

F. C. MARQUARDT.
 PLATE REGISTERING MECHANISM FOR PRINTING MACHINES.
 APPLICATION FILED MAY 18, 1918.

1,374,859.

Patented Apr. 12, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

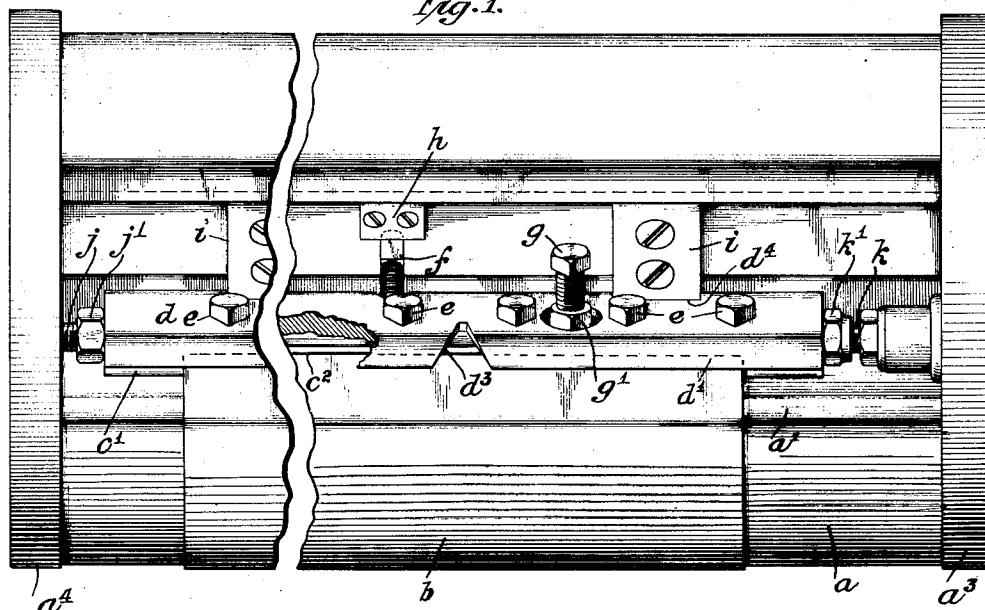
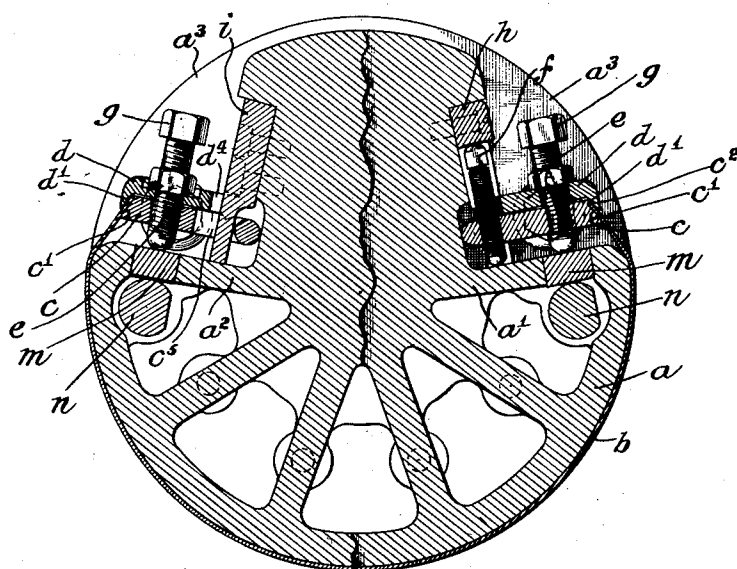


Fig. 2.



WITNESSES:
Ed. Mitchell

Frank C. Marquardt INVENTOR.

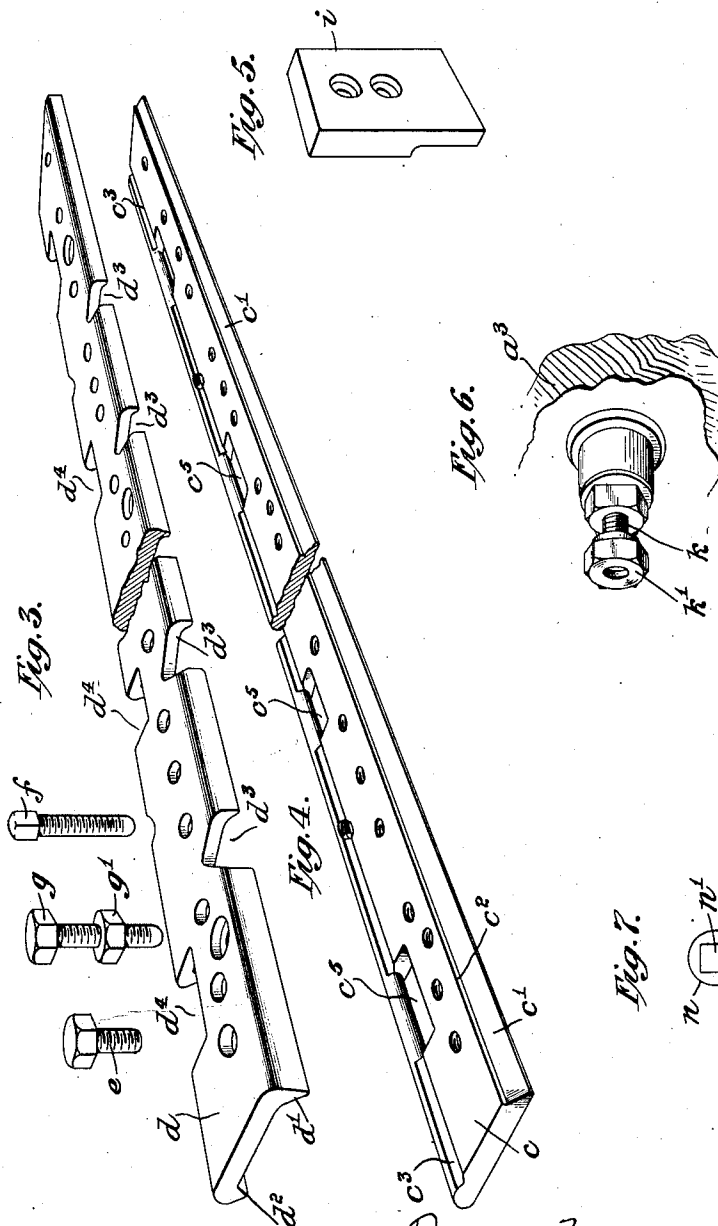
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WITNESSES:

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PLATE-REGISTERING MECHANISM FOR PRINTING-MACHINES.

1,374,859.

Specification of Letters Patent.

Patented Apr. 12, 1921.

Application filed May 18, 1918. Serial No. 235,329.

To all whom it may concern:

Be it known that I, FRANK C. MARQUARDT, a citizen of the United States, residing at the borough of Brooklyn, in the city of New York, county of Kings, and State of New York, have invented certain new and useful Improvements in Plate-Registering Mechanism for Printing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings, which form a part thereof.

My invention relates to plate registering mechanisms for printing machines, and more particularly to mechanisms adapted for use in properly and accurately positioning flexible metallic plates such as are commonly used in planographic printing machines of the plate cylinder type.

In machines of this type, the plates are mounted upon a segmental portion of the cylinder, by means of clamps engaging the edges of the plate which clamps are utilized to tighten the plate upon the cylinder, and position it during the make ready.

The object of my present invention is to so construct and arrange the clamp mechanisms as to not only permit the tightening of the plate, but to permit a rapid, convenient and minute universal shifting movement of the plate upon the cylinder, so as to secure the proper register of the design upon the plate with impressions previously made, as with the designs upon plates carried by other cylinders in the same machine.

To secure the desired accuracy in the positioning of the plate, I provide a clamp structure which may be minutely adjusted axially of the cylinder, or circumferentially thereof or both axially and circumferentially without releasing the plate from the clamps. The clamp mechanism is also so constructed and supported as to permit either end of the clamp to be tilted in a manner to effect, or correct, a slight skewing of the plate.

In order to facilitate the desired varying of the position of the plate, it is essential that the clamps be so mounted as to have no rigid connections between them and the plate cylinder, yet said clamps must be supported in a manner to impart such rigidity thereto as to avoid loss of register from vibrations, while the press is in operation. Furthermore, the clamp construction of my invention is such as to permit the creation of slack at either edge of the plate, to allow

circumferential shifting of the plate without developing distorting, or breaking stresses upon the plate, or disturbing the lateral adjustment thereof.

With a register mechanism made in accordance with my invention, the plate may be adjusted with relation to the cylinder without varying the adjustments for securing the desired tightening of the plate upon the cylinder, although I contemplate the provision of means whereby slack may be created in the plate to facilitate adjustment for register without disturbing the adjustments for tightening of the plate. The adjustment for register is secured, however, by the physical shifting of the plate in its entirety, rather than by a loosening of a portion of the plate in relation to the cylinder and a subsequent tightening thereof with the incidental shifting of the plate.

To facilitate the creation of slack in the plate, I may, and preferably do, provide the cylinder itself with means whereby the tensioning stresses on the plate may be relieved without changing any of the adjustments on the clamp, which means, when the desired shifting of the plates has been effected, may be quickly reset, prior to the final adjustment of the plate.

The clamp mechanism itself is so constructed as to permit the plate to be alined with reasonable accuracy in relation thereto, the gripping areas of the clamp members being so constructed and arranged, as to avoid possibility of slippage of the plate with relation thereto during subsequent adjustments of said clamp members and the plate carried thereby.

A further object of the invention is to provide positively acting, actuating means for imparting movement to the clamps, which will have no lost motion, and which will maintain the adjustment without likelihood of a loss of register of the plate as the result of vibration during the run of the machine.

The invention consists primarily in a plate adjusting mechanism for printing machines, embodying therein a plate cylinder, having bearing surfaces upon opposite sides thereof, a clamping mechanism movably mounted adjacent each of said bearing surfaces, embodying therein two co-acting clamp plates extending from adjacent one end of said bearing surface to adjacent the

other end thereof, and means for closing said plates upon the edges of the printing plate, means retaining said clamping mechanisms in relation to said cylinder while permitting oscillatory or rectilinear movement thereof with relation to said surfaces and means whereby said clamping mechanisms may have imparted thereto pivotal movement, movement toward or from said surfaces, or movement axially of said cylinder, to vary the position of the plate upon the cylinder; and in such other novel features of construction and combination of parts as, are hereinafter set forth and described, and more particularly pointed out in the claims hereto appended.

Referring to the drawings,—

Figure 1 is an elevation of a plate cylinder showing a clamping mechanism embodying my invention;

Fig. 2 is a transverse section of the cylinder shown in Fig. 1, upon different vertical planes as to different sides thereof;

Fig. 3 is a perspective view of the upper clamp plate, and the screw bolts of the different types used in the clamp;

Fig. 4 is a similar view of the lower plate;

Fig. 5 is a perspective view of one of the retaining plates;

Fig. 6 is a perspective view of one of the axially adjusting mechanisms; and

Fig. 7 is a detail end view of one of the tension relieving mechanisms.

Like letters refer to like parts throughout the several views.

In the embodiment of the invention shown in the drawing, a indicates a plate cylinder having shoulders a' — a^2 at opposite sides thereof, said shoulders forming oppositely presented bearing surfaces. The plate itself, which is of the ordinary zinc or aluminum etched type, is shown at b .

Mounted upon the cylinder a adjacent the shoulders a' and a^2 respectively, are clamping mechanisms adapted to engage opposite edges of the plate b , said clamping mechanisms being so supported as to be capable of movement axially of said cylinder, to permit lateral shifting of the plate, and circumferentially of said cylinder with the twofold function of either permitting circumferential adjustment of said plate or drawing said plate firmly, upon said cylinder.

The construction and arrangement of each of the clamping mechanisms is like that of the other, so that a description of but one of said mechanisms is necessary.

To insure the desired firm gripping of the edge of the plate, I employ a lower clamp plate c having an inclined gripping area c' , and a straight shoulder c^2 adjacent the top of said incline. Pivotaly mounted upon the plate c is an upper clamp plate d having a gripping edge d' projecting toward and adapted to clamp the

plate b adjacent the edge thereof against the gripping area c' . The plate c is provided with a bearing groove c^3 adjacent the rear edge thereof, which groove is adapted to receive a bearing tongue d^2 upon the plate d . Passing through the plate d and engaging screw threads in the plate c , is a plurality of screw bolts e , the heads of which project into engagement with the plate d . The openings through said plate d are sufficiently large, however, to permit the desired pivotal movement of said plate in developing the desired clamping action.

The plate d is also provided with a plurality of notches d^3 in the forward edge thereof serving as sight gages to facilitate accuracy in the positioning of the edge of the plate in relation to the shoulder c^2 . Said notches d^3 are spaced apart sufficiently to expose widely divergent portions of the plate adjacent the edge thereof. The screw bolts e are positioned intermediate the tongue and groove d^2 , c^3 , and the forward edge of the clamp bar, thus permitting the development of the desired pressure upon the plate b between the gripping edge d' and the gripping area c' .

The plates c and d are so mounted in relation to the cylinder as to be capable of either or both a rocking movement about a variable fulcrum, and a lineal movement parallel with the axis of the cylinder or axially thereof, these adjustments being entirely independent one of the other. Passing through openings in the plate d and cooperating with screw threads in the plate c , are two sets of pivot screws f and g , one set being positioned adjacent the rear edge of said plates, and the other set being positioned adjacent the forward edge thereof. The screws of each set bear upon the shoulder a' or a^2 , without being connected therewith. The lower end of the screws g and both ends of the screws f are rounded as shown. The tops of said screws f bear against a shoulder formed by a block h secured to the cylinder a . By this construction either set of screws may be used to impart slight oscillatory movement to the plates c and d , the rear edges of said plates being held against displacement by the screws f when the screws g are actuated, said screws, however, being capable of a tilting action between the bearings at the opposite ends thereof, to permit the desired oscillatory movement of said plates under the control of said screws g . This movement may be in either direction.

If the screws f , however, be actuated, the plate will move about the rounded ends of the screws g as a fulcrum, the resistance of the plate b at all times serving to hold said screws in engagement with the shoulder upon which they bear.

By employing a plurality of screws f and

g in each set, the desired rigidity in the support for the clamp bars *c* and *d*, is secured, and at the same time the opposite ends of either clamp may be adjusted independent
 5 of the other and to a variable extent, or in opposite directions to correct or secure a slight skewing of the plate.

Movement of the plates *c* and *d*, outwardly of the cylinder or substantially radially thereof, is prevented by means of retainer plates *i* secured to the cylinder and passing through openings *c*⁵ in the plate *c*. The plate *d* is recessed adjacent the openings *c*⁵ as shown at *d*⁴ to afford the proper
 15 clearance for said retainer plates *i*. The dimensions of the openings *c*⁵ and the recesses *d*⁴ are sufficiently greater than those of the plates *i*, to permit adjustment of the clamp plates *c* and *d* axially of the cylinder, and
 20 freedom of oscillatory movements. The rear wall of each of the openings *c*⁵ is rounded as shown, to afford a proper bearing between said plates *c* and *i*.

The screws *g* are each provided with a
 25 lock nut *g*⁷ to minimize likelihood of loss of adjustment of said screws as a result of vibrations.

Carried by the end plates *a*³ and *a*⁴ of the cylinder *a* are screw studs *j* and *k*, having
 30 mounted thereon respectively nuts *j*⁷ and *k*⁷ adapted to bear against opposite ends of the clamp plates *c* and *d* for the purpose of defining the position of said plates with relation to the cylinder, or shifting them laterally thereof for correcting or securing
 35 register of the plate.

The shoulders *a*¹ and *a*² are each provided with a thrust member, against which the screws *g* bear, this member being adapted
 40 to have movement away from the said shoulder and the clamp plates in a manner to relieve the tensioning stresses applied to the plate for the purpose of facilitating the adjustment thereof. In the form of the invention shown, I employ a bar *m* extending
 45 laterally of the cylinder and positioned in a slot in the shoulder *a*¹ or *a*², the end plates of the cylinder having mounted therein beneath, and in operative relation to, said
 50 bar, an eccentric rod *n* provided with a square end *n*⁷ or other means by which the rod may be turned.

The clamping mechanism above described is duplicated on opposite sides of the plate
 55 cylinder, the two clamping mechanisms being oppositely acting or opposed to each other in their functioning.

The construction of the cylinder *a*, as to the arrangement of the backing surface for the plate, and the recessed portions for the clamps, is old and well known in this art, no claim of invention being made thereto.

The operation of the herein described mechanism is substantially as follows:—

65 One pair of clamp plates *c* and *d* is mount-

ed in each of the recesses upon the opposite sides of the cylinder *a* adjacent the shoulders *a*¹ and *a*² respectively, said plates being held in this position by means of the
 70 retainer plates *i*, a plurality of which are employed at different points in the length of said clamp plates. The set of pivot screws *g* carried by the plate *c* of each pair holds the edge of said clamp plates, adjacent the gripping areas thereof, away from
 75 said shoulder, while the pivot screws *f* hold the opposite edge of said clamp plates away from the shoulder, the screws *f* and *g* of each set being disposed at different points of the length of said plates. The nuts *j*⁷
 80 and *k*⁷ merely bear against the ends of the clamp plates, said plates not being pivotally, or otherwise connected, thereto.

During the makeready of the press, the screw bolts *e* carried by each pair of clamp
 85 plates, are loosened, thus permitting the free separation of the plates *c* and *d* adjacent the gripping areas thereon. One edge of the printing plate *b* is then inserted between the members *c* and *d* of one pair of
 90 clamp plates, with the edge thereof bearing against the shoulder *c*¹, so as to secure approximate accuracy in the alinement of the plate. The accurate positioning of this edge of the plate is facilitated by the presence of
 95 the sight openings *d*³ in the plate *d*. When this edge of the plate has been thus positioned, the screw bolts *e* are tightened, thus forcing the gripping edge *d*¹ in a slight arc
 100 downwardly, and toward the inclined gripping area *c*¹, and causing said gripping edge *d*¹ to take a firm bite upon the portion of the printing plate *b* between it and said surface *c*¹. The tongue and groove *d*², *c*³,
 105 afford a fulcrum point about which the plate *d* turns when closing the clamp, thus insuring the desired firm bite. The fact that the pivot screws *f* and *g* are not connected in any way with the plate *d* permits
 110 this clamping action.

When one edge of the printing plate *b* has been thus secured between one pair *c*—*d* of clamp plates, this plate *b* is brought about the cylinder, and the other edge thereof is
 115 similarly secured between the clamp plates *c* and *d* upon the other side of the cylinder.

In mounting the plate upon the cylinder, it is desirable to avoid the tightening of the plate during this operation. To secure the desired positioning of the clamp plates, and
 120 to permit the mounting of the plate *b* without necessity for tightening it at the same time, movement of either or both pairs of clamp plates circumferentially of the cylinder is permitted, this movement being secured
 125 either by the actuation of the pivot screw *f* or *g*, or the rotation of the rod *n* in a manner to permit the bar *m* to recede slightly within the shoulder *a*¹ or *a*².

When the printing plate *b* has thus been 130

more or less accurately positioned in relation to the oppositely disposed pairs of clamp plates, the rods n are turned so as to force the bars m toward said clamp plates, thus tightening the plate b upon the cylinder. If it be found that the movement of said bars is in excess of that required to properly tighten the plate, the screws g upon either or both clamp bars c are withdrawn slightly until the rod n is permitted to turn freely with the development of the desired stresses upon the plate b . If, to the contrary, the actuation of the rods n or either of them, will not draw the plate b sufficiently tight upon the cylinder, the screw bolts g carried by either or both clamp plates c are actuated to force the edge of the plates c and d adjacent the gripping area c' and the edge d' , away from the shoulder a' or a^2 until the plate has been properly tightened.

When the plate b has been mounted upon the cylinder, the usual tests for register are made, and if the plate be found at all out of register, the clamp plates c and d of each pair may be moved by means of the screws f , or g and the nuts j' and k' in a manner to secure even the most minute adjustment of the plate in any direction, to bring the plate into the proper register.

If the plate in its entirety be found to be slightly out of register laterally of the cylinder, this may be corrected by turning one of the nuts j' or k' to provide clearance at one side of the clamp plate and then by turning the other nut k' or j' in a manner to force the clamp plates laterally of the cylinder to the desired extent. It is ordinarily desirable to minimize friction between the plate b and the cylinder a by relieving the stresses upon said plate b by actuating the rod n so as to permit the bar m to drop within the shoulder. During lateral adjustment of the plate b , actuation of the pivot screws f and g is unnecessary, so that when correcting a loss of register laterally of the cylinder, there is no likelihood of loss of adjustment for circumferential register.

When lateral register of the plate is correct, but the plate is out of register circumferentially of the cylinder, the pivot screws g carried by the plate c upon one side of the cylinder, are withdrawn slightly, permitting the plates c and d to turn upon the pivot screws f to create what may be termed "slack" in the plate b , so that by the subsequent actuation of the pivot screws g carried by plate c , of the other pair of clamp plates, the plate b in its entirety may be shifted circumferentially of the cylinder to the required extent to secure register. Ordinarily the actuation of the rods n is unnecessary during this operation, since the loosening of one set of screws g will relieve

the stresses upon the plate b to an extent to permit it to slide freely in relation to the cylinder. If, however, the adjustment be very slight, said rods may be used to loosen the plate with relation to the cylinder.

When turning the screws g for shifting the plate circumferentially of the cylinder, the clamp plates c and d actuated by said screws, turn about the pivot screws f .

When the screws g are actuated, whether with the object of tightening the plate upon the cylinder, or shifting it circumferentially thereof, the movement of the clamp plates c and d of each pair, is a pivotal movement about the pivot screws f , the opposite ends of these screws having movement in relation to the shoulders a' or a^2 , and the bearing blocks h , in a manner to permit this movement. Hence, with the actuation of the pivot screws g the clamp plates c and d move in their entirety and to the same extent, a plurality of such screws being used in each set to secure the desired rigidity throughout the entire length of the clamp plates.

It is sometimes found, however, that while the lateral and circumferential register of the plate b is correct, this plate is slightly skewed either by reason of inaccuracy in mounting the plate b in the clamp or in placing the design upon the plate. To correct this condition, the pivot screws f carried by the plate c of one pair of plates, are, adjacent one end of said plates, withdrawn slightly, the pivot screws g at the same side of the plate being also withdrawn, so as to tilt the clamp plates slightly laterally of the machine. The pivot screws f and g at the same end of the other pair of clamp plates are then turned to force the last named pair of clamp plates, away from the adjacent shoulder a' or a^2 , and thus impart a slight skewing action to the entire plate b . By actuating the screws f and g toward the opposite ends of each pair of clamp plates to a differential extent, or in opposite directions, the plate may be moved to any desired extent to correct loss of register due to the skewing of the plate.

The stresses applied to the plate or sheet b are transmitted through the clamp bar c to the retainer plates i , the slots c^5 in said clamp plate c permitting the desired freedom of movement of the clamp plates either in mounting the plate b upon the cylinder or in adjusting the register in relation thereto.

By the construction herein described, absolutely parallel movement of the plate in tightening it upon the cylinder, may be secured since said clamp plates c and d in tightening the plate b , have an oscillatory movement about fixed pivotal points, afforded by the screws f . When adjusting the plate circumferentially of the cylinder,

the withdrawal of the screws *g* carried by one clamp plate *c* and the driving of the screws *g* carried by the other clamp plate *c*, toward the shoulder *a'* or *a''* against which they bear, also insures an absolute parallel movement of the plate *b* during this circumferential adjustment. The lateral or axial adjustment for register does not affect any other adjustments and results in a true parallel movement.

By a movement of the plate *b* circumferentially of the cylinder *a* and a movement axially of said cylinder, practically universal adjustment is secured unless the plate is askew, to correct which condition the clamp plates upon opposite sides of the cylinder may be tilted laterally thereof without disturbing other adjustments of the plate; and this tilting action may be graduated so as to vary laterally the fulcrum about which the clamp plates move.

By using pivot screws *f—g* and screw studs *j—k* of fine pitch, micrometrical adjustments for register may be secured, and I have found it possible to secure absolute register in multicolor work by means of the mechanism herein described.

In mounting a plate upon the cylinder, accurate register may be approximated, so that the quantity of movement required to correct slight absence of register, is very small.

While a plate registering mechanism made in accordance with my invention is particularly adapted for use in printing machines for multicolor work, employing a plurality of printing couples, nevertheless it may be advantageously used in printing machines employing only a single couple.

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

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

1. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a clamping mechanism movably mounted adjacent each of said bearing surfaces, embodying therein two co-acting clamp plates extending from adjacent one end of said bearing surface to adjacent the other end thereof, and means for closing said plates upon the edges of the printing plate, means retaining said clamping mechanisms in relation to said cylinder while permitting oscillatory or rectilinear movement thereof with relation to said surfaces and means whereby said clamping mechanisms may be adjusted pivotally of, or

toward and from said bearing surfaces, to vary the position of the plate upon the cylinder.

2. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, clamping mechanisms pivotally supported from said bearing surfaces respectively, means retaining said clamping mechanisms in relation to said cylinder and means carried by said clamping mechanism and coöperating with said bearing surfaces whereby said clamping mechanisms may be oscillated about their point of pivotal support to shift the plate circumferentially of the cylinder or to tighten said plate upon the cylinder.

3. A plate registering mechanism for printing machines embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a clamping mechanism adjacent each of said bearing surfaces, means preventing movement of said clamping mechanisms respectively radially of said cylinder while permitting movement thereof circumferentially and laterally of said cylinder, a plurality of adjustable pivots carried by each of said clamping mechanisms, whereby movement may be imparted to said clamping mechanisms respectively with relation to the adjacent bearing surface, and adjustable means acting upon the opposite ends of said clamping mechanism respectively, whereby said mechanisms may be adjusted laterally of the cylinder.

4. A plate registering mechanism for printing machines embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a clamping mechanism adjacent each of said bearing surfaces, means preventing movement of said clamping mechanisms respectively radially of said cylinder while permitting movement thereof circumferentially and laterally of said cylinder, a plurality of pivots carried by each of said clamping mechanisms, whereby said clamping mechanisms may have oscillatory and lateral movement with relation to the cylinder, a plurality of adjustable means coöperating with the bearing surface adjacent each clamping mechanism carried by said clamping mechanism, whereby said mechanisms may be oscillated about said pivots to shift the plate circumferentially of said cylinder, to tighten said plates upon the cylinder, and adjustable means acting upon the opposite ends of said clamping mechanisms respectively, whereby said mechanisms may be adjusted laterally of the cylinder.

5. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented

bearing surfaces at different points of the periphery thereof, clamping mechanisms supported from, and movable with relation to said bearing surfaces respectively comprising clamp plates extending from adjacent one end of said bearing surface to adjacent the other end thereof, and means for closing said plates upon the edges of the printing plate, means retaining said clamping mechanisms in relation to said cylinder, and means carried by said clamping mechanisms adjacent the opposite ends thereof, and co-acting with said bearing surfaces whereby the opposite ends of said clamping mechanisms may be moved independently of the other end thereof to skew the plate upon the cylinder.

6. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, clamping mechanisms pivotally supported from said bearing surfaces respectively, means retaining said clamping mechanisms in relation to said cylinder, means carried by said clamping mechanisms respectively, and co-acting with said bearing surfaces whereby said clamping mechanisms may be oscillated about their point of pivotal support to shift the plate circumferentially of the cylinder or to tighten said plate upon the cylinder, means for shifting said clamping mechanisms laterally of the cylinder, whereby the plate may be shifted laterally of the cylinder; and differentially operative means adjacent the opposite ends of said clamping mechanisms respectively whereby either end of said clamping mechanisms may be moved toward or from said bearing surfaces independently of the other end thereof, to skew the plate upon the cylinder.

7. A plate registering mechanism for printing machines embodying therein a clamping mechanism consisting of a lower clamp plate having an inclined gripping area along the outer edge thereof, a straight shoulder adjacent said edge, and a bearing groove adjacent the rear edge thereof, a second clamp plate having a bearing tongue thereon adapted to enter said groove and permit oscillatory movement of said last named plate with relation to said first named plate, and clamp screws passing through an enlarged opening in said last named plate and engaging screw threads in said first named plate, said screws being positioned between said groove and tongue and the gripping area of said first named plate, said last named plate having a gripping edge projecting toward, and adapted to clamp a plate against the gripping area upon said first named plate.

8. A plate registering mechanism for printing machines embodying therein a

plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a clamping mechanism adjacent each of said bearing surfaces, means preventing movement of said clamping mechanism respectively radially of said cylinder while permitting movement thereof circumferentially and laterally of said cylinder, a plurality of adjustable pivots carried by each of said clamping mechanisms, whereby said clamping mechanisms may have oscillatory and lateral movement with relation to the cylinder, a plurality of adjustable means coöperating with the bearing surface adjacent each clamping mechanism carried by said clamping mechanism, whereby said mechanisms may be oscillated about said pivots to shift the plate circumferentially of said cylinder, to tighten said plate upon the cylinder, and adjustable means acting upon the opposite ends of said clamping mechanisms respectively, whereby said mechanisms may be adjusted laterally of the cylinder.

9. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, pivotally supported clamping mechanisms mounted adjacent said bearing surfaces respectively, said clamping mechanisms having means adapted to engage the edge of the printing plate, means retaining said clamping mechanisms in relation to said cylinder, a plurality of adjustable pivot screws adjacent the edge of said clamping mechanisms engaging the edge of the plate, whereby said clamping mechanisms may be oscillated about their point of pivotal support to shift the plate circumferentially of the cylinder or to tighten said plate upon the cylinder, and laterally adjustable members mounted adjacent the opposite ends of the cylinder and bearing upon opposite ends of said clamping mechanisms respectively, whereby the printing plate may be shifted laterally of the cylinder.

10. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, clamping mechanisms mounted adjacent said bearing surfaces respectively, means retaining said clamping mechanisms in relation to said cylinder, screw studs carried by said cylinder adjacent the opposite ends of each of said clamping mechanisms, and nuts adjustably mounted upon said studs and adapted to engage said clamping mechanisms, whereby said clamping mechanisms may be shifted laterally of said cylinder to vary the position of the plate upon the cylinder laterally thereof.

11. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a clamping mechanism movably mounted adjacent each of said bearing surfaces, means retaining said clamping mechanisms in relation to said cylinder, and two sets of pivot screws adjustably mounted in each of said clamping mechanisms, one set being mounted adjacent one edge thereof and the other set about the other edge thereof, whereby said clamping mechanisms may be adjusted relatively to said bearing surfaces to vary the position of the plate circumferentially of the cylinder or to skew the plate upon the cylinder.

12. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a plurality of retainer plates adjacent each of said surfaces, a clamping mechanism, one of the plates of which has a plurality of slots therein through which said retainer plates pass, and means whereby said clamping mechanisms may be adjusted relatively to said bearing surfaces and said retainer plates to vary the position of the plate upon the cylinder.

13. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a clamping mechanism movably mounted adjacent each of said bearing surfaces, means retaining said clamping mechanisms in relation to said cylinder, means whereby said clamping mechanisms may be adjusted relatively to said bearing surfaces to vary the position of the plate upon the cylinder, a thrust member cooperating with said last named means, and means whereby said thrust member may be actuated to move said clamping mechanism through said last named means, to control the stresses upon the plate.

14. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, a thrust bar mounted in said cylinder and projecting through said bearing surfaces respectively, pivotally supported clamping mechanisms mounted adjacent said bearing surfaces respectively, means retaining said clamping mechanisms in relation to said cylinder, a plurality of adjustable screws carried by said clamping mechanisms respectively, and bearing upon said thrust bars, and means whereby said thrust bars may be advanced toward said clamping mechanisms or withdrawn within said bearing surfaces to control the stresses upon the printing plate.

15. A plate registering mechanism for printing machines, embodying therein a plate cylinder having oppositely presented bearing surfaces at different points of the periphery thereof, thrust bars mounted in said cylinder and projecting through said bearing surfaces respectively, a plurality of retainer plates adjacent each of said surfaces, clamping mechanisms, one of the plates of each of which has a plurality of slots therein through which said retainer plates respectively pass, a set of pivot screws adjustably mounted in each of said clamping mechanisms adjacent said retainer plates, a set of pivot screws adjustably mounted in said clamping mechanisms respectively and bearing upon said thrust bars, and means whereby said thrust bars may be advanced toward said clamping mechanisms or withdrawn within said bearing surfaces to control the stresses upon the printing plate.

In witness whereof I have hereunto affixed my signature this 2nd day of May, 1918, in the presence of two subscribing witnesses.

FRANK C. MARQUARDT.

Witnesses:

A. C. CARY,
EDWIN L. TARIS.