E. L. POPE.

RAND MACHINE.

APPLICATION FILED JULY 3, 1909.

951,575.

Patented Mar. 8, 1910.

4 SHEETS—SHEET 1.

Fig. 2.

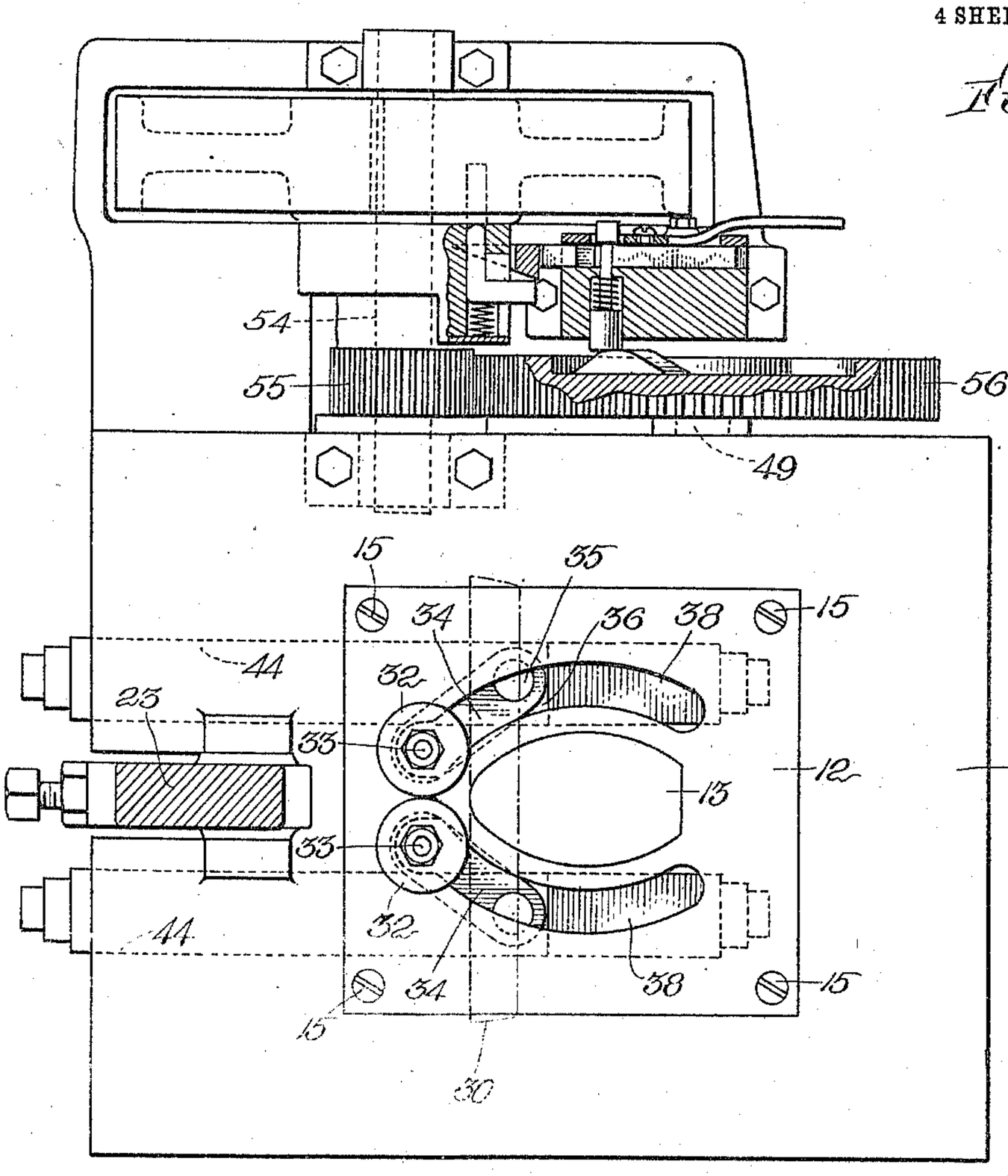
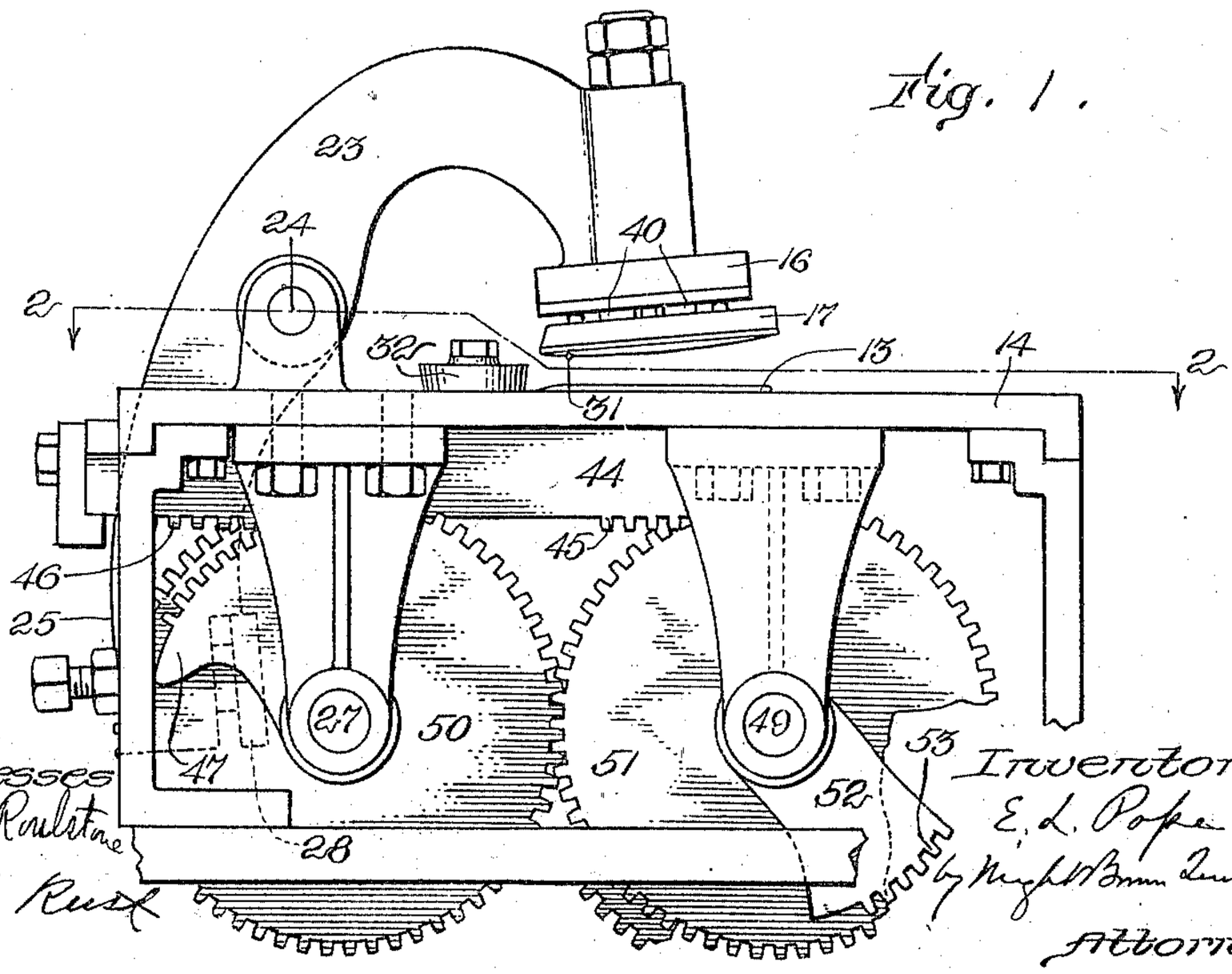


Fig. 1.



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4 SHEETS—SHEET 2.

Fig. 3.

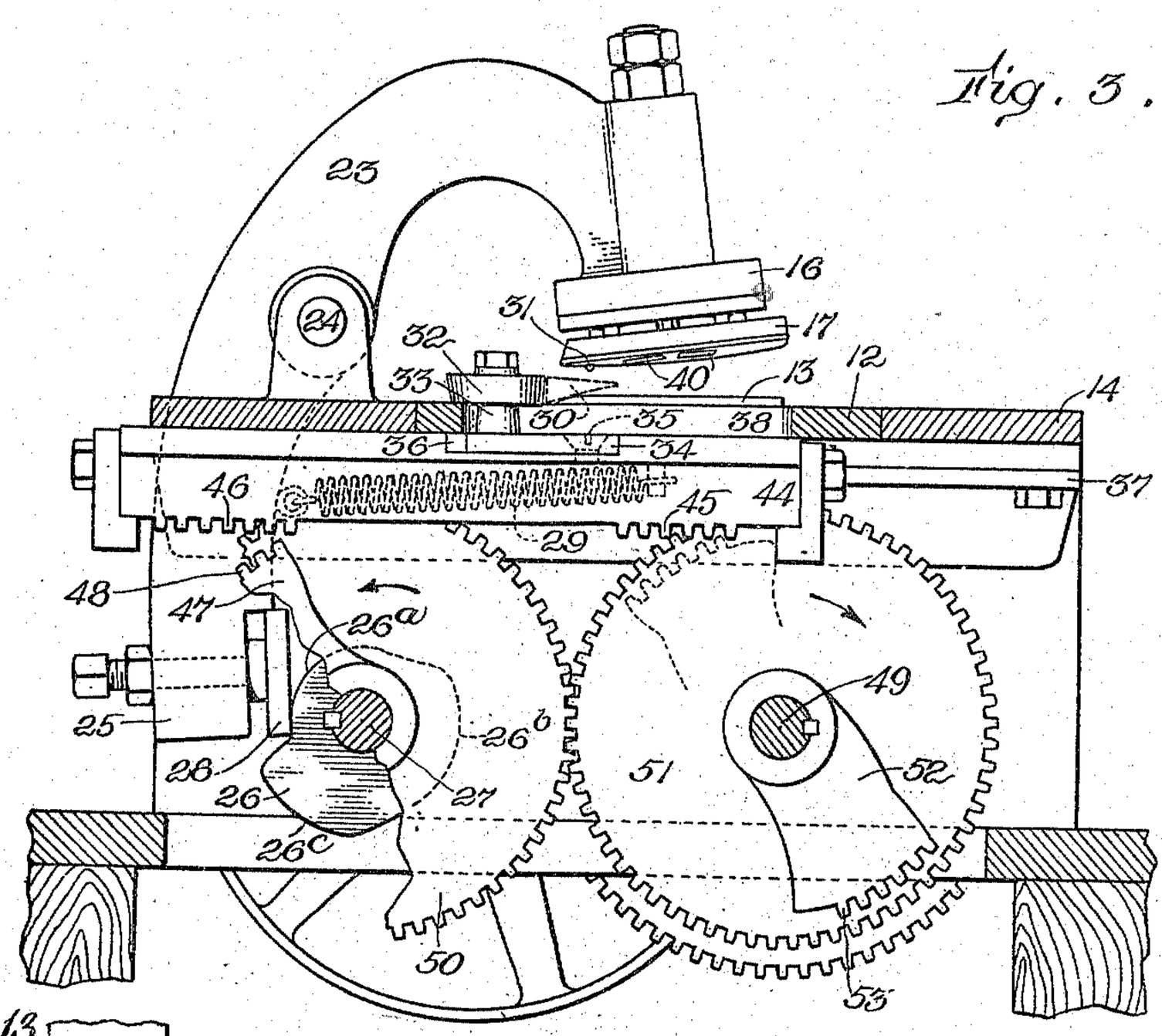

Fig. 13.

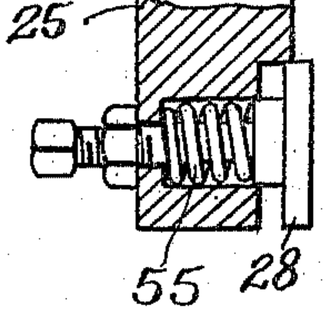

Fig. 4.

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4 SHEETS—SHEET 3.

Fig. 5.

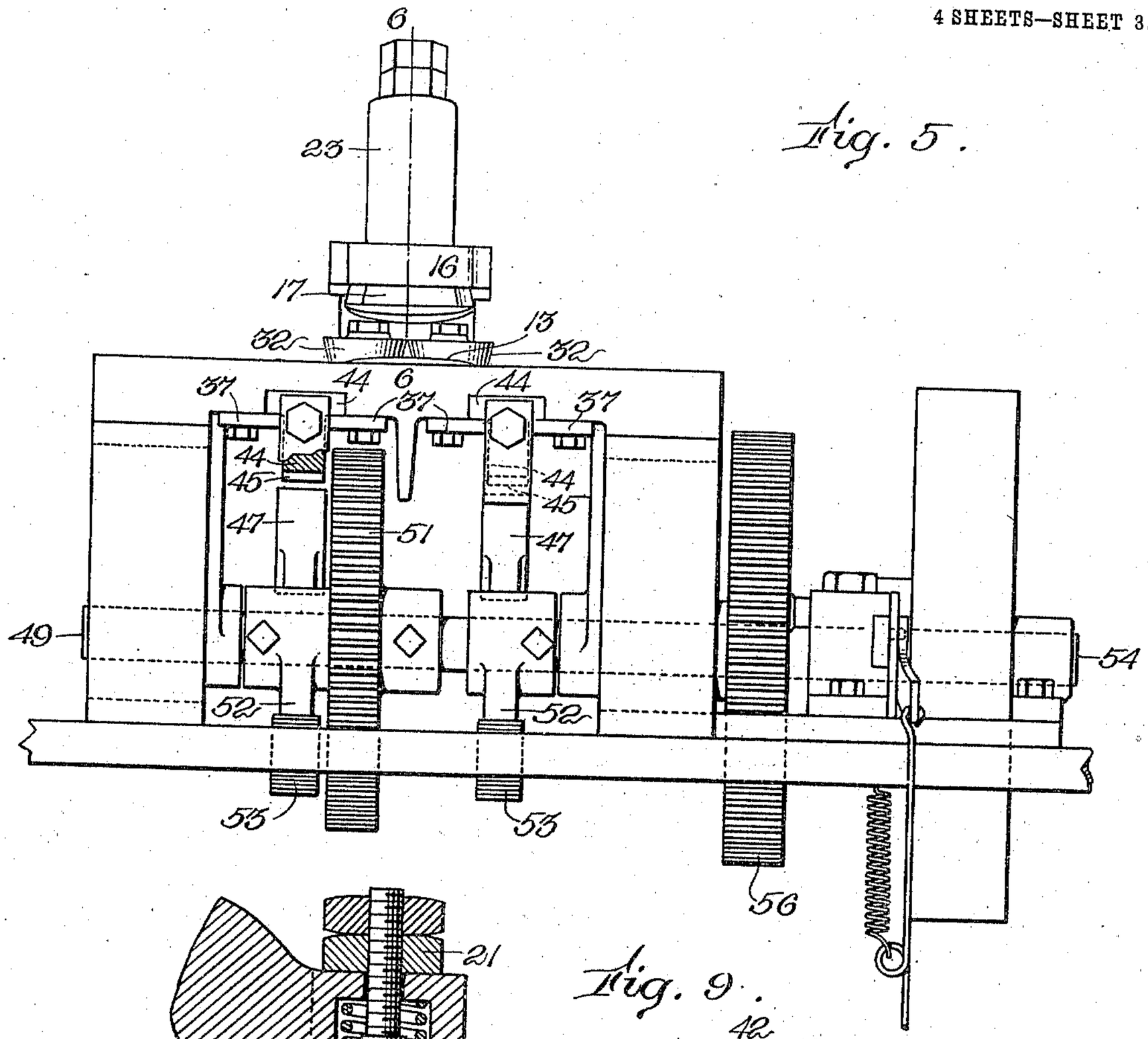


Fig. 9.

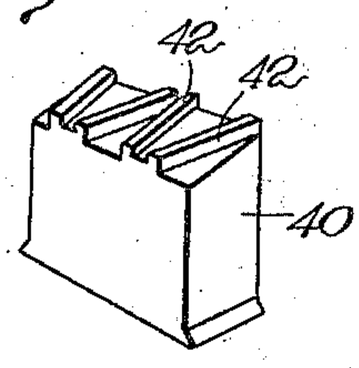


Fig. 6.

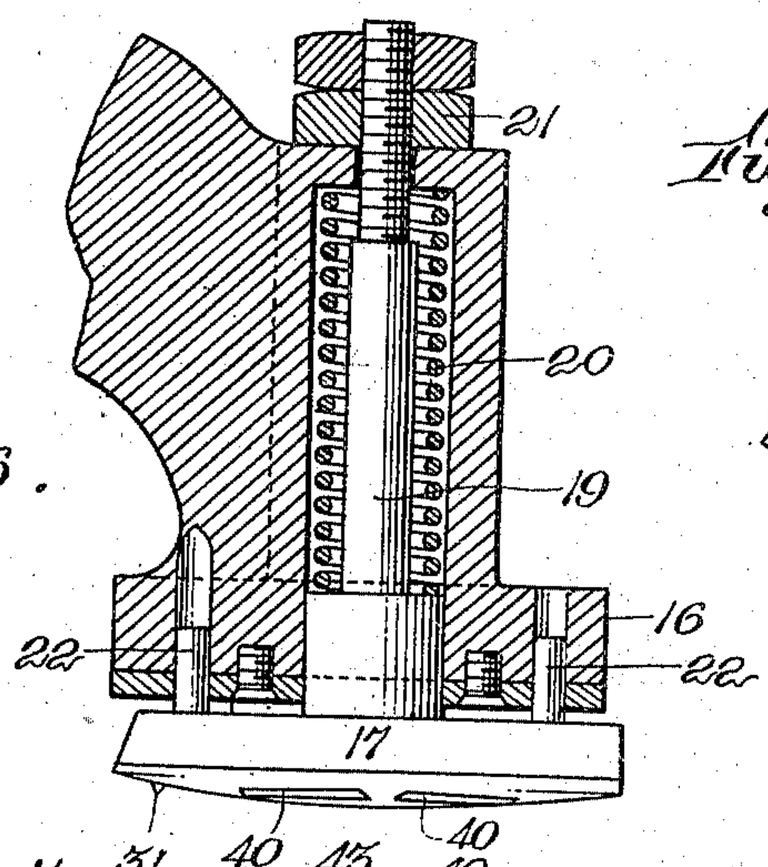


Fig. 8.

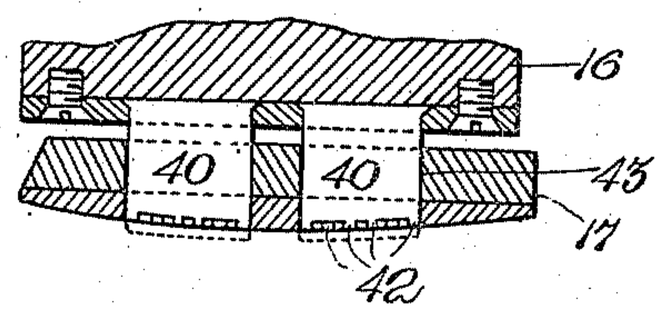
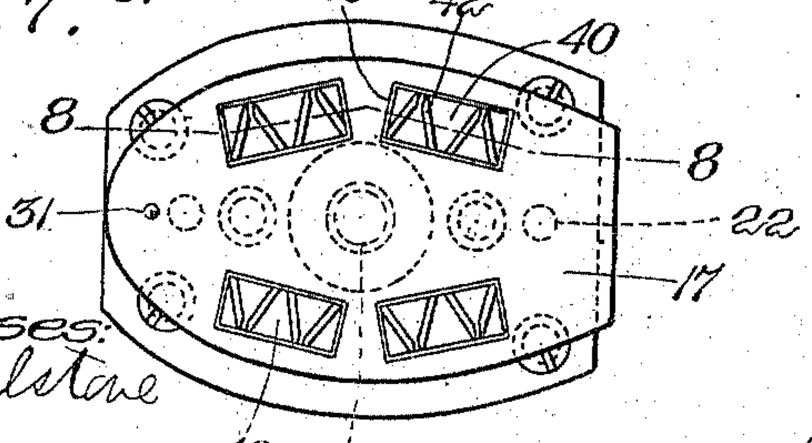


Fig. 7.



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4 SHEETS—SHEET 4.

Fig. 10.

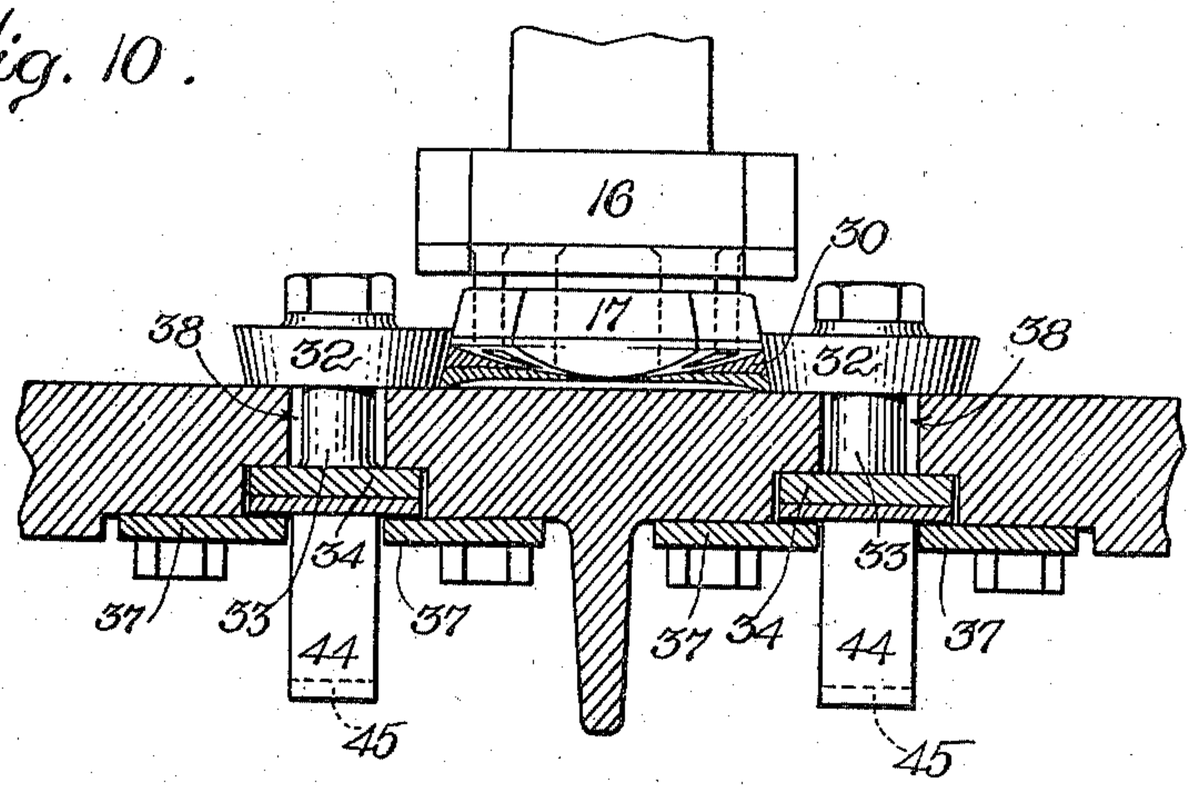

Fig. 11.

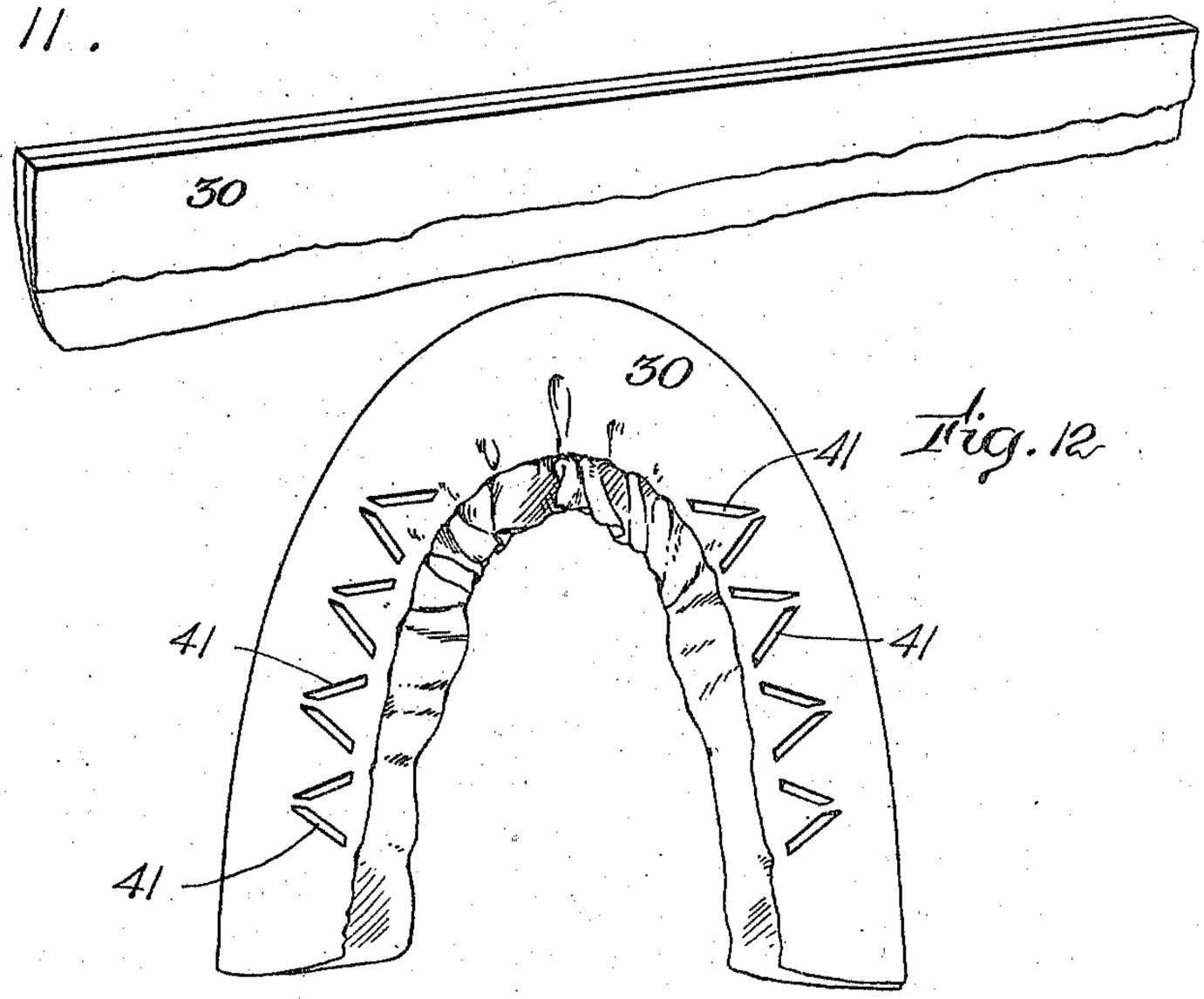

Fig. 12.

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UNITED STATES PATENT OFFICE.

EDWIN L. POPE, OF BROCKTON, MASSACHUSETTS.

RAND-MACHINE.

951,575. Specification of Letters Patent. Patented Mar. 8, 1910.

Application filed July 3, 1909. Serial No. 505,863.

To all whom it may concern:

Be it known that I, EDWIN LINCOLN POPE, of Brockton, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Rand-Machines, of which the following is a specification.

This invention relates to a machine for forming a rand strip for boot and shoe heels into substantially the heel shape which the rand possesses when in use, the rand having a relatively thick outer edge and a thin inner edge. The operation of bending the rand strip or blank into heel shape causes a corrugation of the thin inner edge. A machine of the class to which my invention relates is provided with means for bending the blank into heel form and then applying pressure to the opposite sides of the bent rand to compact the same and flatten the corrugations of its inner edge.

The invention consists in certain improvements in a machine of the character stated, looking to the simplicity, compactness and increased effectiveness of the machine and to the production of a rand having a permanent form and free from liability to depart from the form imparted to it by the machine.

The invention consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a side elevation of a rand machine embodying my invention. Fig. 2 represents a section on line 2—2 of Fig. 1, and a plan view of the parts below said line. Figs. 3 and 4 represent views similar to Fig. 1, the parts of the machine being shown in section, and the machine being shown at different stages of the operation. Fig. 5 represents an end elevation of the machine in the condition shown in Figs. 1 and 3. Fig. 6 represents a section on line 6—6 of Fig. 5. Fig. 7 represents a bottom plan view of the platen shown in Fig. 6. Fig. 8 represents a section on line 8—8 of Fig. 7. Fig. 9 represents a perspective view of one of the indenting dies hereinafter referred to. Fig. 10 represents a section on line 10—10 of Fig. 4. Fig. 11 represents a perspective view of a rand blank. Fig. 12 represents a side view of the completed rand, and Fig. 13 represents a fragmentary view showing a modification.

The same reference characters indicate the same parts wherever they occur.

In the drawings 12 represents a substantially horizontal fixed table, the upper surface of which is preferably flat.

13 represents a fixed pressing bed which preferably forms part of the table and has a convex or crowning upper surface shaped to impart to the upper side of a heel rand the usual concave or dished form which is desirable. The table and bed are rigidly supported in any suitable way by the general frame of the machine, which, as here shown, includes a top portion 14 apertured to receive the table 12, the latter being secured in the aperture by means of screws 15, as shown in Fig. 2 or otherwise. The upper surface of the pressing bed 13 preferably projects, by reason of its convex form, above the upper surface of the table 12, the bed being either integral with the table or formed as a separate piece and suitably secured thereto.

16 represents a carrier which is movable toward and from the bed 13. 17 represents a platen which is mounted on said carrier and is preferably adapted to have a limited yielding movement relatively to the carrier, so that, when the platen is pressed downwardly on a rand interposed between it and the bed, the pressing face of the platen is adapted to conform to variations in the thickness of different rands. The preferred construction, whereby this limited movement of the platen is permitted, is shown in Fig. 6 where 19 represents a shank affixed to the platen and movable in a socket in the carrier, and normally pressed downwardly therein by means of a spring 20 to the extent permitted by a stop 21 which may be a nut engaged with the threaded upper end of the shank 19 bearing on a surface formed on the carrier, the shank being adapted to slide endwise in the carrier. Dowel pins 22 on the platen, entering sockets in the carrier, pre-

vent the platen and its shank from rotating. If desired, however, the platen may be rigidly attached to the carrier, the yielding movement required to accommodate different thicknesses of rand strip being provided by other means such as the modification shown in Fig. 13 and hereinafter described.

The carrier 16, as here shown, constitutes one end portion of a lever 23 which is fulcrumed at 24 on the frame of the machine, said lever having an arm 25 below its fulcrum engaging a cam 26 affixed to a shaft 27 which is journaled in bearings in the frame of the machine. As here shown, the cam 26 bears on a face plate 28 adjustably mounted on the lever arm 25. The lever is, in this case, held in engagement with the perimeter of the cam by a spring 29 which acts to normally hold the carrier and the platen in the raised position shown in Figs. 1 and 3. The cam 26 is rotated in the direction indicated by the arrow in Fig. 4, and its formation is such that its rotation imparts a step-by-step movement to the carrier and platen toward the bed 13, so that the platen is first moved toward the bed sufficiently to come to a relatively light bearing on the rand 30 interposed between the bed and platen, and cause the positive confinement of the central portion of the rand by means of a spur 31 projecting downwardly from the pressing surface of the platen, the end positions of the blank being left free. The platen remains in this confining position without exerting any considerable pressure on the rand until the bending instrumentalities, hereinafter described, have bent the rand into heel shape and caused the insertion of all parts of the inner edge of the rand between the bed 13 and the platen. After the blank has been thus bent, the cam moves the carrier and platen downwardly another step causing the platen to exert a final compressive side pressure on the bent rand. The cam, as here shown, has three concentric portions 26^a, 26^b and 26^c of different radii connected by eccentric portions as shown in Figs. 3 and 4. Said cam portions are so formed and proportioned that, when the cam is in the position shown in Fig. 3, it permits the carrier and platen to be fully raised by the spring 29. When the cam is moved to the position shown in Fig. 4, the concentric portion 26^b imparts a partial downward movement to the carrier and platen, and when the cam is moved from the position shown in Fig. 4 to bring its portion 26^c into engagement with the lever, it imparts an additional downward movement to the carrier and platen which causes the platen to coöperate with the bed 13 in imparting the desired compacting pressure on the sides of the rand. Each of the concentric portions of the cam is of such length that the carrier and platen remain in each of the three positions described, namely, its raised position, its partially depressed position, and its fully depressed position, for the length of time required to permit the insertion of a rand while the platen is fully raised, the operation of the bending instrumentalities while the plate is partly depressed, and the retention of the rand under pressure for a suitable length of time while the platen is fully depressed.

A rand, when inserted in the machine, is practically straight as shown by dotted lines in Fig. 2, the rand being placed in this position on the table 12 with the central portion of its inner edge resting on one end portion of the bed 13. The first depression of the platen causes the spur 31 to engage the central portion of the rand and confine it during the subsequent bending operation performed by means next described.

32, 32 represents a pair of rolls, the peripheries of which are preferably tapered. Said rolls are adapted to rotate loosely on studs 33 which are mounted on the swinging ends of arms 34, Fig. 2, said arms being pivoted at 35 to slide 36 movable in fixed guides 37 on the frame of the machine.

38, 38 represent curved slots formed in the table 12 and extending substantially parallel with the side portions of the bed 13 as shown in Fig. 2. The roller-carrying studs 33 extend through the slots 38 and are reciprocated therein by the slides 36, the swinging arms 34 permitting the rolls to follow the curvature of the curved slots or guides 38.

The slides 36 are reciprocated by mechanism, hereinafter described, the rolls being thus caused to move along the sides of the bed 13 and platen 17. The rolls in moving from the position shown in Fig. 3 to that shown in Fig. 4 cause the bending of the rand into heel form and insert all parts of its inner edge between the bed and platen, the latter being, as above stated, partially depressed so that it exerts practically no pressure on the rand. While the rolls 32 are in their forward position, shown in Fig. 4, the second downward movement is imparted to the carrier and platen by the portion 26^c of the cam, thus causing the platen and the bed 13 to coöperate in imparting the requisite compressive pressure to the bent rand, the rolls 32 remaining in their forward position during the application of this pressure. After the compressive side pressure has thus been imparted to the rand, and while the said pressure is maintained, the rolls 32 return to their rear position shown in Fig. 3, and exert an inward edgewise pressure on the outer edge of the rand, this pressure forcing inwardly any material of the rand which may have been caused to bulge outwardly at its outer edge by the side pres-

sure, and imparting to the outer edge of the rand a beveled form as illustrated in Fig. 10.

A rand of this character is usually composed of wedge-shaped layers cemented or otherwise secured, as represented in Fig. 11. I have found that a rand either made in layers, as shown, or in a single piece which is wedge-shaped in cross section, after being bent and pressed, has a tendency when the compressing pressure has been removed, to spring outwardly or partially straighten out the rand, losing a part of the curvature imparted to it by the forming and pressing instrumentalities. To prevent this change of form, I provide indenting dies 40 which are caused by the side pressure imparted to the rand to form indentations 41 therein, as indicated in Fig. 12, these indentations extending crosswise of the rand and being preferably arranged obliquely and at different angles as shown. I find that indentations thus formed, particularly in a pieced rand, are effectual in preventing the rand from departing from the form imparted to it by the bending and pressing instrumentalities above mentioned, the indentations stiffening the rand transversely and causing it to retain the shape imparted to it. The dies 40 are provided with ribs 42 adapted to form the indentations 41. Said dies in the embodiment of my invention here shown, are attached to the carrier 16 and project through the slots 43 in the platen 17, the length of the dies being such that, when the platen is normally held in its normal position by the spring 20, the ribs 42 are substantially flush with the pressing surface of the platen so that, when the second depression of the carrier and platen takes place and the platen yields somewhat to the surface of the rand against which it is pressed, the dies will be projected below the pressing surface of the platen as indicated by dotted lines in Fig. 8.

Mechanism which reciprocates the bending rolls 32 in this embodiment of my invention is as follows:—The slides 36, which carry the rolls 32, are provided with rack bars 44, each having two series of rack teeth 45 and 46 on its lower edge. To the shaft 27 is affixed two arms 47, each having a segmental series of rack teeth 48 at its outer end adapted to engage the rack teeth 46. 49 represents a shaft journaled in bearings on the frame of the machine and extending parallel with the shaft 27, the shafts 27 and 49 being connected to rotate in unison in opposite directions by gears 50 and 51. To the shaft 49 are affixed two arms 52, 52 each having a segmental series of rack teeth 53 at its outer end adapted to engage the rack teeth 45 on the bar 44. The driving shaft 54 of the machine is provided with a gear 55 meshing with a gear 56 affixed to the shaft 49. The arms 47 and 52 project in different directions from their centers of rotation as indicated in Fig. 3, and are so arranged that, when the rolls 32 and rack bars 44 are in the position shown in Fig. 3, they will remain in said position until the teeth 53 of the arms 52 reach the position shown by dotted lines in Fig. 3, and are thus caused to engage the teeth 45 of the bars 44. The engagement of the teeth 53 with the teeth 45 causes the rack bars 44 to move to the position shown in Fig. 4, the rolls 32 being moved forward through the described connections between them and the rack bars 44. The rolls remain in the last described position until the teeth of the arms 47, revolving in the direction indicated, engage the teeth 46 of the rack bar, this engagement causing the rack bars and the rolls 32 to move back to the position shown in Fig. 3.

The operation as a whole is as follows:— The operator first lays the unbent rand horizontally on the table 12, the bending rolls being retracted as shown in Figs. 1, 2 and 3. By referring to Fig. 2, it will be observed that the rolls 32, which constitute the means for bending the blank into heel form, are movable from and to a position relatively to the bed and platen to permit the rand to be inserted while in substantially straight condition. This feature, in connection with the fact that the bed is horizontal while the platen moves substantially vertically, enables the operator to either slide the unbent rand over the bed and under the platen, or to insert the rand endwise. When the rand is inserted, it rests easily in position on the horizontal bed, without requiring special means to control its position or to hold it stationary. And since it is in a position which can readily be seen, it is easy for the operator to properly locate it in the position shown in Fig. 2. Owing to the fact that the rand is in a horizontal position when resting on the table 12, no rand-securing means are necessary excepting the spur 31. The platen is then partially depressed sufficiently to cause the spur to engage the rand, after which the rolls 32 are moved forward, bending the rand and inserting all parts of its inner edge between the bed and platen. While the rolls are projected, the second depression of the platen takes place, the rand being thus depressed sidewise and its outer edge caused to bulge more or less. While the depression of the platen is maintained, the rolls move backwardly compressing the outer edge of the rand and forcing inwardly the bulging material thereof. After the rolls have been retracted, the platen is raised to its highest position and the completed rand is removed.

As above stated, the platen may be rigidly attached to the carrier 16, in which case the

yielding pressure of the platen necessary to accommodate it to the thickness of the rand, may be produced by a spring 56 interposed between the face plate 28 and the lever arm 25 as shown in Fig. 13.

I claim:

1. A rand machine comprising a fixed heel shaped bed, a platen opposed to said bed, means for moving the platen step by step toward the bed, and means for bending a blank into heel form between the bed and platen after the first and before the final movement of the platen, said means being movable from and to a position relatively to the bed and platen to permit the insertion of the rand in substantially straight condition.

2. A rand machine comprising a fixed horizontal heel shaped bed, a platen opposed to said bed, means for moving the platen step by step toward the bed, horizontally movable means for bending a blank into heel form between the bed and platen after the first and before the final movement of the platen, said means being movable from and to a position relatively to the bed and platen to permit the insertion of the rand in substantially straight condition and means for indenting the bent blank or rand.

3. A rand machine comprising a fixed horizontal heel shaped pressing bed, a platen carrier movable toward and from the bed, a heel shaped platen mounted on said carrier, means for imparting to the carrier two successive movements toward the bed, and horizontally movable means for bending a rand blank into heel form between the bed and platen after the first and before the final movement of the platen, said means being movable from and to a position relatively to the bed and platen to permit the insertion of the rand in substantially straight condition.

4. A rand machine comprising a fixed heel shaped pressing bed, a platen carrier movable toward and from the bed, a heel shaped platen mounted on said carrier, means for imparting to the carrier two successive movements toward the bed, and means for bending a rand blank into heel form between the bed and platen after the first and before the final movement of the platen, the carrier being provided with indenting dies adapted to indent the rand.

5. A rand machine comprising a fixed heel shaped pressing bed, a platen carrier movable toward and from the bed, a heel shaped platen mounted on the carrier, means for moving the carrier step by step toward the bed, a pair of bending and edge pressing rolls, and means for moving said rolls in curved paths along the side portions of the bed and platen, whereby a rand blank is bent and its arms are forced between the platen and bed, after the first movement of the platen, the outer edge of the bent rand being subsequently pressed inwardly by the rolls after the final movement of the platen.

6. A rand machine comprising a fixed heel shaped bed, a platen movable toward and from the bed, said parts having opposed convex pressing faces, and a pair of tapered rolls movable in curved paths along the sides of the bed and platen, means for pressing the platen toward the bed to press and concave the sides of a rand, and means for moving the rolls in their curved paths to bend, press and bevel the outer edge of the rand.

7. A rand machine comprising a fixed heel shaped bed, a carrier movable toward and from the bed, indenting dies affixed to the carrier, a platen mounted on the carrier, and having slots which receive said dies, the platen being movable to a limited extent independently of the carrier, a spring which normally backs the platen yieldingly, and permits it to be rigidly backed by the carrier, means for imparting to the carrier two successive movements toward the bed, and means for bending a rand blank into heel form between the bed and platen after the first and before the final movement of the platen.

8. A rand machine comprising a fixed heel shaped bed, a platen opposed to said bed, means for moving the platen step by step toward the bed, and means for bending a blank into heel form between the bed and platen after the first and before the final movement of the platen, said means including a pair of rolls, curved guides in which said rolls are movable, said guides being substantially parallel with the sides of the bed and platen, and mechanism for reciprocating the rolls in said guides.

9. A rand machine comprising a fixed heel shaped pressing bed, a lever fulcrumed on the frame of the machine, one arm of the lever constituting a platen carrier which is movable toward and from the bed, a platen mounted on said carrier, a cam engaging the other arm of said lever and adapted to impart successive movements thereto, and means for bending a rand blank into heel form between the bed and platen after the first and before the final movement of the platen.

10. A rand machine comprising a fixed heel shaped pressing bed, a lever fulcrumed on the frame of the machine, one arm of the lever constituting a platen carrier which is movable toward and from the bed, a platen mounted on said carrier, a cam engaging the other arm of said lever and adapted to impart successive movements thereto, a pair of blank bending rolls, curved guides in

which the rolls are movable along the sides of the bed and platen, and mechanism including a shaft which carries said cam, for reciprocating said rolls, said mechanism being timed to give the rolls their forward movement after the first and before the final movement of the platen, the return movement of the rolls occurring after the final movement of the platen, and while the rand is under pressure.

In testimony whereof I have affixed my signature, in presence of two witnesses.

EDWIN L. POPE.

Witnesses:

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