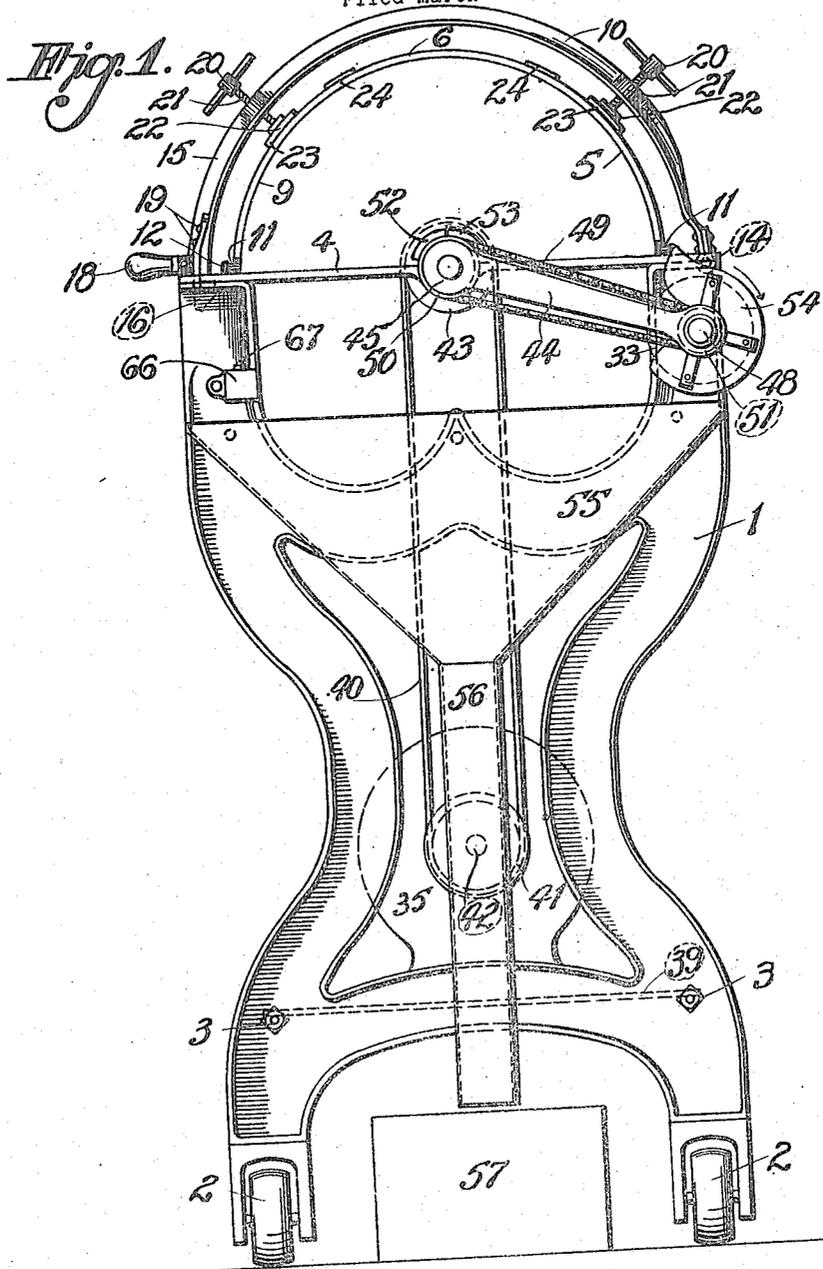


Nov. 18, 1924.

1,515,726

W. H. BURKLIN
CURVED PLATE TRIMMER
Filed March 26, 1923

2 Sheets-Sheet 1



Inventor:
WILLIAM H. BURKLIN.

Per *Hydon & Hydon Attys*

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2 Sheets-Sheet 2

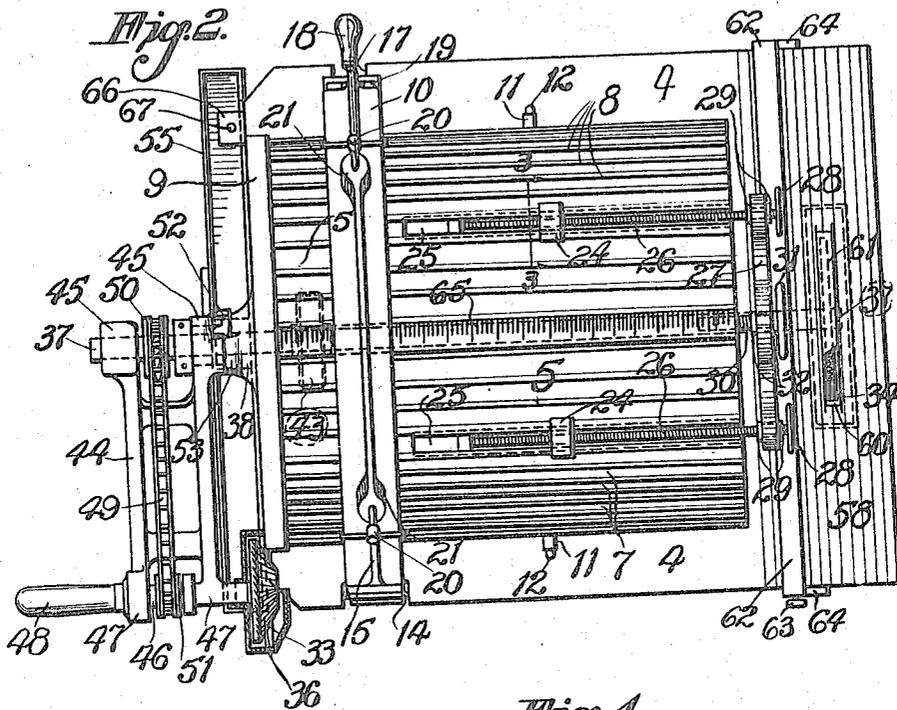


Fig. 3.

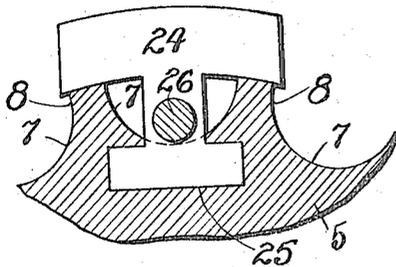


Fig. 4.

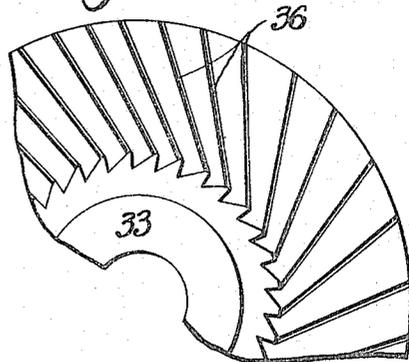
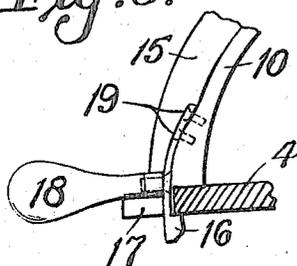


Fig. 5.



Inventor:
WILLIAM H. BURKLIN.

By Higdon & Higdon Attys

UNITED STATES PATENT OFFICE.

WILLIAM H. BURKLIN, OF ST. LOUIS, MISSOURI.

CURVED-PLATE TRIMMER.

Application filed March 26, 1923. Serial No. 627,614.

To all whom it may concern:

Be it known that I, WILLIAM H. BURKLIN, a citizen of the United States, residing at St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Curved-Plate Trimmers, of which the following is a specification containing a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention consists in the novel construction and combination of parts herein-after particularly described and distinctly claimed.

The object of my invention is to provide an improved machine for trimming the edges or ends of curved stereotype-plates, electrotype-plates, and other printing-plates, more quickly, more efficiently, and at greatly decreased cost, in making them ready for the press.

In the drawings,

Fig. 1 is an elevation of the cutter-end of a curved-plate trimming-machine embodying my invention.

Fig. 2 is a top plan-view of the same, with parts in section.

Fig. 3 is an enlarged detail section of a fragment of the plate-block, the section being taken on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged detail elevation of the cutting-face of the beveled rotary-cutter, detached from its arbor; but shown in fragmentary form, and

Fig. 5 is a detail view of the plate-band lock.

The numeral 1 designates the vertical end-frames or supporting-legs of the machine, having (in the present illustration) graceful and ornamental curved parts, although they would operate as supports if perfectly plain and angular in form.

The said end-frames 1 are provided with castors or rollers 2, to facilitate movement of the machine from place to place, as convenience may require.

The lower portions of said vertical end-frames 1 are spaced apart by common horizontal tie-rods 3, and a horizontal table 4 surmounts the upper ends of said end-frames, and holds the same at a proper distance apart. Said end-frames 1, and said table or top 4, are preferably made of cast-iron or other metal, although of course they may be made of hard wood or any other suitable material.

A semicylindrical plate-block or curved

base-plate 5 is mounted upon and fixed to the top of the frame, preferably as shown in Fig. 1, where it appears above the said top 4.

Said curved plate-block 5 is preferably made of cast iron or cast-steel, in the form of a shell, so that it will be comparatively light, and it has a length considerably greater than that of the axial length of the largest printing-plate that is to be trimmed on the machine; whereby the machine will be adapted to trim long plates, as well as short or narrow curved plates.

The curvature of the face of said plate-block 5 should be exactly the same as the curvature of the circumference of the press-cylinder (not shown) upon which the trimmed plates are to be mounted, in printing therefrom, as will be readily understood; the relative curvatures of the said plate-block and plates being shown in Fig. 1, wherein a printing-plate 6 is in place upon said block, ready to have its curved edge trimmed.

The outer face of the said plate-block 5 is preferably provided with numerous longitudinal parallel corrugations, or is fluted, for a purpose presently mentioned; said corrugations (in the present instance) being formed by alternate parallel grooves 7 and ribs 8.

However, said grooves 7 and ribs 8 do not extend the full length of the plate-block face, and they preferably terminate before the cutter-end of said block is reached, and they end there against a narrow curved smooth surface 9, upon which the curved edge of the plates to be trimmed rests, and is supported throughout the length of the edge to be trimmed; thereby affording a firmer support during the trimming operation, than if said corrugations were extended to the cutting-end of the plate-block.

The purpose of the said corrugated face of said plate-block 5, is to lessen the surface-friction (or contact surface) between the face of said block and the plate to be trimmed; so that the latter will rest only in contact with the said ribs 8, and may be moved and adjusted in any desired direction with greater ease, before it is clamped in the desired position by the plate-band 10, and thereby firmly held during the trimming operation.

Furthermore, the said grooves 7 in the face of said plate-block 5 act as receptacles to receive and temporarily hold any chips or other obstructions which might acciden-

tally get under the plate 6 and hold same in an improper position while being trimmed.

A small roller 11 is mounted on a pintle 12, projecting horizontally from the base of the said plate-block 5, at each side of the latter, to act as a temporary support for the adjacent edge of the plate 6, while the same is being adjusted toward and from the cutter-end of the plate-block, prior to locking the plate to the block by means of said plate-band 10.

In adjusting said plate 6 longitudinally of said plate-block 5, previous to locking same down of course, one edge of the plate should be lifted clear of the block by the fingers of the operator, and the opposite edge may then be readily moved on the oppositely-located roller 11 to the desired position, and then the raised edge should be dropped onto the block, and be clamped in position.

The plate-band 10 is curved in semicircular-form, and extends over the plate 6 at some distance therefrom, and is provided at one end with a suitable hinge 14, by means of which that end is pivotally-connected to the top 4 of the machine, so that the band may be swung upwardly and downwardly, away from and towards the plate to be clamped in place, to release and fasten the plate very quickly, as may be required.

Said plate-band 10 is provided with a strengthening-rib 15 for an obvious purpose.

A plate-band lock is provided at the end of said plate-band that is opposite its hinged end, and such lock comprises (in the present case) a hook or beveled-head 16, that engages and springs beneath the edge of the top 4, when said band is thrown down to a locking-position, Fig. 5, there being a recess 17 cut in the adjacent edge of said top to receive the said spring-head, and permit same to pass up and down, in locking and unlocking.

A suitable handle 18 is mounted on said spring-head's shank, the upper portion of which latter is secured to the band 10 by means of rivets 19 or other proper fastenings.

Clamping-screws 20, having a suitable cross-bar handle, or other means for turning them, are threaded through bosses 21 on the back of said plate-band 10, and have the usual pressure-jaw 22 pivotally-mounted on their inner ends, for clamping down the plate 6, and securely holding same against movement during the trimming operation.

A suitable cushion 23, of felt, leather or other soft material, is placed between the pressure-jaws 22 of said clamping-screws 20 and the plate 6, to prevent any possible damage to the latter, when said screws are tightened up.

Adjustable stops 24, against which the inner edge of the plate 6 rests in adjusting

the latter, are mounted to be moved back and forth longitudinally on the face of the said plate-block 5 by means of suitable feed-screws and other appliances now to be described in detail.

A plurality of said adjustable plate-stops 24 are made use of; there being in the present case two of them arranged to be moved either independently of each other, or simultaneously, as may be necessary or desirable, in adjusting the plate before finally clamping same in place for a cut, or in moving it for the purpose of making additional cuts or trims.

Said plate-stops 24 are T-shaped in form, and are mounted with the undersurface of their heads in contact with two adjacent plate-block ribs 8, as shown more clearly in Fig. 3, while their feet or inner flanged-ends are mounted to slide freely in longitudinal grooves, 25, formed in said plate-block 5.

Each of said plate-stops 24 has a feed-screw 26 which is threaded through the body of said stops, and extends beyond the feed-screw end of the plate-block 5, passes loosely through a bearing in a feed-screw cross-head 27, and has a hand-wheel 28 or other means by which it may be revolved, fixed upon its outer end. Fig. 2. Said feed-screws 26 are located in appropriate ones of previously-mentioned plate-block grooves 7, so that they are in a plane below the faces of said plate-block-ribs 8, and do not interfere with the free movement of the plates that are to be clamped upon said plate-block.

Common shoulders or collars 29 are fixed upon said feed-screws 26 on either side of said cross-head 27, to prevent axial movement of said screws in the latter.

Said cross-head 27 is mounted loosely at the center of its length upon a master (or main) feed-screw 30, the inner portion of which is threaded into a bearing formed in the adjacent end or head of the said plate-block 5.

Said master feed-screw 30 extends outwardly beyond the outer face of said cross-head 27, and has a hand-wheel 31 or some other appropriate form of handle fixed upon it, for revolving said screw.

Common shoulders or collars 32 are fixed upon said master feed-screw 30, on opposite sides or faces of said cross-head, to prevent axial movement of said screw in the latter, so that when said screw is revolved by means of its hand-wheel 31, the cross-head 27 will be correspondingly moved out or in, and carry both of the said plate-stop feed-screws 26 and their stops 24 simultaneously with it.

The cutting and sawing devices.

The cutting and sawing devices of the machine comprise a rotary-cutter 33 and a circular-saw 34, both driven by an electric-motor 35 preferably, although of course any

other suitable source of power may be made use of, where it is not convenient to install an electric-motor.

Said cutter 33 is, as shown more clearly in Fig. 4, provided with a beveled cutting-face having spiral cutting-teeth 36, for making the well-known draw-cut; although a common saw-tooth cutter that is beveled on one side, may be used if desired.

The reason for using a beveled-face cutter is to make a beveled-edge or end on the printing-plates, to fit the well-known beveled rings of the printing-press cylinders.

When the edge or end of a printing-plate is to be cut or trimmed with a square cut, the said circular-saw 34 is used.

A horizontal drive-shaft 37 is mounted in bearings 38, and extends longitudinally and axially beneath the said plate-block 5, and has its ends or extensions projecting a distance beyond the ends of said plate-block. Fig. 2.

The electric-motor 35 is mounted, in the present arrangement, on a suitable platform or other support 39 that extends between said frame tie-rods 3, and a suitable endless-belt 40 conveys power from said belt-pulley 41 on the motor-shaft 42 to another pulley 43 that is fixed on said drive-shaft 37. Fig. 1.

The arrangement just described makes the machine entirely self-contained and portable, and capable of being operated by merely placing the plug of the motor feed-conductors or flexible electric-cord or cable in any ordinary electric-lighting or lamp-socket. Such electric-connections being well known, are not illustrated in the drawings.

A swinging cutter-frame 44, has its inner end provided with bearings 45 which are loosely mounted upon the projecting end of said drive-shaft 37 that is adjacent the cutting-end of the machine, and a cutter-spindle or arbor 46 is mounted in bearings 47 at the outer end of said cutter-frame, so that the said cutter 33 that is secured upon said cutter-spindle by the usual means, may be swung in a curved or circular path back and forth across and in contact with the curved edge of the plate 6 to be trimmed, while the latter is clamped in position upon said plate-block 5, in the manner and by the clamping-devices previously described.

A suitable handle 48 is conveniently attached to the outer portion of the said swinging cutter-frame 44, to be grasped by the operator in manipulating the cutter-frame.

Said cutter-spindle and its cutter 33 are driven, in the present case, by means of a common silent sprocket-chain 49 or other suitable endless-belt device, which runs over a sprocket-wheel 50 on said drive-shaft 37, and engages another sprocket-wheel or pinion 51 carried by the said cutter-spindle 46.

A stop-lug 52 on the inner bearing 45 of said swinging cutter-frame 44, engages another stop-lug 53 that projects from the adjacent drive-shaft bearing 38 in the path of said first-mentioned stop-lug, and limits the swinging movement of said frame in both directions; and when the cutter-frame is at rest, ready to begin a cut, (in which position it is shown) the said contacting stop-lugs support said cutter-frame in a substantially horizontal position, and prevent same from gravitating to a vertical position, which it might otherwise assume, were said stop-lugs not provided. In other words, said stop-lugs 52 and 53 support the said cutter-frame in a most convenient position when at rest, with its handle 48 easily within reach of the operator, without his stooping to reach the same.

A common form of guard 54 is suitably mounted on said swinging cutter-frame 44, to extend over and around the parts of said cutter 33 that would otherwise be exposed to the operator's hands, to prevent accidents; and yet said guard does not obstruct the operator's clear view of the cutting portion of said cutter, or of the work, while the cutter is at work trimming a plate, and the operator can therefore see and control the depth of cut being made, at any part of the radial swinging-movement of said cutter-frame and cutter.

A chip-hopper 55 is located directly below the path of the said cutter 33, being large enough to extend completely across the machine, and catch the chips or cuttings as they fall from the trimmed plate 6; the metal of which printing-plates are composed being quite valuable, and considerable loss is effected by saving said chips.

A spout 56 extends from said chip-hopper 55 to a point above a pan or receptacle 57 that is located beneath said spout or chute, so that the chips may be removed from said pan from time to time, and remelted and used over in making plates.

A saw-table 58, having the usual and well-known parallel gauge-lines upon its upper surface, is located horizontally at the end of the machine that is opposite the cutter-end thereof, and a common circular-saw 34 is mounted on a saw-arbor or saw-clamping device that forms an extension of the said drive-shaft 37 beneath said saw-table.

Said circular-saw 34 extends upwardly through the usual slot 60 in said saw-table, and any common form of saw-guard 61 extends over the exposed teeth of said saw, to prevent accidental cutting of the operator's hands or fingers.

A saw-table gauge 62 is adjustably mounted on said saw-table 58, and is adapted to be set thereon, as required, for making a wide or narrow detachment from the straight edge or edges of the curved (or any other form

of) printing-plates, as it is sometimes desirable to do, when the radial extent of same is too great.

In the present case, a gauge set-screw 63 is threaded through one of the end-clamps 64 of said gauge 62 into contact with the end of said saw-table 58, and holds said gauge in place.

A suitable rule or gauge 65, that is graduated in inches and fractions of an inch, may be (as shown in Fig. 2) placed upon the apex of the said plate-block 5 to guide the operator in setting the plates 6 thereon, in order that the plates may be trimmed to the desired size by the cutter 33.

An electric push-button switch 66 is mounted on the cutter-end of the machine, in the path of the inner bearing 47 of the swinging cutter-frame 44, to automatically cut off the current to the said motor 35, and stop the cutter at the end of its cutting strokes; so that the said swinging-frame may be retracted to begin another cutting stroke, while the cutter is at rest.

This forms an automatic stop-switch, to prevent possible accidental damage to the plate being trimmed, in case the operator inadvertently feeds the plate forward before the cutter has been returned to its normal position, which is that in which it is shown, and where it is ready to begin a cut.

However, short-stroke cuts can be made without stopping the cutter between cuts; but the operator will have to be very careful in moving the cutter against the plate-edge in the same direction the teeth thereof are moving, else the cutter will grip the plate, and feed itself too fast, and thereby be choked and stopped or possibly damage the plate.

Said automatic stop-switch 66 is, in the present form, provided with the well-known push-button 67, which will break the motor-circuit when contacted and pushed by the said swinging cutter-frame bearing 47, and will hold said circuit open and stop said motor 35 until again pushed, when the motor will be again set in motion.

The operation.

The operation of my invention will be readily apparent to skilled workmen, without further description.

However, I may make it a little clearer by stating that the plate 6, which is to be trimmed, is placed in position upon plate-block 5 of the machine, and adjusted thereon by manipulating the feed-screws 26 and 30 by means of their hand-wheels 28 and 31, and clamped down by means of the plate-band 10.

The motor 35 is then started by pushing the switch-button 67, or by closing any other common form of switch in the motor-circuit (not shown).

Then the operator grasps the handle 48 of the swinging cutter-frame 44, and swings the said frame upwardly from the position in which it is shown, until the cutting-teeth 36 of the cutter 33 are brought into contact with the adjacent projecting curved edge or end of the clamped plate; and then the movement of said frame is continued until said cutter trims the full length (or any desired part) of said plate edge, and nears the limit of its cutting stroke at the opposite side of the machine, and has passed off of said plate, when the bearing 47 of the cutter-frame will descend upon the said push-button 67 of the switch 66, and stop the motor, and the cutter-frame will be stopped, and will rest at the limit of the stroke, by reason of said stop-lug 52 (on the inner bearing 45 of said frame) coming in contact with the other stop-lug 53 that is fixed upon the adjacent drive-shaft bearing 38.

To make another cut, the swinging cutter-frame should be returned to its normal position; then the plate 6 should be adjusted (or fed) across the said smooth supporting-surface 9 of said plate-block a sufficient distance to afford the desired cut; then the motor should be again started by pressing said switch-button 67, and the previously-described radial movement of said cutter-frame should be repeated, to bring the teeth of the cutter again into cutting contact with the projected edge of said plate, and so on, until the proper trimming of the plate has been accomplished satisfactorily.

It is sometimes desirable to feed said plate 6 more, or entirely, at one side; and in that case one or the other of the adjustable plate-stops 24 should be moved against or away from the inner edge of the plate, by turning the feed-screw hand-wheels 28 in the desired direction, the said plate being first released on one side by loosening the proper one of the plate-band clamping-screws 20, which should be again tightened when a cut is to be made.

To feed the plate 6 bodily and evenly throughout its curved edge which is to be trimmed, when a cut along the entire edge is desired to be made, it will only be necessary to turn the master feed-screw 30 by means of its hand-wheel 31, and thereby simultaneously move the feed-screw cross-head 27 and both of the plate-stops 24 a like distance, thus feeding said plate bodily toward the cutter.

When it is desired to remove some material from the straight edge or edges of the plate 6, as is necessary when the plate is too large circumferentially, the circular-saw 34 may be readily and conveniently used. The saw-table is stationary, and the work to be trimmed is moved thereon by hand in the usual manner.

I do not limit myself to the exact form of

parts shown in the drawings, as it is obvious that same may be changed by skilled mechanics, and the changes made by them, if within the scope of my invention and claims, will be merely a modification of my invention. For instance, any other form of teeth may be used upon the cutter 33, and said teeth may be spiral or slanting as herein shown, or they may be radial only; although I prefer the form of teeth shown, as such produces a smooth draw-cut, that would be impossible with teeth whose cutting-edges are in strict radial lines.

I claim:—

1. A machine for trimming the curved edges of printing-plates, comprising a suitable supporting-frame; a semi-cylindrical plate-block mounted on said frame; a drive-shaft mounted axially of said plate-block and having one of its ends extended beyond the cutting-end of said block; a radially-swinging cutter-frame having its inner end mounted loosely to rock on said extended end of said drive-shaft; a cutter mounted at the outer end of said cutter-frame, and arranged to have its teeth brought into contact with the curved edge of the plate to be trimmed, upon radially moving said cutter-frame adjacent said edge; means for adjusting and clamping said plate upon the said plate-block; means for rotating said cutter while same is being moved in contact with the curved edge of the plate to be trimmed, a circular-saw mounted on the end of said drive-shaft which is opposite that on which said radially-swinging cutter-frame is mounted; and a saw-table for said circular-saw.

2. A machine for trimming the curved edges of printing-plates, comprising a suitable supporting-frame; a semi-cylindrical plate-block mounted on said frame; a drive-shaft mounted axially of said plate-block and having one of its ends extended beyond the cutting-end of said block; a radially-swinging cutter-frame having its inner end mounted loosely to rock on said extended end of said drive-shaft; a cutter mounted at the outer end of said cutter-frame, and arranged to have its teeth brought into contact with the curved edge of the plate to be trimmed, upon radially moving said cutter-frame adjacent said edge; means for adjusting and clamping said plate upon the said plate-block; means for rotating said cutter while same is being moved in contact with the curved edge of the plate to be trimmed, said semi-cylindrical plate-block being constructed with alternate longitudinal ribs and grooves upon its outer face, abutting a smooth supporting-surface located at the cutter-end of said plate-block.

3. A machine for trimming the curved edges of printing-plates, comprising a suitable supporting-frame; a semi-cylindrical

plate-block mounted on said frame; a drive-shaft mounted axially of said plate-block and having one of its ends extended beyond the cutting-end of said block; a radially-swinging cutter-frame having its inner end mounted loosely to rock on said extended end of said drive-shaft; a cutter mounted at the outer end of said cutter-frame, and arranged to have its teeth brought into contact with the curved edge of the plate to be trimmed, upon radially moving said cutter-frame adjacent said edge; means for adjusting and clamping said plate upon the said plate-block; means for rotating said cutter while same is being moved in contact with the curved edge of the plate to be trimmed, means for adjusting the plate to be trimmed upon said plate-block, consisting of adjustable plate-stops which engage the curved edge of the said plate which is opposite the end or edge that is being trimmed by said cutter, and feed-screws arranged to move said plate-stops separately or simultaneously.

4. A machine for trimming the curved edges of printing-plates, comprising a suitable supporting-frame; a semi-cylindrical plate-block mounted on said frame; a drive-shaft mounted axially of said plate-block and having one of its ends extended beyond the cutting-end of said block; a radially-swinging cutter-frame having its inner end mounted loosely to rock on said extended end of said drive-shaft; a cutter mounted at the outer end of said cutter-frame, and arranged to have its teeth brought into contact with the curved edge of the plate to be trimmed, upon radially moving said cutter-frame adjacent said edge; means for adjusting and clamping said plate upon the said plate-block; means for rotating said cutter while same is being moved in contact with the curved edge of the plate to be trimmed; means for clamping the plate to be trimmed upon said plate-block, consisting of a curved plate-band hinged at one end and extending above and across said plate-block; a spring locking-head at the free end of said band, arranged to engage a part of the machine and lock said band in a clamping position above the plate to be clamped; in combination with a handle for operating said locking-head and lifting the band, and clamping-screws threaded through said band and carrying clamping-jaws on their inner ends, for holding said plate in position upon said plate-block.

5. A machine for trimming the curved edges of printing-plates, comprising a suitable supporting-frame; a semi-cylindrical plate-block mounted on said frame; a drive-shaft mounted axially of said plate-block and having one of its ends extended beyond the cutting-end of said block; a radially-swinging cutter-frame having its inner end

mounted loosely to rock on said extended
 end of said drive-shaft; a cutter mounted
 at the outer end of said cutter-frame, and ar-
 ranged to have its teeth brought into contact
 5 with the curved edge of the plate to be
 trimmed, upon radially moving said cutter-
 frame adjacent said edge; means for adjust-
 ing and clamping said plate upon the said
 plate-block; means for rotating said cutter
 10 while same is being moved in contact with
 the curved edge of the plate to be trimmed,
 and stop-lugs for stopping and supporting
 the said radially-swinging cutter-frame at
 the limits of its movement in both direc-
 15 tions.

6. A machine for trimming the curved
 edges of printing-plates, comprising a suit-
 able supporting-frame; a semi-cylindrical
 plate-block mounted on said frame; a drive-
 20 shaft mounted axially of said plate-block
 and having one of its ends extended beyond
 the cutting-end of said block; a radially-
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 frame adjacent said edge; means for adjust- 30
 ing and clamping said plate upon the said
 plate-block; means for rotating said cutter
 while same is being moved in contact with
 the curved edge of the plate to be trimmed,
 and an automatic electric stop-switch hav- 35
 ing a member located in the path of said ra-
 dially-swinging cutter-frame, to stop the ro-
 tation of said cutter at the end of the move-
 ment of said cutter-frame.

In testimony whereof, I have signed my 40
 name to this specification in presence of two
 subscribing witnesses.

WILLIAM H. BURKLIN.

Witnesses:

JOHN C. HIGDON,
 HENRY L. HIGDON.