No. 792,298. PATENTED JUNE 13, 1905.

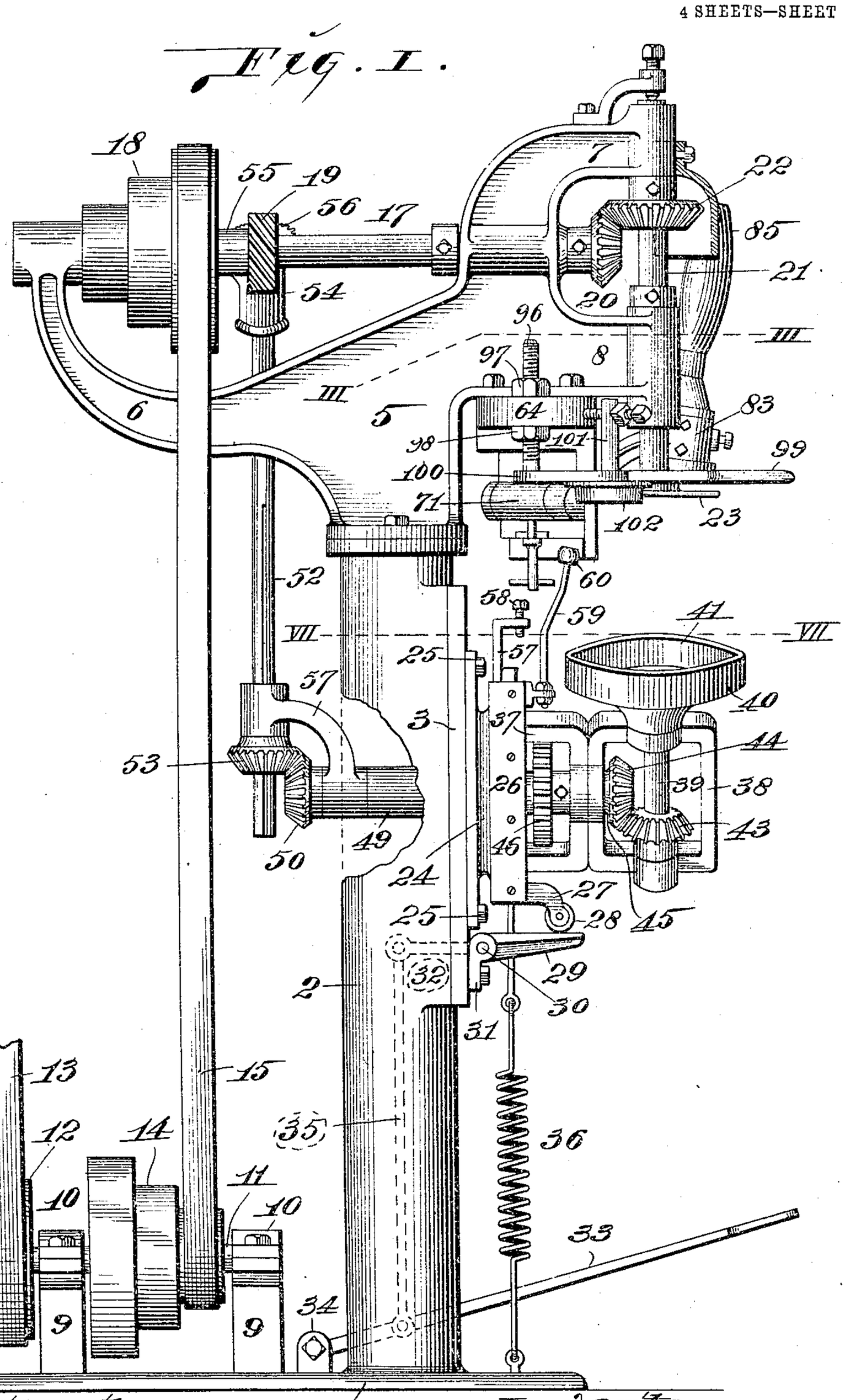
F. W. C. VOLKENING.

CAN SEAMING MACHINE.

APPLICATION FILED JUNE 20, 1904.

4 SHEETS—SHEET 1.

Fig. 1.




Attest:
M. P. Smith
E. C. Knight

1

Inventor:
F. W. C. Volkening.
By Wright, Brown & Quinby Attys

PHOTO LITHOGRAPHED BY SACKETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 792,298. PATENTED JUNE 13, 1905.

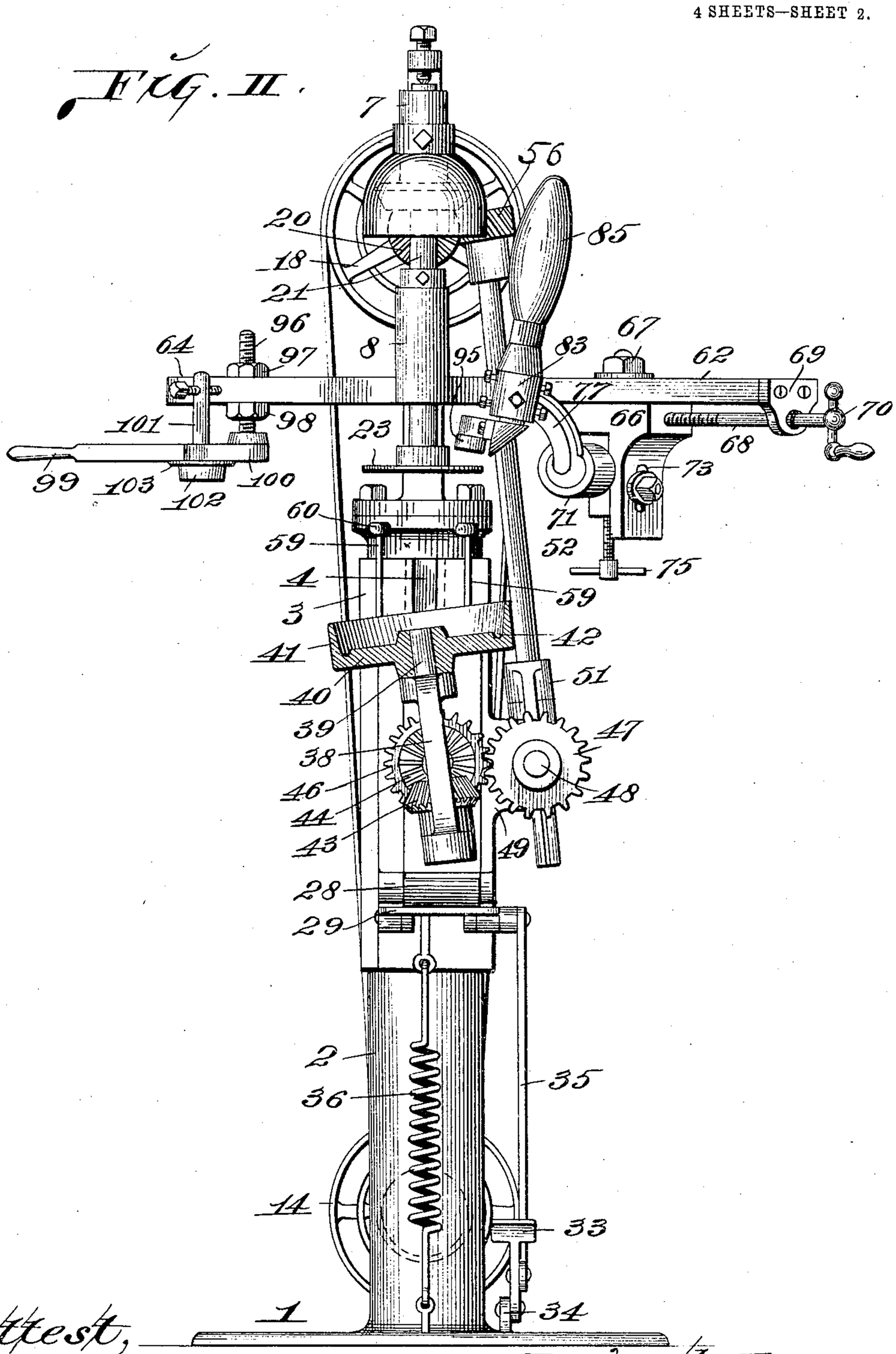
F. W. C. VOLKENING.

CAN SEAMING MACHINE.

APPLICATION FILED JUNE 20, 1904

4 SHEETS—SHEET 2.

FIG. II.




Attest,

W. F. Smith

E. L. Knight

Inventor:—

F. W. C. Volkening.

By Wright Bros

attys.

No. 792,298. PATENTED JUNE 13, 1905.

F. W. C. VOLKENING.

CAN SEAMING MACHINE.

APPLICATION FILED JUNE 20, 1904.

4 SHEETS—SHEET 3.

Fig. III.

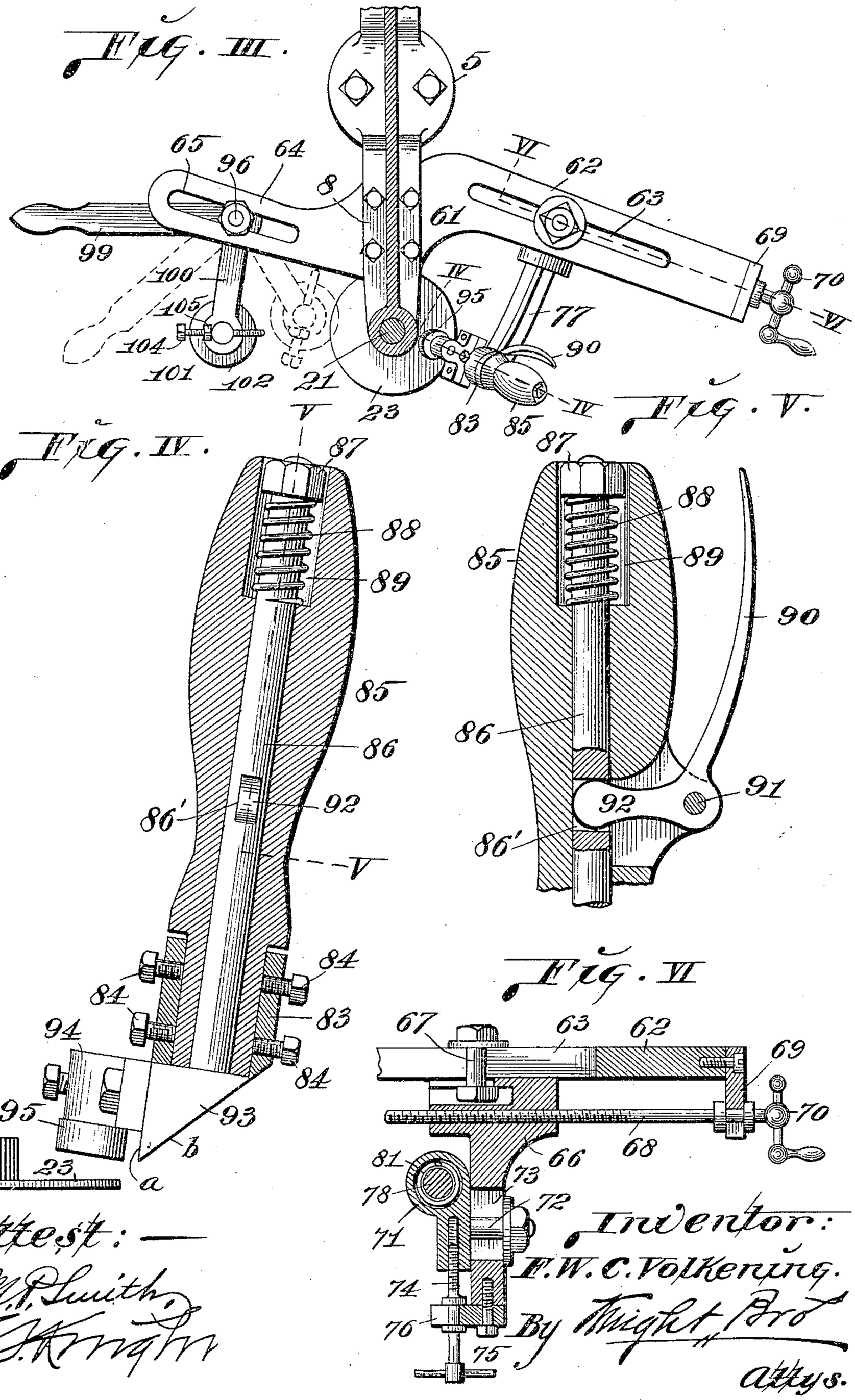



Fig. IV.

Fig. V.

Fig. VI




Attest:—

M. F. Smith,

E. Knight

Inventor:

F. W. C. Volkening.

By Wright Bro

Attys.

PHOTO LITHOGRAPHED BY SACKETT & WILHELMS LITHO & PTG. CO. NEW YORK.

No. 792,298. PATENTED JUNE 13, 1905.

F. W. C. VOLKENING.

CAN SEAMING MACHINE.

APPLICATION FILED JUNE 20, 1904.

4 SHEETS—SHEET 4.

FIG. VII.

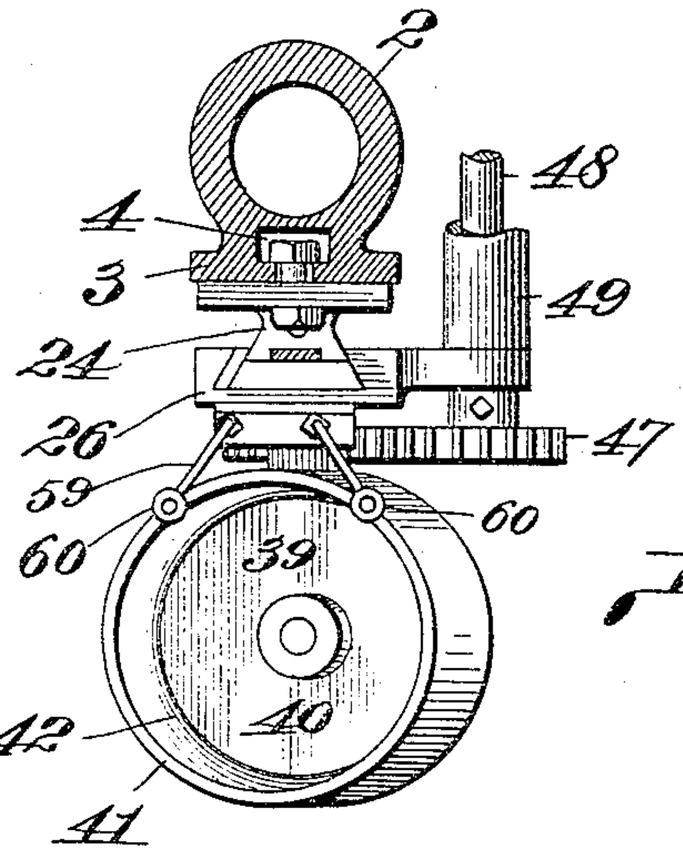



FIG. VIII.

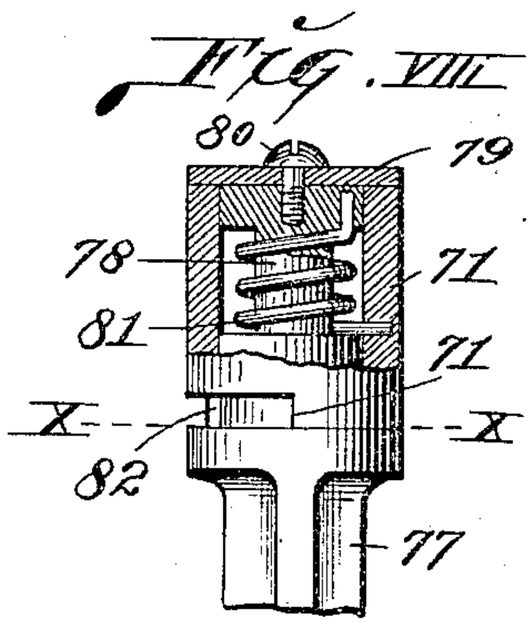



FIG. IX.

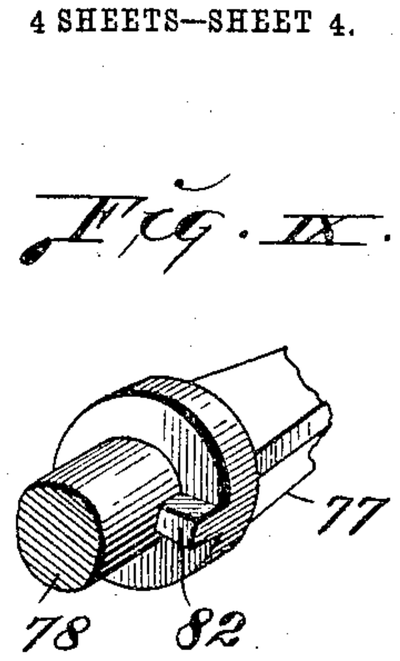



FIG. X.

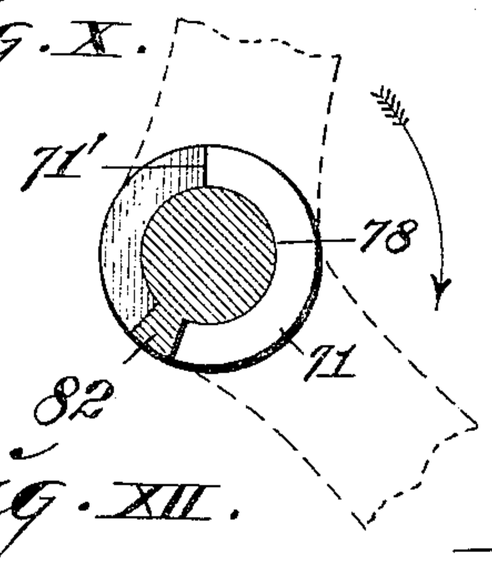



FIG. XI.

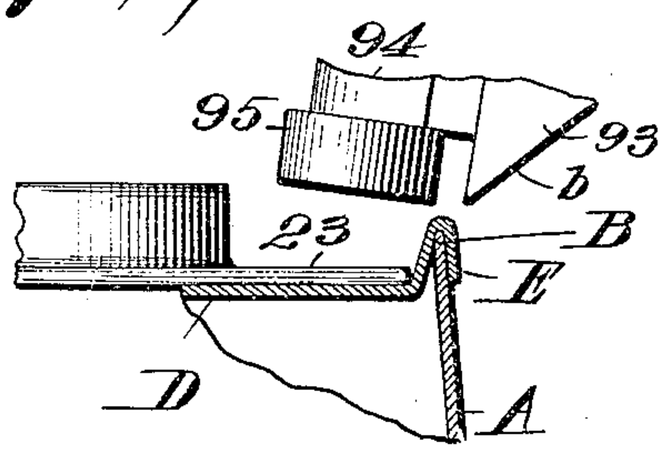



FIG. XII.

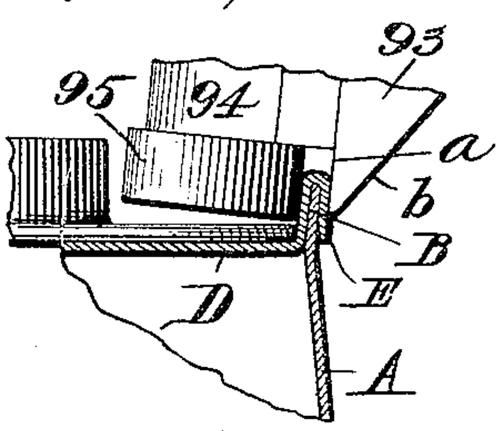



FIG. XIII.

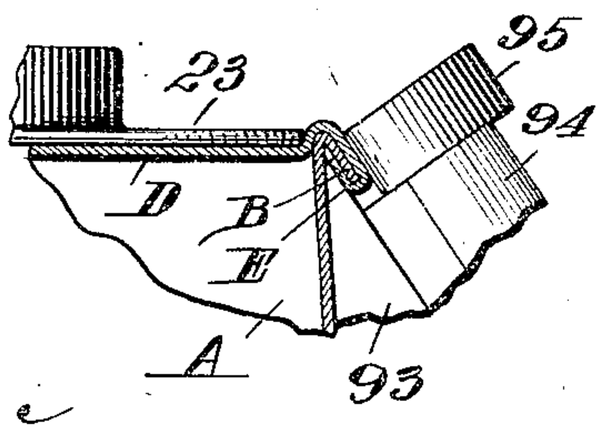



FIG. XIV.

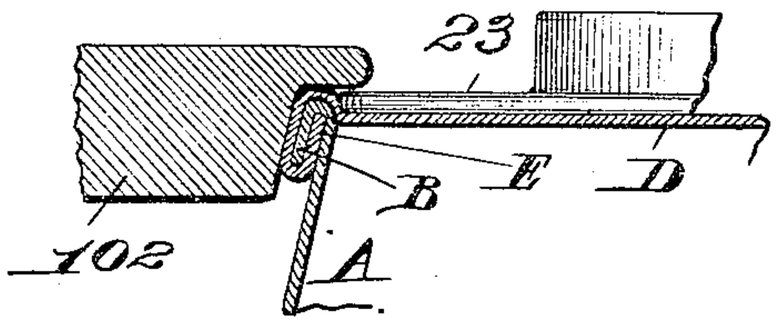
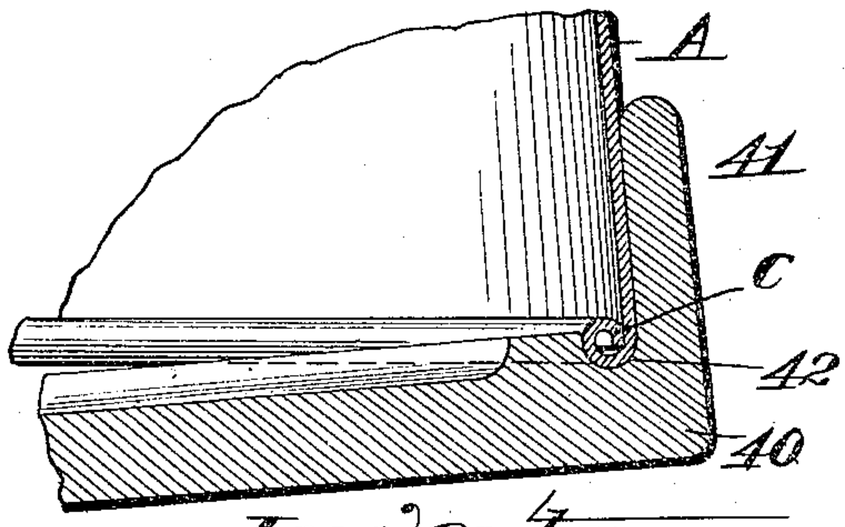



FIG. XV.




Attest.

M. P. Smith.

E. D. Knight

Inventor:

W. W. C. Volkening

By Wright Bro

Atty's

PHOTO-LITHOGRAPHED BY SACKETT & WILHELMS LITHO & PTG. CO. NEW YORK

No. 792,298. Patented June 13, 1905.

# UNITED STATES PATENT OFFICE.

FREDERICK W. C. VOLKENING, OF ST. LOUIS, MISSOURI.

## CAN-SEAMING MACHINE.

SPECIFICATION forming part of Letters Patent No. 792,298, dated June 13, 1905.

Application filed June 20, 1904. Serial No. 213,212.

*To all whom it may concern:*

Be it known that I, FREDERICK W. C. VOLKENING, a citizen of the United States, residing in the city of St. Louis, in the State of Missouri, have invented certain new and useful Improvements in Can-Seaming Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to a machine for forming the bottoms of sheet-metal cans and seaming them to the can-cylinders and also for beading the upper ends of the can-cylinders.

The object of the present improvement is to produce a machine by which the operations mentioned are carried on simultaneously in a single apparatus, thereby avoiding double handling of the cans in forming them.

Figure I is a side elevation of my machine. Fig. II is a front elevation. Fig. III is a horizontal section taken on line III III, Fig. I, with parts beneath and partially above said line shown in plan. Fig. IV is an enlarged vertical section taken on line IV IV, Fig. III. Fig. V is a longitudinal section taken on line V V, Fig. IV. Fig. VI is a vertical longitudinal section taken on line VI VI, Fig. III. Fig. VII is a horizontal section taken on line VII VII, Fig. I, with the bead-forming disk, gage-posts, and the members supporting said parts shown in plan. Fig. VIII is a view, partly in plan and partly in horizontal section, of the seaming-tool-supporting members. Fig. IX is a perspective view of a fragment of the seaming-tool-supporting arm. Fig. X is a cross-section taken on line X X, Fig. VIII. Fig. XI is a diagrammatical view illustrating the positions of parts of my machine just previous to the first seaming step. Fig. XII is a diagrammatical view illustrating the first seaming action. Fig. XIII is a diagrammatical view illustrating the second seaming action. Fig. XIV is a diagrammatical view illustrating the seam-flattening operation. Fig. XV is a diagrammatical view illustrating the formation of the top bead of the can.

1 designates the base of my machine, which is surmounted by a standard 2, on which is a face portion 3, that is provided with a vertical dovetail groove 4.

5 designates a frame having a rear arm 6 and forward arms 7 and 8, each of which terminates in a journal-box, the journal-box on the arm 6 being disposed horizontally and those on the arms 7 and 8 being disposed vertically, as seen in Fig. I.

9 designates posts surmounting the base 1 and equipped with journal-boxes 10, in which is mounted a driven shaft 11, provided with a main pulley 12, that receives power from any suitable source through the medium of a belt 13, applied thereto. On the shaft 11 is also a cone-pulley 14. 15 is a belt that operates on said cone-pulley.

17 designates a horizontal shaft which is journaled in the arms 6 and 7. Fixed to this shaft is a cone-pulley 18, that receives the belt 15, through the medium of which rotation is imparted to the shaft. Rigidly mounted on the shaft 17 is a worm 19 and also a bevel-pinion 20, to both of which more particular reference will hereinafter be made.

21 designates a vertical shaft journaled in the boxes of the frame-arms 7 and 8 and bearing intermediate of said arms a bevel-pinion 22, that meshes with the bevel-pinion 20 on the shaft 17. Fixed to the lower end of said vertical shaft is a platen-disk 23.

24 designates a dovetail guide-block that is connected to the face portion 3 of the standard 2 by bolts 25, (see Figs. I and VII,) that are seated in the vertical groove in the standard face portion.

26 is a slide loosely fitted to the dovetail of the slide-block 24 for vertical movement thereon. At the lower end of the slide 26 is an arm 27, in which is a roller 28.

29 is a lift-arm positioned beneath the arm 27 and its roller and pivoted at 30 in a bracket 31, supported by the standard 2. Extending rearwardly from said lift-arm is a crank-arm 32, (see dotted lines, Fig. I.)

33 is a foot-lever pivoted at 34 to the base 1 of the machine and united to the crank-arm 32 by a connecting-rod 35. When the foot-lever 33 is depressed, the lift-arm 29 is elevated through the medium of the connecting-rod 35 and crank-arm 32 to raise the slide 26.

36 is a return-spring connecting the slide 26 with the base of the machine to render the downward movement of said slide positive af-

ter downward pressure upon the foot-lever is discontinued in the practical operation of the machine.

37 and 38 are two frames arranged in alinement and carried by the slide 26, the said frames being disposed at a slight inclination to the axis of the standard 2 of the machine, as seen in Figs. I and II.

39 designates a shaft that is rotatably journaled in boxes carried by the frame 38 and which, due to the inclination of said frame, is placed at an angle to a vertical line. This shaft carries at its upper end a cup-shaped disk 40, which is provided with an annular rim 41, that is positioned at an angle to the horizontal by reason of the position of the shaft which carries it. In the bottom of the disk 40 is an annular groove 42. (See Figs. II, VII, and XV.)

The shaft 39 is rotated through the medium of the following mechanism: 43 (see Figs. I and II) is a bevel-pinion fixed to the shaft 39, and 44 is a bevel-pinion fixed to a stub-shaft 45, journaled in the frames 37 and 38 and the slide 26. 46 is a pinion fixed to the shaft 45. 47 is a pinion that meshes with the pinion 46. This last-named pinion is carried by a shaft 48, (see Figs. I, II, and VII,) which passes through a bearing-box 49, carried by the slide 26, so that any vertical movement imparted to said slide will be likewise imparted to said box and shaft. At the rear end of the shaft 48 is a bevel-pinion 50. 51 is a bearing-box that is fitted at one end to the shaft 48 forward of the pinion 50. 52 is a shaft having its lower end arranged in proximity to the rear end of the shaft 48 and which passes through the bearing member 51. Feathered to this shaft is a pinion 53, that meshes with the pinion 50. 54 is a bearing member hung at 55 upon the horizontal shaft 17 and through which the upper end of the shaft 52 passes. On the upper end of the shaft 52 is a worm-wheel 56, which meshes with the worm 19 on the shaft 17 for the purpose of imparting rotation to the shaft 52 during the rotation of said shaft 17.

57 designates a vertical arm surmounting the upper end of the slide 26 and fixed to the guide-block 24. This arm is outturned at its upper end, and in the outturned portion is a stop-screw 58, that serves to limit the upward movement of the slide 26, which travels toward it.

59 designates gage-posts carried by the slide 26 and positioned at the rear of the cup-shaped disk 40, each post being provided at its upper end with a roller 60, against which the cans to be operated upon rest during the acts of seaming them. These posts serve as gages against which the can-cylinders are placed when they are set into the disk 40 to provide for the accurate setting of the cylinders in said disk.

61 designates (see Figs. I, II, and III) a horizontal plate secured to the lower side of the machine-frame arm 8. This plate has an arm 62, provided with a longitudinal slot 63, and extends laterally from said frame-arm in one direction, and an arm 64, extending laterally from said frame-arm in the opposite direction. In the arm 64 is a longitudinal slot 65.

66 is a hanger that is adjustably fitted to the lower side of the plate-arm 62, to which it is connected by a bolt 67, that passes through the slot 63 in said arm.

68 is a shift-screw that is tapped into the hanger 66 and the outer end of which is rotatably seated in a bearing-plate 69, fitted to the end of the arm 62. 70 is a handle by which said shift-screw is rotated to impart reciprocation to said hanger 66 when the bolt 67 is in loosened condition.

71 designates a bearing-block that is adjustably secured to the hanger 66 by a supporting-bolt 72, which passes through a vertical slot 73 in said hanger (see Fig. III) and through the medium of which said block is held in a fixed position after it has been adjusted to the desired elevation. 74 is a shift-screw that is tapped into the lower end of said bearing-block and is provided with a handle 75. This shift-screw is rotatably seated in a bearing-plate 76, secured to the lower end of the hanger 66. When the clamp-bolt 72 is in loosened condition, the bearing-block may be adjusted vertically to any desired degree through the medium of said shift-screw, and the block may then be firmly secured in the adjusted position by the tightening of the nut on the clamp-bolt.

77 is a rocking arm that is provided with a shaft portion 78, which extends into the bearing-block 71, (see Figs. VI and VIII,) in which it is held by a cap-plate 79, that is connected to the end of the shaft portion by a screw 80, inserted through the cap-plate. The shaft portion of the rocking arm 77 is reduced within the bearing-block 71, and surrounding said shaft portion is a coil-spring 81, having one of its ends fixed to the shaft portion and the other end fixed to said bearing-block, as seen in Fig. VIII. On the shaft portion is a stop-lug 82, (see Figs. VIII, IX, and X,) which is positioned between a pair of shoulders 71′ at one end of the bearing-block. This stop-lug limits rotation of the rocking arm and its shaft portion. The rocking arm 77 extends upwardly from the bearing-block 71, and it carries at its free end a sleeve 83. (See Figs. I, II, III, and IV.) In said sleeve are set-screws 84. 85 is a grip-handle, the inner end of which is adjustably positioned in said sleeve, to which it is held by the set-screws 84.

86 is a reciprocating rod that passes longitudinally through the grip-handle and which bears at its outer end a nut 87. Surrounding said reciprocating rod is an expansion-spring 88, that occupies a recess 89 in the grip-han-

dle and is confined by the nut 87. (See Figs. IV and V.)

90 is an actuating-lever for the reciprocating rod 86, which is pivoted at 91 to the grip-handle 85 and has an arm 92, that extends into a slot 86′ in said reciprocating rod.

93 is a tapering seaming-head carried by the reciprocating rod 86 at its inner end and having the inclined face *b* and the straight working face *a* at its point.

94 is a bearing-box carried by the seaming-head 93, and 95 is a seaming-roller that opposes the working face *a* of the seaming-head and the shaft of which is journaled in the bearing-box 94.

The seaming-head 93 and its coexisting forming-roller are designed to be adjusted relative to the rocking-arm sleeve 83 by adjustment of the grip-handle 85 in said sleeve, so that said seaming members may be seated directly against said sleeve or positioned away from the sleeve to secure desired closeness of association between the seaming members and the platen-disk 23, adjacent to the edge of which the seaming members operate during the can-seaming operations.

96 (see Figs. I, II, and III) designates a screw-rod that passes through the slot 65 in the plate-arm 64. This screw-rod is held to said arm by upper and lower clamp-nuts 97 and 98. The screw-rod 96 occupies a vertical position, and loosely fitted to its lower end is a hand-lever 99, from the inner end of which extends an arm 100. In the arm 100 is rigidly seated a shaft 101, that carries a seaming-roller 102, journaled in its lower end. This seaming-roller is provided at its upper edge with an annular flange 103. (See Figs. I, II, and XIV.) The hand-lever 99 is adapted to be swung horizontally to bring the seaming-roller 102 to the edge of the platen-disk 23 by moving the arm 100 in a direction toward said disk, as illustrated in dotted lines, Fig. III, and when the arm is so moved the degree of throw thereof is limited by a stop-screw 104, that passes through the shaft 101 and the point of which is adapted to strike against the edge of the horizontal arm 64. The stop-screw is held in a set position by a jam-nut 105.

In Figs. XI to XV, inclusive, I have illustrated diagrammatically the various operations performed upon a can in my machine. In these views, A designates the cylinder of the can, having the bottom edge B and the top edge C, which, as illustrated, are in inverted positions. D is the can-bottom, that previous to being introduced into the machine is formed into the shape seen in Fig. XI and has the annular flange E, which occupies an angle to the plane of the main body of the bottom, so that it will fit exterior of the cylinder A.

In the practical operation of my machine the can-cylinders A are first set into the cup-shaped disk 40 of the machine, which is rotatably driven in connection with the other power-driven parts of the machine. When the can-cylinder is put in place in said disk, with the bottom D resting thereon, it is in inverted position, with its top edge resting in the groove 42 of said disk, which, as hereinbefore explained, is set at an angle to a horizontal line. Instead of the cylinder seating completely in said groove it is upheld in horizontal position by the posts 59, so that the top edge of the cylinder will rest only at one point in the disk-groove, that point being at the most elevated point of the disk, as seen in Fig. XV. The operator by placing his foot upon the foot-lever 33 causes the lift-arm 29 to be thrown upwardly, due to its connection with said foot-lever, and as a consequence the slide 26 is reciprocated vertically to elevate the cup-shaped disk, due to its being carried by the frames 37 and 38, that are supported by said slide. The can seated in the disk 40 is therefore raised into a position that will cause its bottom D to be brought against the lower side of the platen-disk 23, as seen in Fig. XI. It will be seen that at this time the edge of the can-bottom D projects beyond the platen-disk and overhangs the bottom edge of the can-cylinder and that the seaming members 93 and 95 are positioned immediately above the edge of said disk and the edge of the bottom of the can. The operator then grasps the grip-handle 85 and its lever 90, and by pressing said lever to said handle inward reciprocation of the reciprocating-rod 86 is caused to lower the point of the seaming-head 93 to a position against the outer face of the can-bottom flange E and the seaming-roller 95 to a position against the inside face of the fold of said can-bottom, as seen in Fig. XII. When the seaming members are so lowered, the fold of the can-bottom rotates between said members and the fold is compressed to the bottom edge of the can-cylinder, due to its being spun between the seaming members. The operator next, without releasing his hold upon the grip-handle 85 and its lever, swings said handle downwardly to bring the seaming members 93 and 95 into the position seen in Fig. XIII, during which they carry the fold of the can-cylinder and its flange folded thereover in a downward direction. This movement of the grip-handle and the seaming members is permitted by the rotatable mounting of the rocking arm 77 in the bearing-block 71, which rotation is limited by the stop-lug 82, that operates between the shoulders 71′ and said bearing-block. After the edges of the can-cylinder and the bottom applied thereto have been folded over into the condition seen in Fig. XIII the lever 90, carried by the grip-handle 85, is released, thereby permitting action of the spring 88 to retract the rod 86 and carry the seaming members 93 and 95 away from the fold. The rocking arm 77 is then rocked reversely, and when it is moved into its elevated

position it is upheld by the coil-spring 81, surrounding the shaft portion of said arm. The seaming-roller 102 is next brought into action by swinging the hand-lever 99 horizontally to throw its arm 100 toward the platen-disk 23 and the partially-crimped can thereon, with the result that said seaming-roller is brought into bearing against the downwardly-extending fold of the can-cylinder and its bottom, thereby pressing said fold inwardly into the condition seen in Fig. XIV, whereby the fold is flattened against the outer face of the can-cylinder, this being the final operation in forming said fold and being accomplished by the fold spinning against the perimeter of the seaming-roller 102. While the perimeter of said roller is operating against the can-fold its flange 103 overhangs the bottom edge of the can and prevents bulging of the crimped fold.

During the procedure of bending the fold at the bottom of the can by the steps that have been described the top edge C of the can-cylinder in its inverted position rests in the groove 42 of the cup-shaped disk 40 at the highest point in said groove, as explained, and due to the thrust exerted against said edge of the cylinder the edge is curled inwardly into a bead, as seen in Fig. XV, to give finish to the top edge of the can.

I claim as my invention—

1. In a can-seaming machine, the combination of a disk, a second bead-forming disk rotatably mounted and positioned at an angle with respect to the axis of said first-named disk and provided with a groove located at its side facing said first-named disk, and means for seaming the bottom and cylinder of a can positioned between said disks simultaneously with the bead-forming action, substantially as set forth.

2. In a can-seaming machine, the combination of an upper platen-disk, a lower bead-forming disk rotatably mounted and having its axis at an angle to the axis of said platen-disk, gage-posts located alongside of said bead-forming disk, and means for seaming the bottom of the can to its cylinder, substantially as set forth.

FREDERICK W. C. VOLKENING.

In presence of—
E. S. KNIGHT,
BLANCHE HOGAN.