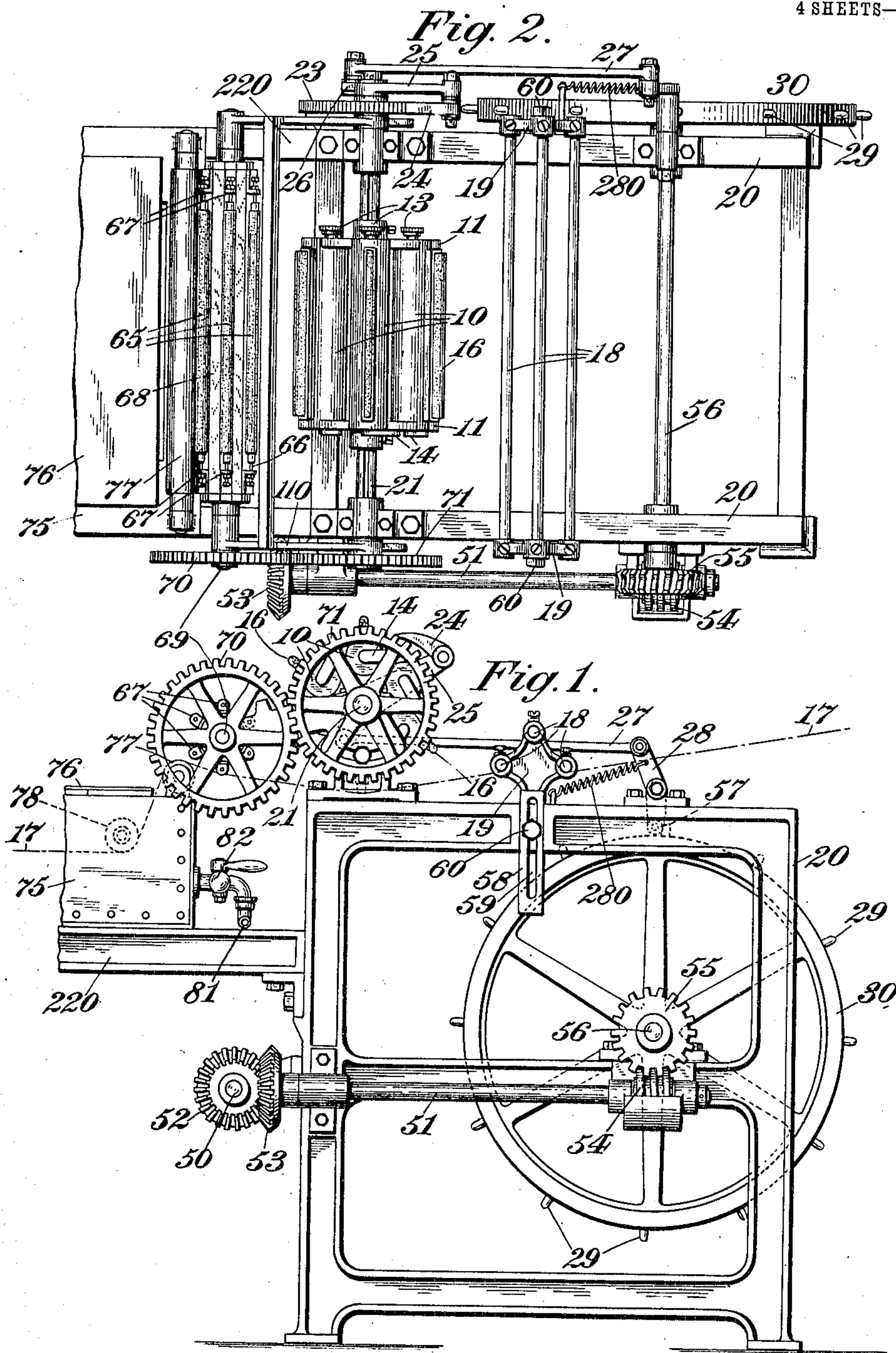


No. 871,376.

PATENTED NOV. 19, 1907.

J. SULZBACH.
DYEING MACHINERY.
APPLICATION FILED MAR. 14, 1907.

4 SHEETS—SHEET 1.



Witnesses:
J. L. Edwards.
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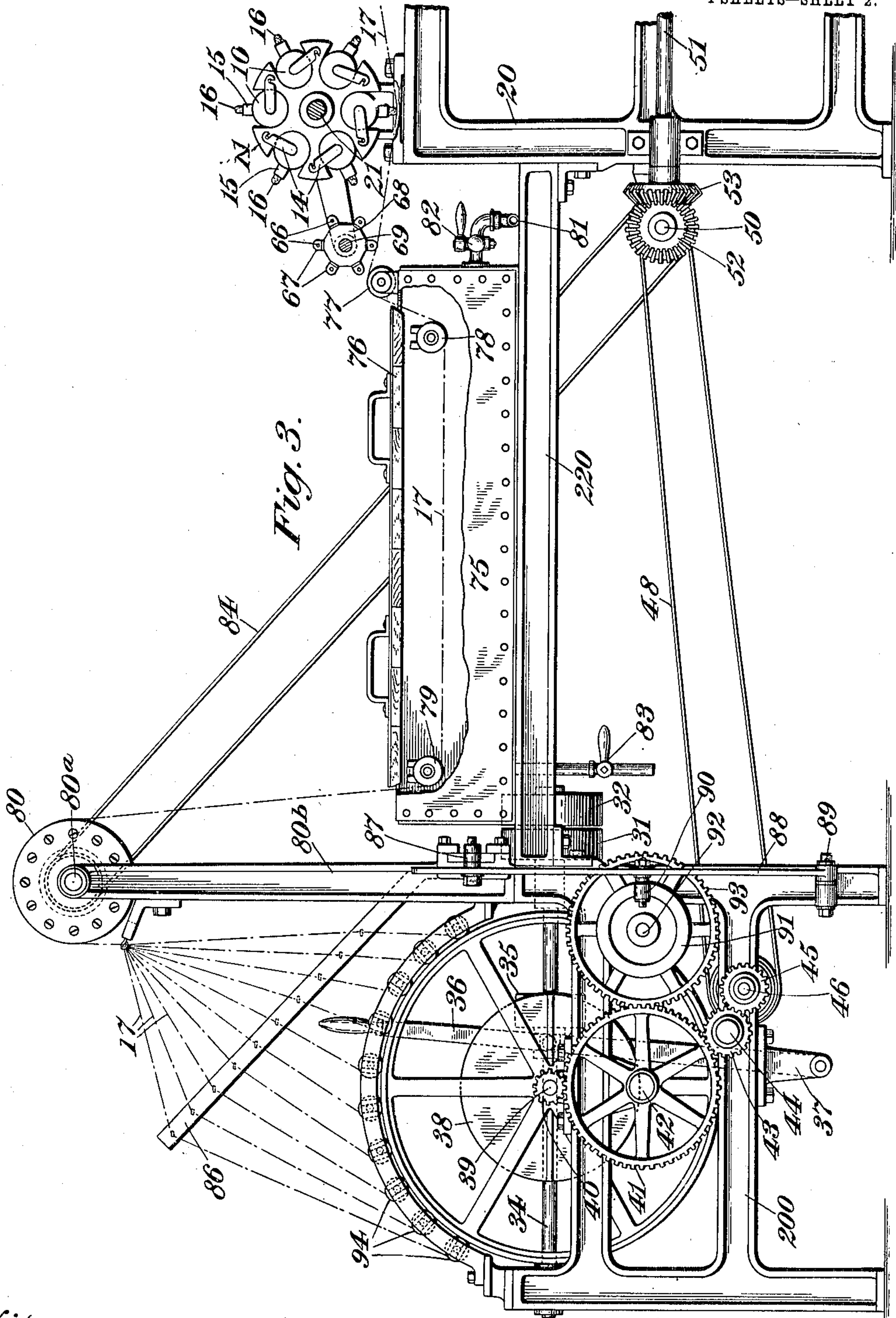
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4 SHEETS—SHEET 2.



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4 SHEETS—SHEET 3.

Fig. 5.

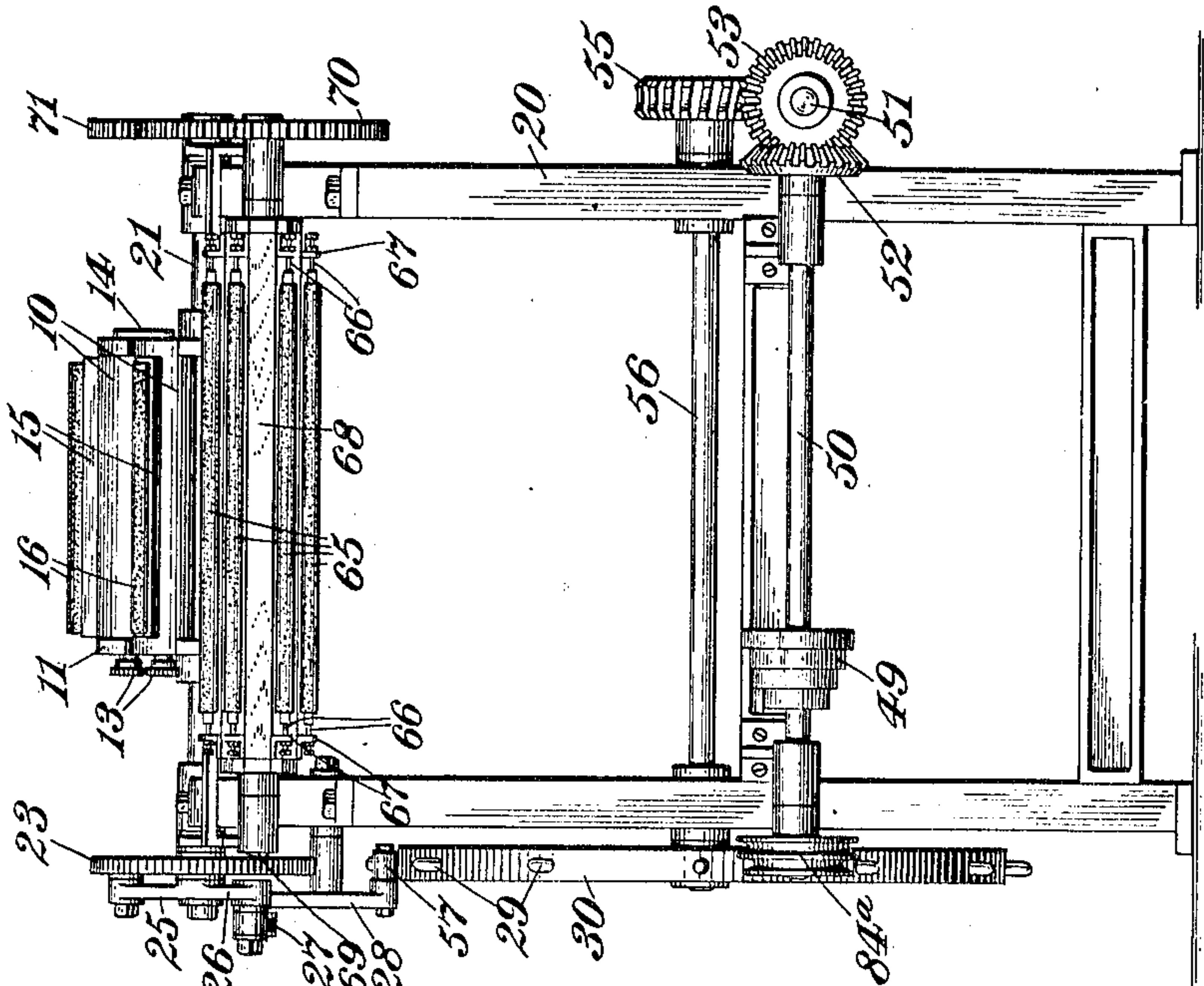
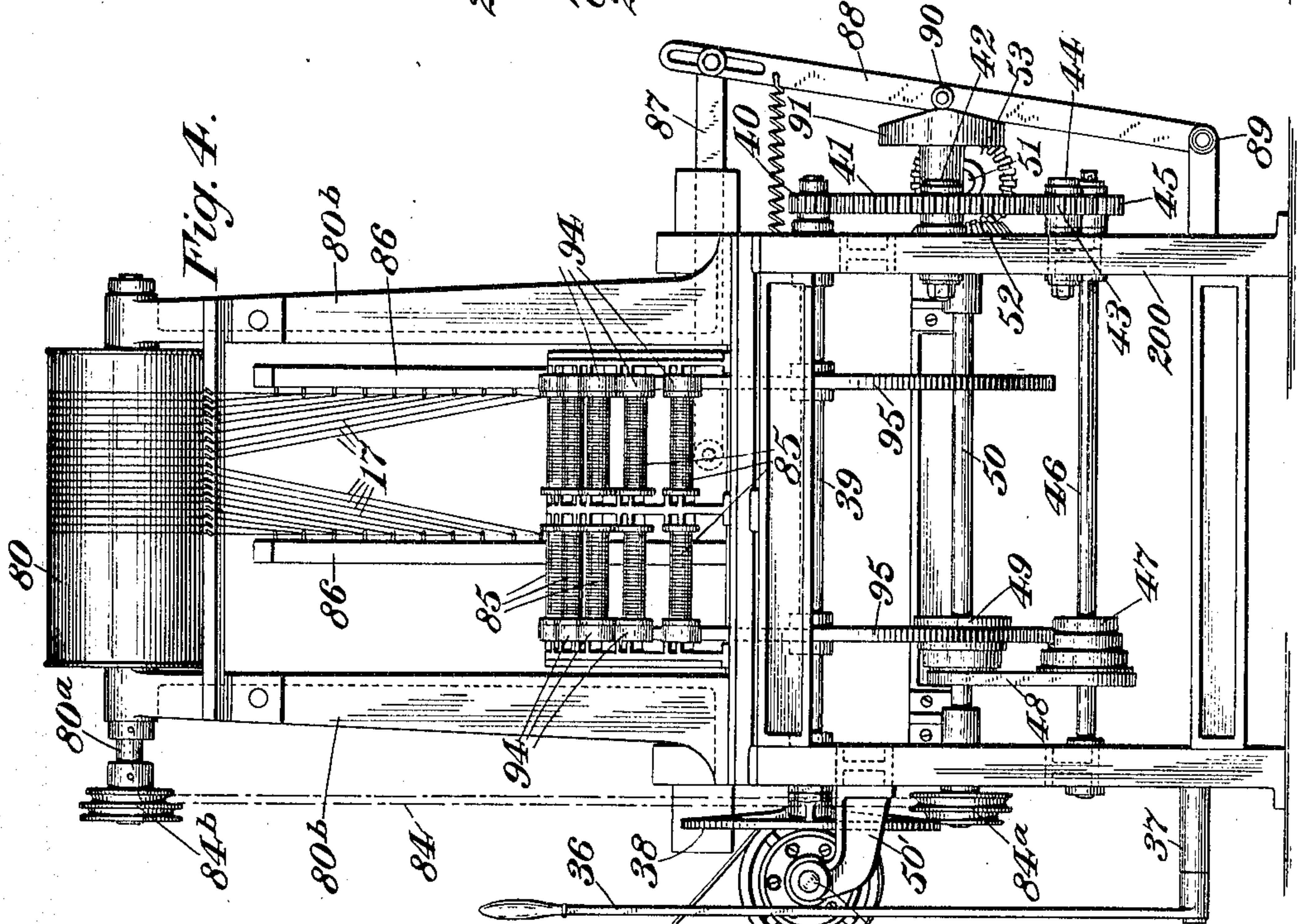


Fig. 4.



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4 SHEETS—SHEET 4.

Fig. 10.

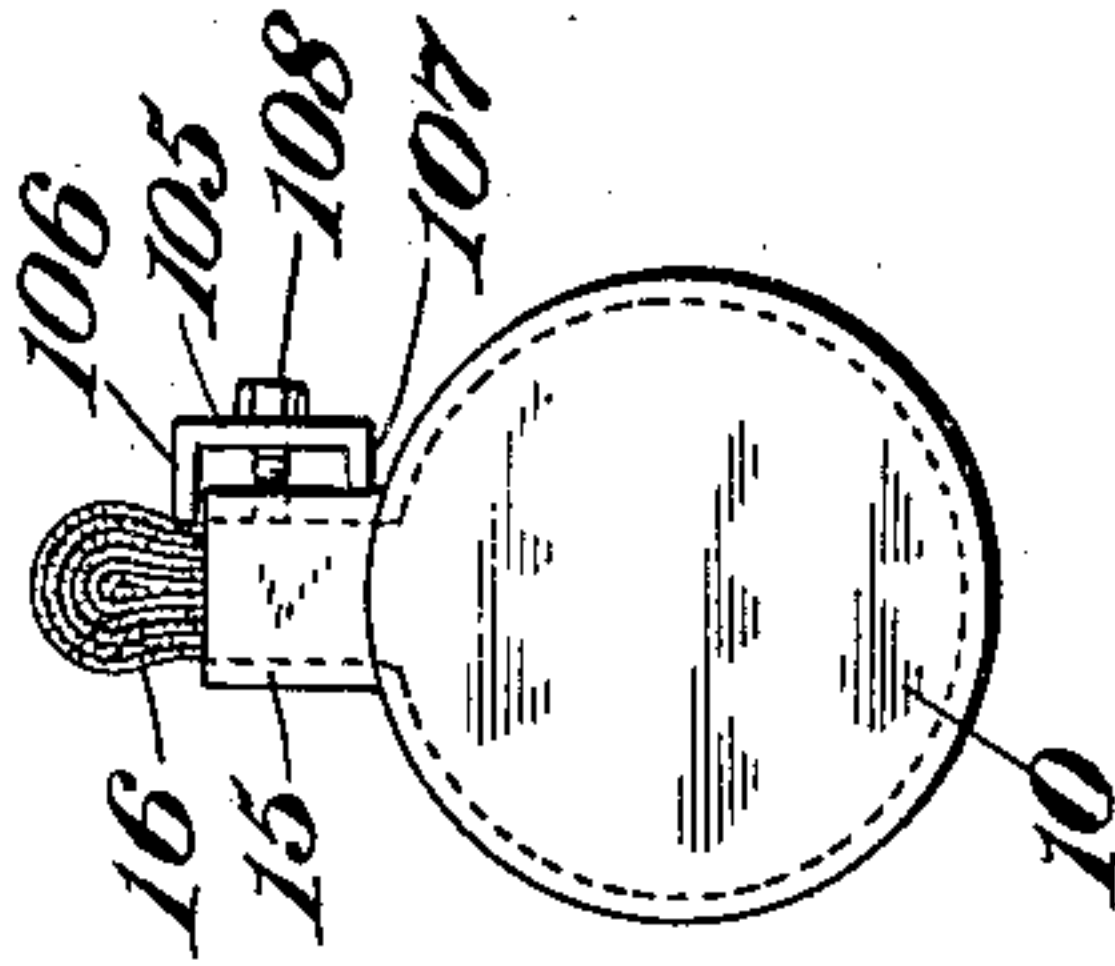


Fig. 8.

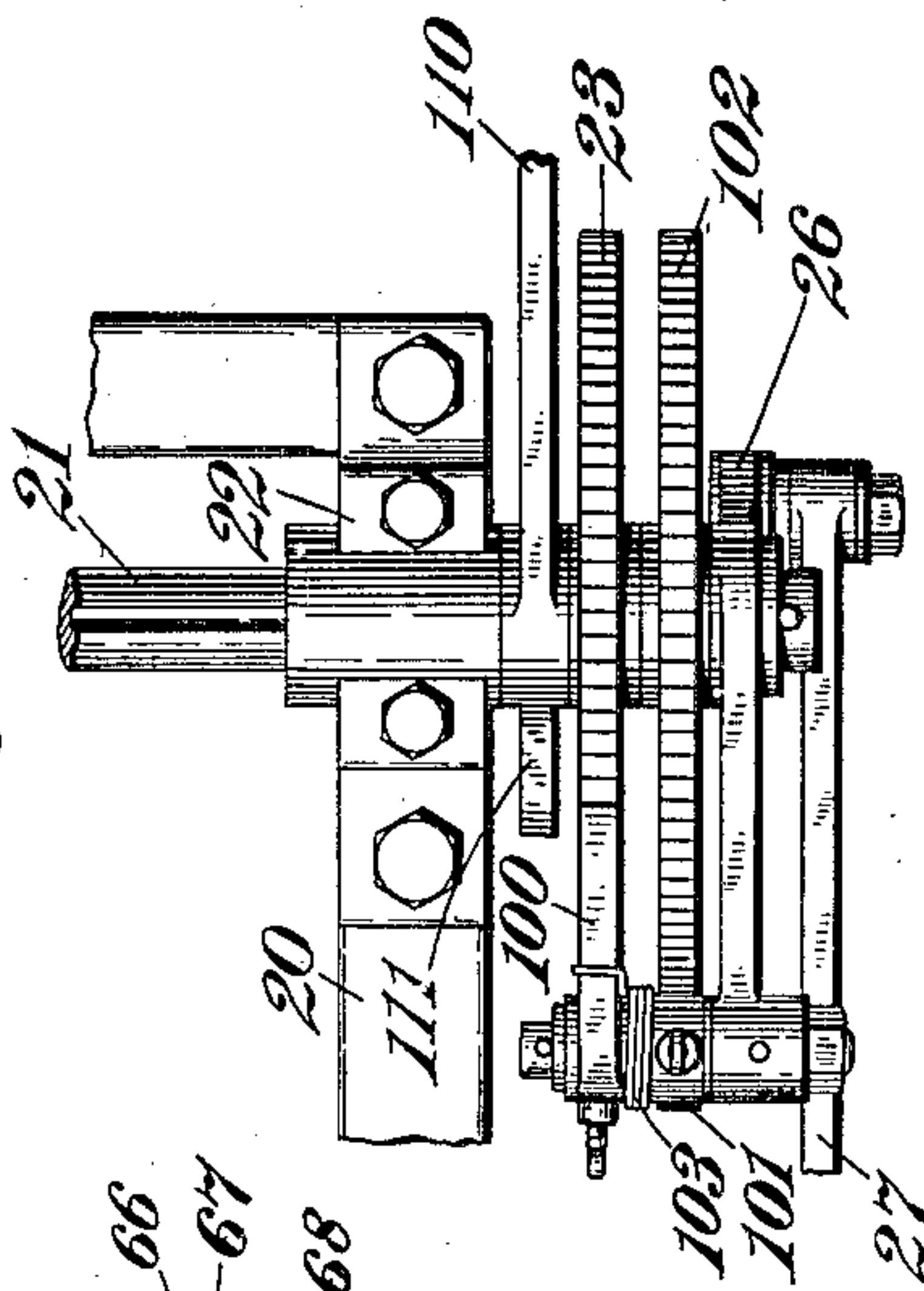


Fig. 9.

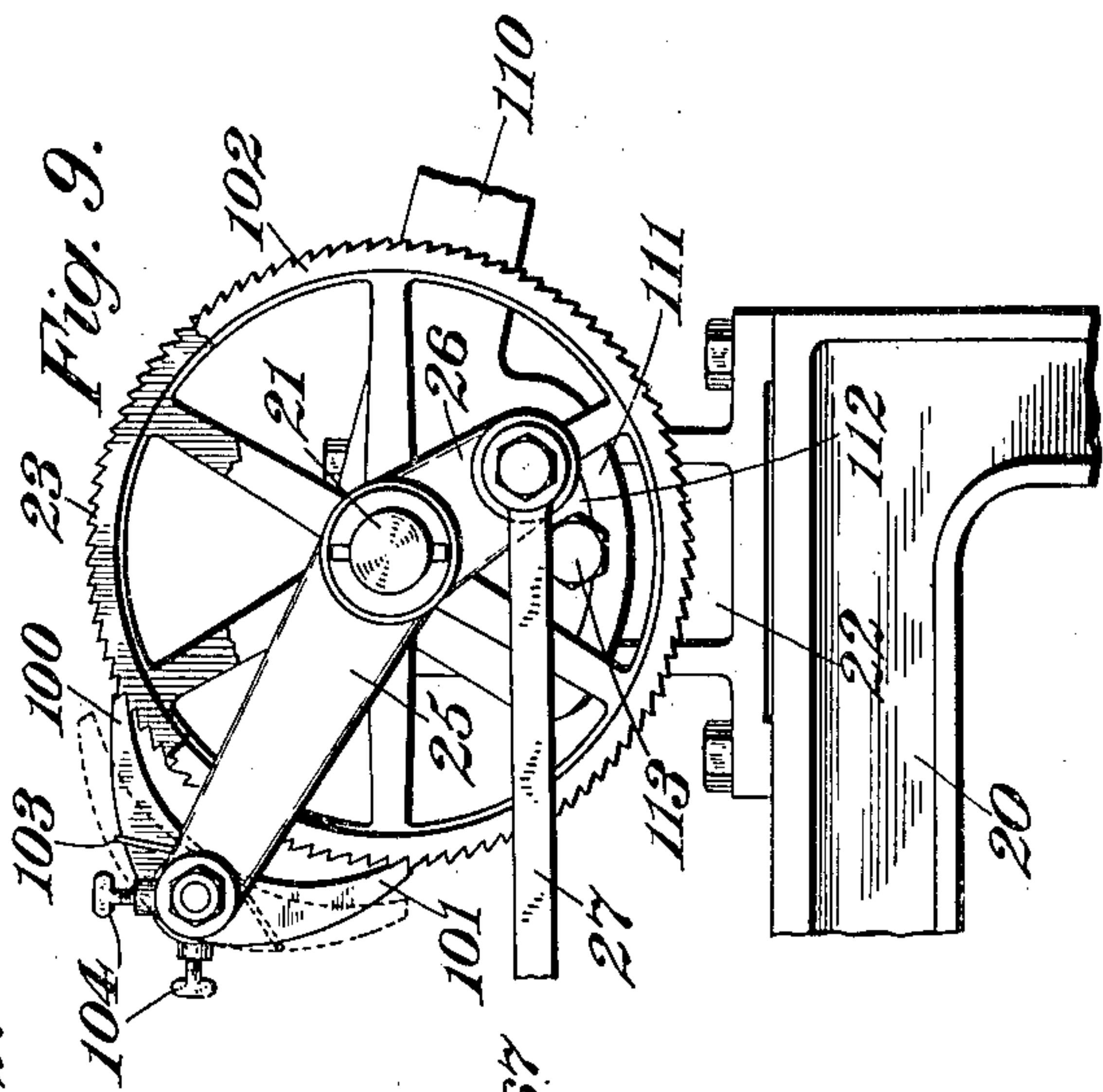


Fig. 6.

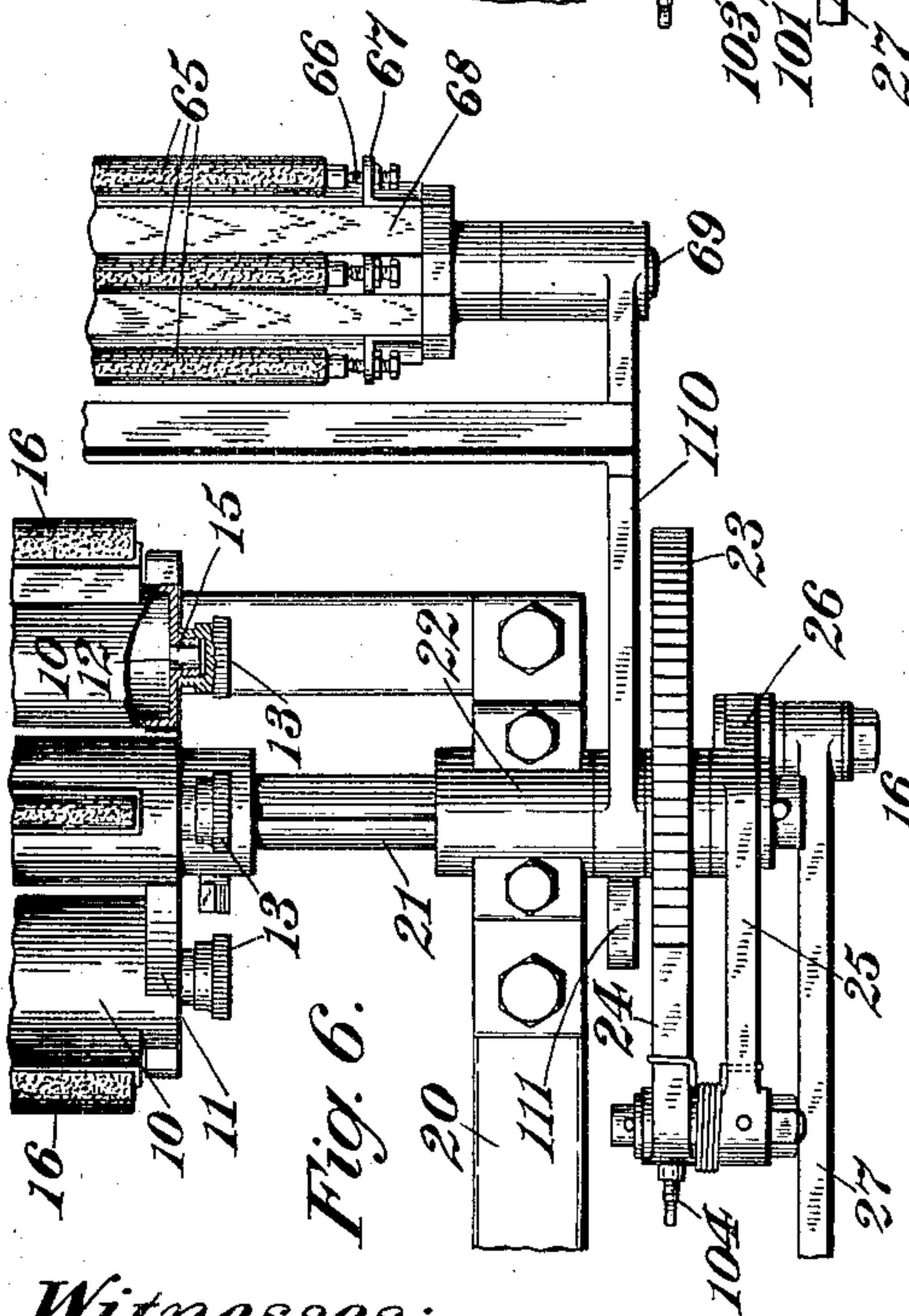
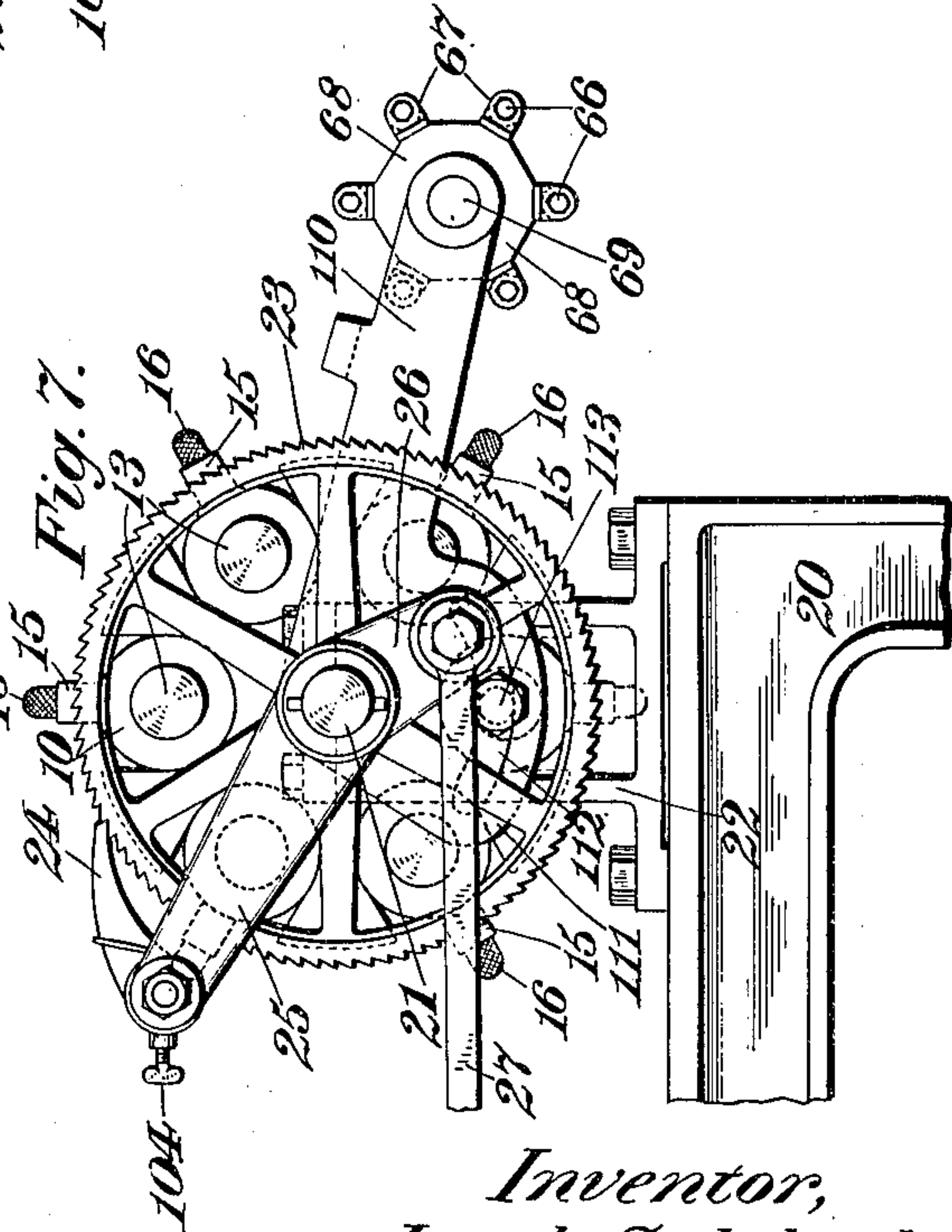


Fig. 7.



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UNITED STATES PATENT OFFICE.

JACOB SULZBACH, OF COLLEGE POINT, NEW YORK.

DYEING MACHINERY.

No. 871,376.

Specification of Letters Patent.

Patented Nov. 19, 1907.

Application filed March 14, 1907. Serial No. 362,261.

To all whom it may concern:

Be it known that I, JACOB SULZBACH, a citizen of the United States, residing in College Point, city of New York, in the county of Queens and State of New York, have invented certain new and useful Improvements in Dyeing Machinery, of which the following is a specification.

This invention relates to dyeing machinery, and has for an object to provide improved mechanism whereby color or dye may be evenly distributed upon material, as for instance, threads, fabric or yarns passing through the machine, and from which the surplus color or dye may be evenly and effectively removed; and also relates to mechanism for multi-color, variegated or shaded dyeing.

This invention is particularly useful in coloring threads, as for instance silk threads, which are intended for embroidery purposes, so that the thread will be shaded or variegated in color to enable various artistic effects to be produced, and the mechanism is so organized that the colors may be blended one into the other.

Various tints of the same color may be employed in the color applying devices or different colors may be used as occasion may demand. In the present instance there are shown a number of color distributors, each of which may have a different shade or a different color for distribution, and these may be applied serially. Or by means of the reversing driving mechanism illustrated, two of the shades or colors may be alternated one with the other for producing some desired effect.

It will also be observed that each of the color applying devices has its own surplus removing device so that the colors will not be improperly blended through contact with a color remover which has been used for removing the surplus distributed by another color applying device.

In the drawing accompanying and forming a part of this specification Figure 1 is a side view of one end of the machine showing the dye applying and dye removing mechanisms together with a broken away portion of the steam chest through which the materials in their treatment will pass after having had the dye applied and the surplus removed. Fig. 2 is a top plan view of the portion of the mechanism illustrated in Fig. 1. Fig. 3 is a side view of the other end of the

machine from that illustrated in Fig. 1, but showing certain of the parts which are illustrated in Fig. 1. Fig. 4 is an end view of the mechanism illustrated in Fig. 3 looking at this from the left hand end. Fig. 5 is a view of the mechanism illustrated in Fig. 1 looking at this from the left hand end, the steam chest, however, not being illustrated in Fig. 5. Fig. 6 is an enlarged plan view of a portion of the dye applying and dye removing devices together with the means for revolving the dye applying devices. Fig. 7 is an end view of the mechanism illustrated in Fig. 6. Fig. 8 is a top plan view of a form of driving mechanism for oscillating the dye applying devices. Fig. 9 is an end view thereof; and Fig. 10 is an end view of a dye bottle.

The dye or other material which it may be desired to apply with this mechanism will be carried in a series of bottles, the bottles are designated in a general way by 10, and are mounted in a rotary bottle carrier 11. Each of the bottles has a neck 12 closed by a stopper 13 for supplying fresh dye liquors as occasion may demand, latches 14 are pivoted to the bottles to hold them in the carrier, they are mounted in this for removal by movement in a longitudinal direction. The bottles are provided with necks or mouths 15 in which are located some permeable color distributing or applying material 16, as for instance felt or sponges, which will absorb the dye liquor. And as the material under treatment is passed in contact with this material 16 it will be coated or saturated with the dye liquor. The dotted line 17 shows the course of the movement of the material being treated.

Without limiting the invention applicant has shown this constructed as designed for use in dyeing threads. The material under treatment will pass around a suitable tension device, shown as comprising a number of rolls 18 mounted in a framework 19 and carried by the frame 20 of the machine. The bottle carrier 11 will have a shaft 21 mounted in a bearing bracket 22 carried by the frame, which shaft is shown having fast upon it a ratchet wheel 23 which is engaged by a pawl 24 carried by an arm 25 pivoted upon the shaft 21 of the bottle carrier. An extension 26 of such arm will be articulated to a link 27, shown articulated to a rock arm 28 and which will be engaged by tappets 29 carried by a tappet wheel 30.

The machine frame is shown as comprising in the present illustration two framing members 20 and 200 which are represented as being at the respective ends of the machine, and these are connected by beams 220 which form a convenient support for some of the intermediate portions of the apparatus, presently to be described.

The power in the present instance is furnished by means of fast and loose pulleys 31—32 driven by means of a belt 33 from some suitable source of power, not shown, these pulleys are mounted upon the driving shaft 34 which has bearings in the brackets 50'. A friction driving wheel 35 is splined upon the driving shaft and is reciprocated in the present instance by means of a lever 36 supported by a bracket 37 from the frame. This feature of reciprocation of the friction driving wheel 35 is for regulating the speed imparted by such wheel, since it may be advanced toward and from the axis of rotation of a friction disk 38 which it is adapted to rotate and which will afford the connection between the various parts of the machine and the driving shaft. The connection between the friction disk 38 and the tappet wheel 30 is as follows: The friction disk 38 is mounted upon a shaft 39 upon which is fast a pinion 40 meshing with a gear wheel 41 carried by a stub shaft 42 and which gear wheel 41 meshes with a pinion 43 which may be in the nature of an idler and is carried by a stub shaft 44 and meshes with a pinion 45 carried by a shaft 46 upon which shaft is fast a cone pulley 47 which is connected by means of a belt 48 with a cone pulley 49 fast upon a shaft 50 and which shaft is connected to a shaft 51 by means of a pair of miter gears 52—53. The shaft 51 has fast upon it a worm 54 which engages a worm wheel 55, fast upon the shaft 56 which carries the tappet wheel 30. The arm 28, of course, will be provided with some suitable means for properly receiving the blows or driving impulses of the tappets, and in the present instance is shown as equipped with an antifriction roller 57. The member 19 is carried by a slide 58 having a slot 59 for the engagement of suitable set screw 60 whereby the height of this may be regulated for regulating the force of engagement between the material which is being treated and the dye distributors. After the color or dye has been distributed upon the material under treatment such material will pass, in the present illustration toward the left, and that this may be properly distributed and all surplus dye or color removed a series of wipers 65 is provided, each of which is shown as in the form of a roller having connection by means of pivots 66 carried by brackets 67, with a wiper carriage 68, which carriage is supported upon a shaft 69, the shaft carrying a gear wheel 70 in mesh with a gear

wheel 71 carried by the shaft 21 of the bottle carrier.

It will be seen that in the present construction there are as many wipers 65 as there are dye applying devices, in the present instance the bottles with their sponges or felt dye applying instrumentalities 16, and that the bottle carrier and the wiper carrier are geared together by equal gears so that when multi-color work is being done the colors will not be blended or marred by means of the wiper which has been used for one color wiping the silk or other material which has passed through and has been dyed by another color.

When it is desired to blend two colors two of the dye applying devices will be brought into position to deliver dye to the thread concurrently and the two corresponding wipers will be engaging the material and thus producing the desired blend.

The shaft 21 upon which the bottle carrier is mounted is provided with a splineway and the carrier is splined upon this, so that the carrier may be reciprocated as occasion may demand, this being brought about when it is desired to change the position of the thread upon the drying drum.

The thread or other material being treated after passing the wipers will in the present illustration go into a steam chest 75 which is shown mounted upon the beams 220. This steam chest has a removable cover 76 and the material is led into it over a roller 77. A pair of rollers 78—79 are located within the steam chest and the material is led under these and then passes out and over a drying drum 80 about which it may be given one or more convolutions for the purpose of exposing the material to a greater surface and for a longer time. The steam chest 75 may be furnished with steam by means of a pipe 81 controlled by a valve 82; steam will come from some suitable source of supply and preferably not under pressure, which will mean that the steam is somewhat moist, this moisture will be effective for setting the colors in the threads or material treated. After the threads have passed out of the steam chest they will carry with them sufficient heat that upon becoming exposed to the atmosphere they will readily and rapidly dry. Of course the steam may be laden with some color fixing properties which will enable it to act as a mordant for the dye. Water of condensation may be removed from the steam chest and also the steam may be permitted to escape through some suitable cock, as for instance a cock 83. The threads are guided to a series of bobbins 85 by means of guides 86. The drum 80 is driven by means of a belt 84 passing over a pulley 84^a upon the shaft 50 and a pulley 84^b upon the shaft 80^a which carries the drum 80, and which shaft is supported in standards 80^b

rising from the machine frame 200. The guides 86 are carried by a framework embodying a bar 87 slidably articulated to a lever 88 pivoted at 89 carrying a roll 90 engaging the face of a cam 91 carried by a stub shaft 92 to which is fast a gear wheel 93 meshing with the gear wheel 41. This device is for the purpose of passing the threads back and forth upon the bobbins in winding. This part of the mechanism forms no part of my present improvement, but is shown as a convenient means for drawing the threads through the apparatus and for disposing of the finished product.

Each of the bobbin spindles is shown as having a friction head 94, which friction heads run upon friction disks 95 fast upon the shaft 39. The rotation of the bobbins will draw the threads through the machine. The drum 80 will be rotated for preventing any drag upon the threads and may also be run at a sufficient speed to augment the pulling of the threads by the spindles or may be adjusted so that it will perform the drawing almost entirely, the winding of the bobbins then being merely the initial tensioning of the thread.

Sometimes when multi-color work is being done it may be found desirable to have certain colors alternate back and forth with each other instead of having the entire series of colors, in which instance the arm 25 may carry two pawls 100—101; the pawl 100 engaging the ratchet wheel 23 and the pawl 101 engaging a ratchet wheel 102 facing in the opposite direction. By this means an impulse of the tappet wheel will have the effect of moving the wheel 23 one stroke and bringing one of the dye distributing devices into operative position and the return of the arm 25 will have the effect of reversing the movement. The pawls may be held to the work by means of suitable springs 103 and each pawl may have a set screw 104 for effecting its adjustment upon the pivot arm 25. A spring 280 is employed for returning the arm 28 to initial position after it has been swung by engagement with one of the tappets.

In Fig. 10 a convenient device is illustrated for regulating the flow of coloring material from the bottles or receptacles 10. This is shown as a clamp 105 having the end 106 for engaging the distributing material 16 above the neck 15 and an end 107 for engaging the neck 15 and between these is located the set screw 108 whereby the end 106 may be forced into the distributing material to any desired extent for adjustably restricting the flow of the coloring material.

In the present instance the height of the wipers 65 may be regulated relative to the height of the color distributors and the shaft 69 is for this reason shown mounted in an adjustable bracket 110 having a portion 111 provided with a slot 112 for receiving a set

bolt 113. By this means the pressure of the wipers upon the material being treated may be regulated and by this means the amount of color or dye left upon the material may be regulated. The material under treatment, which, as before stated, was designated as 17 and which may be threads, will pass over the guiding rolls 118 and to the working point of the dye distributors and will pass under the dye distributors to the guide roll 77, but between the working point of the distributor and the guide 77 will come the working point of the prepared wiper.

Having described my invention I claim:

1. In a dyeing machine, the combination with a series of independent dye distributors and means for bringing these serially into the working position at regularly recurring intervals, of a series of wipers comprising a wiper for each distributor and means for moving these into and out of the working position concurrently with the movement of the respective distributors, and means for passing the material under treatment through the working position of said distributors and wipers.

2. In a dyeing machine, the combination with a series of color receptacles, an adjustable color distributor for each receptacle, means for moving said series for bringing the distributors alternately into working position, means for moving the material under treatment to the working position at faster speed than the movement of the receptacles and their distributors.

3. In a dyeing machine, the combination with a series of color receptacles, an adjustable color distributor for each receptacle, means for moving said series for bringing the distributors alternately into working position, means for moving the material under treatment to the working position at faster speed than the movement of the receptacles and their distributors, a wiper for each distributor, and means for bringing these into working position.

4. In a dyeing machine, the combination with a series of dye distributors, driving means, means connecting the driving means to the distributors for intermittently moving these serially into the working position, means for moving the material connected to said driving means and so constructed and timed that the material under treatment will be moved continuously and at a greater speed than the movement of the distributors.

5. In a dyeing machine, the combination with a bottle carrier embodying a rotatable frame having a number of bottle receptacles, a series of bottles located in said receptacles and each having a neck, dye distributing material located in each of said necks, means for adjusting the flow of dye from said necks, means for rotating the bottle carrier step by step, a series of wipers one for each of the dye

distributers, a carrier for said wipers, a train of one to one gearing connecting the bottle carrier with the wiper carrier, and means for moving the material under treatment to the
5 working position of said distributers and wipers.

6. In a dyeing machine, the combination with a rotatable bottle carrier having a series of bottle receptacles disposed parallel to its
10 axis of rotation, a series of bottles carried thereby each having a filling opening, latches for holding the bottles from longitudinal movement in said carrier, each of said bottles being provided with a longitudinally dis-
15 posed neck, absorbent distributing material located in said neck, a clamp for controlling the outflow through said material and embodying an end for resting upon said neck, an end for resting upon the distributing ma-
20 terial above the neck, and a set screw engaging said clamp and the neck between said ends.

7. In a dyeing machine, the combination with a bottle holder, of bottles located in said
25 holder, distributing devices carried by the bottles, means for moving the holder step by step, a wiper for each of said distributers, a carrier for said wipers, a train of one to one gearing between the wiper carrier and the
30 bottle carrier.

8. In a dyeing machine, the combination with a bottle holder, bottles located in said holder, distributing devices carried by the bottles, means for moving the holder step by
35 step, a wiper for each of said distributers, a carrier for said wipers, and means for moving the wiper carrier in unison with the bottle carrier.

9. In a dyeing machine, the combination
40 with a rotatable bottle carrier having a series of bottle receptacles disposed parallel to its axis of rotation, a series of bottles carried thereby, means for holding the bottles from longitudinal movement in said carrier, each
45 of said bottles being provided with a longitu-

dinally disposed neck and a filling opening separate from said neck, absorbent distribut-
ing material located in said necks, a clamp for controlling the outflow through said ma-
terial and embodying an end for resting upon 50 the distributing material above the neck, and means for regulating the pressure of said clamp upon said material.

10. In a dyeing machine having a frame, the combination with a bottle holder mount- 55 ed on a bracket of the frame, of bottles located in said holder, distributing devices carried by the bottles, means for moving the holder step by step, arms adjustably carried by said bracket, a wiper carrier mounted on 60 said arms, a wiper for each of said distributers carried by said wiper carrier, and gearing between the wiper carrier and the bottle carrier.

11. In a dyeing machine, the combination 65 with a series of independent dye distributers and means for moving these serially into the working position, means for guiding the material to the working position of said distribu-
ters and means for adjusting the height of 70 said guiding means, a series of wipers comprising a wiper for each distributer, means for moving these into and out of working position, and means for raising and lowering the series of wipers relative to the series of 75 distributers.

12. In a dyeing machine, the combination with a series of dye distributers, of a carrier therefor, a shaft upon which said carrier is mounted, a pair of ratchet wheels mounted 80 upon said shaft with their teeth directed in opposite directions, a rock arm mounted upon said shaft, a pawl carried upon said rock arm for each of said ratchet wheels, and means for rocking said rock arm.

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Witnesses:

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