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LITHOGRAPHER'S PLATE HOLDING MECHANISM.

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1,286,684. Patented Dec. 3, 1918.

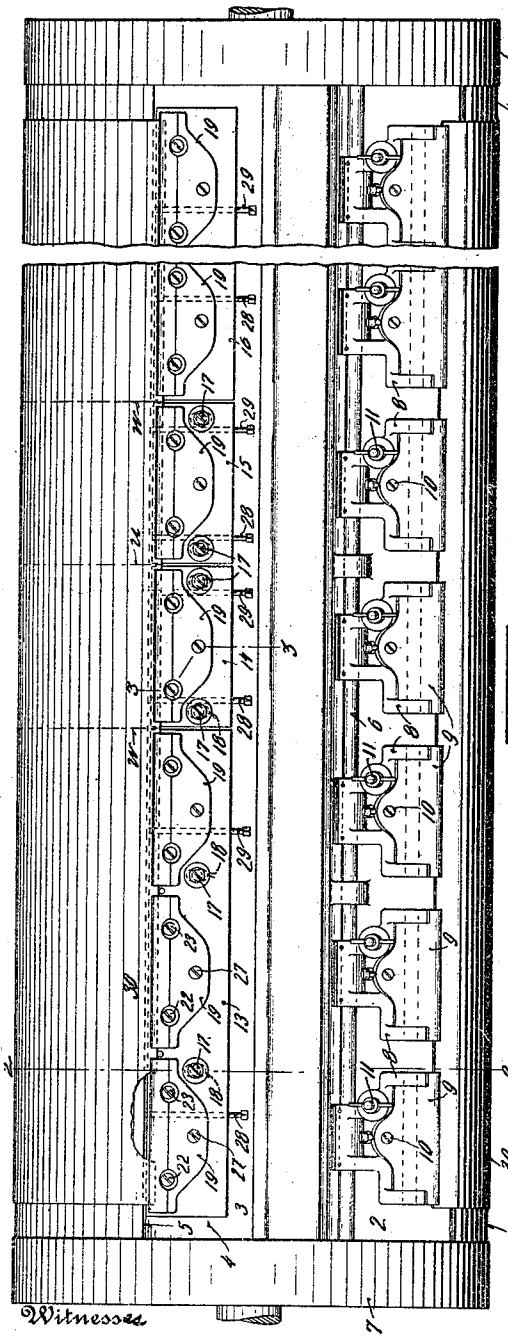

Fig. 1.

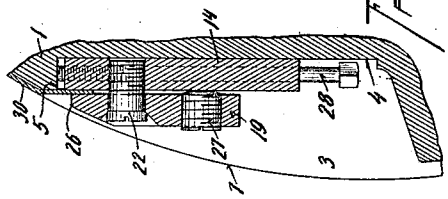

Fig. 3.

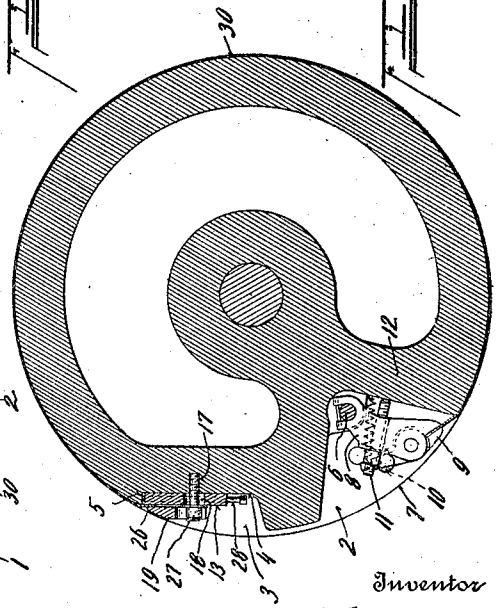

Fig. 2.

Witnesses

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UNITED STATES PATENT OFFICE.

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LITHOGRAPHER'S PLATE-HOLDING MECHANISM.

1,286,684. Specification of Letters Patent. Patented Dec. 3, 1918.

Application filed December 13, 1916. Serial No. 136,702.

To all whom it may concern:

Be it known that I, JAMES D. McCRACKEN, a citizen of the United States, and residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Improvement in Lithographers' Plate-Holding Mechanism, of which the following specification is a full disclosure.

My invention relates to an improvement in mechanism for holding a lithographing plate upon the support of a printing press, such as a cylinder or flat bed.

The invention is illustrated in its preferred form as applied to the cylinder of a lithographic press of the offset type, and it is shown in this usage because the problem of holding and adjusting a thin shell or lithograper's plate upon a curved surface presents difficult mechanical conditions not incident to flat beds, although the invention constitutes a useful improvement in this relation also.

The object of the invention will be best understood by brief mention of the particular lithographic problem involved.

In lithography work, such as two or more color printing, or say, in the work of printing playing cards, it is necessary that the successive prints from a given plate register accurately with one another.

In color work the prints have to run through the press as many times as there are colors, and, therefore, successive registration is essential. So, also, in making playing cards, the spots and pictures constituting the face of the card have to always be in the same relationship to one another so as to register accurately and invariably with the printing of the backs of the cards.

In very delicate work of this sort slight irregularity may be serious in practice. Owing to the flexibility of paper, and possibly, also, because of its liability to shrink, it happens that in the work of running the paper through the presses, the paper will stretch more in some instances than it will in others, or that a given piece of paper will stretch more along one edge in a direction circumferential of the cylinder than on the other edge.

It is the object of my invention to provide a holding mechanism for the edge of a plate which will securely hold the plate down upon the curved cylinder surface, but in which a portion of the clamping edge may be adjusted circumferentially in relation to another clamped portion of the edge of the printing plate which is held stationary.

In other words, if, say, on a given job the left hand edge of a print is flexed say one-sixteenth of an inch in a direction circumferential of the cylinder more than the right hand edge, this can be corrected by adjusting the appropriate plate holding devices to draw the right hand edge of the plate the needed one-sixteenth of an inch over the cylinder to compensate for the dimension of paper stretching at the left hand edge of the printing plate.

Preferably the printing surface is divided into separably adjustable circumferential plate sections, enabling a realinement to be made through the adjusting mechanism to correct nonregistration.

The features of the invention will be more fully set forth in the description of the accompanying drawings, forming a part of this specification, in which:—

Figure 1 is a plan view of a cylinder showing the holding mechanism.

Fig. 2 is a section on line 2—2, Fig. 1.

Fig. 3 is an enlarged detail vertical sectional view through one of the adjustable plate-holders on line 3—3, Fig. 1.

The form of cylinder 1, shown, is conventional. A portion of the cylinder is broken away to form the recess 2 for the fixed clamping mechanism, and another portion broken away to form the recess 3 for the adjustable plate holding mechanism, positioning the plate-holding devices at opposite ends of and below the support surface for the printing plate.

The recess portion 3 is formed with a flat or seat surface 4, enabling the adjustment of the plate-holder in a straight line, and the recess end nearest the cylinder surface is formed to constitute a shoulder or abutment 5 extending clear across the cylinder in a direction parallel to the axis.

In the recess 2 is a pivot or fulcrum rod 6 secured between the cylinder heads 7 and fulcrumed upon this rod are a series of yoke arms 8 having clamping jaws 9 formed at their outer ends, which jaws are opened and closed by a screw clamp 10, and these yoke arms are strained by means of adjusting bolts 11, the ends of which bear against the radial web 12, which defines one wall of the recess 2.

The adjustable plate holding members are positioned in the recess 3 and seated upon the flat surface 4 so as to be slidable thereon. These adjustable plate-holders comprise a series of transversely elongated base members 13, 14, 15, 16, seated on the slide-way 4 and secured thereto by bolts 17, there being two such bolts for each of said base members. The base members are formed with slightly enlarged apertures 18 for said bolts 17, enabling the bases to be moved on the seat to or from shoulder 5, or angularly thereto, the bases extending preferably nearly the full length of the seat and being narrower in width than the seat.

These base members constitute the bottom or lower jaw members for adjustably holding the plate. Upon each of said base members 13, 14, 15, 16, are one or more top clamp members or upper jaws 19. Each top member is secured upon its base by bolts 22, 23, passing through slightly enlarged apertures in the top members and screwing into the base members. These two bolts are alined enabling the top members to rock on this alinement as a fulcrum line so that the front edge 26 of one of these top members can be clamped downwardly upon the base members to tightly grasp one edge of the printing plate and this clamp is effected by the bolt 27 which passes through a rear portion of the top member, its inner end downwardly abutting a surface of the lower base for exerting a clamping or gripping strain on a plate edge, and securing it firmly upon the base.

The bases are adjusted on the seat 4 by means of bolts 28, 29, which extend through the bases and abut against the shoulder 5, after which they are clamped in an adjusted position on the seat by bolts 17.

One edge of the plate 30 is clamped between the jaws 9 and the bolts 11 are tightened up to properly set and hold this end of the plate in relation to the cylinder.

While the invention may be utilized in relation to a single plate extending substantially across the cylinder from end to end, I have found that it is particularly useful in relation to a unitary plate which is divided up, as indicated by lines *w*, *w*, *u*, so as to constitute separable circumferential sections of what may be regarded as a unitary plate or printing surface.

The other end of the plate is held between base members 13, 14, 15, 16, and the top members 19, and normally, or in starting, the bolts 28, 29, are tightened up to stretch the plate uniformly around the cylinder, and it will be assumed that in this normal, or initial position, these bases are all substantially alined on the seat 4.

As prints are run off from the cylinder they are from time to time matched with a test print and notations taken to detect any defective registration due to paper flexation, to correct which the plate holding bases have to be properly reset.

One of these bases may be drawn in relation to the other, that is, drawn out of the initial alinement, depending upon where the correction is to be made, or a correction can be made by adjusting one end of a given base in relation to its other end, as by relaxing the bolts 17, and adjusting one or the other of the bolts 28, 29, whereby that end of the jaw corresponding to the bolt adjusted moves in the arc of a circle in relation to the other end of the jaw, which is relatively fixed, that is to say, the non-adjusted bolt 28 or 29 serves as the center of this adjusting movement.

Of course to effect this adjustment, the grip on the other end of the plate, in recess 2 should be slightly relaxed at the proper place, until the base members in recess 3 are repositioned, and then the members in recess 2 are again tightened up. That is to say, the grip is relaxed of those jaws in recess 2 corresponding to the positions of the plate or plate section, which is to be readjusted through the appropriate plate holding members in recess 3.

When, as in the preferred form, the plate is separable, or divided in circumferential lines, one of these sections of the printing plate, say the medial section, can be circumferentially adjusted in relation to the fixed section of the plate, say the end sections, or vice versa.

It will be readily seen that this mechanism provides very delicate and yet very precise means for making circumferential adjustments of one portion of a printing plate in relation to another in the direction endwise of the cylinder, and at the same time that the plate is securely held upon the supporting surface. Ordinarily such a printing plate is a thin metallic shell, and to adjust one portion thereof in relation to another, the clamping or adjusting strains must be in right lines and not in directions liable to buckle or bend the plate.

This characteristic will be understood for instance from the fact that all of these adjustments take place on the flat or plane seat surface 4, and that it is all accomplished through movements of these bases 13, 14, 15, 16, on this flat seat, the movements being either a bodily movement in or out of one of the entire base, or a slight swiveling of one of these elongated bases on seat 4.

The flat seat 4 extends in a line transverse to the cylinder axis, and so provides a lineal adjustment for one set of clamps, transverse to the cylinder axis. The angular or pivotal adjustment of the clamp on this flat seat are upon axes perpendicular to the seat, so that a very flexible adjustment is

provided for correcting all kinds of irregularity in the printing surface, and for truing the plate on the cylinder surface.

I claim:—

1. In a device of the class described, a printing plate support, means at one end of the support and below the supporting surface for gripping the plate and holding it down on the support, a plurality of bases at the other end of the supporting surface independently adjustable lineally and pivotally in relation to the support, and means for clamping the edge of the plate upon said bases.

2. In a device of the class described, a printing plate support, means at one end of the support for holding the edge of the plate upon said support, a flat seat at the other end of the support extending transversely of the support and below the level of the support surface, a series of bases on said seat extending transversely to the support, and independently adjustable lineally and pivotally on the seat, means for clamping the bases upon the seat in adjusted position, and means for clamping a plate edge upon said bases.

3. In a device of the class described, a printing plate support, a seat formed at one end of the support below the supporting surface, said seat extending transversely to the axis of the cylinder, a series of bases on the seat independently movable bodily or angularly upon the seat, means for clamping the bases independently on the seat in adjusted position and means on each base for securing a plate edge thereto.

4. In a device of the class described, a cylindrical support surface for a printing plate, a printing plate separable circumferentially, means for clamping a plate edge at one end of the support, a seat surface at the other end of and depressed relative to said support, plate section holding members independently adjustable lineally and angularly on said seat surface, and means for securing each of said members in adjusted position in relation to the end of the support.

5. In a device of the class described, a cylindrical supporting surface for a printing plate, means for gripping the plate edge at one end of the support, a flat seat and a shoulder formed at the other end of the support, a series of bases independently adjustable on said seat, screw members passing through said bases parallel with the seat and abutting the shoulder for effecting the adjustment, means for clamping each of the bases on the seat in adjusted position, and means on each base for gripping a plate edge.

6. In a device of the class described, a printing plate support, means carried by said support for securing one edge of a printing plate and an adjustable device carried by said support for clamping the opposite edge of said plate, said device being adjustable in a linear direction and in circular directions about an axis perpendicular to the plane of linear adjustment.

7. In a device of the class described, a printing plate support, means carried by said support for securing one edge of a printing plate, a flat seat on said support, a series of clamping devices mounted upon said seat in surface engagement therewith, said clamping devices being independently adjustable on said seat in linear directions and in circular directions in planes parallel with said seat and means for adjusting said clamping devices.

8. A printing cylinder having a first peripheral depression, plate chains secured thereon, and a second peripheral depression providing a flat seat extending as a section of a chord in relation to the cylinder, and a shoulder perpendicular to said seat, plate chains adjustable lineally on said seat and also angularly adjustable on said seat.

9. A printing cylinder having a first peripheral depression, plate-holders thereon, said cylinder being formed with another peripheral depression providing a flat seat extending endwise of the cylinder and transversely to the cylinder axis, and having an abutment shoulder, plate grippers adjustable lineally and angularly on said seat, and adjustment and clamp members for said gripper to engage said seat and abutment shoulders.

In witness whereof I hereunto subscribe my name as attested by the two subscribing witnesses.

JAMES D. McCRACKEN.

Witnesses:

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