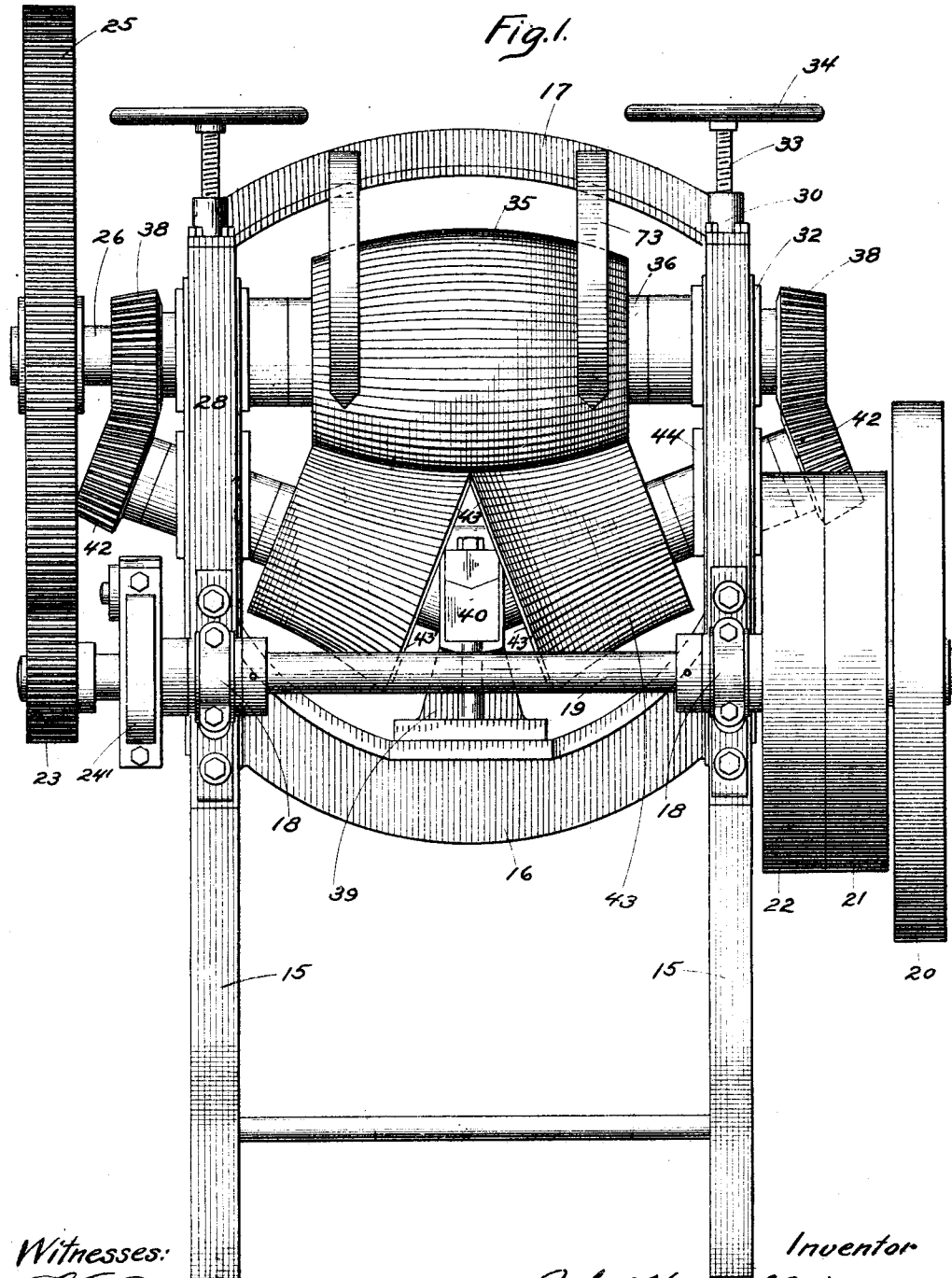


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MACHINE FOR MAKING SHEET METAL BARRELS.
APPLICATION FILED APR. 12, 1909. RENEWED NOV. 11, 1912.

1,056,030.

Patented Mar. 18, 1913.

3 SHEETS—SHEET 1.



Witnesses:

C. Durnap
Henry Parks

Inventor

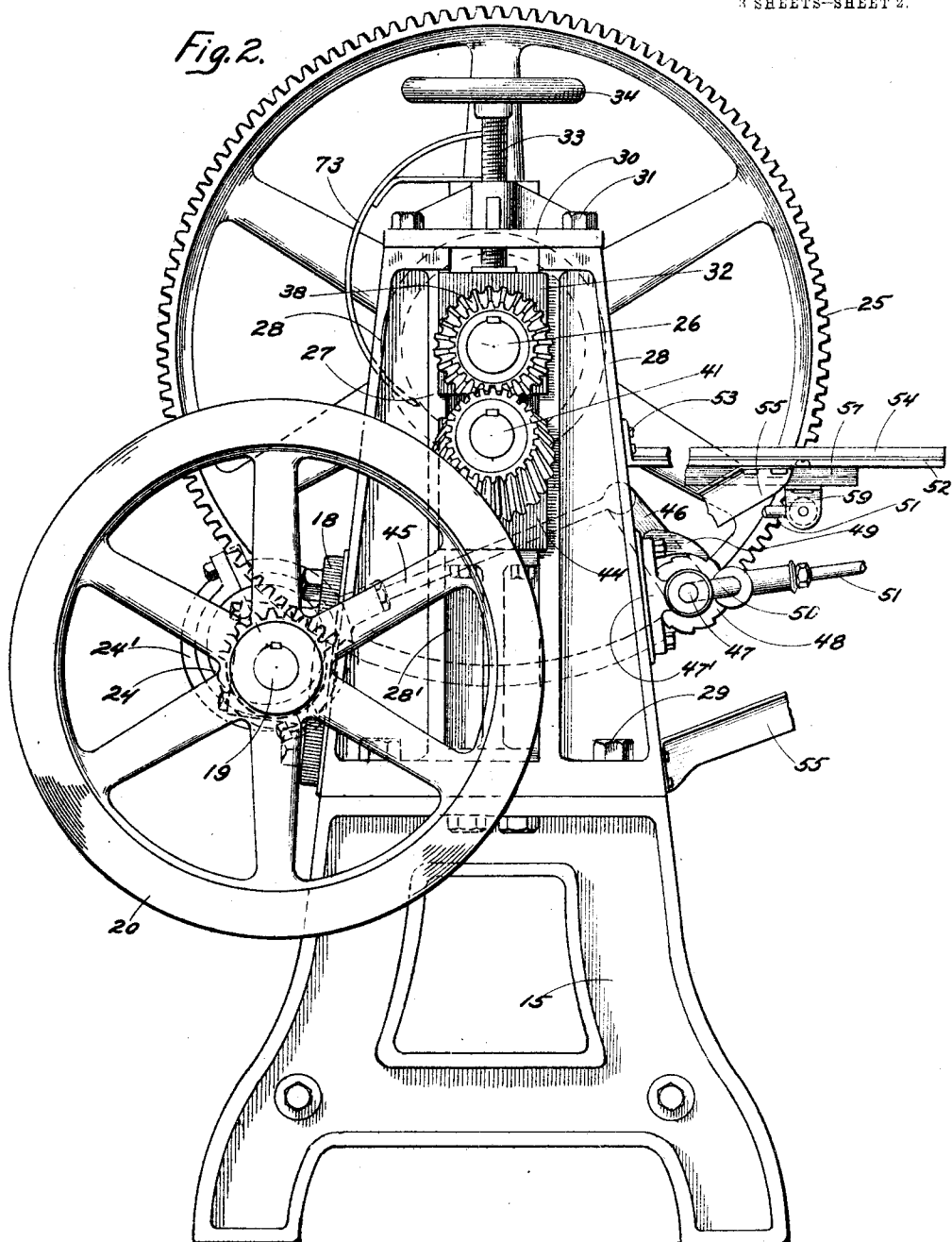
John H. Killion
By *Sheridan, Wilkinson & Scott* Attys

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By

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UNITED STATES PATENT OFFICE.

JOHN H. KILLION, OF CHICAGO, ILLINOIS.

MACHINE FOR MAKING SHEET-METAL BARRELS.

1,056,030.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed April 12, 1909. Serial No. 499,250. Renewed November 11, 1912 Serial No. 730,787.

To all whom it may concern:

Be it known that I, JOHN H. KILLION, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Machines for Making Sheet-Metal Barrels, of which the following is a specification.

The principal object of my invention is to provide a machine for shaping the side walls for sheet metal barrels.

Another object is to provide a machine for corrugating such sheets.

Still another object is to provide a machine for corrugating such sheets and at the same time giving them a bilge shape.

Still another object is to provide means for successfully detaching the sheets from the machine after they have passed through the same.

A still further object is to provide suitable feeding mechanism to work in combination with such a machine.

Other objects of my invention will be more readily made apparent in the following specification and claims taken in connection with the accompanying drawings.

With these objects in view, I have illustrated in the accompanying drawings a specific embodiment of my invention which is at present the form preferred by me. My invention however, consists of the combination of elements stated in the appended claims.

Referring to the drawings.—Figure 1 is a front elevation of my machine. Fig. 2 is an end elevation thereof. Fig. 3 is an end elevation of one of the rolls of the machine. Fig. 4 is an axial section of the same. Fig. 5 is a section of the feed table taken on the line 5 in Fig. 6. Fig. 6 is a section of the same table taken on the line 6 in Figs. 5 and 7. Fig. 7 is a top plan view of the feed table. Fig. 8 is a perspective view of an element of the stripping mechanism.

The machine stands on a base consisting of two parts joined together by the frame member 16. Mounted upon this base and secured thereto by the stud bolts 29 are the standards 28 with opposed guide faces 27 filled in at their lower part by a block 28'. These guide standards 28 are joined across at the top by the arching frame member 17 which spreads out at the

ends as indicated by the reference numeral 30 and is fastened by the stud bolts 31.

The standards 28 carry on one side projecting journal brackets 18 in which is mounted the shaft 19 carrying a fly wheel 20 at its end. Loosely mounted upon this shaft 19 is the loose pulley 21 and the keyed driving pulley 22. At the other end of the shaft 19 is a spur gear pinion 23. Also mounted upon this shaft 19 is the eccentric 24. The spur pinion 23 is engaged by the large gear wheel 25 on the shaft 26. Within the guides 27 are vertical sliding blocks 32 which constitute journal bearings for the shaft 26. The frame members 30 have the vertical screw threaded shafts 33 therein, the lower ends of which act against the blocks 32 and the upper ends of which carry the adjusting hand wheels 34. The shaft 26 carries the large longitudinally corrugated convex roll 35, seen in end elevation and section in Figs. 3 and 4. This roll is a single casting with sleeves 36 at its ends, adapted to fit upon the shaft 26 and be secured in place by means of keys in the key ways 37. The shaft 26 also carries at opposite ends the beveled gear pinions 38.

The transverse frame member 16 has a block 40 at its middle which has bearings for the lower ends of the two oppositely inclined shafts 41 (see Fig. 2). The upper ends of these two shafts 41 have journal bearings in the blocks 44, which rest upon the filler blocks 28' between the guides 27. The extremities of the shafts 41 carry beveled gear pinions 42 in engagement with the respective pinions 38 on the shaft 26. Each shaft 41 carries a tapering concave longitudinally corrugated roll 43, each such roll 43 being in engagement with the roll 35 at one side of the equatorial line thereof.

The corrugations of the roll 35 are deeper at the ends than at the middle. The corrugations of the two rolls 43 are deeper at the smaller ends thereof, that is, the depth of the corrugations in the rolls 43 corresponds to the depth in the roll 35. The ratio of the radii at the outer ends of the rolls 35 and 43 is substantially the same as the ratio of the radii of the roll 35 at its middle and of the roll 43 at its inner end. But at intermediate points, this ratio is slightly different. However, the corrugations on the rolls do not intermesh exactly, enough play being left

to allow for slightly varying peripheral velocities of rotation of the rolls. The inner ends of the rollers 43 have beveled edge tracks 43' which roll together and thus take up the end thrust on the shafts 41.

5 The eccentric strap 24' engages the eccentric 24 on the shaft 19 and connects by the eccentric rod 45 to the crank 46 loosely mounted on the shaft 47. This shaft 47 is supported
10 by journal brackets 47' attached to the guide standards 28. The shaft 47 carries a crank 50 and a ratchet wheel 48. The crank 46 carries a pawl 49 that coacts with said ratchet wheel 48. Connected to the
15 crank 50 is a link 51, the other extremity of which is pivoted to the bracket 59 attached to the under side of the reciprocating feed slide 58.

The feed table 52 has upturned ears 53 at
20 its corners bolted to the guide standards 28. Angle irons 54 are attached to the side edges of the feed table 52 to act as guides. Bracket-braces 55 extend out from the main framework of the machine to support the
25 feed table 52. Attached to the underside of the feed table 52 are guide lips 57 within which is the slide 58. The transverse angle iron 60—61 lies on top of the feed table 52, the flange 60 being turned up and
30 the flange 61 lying flat on said table. This flange 61 has slots 62 therein through which pass the stud screws 63 having the parts 66 in engagement with holes in the slide 58. Each screw 63 has an enlarged shoulder 65
35 surrounded by a collar 64 lying within the slot 52' in the table 52.

The radial webs 35' which extend out from the sleeve parts 36 to support the corrugated convex roll 35 have enlarged portions 35'' in which are radial holes 67, these
40 holes being enlarged and screw threaded at their outer parts 68. Each hole 67 contains a reciprocating plug 69 having an axial cylindrical hole 70 in the inner end, occupied
45 by a helical spring 70'. The outer part of the plug 69 is made smaller and is square as shown at 72 in Fig. 8, around which fits the collar 71 having screw threaded engagement in the seat 68. It will be seen that
50 the plug 69 may have a limited reciprocatory movement within the hole 67 being normally held outwardly by means of the spring 70'. The collar 71 is corrugated continuously with the corrugations in the surface
55 of the roll 35. The projecting end 72 of the plug 69 is also corrugated so that when the plug 69 is pushed down in its socket 67, these corrugations will be continuous with the corrugations of the roll 35
60 and the collar 71. Curved stripper guides 73 have their upper ends attached to the cross frame member 17 and their lower ends in proximity to the surface of the convex roll 35.

65 By means of the driving mechanism that

has been described, the rolls 35, 43, 43 are driven continuously from the drive pulley 22. The reciprocations of the eccentric rod 45 cause the pawl 49 to rotate the ratchet wheel 48 one tooth for each revolution of
70 the shaft 19. The relation of the parts is such that the ratchet wheel 48 is rotated once for two complete revolutions of the drums 35 and 43. The rotation of the ratchet wheel 48 reciprocates the slide 58
75 in correspondence therewith. When the slide 58 with its attached angle iron 60—61 is toward the end of the feed table 52 that is away from the machine, then the attendant lays a plane sheet of metal on the
80 table 52 between the side guides 54 and before the angle iron 60—61. Then as the ratchet wheel 48 continues to rotate, the sheet of metal is pushed ahead until its front edge is caught between the roll 35 and
85 rolls 43. The relation of the gearing and the adjustment of the slots 62 on the screws 63 is such that the piece of sheet metal operated upon is caught between the rolls so that its forward edge comes just against
90 the plungers 69—72. As the rolls go around, these plungers are forced back against the springs 70' by the rolls 43 and the piece of sheet metal is corrugated and bent to bilge shape. It would have a tendency
95 to follow the roll 35 around, but as soon as the forward edge gets through from between the roll 35 and the rolls 43, then the springs 70' force said forward edge off from the roll 35 and a moment later this
100 forward edge is caught by the lower extremities of the curved guides 73. Then as the piece of sheet metal passes on between the rolls, it follows the guide 73, and finally when it has passed clear through, it
105 falls from the rolls. As delivered from the rolls, the corrugated sheet is not completely curved in barrel shape, but it is an easy matter after the corrugations are made and the curve is started, to bend it around the rest
110 of the way by hand.

A slight degree of adjustment in the spacing of the rolls can be obtained by means of the hand wheels 34. Although this would vary the relation of the gears a little, it
115 would not be enough to do any harm. The machine will roll one sheet for every two revolutions of the rolls, the slide 58 being geared to reciprocate accordingly, and the attendant placing a sheet on said slide at
120 each complete cycle of movement thereof.

It will be seen that the machine which has just been described is adapted to perform the objects already stated, but it is apparent that other devices within the scope of the
125 following claims are comprehended within my invention.

I claim:

1. In a plate corrugating machine, the combination of a convex longitudinally cor- 130

rugated roll, an axle shaft on which said roll is rigidly mounted, two similar and equal concave corrugated rolls in corrugation registering engagement with the said
 5 convex roll throughout its whole length, axle shafts on which said concave rolls are rigidly mounted respectively, said shafts all being in a common plane and having suitable bearings therefor, the two latter shafts being inclined with respect to the first and to
 10 each other, suitable coacting gears connecting the several shafts and adapted to drive the said rolls in unison, said concave rolls also having a smooth rolling engagement with each other on the side adjacent the said
 15 convex rolls, and means adapted to adjust and regulate the degree of engagement between the said convex and concave rolls.

2. In a plate corrugating machine, the
 20 combination of a convex longitudinally corrugated integral roll, a horizontal axle shaft on which said roll is rigidly mounted, two similar and equal concave corrugated integral rolls in loose corrugation registering
 25 engagement with the said convex roll throughout its whole length, one for each half thereof, axle shafts on which said concave rolls are rigidly mounted respectively, said shafts all being in a common plane and
 30 having suitable bearings therefor, the two latter shafts being inclined with respect to the first and to each other, suitable coacting gears connecting the several shafts and adapted to drive the said rolls in unison,
 35 said concave rolls also having a smooth conical rolling engagement with each other on the side adjacent the said convex roll, and means adapted to adjust and regulate the degree of closeness of engagement between the said convex and concave rolls.

3. In a device of the class described, a convex corrugated roll, and two concave corrugated rolls in engagement therewith throughout its whole length, said concave
 45 rolls having smooth conical rolling contact with each other on their edges adjacent the said convex roll.

4. In a device of the class described, a convex longitudinally corrugated roll, a
 50 horizontal shaft on which the same is mounted, a journal bearing beneath the central part of said roll, two inclined shafts having an end of each mounted in said journal bearings, concave corrugated rolls
 55 in corrugation registering and continuous engagement with the said convex roll mounted on said inclined shafts, suitable bearings for the outer ends of the several shafts, gearing connecting the inclined
 60 shafts to the shaft for the convex roll, and means associated with the bearings to vary the proximity of the convex roll to the concave rolls.

5. In a device of the class described, a
 65 frame, coacting rolls journaled in the said

frame, one of said rolls being convex, said rolls being adapted to transmit between them and thereby give a new shape to sheets of metal, and arms attached to said frame and extending inwardly and inclined
 70 against the roll engaging surface of said convex roll back of the engaging line of said rolls and pointing in a direction opposite to that of rotation, said arms cooperating with a stripper plug attached to the
 75 said convex roll to throw the rolled plates away from the said convex roll as they emerge from the rolls.

6. In a device of the class described, a frame, coacting corrugated rolls journaled in said frame, one of said rolls being convex and two others being correspondingly
 80 concave, said rolls being adapted to transmit between them and thereby corrugate sheets of metal, curved arms attached to said frame and extending inwardly and inclined toward but slightly out of contact with the roll engaging surface of said convex
 85 roll slightly back of the engaging line of said rolls and in a direction opposite to that of rotation, said arms cooperating with a plate-edge-lifting means attached to the said convex roll to throw the rolled plates
 90 away from the said convex roll as they emerge from between the rolls and prevent the said plates from adhering to the said convex roll.

7. In a device of the class described, coacting rolls, one of said rolls having a radial socket therein, a movable plug in said
 100 socket, a spring tending to push the plug outwardly, and means to prevent axial rotation of said plug.

8. In a device of the class described, coacting rolls, one of said rolls having a radial socket therein, a movable plug in said
 105 socket, a spring between the bottom of the plug and the bottom of the socket, means to prevent turning of said plug in its socket, and a step permitting the plug to project from the socket a limited distance only.

9. In a device of the class described, coacting corrugated rolls, one of said rolls having a radial socket therein, a plug in
 115 said socket normally projecting therefrom, a spring to push said plug outwardly, said plug having its end corrugated so as to conform to the corrugations of the roll when the plug is pushed in against the
 120 spring.

10. In a device of the class described, coacting rolls, one of said rolls having a radial socket therein, a plug in said socket having its outer portion reduced in size and
 125 provided with means to prevent turning in the socket, a bushing screwed into said socket around said reduced portion, and a spring in the socket tending to push the plug outwardly.

11. In a device of the class described, co-acting rolls, one of said rolls having a radial socket therein, a plug in said socket normally projecting a little therefrom, means to push said plug back when its extremity comes in contact with the other roll, means to push said plug out again immediately thereafter, and means to prevent the plug from turning in the socket.

12. In a plate corrugating machine, a frame, coacting longitudinal rolls mounted thereon, plate-edge-lifting means on one of said rolls, a feeding frame attached to said frame with one edge adjacent to said rolls where they meet, a guide attached to the second said frame and extending toward said rolls, a reciprocating feeding member mounted on said second frame, means for adjusting said feeding member on said second frame, automatic means to suddenly thrust said feeding member forward toward said rolls at certain predetermined times coincident with a certain position of said rolls, mechanism connecting the said rolls and feeding member, and means to drive said rolls.

13. In a plate corrugating machine, an upright frame, coacting longitudinally corrugated rolls mounted horizontally thereon in a vertical plane, plate-edge-lifting means on one of said rolls, a horizontal table attached to said frame with one edge adjacent to said rolls where they meet, a guide attached to said table and extending toward said rolls, a reciprocating step-by-step feeding member mounted on said guide and adapted to engage the rear edge of a plate and push it forward, means for adjusting said feeding member on said guide, automatic means to suddenly and quickly thrust said feeding member forward toward said rolls at certain predetermined times coincident with a certain position of said rolls, mechanism connecting the said rolls and feeding member, and means to drive said rolls.

14. In a device of the class described, co-acting rolls, a feed table adjacent said rolls where they meet, a driving shaft, gearing connecting the same to the rolls, an eccentric on said shaft, a pawl oscillated by said eccentric, a ratchet wheel actuated by said pawl, a crank rotated by the ratchet wheel, and a feeding member mounted to reciprocate on said table and connected to said crank, the movement of said crank and feeding member being step by step and being related definitely to a certain point on said rolls.

15. In a device of the class described, longitudinally coacting corrugated rolls, one of said rolls having a stripper plug, feeding

mechanism and driving mechanism for the rolls, said mechanisms being connected so as to suddenly bring the edge of the plate to be rolled adjacent to said stripper plug between the rolls.

16. In a device of the class described, co-acting rolls, one of said rolls having a radial socket therein, a plug in said socket having its outer portion reduced in size and made rectangular, and a bushing screwed into said socket around said reduced portion, the outer end surfaces of said plug and bushing being corrugated to conform to the corrugations of the roll when the sleeve is in place and the plug depressed.

17. In a device of the class described, co-acting rolls, a pair of stripper plugs on one of the said rolls, a pair of curved guides, one end to fit closely to the roll having the plugs to assist the arms in throwing off the plates, a feed table, and a feed slide on said table, said slide being adjustable in its relation to said rolls and particularly to said plugs by means of interconnecting mechanism which also serves to reciprocate the slide, the said mechanism being such that the slide is caused to move forward and backward in a series of successive steps rather than by a continuous motion each way.

18. In a device of the class described, co-acting rolls, a frame, an arm on said frame with one end extending toward and inclined against the direction of rotation of one of the rolls, and a plunger mounted radially in the surface of the said roll and feeding mechanism to introduce plates with their front edges resting upon the said plunger, said plunger and arm cooperating to remove any plate that tends to adhere to the said roll.

19. In a device of the class described, a convex roll coacting with two concave rolls, radial sockets in said convex roll, plungers in said sockets adapted normally to extend slightly beyond the surface and to be flush with the surface when suitably constrained, a frame, and arms supported on said frame, said arms having free ends extending adjacent to said convex roll in a direction against that of rotation, said ends reaching within the radial sweep of the outer extremities of said plungers at one side of same and cooperating with said plungers in throwing off any plate passing between the rolls and tending to adhere to said convex roll.

In testimony whereof, I have subscribed my name.

JOHN H. KILLION

Witnesses:

HENRY A. PARKS,
ANNA L. WALTON.