(No Model.) 2 Sheets—Sheet 1.

R. M. HUGHES.

APPARATUS FOR THE MANUFACTURE OF VINEGAR.

No. 502,819. Patented Aug. 8, 1893.

Fig. 1.

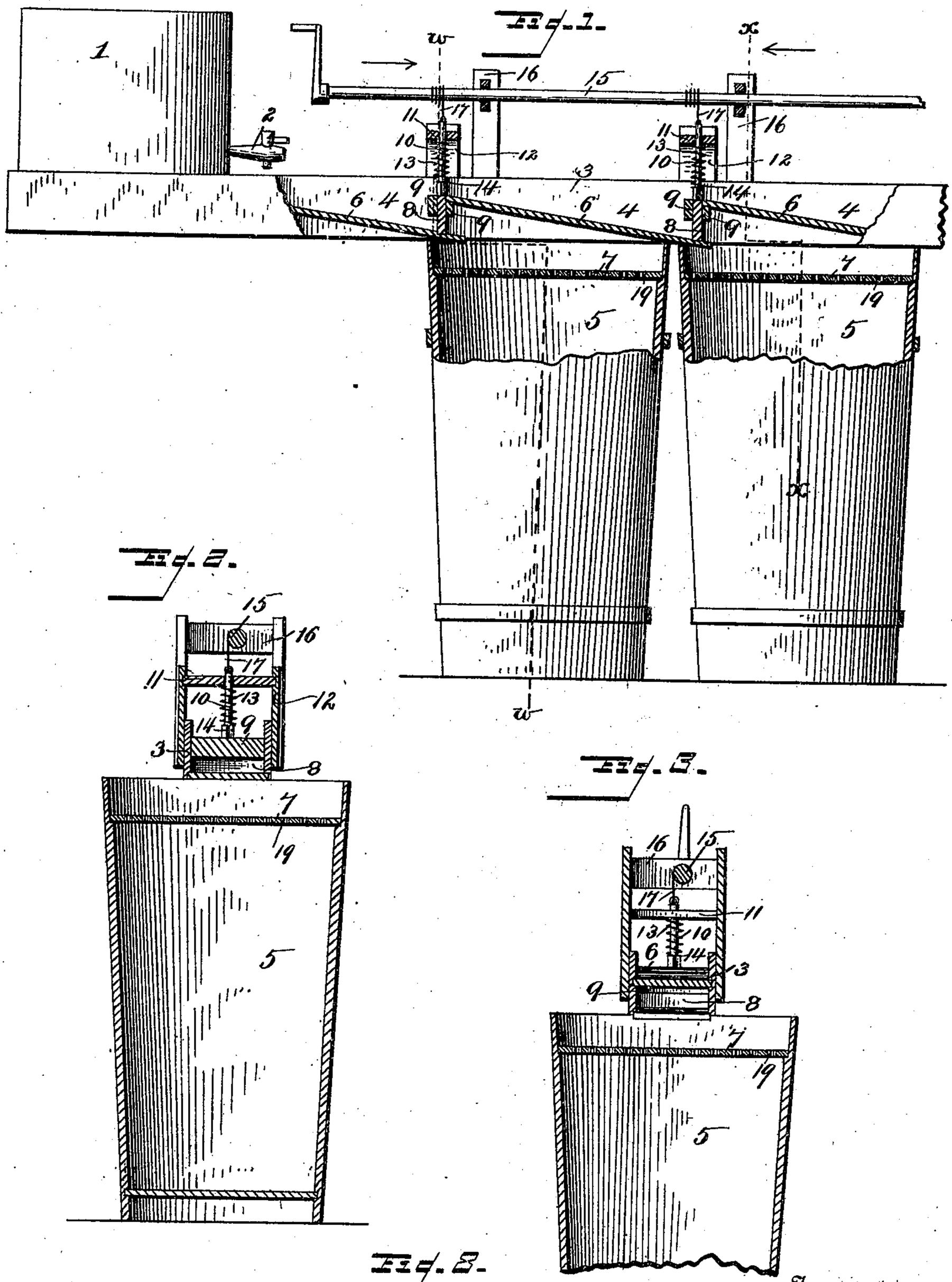
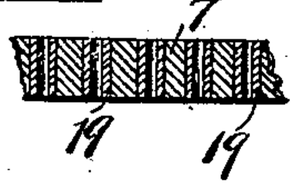


Fig. 2.

Fig. 3.

Fig. 4.



Witnesses
C. E. Hunt.
C. E. W. Govan

Inventor
R. M. Hughes
by L. R. Littell
his Attorney

(No Model.) 2 Sheets—Sheet 2.

R. M. HUGHES.

APPARATUS FOR THE MANUFACTURE OF VINEGAR.

No. 502,819. Patented Aug. 8, 1893.

Fig. 4.

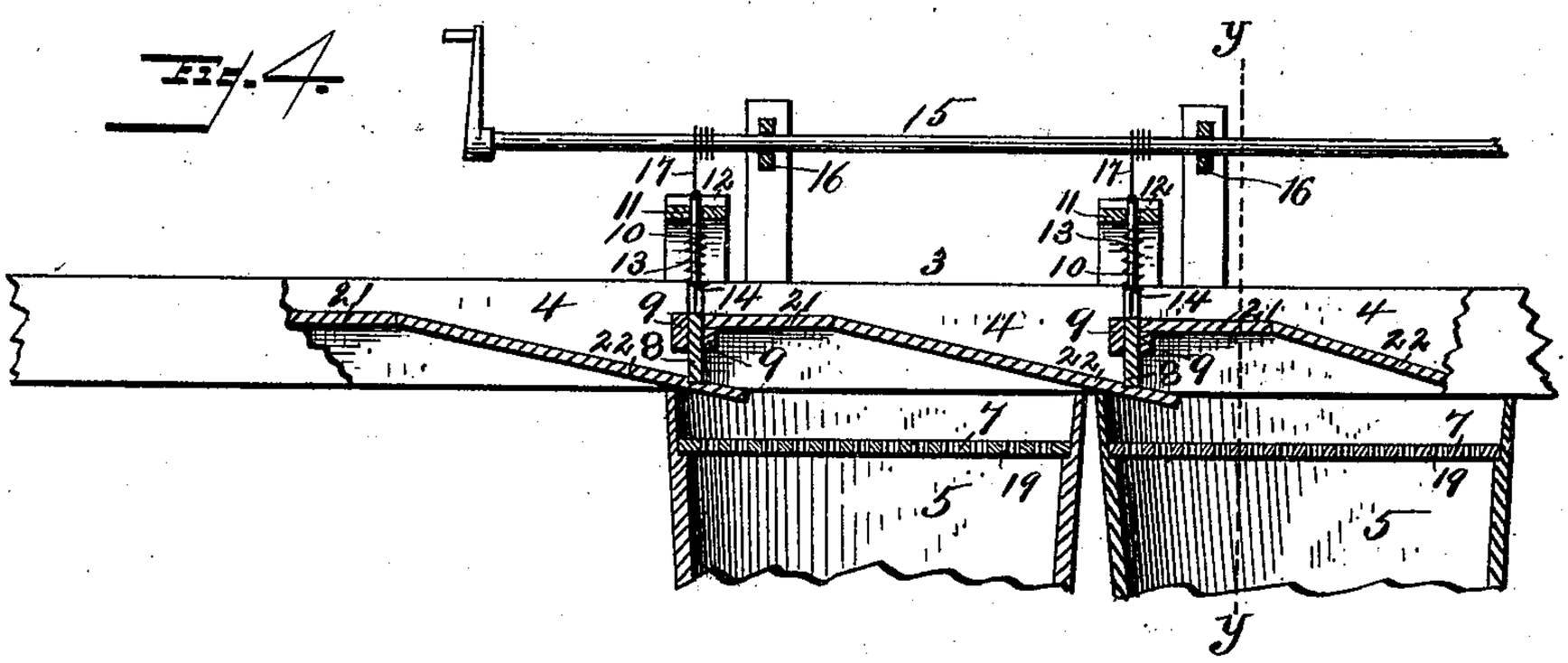


Fig. 5.

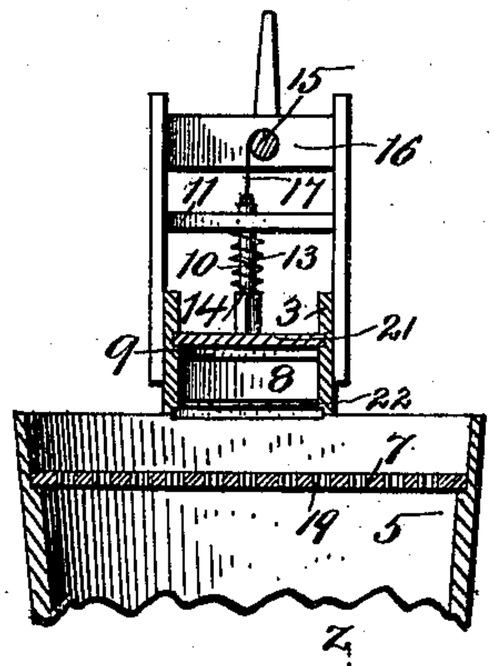


Fig. 6.

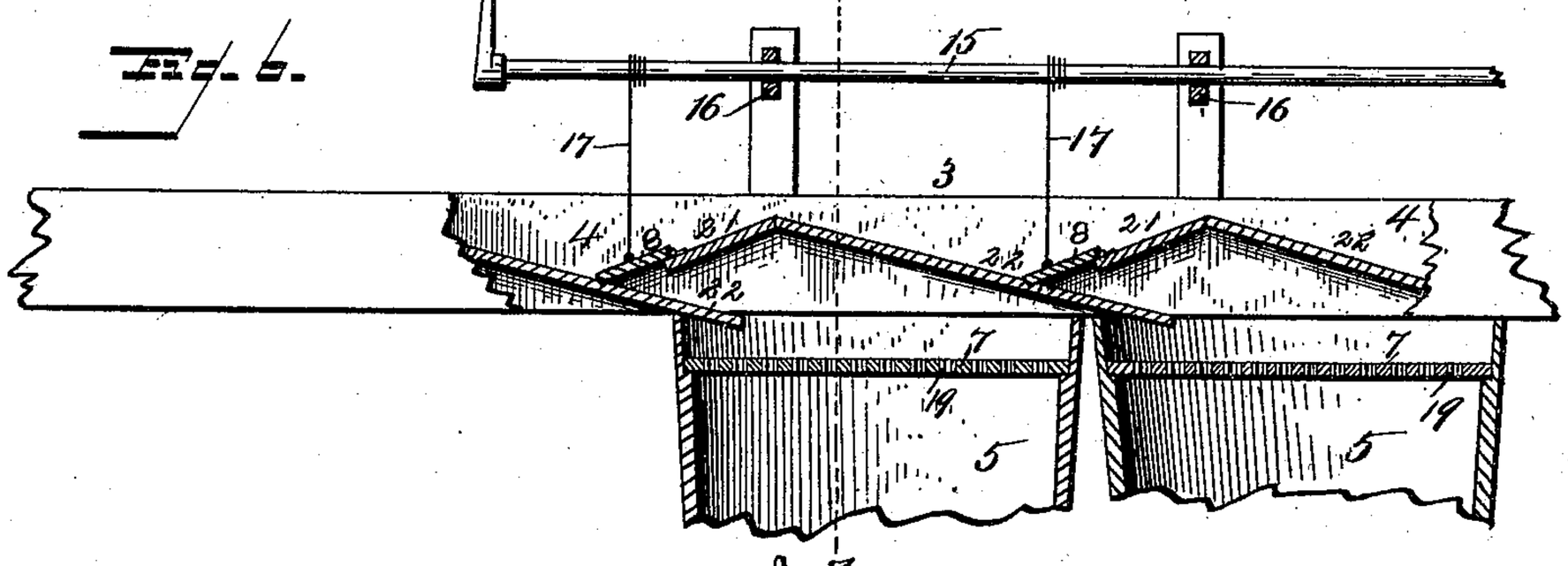
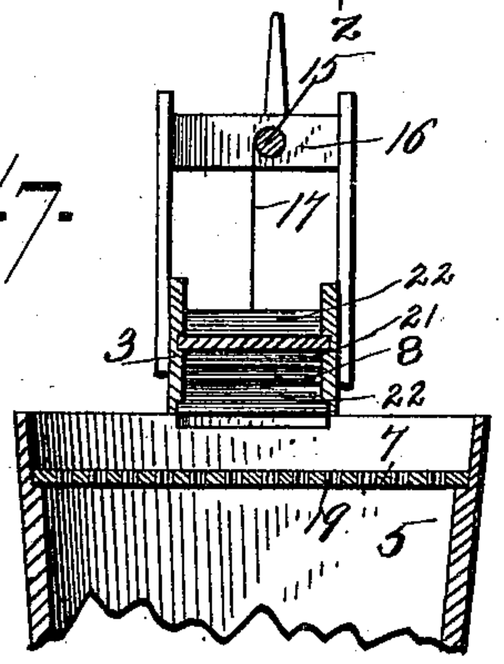


Fig. 7.



Witnesses
C. E. Hunt.
C. E. M. Gorman.

Inventor
R. M. Hughes
by L. R. Littell
his Attorney

UNITED STATES PATENT OFFICE.

RUSSELL M. HUGHES, OF LOUISVILLE, KENTUCKY.

APPARATUS FOR THE MANUFACTURE OF VINEGAR.

SPECIFICATION forming part of Letters Patent No. 502,819, dated August 8, 1893.

Application filed December 19, 1892. Serial No. 455,634. (No model.)

To all whom it may concern:

Be it known that I, RUSSELL M. HUGHES, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Apparatus for the Manufacture of Vinegar; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved apparatus for the manufacture of vinegar; and is more particularly designed as an improvement upon the mechanism covered in the patent granted to me September 20, 1892, No. 483,063, the object of my present invention being to simplify and improve the construction of said mechanism so that it will possess additional advantages in point of inexpensiveness, simplicity, effective operation, durability, economy in use, and general efficiency.

In my above mentioned patent, it will be noted that it requires two separate and distinct operations to discharge the liquid from the charging trough into the series of generators, whereas my present invention aims to accomplish this result by a single operation, and by a single series of valves. To these ends my invention comprises an improved charging trough discharging directly onto the perforated plates in the upper ends of the generators, thus dispensing with the auxiliary tilting buckets described in said patent.

My invention further consists in novel features of construction and arrangement of parts, all substantially as hereinafter described and particularly pointed out in the claims.

In the drawings:—Figure 1 is an elevation, partly in section, of my improved apparatus. Fig. 2 is a sectional view of the charging trough, taken on the line *w—w*, Fig. 1, and looking from the charging box. Fig. 3 is a similar view taken on the line *x—x*, Fig. 1, and looking toward the charging box. Fig. 4 is a detail side elevation of the charging trough, partly in section, illustrating a modification. Fig. 5 is a sectional view taken on the line *y—y*, Fig. 4. Fig. 6 is a side elevation, partly in section, illustrating another modification. Fig. 7 is a sectional view taken on the line *z—z*, Fig. 6. Fig. 8 is a detail sectional view taken through one of the perforated plates of the generators.

Similar numerals of reference denote corresponding parts in the several views.

Referring to the drawings, the numeral 1 designates the charging box, to which the wash is supplied from the usual wash-tank. Said box has a faucet, 2, of the ordinary construction, and is of a capacity to hold just enough and no more than to properly charge or fill all the compartments of the charging trough, 3. The improved trough 3 is, as shown, subdivided into a series of compartments, 4, one for each generator, 5. These compartments are formed by a series of inclined bottoms, 6, projecting at their lower ends over the edges of the generators, whereby the wash may be delivered upon the perforated plates 7. The valves for controlling the flow of the wash from the trough are preferably formed as shown in Figs. 1 and 2 and consist of the gates 8, sliding vertically between the cross-bars 9 supported in the sides of the trough. These gates are operated by the spindles 10 connected therewith and projecting upward through the cross pieces 11, supported from the sides of the trough by the uprights 12. A series of springs 13 coiled around the upper portion of the spindles and held under tension between the cross pieces 11 and the shoulders 14 on said spindles, serves to retain the gates normally in the closed positions. A shaft, 15, having a handle at one end and journaled in supports or brackets, 16, projecting from the sides of the trough, forms a means for raising the gates 8 against the tension of the springs, through the medium of straps or cords, 17, connected at their lower ends to the spindles 10 and at their upper ends adapted to be wound upon the shaft 15 when the latter is rotated. It will be observed that the construction and operation of the shaft 15 and retracting springs are substantially the same as shown in my patent hereinbefore referred to.

The vertically moving gates 8 which operate in conjunction with the inclined bottoms 6 of the separate compartments 4 correspond to the plug in my before mentioned previous patent which operated in conjunction with discharge openings in the bottom of the

trough. The cross-bars 9 are located some distance below the top of the trough, and the valve gates 8 do not project above said cross-bars when in closed position, so that the wash when it has filled the first compartment flows over the cross-bars 9 into the next compartment and so on throughout the series of compartments until all are filled.

In conjunction with the construction and operation just described, the relative capacity of the aggregate compartments of the trough or feeder 3 and the charging box 1 is identical, so that the latter will hold just enough and no more liquid than will fill all the compartments of the trough. Thus, when the charging box is open the trough is automatically and completely filled with safety and a convenient and efficient operation secured.

The inclined bottoms 6 which respectively form the complete bottom of each compartment 4 are preferably supported at their top ends upon the cross-bars 9, in rear of the valve gates 8, and extend downwardly over and across the top of one of the generators 5 to a point under the next valve gate 8, the end of the bottom thus projecting slightly over the edge of the adjoining generator, as shown.

In order to prevent the closing of the perforations in the plates 7, due to the swelling of the wood, I provide a lining for the perforations consisting of a tube inserted through the perforations in the wood and corresponding thereto, said tubes being formed of reed, glass, porcelain, or other suitable material, as indicated at 19, that will neither corrode nor swell under the action of the wash.

From the foregoing description it will be readily understood that when the faucet 2 is opened the contents of the charging box 1 flow into the subdivisions or compartments 4 of the trough 3 successively until all of them are filled. Then the shaft 15 is rotated, raising the gate valves 8 and permitting the discharge of the wash onto the perforated plates 7 of the generators, through which it passes into said generators and is drawn off in the usual manner.

In Figs. 4 and 5, I have illustrated a slight modification of my invention, which consists in making the bottoms of each compartment 4 of the trough horizontal for a portion of its length, as at 21, thence inclining more abruptly toward its discharge end, as at 22. By making the compartments deeper the same quantity of wash can be held while the resulting advantage is that, as the more abrupt the incline is the quicker and more forcibly its contents are discharged, the wash will be more thoroughly distributed over the perforated plates 7. The horizontal portion 21 of the bottoms 6 in the present modification preferably extends from the cross-bars 9 a short distance to the commencement of the incline 22, thus forming a plane which is practically an extension of the cross-bar over which the wash flows from one compartment to the other.

Another modification is illustrated in Figs. 6 and 7, in which the rear portion 21 of the bottom of the compartments is inclined downwardly and rearwardly, as shown, in lieu of being horizontal as in the constructions illustrated in Figs. 4 and 5, and the valve gates 8 are formed by plates which are hinged at the end of the inclined portions 21 and form practically an extension thereof. The construction and arrangement embodied in the present modification are preferred under some circumstances inasmuch as they materially simplify the general construction, the cords 17 for lifting the valve gates 8 being directly connected with the hinged plates and the cross-bars 9, uprights 12, cross pieces 11, and springs 13, being dispensed with.

While I prefer to employ the herein described mechanism for operating the valve gates, I do not wish to be understood as limiting myself to this particular mechanism, it being obvious that the opening of the valve gates may be accomplished in any suitable manner and by any adapted means. It is also obvious that the valve gates may be opened in any suitable direction, though I prefer to open them upwardly so as to entirely cut off the liquid to each compartment.

By my herein described improved inclined bottoms 6 forming the bottom of each compartment and projecting over the perforated plates 7 of the generators, in conjunction with the valve gates of the discharge end of each compartment, the liquid is thrown from the discharge end with considerable force, according to the inclination of the bottom and the capacity of the compartment, thus insuring a thorough and good distribution of the wash over the surface of the perforated head plates 7 of the generators. It will also be understood that the valves may be set back at any desired point in the compartments, for instance: as shown in Fig. 6, to regulate the capacity of the compartment and adapt it for holding the proper amount as desired.

The construction of the perforated head plates 7 as embodied in my present improvements enables me to employ very small perforations or holes (which is a desideratum in the practical manufacture of vinegar) without liability to closing by reason of the swelling of the wood.

I do not wish to be understood as specifically limiting myself to the exact construction and arrangement herein shown and specified, but reserve the right to all such variations and modifications as properly fall within the spirit and scope of my invention and the terms of the claims.

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

1. As an improvement in apparatus for the manufacture of vinegar, the combination, with the charging box and the series of generators, of a fixed charging trough divided into compartments, one for each generator and dis-

charging directly into the latter, valves for controlling the discharge of said compartments, and means for simultaneously and positively operating the series of valves to discharge the contents of the compartments, substantially as set forth.

2. As an improvement in apparatus for the manufacture of vinegar, the combination, with the generators, of a feed trough divided into compartments, each compartment having an inclined bottom projecting over the head of one of the generators, and valve gates operating in conjunction with said inclined bottoms, substantially as set forth.

3. As an improvement in apparatus for the manufacture of vinegar, the combination, with the generators, of the feed trough divided into the compartments 4 adapted to be successively filled by the overflow from one compartment to another, each compartment being provided with an inclined bottom inclined toward the adjoining generator and terminating over the head of the same, and valves provided at the rear end of the bottom portions of each compartment and adapted to control the discharge of the adjoining compartment, substantially as and for the purpose set forth.

4. As an improvement in apparatus for the manufacture of vinegar, the feed trough divided into compartments, each compartment having an inclined bottom inclined toward the next compartment in successive series and there terminating in a discharge end, and means for controlling the discharge of said compartments, substantially as and for the purpose set forth.

5. An improved apparatus for the manufacture of vinegar, comprising the generators, and a charging compartment therefor having an inclined bottom pitched downwardly toward the generator and terminating in a discharge end projecting over the head of the latter, and valve gates for controlling the discharge from said inclined bottom, whereby the force of the charge of the wash or liquid is regulated by the pitch of the inclined bottom and a good distribution over the head of the generator is secured, substantially as set forth.

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

RUSSELL M. HUGHES.

Witnesses:

WALTER N. HUGHES,

S. S. HOLLIS.