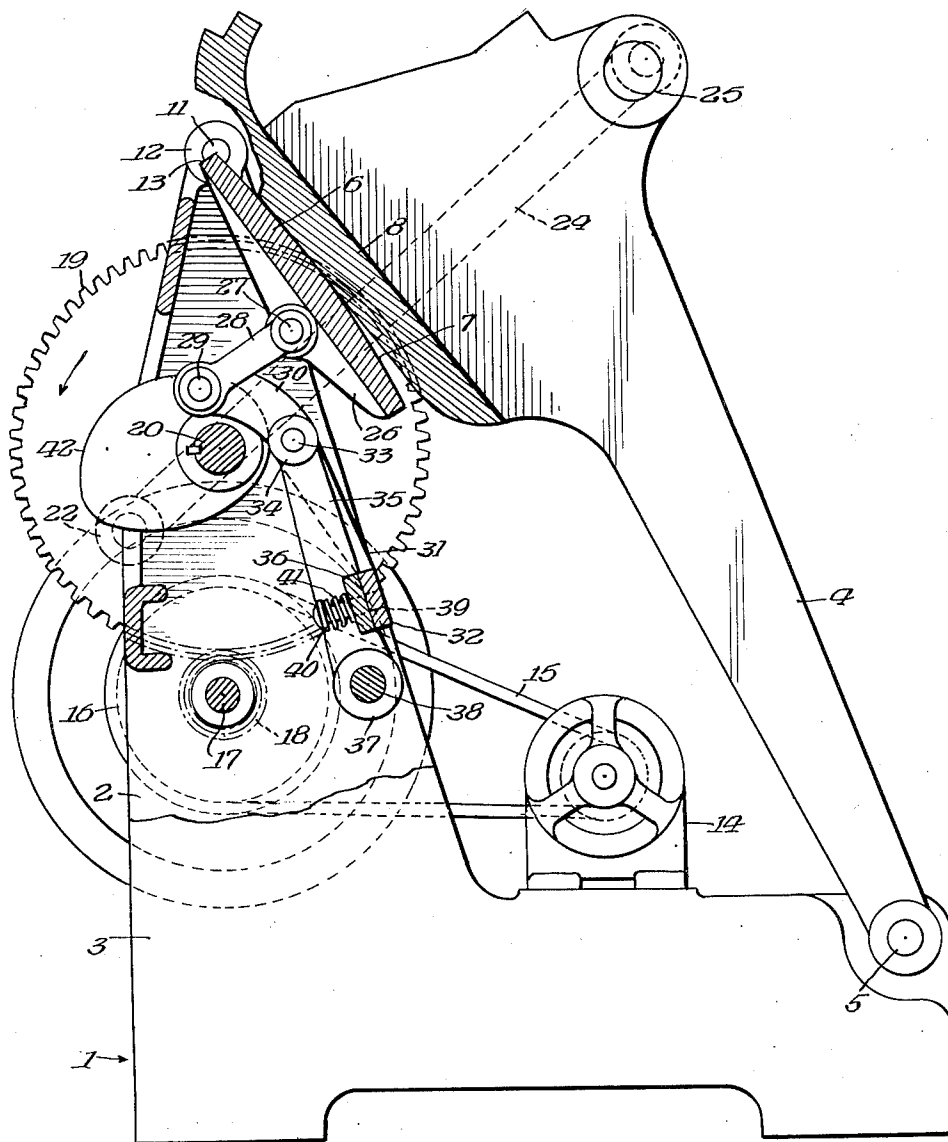
2,613,599

OSCILLATING BED AND PLATEN PRESS

Filed Aug. 23, 1946

4 Sheets-Sheet 3

Fig. 3



Inventor:
William G. Rupp

By: Spencer, Mangall, Johnson & Cook Attys

Oct. 14, 1952

W. C. RUPP

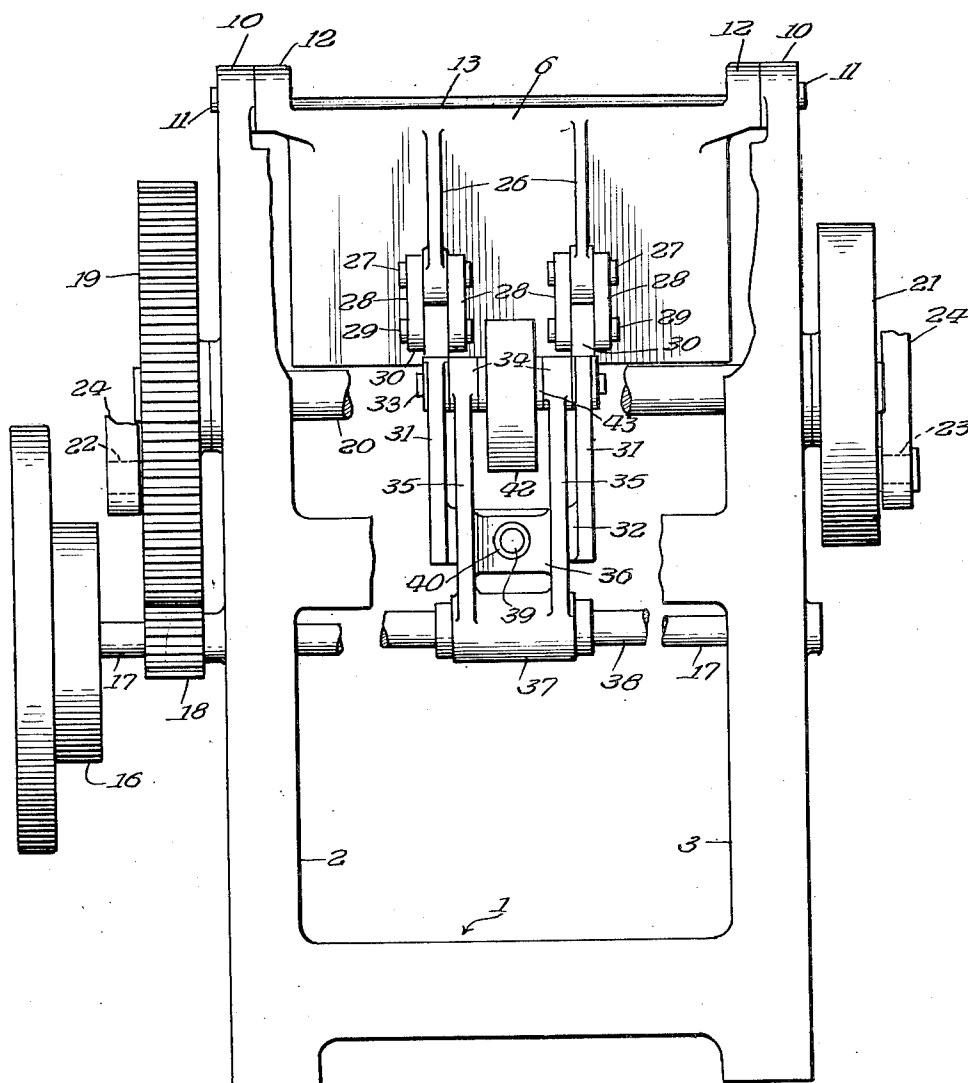
2,613,599

OSCILLATING BED AND PLATEN PRESS

Filed Aug. 23, 1946

4 Sheets-Sheet 4

FIG. 4



Inventor
William C. Rupp

By Spencer, Marshall, Johnston & Co.
Attorneys

UNITED STATES PATENT OFFICE

2,613,599

OSCILLATING BED AND PLATEN PRESS

William C. Rupp, Parma, Ohio, assignor to The
Chandler & Price Company, Cleveland, Ohio, a
corporation of Ohio

Application August 23, 1946, Serial No. 692,567

5 Claims. (Cl. 101-298)

1

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.

The present form of curved platen press as disclosed herein is of the character wherein the curved platen is pivotally mounted for rotation about an axis adjacent one end thereof and is so mounted on a stationary frame. The type bed is mounted on an oscillating frame in a manner similar to the type of press commonly known in the trade as a Gordon press. The similarity resides in the fact that the platen is mounted on the stationary frame and the type bed on the oscillating frame.

The present invention also is distinguishable from other curved platen presses in that the curved platen is pivotally mounted to rotate about one end thereof on the stationary frame, rather than on the oscillating frame. This type of construction presents entirely different structural problems which has enabled me to overcome previously encountered difficulties in a novel and efficient manner.

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. In that case, however, while the type bed was rigidly mounted on the oscillating frame, the curved platen was pivotally mounted to rotate in the usual way about an axis between the ends of the platen. Proper register between the platen and type bed was supposedly obtained by rolling the platen against the bed during the printing operation and controlling this action by use of pins on the platen received by holes on the edge of the bed. The present invention contemplates pivoting the curved platen about one end thereof, preferably a fixed axis located adjacent the upper end, and positioning the fixed pivotal point of the oscillating frame carrying the type bed relative to the

2

fixed pivotal axis of the curved platen in such a way as to obtain pin point contact or proper registry during the printing operation.

It is imperative in any printing operation that there be no slippage between the platen and the type form. This problem is increased when a curved platen is used and, in order to obtain what may be termed "pin point contact" between the impression members during the printing operation in a simple and efficient manner, it is necessary to properly position the pivotal points of the two members relative to each other and properly control the rotation of the curved platen. Pin point contact is a term which is synonymous with maintaining the platen and bed in proper register during the printing operation and the meaning thereof may be fully explained in the following manner.

When any curved surface is caused to roll over a flat plane, if this rolling motion is accomplished from one end of the curved surface to the other without having any slippage between the two surfaces, the result will be perfect pin point contact at every point along the two surfaces from one end thereof to the other. This is the result which should be obtained or closely approximated with a curved platen press in order to obtain a perfect printing impression. When one end of a curved surface is pressed against a flat plane and is rolled thereon in such a way as to produce perfect pin point contact, the other end of the curved surface will travel a predetermined path, which will not be an arc of a true circle. This can be clearly illustrated by the use of a curved surface which has a very small radius. As this radius of curvature increases and the length of travel of the ends of the curved surface decreases, the path of travel thereof will approach an arc of a true circle. The underlying principle upon which this invention is based is the pivoting of the curved platen to a stationary frame in such relation with the fixed axis of the oscillating frame that the relative movement between the curved platen and the type bed will be a perfect rolling action, thus obtaining perfect registry during the printing operation between the impression members.

It is, therefore, one of the principal objects of the present invention to provide a platen printing press wherein the platen member has a curved face thereon of convex form and is pivotally mounted to rotate about one end thereof as an axis on a stationary frame.

Another object of the invention is to provide a platen printing press having a main stationary frame and an oscillating frame pivotally mount-

3

ed thereon wherein the platen has a curved surface and is mounted on the stationary frame to rotate about an axis adjacent the upper end thereof.

A further object is to provide a platen printing press of the curved platen type wherein the type bed is mounted on an oscillating frame rotatable about a fixed axis and the curved platen is pivotally mounted on a stationary frame, and the pivotal points of the platen and oscillating frame are so located relative to each other as to obtain pin point contact or proper registry between the platen and type form during the printing operation.

Still another object is to provide in a platen printing press a platen having a curved face mounted for rotation about a fixed axis coincident with the curved face and upper edge thereof, and actuating means for rotating the platen about its fixed axis to sheet receiving and to printing positions.

Another and more specific object of the invention is to provide a curved platen printing press wherein the platen is mounted for rotation on a stationary frame with means yieldable during the printing operation to compensate for any excess pressure which might be present between the impression members.

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

Fig. 1 is a side elevation of the machine with parts thereof broken away and shown in section for the sake of clarity;

Fig. 2 is a view similar to Fig. 1 but showing the curved platen and type bed in the initial printing position;

Fig. 3 is a view similar to Fig. 2 but showing the impression members in the final printing position; and

Fig. 4 is a front elevational view of the machine.

Referring now more particularly to the drawings, a stationary frame, generally indicated by the numeral 1, may be provided with spaced side members 2 and 3. An oscillating frame 4 is adapted to pivot about a fixed axis indicated by the numeral 5, which may be a shaft extending between the side members of the stationary frame 1.

A platen member 6 is mounted between sides of the stationary frame 1 and is provided with a curved face 7 thereon of convex form. A type bed 8 of the usual character is mounted at the upper side of the oscillating frame 4 which may also be provided with suitable inking rollers 9. The operation of these rollers is well known and their actuating parts need not be described in detail. Since the press is generally of the Gordon type, the actuating means for the rollers may be similar to that employed in a Gordon press. Fig. 1 shows the platen and type bed separated where the platen is in sheet receiving position and the type bed is in a position where the inking rollers 9 have travelled downwardly to ink the type form located on the type bed in the usual and well known manner.

Contrary to usual practice, I prefer to mount the curved platen 6 for rotation about an axis adjacent the upper end thereof. For this purpose I provide the upper ends of the spaced side members 2 and 3 with journals or bearing members 10 adapted to receive a shaft or pin 11 at each side thereof as more clearly shown in Fig. 4. The platen 6 is also provided with bearing members 12 at the upper side thereof and at each

4

end which are mounted on the inner ends of the pins 11. While I do not wish to be limited specifically to the position of the axis of rotation of the platen, as disclosed herein I have found it preferable to locate the axis at the intersection of the curved face 7 and the upper edge 13 of the platen. It will be noted that this intersection is coincident with the center of the pins 11.

The press may be actuated by any suitable driving means such as a motor 14 connected by means of the belt 15 to a pulley 16 keyed to the shaft 17 extending between the sides of the stationary frame. A pinion 18 is also keyed to the shaft 17 and is in mesh with and drives a large gear 19 located at one side of the frame and mounted on one end of a shaft 20. This shaft 20 extends between the sides of the stationary frame and at its opposite end has what may be termed a small head 21 secured thereto.

The gear 19 is provided with a wrist pin 22 and the small head has a similar wrist pin 23 mounted on the outer side thereof whereby one end of each of the connecting links 24 may be mounted thereon to drive the oscillating frame 4. The opposite ends of the links 24 are suitably mounted on pins 25 at the upper end of the frame 4 so that rotation of the gear 19 and the small head 21 on the shaft 20 will cause the wrist pins 22 and 23 to revolve about the shaft and oscillate the frame 4. This operation is also in accordance with common and well known practice.

Novel means are provided to rotate the curved platen 6 about its pivotal point to sheet receiving position and to printing position. The mechanism for imparting the rotative movement to the platen must be in timed relation with the opening and closing of the type bed. Referring more particularly to Fig. 4, it will be seen that the underside of the platen is provided with a plurality of ribs 26 having suitable openings therein so that each rib may receive a pivot pin 27. For purposes of illustration, two of these ribs have been shown, but the number thereof may obviously be varied. Each of these pins extends a sufficient distance on each side of its respective rib so as to receive spaced links 28. The links 28 are paired, and each pair receives another pivot pin 29 at the opposite end thereof. It will be observed that the links 28 are located one on each side of each of the ribs 26. This will permit the reception of the upper end 30 of an arm 31 between each pair of links 28 on each pivot pin 29. The lower ends of the arms 31 are connected by means of a cross member 32 so as to unify any rotative movement of these arms.

Another pin or small shaft 33 extends between the arms 31 intermediate the ends thereof and supports the upper ends 34 of the spaced arms 35. These arms also have a cross member 36 connecting them together, which cross member is adapted normally to bear against the cross member 32 connecting the arms 31 (see Figs. 1, 2 and 3).

The lower ends of the arms 35 form a single bearing member 37 adapted to receive and be mounted on a shaft 38 extending between the side members of the stationary frame 1.

By viewing Figs. 1, 2 and 3, it will become apparent that oscillation of the arms 35 about their pivotal point 38 will cause the platen 6 to rotate about its pivotal point 11 through the medium of the curved upper ends 30 of the arms 31 and their pivotal connection to the links 28. As the arms 35 are caused to move in a clockwise direction, as viewed in the drawings, about their

5

6

pivotal point 38, the platen will be elevated to sheet receiving position as shown in Fig. 1. As these arms move toward the left in a counter-clockwise direction, the platen will be rotated to printing position as shown in Figs. 2 and 3.

A bolt 39 is secured to the cross member 32 and extends through and beyond the cross member 36, being provided at its outer end with a collar 40 against which one end of a coiled compression spring 41 is adapted to bear. This spring is coiled around the bolt 39 and bears at its other end against the cross member 36, thus maintaining the two cross members 32 and 36 normally in contact with each other.

At this point it may be noted, however, that the platen itself will be able to rotate in a clockwise direction about its pivotal axis if it is forced to do so independently of any movement of the arms 35. Any such movement will take place against the compression of the spring 41 and tend to move the cross member 32 and its connected parts away therefrom.

Ordinarily, during operation of the machine, such a movement might not take place, but it is a contingency for which provision should be made in the event of the presence of any excessive pressure between the impression members. If for any reason an excessive pressure occurs between the type form and platen during the printing operation, such, for example, as might occur because of excessive packing of the tympan, the platen will be urged in a clockwise direction about its pivotal point beyond the position which it ordinarily assumes. This tendency will present an undue strain on the various parts if some means is not provided to allow the platen to yield and thus compensate for such excessive pressure. It will be clear that with the yieldable means including the compression spring above described, any excessive pressure tending to move the platen further downwardly beyond its normal printing position, will rotate the arms 31 about the pivotal point 33 in a counter-clockwise direction. This movement of the arms 31 will carry the cross member 32 against the compression of the spring 41 and thus permit this slight additional movement of the platen when necessary.

The platen is governed and controlled in its rotative movement by the cam 42 which is keyed to the shaft 20 and against which the cam follower 43 is adapted to normally bear. The cam follower 43 is located on the small shaft 33 between the upper ends 34 of the arms 35. The periphery of the cam is so shaped as to force the cam follower and its connected parts toward the right, as viewed in Fig. 1, to elevate the platen to sheet receiving position when the type bed is open and ready for inking. As the cam continues to rotate in a counter-clockwise direction, the cam follower will lower the platen to its initial printing position as shown in Fig. 2.

As explained hereinbefore, it is necessary for proper registry between the platen and the type bed that a rolling action take place therebetween. Since the length of the arc on the curved face of the platen will be slightly greater than the length of the cord of that arc, the point of final contact on the type bed which is to contact the upper edge of the platen in the final printing position must move downwardly from its position shown in Fig. 2 to that shown in Fig. 3. To accomplish this result, a proper contour of the cam is necessary to allow the platen to recede during the printing operation while the type bed is still moving forwardly. This action will al-

low the platen to roll the curved face thereof against the type bed without any slippage therebetween, thus obtaining pin point contact or proper registry as between the platen and the type bed during the impression period.

It is also to be noted that as the cam 42 continues to rotate from the final printing position of Fig. 3, there is a substantially concentric portion of the cam which will be contacted by the roller 43 for a short distance, whereby the platen will remain stationary or be retained in its final printing position for a short period of time while the movable frame member moves away from the platen before the platen begins to move toward its sheet receiving position.

In the arrangement of the parts illustrated herein, it is to be noted that in order to produce proper registry between the platen and type form, it is necessary to position the pivotal point 5 of the type bed at the right side or rear of the plane of the type bed. This fact is clearly brought out by the dotted line A indicating a plane coincident with the plane of the type bed.

From the foregoing description it will be evident that I have provided a novel form of platen press wherein the platen is curved and wherein positive means are provided to rotate the platen about its upper end to sheet receiving position and to printing position. It will thus be observed that one of the principal features is the provision of a curved platen which rotates about a fixed axis on a stationary frame.

It will be clear that certain changes may be made in the form, construction and arrangement of parts from those disclosed herein without in any way departing from the spirit of the invention or sacrificing any of the attendant advantages hereof, provided, however, that such changes fairly 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. A platen printing press comprising a stationary frame, a second frame mounted for oscillation on said stationary frame toward and away therefrom for a printing operation, means for moving said frames to and from printing position, a type bed mounted on said second frame, a curved platen mounted on said stationary frame, pivot means mounting the upper end of said curved platen on said stationary frame for free swinging movement, link means pivotally mounted at one end thereof on said curved platen, a second link rotatably mounted at one end thereof on said stationary frame and pivotally mounted at the other end thereof intermediate the ends of said linkage means, a cam follower at said other end of said second link, a rotatable cam mounted on said stationary frame, means rotating said cam in timed relation with the movement of said oscillating frame, said platen and link means urging said cam follower into contact with said cam, said cam cooperating with said cam follower and both said link means, said cam having a portion thereon for moving said follower and through said linkage swinging said curved platen upwardly about said pivot means to sheet receiving position while said stationary frame and said second frame are in nonprinting position, said rotatable cam having a second portion thereon cooperating with said follower and said linkage means for swinging said curved platen about said pivot

7

means from sheet receiving position to initial printing position as said oscillating frame moves toward said stationary frame, a third portion on said rotatable cam cooperating with said follower and said linkage means to provide a substantially constant pressure between said curved platen and type bed during the printing operation, said third portion on the rotatable cam controlling the swinging movement of said curved platen toward its frame about said pivot means under pressure of said type bed thereagainst during the printing operation, and means including said pivot means to obtain line contact between said curved platen and type bed progressively from one end thereof to the other as the lower end of said curved platen is moved toward its frame during the printing operation.

2. A platen printing press comprising a stationary frame, a second frame mounted for oscillation on said stationary frame toward and away therefrom for a printing operation, means for moving said frames to and from printing position a type bed mounted on said second frame, a curved platen mounted on said stationary frame, pivot means mounting the upper end of said curved platen on said stationary frame for free swinging movement, link means pivotally mounted at one end thereof on said curved platen, a second link rotatably mounted at one end thereof on said stationary frame and pivotally mounted at the other end thereof intermediate the ends of said linkage means, a cam follower at said other end of said second link, a rotatable cam mounted on said stationary frame, means rotating said cam in timed relation with the movement of said oscillating frame, said platen and link means urging said cam follower into contact with said cam, said cam cooperating with said cam follower and both said link means, said cam having a portion thereon for moving said follower and through said linkage swinging said curved platen upwardly about said pivot means to sheet receiving position while said stationary frame and said second frame are in nonprinting position, said rotatable cam having a second portion thereon cooperating with said follower and said linkage means for swinging said curved platen about said pivot means from sheet receiving position to initial printing position as said oscillating frame moves toward said stationary frame, a third portion on said rotatable cam cooperating with said follower and said linkage means to provide a substantially constant pressure between said curved platen and type bed during the printing operation, said third portion on the rotatable cam controlling the swinging movement of said curved platen toward its frame about said pivot means under pressure of said type bed thereagainst during the printing operation, and means including said pivot means to obtain line contact between said curved platen and type bed progressively from one end thereof to the other as the lower end of said curved platen is moved toward its frame during the printing operation, and yieldable means between said linkage means and said second link to compensate for excessive pressure between said curved platen and said type bed during the printing operation.

3. A platen printing press comprising a stationary frame, a second frame mounted for oscillation on said stationary frame toward and away therefrom for a printing operation, means for moving said frames to and from printing

8

position, a pair of cooperating impression members including a type bed mounted on one of said frames and a curved platen mounted on the other of said frames, pivot means mounting the upper end of the impression member on said stationary frame for free swinging movement, link means pivotally mounted at one end thereof on the pivoted impression member, a second link rotatably mounted on said stationary frame and pivotally connected to said link means, a cam follower on said second link, a rotatable cam mounted on said stationary frame, means rotating said cam in timed relation with the movement of said oscillating frame, said pivoted impression member and link means urging said cam follower into contact with said cam, said cam cooperating with said cam follower and both said link means, said cam having a portion thereon for moving said follower and through said linkage swinging said pivoted impression member upwardly about said pivot means to sheet receiving position while said stationary frame and said second frame are in non-printing position, said rotatable cam having a second portion thereon cooperating with said follower and said link means for swinging said pivoted impression member about said pivot means from sheet receiving position to initial printing position as said oscillating frame moves toward said stationary frame, a third portion on said rotatable cam cooperating with said follower and said link means to provide a substantially constant pressure between said impression members during the printing operation, said third portion on the rotatable cam controlling the swinging movement of said pivoted impression member toward its frame about said pivot means under pressure of the other impression member thereagainst during the printing operation, and means including said pivot means to obtain line contact between said curved platen and type bed progressively from one end to the other as the lower end of said pivoted impression member is moved toward its frame during the printing operation.

4. A platen printing press comprising a stationary frame, a second frame mounted for oscillation on said stationary frame toward and away therefrom for a printing operation, means for moving said frames to and from printing position, a type bed mounted on said second frame, a curved platen mounted on said stationary frame, pivot means mounting the upper end of said curved platen on said stationary frame for free swinging movement, link means pivotally mounted at one end thereof on said curved platen, a second link rotatably mounted on said stationary frame and pivotally connected to said link means, a cam follower mounted on said second link, a rotatable cam mounted on said stationary frame, means rotating said cam in timed relation with the movement of said oscillating frame, said platen and link means urging said cam follower into contact with said cam, said cam cooperating with said cam follower and both said link means, said cam having a portion thereon for moving said follower and through said link means swinging said curved platen upwardly about said pivot means to sheet receiving position while said stationary frame and said second frame are in non-printing position, said rotatable cam having a second portion thereon cooperating with said follower and said link means for swinging said curved platen about said pivot means from sheet

receiving position to initial printing position as said oscillating frame moves toward said stationary frame, a third portion on said rotatable cam cooperating with said follower and said link means to provide a substantially constant pressure between said curved platen and type bed during the printing operation, said third portion on the rotatable cam controlling the swinging movement of said curved platen toward its frame about said pivot means under pressure of the type bed thereagainst during the printing operation, and means including said pivot means to obtain line contact between said curved platen and type bed progressively from one end thereof to the other as the lower end of said curved platen is moved toward its frame during the printing operation.

5. A platen printing press comprising a stationary frame, a second frame mounted for oscillation on said stationary frame toward and away therefrom for a printing operation, means for moving said frames to and from printing position, a type bed mounted on said second frame, a curved platen mounted on said stationary frame, pivot means mounting the upper end of said curved platen on said stationary frame for free swinging movement, link means pivotally mounted at one end thereof on said curved platen, a second link rotatably mounted on said stationary frame and pivotally connected to said link means, a cam follower mounted on said second link, a rotatable cam mounted on said stationary frame, means rotating said cam in timed relation with the movement of said oscillating frame, said platen and link means urging said cam follower into contact with said cam, said cam cooperating with said cam follower and both said link means, said cam having a portion thereon for moving said follower and through said link means swinging said curved platen upwardly about said pivot means to sheet receiving position while said stationary frame and said second frame are in non-printing position, said rotatable cam having a second portion

thereon cooperating with said follower and said link means for swinging said curved platen about said pivot means from sheet receiving position to initial printing position as said oscillating frame moves toward said stationary frame, a third portion on said rotatable cam cooperating with said follower and said link means to provide a substantially constant pressure between said curved platen and type bed during the printing operation, said third portion on the rotatable cam controlling the swinging movement of said curved platen toward its frame about said pivot means under pressure of the type bed thereagainst during the printing operation, means including said pivot means to obtain line contact between said curved platen and type bed progressively from one end thereof to the other as the lower end of said curved platen is moved toward its frame during the printing operation, and yieldable means between said link means and said second link to compensate for excessive pressure between said curved platen and said type bed during the printing operation.

WILLIAM C. RUPP.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
84,440	Reese	Nov. 24, 1868
796,707	Clark	Aug. 8, 1905
857,721	Clark	June 25, 1907
887,820	Kuster	May 19, 1908
1,034,083	Clark	July 30, 1912
1,157,807	Rockstroh	Oct. 26, 1915
1,360,063	Waters	Nov. 23, 1920
1,553,529	Hayden	Sept. 15, 1925
1,767,237	Clark	June 24, 1930
2,177,088	Albertoli	Oct. 24, 1939
2,344,609	Hanson	Mar. 21, 1944
2,497,798	Root	Feb. 14, 1950
2,497,799	Root	Feb. 14, 1950