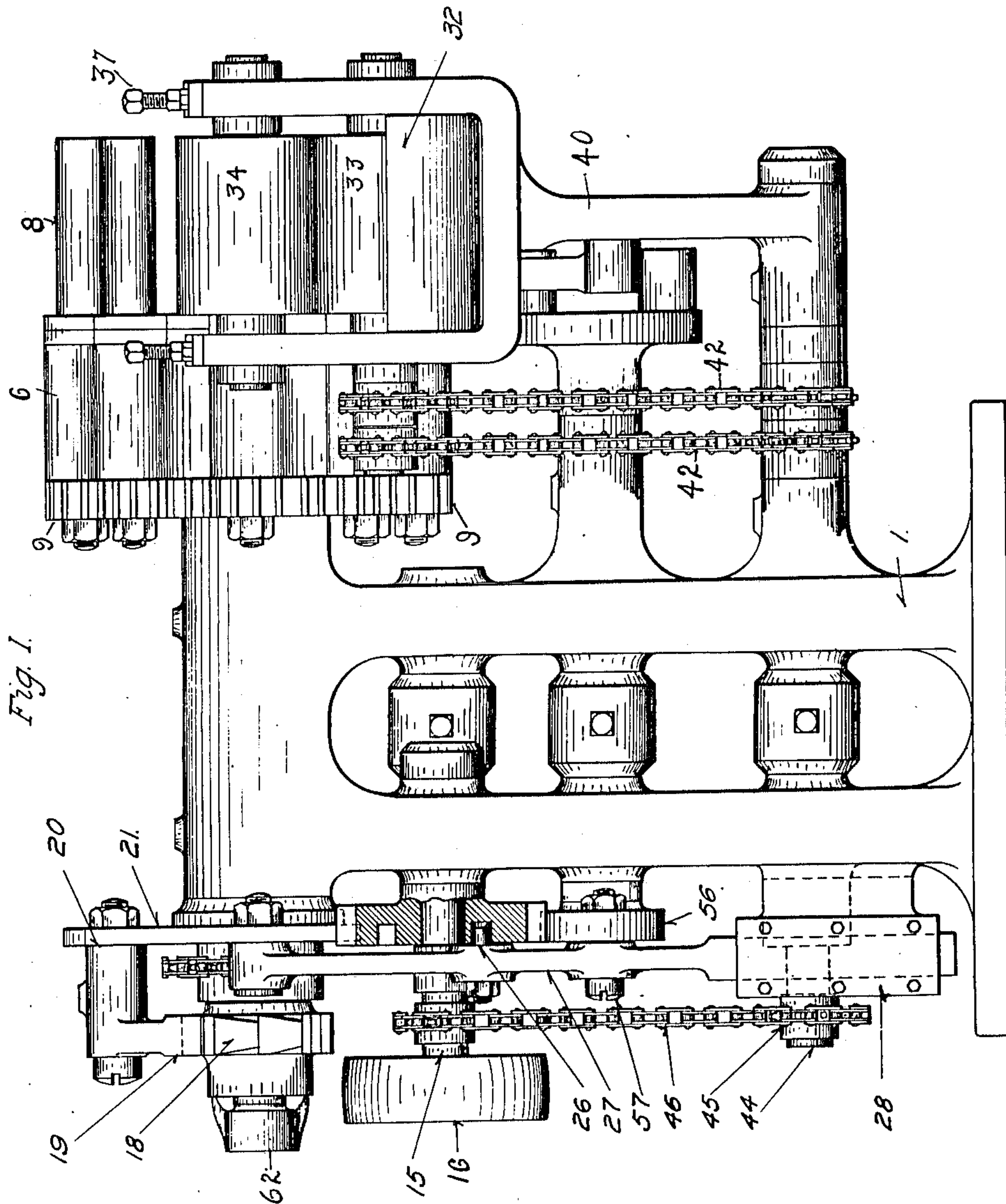


C. D. WOODS.
CAN BODY COATING MACHINE.
APPLICATION FILED DEC. 24, 1908.

947,537.

Patented Jan. 25, 1910.

3 SHEETS—SHEET 1.



WITNESSES

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Marie Weaver.

INVENTOR

Charles D. Woods
By Fred W. Winter
His attorney

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Fig. 4.

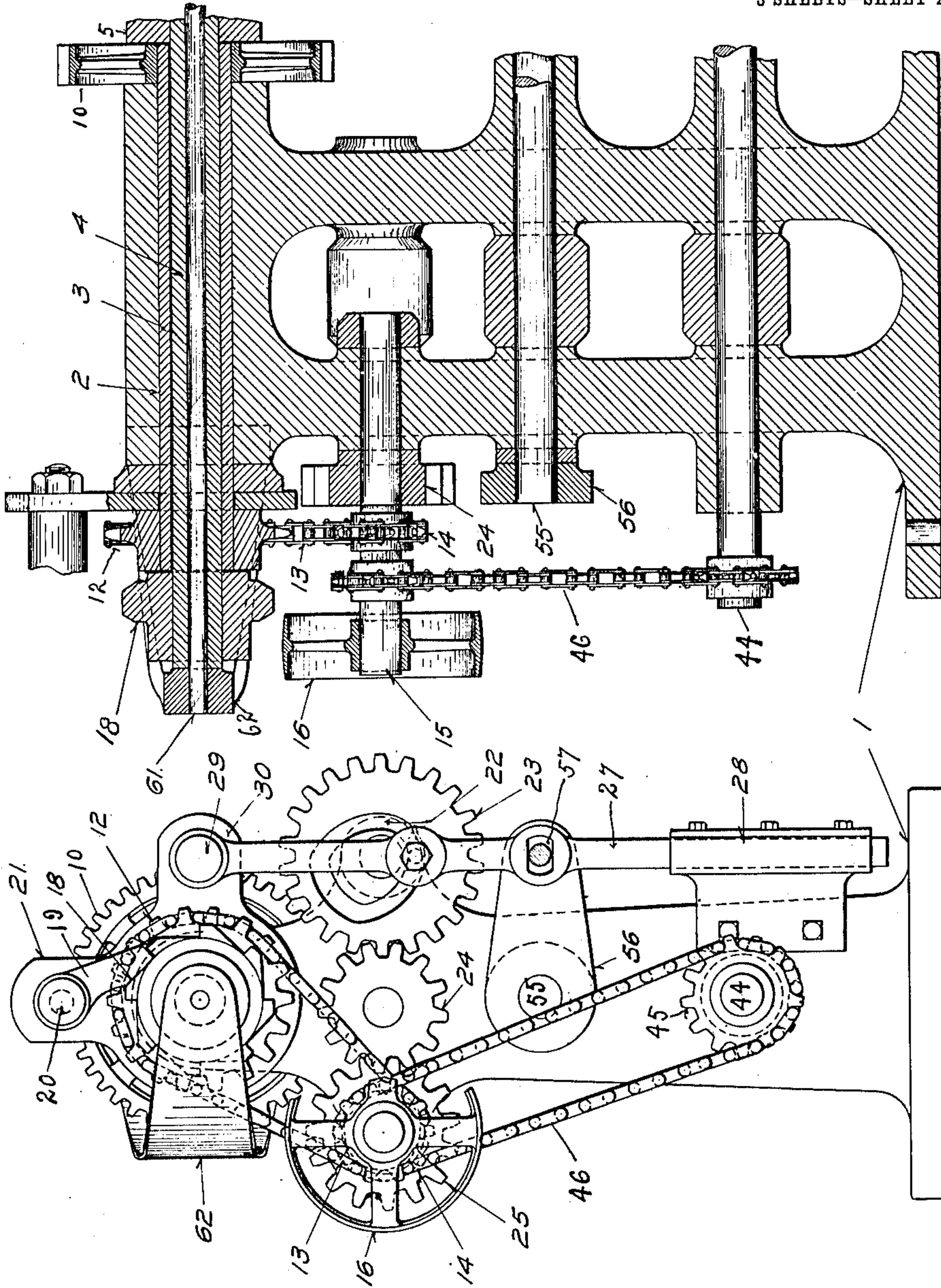
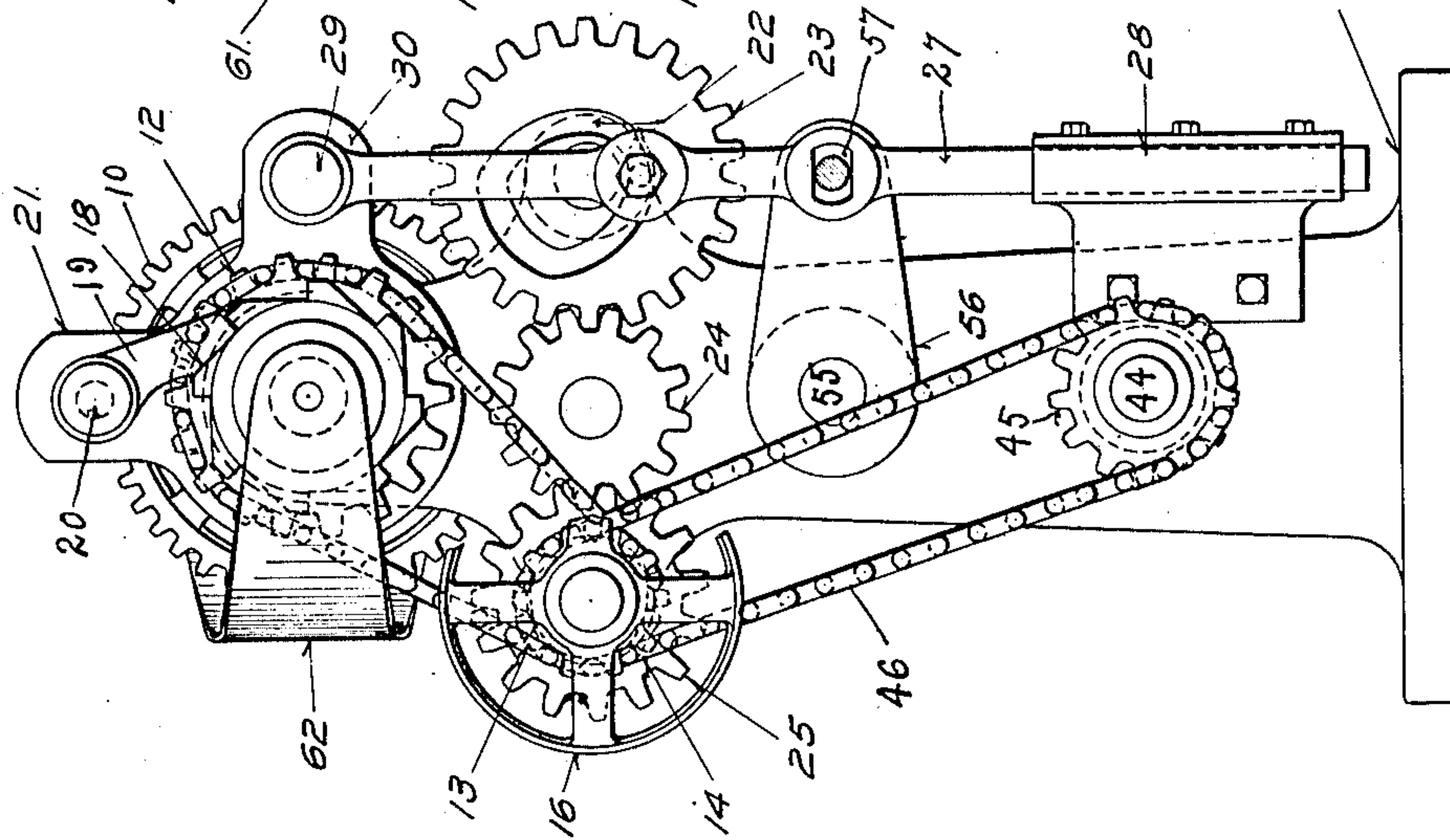


Fig. 2.



WITNESSES

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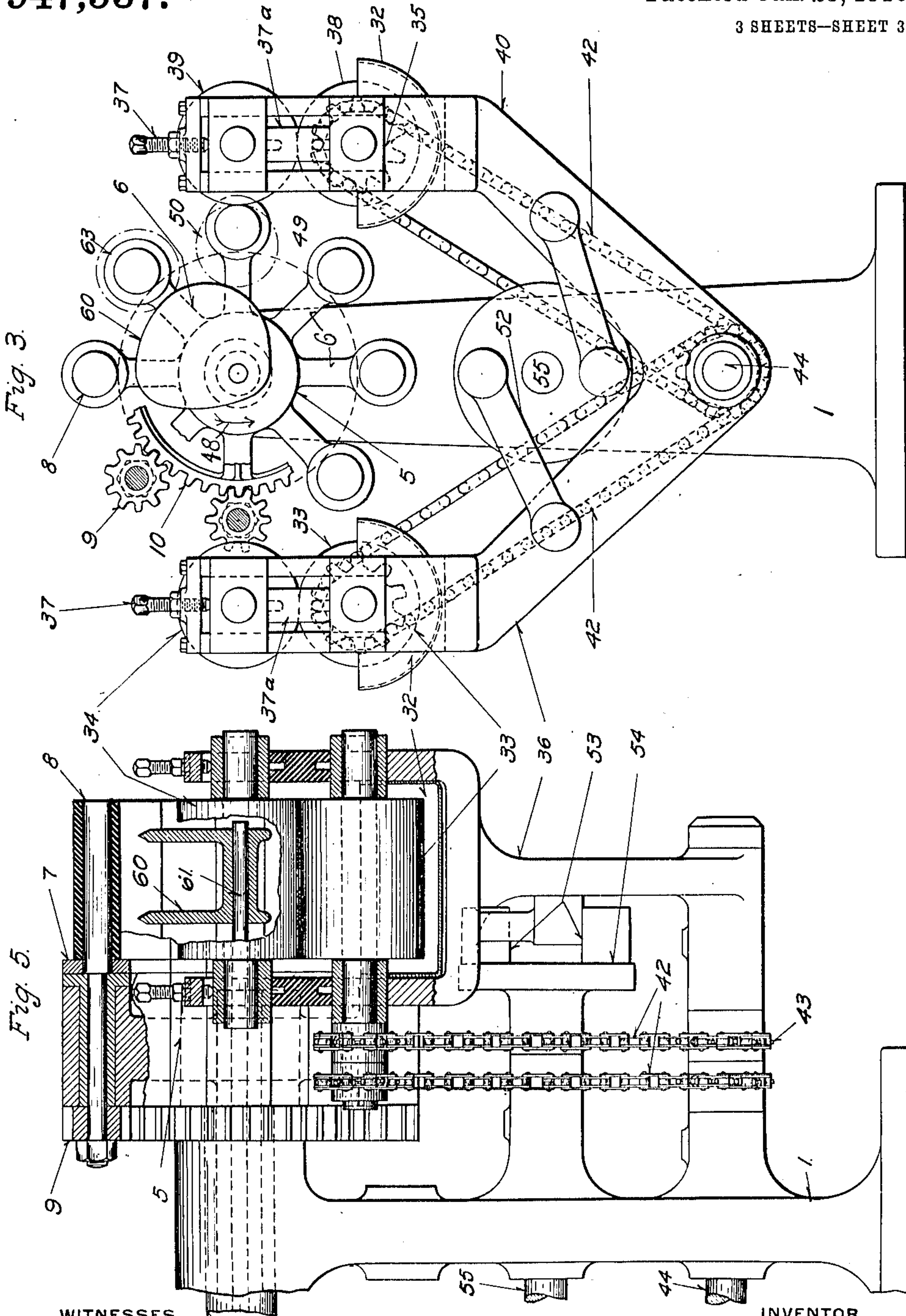
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3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

CHARLES D. WOODS, OF McKEESPORT, PENNSYLVANIA.

CAN-BODY-COATING MACHINE.

947,537.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed December 24, 1908. Serial No. 489,138.

To all whom it may concern:

Be it known that I, CHARLES D. WOODS, a resident of McKeesport, in the county of Allegheny and State of Pennsylvania, have
5 invented a new and useful Improvement in Can-Body-Coating Machines, of which the following is a specification.

This invention relates to apparatus for coating can bodies both inside and outside,
10 and more particularly for applying to can bodies a coating of lacquer or other material which is not affected by the contents of the can in order to render the latter strictly sanitary.

15 Fruit and various other materials which are largely put up in tin cans contain acids which dissolve the tin or lead used in soldering the joints of the cans. This frequently discolors the contents of the can and
20 also frequently form poisonous compounds so that for many purposes tin cans can not be safely used on the ground of being unsanitary. Various attempts have been made to provide tin or other sheet metal cans
25 which are perfectly sanitary. There are preparations, such as forms of lacquer, which are unaffected by the acids of fruit or other materials put up in cans, but difficulty is experienced in giving the cans a
30 uniform and unbroken coating of such coating material.

The present invention covers a machine for applying to sheet metal can bodies lacquer or other coating in a thin, uniform
35 and unbroken layer, so as to render the can perfectly sanitary, and preferably this coating will be applied to the exterior as well as to the interior of the can body.

40 The invention comprises a machine constructed, arranged and operating as hereinafter described and claimed.

In the accompanying drawings Figure 1 is a side elevation of the machine; Fig. 2 is a rear end elevation of the same; Fig. 3
45 is a front end elevation of the same; Fig. 4 is a vertical longitudinal section of rear part of the machine; and Fig. 5 is a longitudinal section of the forward part of the machine.

50 The machine includes a suitable frame, standard, or housing 1 in which all of the operative parts are mounted. In the upper part of the frame or housing are suitable bearings 2 in which is mounted a hollow shaft 3, and inside of this shaft is another
55 shaft 4. Secured to the front end of the shaft 4 is a spider or frame 5 provided

with one or more arms 6, eight such arms being shown in the particular machine illustrated, in whose outer ends are mounted
60 rotary spindles 8. The forward or outwardly projecting ends of these spindles are formed of or covered with some suitable yielding composition, such as rubber or a composition similar to the inking rollers of printing presses, such spindles or
65 rolls being adapted to enter the can body and coat the interior thereof. Steel or other hard washers 7 are placed at the bases of the spindles. Secured to the rear end of each spindle 8 is a small gear or pinion 9,
70 meshing with a central gear 10 fastened on the forward or outer end of the hollow shaft 3. To the rear end of the hollow shaft 4 is secured a sprocket wheel 12 over which runs a chain 13, which engages another
75 sprocket wheel 14 on the driving shaft 15, the latter being provided with a pulley 16 or other suitable means for imparting power thereto. By means of the sprocket gears 12 and 14, sprocket chain 13, hollow shaft
80 3, gear 10 and pinions 9, continuous rotary motion is imparted to the spindles or rolls 8 which constitute the means for applying the coating to the interior of can bodies.

85 The inner shaft 4 is given an intermittent step by step rotation in order to carry the spider 5 around intermittently. This is effected by means of a ratchet wheel 18 secured to the rear or outer end of shaft 4 and provided with as many teeth as there are
90 arms to the spider 5. Coöperating with said ratchet wheel is a pawl or dog 19 pivoted at 20 to a disk or plate 21 which is mounted on the shaft 3 so that it cannot rock or oscillate thereon. This plate is
95 oscillated by means of a cam 22 formed in a gear wheel 23 which is driven by means of an intermediate or idler pinion 24 meshing with wheel 23 and wheel 25 on driving
100 shaft 15. Running in the cam groove 22 is a roller 26 rotatably mounted on a bar 27 which is guided at its lower end in the vertical guide 28 and at its upper end is connected by pin and slot connection 29 to an
105 arm 30 on the disk 21. The cam 22 imparts a vertical reciprocating movement to bar 27, thus oscillating the disk 21 and through the pawl 19 coöperating with ratchet wheel 18 imparting a step by step
110 rotary movement to shaft 4 and to the spider 5 carried thereby.

The spindles or rolls 8 apply the coating

material to the interior of the can bodies, and in order to do this it is necessary to supply said spindles with the coating material or lacquer before the cans are placed thereon. For this purpose I provide means somewhat similar to inking mechanism of printing presses. The coating material is placed in a trough 32 in which runs a roll 33, and contacting with this roll is another roll 34 so located that the spindles 8 are successively brought into contact therewith. The roll 33 is positively driven, thereby supplying the coating liquid to roll 34 and from the latter it is transferred to the spindles 8, as will be apparent from Fig. 3. The rolls 33 and 34 are mounted in suitable bearings 35 held in frames 36. Screws 37 serve to hold the roll 34 in contact with roll 33, and springs 37^a, shown as rubber cushions, tend to separate said rolls. To coat the exterior of the can body a similar set of rolls is provided on the opposite side of the machine, namely, a trough 37 in which runs a roll 38 and contacting with the latter a roll 39, these rolls being mounted in suitable bearings 35 held in the frames or housings 40 and being held in contact by adjusting screws 37. The rolls 33 and 38 are positively driven by means of sprocket chains 42 running over sprocket wheels 43 on a shaft 44 mounted in the lower part of the frame of housing 1 and its rear end provided with a sprocket wheel 45 which is driven by sprocket chain 46 from driving shaft 15.

In the operation of the machine the rolls 33 and 38 are continuously driven. The spider 5 is intermittently rotated so as to bring the spindles 8 successively into contact with roller 34, in which position the spider pauses so that the spindles 8 are supplied with coating material by contacting with roll 34. The spider is then rotated intermittently in the direction of the arrow 48 and then can bodies are slipped onto the spindles when in position indicated at 49. One of the can bodies is shown at 50. When the spindle with the can body thereon comes in contact with the roll 39 it again pauses and the can body is pinched between the spindle and the roll and is rotated. The spindle and the roll rotate with the same surface speed, so that thereby both the interior and the exterior of the annular can body are coated with the material, and there is no slipping or wiping action on either the interior or exterior of the can. The consequence is that the can body is coated both inside and outside with a uniform and unbroken layer of lacquer or other coating material. The rollers 34 and 39 as well as spindles 8 are formed of some yielding composition, such as rubber or compositions used in making printing press inking rolls. Preferably the rolls 34 and 39 are alter-

nately brought against the spindles 8 and released therefrom so as to release the can body and permit the same to be brought into place. This is accomplished by pivoting the frames 36 and 40 at their lower ends, as on the shaft 44, and connecting said frames by means of links 52 to crank pins 53 on disk 54 secured on the end of rock shaft 55 mounted in the frame or housing 1 and having secured to its rear end an arm 56 which has a pin and slot connection 57 with the bar 27, so that in the reciprocation of said bar oscillatory movement is imparted to shaft 55 and disk 54 thereby alternately spreading and closing the frames 36 and 40. The parts of the mechanism are so proportioned and arranged that the separating of these frames occurs in alternation with the step by step rotary movement of the spider 5, the action being that with the spider in the position shown in Fig. 3 the frames are first separated, after which the spider is given a forward step-like rotary movement, after which the frames are brought toward each other to bring the roll 34 into contact with a fresh spindle 8 and the roll 39 into contact with the can. The rolls 34 and 39 and spindles 8 are constantly rotated and the gearing for rotating these members is so proportioned that they have uniform surface speeds.

The coating material is necessarily in liquid form, and if the can body after leaving the roll 39 were permitted to rest upon the spindle 8 it would be likely to mark the interior of the can and give a line of coating of less than the required thickness. To prevent the can body from resting against the spindle 8 I provide suitable means for supporting the can body away from the spindle while being carried upwardly by the spider. The means shown for this purpose comprises one or more cam shaped disks 60 provided with very thin edges to contact with the outside of the cans on a line, the cam being shaped as indicated in Fig. 3 so that as the spider rotates upwardly the can body is held out of contact with the spindle. The cam 60 is shown as stationary, being held in this position by being secured to a rod 61 which extends through a central hole in shaft 4 and at its rear end is connected to an arm 62 projecting from the frame 1, although it may be rotated if desired. The cans are removed from the spindles 8 at substantially the position 63.

Suitable mechanism may be provided for automatically placing the can bodies on the spindles 8 and for removing the same therefrom and conveying the same away.

The operation of the machine will be readily understood from the foregoing description. In the operation of the machine the spindles 8 are successively brought into contact with roll 34 and coated with the

coating material after which the can bodies are slipped on to the spindles and carried around until brought in contact with roll 39 into which position the annular can body is pinched between the spindle and roll and coated both inside and outside by a strictly rolling action and without any wiping movement which would tend to wipe off the coating material. The spider pauses sufficiently long to secure the proper coating of the can body both inside and outside. The consequence is that the can body is provided with a thin but uniform, unbroken coating of lacquer or other acid resisting material and is perfectly sanitary. A thin coating is necessary to prevent the material from running or sagging before drying. For sanitary purposes the interior of the can body only need be coated. It is preferred, however, to also coat the outside of the can and particularly as it enables the use of untinned sheet plate, such as a black plate, which would rust unless coated on the outside.

The machine can, of course, be used for coating annular bodies of any kind, or can bodies made of tinned sheet metal, and is not limited to coating can bodies of black plate.

In case the can body is to be coated only on the inside, coating material would not be applied to the roll 39, but it would still be necessary to have said roller to contact with the outside of the can body and pinch the latter against the spindle 8 in order to give the necessary rotary movement and pressure to coat the interior of the can body.

What I claim is:

1. Apparatus for coating tubular articles, comprising driven rotary means for applying coating material to the inside of the tubular article, and means for rotating the tubular article in contact with said coating applying means and at the same peripheral speed.

2. Apparatus for coating tubular articles, comprising driven rotary means for applying coating material to the inside of the article, means for supplying coating material to said applying means, and means for rotating the article while in contact with said coating applying means and at the same peripheral speed.

3. Apparatus for coating tubular articles, comprising driven rotary means for applying coating material to the inside of the tubular article, means for supplying coating material to said coating applying means, means for rotating the tubular article in contact with said coating applying means, and at the same peripheral speed, and mechanism for moving the coating applying means from the coating supplying means to the rotating means.

4. Apparatus for coating tubular articles,

comprising a driven roll or spindle over which the tubular article is placed, a driven roll arranged to contact with the exterior of said tubular article to rotate the same, and mechanism for driving the spindle and roll at the same peripheral speed.

5. Apparatus for coating tubular articles, comprising a driven roll or spindle over which the tubular article is placed, a driven roll arranged to be contacted by said roll or spindle for supplying coating material to the latter, and mechanism for rotating the article on said roll or spindle.

6. Apparatus for coating tubular articles, comprising a continuously driven roll or spindle over which the tubular article is placed, a driven roll arranged to be contacted by said roll or spindle, a trough arranged beneath said driven roll for supplying coating material to the latter, and means for rotating the article on said roll or spindle.

7. Apparatus for coating tubular articles, comprising a trough, a driven roll arranged to be supplied with coating material from the trough, a driven roll or spindle over which the tubular article is placed, means for moving said roll or spindle into contact with said driven roll to receive a supply of coating material and away therefrom to permit the tubular article to be placed thereover, and means for rotating the article on said roll or spindle.

8. Apparatus for coating tubular articles, comprising a driven coating supply roll, a rotating roll or spindle over which the tubular article is placed, means for moving said roll or spindle into contact with said driven roll, and means for pressing the tubular article against said spindle or roll and rotating the same therewith.

9. Apparatus for coating tubular articles comprising a rotating roll or spindle over which the tubular article is placed, means for supplying coating material thereto, means for rotating the tubular article with said roll or spindle, and mechanism for carrying the roll or spindle from the coating supplying means to the rotating means.

10. Apparatus for coating tubular articles, comprising a rotary roll or spindle over which the tubular article is placed, a driven roller with which the spindle may contact to supply the latter with coating material, a second driven roller with which the spindle is brought into operative relation for contacting with the exterior of the tubular article and rotating the same, and a carrier for said spindle arranged to bring the same in succession into operative relation with both of said rolls.

11. Apparatus for coating tubular articles, comprising a rotary roll or spindle over which the tubular article is placed, a pair of driven rolls, one for supplying coating mate-

rial to said roll or spindle and the other to contact with the exterior of the tubular article and rotate the same, means for bringing the spindle into operative relation with said rolls in succession, and means for supplying coating material to one of said rolls.

12. Apparatus for coating tubular bodies, comprising a rotary spindle over which the tubular article is placed, a pair of driven rolls, one for supplying coating material to said spindle and the other for contacting with the exterior of the tubular article and rotating the same, means for bringing the spindle into operative relation in succession with both of said rolls, and means for supplying coating material to both of said rolls.

13. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles rotatively mounted on said frame, a pair of driven rolls adjacent to the frame and with which the spindles are successively brought into operative relation, one of said rolls being arranged to contact with the exterior of the body and rotate the same, means for supplying coating material to the other of said driven rolls, and mechanism for rotating the frame step by step.

14. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles rotatively mounted on said frame, a pair of rolls adjacent to the frame and with which the spindles are successively brought into operative relation, one of said rolls being arranged to contact with the exterior of the tubular body and rotate the same, mechanism for rotating the spindles, means for supplying coating material to the other of said rolls, and mechanism for rotating the frame step by step.

15. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles rotatively mounted on said frame, mechanism for rotating said frame step by step, a pair of rolls adjacent to the frame with which the spindles are successively brought into operative relation, one of said rolls being arranged to contact with the exterior of the tubular body and rotate the same, and means for supplying coating material to both of said driven rolls.

16. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles rotatively mounted on the frame, a pair of rolls adjacent to the frame with which the spindles are successively brought into operative relation, one of said rolls being arranged to contact with the exterior of the tubular body and rotate the same, means for supplying both of said rolls with coating material, means for rotating said spindles, and mechanism for rotating the frame step by step.

17. Apparatus for coating tubular bodies, comprising a spindle over which the tubular body is placed, means for supplying coat-

ing material to said spindle a roll arranged to contact with the exterior of the body on said spindle to rotate the same, and mechanism for rotating said spindles and roller at the same peripheral speed.

18. Apparatus for coating tubular bodies, comprising a spindle adapted to have the tubular body placed over the same, a roll arranged to be contacted by the spindle for supplying the latter with coating material, a second roll arranged to contact with the exterior of the tubular body to rotate the same, and mechanism for rotating said spindle and second roll at the same peripheral speed.

19. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles rotatively mounted thereon, a pair of rolls adjacent to the frame and with which the spindles are brought in successive operative relation, one of said rolls being arranged to supply coating material to said spindles and the other being arranged to contact with the exterior of the tubular bodies and rotate the same, mechanism for rotating the frame step by step, and mechanism for rotating said spindles and rolls at the same peripheral speed.

20. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles mounted on said frame, a driven gear concentric with the axis of said frame and meshing with gears on said spindles, a pair of rolls with which said spindles are successively brought into operative relation, means for supplying coating material to one of said rolls, and mechanism for rotating the other one of said rolls at the same peripheral speed as the spindles.

21. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles mounted on said frame, a driven gear concentric with the axis of said frame, gears on said spindles meshing with said driven gear, a pair of rolls arranged to have the spindles successively brought into operative relation thereto, means for supplying one of said rolls with coating material, and means for driving one of said rolls at a uniform peripheral speed with said spindles.

22. Apparatus for coating tubular bodies, comprising a movable frame, a plurality of spindles rotatively mounted thereon, a pair of driven rolls arranged to have the spindles successively brought into operative relation thereto, means for moving said rolls toward and from said frame, means for supplying one of said rolls with coating material, and mechanism for rotating the other one of said rolls at the same peripheral speed as the spindles.

23. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of spindles rotatively mounted thereon, mechanism for rotating said frame step by step,

a pair of driven rolls with which said spindles are successively brought into operative relation, means for supplying coating material to one of said rolls, and mechanism for
5 moving said driven rolls toward and away from said rotating frame.

24. Apparatus for coating tubular bodies, comprising a rotary frame, a plurality of
10 spindles rotatively mounted on said frame, means for rotating said frame step by step, driven rolls arranged in operative relation to the spindles of the frame, mechanism for driving said rolls, frames in which said rolls
15 are mounted, and means for simultaneously moving said frames toward and from said rotary frame.

25. Apparatus for coating tubular bodies, comprising a rotary frame, spindles rotatively mounted thereon, means for supplying coating material to said spindles, a
20 driven roll arranged to contact with the exterior of the tubular body to rotate the same, mechanism for rotating said frame step by step, and a cam guide arranged to hold the
25 tubular body out of contact with the spindles after leaving the driven roll.

In testimony whereof, I have hereunto set my hand.

CHARLES D. WOODS.

Witnesses:

JOHN S. CORT,
F. W. WINTER.