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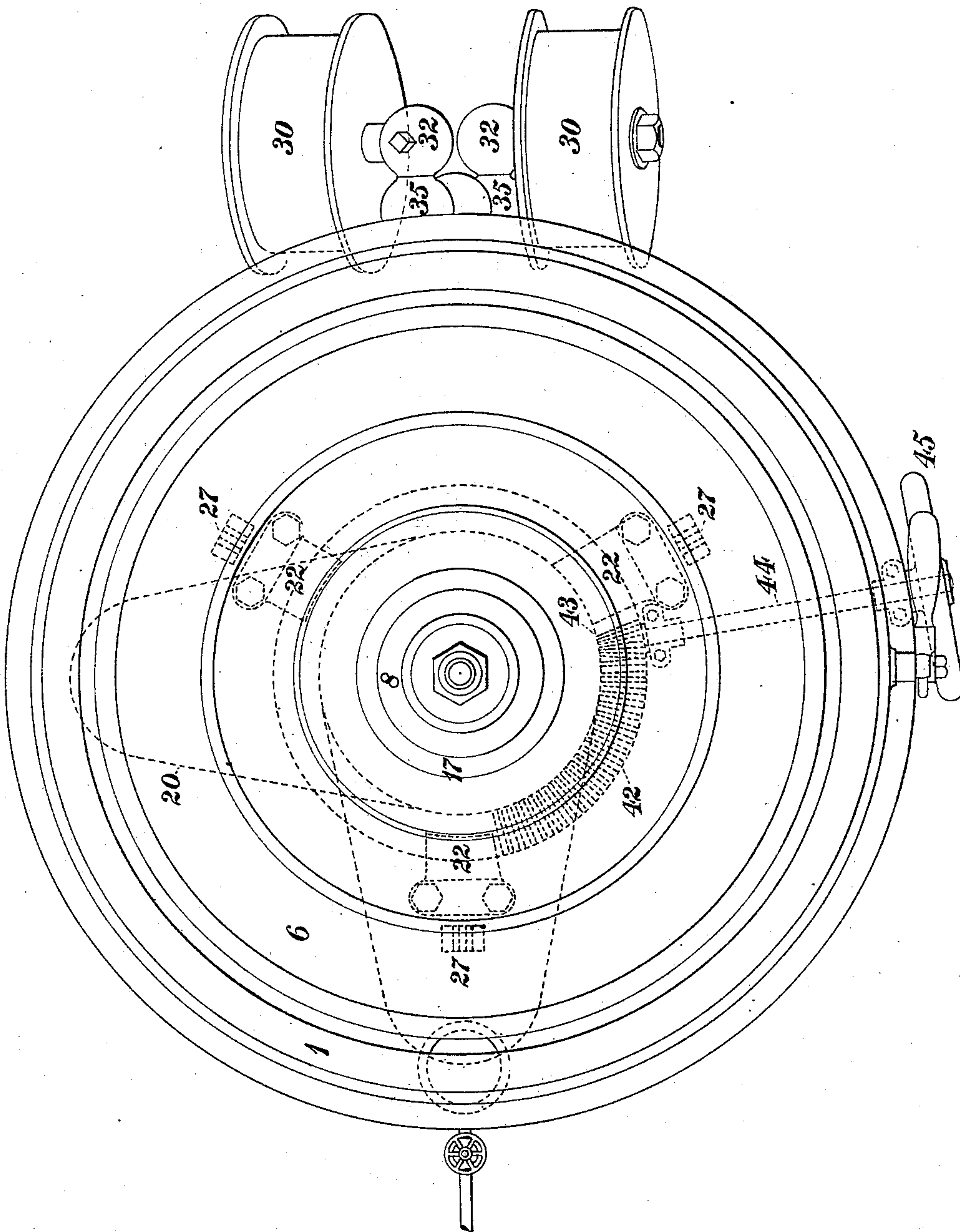
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H. W. LAFFERTY.  
CENTRIFUGAL DRAINING MACHINE.

No. 304,942.

Patented Sept. 9, 1884.

Fig. 1.



WITNESSES:

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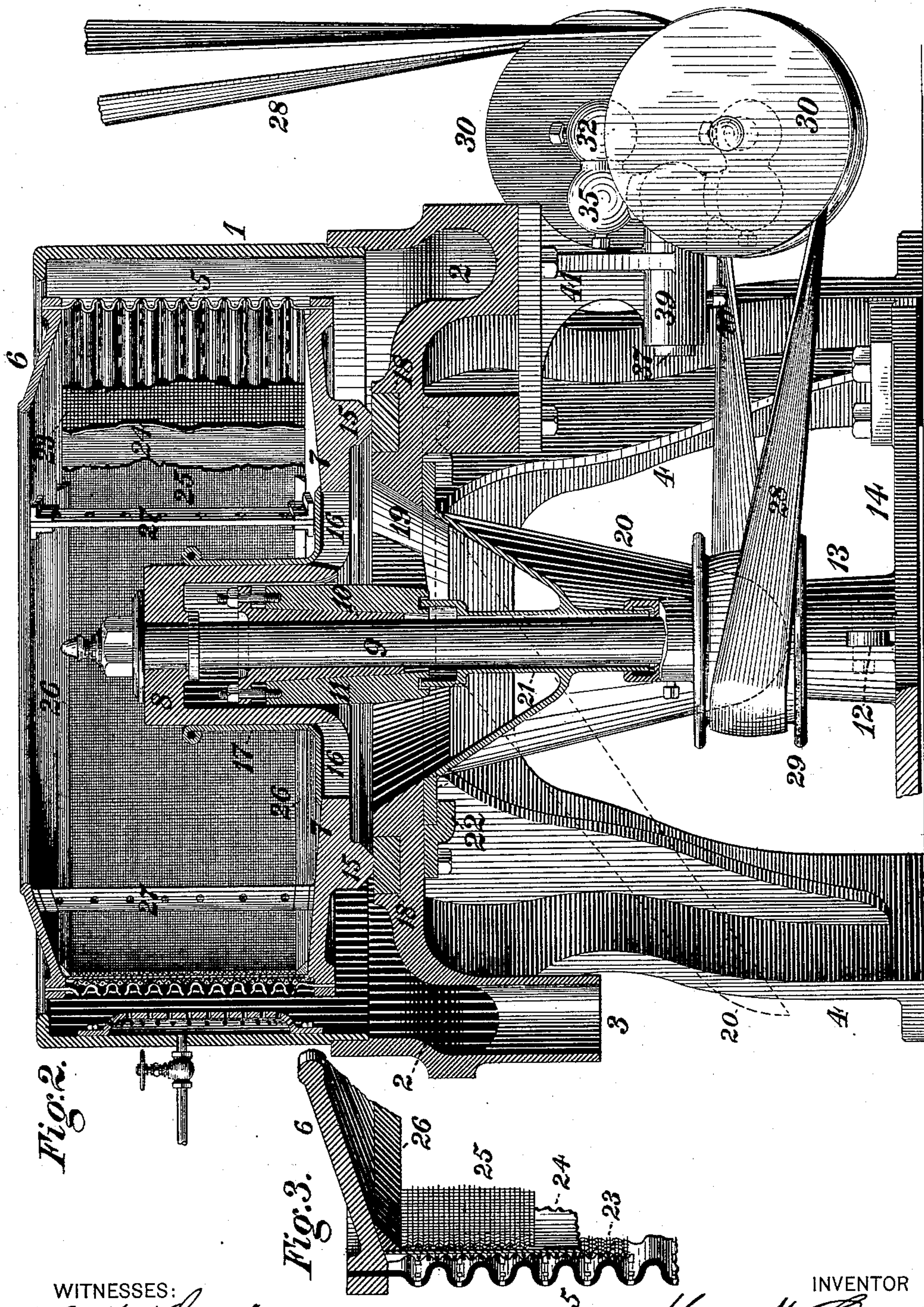
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WITNESSES:

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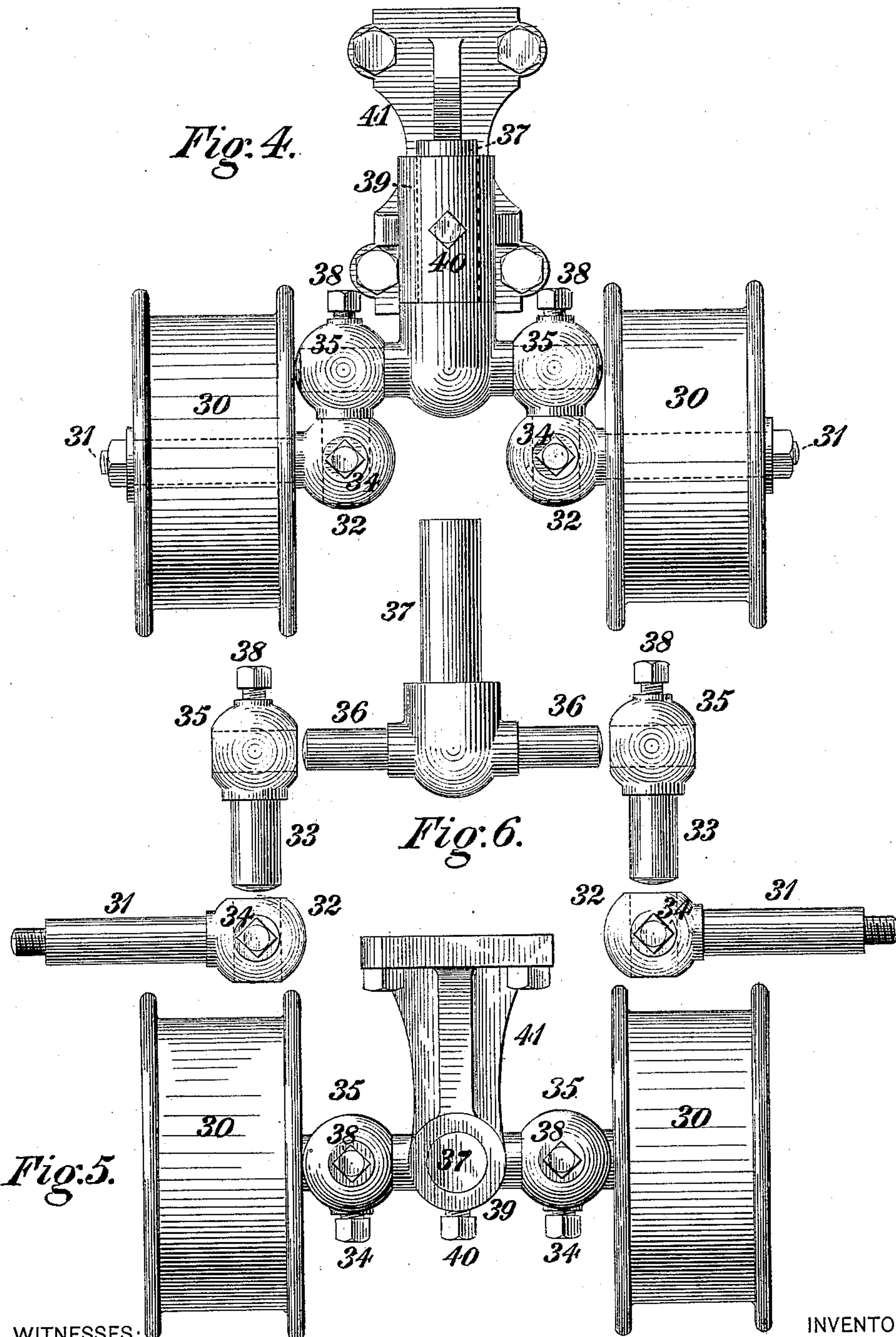
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# UNITED STATES PATENT OFFICE.

HUGH W. LAFFERTY, OF GLOUCESTER CITY, NEW JERSEY.

## CENTRIFUGAL DRAINING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 304,942, dated September 9, 1884.

Application filed April 1, 1884. (No model.)

*To all whom it may concern:*

Be it known that I, HUGH W. LAFFERTY, of Gloucester City, in the county of Camden and State of New Jersey, have invented certain new and useful Improvements in Centrifugal Draining-Machines, of which improvements the following is a specification.

My invention relates to centrifugal draining-machines of the class which in its general features is exemplified in Letters Patent of the United States No. 154,686, granted and issued to myself and Robert Lafferty under date of September 1, 1874; and the objects of my present invention are to enable a driving-belt to be employed in lieu of gearing in the operation of the machine, and to render the same specially adaptable to use in the separation of water, gluten, and other impurities from starch.

My improvements to these ends consist in certain novel devices and combinations, as hereinafter fully set forth.

In the accompanying drawings, Figure 1 is a plan or top view of a centrifugal draining-machine embodying my invention; Fig. 2, a vertical central section through the same; Fig. 3, a section, on an enlarged scale, through a portion of the basket; Fig. 4, a bottom view of the guide-pulleys and their supporting devices; Fig. 5, a side view of the same as seen from the left of Fig. 1, and Fig. 6 a view showing the several articulated or joint members which support the guide-pulleys separated one from another.

The outer casing, 1, of the machine is, as heretofore, of cylindrical form, communicating at the bottom with a circumferential discharge-channel, 2, provided with a spout or discharge-nozzle, 3, and is supported upon legs or standards 4, by which it may be secured to any suitable foundation. The drum or basket is composed of a cylindrical perforated shell of corrugated metal, lined as hereinafter described, secured at its upper side to an annular cap-plate, 6, and at its lower side to a bottom plate, 7, which is dished or downwardly inclined from its periphery to a central cylindrical hub, 8, in order to drain liquid constituents of the material treated toward a series of openings, 16, formed in the bottom plate, 7, around the hub 8, and adapted to be covered or uncovered by a cap, 17, fitting around the

hub 8 and over the openings 16. The hub 8 is secured to the upper end of a vertical spindle, 9, which, as in Letters Patent No. 154,686 aforesaid, passes through a gland or bushing, 10, in a central sleeve or upper bearing, 11, formed on the lower portion of the outer casing, 1, and is adapted to rotate on a lower step supported on a transverse bar, 12, in a bar or casing, 13, on a plate, 14, secured to the standards 4 of the machine. An annular projection or braking-shoe, 15, which may be of V or angular transverse section, is formed upon the lower side of the bottom plate, and an annular facing, 18, of Babbitt metal or other soft metal or alloy suitable to form a frictional surface, is inserted in the lower portion of the outer casing, 1, immediately below the braking-shoe 15, the contact of which with the facing 18, when the drum and spindle are lowered by the movement of the bar 12, serves to quickly and noiselessly arrest their rotation.

Openings 19 are formed in the lower portion of the outer casing, 1, around the sleeve 10, and a chute or discharge-spout, 20, having a central sleeve, 21, through which the spindle 9 passes freely, is fitted to the casing below the openings 19, so as to lead off therefrom constituents of the charge of the basket which may be admitted through the openings 16 thereof. The chute 20 is flanged outwardly at its top, and is supported by gibs or recessed plates 22, secured to the bottom of the outer casing, 1, within which gibs the flange of the chute fits freely, so as to be movable in a horizontal plane. The chute is thereby adapted to be moved about the axis of the spindle in order to discharge at different desired points, as indicated in dotted lines in Figs. 1 and 2; and in order to enable its movements to be readily effected by the operator whenever desired a segmental gear, 42, is formed upon or secured to the lower side of the flange of the chute, said gear meshing with a pinion, 43, on a horizontal shaft, 44, mounted in bearings beneath the casing and carrying on its outer end a crank or hand-wheel, 45, by which it may be rotated, so as to move the chute into either of its discharging positions, as required. The gib or support of the chute adjacent to that portion on which the teeth of the gear 42 are formed is made of proper depth to admit



of their passage and of width sufficient to extend over the full length of the teeth.

The provision of a movable discharge-chute enables the machine to be desirably employed in the separation of gluten, water, and other impurities and foreign matters from starch. In such operation the mixture to be treated is placed in the basket, and the latter is rotated for, say, two or three minutes, when starch is driven toward and collects in a mass on the lining of the basket. The machine is then stopped and the greater portion of the water and gluten is discharged through the bottom openings and the discharge-spout, when the latter is turned into one position—to wit, above a conduit proper to carry off the water and gluten. The basket is then again rotated for about the same time, to drain off any remaining liquid constituents, after which it is stopped, and, the chute being moved into the other position, the dried starch is removed from the lining and discharged into a suitable receptacle.

The shell 5 of the drum or basket is provided with a lining designed to effect a thorough separation of the solid and liquid portions of the charge, and to enable adhering solid matter to be readily removed without injury. To this end a sheet of coarse wire-netting, 23, is fitted inside of and against the corrugated plate 5, and a sheet of cloth, 24, is applied against the netting 23. The inner face of the lining is formed of a sheet of fine wire netting or gauze, 25, fitting against the cloth sheet 24, said netting serving to protect the cloth from undue wear and from injury in removing solid matters that may adhere to the drum after the draining of the charge is completed. The nettings 23 25 and cloth 24 are held in position by upper and lower split rings, 26, which are cut and driven into place, and the removal and replacement of the lining or either of its sections may thus be readily effected.

A series of vertical perforated plates, 27, preferably removable, is inserted radially in the drum between the cap and bottom plates, 6 7, and adjacent to the inner side of the top plate, said perforated plates fitting removably in seats in the top and bottom plates of the basket, and serving to arrest the movement of the liquid coincidently with the stoppage of the basket, and thereby to prevent it from mixing with and washing down by its continued movement the solid portions from the lining of the basket. The plates 27 further serve to prevent a preponderance of water toward any particular portion of the drum, and thereby to maintain the machine in balance during operation.

Rotation is imparted to the spindle and drum by a driving-belt, 28, passing around a pulley on a counter-shaft driven by any suitable prime mover, and thence around a pair of guide or idle pulleys, 30, and a pulley, 29, on the spindle 9.

In order to enable the guide-pulleys 30 to be adapted to any required inclination of the driving-belt as resultant upon the position of the counter-shaft relatively to the machine and the diameter of the counter-shaft pulley, they are mounted upon the machine so that their axes shall be capable of swiveling movements and of relative angular adjustment without interfering with their normal rotation. To this end each of the guide-pulleys 30 is fitted to rotate upon a stem, 31, having an eye or boss, 32, on one of its ends, fitting a stem, 33, and capable of being axially adjusted and fixed thereon by a set-screw, 34. Each of the stems 33 has a similar eye or boss, 35, on one end, and said eyes 35 fit around two stems, 36, which are formed on or secured to a stem, 37, in line one with the other and at right angles to the stem 37. The eyes 35 may be adjusted independently about the common axis of the stems 36, and fixed in desired position thereon by set-screws 38, and the stem 37 fits in a sleeve, 39, on the lower end of a hanger or bracket, 41, secured to the bottom of the outer casing, 1, of the machine, and may be adjusted axially in said sleeve and fixed therein in adjusted position by a set-screw, 40.

It will be seen that by the above construction the axes of the guide-pulleys may be independently adjusted so as to be either in line or at any desired angle one to the other, and that the stem 37, through which their supporting stems or bearings 31 are connected to the machine, may be turned in its bearings, so as to vary the angle of their axes to the vertical plane of the spindle. The wide range of adjustment thereby afforded enables the machine to be effectively operated under any desired angle of driving-belt and location of counter-shaft.

I claim as my invention and desire to secure by Letters Patent—

1. In a centrifugal draining-machine, the combination, with a drum or basket having a perforated shell, of a lining composed of a sheet of coarse wire-netting located adjacent to the shell, a sheet of cloth adjacent to said coarse netting, and a sheet of fine wire-netting within and adjacent to said sheet of cloth, substantially as set forth.

2. In a centrifugal draining-machine, the combination of a drum or basket having a perforated shell, a lining fitting within said shell, and split rings driven into position against said lining and serving to retain the same in position, substantially as set forth.

3. In a centrifugal draining-machine, the combination of a drum or basket having an annular projection or braking-shoe on the lower side of its bottom plate, and an outer casing having a facing of soft metal or alloy located below and concentric with said braking-shoe, substantially as set forth.

4. In a centrifugal draining-machine, the combination of an outer casing, a drum or basket secured upon a spindle adapted to ro-



tate within said casing, and a discharge-chute fitting freely around said spindle and supported with the capacity of movement about the axis thereof, substantially as set forth.

5 5. In a centrifugal draining-machine, the combination of an outer casing, a drum or basket secured upon a spindle adapted to rotate within said casing, a discharge-chute fitting freely around said spindle and supported  
10 with the capacity of movement about the axis thereof, a segmental gear formed upon or secured to said discharge-chute, and a pinion meshing with said gear and fixed upon a shaft provided with a crank or hand-wheel exte-  
15 rior to the casing, substantially as set forth.

6. In a centrifugal draining-machine, the combination of a drum or basket and a series of perforated plates fitting radially therein, substantially as set forth.

20 7. In a centrifugal draining-machine, the combination of a spindle, a drum or basket,

and a driving-pulley secured thereon, and a pair of guide-pulleys adapted to rotate on stems or bearings which are adjustable relatively one to the other and to the axial plane 25 of the spindle, substantially as set forth.

8. In a centrifugal draining-machine, the combination of a spindle carrying a drum or basket and a driving-pulley, a pair of guide-pulleys, each mounted on a stem which is ad- 30 justable axially on a second or intermediate stem, and a stem or support which is adjustable axially in a hanger on the machine, and is provided with two arms at right angles to its axis, on which arms the second or interme- 35 diate stems are mounted with the capacity of axial adjustment, substantially as set forth.

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Witnesses:

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