

J. NAYLOR, Jr.
CENTRIFUGAL MACHINE.

Patented Nov. 20, 1894.

Fig 1

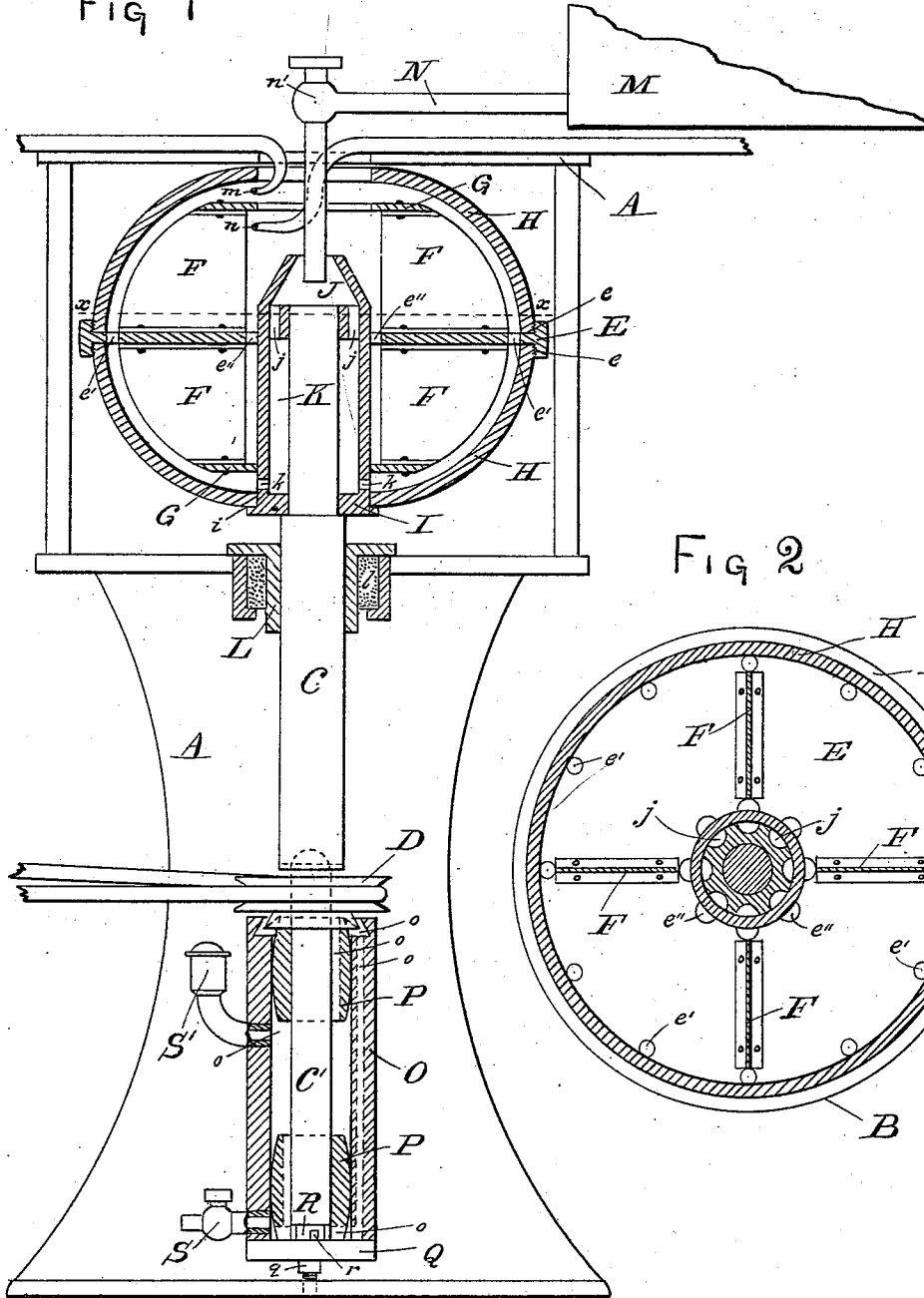


Fig 2

INVENTOR

Geo Taylor
M. W. E. Brunkhorst.

James Naylor Jr

UNITED STATES PATENT OFFICE.

JAMES NAYLOR, JR., OF BOSTON, MASSACHUSETTS, ASSIGNOR OF THREE-
FOURTHS TO GEORGE THOMAS McLAUTHLIN, OF SAME PLACE.

CENTRIFUGAL MACHINE.

SPECIFICATION forming part of Letters Patent No. 529,664, dated November 20, 1894.

Application filed March 30, 1893. Serial No. 468,407. (No model.)

To all whom it may concern:

Be it known that I, JAMES NAYLOR, Jr., a citizen of the United States, and a resident of Boston, in the county of Suffolk and State of Massachusetts, have invented a new and useful Improvement in Centrifugal Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My improvements relate to a centrifugal machine intended for treating oils in certain stages of refining processes; and consists essentially of the construction and operation of the bowl which contains and carries the ingredients under treatment, together with means for holding and sustaining said bowl in its operation; and of means for inflowing and discharging the liquids thereto and therefrom.

Figure 1 is a sectional elevation of the machine; Fig. 2, a horizontal section on line *x x* of Fig. 1.

A is the frame of the machine.

The whole bowl B is mounted upon the arbor C, said arbor resting upon a hemi-spherical seat at the upper end of the spindle C'.

D is the pulley secured to the spindle by which the machine is driven.

The whole bowl is made as follows:—E is a flanged disk provided with internal screw threads *e* on its upper and lower flanges, also passages *e'* and *e''* through it as shown.

F are wings riveted to the disk E, one half of said wings being above said disk, and the other half below.

G are upper and lower rings to which the wings are also riveted.

H are the upper and lower shells provided with external screw threads to insert into the screw threads of the disk E. The bore of the parts E, G and H are all alike, so that when the whole bowl is together, its upper and lower parts are exactly counterparts of each other.

I is a bushing made to fit the bore of the parts of the bowl; and provided with the shoulder *i* to support same.

J is a conical cavity within the bushing I to receive the inflow.

j are downward passages to the chamber K and *k* communicating openings from said chamber to the lower compartment of the bowl.

L is the upper bearing box, having a yielding rubber ring *l* encircling it.

M is a storage tank, with the supply pipe N leading therefrom to the conical cavity J, said pipe being provided with the stop cock *n'* to regulate and shut off the flow. Skimmers *m* and *n* of ordinary construction are set one above and the other below the ring G and are secured to the frame of the machine.

O is a part of the frame A which has a bored out interior perfectly true to the arbor.

P are barrel shaped bearing boxes fitted to the bore of the part O of the frame. Oil passages for lubrication are shown at *o* and *r*.

Q is a hardened steel plate held in place by a left hand set screw *q*.

R is a hardened steel step inserted into the spindle C' with an oil passage *r* cut across the bearing surface; so that one side of said passage coincides with the axis of the spindle as seen in Fig. 1.

S is the outlet for worn out oil, the inlet for new oil being at S'.

The operation is as follows:—The stop cock *n'* is opened and the liquid flows from the tank M through the pipe N to the cavity J through the passages *j*, chamber K, and openings *k*, into the lower compartment of the bowl. Meanwhile the proper speed is given the machine. The liquid seeks the periphery of both compartments, passing through the passages *e'*. The bowl fills up until the tips of the skimmers are reached and then the discharges take place. On the supposition that the liquid is an emulsion of oil and an agent used in a prior stage of the refining process; a separation is effected by a difference in their specific gravities; the one seeking the periphery while the other is forced toward the center. As the feed or inflow adds to the quantity contained in the bowl, it causes the discharge of the separated components through the skimmers into separate vessels. Ample provision is made for lubrication of the step R and plate Q between which all the weight of the arbor and bowl tends to keep out the oil as ordinarily made. Once every revolution every part of bearing surface is exposed for lubrication, and the commotion given to the oil causes a circulation of same through the several passages. This feature greatly facilitates the steady

running of the machine. As the oil in time loses its lubricating qualities, it is withdrawn from the set cock S and new oil filled into the cup S'.

5 Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a centrifugal liquid separator, the combination with a supported arbor, and a
10 bushing mounted thereon; of the bowl composed of the disk E, upper and lower shells H, wings F and rings G; and means for inflow to said bowl and discharge therefrom, as herein set forth.

15 2. In a centrifugal liquid separator, the combination with the shells H provided with the external screw threads, the disk E having passages through it and provided with flanges, said flanges having internal screw threads,
20 rings G and wings F; of the bushing I mounted upon a supported arbor, as herein set forth.

3. In a centrifugal liquid separator the combination with a supported arbor and a bushing mounted thereon; of a bowl com-
25 posed of the flanged disk E, shells H, rings G and wings F, said disks, shells and rings being bored all the same size and to fit said bushing, as and for the purpose herein set forth.

4. In a centrifugal liquid separator the
30 combination with a supported arbor and a bushing mounted thereon, said bushing integrally forming and having the cavity J

downward passages j chamber K openings k and the shoulder i; of the bowl fitted to said bushing and resting upon said shoulder and
35 provided with wings F, means for inflow to said cavity and for separate discharges through and from said bowl as herein set forth.

5. In a centrifugal liquid separator the
40 combination with a supported arbor, the bowl B provided with the rings G G, wings F and flanged disk E and means whereby said bowl is secured to said arbor; of the skimmers m—n secured to the frame and located one
45 above and the other below one of the said rings G and of the other when said bowl is reversed as herein set forth.

6. In a centrifugal liquid separator a supported arbor and a bushing mounted thereon
50 provided with the shoulder i, the bowl resting thereon and composed of upper and lower shells, flanged disk, wings and rings; in combination with means for inflow to said bowl and discharge therefrom as herein set forth.
55

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 12th day of January, A. D. 1892.

JAMES NAYLOR, JR.

Witnesses:

A. KENNY,
M. B. MCSAETHLIN.