Dec. 7, 1926. 1,609,986

J. BRENZINGER

FLANGING MACHINE

Filed Sept. 22, 1923 7 Sheets-Sheet 1

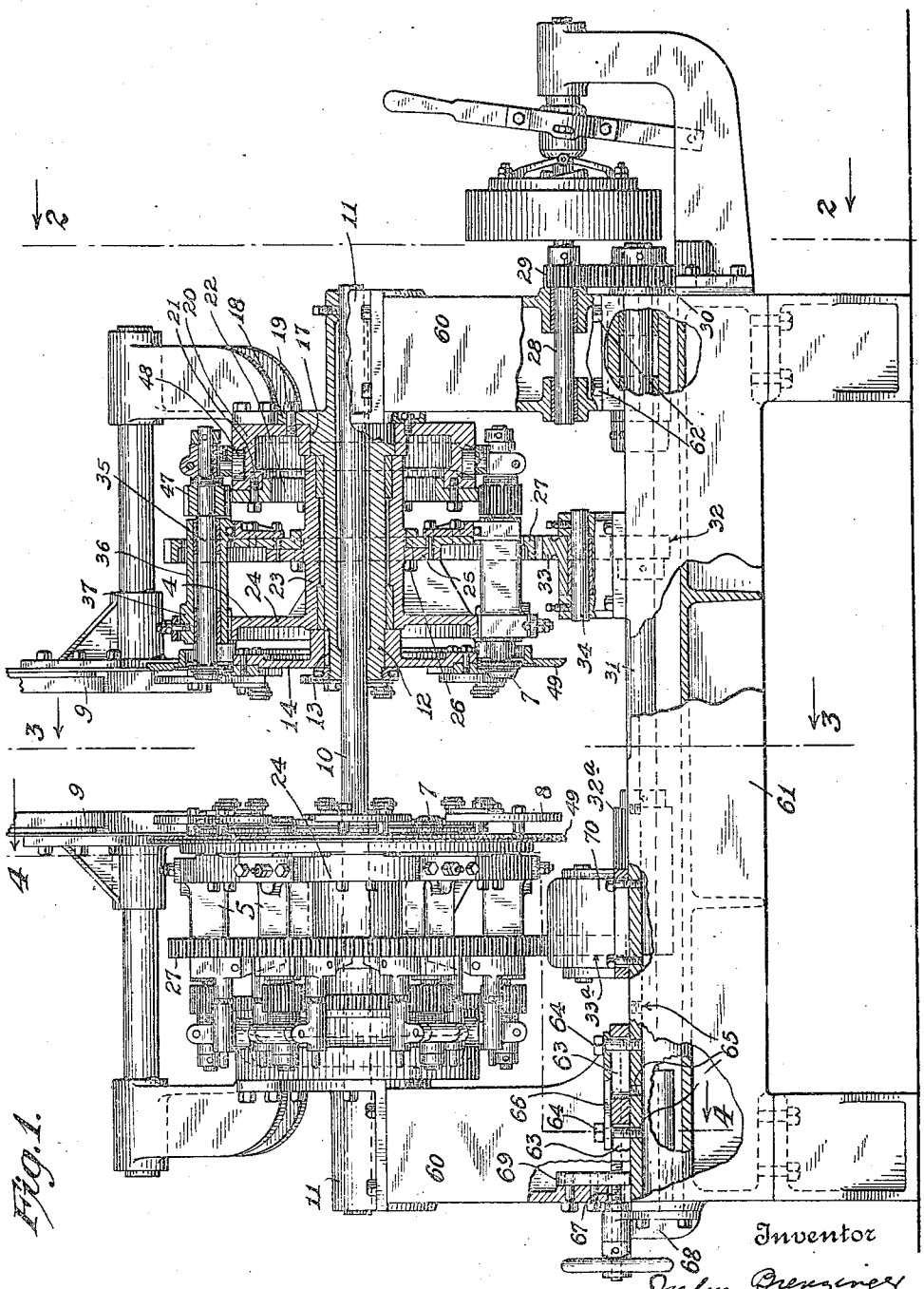


Fig. 1.

Inventor
Julius Brenzinger
By his Attorney
Karl W. Becker

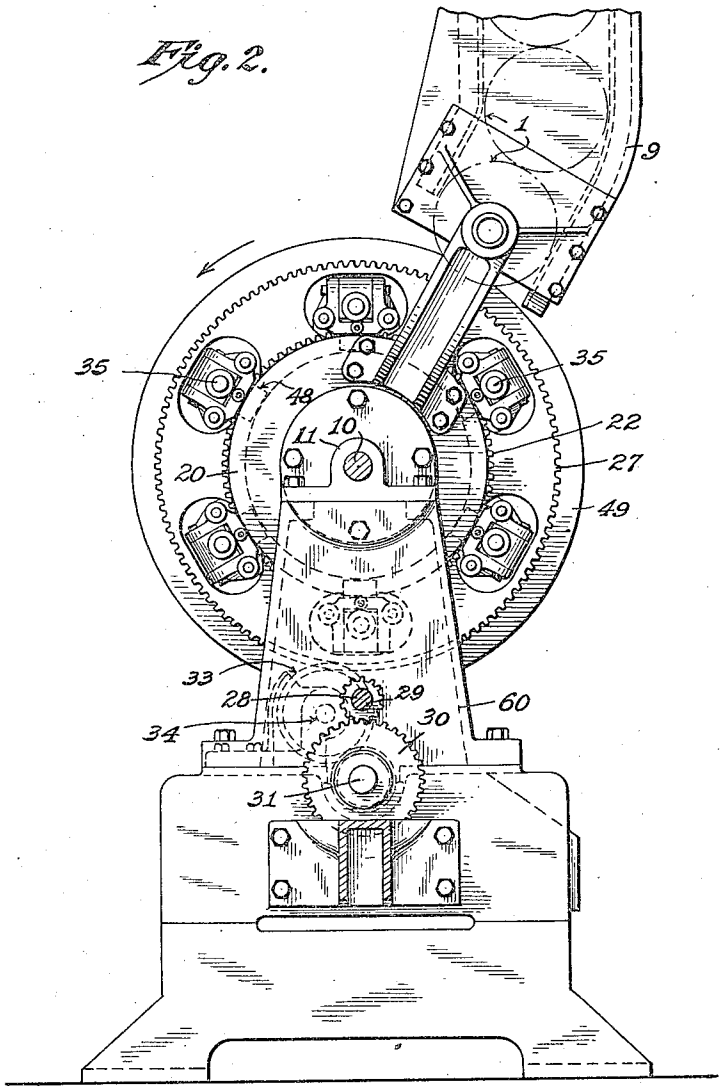
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J. BRENZINGER

FLANGING MACHINE

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Fig. 2.



Inventor
Julius Brenzinger
By his Attorney

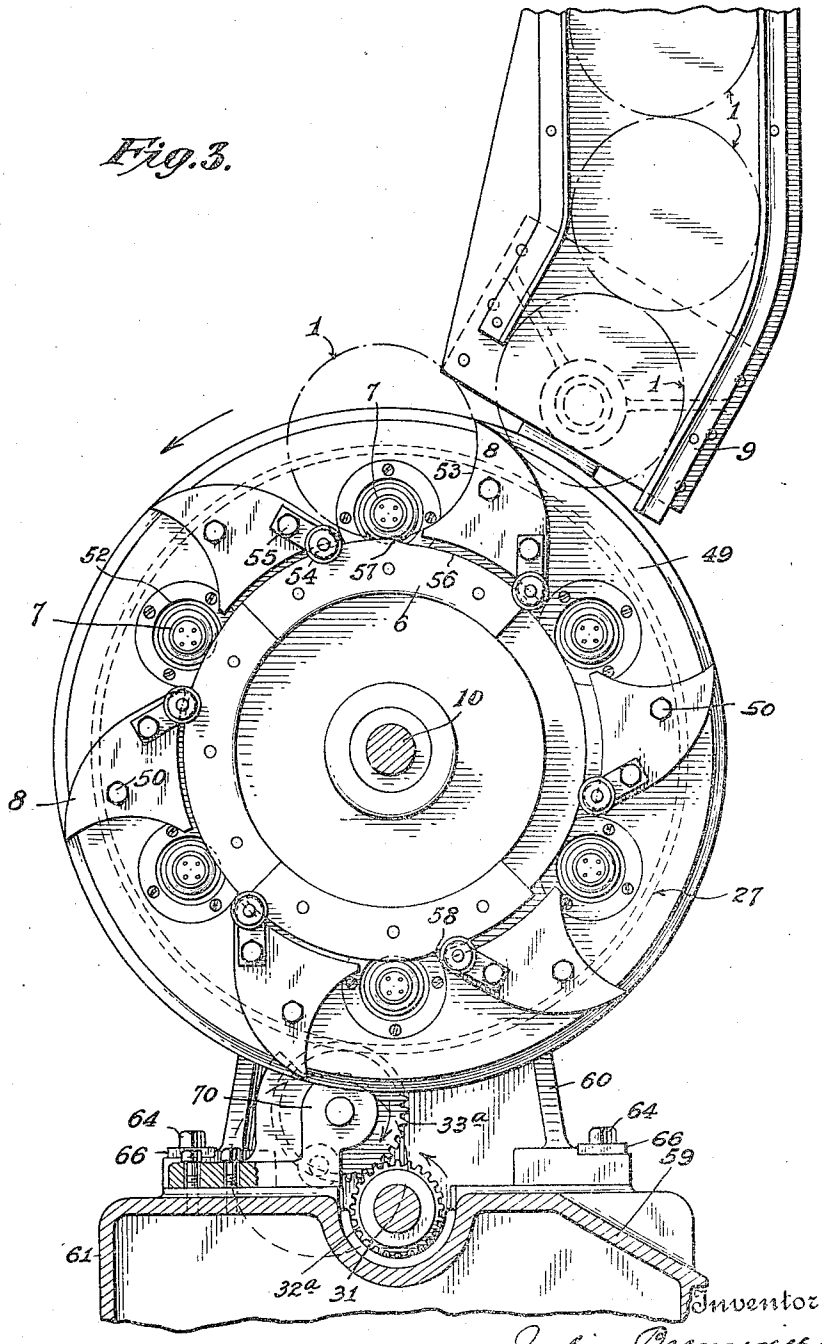
Dec. 7, 1926. 1,609,986

J. BRENZINGER

FLANGING MACHINE

Filed Sept. 22, 1923 7 Sheets-Sheet 3

Fig. 3.



Inventor
Julius Brenzinger
By his Attorney
Paul Pearson

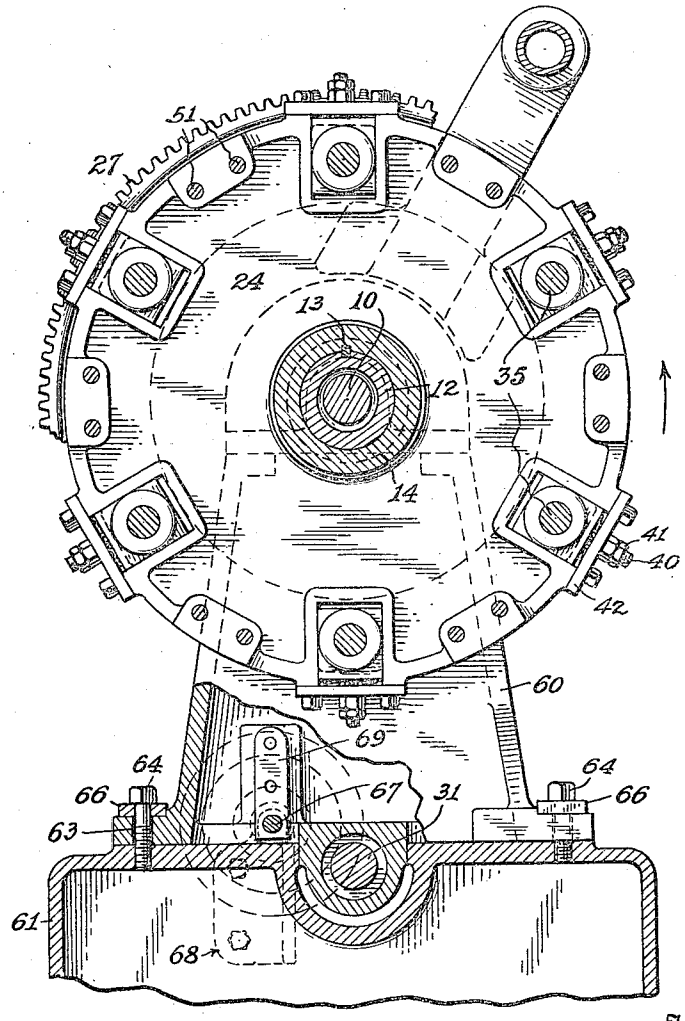
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J. BRENZINGER

FLANGING MACHINE

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Fig. 4.



Inventor

Julius Brenzinger

By his Attorney

Wm. Becker

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J. BRENZINGER

FLANGING MACHINE

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Fig. 5.

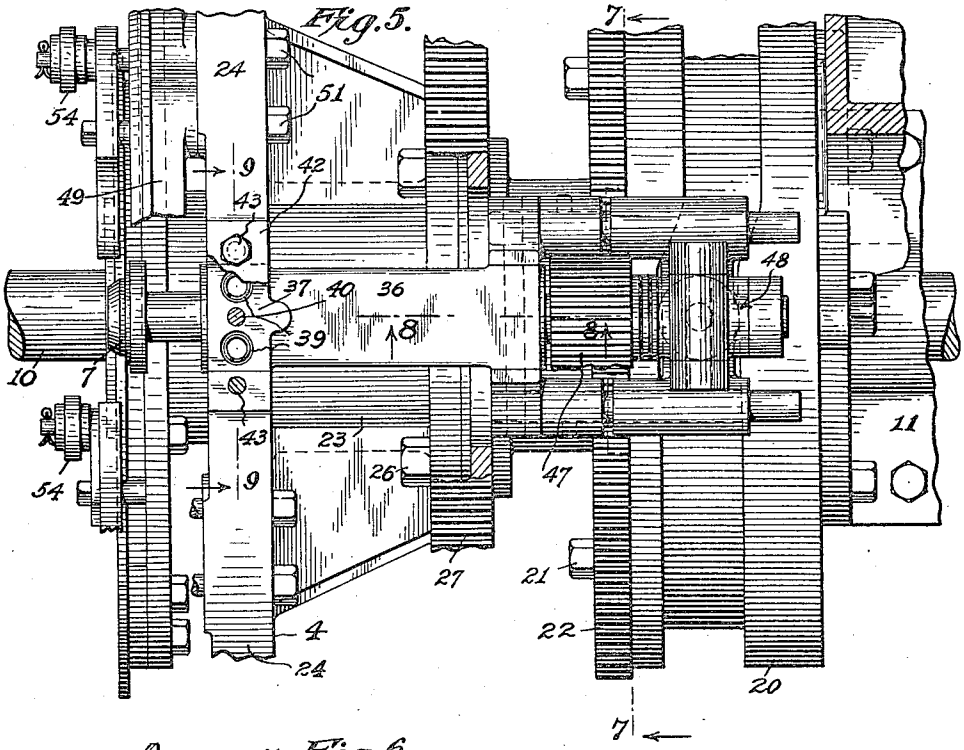
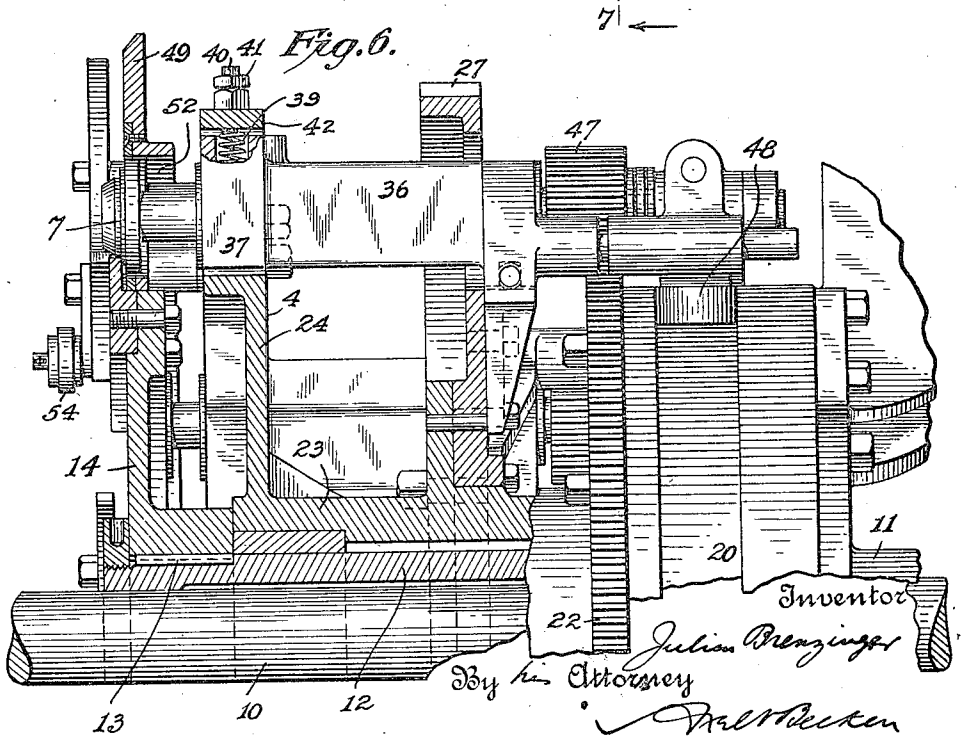


Fig. 6.



Inventor
Julian Brenzinger
By his Attorney
Karl Becker

Dec. 7, 1926. 1,609,986

J. BRENZINGER

FLANGING MACHINE

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Fig. 7.

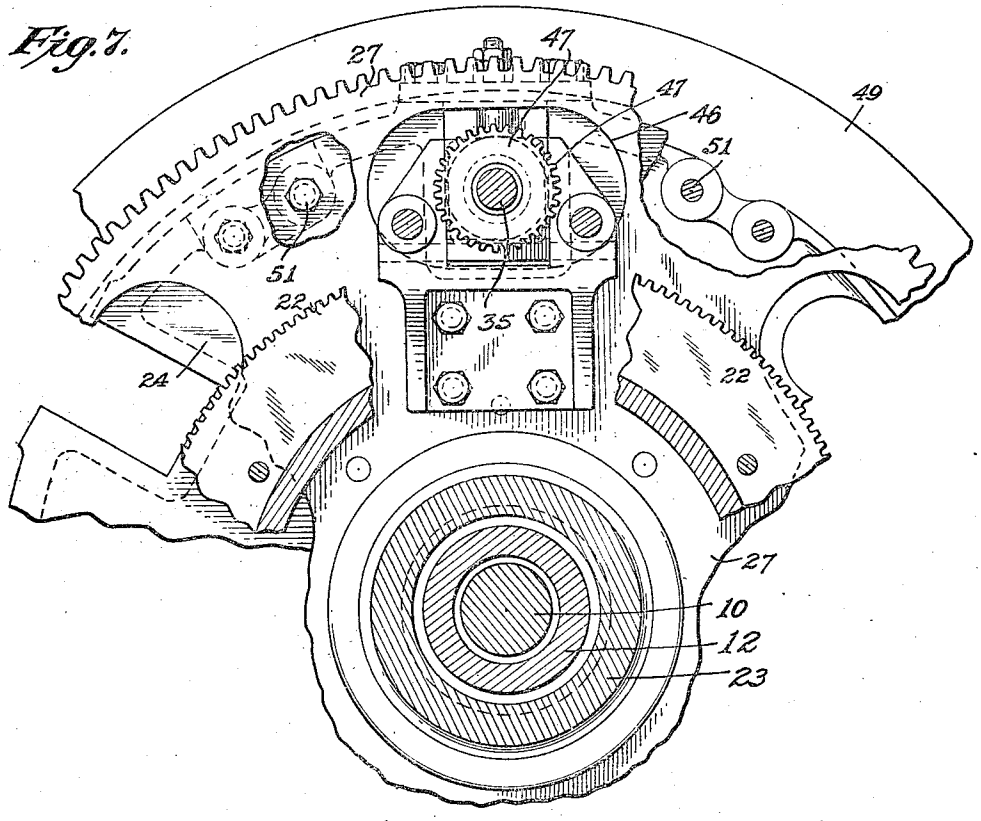


Fig. 8.

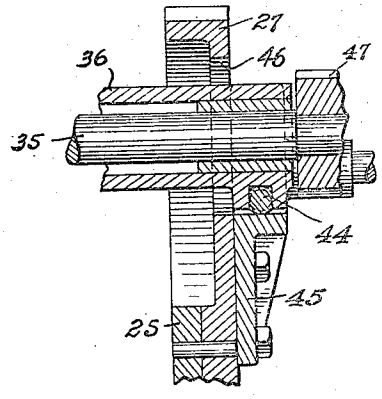
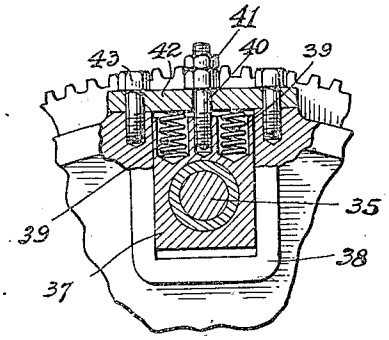


Fig. 9.



Inventor

Julius Brenzinger

By his Attorney

Wm. H. Becker

Dec. 7, 1926. 1,609,986

J. BRENZINGER

FLANGING MACHINE

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Fig. 12.

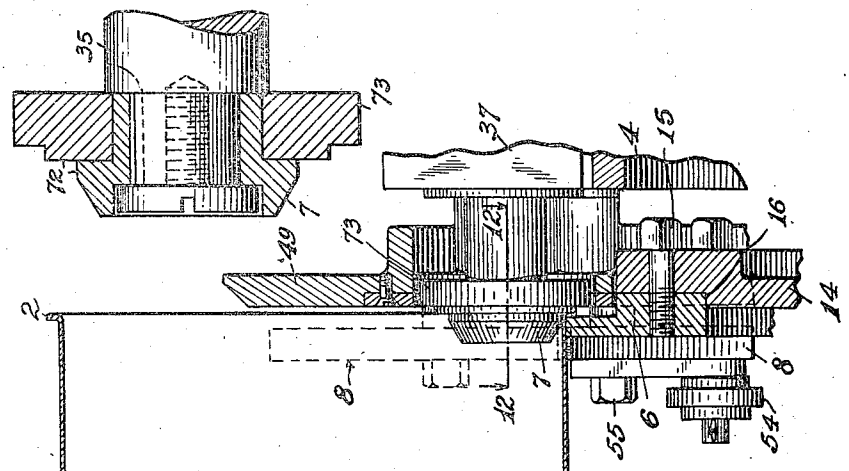


Fig. 10.

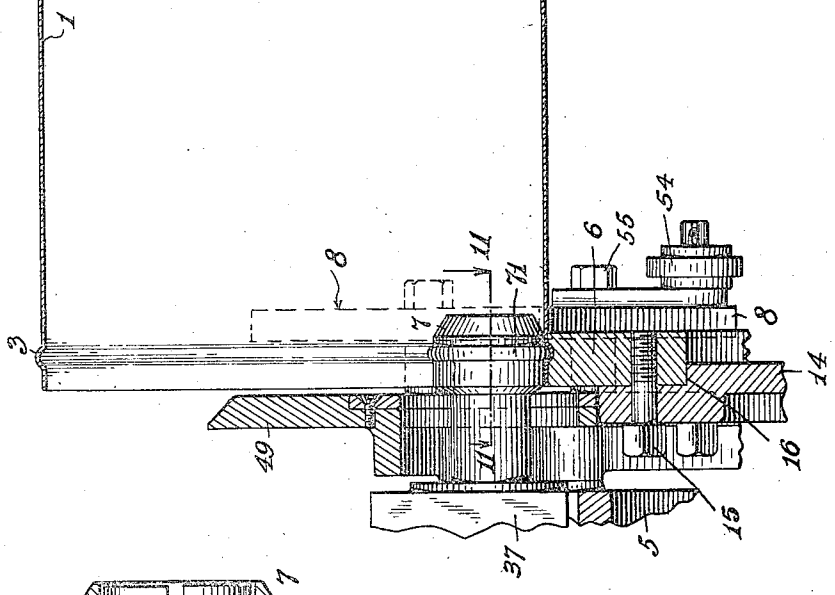
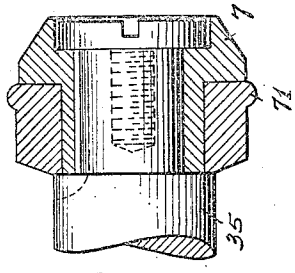


Fig. 11.



Inventor
Julius Brenzinger
By his Attorney
Fred Becker

Patented Dec. 7, 1926. 1,609,986

UNITED STATES PATENT OFFICE.

JULIUS BRENZINGER, OF FAIRFIELD, CONNECTICUT, ASSIGNOR TO THE MAX AMS MACHINE COMPANY, OF BRIDGEPORT, CONNECTICUT, A CORPORATION OF NEW YORK.

FLANGING MACHINE.

Application filed September 22, 1923. Serial No. 664,143.

This invention relates to a machine for flanging, beading or otherwise shaping by pressure bodies of sheet material and has more particularly reference to a machine which will act simultaneously on both ends of a body of sheet material.

The main object and feature of the invention is the production of a machine for quickly and efficiently shaping previously formed bodies of sheet material coming in a constant stream from a hopper or from a body-forming or other machine, the bodies being fed automatically to the machine, properly positioned therein with respect to the shaping tools, shaped while traveling through the machine and finally automatically delivered. In this manner a greatly increased production is obtained.

Other features of invention will appear as the specification proceeds.

In the accompanying drawings the invention is embodied in a concrete and preferred form in which:

Figure 1 is a front elevation of a machine embodying the invention, partly in section.

Fig. 2 is a transverse sectional view on the plane of line 2—2 of Fig. 1.

Fig. 3 is a transverse sectional view on the plane of line 3—3 of Fig. 1.

Fig. 4 is a transverse sectional view on the plane of line 4—4 of Fig. 1.

Fig. 5 is a detail plan view, partly broken away and in section, of the upper right hand end of Fig. 1.

Fig. 6 is a detail side elevation, partly in section, of the parts shown in Fig. 5.

Fig. 7 is a transverse sectional view, partly broken away and fragmentary, on the plane of line 7—7 of Fig. 5.

Fig. 8 is a detail sectional view on the plane of line 8—8 of Fig. 5.

Fig. 9 is a fragmentary detail sectional view on the plane of line 9—9 of Fig. 5.

Fig. 10 is more or less of a diagrammatic vertical sectional view of the central part of the machine, showing a body of sheet material being acted upon.

Figs. 11 and 12 are detail sectional views showing different shaping tools that may be employed in connection with the invention.

The body 1 of sheet material shown in Fig. 10 is here illustrated as a tin can body open at both ends. This body may be subjected to a variety of different shaping operations and either one or both ends may be acted upon by the machine. For the sake of illustration the body is represented in Fig. 10 as being provided with a flange 2 at one end and a bead 3 at the other end.

In the preferred embodiment of the invention shown in the accompanying drawings a revolving cradle is shown, this being conveniently formed by two heads 4 and 5 rotating in unison (Fig. 1) which serve to support on a concave surface one or more bodies of sheet material and to carry them over the preferably stationary and convex surface of a shaping tool 6 which latter engages with the outer surface of the body (Figs. 3 and 10), another convex shaping tool as 7 engaging with the interior of the body. This shaping tool 7 revolves with one of the heads and also has a rotating motion about its own axis and by the combined action of the shaping tools causes rotation of the body in its cradle and imparts to it the shape desired. Preferably the machine is provided with a plurality of cradle members 8 so that a constant procession of bodies may pass through the machine and preferably a plurality of shaping tools as 7 is provided on the head, one for each body. The bodies may be fed to the machine in any suitable way as by means of chute 9 which drops them on successive cradle members. The heads are here mounted on a stationary shaft 10 mounted in bearings 11. Since both heads are constructed alike, only one need be described in detail.

Surrounding shaft 10 and conveniently forming a part of bearing 11 is a stationary sleeve 12 to one end of which is mounted fast, as by key 13, a shaping tool support 14 which carries, as by means of bolts 15, stationary shaping tool 6. This tool is segmental-shape and is conveniently seated in a recess 16 of the shaping tool support. Near the other end of said sleeve is a supporting surface 17 and a flange 18 to which is fixed by means of bolts 19 a stationary cam 20 and to the latter is in turn secured by bolts 21 a gear 22, said cam and gear being hollow as shown. Interposed between cam 20 and stationary shaping tool support 14 and surrounding stationary sleeve 12 is the revoluble head 4 (or 5 as the case may

be) consisting here of a sleeve 23 having two circumferential upstanding members or flanges 24 and 25. Secured to flange 25 by means of bolts 26 is a gear 27. Any suitable means may be provided for rotating said gear and thereby the head. In the present instance these means take the following form: 28 is a power shaft suitably mounted in the framework and carrying a pinion 29 meshing with a gear 30 mounted on countershaft 31. Mounted on the countershaft is a pinion 32 meshing with intermediate gear 33 carried by stub shaft 34. Gear 33 meshes with main gear 27 of the head. 35 indicates a shaping tool spindle or shaft of which there may be, and in the present instance are, a number in each head. Each shaft 35 is mounted in a bearing 36 that forms at one end a sliding box 37 mounted in a bearing bracket 38 formed in flange 24 (Figs. 5, 6, 7 and 9). Springs 39 normally tend to press the sliding box downward, and the latter is held adjustable by means of set screw 40 and lock nut 41, the springs being confined by means of cap piece 42 and bolts 43. The other end of bearing 36 is pivotally mounted at 44 (Fig. 8) in bearing bracket 45 bolted to gear 27, gear 27 being formed with an opening 46 to permit the bearing to extend therethrough. When sliding box 37 is adjusted, bearing 36 will rock on pivot 44 and, by this means, pressure of the shaping tool 7 against the body may be regulated. 47 indicates a pinion mounted on spindle 35 meshing with stationary gear 22 whereby revolution of the head causes rotation of the spindle around its own axis. 48 is a cam roll carried by the spindle and engaging with stationary cam 20 whereby said spindle is reciprocated in bearing 36 to move the shaping tool in and out of engagement with the body of sheet material, the pinion 47 remaining in mesh with gear 22 in either of its positions and also during its sliding movement.

Cradle members 8 are adjustably secured to circumferential cradle member support 49 (Figs. 3, 5, 6 and 7) by means of bolts 50, and support 49 is carried on flange 24 of the head by means of bolts 51. Support 49 is provided with openings 52 through which shaping tools 7 project. Each cradle member 8 is provided with an arc-shape surface 53 and with a guide roller 54 adjustably supported by set-screw 55. Roller 54 extends rearwardly and cooperates with the succeeding cradle member 8 to support the body of sheet material.

Bodies of sheet material coming from chute 9 are received between a cradle member 8 and a roller 54 in each head 4 and 5 whereby the body is supported at its opposite ends between the two heads rotating in unison. During the revolution of the heads, the body is carried over stationary segmental shaping-tools 6 which engage with the outer surface of the bodies. Up to this time shaping tools 7 have occupied a retracted position within the heads but now move outwardly and within the bodies to engage its inner surface. This occurs while the body is traveling over the low portion 56 (Fig. 3) of stationary shaping members 6 so as to permit shaping tools 7 to pass over the material of the body. The body now strikes the raised surface 57 of the stationary shaping members and is then pinched between the shaping tools 6 and 7. This causes the body to rotate around its own axis and to receive the shape intended, and the operation continues until the body reaches low surface 58 when shaping tools 7 are retracted and the body falls out of the cradle and rolls down over chute 59.

Guide rollers 54 are adjusted in accordance with the size of the body to be acted upon. When the inner tool 7, which rotates in a direction opposite to the direction of revolution of the head, begins to act on the body at the point 57 said body tends to move away from roller 54 and toward cradle member 8 so that, owing to its rotation against arc-shape surface 53, the body is not merely shaped by the tools but is also rounded.

Suitable means are provided for moving the heads closer together or farther apart, these means in the present instance taking the following form: Bearings 11 are carried by brackets 60 the latter mounted on base plate 61, one stationarily and the other adjustably. Viewing the machine as in Fig. 1, the right hand bracket is bolted fast to the bed plate by means of bolts 62, whilst the left hand bracket is provided with elongated slots 63 through which pass bolts 64 engaging tapped holes 65 in the bed plate. 66 is a clamping bar through which bolts 64 pass. To facilitate adjustment of the bracket a threaded stem 67 is rotatably mounted in bearing 68 bolted to the bedplate and this stem engages a threaded opening in plate 69 bolted to the bracket. In order to compensate for this adjustment, gear 32^a on shaft 31 is of unusual length and bearing 70 that carries the shaft of gear 32^a is made adjustable on the base plate by means of bolts and slots so that gear 33^a will be properly alined with gear 27 of head 5.

In Figs. 11 and 12 are shown examples of the rotatable shaping members or rollers that may be employed. In order to roll bead 3, a roller with a circumferential flange 71 is employed while in order to roll flange 2 a roller with a stepped face 72 is employed. When the rollers working at opposite ends of the blank are engaging the blanks at different diameters there would be a tendency to twist the blank in view of the fact that the blank is rotated by friction. To prevent this from occurring one of the rollers, say

the one shown in Fig. 12, may have member 73 mounted loosely so that it need not follow the timed rotation of spindle 35.

I claim:—

1. A machine of the character set forth comprising: a stationary segmental shaping tool to engage the exterior of a body of sheet material, a revolving cradle to support a body of sheet material and to carry it over the surface of the shaping tool, a second shaping tool revolving in unison with the cradle and rotatable about its own axis to engage the inner surface of the body and to press it against the first shaping tool thereby causing the body to revolve in the cradle, and means for reciprocating the second shaping tool longitudinally of the body to bring it into and out of engagement with the body.

2. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool to engage the exterior of a body of sheet material, a revolving head on said supporting member, a plurality of cradle members carried by the revolving head to support bodies of sheet material and to carry them over the surface of the shaping tool, a plurality of spindles carried by the revolving head, means for rotating said spindles, means for reciprocating said spindles, and other shaping tools carried by the spindles to engage the inner surface of the bodies and to press them against the stationary shaping tool to thereby revolve the bodies in the cradle members.

3. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool to engage the exterior of a body of sheet material, carried by said member, a revolving head on said member, a cradle member support carried by said head and having openings therein, a plurality of cradle members on said cradle member support to support bodies of sheet material and to carry them over the surface of the stationary shaping tool, a plurality of spindles carried by said revolving head, means for rotating said spindles, means for reciprocating said spindles through the openings in the cradle member support, and other shaping tools carried by the spindles to engage the inner surface of the bodies and to press them against the stationary shaping tool to thereby revolve the bodies in the cradles.

4. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool to engage the exterior of a body of sheet material, a revolving head on said member, a plurality of cradle members carried by the revolving head to support bodies of sheet material and to carry them over the surface of the shaping tool, a plurality of spindles carried by the revolving head, means for rotating said spindles, a stationary cam on the shaft for reciprocating said spindles, and other shaping tools carried by the spindles to engage the inner surface of the bodies and to press them against the stationary shaping tool to thereby revolve the bodies in the cradle members.

5. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool, to engage the exterior of a body of sheet material, carried by said member, a revolving head on said member, a cradle member support carried by said head and having openings therein, a plurality of cradle members on said cradle member support to support bodies of sheet material and to carry them over the surface of the stationary shaping tool, a plurality of spindles carried by said revolving head, means for rotating said spindles, a stationary cam on the supporting member for reciprocating said spindles through the openings in the cradle member support, and other shaping tools carried by the spindles to engage the inner surface of the bodies and to press them against the stationary shaping tool to thereby revolve the bodies in the cradle.

6. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool, a revolving head on said member, a plurality of spindles carried by the revolving head, means for rotating the spindles, means for reciprocating said spindles, and other shaping tools carried by the spindles to coact with the stationary shaping tool.

7. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool, a revolving head on said member, a plurality of spindles carried by the revolving head, a pinion carried by each spindle, a stationary gear on the supporting member for engagement with the pinions to rotate the spindles, means for reciprocating the spindles, and other shaping tools carried by the spindles to coact with the stationary shaping tool.

8. A machine of the character set forth comprising: a stationary supporting member, a stationary shaping tool, a revolving head on said member, a plurality of spindles carried by the revolving head, a pinion carried by each spindle, a stationary gear on the supporting member for engagement with the pinions to rotate the spindles, a stationary cam on the supporting member for reciprocating the spindles, and other shaping tools carried by the spindles to coact with the stationary shaping tool.

9. In a machine of the character set forth comprising: a stationary supporting member, a segmental shaping tool carried at one end of the supporting member, a gear and a cam carried at the other end of the

supporting member, a revolving head mounted for rotation on said supporting member intermediate the shaping tool and the gear and cam, a plurality of spindles mounted in the revolving head, means for rotating the spindles from said gear, means for reciprocating said spindles from said cam, and other shaping tools carried by the spindles to coact with the first mentioned shaping tool.

10. A machine of the character described comprising: a concave cradle to loosely support a cylindrical blank, a convex stationary shaping tool to engage the exterior of the blank and a rotatable shaping tool to engage the interior of the blank at a given point of its periphery to thereby rotate the blank and shape it circumferentially.

11. A machine of the character described comprising: a concave cradle to loosely support a cylindrical blank, a convex stationary shaping tool to engage the exterior of the blank, a rotatable shaping tool to engage the interior of the blank at a given point of its periphery to thereby rotate the blank and shape it circumferentially, and means for moving the cradle and the interior shaping tool over the surface of the convex shaping tool.

12. In a machine of the character set forth comprising: two revolving heads in spaced relation, a cradle moving in unison with the heads and having a concave surface for supporting a cylindrical blank intermediate the heads, two stationary convex shaping tools at opposite ends of the blank, and rotatable shaping tools, to engage the interior of the blank, carried by the revolving heads.

Signed at Bridgeport in the county of Fairfield and State of Connecticut, this 14 day of September 1923.

JULIUS BRENZINGER.