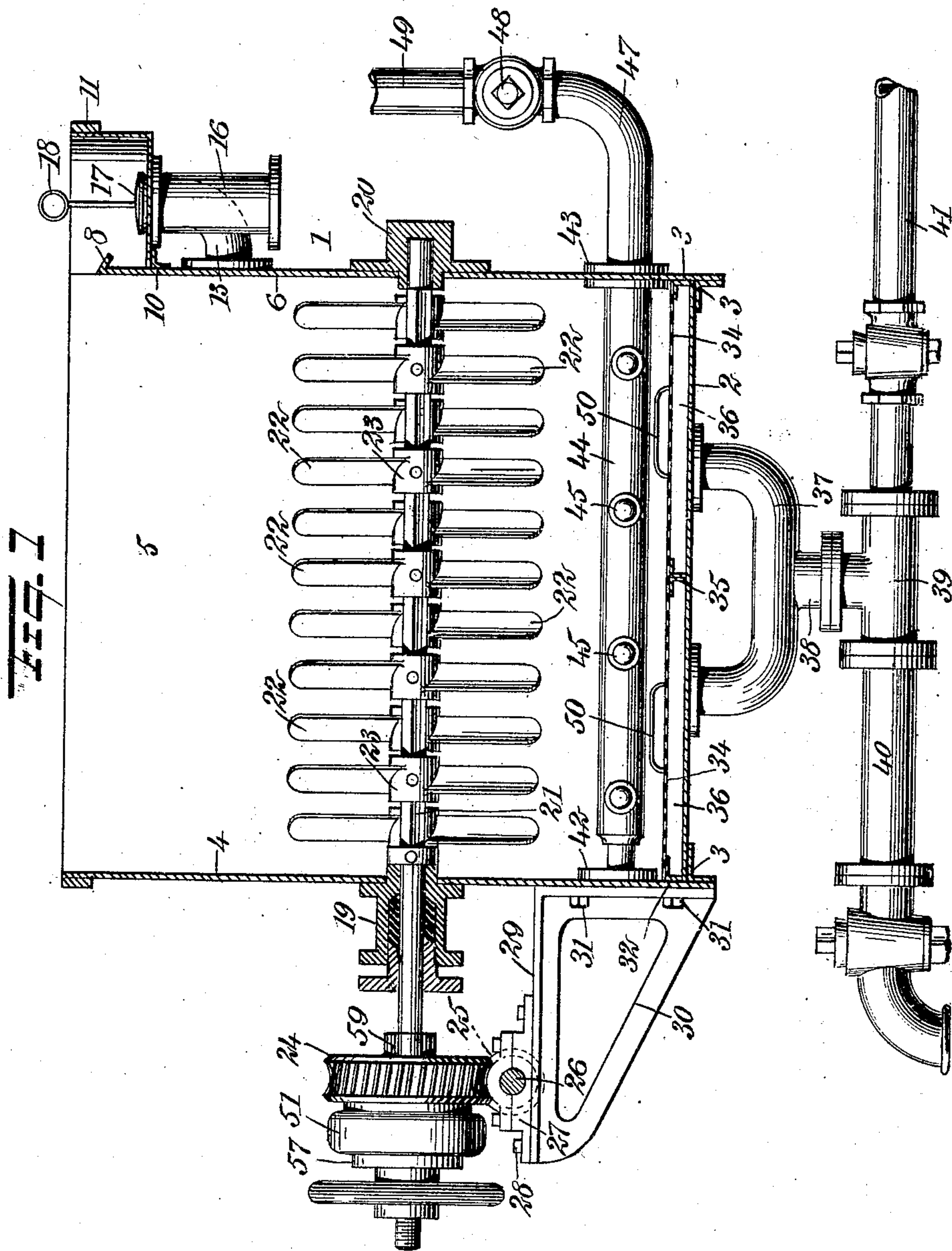


No. 842,731.

PATENTED JAN. 29, 1907.

R. M. VILLARINO.
FILTER FOR DEFECTION.
APPLICATION FILED NOV. 1, 1905.

3 SHEETS—SHEET 1.



WITNESSES:

John A. Bergstrom
E. E. Ellis

INVENTOR

Ramon Manuel Villarino

BY

Wm. M. Ellis
ATTORNEYS

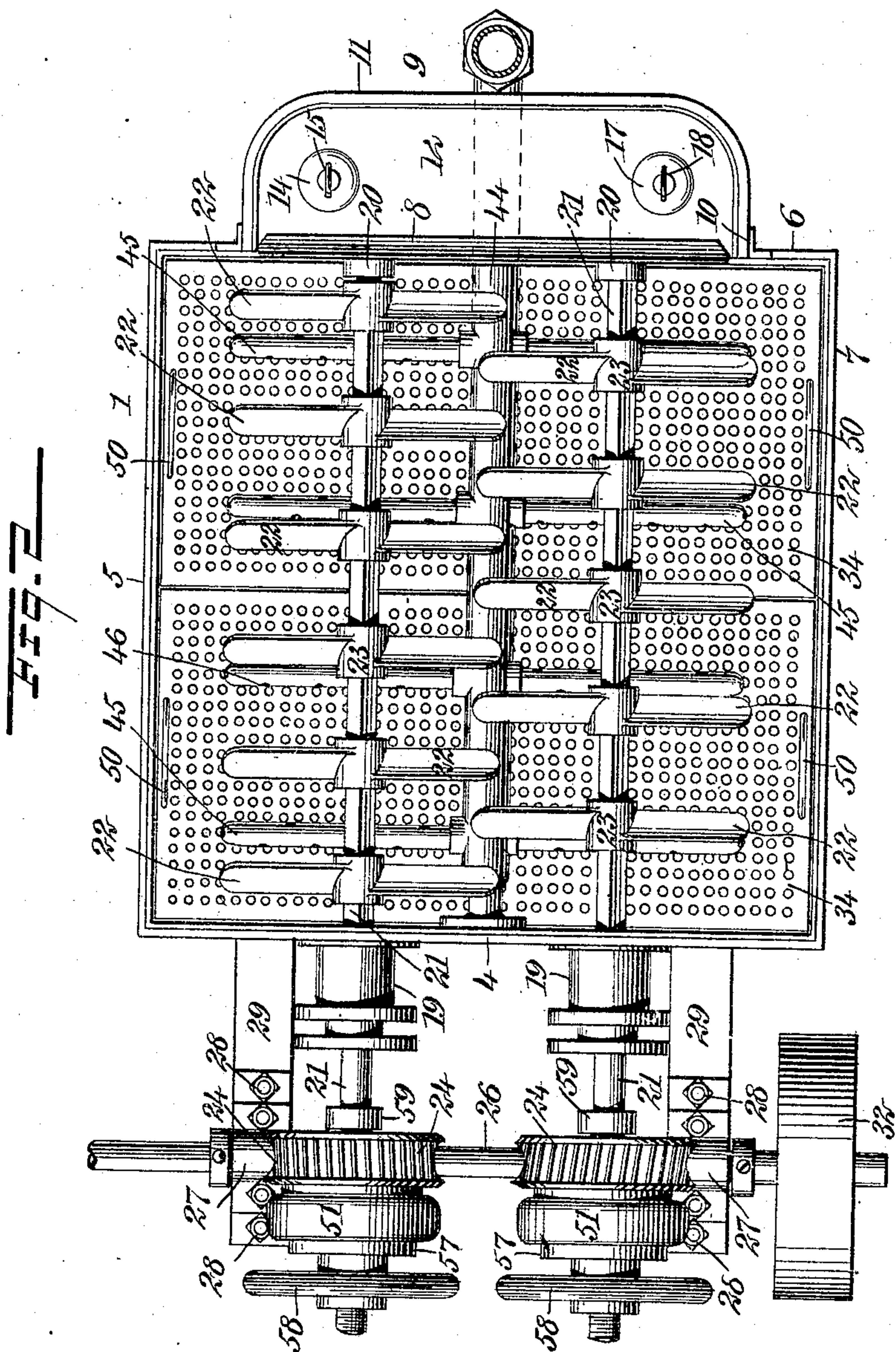
No. 842,731.

PATENTED JAN. 29, 1907.

R. M. VILLARINO.
FILTER FOR DEFECTION.

APPLICATION FILED NOV. 1, 1905.

3 SHEETS—SHEET 2.



WITNESSES:

John A. Bampton
E. C. Ellis

INVENTOR

Ramon Manuel Villarino

BY *Mumma*

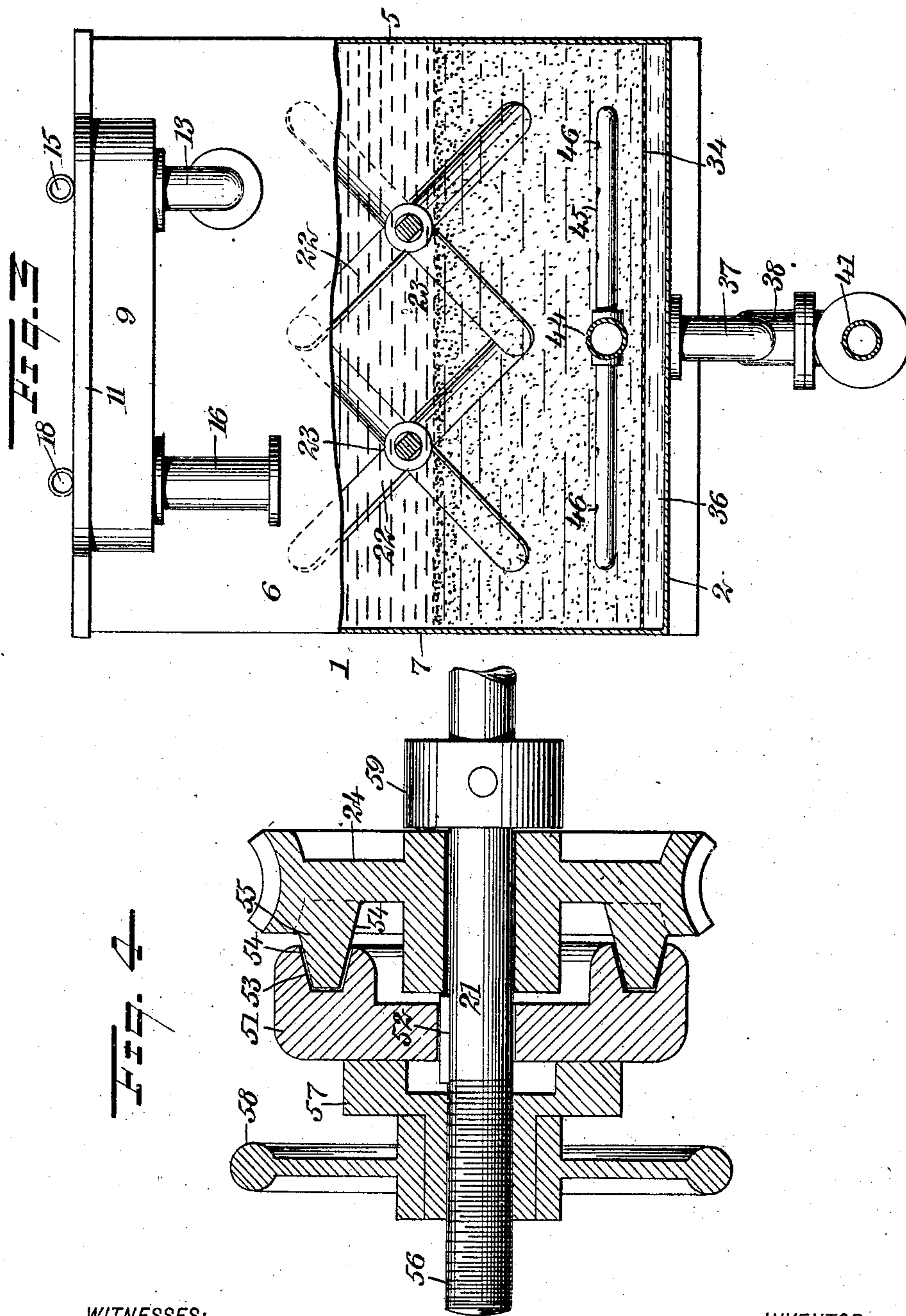
ATTORNEYS

No. 842,731.

PATENTED JAN. 29, 1907.

R. M. VILLARINO.
FILTER FOR DEFECACTION.
APPLICATION FILED NOV. 1, 1905.

3 SHEETS—SHEET 3.



WITNESSES:
John A. S. S. S.
E. E. Ellis

INVENTOR
Ramon Manuel Villarino
BY *Munroe*
ATTORNEYS

UNITED STATES PATENT OFFICE.

RAMON MANUEL VILLARINO, OF CAMPECHUELA, CUBA.

FILTER FOR DEFEICATION.

No. 842,731.

Specification of Letters Patent.

Patented Jan. 29, 1907.

Application filed November 1, 1905. Serial No. 285,448.

To all whom it may concern:

Be it known that I, RAMON MANUEL VILLARINO, a citizen of the Republic of Cuba, and a resident of Campechuela, Cuba, have
5 invented a new and Improved Filter for Defecation, of which the following is a full, clear, and exact description.

This invention relates to filters; and it consists, substantially, in the details of construction and combinations of parts herein-
10 after more particularly described, and pointed out in the claims.

The invention has reference more especially to filters for the defecation of the syrups
15 of sugar—as molasses, for instance; and one of the principal objects thereof is to provide a structure of this kind of an embodiment to overcome numerous disadvantages and objections encountered in the use of
20 many other structures of the kind hitherto devised.

A further object is to provide a filter for the purpose specified which is simple in construction and comparatively inexpensive to manu-
25 facture, besides being effective and reliable in operation, readily cleaned and repaired, and possessing the capacity for long and repeated service.

The above and additional objects are attained by means substantially such as are
30 illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal sectional view of a filter embodying my improvements. Fig.
35 2 is a top plan view. Fig. 3 is an end view partially broken out to more clearly indicate the inner construction of the filter, and Fig. 4 is an enlarged sectional view of the speed-regulating devices employed for each of the shafts
40 of the agitators or stirrers within the filter.

Before proceeding with a more detailed description it may be stated that in the form of my improvements herein shown I employ a tank of special construction for containing
45 the molasses or other syrup to be defecated and within which are disposed specially-constructed agitators or stirrers for the molasses in connection with shafts, special means being employed for revolving the same in opposite directions, as will presently be explained. Special means are also employed
50 for regulating the speed of each of the shafts referred to, as well as further special means for cleaning the structure, still further special
55 means being associated with the tank for receiving the overflow therefrom and which

may be caused to return to the tank at will, said last-named means embodying a special valve-controlled discharge-pipe for any lees or sediment which may collect therein. 60

Reference being had to the drawings by the designating characters thereon, 1 represents the tank of my improved filter, which may be mounted in position in any suitable way and upon any suitable supports (not
65 shown) therefor, said tank being also of any preferred material and dimensions and being open at the top and having a closed bottom 2 secured in any suitable manner upon angle-supports 3 therefor. (See Fig. 1.) 70

The tank is preferably rectangular in form, having four sides, (indicated at 4, 5, 6, and 7, respectively,) it being noted that the height of the side 6 thereof is less than that of the
75 remaining sides and is provided with an outwardly and downwardly extending ledge or chute 8, leading to a trough 9, secured to the side 6 in any suitable way—as by means of an angle-support 10, for instance—said trough
80 being of suitable depth and other dimensions and being open at the top and preferably having at the upper edge thereof a reinforcing-strip 11. Leading from the bottom 12

of the trough, near one end of the latter, is a curved pipe 13, which is connected with the
85 upper interior of the tank and which is for the purpose of enabling any overflow of molasses received in the trough from the tank to be returned to the tank, the upper end of said curved pipe being preferably closed by
90 means of a suitable plug or valve 14, provided with a rod 15, which may be taken hold of by the hand for the purpose of applying or removing the valve from its seat. The valve may be applied to position and the
95 overflow from the tank may be allowed to accumulate in the trough 9 to any desired depth, and then by removing the valve the overflow will be conveyed back to the tank in an obvious manner by said curved pipe 100

13, it being in this way that the return of the overflow to the tank is controlled at will. Leading from the said bottom 12 of the trough a suitable distance from the other end of the latter is preferably a straight pipe
105 16, also having the upper end thereof closed by a similar plug or valve 17, having a rod 18 to be taken hold of by the operator for the purpose of applying or removing the valve from its seat whenever it is desired. 110

Said straight pipe 16 is for the purpose of discharging any lees or sediment which may

collect in the trough from the overflow received by the latter.

The sides 4 and 6 of the tank have mounted therein duplicate stuffing-boxes 19, and
 5 duplicate bearings 20, respectively, in which are supported the parallel shafts 21, each having mounted thereon a plurality of sets of radially-disposed blades 22, the faces of which are preferably diagonal to the axis of
 10 the shaft, the latter being preferably rectangular transversely, by which to cause the hubs 23 of the blades to turn therewith when the shafts are caused to be revolved in the manner about to be explained. As will be
 15 observed, the sets of blades on the two said shafts 21 alternate with each other, or, rather, the sets of blades on each of the shafts are disposed at or before the spaces between those on the other, and, as will be further ob-
 20 served, the shafts 21 extend beyond the stuffing-boxes 19, and are provided with reversely-disposed worm-wheels 24, each of which is engaged by a corresponding worm 25, carried by a transversely-mounted shaft 26, supported in bearings 27, secured at 28 to the upper surfaces of the horizontal mem-
 25 bers 29 of brackets 30, which are secured at 31 to the outer surface of the said side 4 of the tank, near the lower edge thereof. The shaft 26 is provided at one of its ends with a drive-
 30 pulley 32, to which may be applied a drive-belt from any suitable source of power, to operate the shaft 26 to impart rotary motion to the shafts 21, thereby revolving the sets
 35 of blades 22 in opposite directions to each other within the tank. It will be understood that the said sets of blades constitute agitators or stirrers for the molasses or other material, which may be placed within the
 40 tank for the purpose of having the lees or sediment removed therefrom.

The tank is provided on the bottom 2 thereof at opposite sides of the tank with preferably angle-supports 33 for the outer
 45 edges of preferably two perforated plates 34, the inner edges of which are close to each other and sustained by other angle-supports 35, said plates being at a suitable height above the bottom 2, and the angle-supports
 50 35 for the inner edges of the plates divide or separate the space beneath the plates and bottom into practically separate compartments 36, into which the molasses enters and is discharged from the interior of the tank by
 55 means of a curved pipe 37, having each end thereof in communication with one of said compartments and communicating with a branch 38 of which is a coupling 39, connect-
 60 ing with the ends of which are valve-controlled discharge-pipes 40 and 41, through which the filtered molasses may be caused to pass and from which the molasses may be drawn from time to time during the filtering operation. Supported in bearings 42 and 43
 65 therefor in the said sides 4 and 6 of the tank

and centrally of and beneath the hereinbefore-mentioned shafts 21 of the agitators or stirrers is a hot-water pipe 44, provided at suitable intervals of the length thereof with oppositely-disposed horizontal branches 45, 70 having therein numerous perforations 46, said pipe extending beyond the said side 6 of the tank at 47 and being upturned and provided with a valve 48, from the case of which extends a vertical pipe 49, which may lead to 75 a suitable hot-water supply by which water may be discharged into the tank through the said perforated branches 45 of the pipe 44 for the purpose of cleaning the tank whenever desired. It will be understood that a 80 filtering medium, as sand, (shown in Fig. 3,) is employed within the tank, the same reaching to a suitable height and placed upon the said perforated plates 34, the molasses to be filtered being admitted to the tank in any suit- 85 able way at the top, and as it falls upon the upper surface of the sand it percolates through the mass thereof, thence through the perforations in the plates 34, and finally passes to and through the discharge-pipes 40 90 and 41, it being relieved of all lees and sediment in its course through the sand, as is apparent. The lees or sediment may be removed either by flushing out the tank or by lifting out the plates 34 by means of the han- 95 dles 50, with which they are provided. As the shafts 21 are rotated in opposite directions, the molasses will be agitated or stirred by means of the blades 22, carried by the shafts, thereby facilitating the filtering of 100 the molasses.

The hereinbefore-mentioned reversely-disposed worm-wheels 24 may each be said to constitute practically one member of a friction-clutch for enabling the speed of the 105 shaft on which it is mounted to be varied, as may be desired, in the use of the filter, the other member thereof being indicated at 51 (see Fig. 4) and which is practically a disk keyed to the shaft at 52 to have longitudinal 110 movement thereon and formed on the inner face thereof with an annular recess 53, the sides of which are convergent toward the base of the recess, as shown, and between which are received the correspondingly out- 115 wardly converging sides 54 of an annular rib 55, formed on the adjacent face of the said worm-wheel. The shaft is threaded at 56 for a suitable distance from the outer end thereof, and mounted on this threaded por- 120 tion is a clamp or nut 57, provided with a hand-wheel 58 for turning the same, to either cause the disk 51 to move in the direction of the worm-wheel or to enable the disk to be carried away from the said worm-wheel. By 125 moving the disk 51 toward the worm-wheel the sides of the recess therein become frictionally engaged with the sides of the said rib 55, as is apparent, and it will thus be seen that speed of the worm-wheel will become 130

reduced, as will also that of its shaft, it being understood that the worm-wheel is loose on the shaft and is caused to turn therewith by its frictional engagement with said disk 51 in the manner set forth, said variation of speed thereof resulting from any variation of such frictional engagement, as will be apparent. The shaft is provided with a collar 59 at the inner side of the worm-wheel, so as to maintain the latter in the proper position thereon.

From the foregoing it will be seen that not only may the speed of the two shafts 21 be correspondingly varied, but by proper adjustments of the disks 51 thereon the same may be also driven or operated at different speeds, as may be desired in certain instances of use of the structure.

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

1. A filter for the purpose named, comprising a tank provided at the upper edge thereof with an open trough for receiving therefrom any overflow of the substance being filtered therein, and a curved pipe having communication with the trough and the upper part of the tank.

2. A filter for the purpose named, comprising a tank provided at the upper edge thereof with an open trough for receiving therefrom any overflow of the substance being filtered therein, and a curved pipe having communication with the trough and the upper part of the tank, provided with a valve for controlling such communication.

3. A filter, comprising a tank provided at the upper edge thereof with an open trough for receiving any overflow of the substance being filtered, a valve-controlled pipe having communication with the trough and the upper part of the tank, and a valve-controlled discharge-pipe leading from the bottom of the trough.

4. A filter, comprising a tank rectangular in form, the height of one of its sides being less than that of the remaining sides, the tank being provided at the upper edge of said side with an open trough for receiving any overflow from the tank, and a valve-controlled pipe having communication with the trough and the upper part of the tank.

5. A filter, comprising a tank rectangular

in form, one of the sides of the tank being of less height than that of the remaining sides, and having at its upper edge an outwardly and downwardly inclined chute, a trough at said side to which the chute leads, a valve-controlled pipe having communication with the trough and the upper part of the tank, and a valve controlled discharge-pipe leading from the bottom of the trough.

6. A filter, comprising a tank, means for agitating the substance being filtered therein, the tank being provided at the upper edge thereof with an open trough for receiving any overflow of the substance, and a pipe leading from the bottom of the trough and communicating with the upper part of the tank.

7. A filter comprising a tank, means for agitating the substance to be filtered, the tank being provided at the upper edge thereof at one side with an open trough for receiving any overflow of the substance, a pipe leading from the bottom of the trough and communicating with the upper part of the tank, a discharge-pipe also leading from the bottom of the trough, and valves for closing the upper ends of said pipes.

8. A filter comprising a tank, means for agitating the substance being filtered therein, the tank being provided at the upper edge thereof with an open trough for receiving any overflow of the substance, a pipe leading from the bottom of the trough and communicating with the upper part of the tank, and means for discharging the filtered substance from the tank.

9. A filter comprising a tank, means for agitating the substance being filtered therein, a trough for receiving any overflow from the tank, means for returning the overflow to the tank, a screen spaced from the bottom of the tank, discharge-pipes for the filtered substance leading from the bottom of the tank, and means for discharging hot water into the tank.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RAMON MANUEL VILLARINO.

Witnesses:

L. CENTURION,
MELAHOR XIGUES.