No. 682,608. Patented Sept. 17, 1901.

D. L. EUSTICE.

MACHINE FOR MIXING AND PACKING AXLE GREASE.

(Application filed Oct. 21, 1899.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 1.

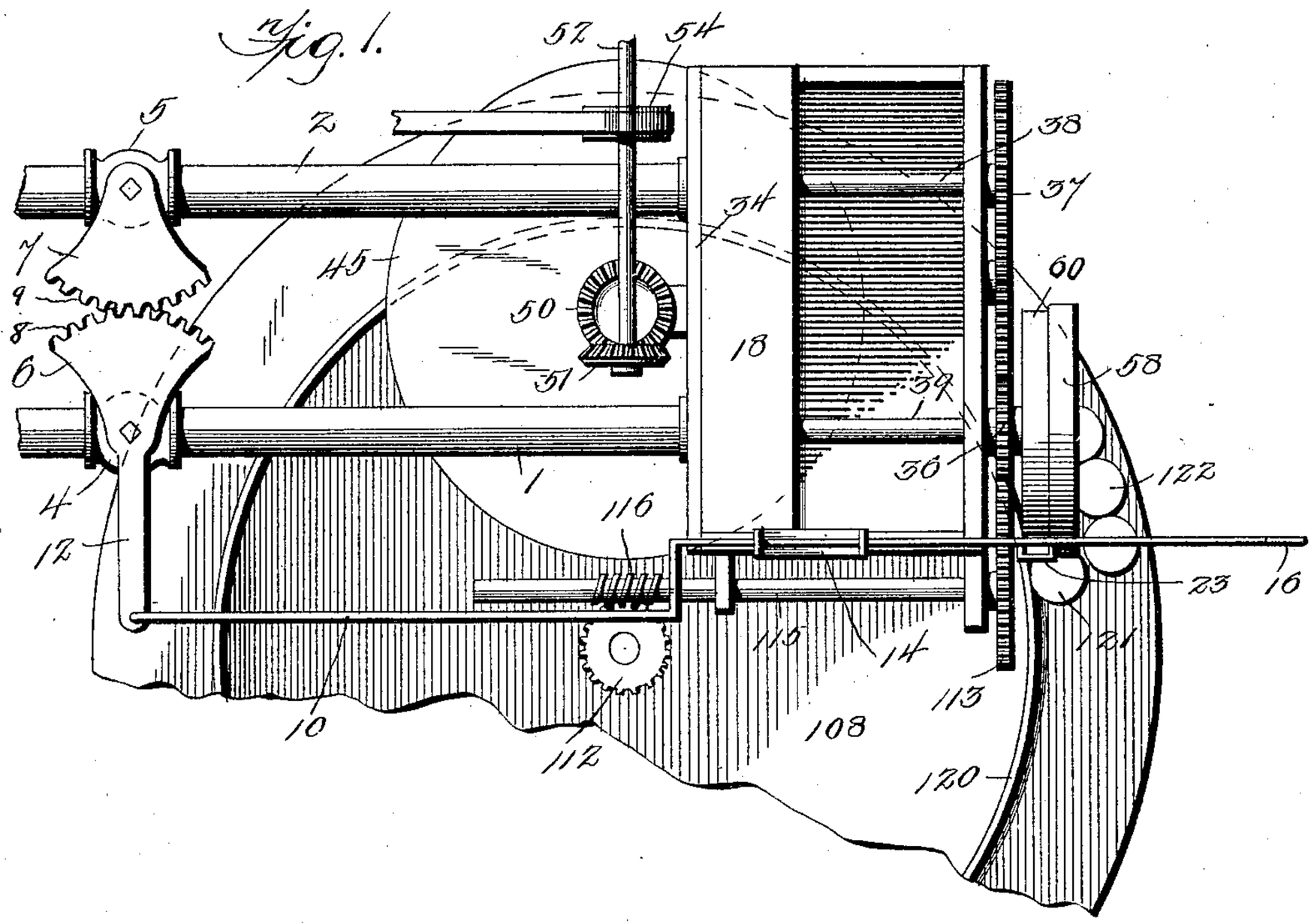
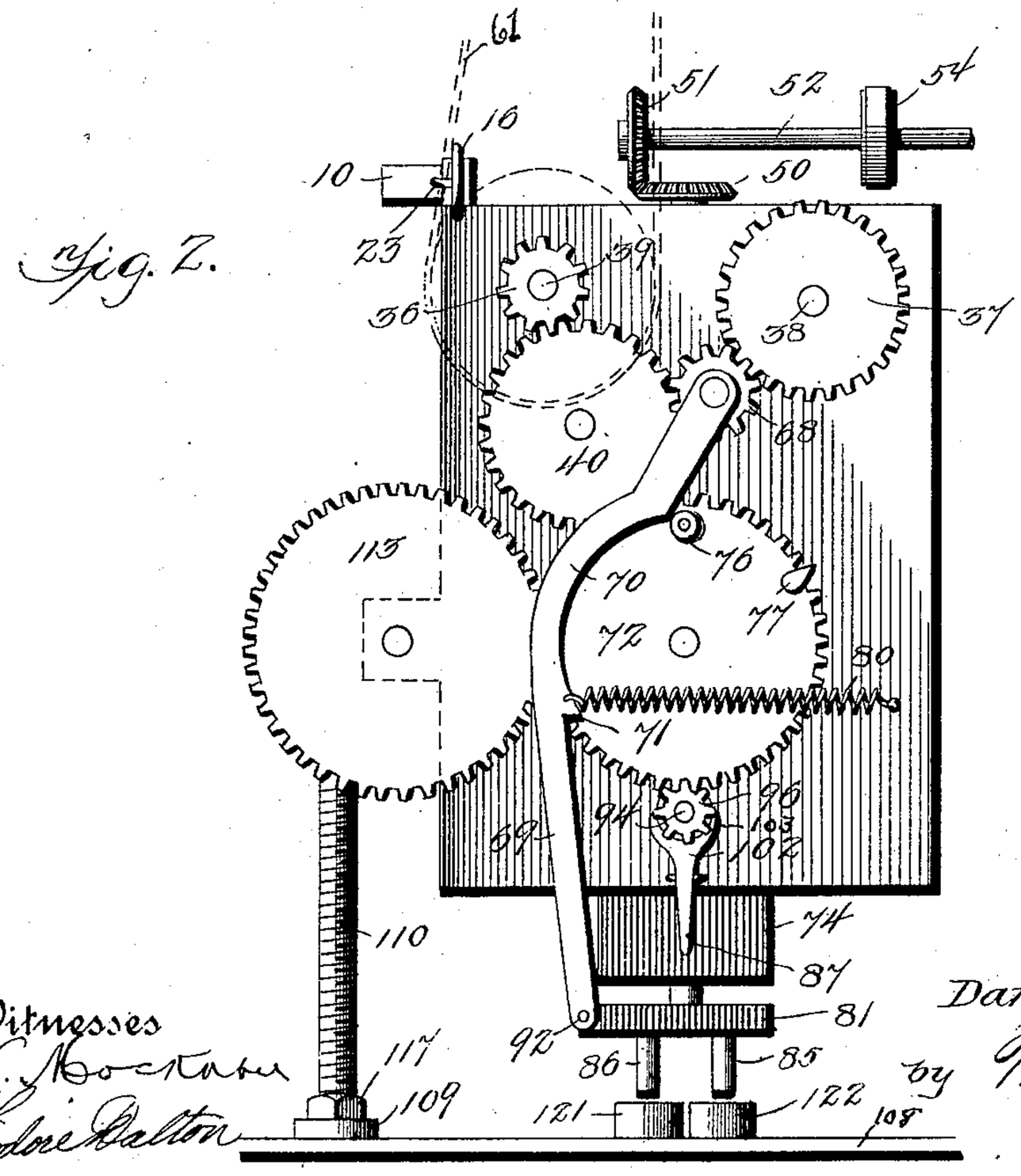


Fig. 2.



Witnesses
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(No Model.) 3 Sheets—Sheet 2.

Fig. 3.

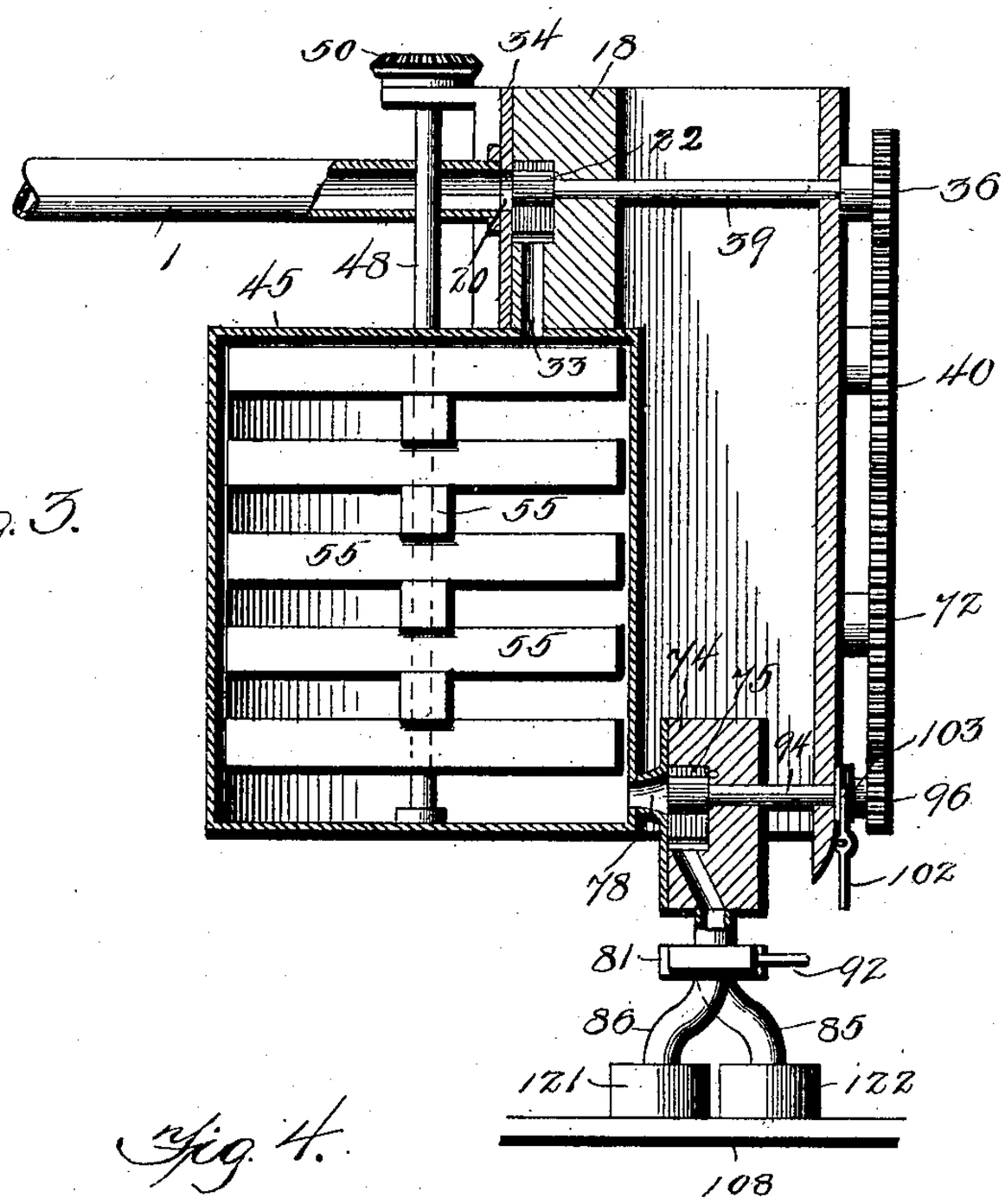

Fig. 4.

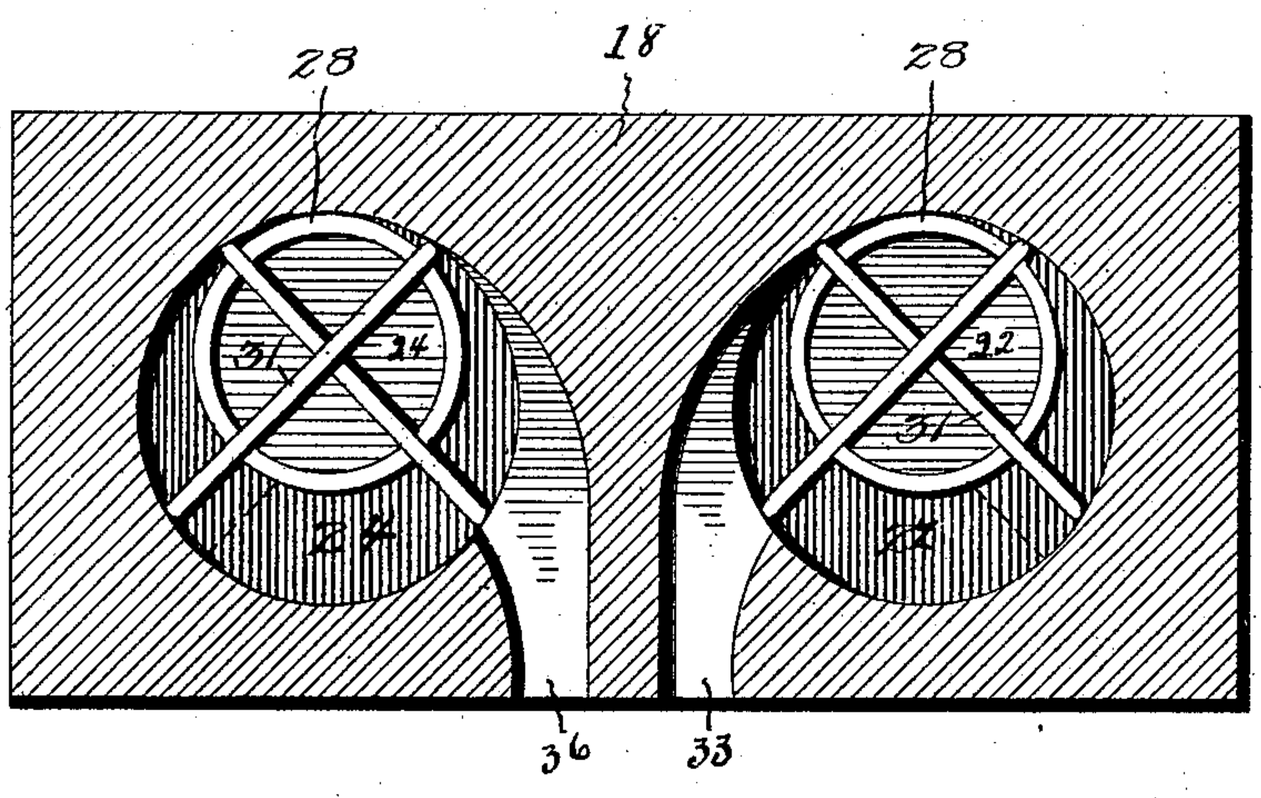

Fig. 8

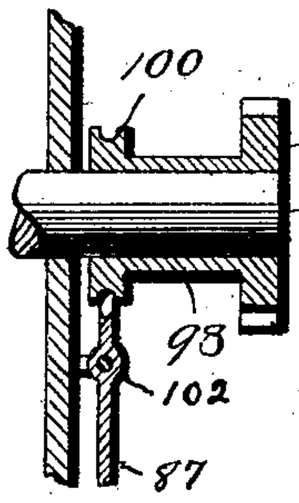

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Fig. 5.

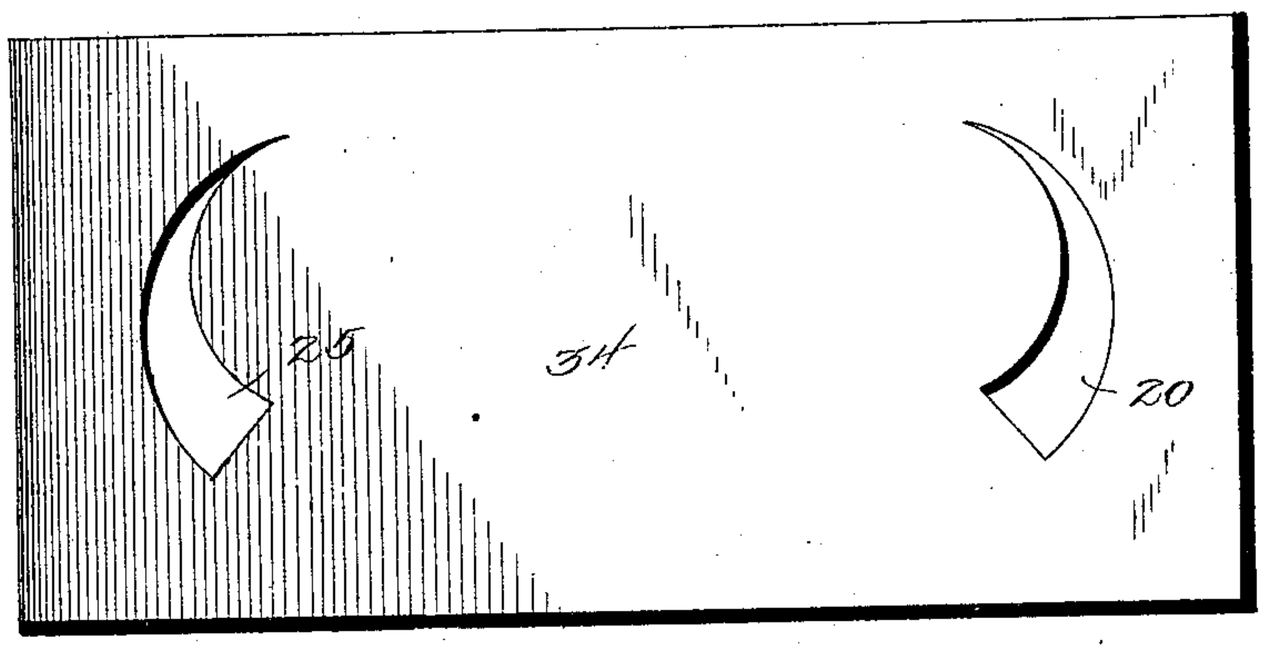


Fig. 6.

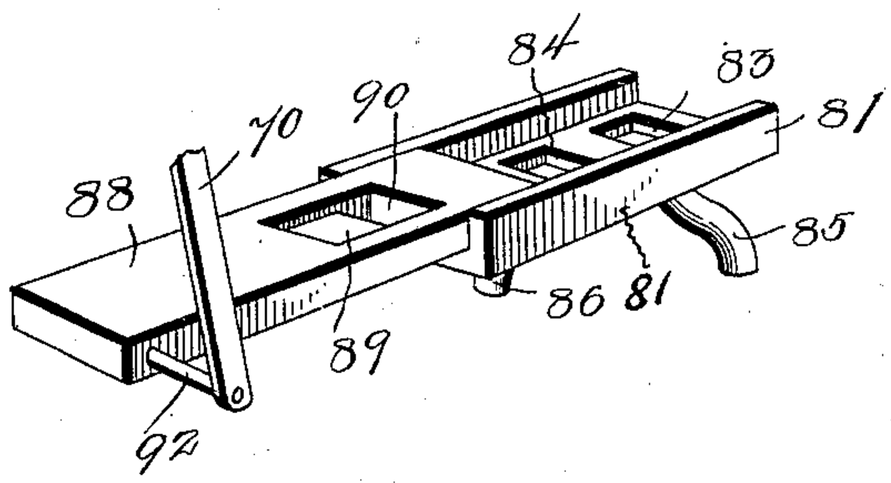
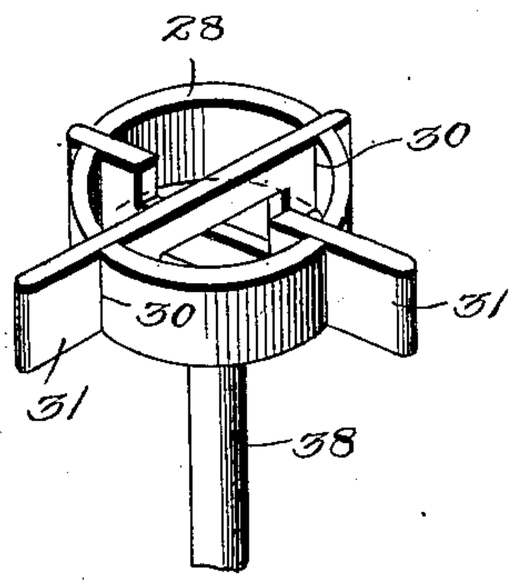


Fig. 7.



Witnesses:
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UNITED STATES PATENT OFFICE.

DANIEL L. EUSTICE, OF GALENA, ILLINOIS.

MACHINE FOR MIXING AND PACKING AXLE-GREASE.

SPECIFICATION forming part of Letters Patent No. 682,608, dated September 17, 1901.

Application filed October 21, 1899. Serial No. 734,407. (No model.)

To all whom it may concern:

Be it known that I, DANIEL L. EUSTICE, a citizen of the United States, residing at Galena, in the county of Jo Daviess and State of Illinois, have invented certain new and useful Improvements in Machines for Mixing and Packing Axle-Grease; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

In the manufacture of axle-grease and in packing the same in cases ready for the market great difficulty has been experienced in controlling the temperature in both hot and cold weather, whereby the constituent parts of the oil and "set" may be brought together in the proper proportions and thoroughly mixed before the setting or hardening process has taken place. A further difficulty arises in filling the packages before the mixture has set or hardened, so that the upper surface of the filled packages will present a smooth and glossy appearance, free from bubbles and streaks arising from insufficient mixing or mixing under improper temperature. Again, in pouring the mixture in packages before it shall have set it requires workmen of long experience to fill the packages rapidly before the mixture shall have hardened and place in each package the same amount, and even the packages filled by the most expert will often vary materially in the quantity therein, and the upper surface of the filled package will present an uneven or rough appearance and unmerchantable on account of the varying temperature causing the sudden hardening of the mixture. Another troublesome feature is found while filling the packages that more or less of the grease will spill or drip upon the outside of the package and will require time to clean it off, and if the package be of thin wood it will often have so entered into the composition of the wood that it cannot be eradicated and the package will be rendered unmarketable. By overcoming these and other minor difficulties I am enabled in all kinds of weather to automatically control the temperature of the constituent parts of the grease, both while it is in the process of manufacture and in packing of the same; to always bring together the oil and the set in the best possible proportions and always in the same ratio, whereby there will be uniformity in the product and a smooth and glossy appearance of the surface of the package; to thoroughly mix the ingredients before there shall be any setting or hardening of the same and that, too, even when the ingredients are very warm; to fill each package of the same size with an equal quantity of the grease; to prevent the soiling of the outside of the packages, and to largely increase the output of the factory with a marked economy in expense.

Other minor objects and benefits will be made apparent in the following specification, wherein is fully explained the construction of my machine and its mode of operation.

Figure 1 is a top plan view of the machine with a portion of the revolving table broken away. Fig. 2 is a face view of one side of the machine, showing the gears for operating the different parts. Fig. 3 is a vertical section through the mixer, oil-measure, and filling-measure. Fig. 4 is a top plan view of the measuring-boxes with the front plate 34 removed. Fig. 5 is a plan view of the front plate detached. Fig. 6 is a perspective of the trough and cut-off that controls the discharge of the material into the boxes. Fig. 7 is a perspective view of one of the measures. Fig. 8 is a detail view in longitudinal section.

Like characters of reference denote corresponding parts in all of the drawings.

Two pipes 1 and 2 are connected with the supply-tanks. (Not shown.) Pipe 1 is connected with the oil-supply and pipe 2 with what is called the "set-supply." These pipes empty into measuring-boxes hereinafter to be described. Within these pipes at a short distance from the machine are stop-cocks or valves 4 and 5, to which are connected the segmental gears 6 and 7. These segmental gears are supplied with the teeth 8 and 9, which mesh into each other and serve to operate the valves evenly and at the same time, thus controlling the supply of both oil and set to the measuring-boxes. The wheels 6 and 7 are operated by the lever 10, attached to the arm 12 of the segments 6, which lever passes out over the top of the machine through the guide-loops 14 and is supplied with a grasping-handle 16.

The pipes 1 and 2 are connected with the receiving-box 18, the pipe 1 emptying its contents through the quarter-moon-shaped hole 20 in the side of the measure into the measuring-box 22 and the pipe 2 delivering the set into the measure 24 through a similarly-shaped hole 25. A plan view of the box 18, together with the two measuring-boxes with cover removed, is shown in Fig. 4. Within each of the measures 22 and 24 is set a circular cup 28, (shown in Figs. 4 and 7,) provided with the slots 30, within which are loosely set measuring-plates 31. (Shown in Fig. 7.) The set is the chemical mixture of any suitable description which is used for causing the grease to harden. The quantity of the set is only about a third or a fourth of the quantity of the oil or grease; but I do not limit my invention in this respect, for the proportions of oil or grease and set may be varied at will. These plates 31 are of the exact width as the depth of the measures 22 and 24 and of the length of the diameter of the measuring-box in which they are situated. The cups 28 are set to one side of the center of the measures 22 and 24, so that when they are revolved one edge of the cups will just touch the upper edge of the measures for the purposes presently to appear. The receiving-box 18 is provided with the two circular recesses 22 and 24 to receive the two measuring-cups 28, mounted eccentrically therein, and the front of the box has bolted thereto a plate 34, which is provided with the two quarter-moon-shaped holes 20 and 25, through which the material is admitted to the measures from the pipes 1 and 2. A shaft 38 extends through one side of the machine and into box 18, to which is rigidly secured the cup 28. Upon the outer end of the shaft 38 is attached a gear-wheel 37, and when the gear-wheel 37 is revolved the cup in the measure 24 will be revolved at the same time.

For the purpose of revolving the cup 28 in the measure 22 a wheel 36 is attached to a shaft 39, which runs into the measure 22 and to which the cup 28 is secured. It will be observed that the wheel 36 revolves twice as fast as the wheel 37, for the reason that twice as much oil is used in the manufacture of the grease as there is of set.

Beneath the box 18 and in the rear of the machine is situated the mixer 45. (Shown in Fig. 3.) This mixer consists of a circular sheet-metal vessel having a shaft 48 pivoted in the center of its bottom and extending up through the top of the mixer 45 and above the machine. At the top of the shaft 48 is attached one part of a bevel-gear 50, which meshes in with the other part of the gear 51. The gear 51 is upon a revolving shaft 52, upon which is a pulley 54. This pulley carries a belt which is attached to the power and revolves the shaft 48 through the bevel-gear. Upon the shaft 48 are two sets of beaters 55, set at right angles to each other and projecting outwardly, terminating near the inner side of the mixer 45. In front of the machine is pivoted a driving-pulley 58 upon the shaft 39, and upon the same shaft is a loose pulley 60. A belt connects these pulleys with the power. Upon the shaft 39 is a cog-wheel 36, which meshes into the cog-wheel 40. Between the wheels 40 and 37 is a cog-wheel 68, which engages with both of said wheels. A cog-wheel 72 is pivoted in the side of the machine and engages with the wheel 40, by which it is driven.

For the purpose of filling the packages with an equal amount of the grease there is placed at the base of the machine a box 74, within which is a measure 75, exactly similar to the measures 22 and 24. This measure 75 is connected with the base of the mixer 45 by a pipe 78, through which the grease after it has been thoroughly mixed is carried into the measure 75. Beneath the box 74 is a rectangular trough 81, (shown in Fig. 6,) which is supplied with two square holes 83 and 84 through the bottom of the trough. To the under side of the trough 81 is secured beneath the hole 83 the outlet-pipe 85 and beneath the hole 84 the outlet-pipe 86. In the trough is a close-fitting slide or cut-off 88, having therein a recess 89 and at one end of the recess a rectangular hole 90, and said slide is supplied with a handle 92, to which a lever 70, hereinafter to be described, is attached for operating it. A shaft 94 passes through the shell of the machine and into the measure 75, where it is secured to a cup exactly similar to cup 28. (Shown in Fig. 4.) To the outer end of the shaft 94 is slidably secured a cog-wheel 96, which meshes in with the wheel 72 and is driven thereby. The cog-wheel 96 is formed on one end of a sleeve 98, and upon the other end of the sleeve is formed a raised band 100, provided with an annular groove, as shown in Fig. 8. Below the band 100 is pivoted a clutch-lever 102, having prongs 103, which engage with the groove in the band 100. The clutch is provided with the grasping-handle 87. It will be seen that whenever it is desired to throw the wheel 96 out of engagement with the wheel 72 the operator has only to grasp the handle 87, press it in toward the machine, and as it is pivoted at or near its center will by the engagement of the prongs 103 within the groove in the band 100 draw the wheel 96 out of engagement with the wheel 72.

Upon the shaft of the wheel 68 is pivoted a lever 69, extending downwardly and attached to the handle 92 in the slide or cut-off 88. The lever is bent in the form of an arc of a circle 70 and terminates in a right-angular notch 71. Against the outer side of the wheel 72, near its outer edge, is fixed a lug 76, and a short distance to the right of that lug is another lug 77 of triangular shape. These two lugs serve to operate the lever 70 and carry it in one direction and open the cut-off 88. A spring 80 is fastened to the side of

the casing of the machine and connects with the lever 69 and brings it back to position after it has been thrown out by the lugs 76 and 77 and at the same time closes the cut-off 88. It will be observed that the lug 77 will be in engagement with the curved portion 70 of the lever 69 and hold it out after the lug 76 has passed the notch 71, and when the lug 76 has traveled just one-half the distance of the wheel 72 and is over the wheel 96 the lug 77 will have come to the notch 71, and the spring 80 will draw immediately the lever 69 inward over the lug 77, and the cut-off 88 will be instantly forced inward. Thus it will be seen that the cut-off will remain drawn out during half of the revolution of the wheel 72 and in during the other half of the revolution of the wheel, thus allowing the contents of the measure 75 to be delivered into one of the packages through the hole 83 and the outlet-pipe 85, and during the other half of the revolution of the wheel the contents of the measure would be delivered into another package through the hole 84 and outlet-pipe 86.

Beneath the machine is a circular table 108, attached at its center to a hub 109, which is screw-threaded, and through this hub passes a screw 110, and upon the top of the screw 110 is a half of a worm-gear 112. In the side of the machine is pivoted a cog-wheel 113 upon the shaft 115, to the outer end of which is the other part of the worm-gear 116. This wheel 113 engages with the wheel 72 and is operated thereby. Upon the screw 110 is a lock-nut 117. Around the outer surface of the table, a short distance from the outer edge, is set a stay-rod 120, and one row of packages 121 are placed against the stay-rod 120, and against these packages 121 are placed another row of packages 122. The table is filled with packages, as before described, and then is turned around upon the screw 110 until the packages are raised to a short distance beneath the outlet-pipes 85 and 86, and the lock-nut 117 is screwed down in engagement with the hub 109 and prevents the table from any further movement up or down.

The manner of operating my device is substantially as follows: Power is applied to the pulley 54, which drives the bevel-gear 50 and 51 and operates the beaters 55 through the shaft 48 in the mixer 45. The operator then grasps the handle 16 of the lever 10 and draws it toward him, which operation turns the segmental gear 6 by its connection with the arm 12, and as the segment 6 is in engagement with the segment 7 the segmental gears will be turned exactly the same and will open the valves 4 and 5 the same distance. This allows the oil to pass into the measuring-box 22 and the set into the measuring-box 24 through the pipes 1 and 2 and the holes 20 and 25. This same movement of the lever shifts the belt 61 from the idle pulley 60 onto the driving-pulley 58, because the driving-belt passes through the loop 23, and as the pulley is affixed to the shaft 39 it turns the wheel 36. As the wheel 36 is in engagement with the wheel 40, all of the wheels 68, 37, 72, 96, and 113 will be started at the same time, and also worm-gear and table. The movement of the wheel 36 turns the cup 28, and with it the measuring-plates 31, in the measure 22, and at each half-turn of the cup 28 the incoming oil will be carried around in the inner side of the measure and emptied through the pipe 33 into the mixer 45. At the same time the wheel 37 turns the cup 28 in the measure 24 and forces out a given quantity of the set through the pipe 36 into the mixer 45. As the beaters travel fast the oil and set will be rapidly mixed and will pass out of the pipe at the bottom of the mixer into the measure 75 and down through into the cut-off and the outlet-pipe 86 into one row 121 of the packages to be filled. The wheel 72, revolving at the same time and operating the lever 69, will as soon as the one package in the row 121 is filled move the cut-off and turn the contents of the measure into the other pipe and deliver it into one of the packages in the row 122, as before described. The same movement of the wheel 72 in engagement with the wheel 113 will turn the table by the worm-gear just the distance of the width of one package and bring the second package in each row in position to be filled. Whenever it is necessary to discontinue the filling of the package, the lever 102 may be used to throw the wheel 96 out of engagement with the wheel 72.

It will be seen that from the time the oil and set come together in the mixer to the time that it is delivered into the package is so short that though the oil be raised to a high temperature still they will have not hardened until the mixture has reached the package, and as it comes into the package in a thin liquid it will spread evenly over the surface of the package and leave it when hardened bright and glossy and with a marketable appearance. Further, the oil and set will always be mixed and in the same proportion and each package filled with the same amount, and there will be no soiling of the outside of the packages.

It is manifest that other modes of measuring and mixing, as well as of operating, may be used without departing from the spirit of my invention.

Having now described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a machine of the character described, one or more receiving-measures, a mixer, one or more measures for filling the packages and means for operating the measures and mixer conjointly for the purposes shown.

2. In a machine of the character described, a measure for measuring the oil-supply, a measure for measuring the set-supply, a mixer for mixing the oil and set, one or more meas-

ures for measuring the mixture and delivering it into the packages, a traveling table for holding the packages and means for operating the measures, mixer and table conjointly, for the purposes shown.

3. In a machine for mixing and packing axle-grease, a mixer, measures for admitting the material into the mixer, measures for delivering the mixture from the mixer, said measures consisting of a box provided with a circular recess, a slotted cup eccentrically mounted within the recess, measuring-plates carried by the cup and adapted to slide back and forth within the slots, and openings for receiving and discharging the material.

4. In a machine for mixing and packing axle-grease, a mixer, measures for admitting the material into the mixer, measures for delivering the mixture from the mixer, a trough beneath the delivering-measures and provided with one or more discharge-openings, a cut-off within the trough whereby a given quantity of the mixture is delivered into each of the packages and means for operating the measures, mixer, and cut-off conjointly, substantially as shown and described.

5. In a machine of the character described, an oil-supply pipe and a set-supply pipe, a mixer, means for delivering a given quantity of oil and set into the mixer, means for discharging a given quantity of the mixture from the mixer, and means for operating the mixer and the delivering and discharging means for the material conjointly.

6. In a machine of the character described, a measure, means for operating said measure, a cut-off, and means for operating said cut-off, consisting of the lever 69, a wheel 72 having lugs 76 and 77 adapted to engage said lever, all combined as and for the purposes shown.

7. A machine of the character described, consisting of two supply-pipes, one for the oil and one for the set, a valve in each pipe, means for operating said valve at the same time, a measure connecting with each of said pipes, a mixer connecting with both of said measures, a measure connected with the mixer and having a discharge-opening, a cut-off beneath the opening, and a traveling table carrying the packages to be filled, with means for operating the mixer, the cut-off and the table, all combined as and for the purposes shown.

8. A machine of the character described, consisting of one or more measures connected with the oil and set supply, a mixer, one or more measures for delivering a given quantity of the completed grease into each package, means for operating said measures and mixer, in combination with a traveling table carrying the packages to be filled, consisting of a table, a central shaft to which the table is secured, and means for operating said shaft in conjunction with the measures and mixer, as and for the purposes shown.

9. In a machine of the character described, one or more measures for measuring the supply, a mixer, a measure for filling the packages, with means for operating the same, and a traveling table carrying packages set beneath the filling-measure, means attached to the table for holding the packages thereon, and a worm-gear for operating said table in conjunction with said filling-measure, substantially as and for the purposes shown.

In testimony whereof I affix my signature in the presence of two witnesses.

DANIEL L. EUSTICE.

Witnesses:
M. M. CADY,
J. B. LANE.