No. 824,613. PATENTED JUNE 26, 1906.

J. BAUM & F. J. NUTTING.

MACHINE FOR FORMING SAFE PLATES.

APPLICATION FILED FEB. 27, 1906.

3 SHEETS—SHEET 1.

FIG. 1.

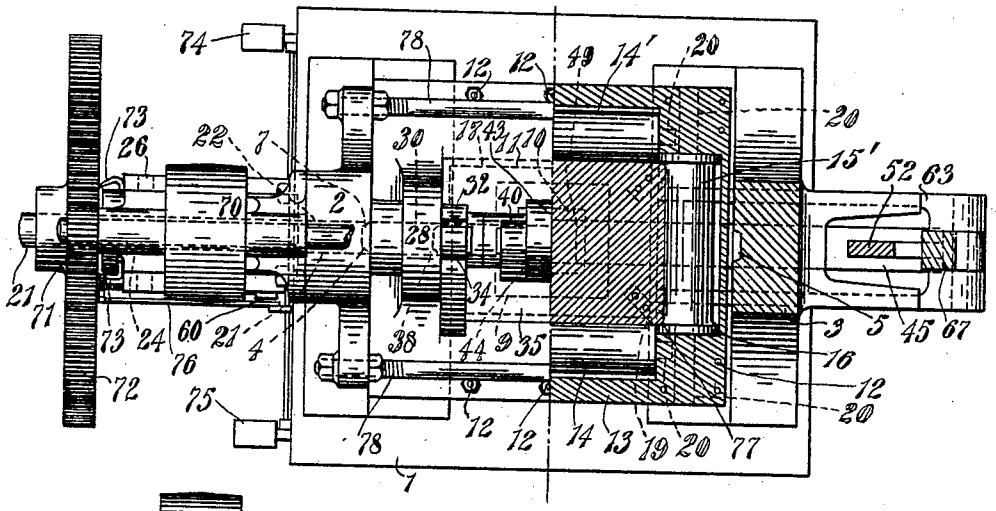
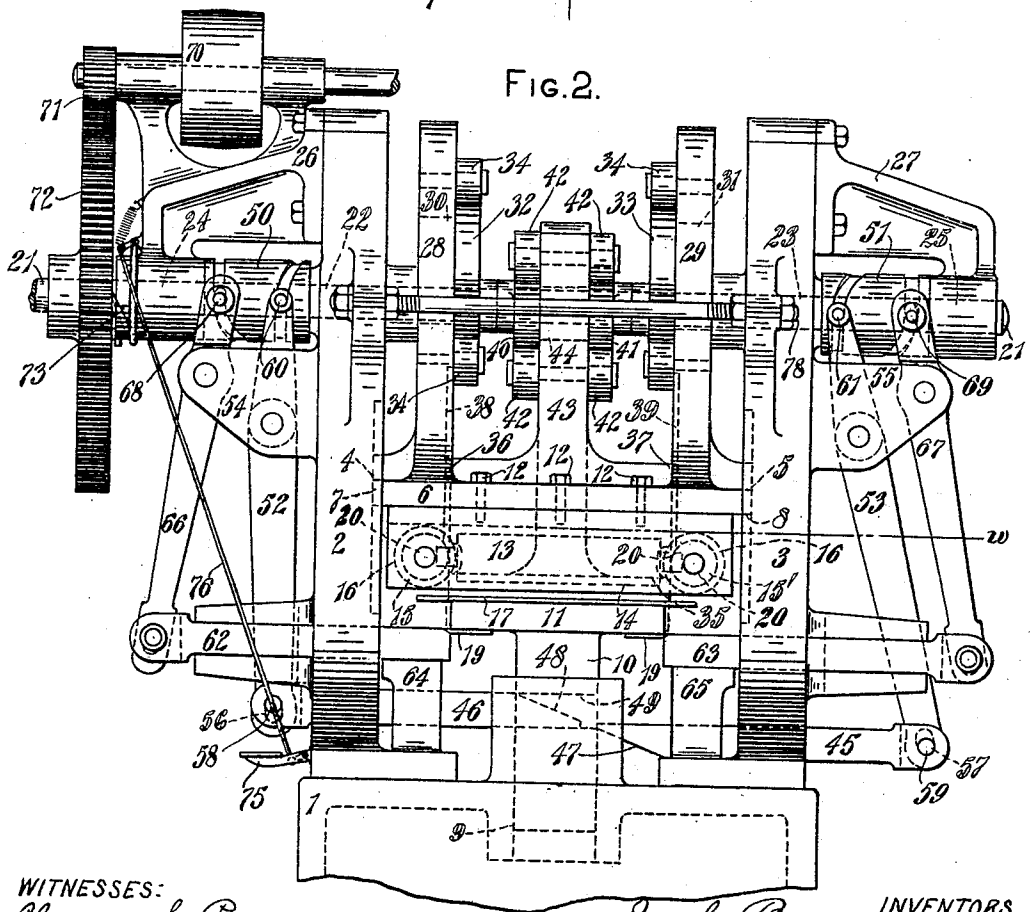


FIG. 2.



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3 SHEETS—SHEET 2.

FIG. 3.

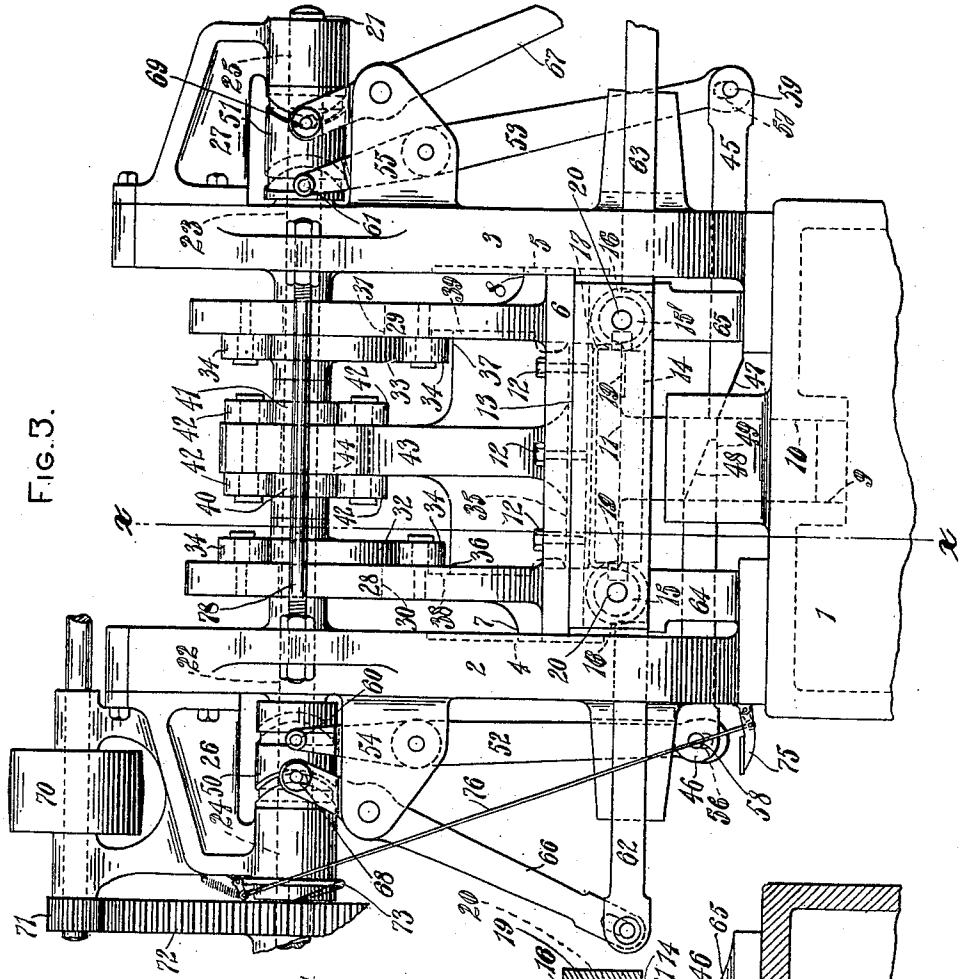
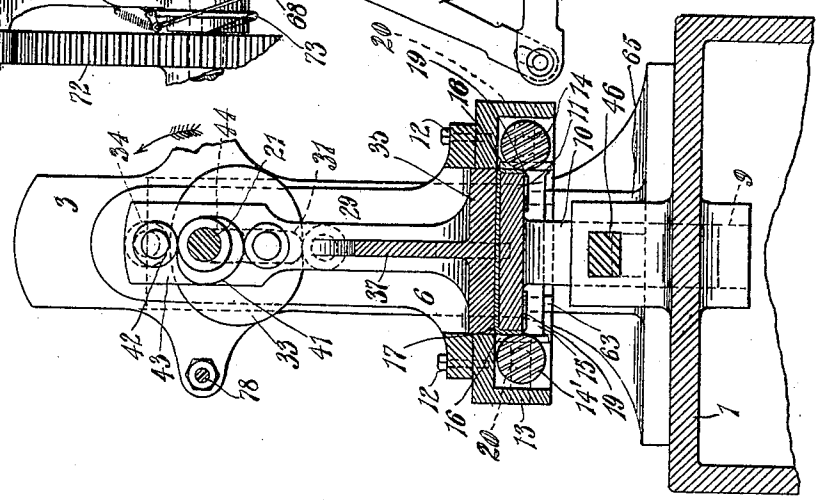


FIG. 4.



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3 SHEETS—SHEET 3.

FIG. 5

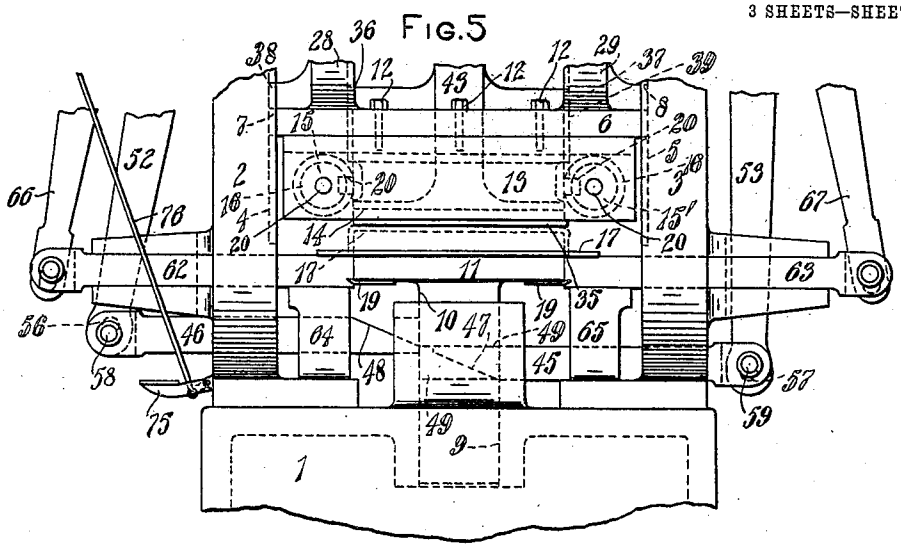


FIG. 6.

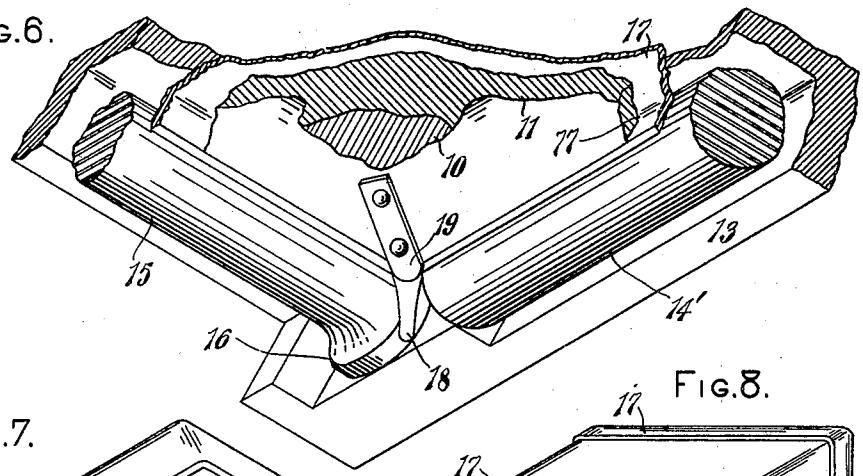


FIG. 7.

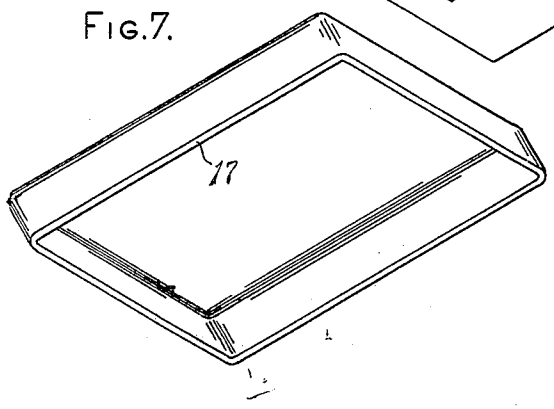
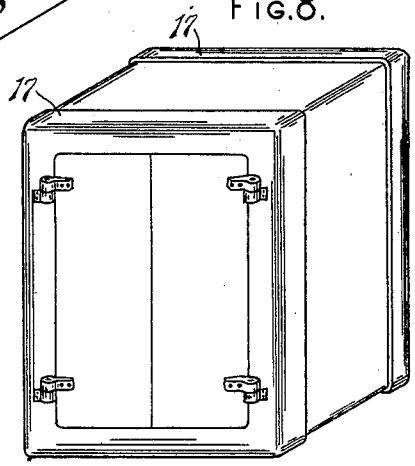


FIG. 8.



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UNITED STATES PATENT OFFICE.

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MACHINE FOR FORMING SAFE-PLATES.

No. 824,613. Specification of Letters Patent. Patented June 26, 1906.

Application filed February 27, 1906. Serial No. 303,256.

To all whom it may concern:

Be it known that we, JACOB BAUM, residing at Cincinnati, in the county of Hamilton, and FREDERICK J. NUTTING, residing at Dayton, in the county of Montgomery, State of Ohio, citizens of the United States, have invented certain new and useful Improvements in Machines for Forming Safe-Plates, of which the following is a specification.

Our invention relates to metal-forming devices, the object being to form of and in one continuous piece an angle-plate that may be used to form a side of a fireproof safe.

Our invention consists of a platen, a roll-frame, rolls journaled in said roll-frame, and of means for reciprocating said roll-frame whereby said rolls are brought past said platen.

Our invention also consists of the parts and of the construction, combination, and arrangement of said parts, as herein fully set forth and claimed.

In the drawings, which serve to illustrate the construction and operation of our invention, Figure 1 is a plan and partial horizontal section on the line *w* of Fig. 2. Fig. 2 is an elevation of our improved machine, showing how the plate is held upon the platen preparatory to forming. Fig. 3 is a similar elevation showing the positions of the various parts of our improved machine when the rollers have finished forming the angle-plate. Fig. 4 is a vertical section on the line *x x* of Fig. 3. Fig. 5 is a partial elevation of our invention, showing the positions of the parts when the machine has completed its cycle of operations, showing how the formed plate may be removed and another plate inserted. Fig. 6 is a perspective view of part of the roll-frame, rolls, and platen from below, showing how the excess metal is removed from the plate. Fig. 7 is a perspective view of the formed plate. Fig. 8 shows how said plate is applied to a safe.

We prefer to construct our improved machine as follows:

A bed-plate 1 supports the upright standards 2 and 3, which are provided with guideways 4 and 5, and a slide 6 has guides 7 and 8 engaging therein. The bed-plate 1 also has the rectangular guideway 9, in which the shank 10 of the platen 11 is adapted to slide upward and downward. Attached to the slide 6, preferably by bolts 12, is the roll-frame 13, in which are journaled the rolls 14, 14′, 15, and 15′ at right angles to each other. The rolls 14 and 14′ are plain cylinders; but the rolls 15 and 15′ have the flanges 16 of such shape that when the roll-frame is forced downward the plate 17, resting upon the platen 11, has its sides bent downward over the edges of the platen, and the excess metal in the corners is squeezed downward, as at 18 in Fig. 6, and cut off between the blade 19 and the roll-flange 16. All the rolls have journals 20.

For causing the reciprocation of the slide 6 and its attached roll-frame 13, as well as to operate the various accessories thereto, we provide the main shaft 21, journaled at 22 and 23 in the standards 2 and 3, respectively, and at 24 and 25 in the brackets 26 and 27, attached to the standards 2 and 3, respectively. The slide 6 has upwardly-extending arms 28 and 29, slotted at 30 and 31, respectively, to pass over the shaft 21, and the shaft 21 has the cams 32 and 33 rigidly mounted thereon adjacent the arms 28 and 29, respectively, which engage the rollers 34 on the respective arms. The roll-frame 13 and the slide 6 are apertured above the platen 11 to admit the clamp 35, having guides 36 and 37, engaging within guideways 38 and 39 in the arms 28 and 29, respectively. For the purpose of pressing this clamp downward and holding it down for the required period of time cams 40 and 41 are rigidly mounted upon the shaft 21 and engage rollers 42 upon the arm 43 of the clamp 35. The arm 43 is also slotted at 44 to pass over the shaft 21. For reciprocating the platen 11 the wedge-bars 45 and 46 are mounted to slide laterally through the standards 2 and 3 and be limited to horizontal movement only, while their inclined surfaces 47 and 48 engage within the recess 49 in the shank 10 of the platen 11. For the purpose of reciprocating said wedge-bars cams 50 and 51 are rigidly mounted upon the shaft 21 within the brackets 24 and 25, respectively, and levers 52 and 53 are fulcrumed in the brackets 54 and 55, respectively. The levers 52 and 53 are slotted at 56 and 57, respectively, to receive the pins 58 and 59, respectively, which are

inserted into the wedge-bars, and they also have studs 60 and 61, respectively, to engage the cams 50 and 51, respectively. The strippers 62 and 63 are also mounted to slide through guideways in the standards 2 and 3, are reinforced by the pedestals 64 and 65, and are likewise reciprocated by means of the levers 66 and 67, fulcrumed in the brackets 54 and 55, respectively, and having the slidable studs 68 and 69 engaging the cams 50 and 51, respectively.

The various cams 32 and 33, 40 and 41, and 50 and 51 are so shaped and proportioned that when the shaft 21 is rotated in the direction of the arrow (shown in Fig. 4) the clamp 35 will press against the plate 17 upon the platen 11 and hold it there, whereupon the roll-frame 13 will be brought into motion, passing the rollers 14, 14′, 15, and 15′ downward past the platen 11 and forming the sides of the plate 17 at right angles to its body portion. When this has been completed, the roll-frame will begin to rise, and the strippers 62 and 63 will move inward until their ends are under the edges of the plate 17, where they will be held while the platen, now brought into motion by the wedge-bars, is drawn downward and out of the formed plate, which will rest upon the strippers 62 and 63 until removed to admit of the insertion of the next plate to be formed. This will be inserted, as shown in Fig. 5, when the above cycle of operations will be repeated.

Suitable means, as the pulley 70, pinion 71, and gear 72, are provided for rotating the shaft 21, and a clutch 73 of suitable construction is provided for the purpose of limiting said shaft to a single revolution. This clutch may be released by depressing either of the treadles 74 or 75, to which it is operatively connected by means of the rod 76. As will be seen, the plates may be inserted from either side of the machine or removed therefrom with the greatest convenience, all that is necessary being to heat the plate to redness, place it in the machine in proper position, and start the machine, which in a single revolution will form the angles complete and remove the excess metal. The corners of the platen 11 are rounded, as shown at 77, and the flanges on the rollers 15 and 15′ are filleted, so that the corners on the formed plate will be rounded at every point, while at the same time being slightly curved to form a nearly sharp angle, thus avoiding the crystallization and consequent weakening of the metal at the corners that results when they are formed square as well as improving the appearance of the finished product. The size of the blades 19 may be varied to adapt them for removing the excess metal, so that when the plate is removed from the machine its edges will be true and require little or no work thereafter.

By forming and cutting the plates as above described, all blacksmith-work is obviated, while the properties of the metal will not be changed, since it is unnecessary to heat it excessively, as is necessary when welding is done. When the plate is removed from the machine, it appears as shown in Fig. 7 and is suitable for forming the back of a safe without further manipulation. For the front of the safe the door-plates are cut out with suitable dies and the hinges attached, as shown in Fig. 8.

For forming plates of different size the platen 11, roll-frame 13, and strippers 62 and 63 may be removed and a roll-frame and platen of suitable size and strippers of suitable length inserted, these parts being made detachable and interchangeable for that purpose. The tie-rods 78 are provided to properly brace the standards 2 and 3, as shown.

While we have shown and described a peculiar construction herein, we do not wish to be understood as limiting ourselves to it, but desire to make such changes as do not depart from the scope and spirit of our invention.

We claim—

1. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame and means for reciprocating said roll-frame whereby said rolls are brought past said platen for the purposes specified.

2. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, additional rolls journaled in said roll-frame, flanges on said additional rolls, and means for reciprocating said roll-frame whereby said rolls are brought past said platen for the purposes specified.

3. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, additional rolls journaled in said roll-frame, flanges on said additional rolls, means for reciprocating said roll-frame and a blade on said platen adapted to coöperate with said rolls.

4. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, means for reciprocating said roll-frame and a blade on said platen adapted to coöperate with said rolls as and for the purposes specified.

5. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, means for reciprocating said roll-frame, a stripper slidably mounted adjacent said platen, means for reciprocating said platen, and means for reciprocating said stripper.

6. In a machine for forming safe-plates, a platen, blades on said platen, a roll-frame, rolls journaled in said roll-frame, means for reciprocating said roll-frame whereby said rolls are brought past said platen and said blades, a stripper slidably mounted adjacent said platen, means for reciprocating said platen, means for reciprocating said stripper,

a clamp slidably mounted in said roll-frame adapted to oppose said platen, and means for reciprocating said clamp.

7. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, an upright arm attached to said roll-frame, a shaft, projections on said upright arm and a cam on said shaft adapted to engage said projections.

8. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, upright arms attached to said roll-frame, projections on said upright arms, a shaft, cams on said shaft adapted to engage said projections and a blade on said platen adapted to coöperate with said rolls as and for the purposes specified.

9. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, means for reciprocating said roll-frame, strippers slidably mounted adjacent said platen, a shaft, a cam on said shaft, a lever pivoted to said stripper and a projection on said lever engaging said cam.

10. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, upright arms attached to said roll-frame, a shaft, projections on said arms, a cam on said shaft adapted to engage said projections, a stripper slidably mounted adjacent said platen, a wedge-bar slidably mounted adjacent to and adapted to reciprocate said platen, an additional cam on said shaft, a lever pivotally connected to said wedge-bar, a projection on said lever engaging said additional cam, a lever pivotally connected to said stripper, and a projection on said lever adapted to engage said additional cam.

11. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, a shaft, upwardly-extending arms attached to said roll-frame, projections on said arms, a cam on said shaft adapted to engage said projections, a clamp slidably mounted in said roll-frame adapted to oppose said platen, an upwardly-extending arm on said clamp, projections on said upwardly-extending arm, and an additional cam on said shaft adapted to engage said projections.

12. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, an upwardly-extending arm attached to said roll-frame, a shaft, a projection on said upwardly-extending arm, a cam on said shaft adapted to engage said projection, a wedge-bar slidably mounted adjacent to and adapted to reciprocate said platen, a lever pivotally connected to said wedge-bar, a projection on said lever, a cam on said shaft adapted to engage said projection, a stripper slidably mounted adjacent said platen, a lever pivotally connected to said stripper, a projection on said lever adapted to be engaged by said cam, a clamp adapted to oppose said platen, an upwardly-extending arm on said clamp, a projection on said upwardly-extending arm, and a cam on said shaft adapted to engage said projection.

13. In a machine for forming safe-plates, a platen, blades on said platen, a roll-frame, rolls journaled in said roll-frame, a shaft, an upwardly-extending arm attached to said roll-frame, a projection on said arm, a cam on said shaft adapted to engage said projection whereby said roll-frame is reciprocated to carry said rolls past said platen and said blades, a stripper slidably mounted adjacent said platen, a lever pivotally connected to said stripper, a projection on said lever, a cam mounted on said shaft adjacent said lever adapted to engage said projection, a clamp slidably mounted in said roll-frame adapted to oppose said platen, an upwardly-extending arm on said clamp, a projection on said arm, and a cam on said shaft adapted to engage said projection.

14. In a machine for forming safe-plates, a platen, blades on said platen, a roll-frame, rolls journaled in said roll-frame, a shaft, an upwardly-extending arm attached to said roll-frame, a projection on said arm, a cam on said shaft adapted to engage said projection and to reciprocate said roll-frame whereby said rolls are brought past said platen and said blades, a stripper slidably mounted adjacent said platen, a wedge-bar slidably mounted adjacent to and adapted to reciprocate said platen, a lever pivotally connected to said wedge-bar, a projection on said lever, a cam on said shaft adjacent said lever and adapted to engage said projection, a lever pivotally connected to said wedge-bar, a projection on said lever adapted to engage said cam, a clamp slidably mounted in said roll-frame adapted to oppose said platen, an upwardly-extending arm on said clamp, a projection on said upwardly-extending arm and a cam on said shaft adapted to engage said projection.

15. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, upright arms attached to said roll-frame, each of said arms having a slot adapted to receive a shaft and be moved vertically in relation thereto, a shaft, projections on said upright arms and cams on said shaft adapted to engage said projections.

16. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, upright arms attached to said roll-frame, a shaft, a clamp slidably mounted in said roll-frame and provided with an upright arm having a slot adapted to receive a shaft and be moved vertically in relation thereto, and means for reciprocating said clamp.

17. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a roll-frame slidably mounted in said

upright standards, a rectangular guideway in said bed-plate, a platen slidably mounted in said rectangular guideway, rolls journaled in said roll-frame, a shaft journaled in said upright standards, upwardly-extending arms attached to said roll-frame, projections on said upright arms, cams on said shaft adjacent to and adapted to engage said projections on said upright arms for the purposes specified.

18. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a roll-frame slidably mounted in said upright standards, a guideway in said bed-plate, a platen slidably mounted in said guideway, rolls journaled in said roll-frame, blades on said platen, upwardly-extending arms attached to said roll-frame, projections on said upwardly-extending arms, a shaft, and a cam on said shaft adjacent to and adapted to engage said projections whereby said rolls are reciprocated to coöperate with said blades as and for the purposes specified.

19. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a roll-frame slidably mounted in said upright standards, a guideway in said bed-plate, a platen slidably mounted in said guideway, rolls journaled in said roll-frame, upwardly-extending arms attached to said roll-frame, projections on said upwardly-extending arms, a shaft, cams on said shaft adjacent to and adapted to engage said projections, a clamp slidably mounted in said roll-frame adapted to oppose said platen, an upwardly-extending arm on said clamp, projections thereon and cams on said shaft adjacent to and adapted to engage said projections.

20. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a roll-frame slidably mounted in said upright standards, a guideway in said bed-plate, a platen, a shank on said platen adapted to slide in said guideway, rolls journaled in said roll-frame, a shaft journaled in said upright standards, upwardly-extending arms attached to said roll-frame, projections thereon, cams on said shaft adjacent to and adapted to engage said projections, a clamp slidably mounted in said roll-frame adapted to oppose said platen, an upwardly-extending arm thereon, projections on said arm, and cams on said shaft adjacent to and adapted to engage said projections.

21. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a roll-frame slidably mounted in said upright standards, a platen slidably mounted in said bed-plate, rolls journaled in said roll-frame, upwardly-extending arms attached to said roll-frame, projections on said upright arms, brackets on said upright standards, a shaft journaled in said upright standards and said brackets, cams on said shaft adjacent to and adapted to engage said brackets, blades on said platen, strippers slidably mounted in said upright standards adjacent to said platen, levers pivotally connected to said strippers, cams on said shaft adjacent said brackets, projections on said levers adapted to engage said cams, wedge-bars slidably mounted adjacent to and adapted to reciprocate said platen, arms pivotally connected to said wedge-bars, projections on said arms adapted to engage said cams adjacent said brackets, a clamp slidably mounted in said roll-frame adapted to oppose said platen, an upwardly-extending arm on said clamp, projections on said arm, and cams on said shaft adjacent to and adapted to engage said projections.

22. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a slide mounted in said upright standards, a roll-frame detachably and interchangeably connected to said slide, a rectangular guideway in said bed-plate, a platen, a shank on said platen adapted to slide in said rectangular guideway and having a recess therein, rolls journaled in said roll-frame, additional rolls journaled in said roll-frame, flanges on said additional rolls, blades on said platen adjacent to and adapted to coöperate with said flanges on said additional rolls, brackets on said upright standards, a shaft journaled in said upright standards and said brackets, upwardly-extending arms on said slide, projections on said arms, cams on said shaft adjacent to and adapted to engage said projections, cams on said shaft adjacent said brackets, wedge-bars slidably mounted in said upright standards, adapted to engage within the recesses in said shank, additonal brackets on said upright standards, levers pivotally connected to said wedge-bars and fulcrumed in said additional brackets, projections on said levers engaging the cams adjacent said brackets, strippers slidably mounted in said upright standards adjacent said platen, levers pivotally connected to said strippers and fulcrumed in said additional brackets, and projections on said levers engaging said cams adjacent said brackets.

23. In a machine for forming safe-plates, a bed-plate, upright standards on said bed-plate, a slide mounted in said upright standards, a roll-frame detachably and interchangeably connected to said slide, a rectangular guideway in said bed-plate, a platen, a shank on said platen adapted to slide in said rectangular guideway and having a recess therein, rolls journaled in said roll-frame, additional rolls journaled in said roll-frame, flanges on said additional rolls, blades on said platen adjacent to and adapted to coöperate with said flanges on said additional rolls, brackets on said upright standards, a shaft journaled in said upright standards and said

brackets, upwardly-extending arms on said slide, projections on said arms, cams on said shaft adjacent to and adapted to engage said projections, a clamp slidably mounted in said slide adapted to oppose said platen, an upwardly-extending arm on said clamp, projections on said upwardly-extending arm, cams on said shaft adjacent to and adapted to engage said projections, cams on said shaft adjacent said brackets, wedge-bars slidably mounted in said upright standards and adapted to engage within the recess in said shank, additional brackets on said upright standards, arms pivotally connected to said wedge-bars and fulcrumed in said additional brackets, projections on said levers engaging said cams adjacent said brackets, strippers slidably mounted in said upright standards adjacent said platen, levers pivotally connected to said strippers and fulcrumed in said additional brackets, and projections on said levers engaging said cams adjacent said brackets.

24. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, means for reciprocating said roll-frame, a clamp slidably mounted in said roll-frame adapted to oppose said platen, and means for reciprocating said clamp.

25. In a machine for forming safe-plates, a platen, a roll-frame, rolls journaled in said roll-frame, means for reciprocating said roll-frame, means for reciprocating said platen, a stripper slidably mounted adjacent said platen, means for reciprocating said stripper, a clamp adapted to oppose said platen, and means for reciprocating said clamp.

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