June 11, 1957 C. F. ROOT 2,795,187

ROLLING CONTACT PLATEN PRESS

Filed Jan. 19, 1954 3 Sheets-Sheet 1

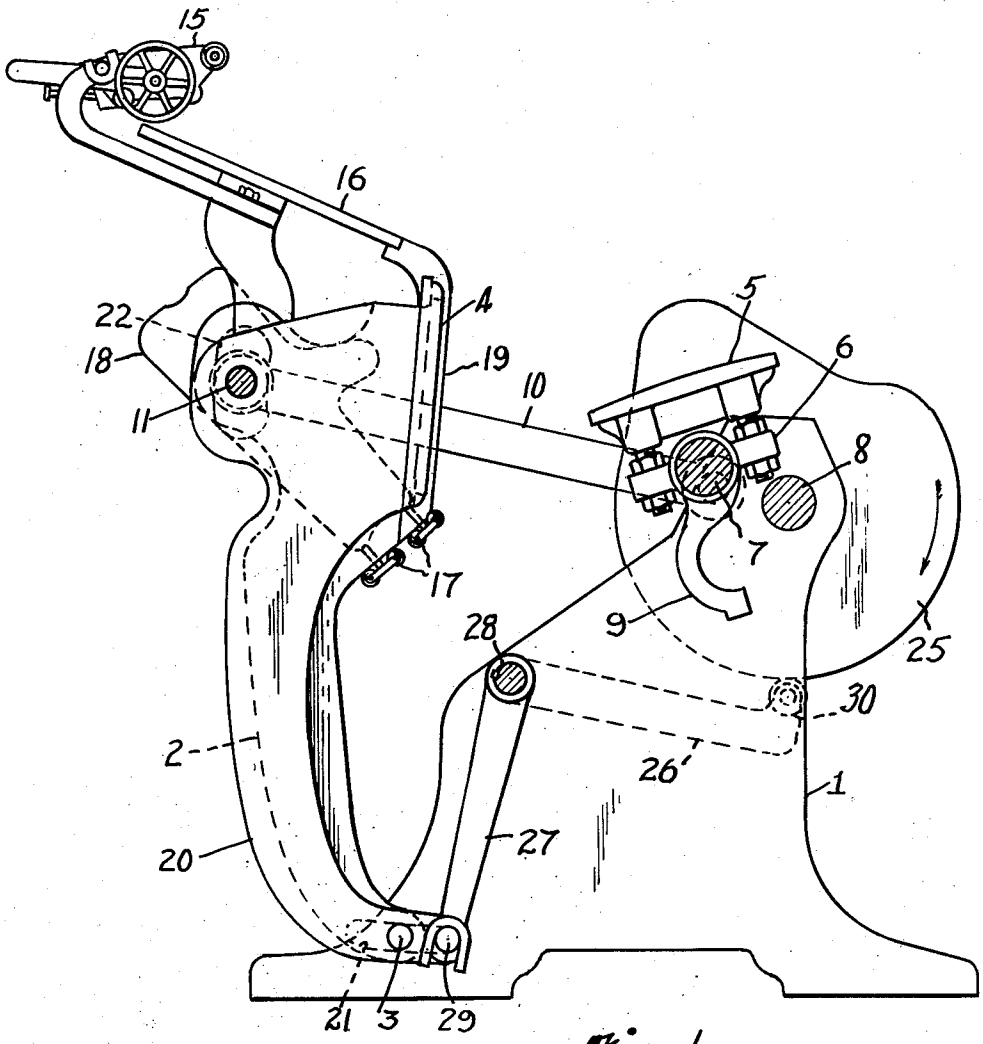



Fig. 1

INVENTOR.
CHARLES F. ROOT
BY
Oberlin & Limbach
ATTORNEYS.

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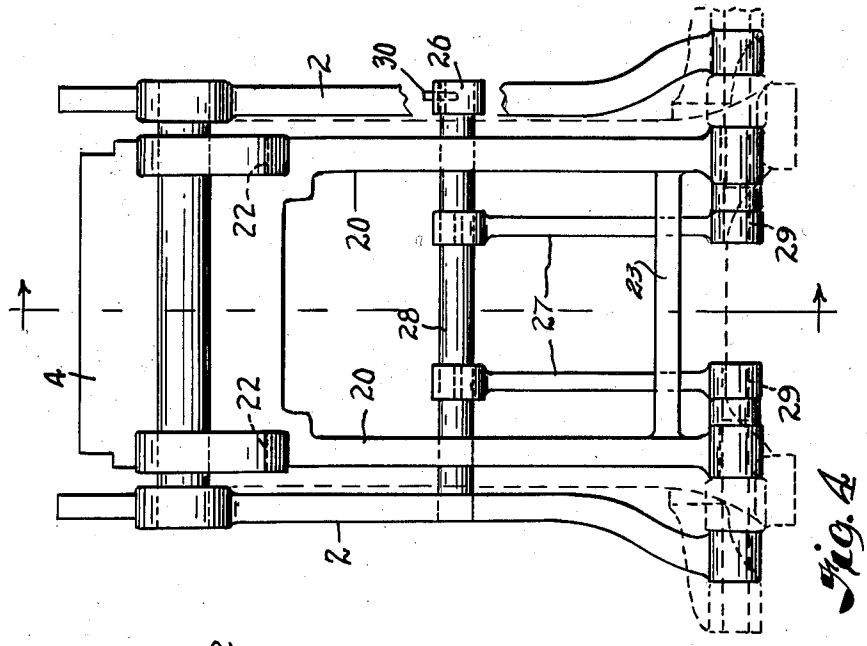



Fig. 4

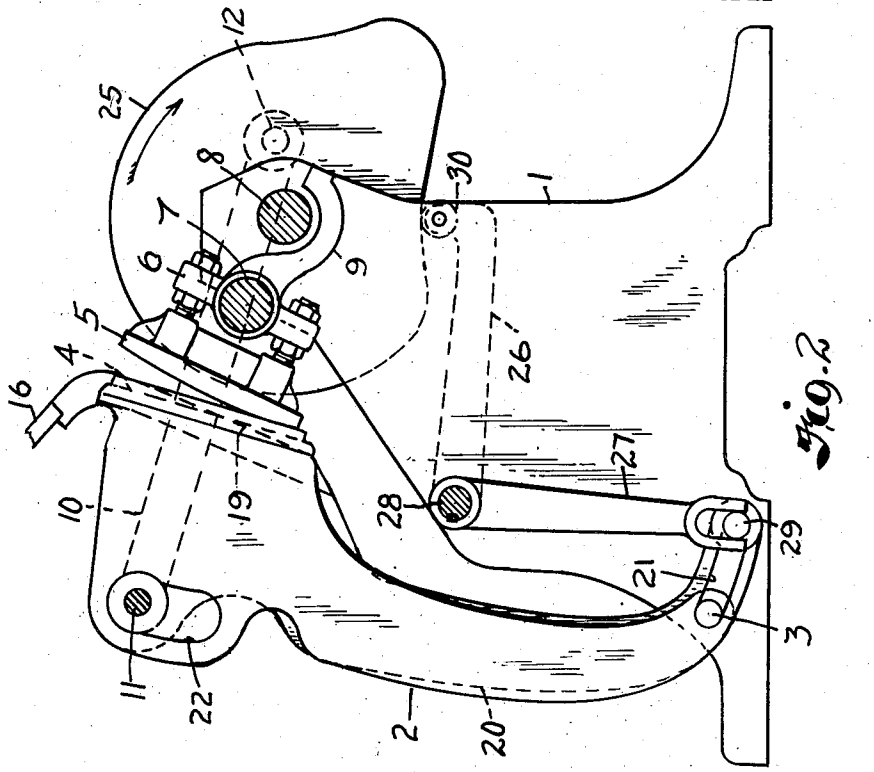



Fig. 2

INVENTOR
CHARLES F. ROOT

BY Oberlin & Limbach ATT'YS.

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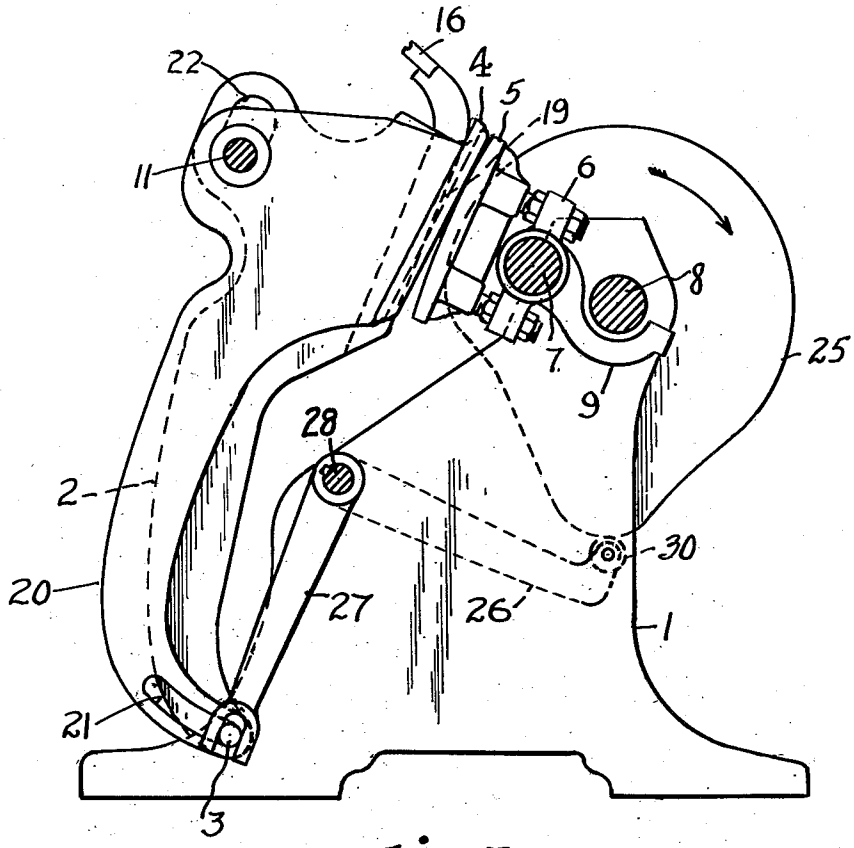



Fig. 3

INVENTOR.
CHARLES F. ROOT
BY
Oberlin & Limbach
ATTORNEYS.

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2,795,187

# ROLLING CONTACT PLATEN PRESS

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

Application January 19, 1954, Serial No. 404,840

5 Claims. (Cl. 101—298)

The present improvements, relating as indicated to platen presses, have more particular regard to platen presses wherein the face of one member of the printing couple, ordinarily the platen member, is convexly curved on an arc of comparatively large radius about an axis transverse to the direction of relative movement between said member and the bed member of the press. While platen presses of this construction are of primary use in the printing field, they may also be advantageously employed in performing analogous operations on sheet material such as scoring or creasing, and even cutting. While in a platen press designed for printing the bed and platen which constitute the directly cooperating members are conveniently termed the printing couple, and such term will be so used in describing the present invention, it will be understood that it is not intended thereby to limit the invention to such specific use.

In a platen press where one member of the printing couple is curved as and for the purpose described, further means are desirably provided whereby, as said members are brought together, contact is progressively made therebetween. In other words, the members should have line-for-line, i. e. non-slipping, rolling contact, one with the other.

A curved platen press incorporating one form of means for accomplishing the foregoing object will be found shown and described in U. S. Letters Patent No. 2,497,801, issued to me under date of February 14, 1950. The platen press there illustrated is of the well-known Gordon type wherein the type bed is carried by an oscillating frame mounted on the stationary frame which carries the platen. The latter is likewise oscillatorily mounted on such stationary frame, being carried by a rocker. However the latter is held stationary during the printing operation and oscillates merely to facilitate the feeding and removal of sheets to the platen.

In such prior patent the platen is curved as above described, and in order that the bed may have non-slipping rolling contact therewith as the bed and platen are brought together during the printing operation, the bed is floatingly mounted on its frame so as to be capable of rocking movement within a limited range. A more specific object of the present invention is to provide improved means for thus floatingly mounting the type bed in a curved platen press that otherwise corresponds in its general construction with the Gordon type press illustrated in said patent.

To the accomplishment of the foregoing and related ends, said invention, then, consists of the means hereinafter fully described and particularly pointed out in the claims.

The annexed drawings and the following description set forth in detail certain mechanism embodying the invention, such disclosed means constituting, however, but one of various mechanical forms in which the principle of the invention may used.

In said annexed drawings:

Fig. 1 is a side elevational view of a press showing the present invention as applied thereto, such press being in its open sheet-receiving position;

Fig. 2 is a side elevation similar to Fig. 1 except for the omission of certain parts, but showing the bed and platen in the position occupied at the beginning of the printing operation;

Fig. 3 is a view similar to Fig. 2 but showing such bed and platen in the position they occupy at the completion of the printing operation; and

Fig. 4 is a rear elevation of the press.



As previously stated, the press illustrated in the drawings is of the so-called Gordon type. Thus it comprises a stationary main frame **1** and a second relatively movable frame **2** that is mounted for oscillation about a transverse shaft **3** near the base of said main frame. Such movable or oscillatory frame **2** carries a type bed **4** wherein a type form, not separately shown, may be secured in familiar fashion. The manner in which such type bed is mounted in the oscillatory frame will be presently described in more detail.

Such type bed with its form is adapted to be oscillated toward and away from a platen **5** which is carried by a so-called rocker **6** that is oscillatory about a transverse shaft **7** mounted in the upper portion of the stationary main frame **1**. This shaft is interconnected with the main shaft **8** of the press which is similarly mounted in the upper portion of the frame **1** so as to rotate said rocker in a counterclockwise direction from the sheet-receiving position shown in Fig. 1 to the printing position shown in Figs. 2 and 3. An arm **9** that projects from rocker **6** is utilized in a conventional manner to lock said rocker when the platen is thus in printing position. Since we are here concerned only with the operation when the platen is thus positioned, a detailed description of such platen locking and other conventional parts of a Gordon type press is considered unnecessary. However it should be noted that the sheet-receiving face of platen **5** is convexly curved on an arc of comparatively large radius about an axis parallel with that of shaft **3** upon which frame **2** is oscillatorily mounted. For that matter, the axes of shafts **7** and **8** are likewise parallel with that of shaft **3**.

Oscillation of frame **2** is accomplished by means of side arms or links **10**, one on each side of the machine, each of which is connected at one end to the corresponding end of a so-called back shaft **11** mounted near the upper end of said frame **2**, while the other end of each such side arm is connected to a pin **12** eccentric of main shaft **8** and mounted to rotate in unison therewith. Usually the one such pin **12** is carried on what is known as the small head (not shown) in a Gordon type press, and the other on a large gear (likewise not shown), through which said shaft **8** is rotated and parts connected therewith caused to operate.

There will be associated with swinging frame **2** suitable inking mechanism whereby a type form mounted on bed **4** may be inked in the open position of the press shown in Fig. 1. As illustrated, such inking mechanism comprises a conventional inking fountain **15**, disk **16** and ink rollers **17** which are carried by arms **18**, one on each side of the press, that are oscillatory about the same shaft **11** to which side arms **10** are connected. Such arms **18** will be operated in conventional manner to move the rollers **17**, when the press is in open position as shown in Fig. 1, downwardly across the disk **16** and thence along rails **19** disposed on either side of the bed **4** in parallel relation thereto and so located that the rollers will contact with the form held mounted on the bed. In the figure in question the rollers are shown at the completion of the movement just described and it will be understood that such movement will be reversed and the

rollers carried upwardly beyond rails **18** well before the printing operation begins.

Whereas in a press of conventional design the form **4** will be attached to or carried directly by the upper portion of the swinging frame **2**, in the present improved construction it is thus carried by supplemental frame **20** that lies between the two sides of said frame **2** and conforms generally in shape and extent with the latter. Said supplemental frame will be substantially equal in strength and rigidity to swinging frame **2**, so as to afford an adequate support for the bed during the printing operation, despite the fact that it is floatingly mounted, in the manner now to be described, in said frame **2**.

In order thus floatingly to mount the supplemental frame **20**, each of the lower depending side portions thereof is formed with a slot **21** that extends in a generally horizontal direction and engages the shaft **3** upon which the swinging frame **2** is mounted, and with a generally vertically extending slot **22** that similarly engages the back shaft **11**. Actually, each of the slots **21** and **22** will be slightly curved so that as movement within the limits of such slots is imparted to such supplemental frame there will in turn be imparted to the bed **4** a rolling movement combined with a slight movement in a direction transverse of that of such rolling movement, i. e. in a vertical direction as illustrated in the several figures of the drawings.

The two sides of the supplemental frame in which the slots **21** and **22** are thus formed are rigidly connected together at their upper ends by the bed **4** and at their lower ends by a cross-bar **23** (see Fig. 4). Accordingly the supplemental bed during the movement thus imparted thereto will at all times be supported by the shafts **3** and **11**. Furthermore, the location of the latter is not only to the rear of and approximately symmetrical to the face of the bed but in line with the pull of the side arms in the closed position of the press, i. e. during the printing operation.

Movement of the supplemental frame **20** within the swinging frame **2** is derived from the main shaft **8** of the press and so will be synchronized with the movement of the other parts of the latter, and particularly with the swinging movement of frame **2** which brings the bed **4** into contact with the platen, after the rocker which carries the latter has been rotated to place the platen in printing position.

For the purpose thus indicated a cam **25** of the contour generally indicated in Figs. 1, 2 and 3 is mounted on main shaft **8** and such cam engages one arm **26** of what is in effect a bellcrank lever, the other arm **27** of which is connected with the lower end of the supplemental frame. More in detail (see Fig. 4), the arms **26** and **27**, there being one of the former and two of the latter, are fixedly mounted on a transverse shaft **28** journalled in main frame **1** of the press more or less directly above shaft **3**; the lower ends of arms **27** are connected to stud shafts or pins **29** that project inwardly from the respective sides of frame **20**; and, in order to reduce friction, a roller **30** is provided on the outer end of the arm **26** to engage with cam **25**.

The operation of my improved construction of press may now be described. As previously stated, the press as illustrated in Fig. 1 is shown in fully open position, i. e. with the platen **5** rocked into its sheet-receiving position, and with the bed **4** in position to permit the form carried thereby to be inked by the passage thereacross of the inking rollers **17**. With the parts thus positioned it will be noted that the supplemental frame **20**, to which the bed **4** is attached, occupies what may be termed an intermediate position in the swinging or oscillatory frame **2**. Thus the downwardly extending side portions of said frame **20** are positioned by cam **25** through the medium of levers **26** and **27** so that the shaft **3** will lie approximately mid-way between the ends of the slot **21** in the lower extremity of each such side



portion. Similarly, the slots **22** in the upper portions of the frame **20** will be positioned so that the shaft **11** is located approximately midway between the ends of such slots.

Coincidentally with the rocking of platen **5** to printing position, as shown in Figs. 2 and 3, the frame **20** is swung to the right so as to bring the bed **4** into close proximity to said platen. Also, coincidentally with such closing movement of the press, the supplemental frame **20** is caused to oscillate within said frame **2** by the action of cam **25** through levers **26** and **27**, so as to bring the left hand end of slot **21** to the limit of its movement in a right hand direction, i. e. with the shaft **3** located in the left hand end of such slot. At the same time the slot **22** will be moved to its downward limit in which shaft **11** is located at the upper end of the slot. The result of the combined action of the slots will be to shift the position of the supplemental frame **20** within frame **2** so that the lower end of the bed **4** will project beyond the adjacent upper portion of said frame **2** and thus cause the lower portion of the form on the bed to make initial contact with the platen, or rather the sheet on such platen which is to receive the impression of the form.

The operation of the press of course continues without interruption. As main shaft **8** continues to rotate in a clockwise direction the upper portion of swinging frame **2** is accordingly brought still closer to platen **5** which remains in printing position. At the same time the portion of cam **25** which controls the movement of the supplemental frame **20** within frame **2** is so formed as to move the lower ends of the side portions of such frame at an accelerated rate to the left until the slots **21** and **22** reach their opposite limits of movement with respect to their corresponding shafts **3** and **11**, as shown in Fig. 3. The effect is to impart a general rocking as well as a slight translatory movement to the bed **4** during the final closing phase. Actually, keeping in mind that the platen remains stationary all the while, the movement of the bed relative thereto is compounded of the swinging movement of frame **2** and of such combined oscillatory and shifting movement of frame **20** within said frame **2**.

By properly designing the cam **25** and slots **21** and **22**, non-slipping rolling contact of the form carried by bed **4** with the curved surface of platen **5** is obtained. Also upon completion of the printing operation the position of the supplemental frame **20** within the swinging frame **2** may be shifted so that there will be no further contact of the form with the platen during opening movement of the press. In other words, the form will be held clear of the platen so as to avoid any danger of a double impression.

From the foregoing description it will be obvious that the recognized conditions for the successful operation of a rolling contact platen press are met with the use of a minimum number of additional parts over those found in a conventional platen press of the Gordon type. At the same time the sturdiness of construction which characterizes such type of press, including direct application of pressure of the form upon the platen, is retained. Finally, the movement of the bed member **20** within, and relatively to, the swinging frame **2** is at all times positively controlled, no spring or other retractible device being required.

Other modes of applying the principle of my invention may be employed instead of the one explained, change being made as regards the mechanism herein disclosed, provided the means stated by any of the following claims or the equivalent of such stated means be employed.

I therefore particularly point out and distinctly claim as my invention:

1. In a platen-bed press, the combination of two frames, one of said frames being stationary and the other being pivotally mounted for relative movement towards and away from said stationary frame, a printing couple com-

prising a platen member and a bed member respectively supported by said stationary and pivotally mounted frames, the operative face of said platen member being convexly curved on an arc of comparatively large radius about an axis parallel with that of said pivotally mounted frame, means mounting said bed member on its supporting frame for combined oscillation and sliding movement about two fixed axes on said frame, one such axis substantially coinciding with the pivotal axis of said frame and the other being likewise parallel with such pivotal axis and located at a substantial distance from the rear of said bed member, and means normally positioning said bed member to bring one end of the bed thereon into initial contact with said platen member when said frames are brought together, such contact thereupon progressively continuing away from such end as said frames swing apart.

2. In a platen-bed press, the combination of two frames, one of said frames being stationary and the other being pivotally mounted for relative movement towards and away from said stationary frame, a printing couple comprising a platen member and a bed member respectively supported by said stationary and pivotally mounted frames, the operative face of said platen member being convexly curved on an arc of comparatively large radius about an axis parallel with that of said pivotally mounted frame, means mounting said bed member on its supporting frame for combined oscillation and sliding movement about two fixed axes on said frame, one such axis substantially coinciding with the pivotal axis of said frame and the other being likewise parallel with such pivotal axis and located at a substantial distance from the rear of said bed member and on a line approximately equidistantly spaced from the upper and lower edges of the contacting face of said bed member, and means normally positioning said bed member to bring one end of the bed thereon into initial contact with said platen member when said frames are brought together, such contact thereupon progressively continuing away from such end as said frames swing apart.

3. In a platen-bed press of the Gordon type, the combination of two frames, one of said frames being stationary and the other being pivotally mounted for oscillatory movement towards and away from said stationary frame, a printing couple comprising a platen member and a bed member respectively supported by said stationary and pivotally mounted frames, the operative face of said platen member being convexly curved on an arc of comparatively large radius about an axis parallel with that of said pivotally mounted frame, a back-shaft on said pivotally mounted frame, side arms connected at their one end to said back-shaft for oscillating said pivotally mounted frame, means mounting said bed member on its supporting frame for combined oscillation and sliding movement about two fixed axes on said frame, one such axis being the pivotal axis of said frame and the other being the axis of said back-shaft, and means normally positioning said bed member to bring one end of the bed thereon into initial contact with said platen member when said frames are brought together, such contact thereupon progressively continuing away from such end as said frames swing apart.



4. In a platen-bed press of the Gordon type, the combination of two frames, one of said frames being stationary and the other being pivotally mounted for oscillatory movement towards and away from said stationary frame, a printing couple comprising a platen member and a bed member respectively supported by said stationary and pivotally mounted frames, the operative face of said platen member being convexly curved on an arc of comparatively large radius about an axis parallel with that of said pivotally mounted frame, a back-shaft on said pivotally mounted frame, side arms connected at their one end to said back-shaft for oscillating said pivotally mounted frame, means mounting said bed member on its supporting frame for combined oscillation and sliding movement about two fixed axes on said frame, one such axis being the pivotal axis of said frame and the other being the axis of said back-shaft, and means normally positioning said bed member to bring one end of the bed thereon into initial contact with said platen member when said frames are brought together, such contact thereupon progressively continuing away from such end as said frames swing apart, said last-named means being positively actuated synchronously with the oscillating movement of said pivotally mounted frame.

5. In a platen-bed press of the Gordon type, the combination of two frames, one of said frames being stationary and the other being pivotally mounted for oscillatory movement towards and away from said stationary frame, a printing couple comprising a platen member and a bed member respectively supported by said stationary and pivotally mounted frames, the operative face of said platen member being convexly curved on an arc of compartively large radius about an axis parallel with that of said pivotally mounted frame, a back-shaft on said pivotally mounted frame, side arms connected at their one end to said back-shaft for oscillating said pivotally mounted frame, means mounting said bed member on its supporting frame for combined oscillation and sliding movement about two fixed axes on said frame, one such axis being the pivotal axis of said frame and the other being the axis of said back-shaft, and means normally positioning said bed member to bring one end of the bed thereon into initial contact with said platen member when said frames are brought together, such contact thereupon progressively continuing away from such end as said frames swing apart, said last-named means including a bell-crank operating synchronously with the oscillating movement of said pivotally mounted frame and connected with said bed member adjacent the pivotal axis of said frame.

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