J. BRENZINGER.

FLANGING MACHINE.

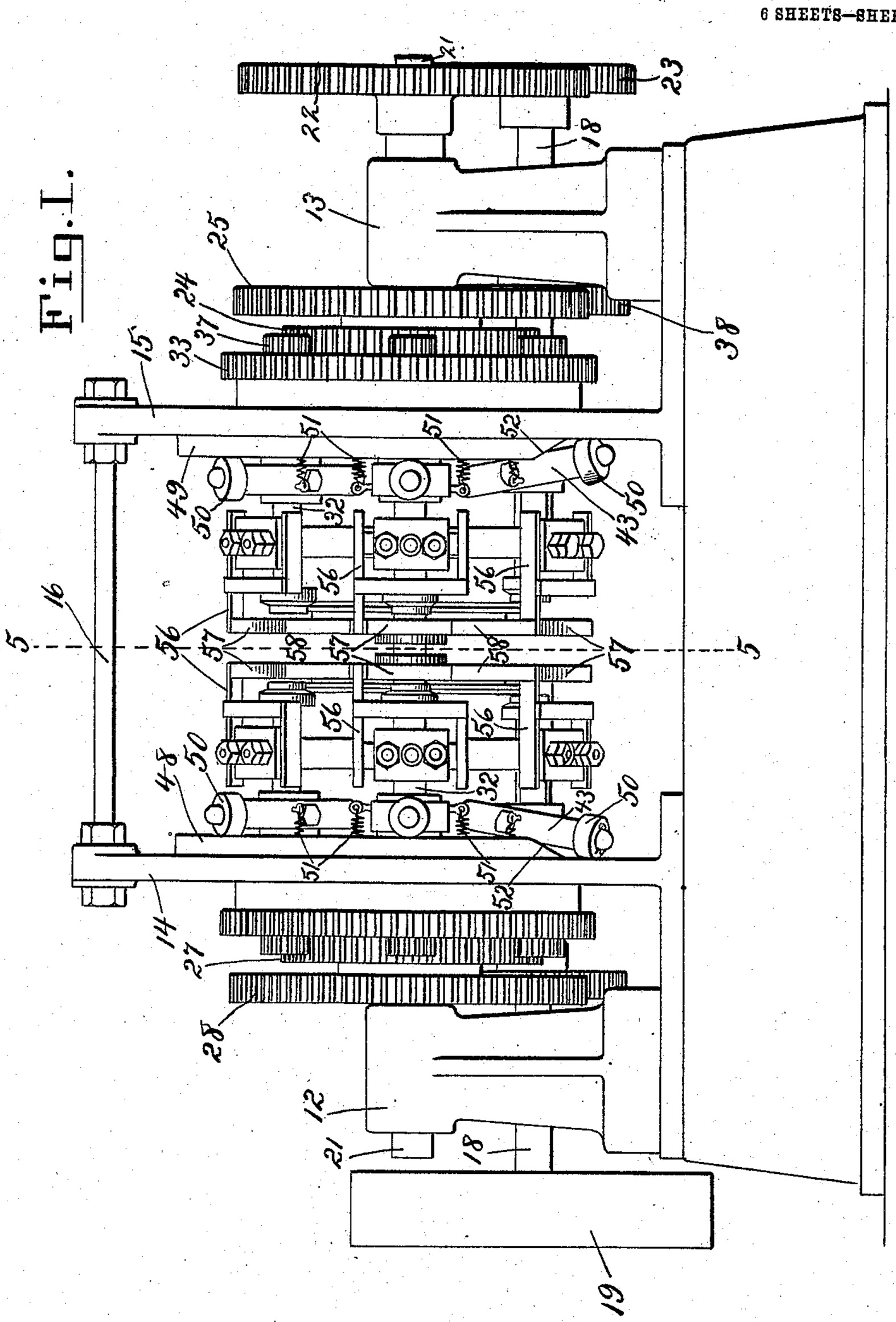
APPLICATION FILED AUG. 15, 1907.

936,598.

Patented Oct. 12, 1909.

6 SHEETS—SHEET 1.

Fig. 1.



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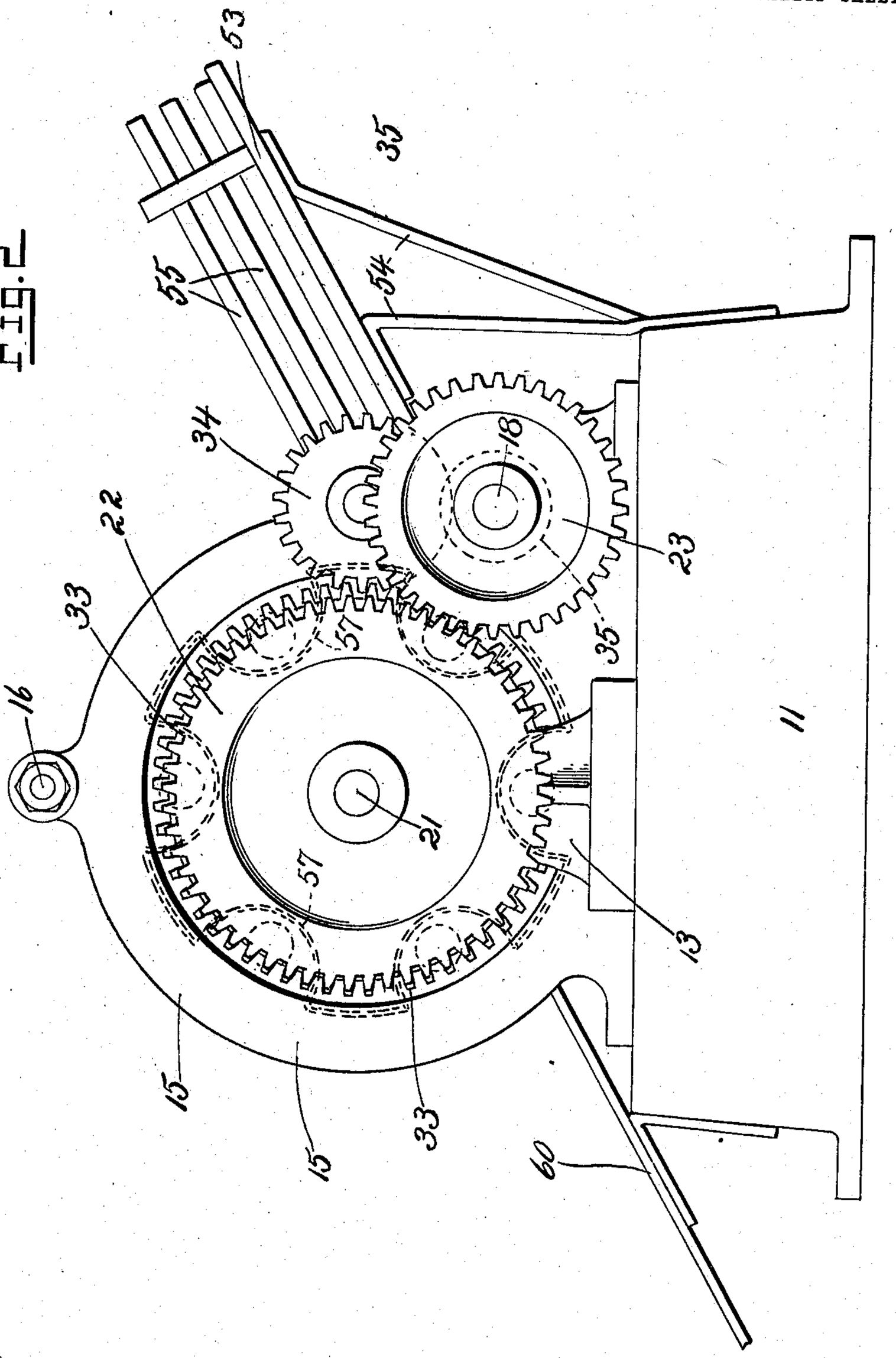
6 SHEETS—SHEET 2.

Fig. 2



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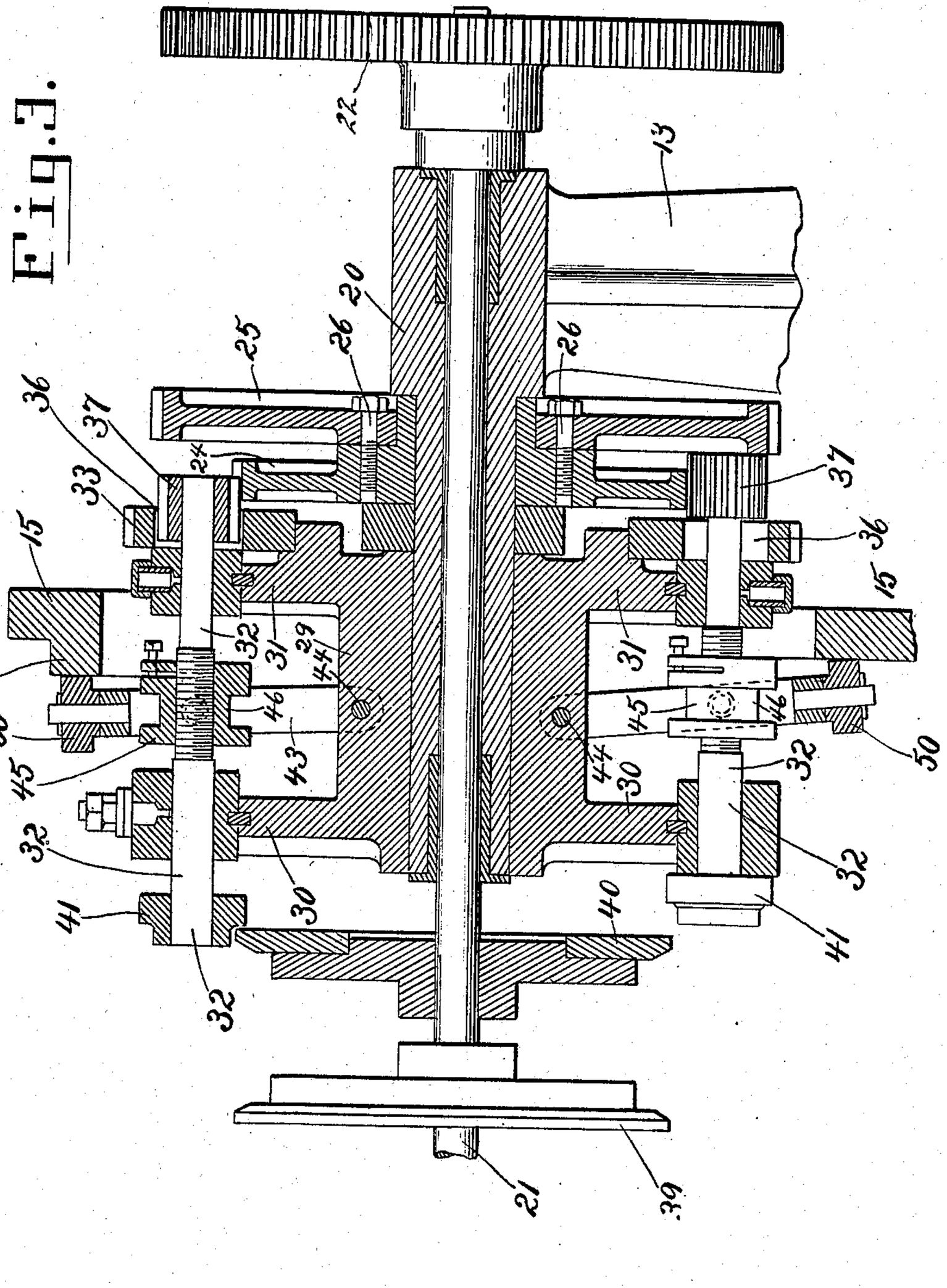
6 SHEETS—SHEET 3.

Fig. 3.



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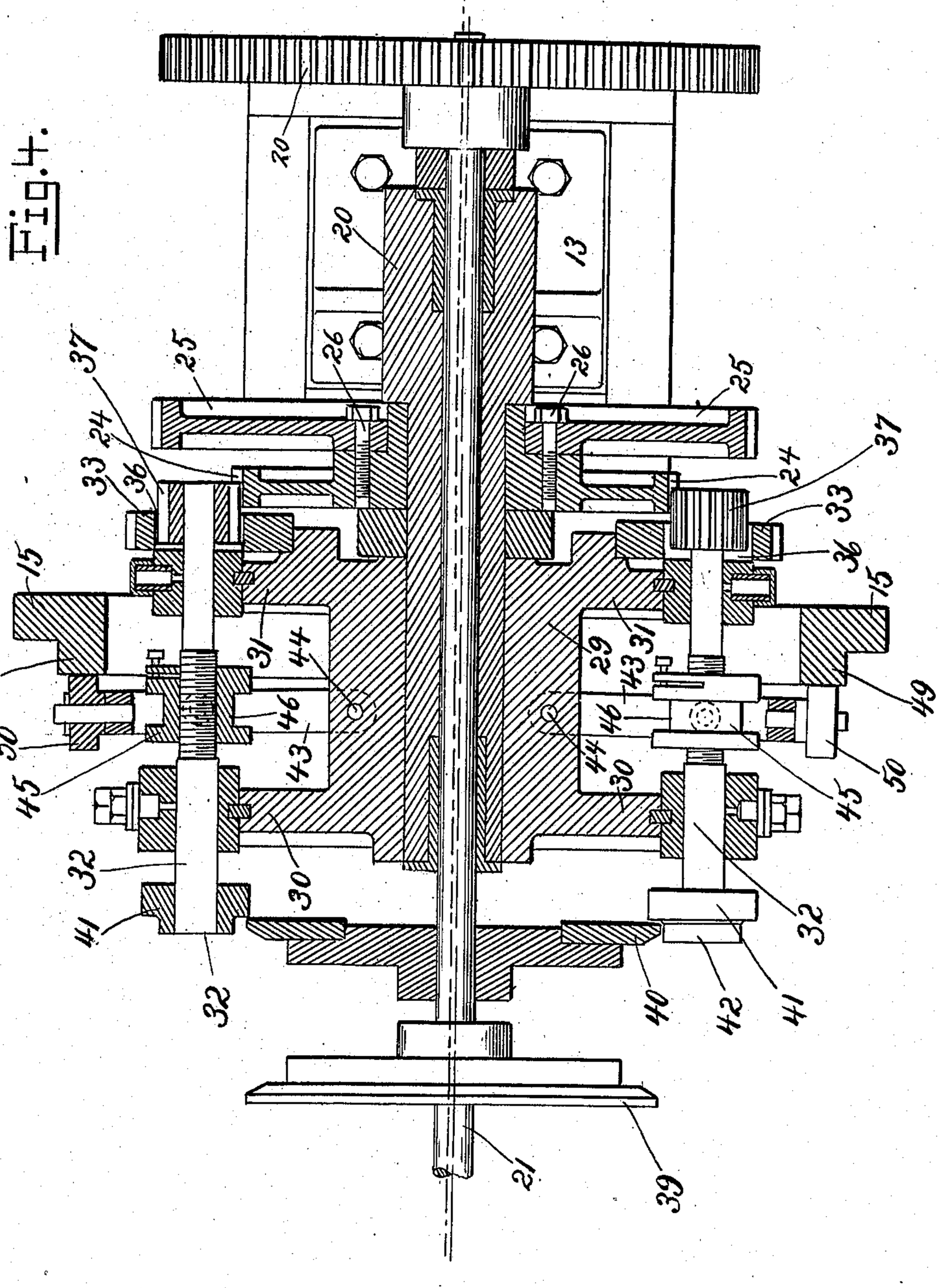
6 SHEETS—SHEET 4.

Fig. 4.



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6 SHEETS—SHEET 5.

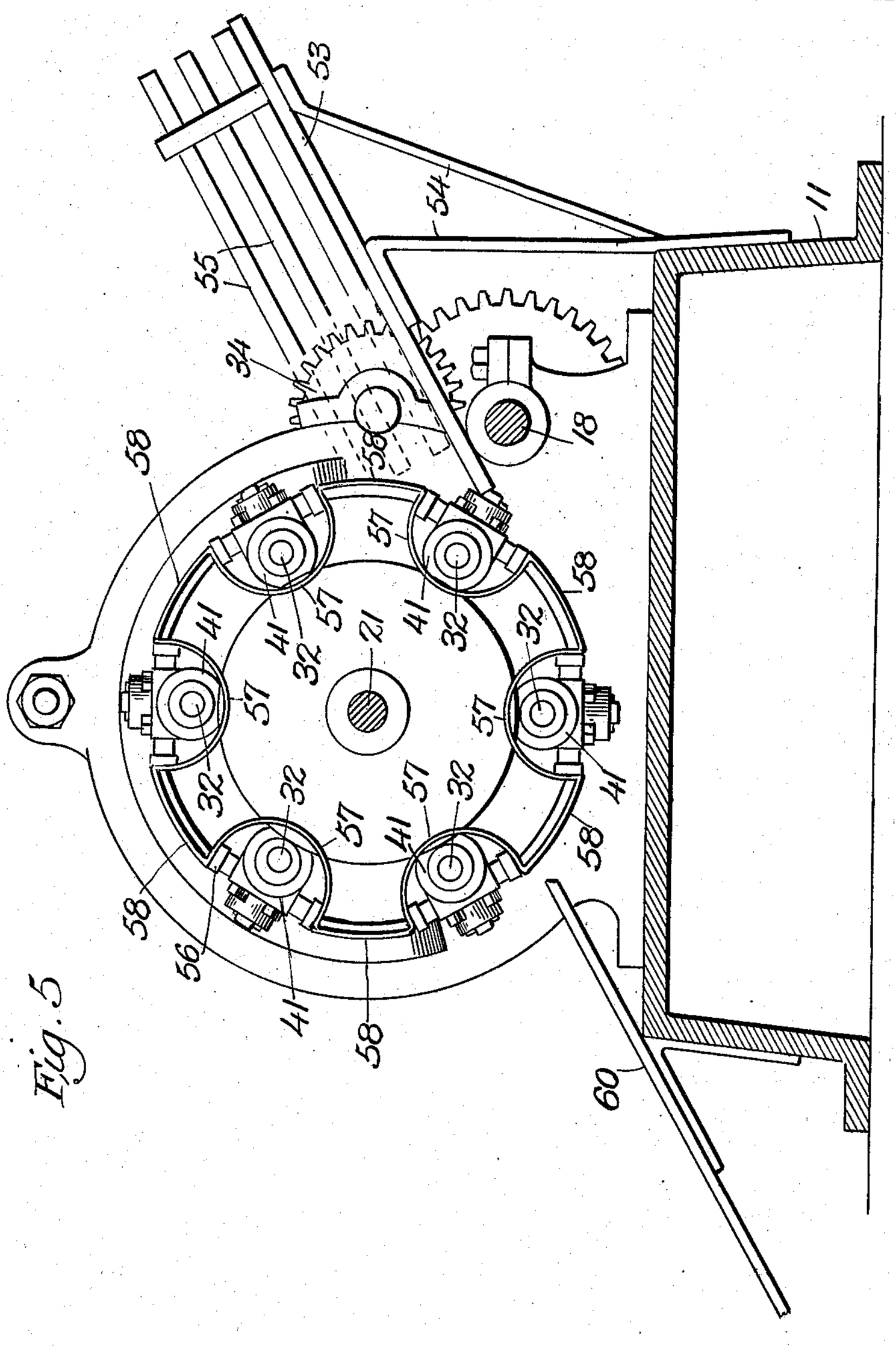

Fig. 5

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936,598.

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6 SHEETS—SHEET 6.

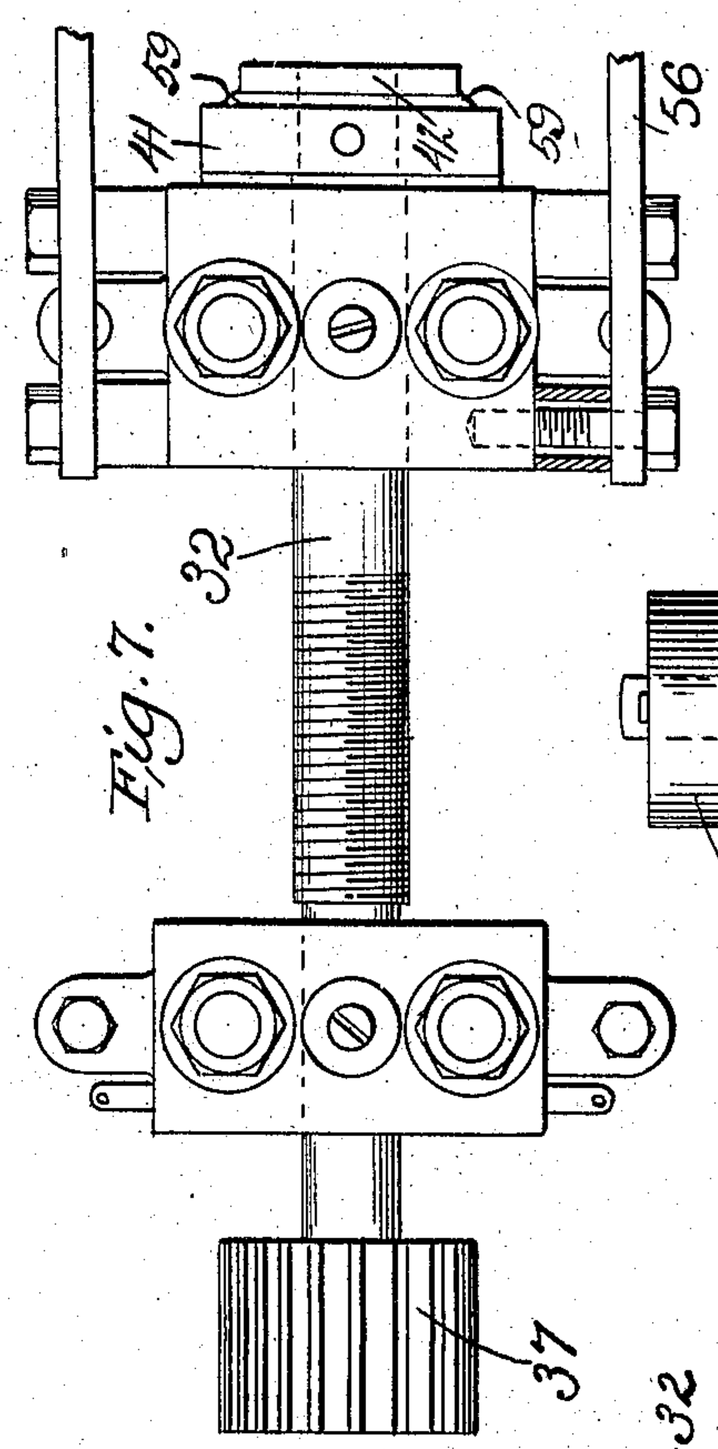

Fig. 7.

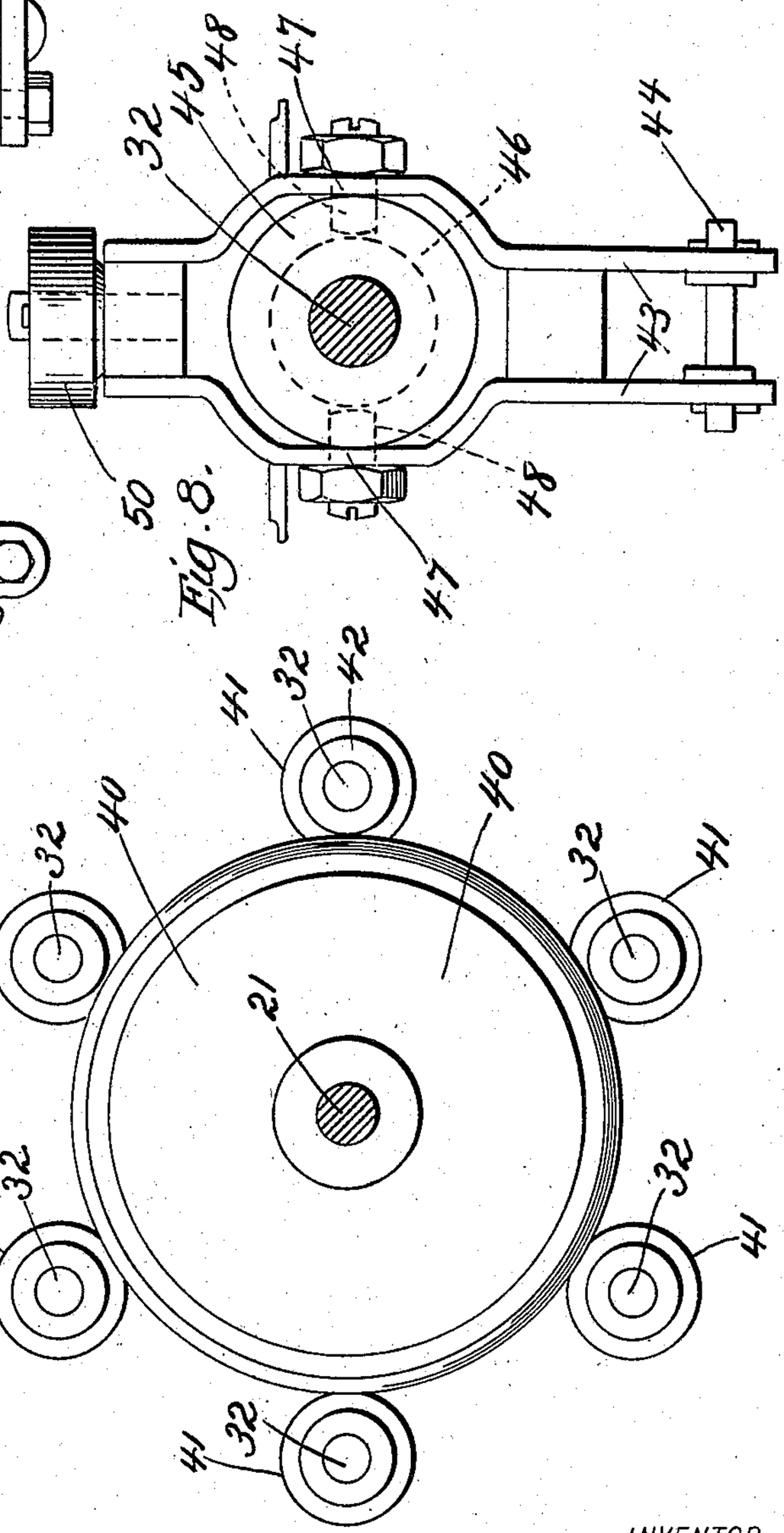

Fig. 8.

Fig. 6.

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UNITED STATES PATENT OFFICE.

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FLANGING-MACHINE.

936,598. Specification of Letters Patent. Patented Oct. 12, 1909.

Application filed August 15, 1907. Serial No. 388,731.

To all whom it may concern:

Be it known that I, JULIUS BRENZINGER, a citizen of the United States, residing at Mount Vernon, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Flanging-Machines, of which the following is a specification.

This invention relates to machines for flanging the ends of the body portions of sheet-metal containers generally known as "tin cans".

It is well known that preliminary to the operation of double seaming, the heads or end-portions to the body-portions of containers of this class, it is necessary that the ends of said body-portion be each provided with a flange which projects outwardly, substantially at right angles to the wall of the can-body, which flange is, by the seaming operation, curled, rolled or folded with the correspondingly-shaped edge of said head or cover into a substantially solid annular bead, comprising portions of both top and body, which forms a tight and interlocked seam or joint.

In flanging machines as heretofore constructed, it has been necessary for the operator to supply and adjust a can-body for each operation and to remove the flanged body thereafter, preliminary to the adjustment of another body for the next succeeding operation. The process of flanging an endless edge being necessarily a process of gradual forming, it is consequently a comparatively slow process. Therefore, where a can-body must be properly adjusted by an operator prior to, and removed subsequent to, each flanging operation, the maximum capacity of the machine must necessarily be exceedingly limited.

The primary object of the present invention, therefore, is the construction of a flanging machine of this character which shall be entirely automatic in its action, the can-bodies being automatically delivered thereto, properly adjusted, flanged and ejected therefrom after the flanging operation.

Further and scarcely less important objects of the invention are rapidity of action in the flanging operation and automatic continuity of successive operations, whereby the capacity of such machines may be materially increased.

My invention will be more readily understood by reference to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side elevation of a machine embodying my invention; Fig. 2 is an end elevation thereof; Fig. 3 is an enlarged central vertical section of one of the counterpart halves of the flanging mechanism; Fig. 4 is a horizontal section of the same; Fig. 5 is an enlarged cross-sectional elevation, taken on the line 5—5 of Fig. 1; Fig. 6 is a view showing in elevation one of the flanging disks and the series of coöperating rollers, indicating the progressive changes in their positional relation; Fig. 7 is an enlarged detail view of one of the flanging rollers with its mountings, and Fig. 8 is a detail view hereinafter described.

Referring now to the drawings in detail, numeral 11 refers to a suitable supporting base, carrying the standards or uprights 12 and 13, one at each end thereof, and the preferably arched upwardly-projecting frames or brackets 14 and 15 connected by the brace 16. The base 11 is also provided with a smaller standard at each end thereof, the standard 17 being shown in Fig. 2 and its counterpart being correspondingly located at the other end of said base. Journaled in these standards 17, and in enlarged base-portions of the frames 14 and 15, is the main driving-shaft 18 carrying at one end thereof the driving-pulley 19 or any other desired form of power transmitting means.

Fixed in a suitable aperture in each of the standards 13 and 14 is a sleeve, the sleeve 20 in the standard 13 being shown in Figs. 3 and 4, and the other (not shown) in the stanchion 12 being its opposite counterpart. In these sleeves is mounted the shaft 21 which is rotated by means of a gear 22, near one end thereof, in permanent intermeshing relation to a gear 23 on the main driving-shaft 18. Mounted to rotate on the sleeve 20 are the gears 24 and 25, which may be rigidly connected together—as by the bolt 26, as shown—or which may be integral or provided with an integral hub, the desired feature being that both rotate as one member on

said sleeve 20. The counterpart sleeve in the stanchion 12 similarly provides bearings for a corresponding pair of gears 27 and 28, rotatable thereon.

My machine may be said to comprise, so far as the effective flanging mechanism is concerned, counterpart halves, as shown in Fig. 1, whereof a detailed description of one will suffice for both. Referring then, first, to one of said counterpart halves, and with particular reference to Figs. 3 and 4, I have shown a collar or hub 29, rotatable on the sleeve 20, suitably held against axial movement, and provided with the heavy flanges 30 and 31 in which are provided bearings for a series of shafts 32 32, preferably six in number, equidistantly disposed with respect to the circumference of said flanges. The flange 31 also carries the gear 33, suitably fixed thereon, in permanent intermeshing relation with a reversing gear 34 having suitable bearings on the frame 15, which, in turn, meshes with a gear 35 on the main driving-shaft 18. The gear 33 is provided with a series of apertures 36 36, corresponding in relative circumferential positions to the shafts 32 32. Each of these shafts 32 32 is provided at its extremity with a small gear 37 which projects into and is freely rotatable in its corresponding aperture in the face of the gear 33, and which, upon axial reciprocation of the shaft upon which it is mounted, has a sliding movement through said aperture. These gears 37 37 are mounted and adjusted to project through said apertures and be in permanent intermeshing relation to the gear 24 on the sleeve 20. It will now be apparent that when the driving-shaft 18 is rotated, motion will be transmitted through the gears 23 and 22 to the shaft 21. The sleeve 20 being fixed, motion will be transmitted to the gear 25, in the same direction, by means of the gear 38, on the shaft 18, meshing with the gear 25. Furthermore, the hub 29, together with the mechanism carried thereby, will be rotated in a reverse direction by means of the gear 35 on the shaft 18 acting through the intermediate gear 34 to drive the apertured gear 33 on the flange 31 of said hub 29. The gear 24 rotates with the gear 25, and the hub 29, driven by the gear 35, rotates in a reverse direction. The gears 37 37, projecting through the apertures 36 in the gear 33, being in permanent intermeshing relation with said gear 24, will not only revolve with said hub 29 around the axis of said hub, but will, on account of the reverse rotation of the gear 24, each rotate rapidly on its own axis.

Suitably mounted and fixed upon the shaft 21, is a pair of circular disks 39 and 40. It is intended that the peripheries of these disks form supports for the extreme ends of the can-body during the flanging operation. Therefore, while fixed upon the shaft during such operation—or during a series of such operations—they should be adjustable on said shaft in order that the distance between their working edges may be made to conform to any one of the various lengths of standard can-bodies.

Referring, now, back to one of the counterpart halves of the flanging mechanism, each of the shafts 32 32 is provided at its end, opposite to the end carrying the gear 37, with a flanging roller 41. Each of these rollers is of a working configuration whereby the same may coöperate with the disk 40 to form the flange at one end of the can body, as hereinafter described.

As hereinbefore suggested, the present invention contemplates a machine to which unflanged can-bodies may be delivered automatically, which bodies will be, after the flanging operation, automatically ejected from the machine. In the delivery of cans to the flanging mechanism, as hereinafter described in detail, these can-bodies are designed to rest against the peripheries of the disks 39 and 40, and in being delivered to said disks it will be apparent that there must be no part or member of the machine interposed in the path of movement of each can-body during its transmission to its adjusted position against the disks. These disks, as hereinbefore shown, are rotated, and in the flanging operation, as contemplated by this invention, the series of flanging rollers 41 41 are adapted, in addition to the purely flanging operation, to each engage a can-body from opposite ends thereof and form an interior support therefor. It is, therefore, obvious that during the revolution of said rollers, they must be moved longitudinally on their axes, to clear the path of movement of the can-body during its delivery to the supporting disks, and returned at the proper time and in such manner that the reduced end-portion 42 of the roller will enter the open end of the can-body, carry the latter forward and support the same from the interior thereof during the flanging operation. Each coöperating pair of the rollers 41 41, therefor, must have three movements; a longitudinal or endwise movement, to provide for their proper lateral adjustment, a revolutionary movement to carry the can-body forward along the coöperative edges of the disks 39 and 40, and a rotary movement to effect the flanging operation. I have hereinbefore described the manner in which said rollers are revolved and rotated, and explained that said rollers, in each of said counterpart halves, are mounted on the ends of shafts 32 32 which have a limited sliding movement in their bearings in the flanges 30 and 31 on the hub 29, the opposite series of rollers being similarly and correspondingly mounted and adjusted. Sliding movement

of each of the shafts 32 is independently controlled by means of a lever 43, fulcrumed in the hub 29 at 44. Each of said shafts is provided with a collar 45 suitably fixed thereon and having an annular groove 46. The lever 43 is further provided with a yoke 47, having lugs or studs 48 projecting into said groove 46, the whole comprising a well-known form of clutch-operating connection, whereby upon operation of said lever 43 a reciprocating sliding movement will be imparted to the shaft 32.

Each of the frame-brackets 14 and 15 is provided with corresponding cams 48 and 49, respectively, and each of the shaft-controlling levers 43 is provided at its free end with a roller 50. The cam 49 (referring again to one of said counterpart halves) is located in the normal orbital path of movement of each of the rollers 50 in the corresponding series thereof, each lever 43 being outwardly pressed at all times by means of a spring 51 in tension between said lever 43 and the frame 15. As each roller 50 reaches the inclined or beveled face 52 of the cam 49, the outer end of each of the levers 43, carrying said rollers, will be moved laterally, carrying therewith its corresponding shaft 32 with the flanging roller 41. It will be apparent, therefore, that these cams 48 and 49 may be so arranged, adjusted and disposed that at a proper point in the revolution of the hub 29 and its opposite counterpart, a pair of flanging-rollers 41 will be simultaneously forced toward each other to engage opposite ends of the can-body, properly positioned against the disks 39 and 40, and carry said body forward for the flanging operation. Similarly, it will be apparent that the cams 48 and 49 may be terminated at a point in the revolution of the mechanism carried by the hub 29 and its counterpart, to simultaneously withdraw said pair of rollers after the flanging operation has been completed, and permit of the withdrawal or ejectment of the flanged can-body.

It is well known in this art that the process of formation of an annular flange at the endless end-edge of a cam-body must be a gradual one. Any abrupt or variable outward bending of said edge would undoubtedly result in strains of a character to fracture the metal. If these strains are gradually imposed, and kept within the limit of the tensile strength of the metal, the latter will yield sufficiently to form the flange which has, of course, a circumference of greater diameter than the normal diameter of the can-body. It is intended, therefore, in the present invention, that each pair of flanging rollers, as suggested, first engage a properly adjusted can body, and within a fraction of one complete revolution of said rollers effect the flanging operation and permit of the ejectment of the flanged can-body.

To effect this flanging operation, it will be noticed that the shaft 21 is not concentrically mounted with respect to the sleeve 20 and its counterpart, but is eccentric with respect thereto, as is best shown in Fig. 4. The hub 29 and its counterpart, being concentrically mounted on said sleeves, are therefore similarly eccentric with respect to said shaft 21 and consequently with respect to the disks 39 and 40. It will thus be apparent that said disks, having circular peripheries which are concentric with respect to the axes of rotation, have a pure rotative movement, while the rollers 41 41, carried by the hub 29 and its counterpart which rotate on said fixed concentric sleeves, revolve in a truly circular orbit which is, however, eccentric with respect to the circular working peripheries of the disks 39 and 40. Obviously, this eccentricity may be made such that the orbit of revolution of said rollers will at one point be substantially tangential to the circumference of one of said disks, from which point it recedes outwardly from said circumference through an arc of 180°, at the end of which arc it reaches its maximum distance from said circumference. Therefore, these flanging rollers may be so mounted that at one point in their orbit of revolution there is no coöperative action between the passing pair of said rollers and said disks. Furthermore, at this point, there has been no coöperative action between the cams 48 and 49 and the levers 43, and the rollers 41 are, therefore, in their most retracted position, (as shown in Fig. 3). As these rollers are advanced from this point by the rotation of the hub 29, the cams 48 and 49 first operate through the levers 43 to slide the shaft 32 and bring the working edge of the roller 41 into substantially the plane of the disk 40, (similar operations taking place in the other counterpart half, but not, at this point, as has been explained) into complete coöperative relation to said disk. The orbit of revolution of said rollers from this point gradually approaches the periphery of the disk, until, at the end of movement through an arc of 180° there is the maximum coöperative action between roller and disk, as shown in Fig. 3. Coöperative action then gradually decreases, until the ends of the cams 48 and 49 are reached at which point the rollers of each pair in turn are again retracted.

To effect the proper delivery of can bodies to the flanging mechanism, I provide an inclined chute 53, preferably supported by braces 54 secured to the base 11 of the machine. This chute 53 is provided with side guides 55 mounted at a distance from each other which approximates the length of the can-bodies which are placed in or delivered to said chute so as to roll by gravity toward the machine, resting against each other successively.

Referring again to one of the counterpart halves of the flanging mechanism, and this description similarly applying to both thereof, I have shown the hub 29, provided with arms 56 to which are secured certain properly formed strips, or guides, projecting on both sides of each arm and located intermediate of the planes of the disks 39 and 40. At one side of each arm 56, corresponding to the location of one of the flanging rollers 41, this strip 57 is upwardly curved to substantially semi-circular form, as best shown in Fig. 5, adapted to partially surround the roller when projected therebetween. On the other side of said arms, the strip 58 substantially corresponds in curvature to the periphery of the disk 40. It will be apparent that as the cans are forced by gravity down the chute 53, the foremost can-body will impinge against the pair of strips 58, which will check further downward movement until the pair of strips 57 are reached, which form a pocket into which the first or next succeeding can-body drops. Immediately upon having dropped into this pocket, the can-body is in position to be engaged by a pair of rollers 41, and at this point the controlling-levers 43 of this pair of rollers are operated by the cams 48 and 49 to effect such engagement, the reduced end-portions 42 of said rollers revolving the respective ends of the can-body. These disks 39 and 40 are so spaced apart that each end-edge of the can-body projects beyond the working edges of its corresponding disk a distance which approximates the width of the flange. As the reduced end-portion 42 is, by the axial movement of the shaft 32, forced into the end opening of the can-body, the circular edge of the latter is first outwardly turned by the beveled or curved face 59 of said roller. Continued revolution of said rollers—which, as has been explained are rapidly rotating with the curved end-edges of the can-body interposed between the same and the working-edges of said disks—carries said can-body forward and as the periphery of the reduced portion 42 of each of the pair of rollers approaches the working-edge of its corresponding disk, the flange is completed.

It will be noted that the substantially circularly-curved strips 57 which form what I have termed a pocket, move with the hubs 29, and therefore are at all times in the same positional relation to their corresponding pair of flanging rollers. The can-body, therefore, does not leave said pocket during said flanging operation, but is carried forward therein, the point of final release of the can-body being below a horizontal plane through the axis of said hub, so that upon such release the flanged can-body will roll by gravity out of said pocket and into the chute 60 for final delivery to any desired point. It will thus be apparent that for each complete rotation of the hub 29 and its counterpart, as many cans may be flanged as there are pairs of flanging rollers carried by said hubs. A machine embodying my invention may thus be successfully operated at a velocity limited only by the time required for gravity to overcome inertia and effect the delivery of a can-body to the containing pocket and its subsequent ejectment therefrom.

Many modifications of minor details of construction, location, adjustment and operation will doubtless readily suggest themselves to those skilled in the art to which this invention appertains, and I therefore do not desire to limit said invention to the specific embodiment thereof herein shown and described.

What I claim as my invention is—

1. In a flanging machine, the combination of a continuously moving element and a member having a working edge moving in an opposite direction, said element having intermittent coöperative action with the working edge of said member to flange a can body interposed therebetween.

2. In a flanging machine, the combination of a continuously moving element, a member having a working edge continuously moving in an opposite direction, said element having intermittent coöperative action with the working edge of said member to flange a can body interposed therebetween, and means for delivering a can body thereto during a period of non-coöperative relation.

3. In a flanging machine, the combination of a continuously moving element, a member having a working edge continuously moving in an opposite direction, said element having intermittent coöperative action with the working edge of said member to flange a can body interposed therebetween, and means for delivering a can body thereto and ejecting a flanged body therefrom during each period of non-coöperative relation.

4. In a flanging machine, the combination of a continuously moving pair of elements providing a carriage and supporting means for one of the bodies to be flanged, and a pair of members each having a working edge continuously moving in a direction opposite to that of said elements, said elements having intermittent coöperative action with the working edges of said members to simultaneously flange both end edges of a can body interposed therebetween.

5. In a flanging machine, the combination of a continuously moving pair of elements providing a carriage and supporting means for one of the bodies to be flanged, a pair of members each having a working edge continuously moving in a direction opposite to that of said elements, said elements having intermittent coöperative action with the working edges of said members to simul-

taneously flange both end edges of a can body interposed therebetween, and means for delivering a can body thereto during a period of non-coöperative relation.

6. In a flanging machine, the combination of a continuously moving pair of elements providing a carriage and supporting means for one of the bodies to be flanged, a pair of members each having a working edge continuously moving in a direction opposite to that of said elements, said elements having intermittent coöperative action with the working edges of said members to simultaneously flange both end edges of a can body interposed therebetween, and means for delivering a can body thereto and ejecting a flanged body therefrom during each period of non-coöperative relation.

7. In a flanging machine, the combination of a series of pairs of continuously moving elements, each pair providing a carriage and supporting means for one of the bodies to be flanged, and two members each having a working edge continuously moving in a direction opposite to that of said elements, each pair of elements having intermittent coöperative action with the working edges of said members to flange both end edges of a can body interposed therebetween.

8. In a flanging machine, the combination of a series of pairs of continuously moving elements, each pair providing a carriage and supporting means for one of the bodies to be flanged, two members each having a working edge continuously moving in a direction opposite to that of said elements, each pair of elements having intermittent coöperative action with the working edges of said members to flange both end edges of a can body interposed therebetween, and means for delivering a can body to each of said carriages during a period of non-coöperative relation.

9. In a flanging machine, the combination of a series of pairs of continuously moving elements, each pair providing a carriage and supporting means for one of the bodies to be flanged, two members each having a working edge continuously moving in a direction opposite to that of said elements, each pair of elements having intermittent coöperative action with the working edges of said members to flange both end edges of a can body interposed therebetween, and means for delivering a can body to each of said carriages and ejecting a flanged body therefrom during each period of non-coöperative relation.

10. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit.

11. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit, the coöperation being progressively continuous throughout each flanging operation.

12. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit, and means for delivering a can body to said elements during each period of non-coöperative relation.

13. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body, and intermittently coöperating with said member to flange said body in transit, the coöperation being progressively continuous throughout each flanging operation, and means for delivering a can body to said elements during each period of non-coöperative relation.

14. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in the opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit, and means for delivering a can body to said elements and ejecting a flanged body therefrom during each period of non-coöperative relation.

15. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit, the coöperation being progressively continuous throughout each flanging operation, and means for delivering a can body to said elements and ejecting a flanged body therefrom during each period of non-coöperative relation.

16. In a flanging machine, the combination of a series of elements traveling in an endless path and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit.

17. In a flanging machine, the combination of a series of elements traveling in an endless path and a member having an end-

less working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit, the coöperation being progressively continuous throughout each flanging operation.

18. In a flanging machine, the combination of a series of elements traveling in an endless path and a member having an endless working edge moving in an opposite direction, said element serving to support and advance a can body and intermittently cooperating with said member to flange said body in transit, and means for delivering a can body to said elements during each period of non-coöperative relation.

19. In a flanging machine, the combination of a series of moving elements and a member having an endless working edge moving in an opposite direction, said elements serving to support and advance a can body and intermittently coöperating with said member to flange said body in transit, the coöperation being progressively continuous throughout each flanging operation, and means for delivering a can body to said elements and ejecting a flanged body therefrom during each period of non-coöperative relation.

20. The combination, with a rotating can-body support, a flanging roller and means for revolving said roller around said support in intermittently coöperative relation thereto, of means for successively interposing the end-edge of a can-body between said roller and support during each period of non-cooperative relation.

21. The combination, with a support having an endless working edge, of a flanging roller, means for revolving said roller around said support in intermittently coöperative relation thereto, means for successively interposing the end-edge of a can-body between said roller and support during each period of non-coöperative relation, and means for maintaining said can-body subject to the coöperative action.

22. The combination, with a support having an endless working edge, of a flanging roller, means for revolving said roller around said support in intermittently coöperative relation thereto, means for successively interposing the end-edge of a can-body between said roller and support during each period of non-coöperative relation, means for maintaining said can-body subject to the coöperative action, and means for ejecting the flanged body prior to the next succeeding operation.

23. The combination, with a pair of supports having corresponding endless working edges, of a pair of flanging rollers, means for revolving said rollers around said supports in correspondingly intermittent coöperative relation thereto, and means for successively interposing the opposite end-edges of a can-body between said rollers and said supports during each period of non-coöperative relation.

24. The combination, with a pair of supports having corresponding endless working edges, of a pair of flanging rollers, means for revolving said rollers around said supports in correspondingly intermittent coöperative relation thereto, and means for successively interposing the opposite end-edges of a can-body between said rollers and said supports and releasing a flanged body therefrom during each period of non-coöperative relation.

25. The combination, with a pair of supports having corresponding endless working edges, of a pair of flanging rollers, means for revolving said rollers around said supports in correspondingly intermittent coöperative relation thereto, and means for successively interposing the opposite end-edges of a can-body between said rollers and said supports during each period of non-coöperative relation, and means for maintaining said can-body subject to the coöperative action and ejecting the flanged body at the end thereof.

26. The combination, with a moving can-body support having an endless working edge, of a series of flanging rollers, means for revolving said rollers around said support in successively intermittent coöperative relation thereto, and means for interposing the end-edge of a can-body between each roller and said support just prior to the period of coöperative operation.

27. The combination, with a moving can-body support having an endless working edge, of a series of flanging rollers, means for revolving said rollers around said support in successively intermittent coöperative relation thereto, the points of coöperative and non-coöperative relation being fixed, and means for successively interposing the end-edge of a can-body between each roller and the support at a point of non-coöperative action.

28. The combination, with a pair of rotating can body supports, of a series of pairs of flanging rollers, means for revolving said rollers around said supports, each pair in successively intermittent coöperative relation thereto, and means for interposing the opposite end-edges of a can-body between each pair of rollers and said supports just prior to the period of coöperative operation.

29. The combination, with a pair of rotating can body supports, of a series of pairs of flanging rollers, means for revolving said rollers around said supports, each pair in successively intermittent coöperative relation thereto, and means for interposing the opposite end-edges of a can-body between each

pair of rollers and said supporting means just prior to the period of coöperative operation and releasing the flanged body immediately thereafter.

30. In a machine of the character described, the combination, with a rotating support having an endless working edge, of a flanging roller revolving around said support, rotating on its own axis, and having automatic bodily movement longitudinally with respect to said axis.

31. In a machine of the character decribed, the combination, with a rotating support having an endless working edge, of a roller moving in an orbit of revolution, rotating on its own axis and having automatic bodily movement longitudinally, and means for bringing said roller into intermittent cooperative relation to said support.

32. In a machine of the character described, the combination, with a rotating support having an endless working edge, of a roller rotating on its own axis and revoluble around said support in intermittent cooperative relation thereto, and means for reciprocating said roller longitudinally during each period of non-coöperative operation.

33. In a machine of the character described, the combination, with a rotating support having an endless working edge, of a roller rotating on its own axis and revoluble around said support in intermittent cooperative relation thereto, and means for reciprocating said roller longitudinally during each period of non-coöperative operation without interruption of rotation or revolution.

34. In a machine of the character described, the combination, with a pair of moving supports each having an endless working edge, of a pair of rollers positively rotated on their own axes and unisonally revoluble around said supporting means in correspondingly intermittent coöperative relation thereto, and means for simultaneously reciprocating said rollers longitudinally in opposite directions during the periods of non-coöperative operation.

35. In a machine of the character described, the combination, with a pair of moving supports each having an endless working edge, of a pair of rollers positively rotated on their own axes and unisonally revoluble around said supporting means in correspondingly intermittent coöperative relation thereto, and means for simultaneously reciprocating said rollers longitudinally in opposite directions during the periods of non-coöperative operation without interruption of rotation or revolution.

36. In a machine of the character described, the combination, with supporting means having a circular working edge, of a roller revolving around said supporting means, the orbit of revolution of said roller being eccentric to said working edge whereby their coöperative relation is intermittent.

37. In a machine of the character described, the combination, with supporting means having a circular working edge, of a roller revolving around said supporting means, the orbit of revolution of said roller being eccentric to said working edge whereby their coöperative relation is intermittent, and means for interposing the end-edge of a can-body between roller and supporting means prior to the period of coöperative operation.

38. In a machine of the character described, the combination, with substantially circular supporting means, of a flanging roller revoluble therearound in an orbit which is eccentric with respect thereto, whereby there are intermittent periods of coöperative relation, and means for interposing the end-edge of a can-body between said rollers and said supporting means while said roller is at a point in said orbit anterior to the initial point of coöperative operation.

39. In a machine of the character described, the combination, with substantially circular supporting means, of a flanging roller revoluble therearound in an orbit which is eccentric with respect thereto, whereby there are intermittent periods of coöperative relation, means for interposing the end-edge of a can-body between said rollers and said supporting means while said roller is at a point in said orbit anterior to the point of coöperative operation, means for holding said can-body subject to said operation, and means for ejecting the flanged body prior to one complete revolution.

40. In a machine of the character described, the combination, with substantially circular supporting means, of a roller revoluble therearound in an orbit which is eccentric with respect thereto, whereby there are intermittent periods of coöperative relation, and means for bodily withdrawing said roller during the period of non-coöperative relation for the interposition of the end-edge of a can-body before, and the release thereof after, each period of coöperative relation.

41. In a machine of the character described, the combination, with substantially circular supporting-means, of a series of rollers revoluble therearound in a common orbit which is eccentric with respect to the circular edge of said supporting means, whereby coöperation between said support and each of said rollers is successively intermittent, and means for interposing the end-edge of a can-body between each roller and said supporting means just prior to the period of coöperative operation thereof.

42. In a machine of the character described, the combination, with substantially circular supporting means, of a series of pairs of rollers, revoluble unisonally there-

around in corresponding orbits which are eccentric with respect to the circular edges of said supporting means, whereby coöperation between said supports and each pair of rollers is successively intermittent, and means for interposing the end-edges of a can-body between each pair of rollers and said supporting means just prior to the period of cooperative operation thereof.

43. In a machine of the character described, the combination of a revoluble shaft, a can-edge-supporting disk mounted thereon, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and rotatable thereon, a flanging roller, journaled in bearings in said member and intermittently coöperating with said disk, and means for rotating said shaft and said member in opposite directions.

44. In a machine of the character described, the combination of a revoluble shaft, a can-edge-supporting disk mounted thereon, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and rotatable thereon, a flanging roller journaled in bearings in said member and intermittently coöperating with said disk, means for positively rotating said roller, and means for rotating said shaft and said member in opposite directions.

45. In a machine of the character described, the combination of a revoluble shaft, a can-edge-supporting disk mounted thereon, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and rotatable thereon, a flanging roller journaled in bearings in said member and intermittently coöperating with said disk, means for positively rotating said roller, means for axially reciprocating said roller at fixed intervals, and means for rotating said shaft and said member in opposite directions.

46. In a machine of the character described, the combination of a revoluble shaft, a can-edge-supporting disk mounted thereon, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and rotatable thereon, a series of flanging rollers journaled in bearings in said member and having successively intermittent coöperation with said disk, and means for rotating said shaft and said member in opposite directions.

47. In a machine of the character described, the combination of a revoluble shaft, a can-edge-supporting disk mounted thereon, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and rotatable thereon, a series of flanging rollers journaled in bearings in said member and having successively intermittent coöperation with said disk, means for positively rotating each roller, and means for rotating said shaft and said member in opposite directions.

48. In a machine of the character described, the combination of a revoluble shaft, a can-edge-supporting disk mounted thereon, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and rotatable thereon, a series of flanging rollers journaled in bearings in said member and having successively intermittent coöperation with said disk, means for positively rotating each roller, means for axially reciprocating each roller in turn at a fixed point in the common orbit of revolution, and means for rotating said shaft and said member in opposite directions.

49. In a machine of the class described, the combination of a revoluble shaft and a pair of counterpart flanging mechanisms,—each of said mechanisms comprising a can-edge-supporting disk fixed on said shaft, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and revoluble thereon, and a flanging roller journaled in bearings in said member and intermittently cooperating with said disk,—and means for rotating said shaft and said members in opposite directions.

50. In a machine of the class described, the combination of a revoluble shaft and a pair of counterpart flanging mechanisms,—each of said mechanisms comprising a can-edge-supporting disk fixed on said shaft, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and revoluble thereon, a flanging roller journaled in bearings in said member and intermittently coöperating with said disk, and means for positively rotating said roller on its axis,—and means for rotating said shaft and said members in opposite directions.

51. In a machine of the class described, the combination of a revoluble shaft and a pair of counterpart flanging mechanisms,—each of said mechanisms comprising a can-edge-supporting disk fixed on said shaft, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and revoluble thereon, a flanging roller journaled in bearings in said member and intermittently coöperating with said disk, means for positively rotating said roller on its axis, and means for axially reciprocating said roller at fixed intervals,—and means for rotating said shaft and said members in opposite directions.

52. In a machine of the class described, the combination of a revoluble shaft and a pair of counterpart flanging mechanisms,—each of said mechanisms comprising a can-edge-supporting disk fixed on said shaft, a

non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and revoluble thereon, and a series of flanging rollers journaled in bearings in said member and having successively intermittent coöperation with said disk,—and means for rotating said shaft and said members in opposite directions.

53. In a machine of the class described, the combination of a revoluble shaft and a pair of counterpart flanging mechanisms,—each of said mechanisms comprising a can-edge-supporting disk fixed on said shaft, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and revoluble thereon, a series of flanging rollers journaled in bearings in said member and having successively intermittent coöperation with said disk, and means for positively rotating each roller on its axis,—and means for rotating said shaft and said members in opposite directions.

54. In a machine of the class described, the combination of a revoluble shaft and a pair of counterpart flanging mechanisms,—each of said mechanisms comprising a can-edge-supporting disk fixed on said shaft, a non-rotatable sleeve on said shaft and eccentric thereto, a member concentrically mounted on said sleeve and revoluble thereon, a series of flanging rollers journaled in bearings in said member and having successively intermittent coöperation with said disk, means for positively rotating each roller on its axis, and means for axially reciprocating each roller in turn at a fixed point in the common orbit of revolution,—and means for rotating said shaft and said members in opposite directions.

In testimony of the foregoing, I have hereunto set my hand in the presence of two witnesses.

JULIUS BRENZINGER.

Witnesses:
P. W. SHEPARD,
FRED H. BOWERSOCK.