

(No Model.)

2 Sheets—Sheet 1.

A. C. JACOBI.
MILK MEASURER.

No. 580,866.

Patented Apr. 20, 1897.

Fig. 1

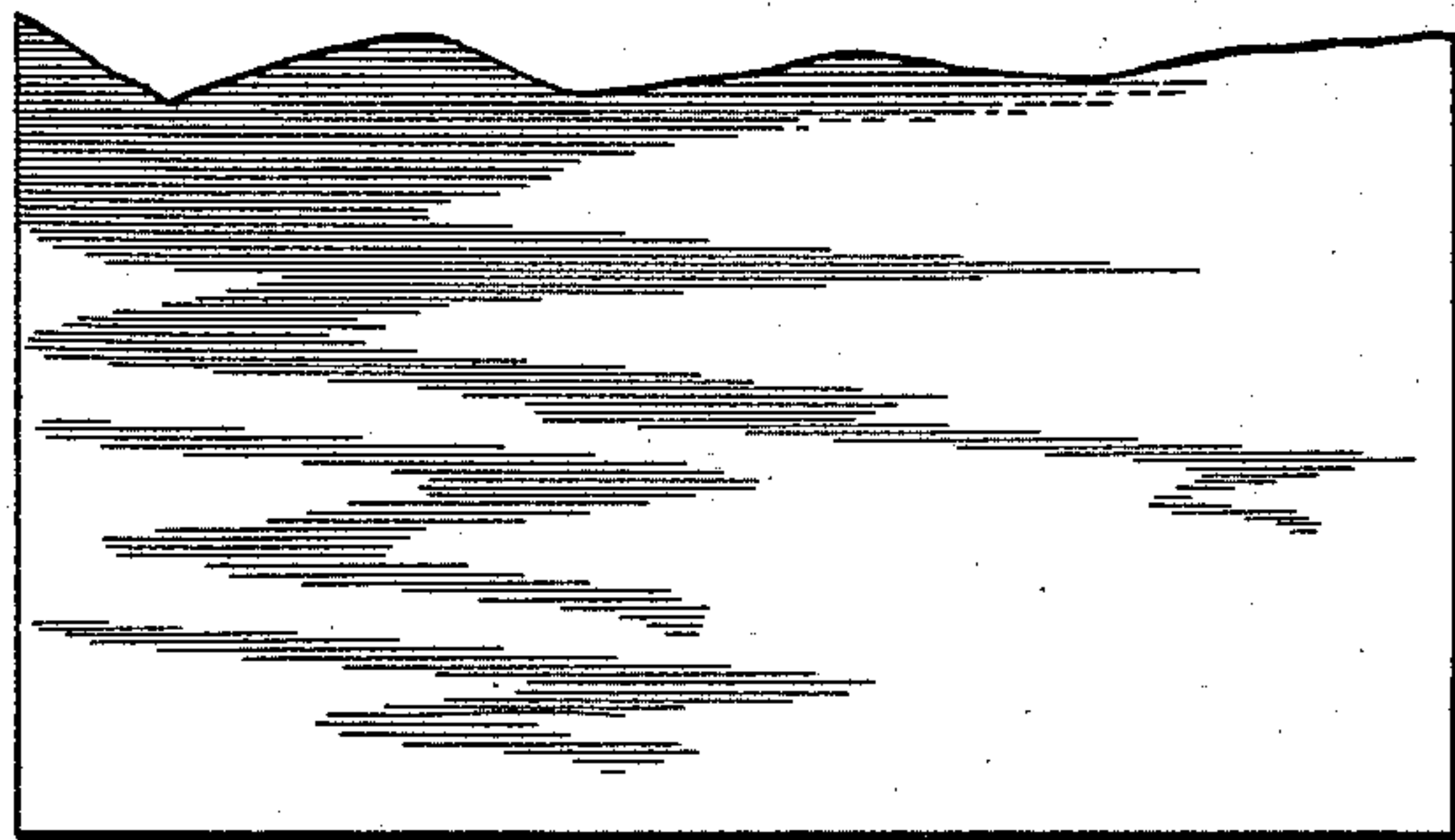


Fig. 3

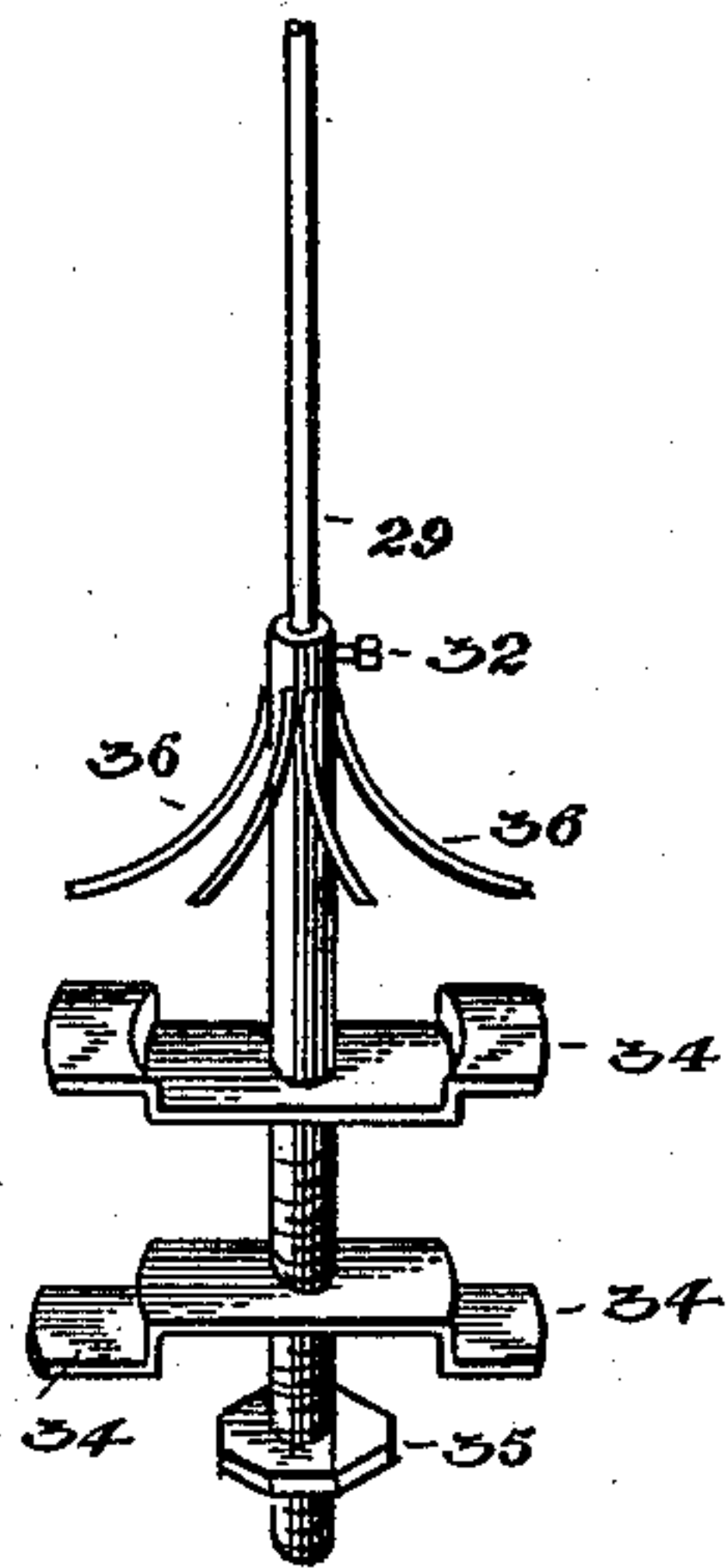
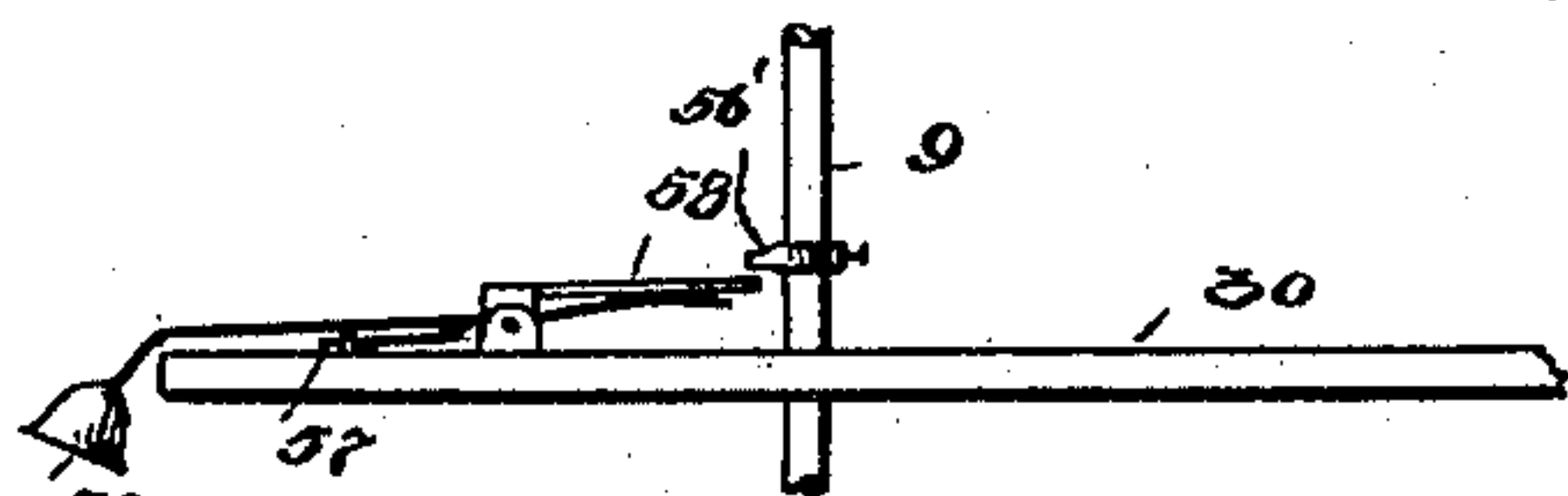


Fig. 9.



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Fig. 2

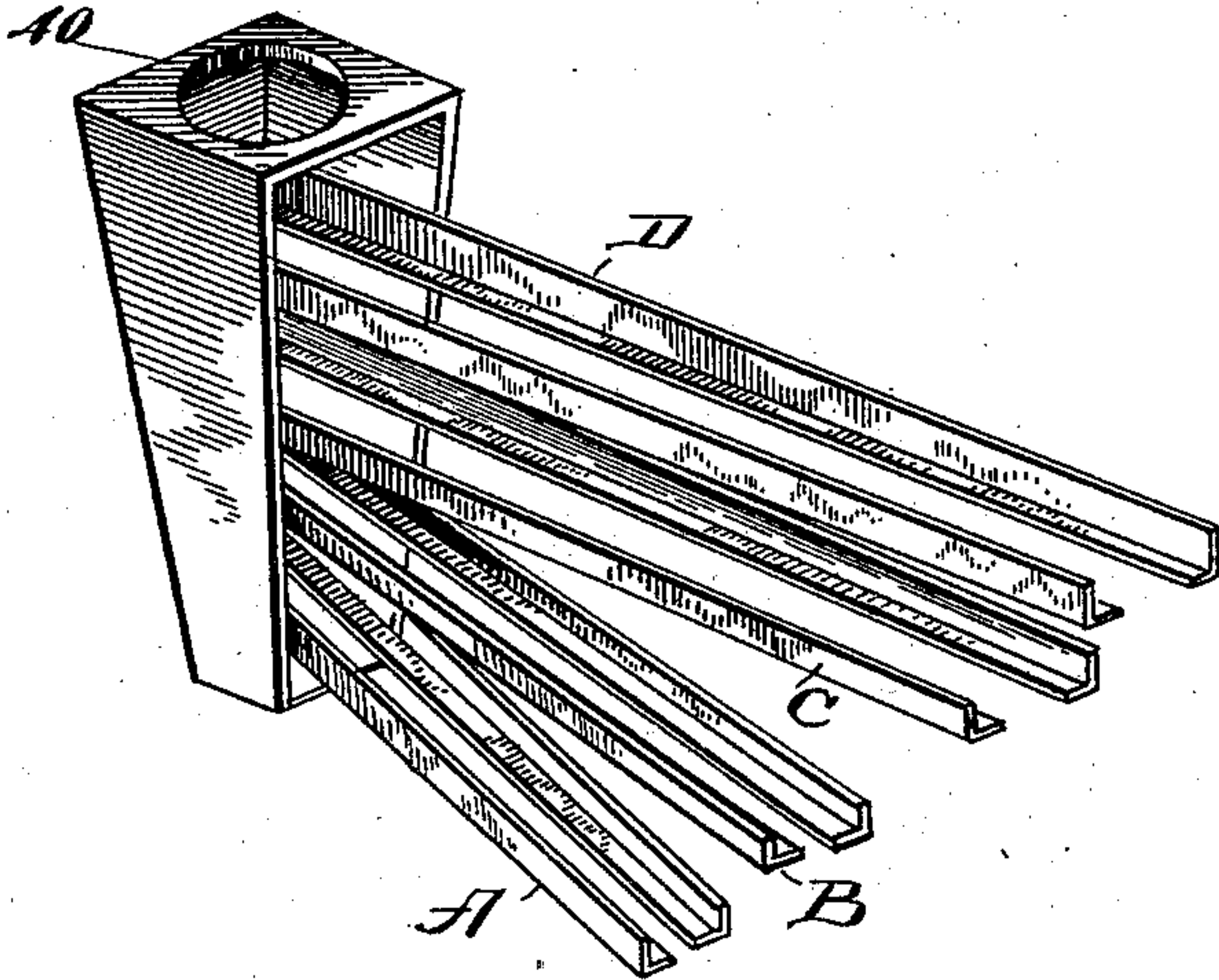


Fig. 4

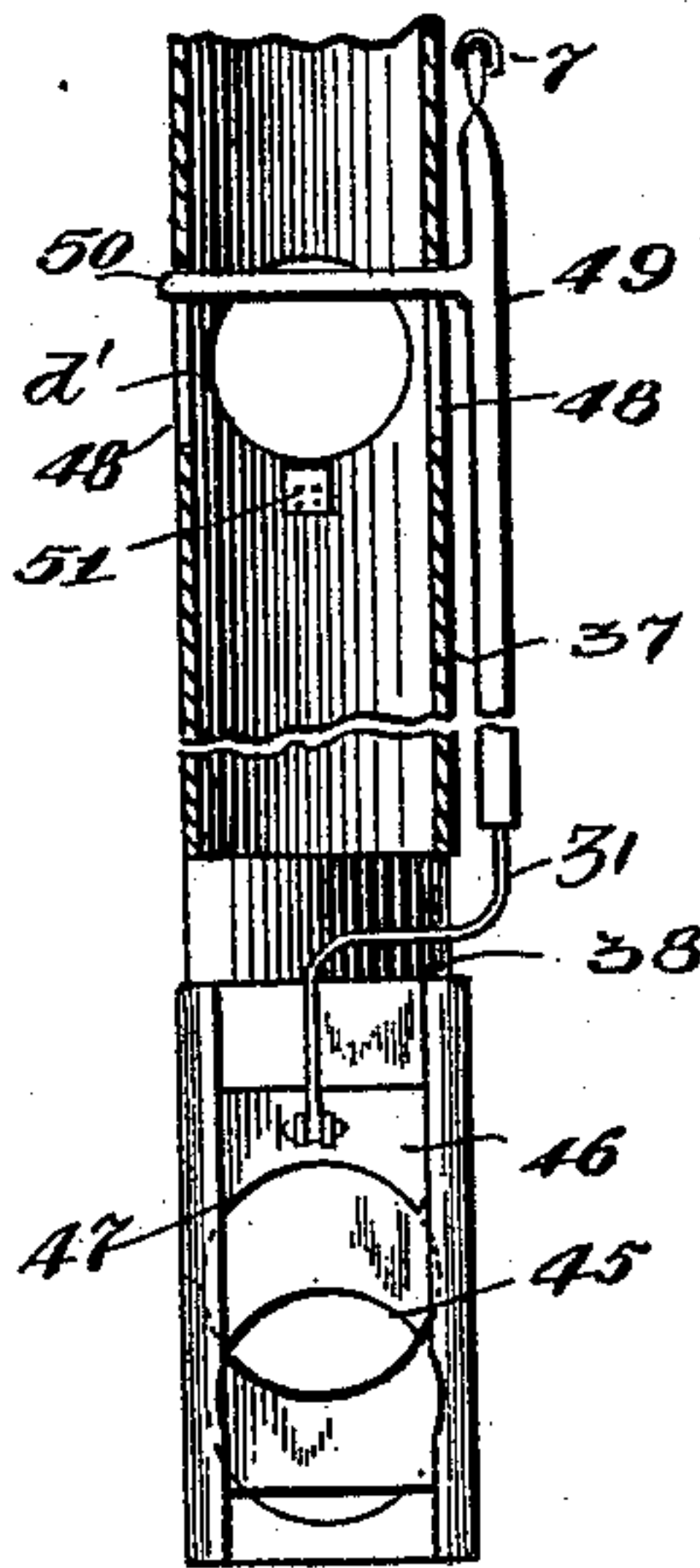


Fig. 5

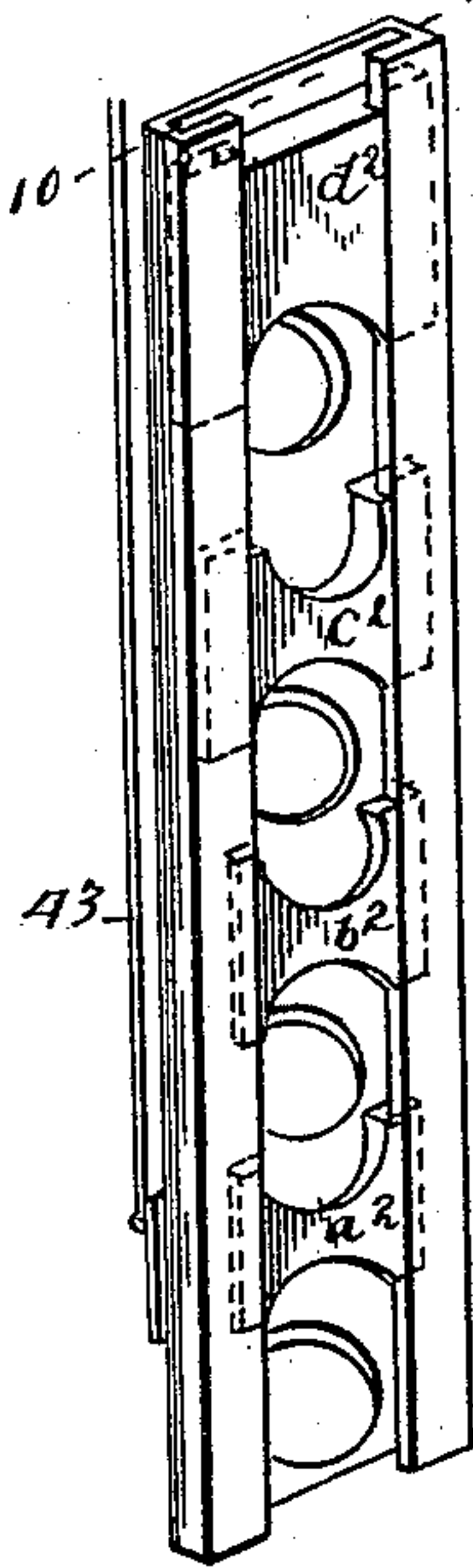


Fig. 10

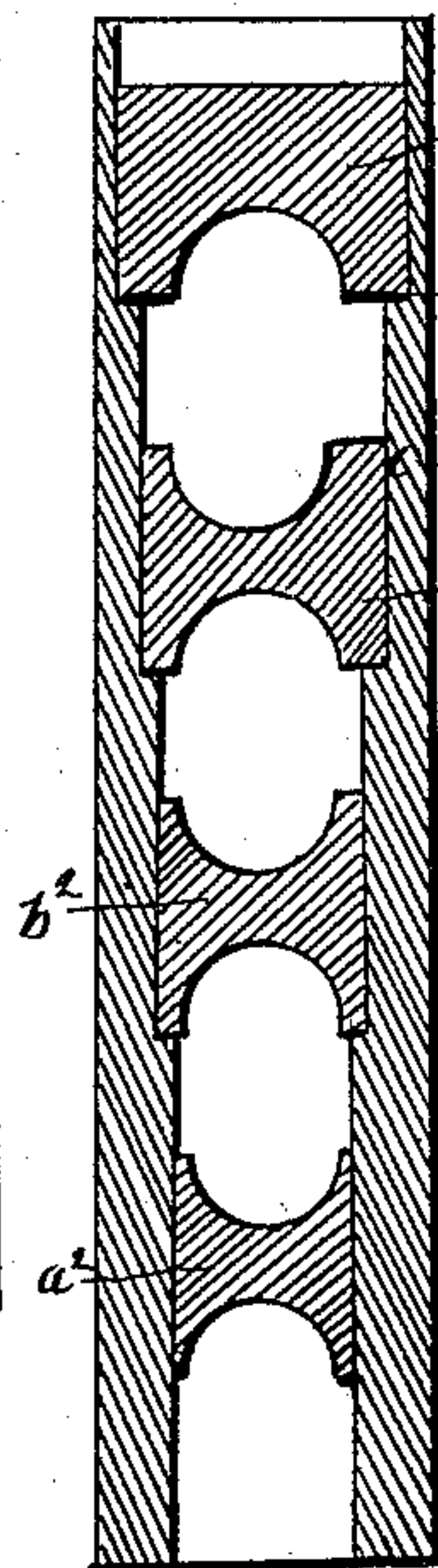


Fig. 6

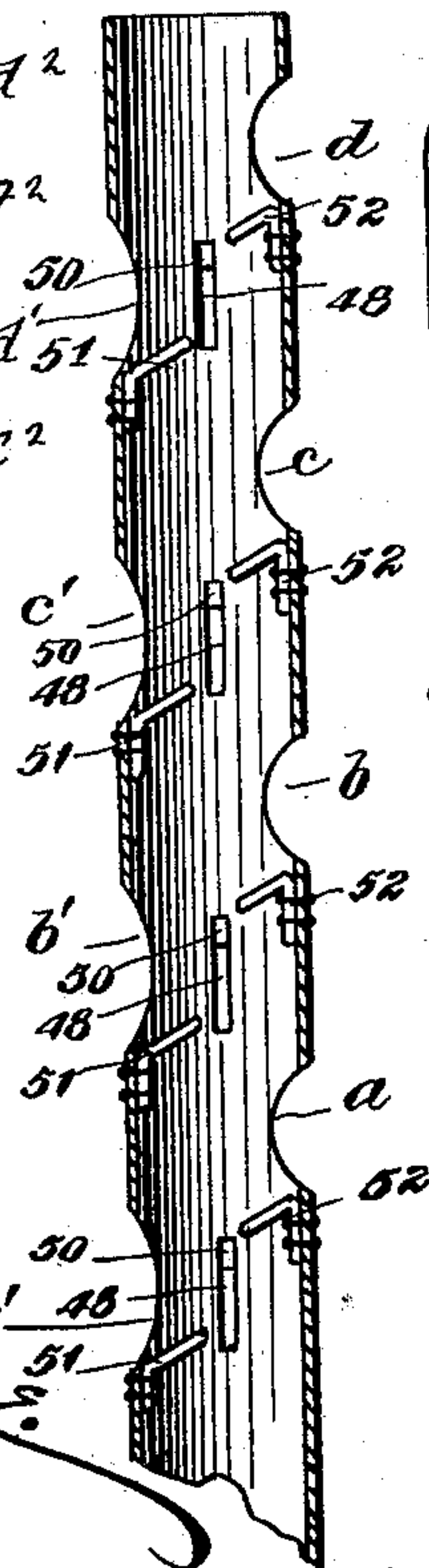


Fig. 7

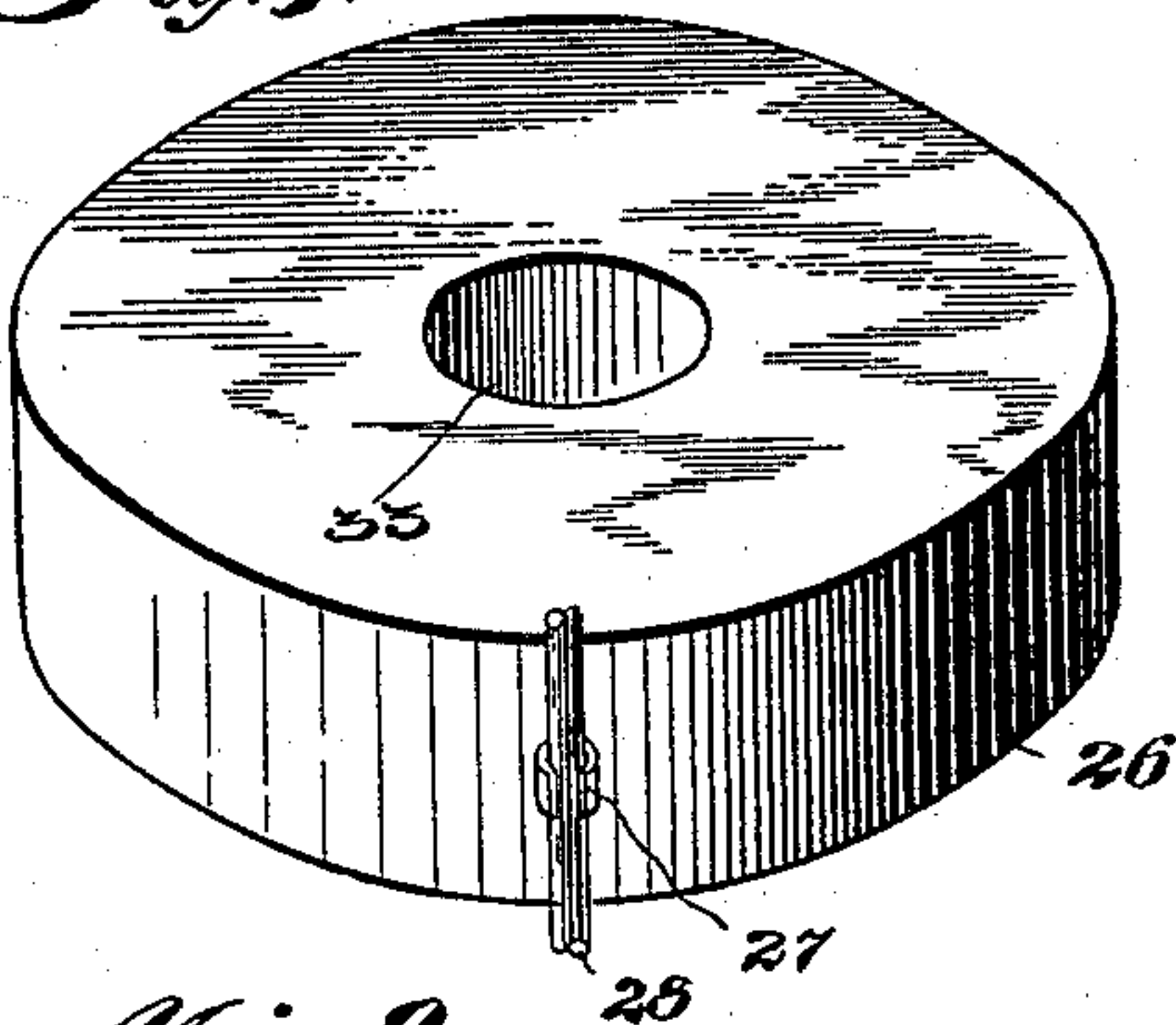
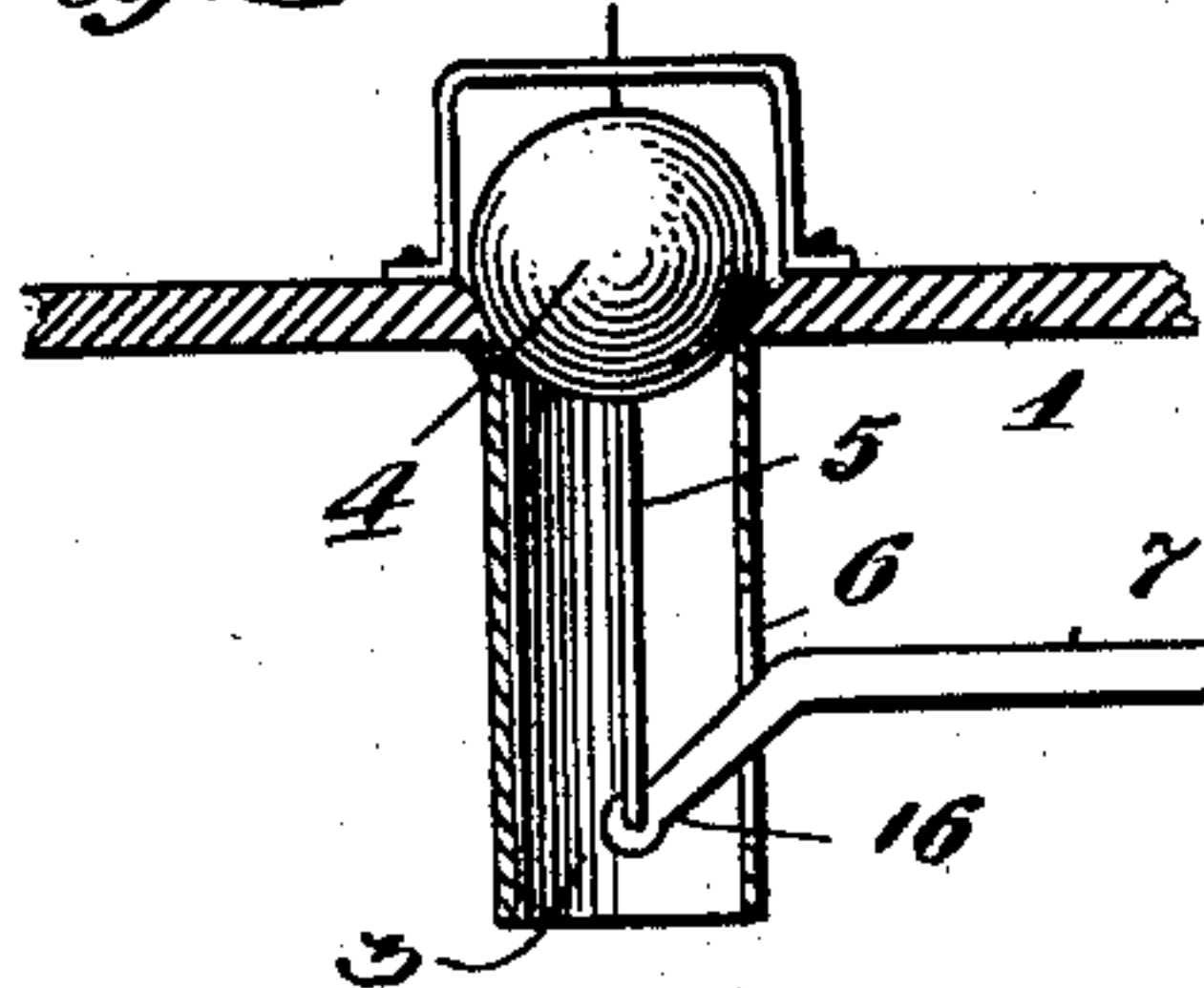


Fig. 8



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UNITED STATES PATENT OFFICE.

AUGUST C. JACOBI, OF MIDDLETON, WISCONSIN.

MILK-MEASURER.

SPECIFICATION forming part of Letters Patent No. 580,866, dated April 20, 1897.

Application filed September 26, 1896. Serial No. 607,073. (No model.)

To all whom it may concern:

Be it known that I, AUGUST C. JACOBI, a citizen of the United States, residing at Middleton, in the county of Dane and State of Wisconsin, have invented certain new and useful Improvements in Milk-Measurers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a novel construction in a machine for measuring liquids, and although it can be applied and employed for measuring any liquid it is especially adapted and designed for measuring skimmed milk.

This invention consists in the features of construction and combinations of parts hereinafter fully described and specifically claimed.

In the accompanying drawings, illustrating this invention, Figure 1 is a side elevation of a machine constructed in accordance with my invention with certain parts broken away for convenience of illustration. Fig. 2 is a perspective view of the ball-sorting device and valve-actuating tubes. Fig. 3 is a detail perspective view of the lower end portion of the rod to which the float is attached. Fig. 4 is a fragmentary view in section and in elevation of the lower end portion of the tube 37 and of the tube 38. Fig. 5 is a perspective view in detail of the guide-slides for controlling the valves. Fig. 6 is a detail vertical section of the tube 37. Fig. 7 is a detail perspective view of the float. Fig. 8 is a fragmentary section illustrating the valve and the outlet-port of the tank 1. Fig. 9 is a side elevation in detail of the alarm mechanism. Fig. 10 is a longitudinal section of the members shown in Fig. 5.

This invention is especially adapted for use in creameries where the farmer brings the milk in in the morning, which, after being separated from the cream by the separators, the farmer usually takes away with him. Ordinarily in creameries a certain amount of milk yields a certain amount of cream, and the farmers, after delivering the milk, know exactly, by weight or measure, the amount of skim-milk they are to receive.

The objection to the present system of de-

livering the skim-milk is that for various causes, sometimes partiality on the part of the man who dispenses it, the last of the farmers receiving his skim-milk does not receive the quantity that he is entitled to. It is the object of this invention to overcome this objection by providing a machine that will weigh out or measure the exact quantity of skim-milk, so that there can be no mistake—for instance, giving out three or four more gallons than a person should receive.

Referring now to said drawings, 1 indicates the tank wherein the skim-milk is held. This tank, of course, in different creameries varies in size, location, and elevation, and since it is intended to place this measuring device beneath the tank 1 means are provided whereby the same is made adjustable to conform thereto. It will be understood, of course, that the size and shape of the tank 1 are immaterial and that this device is operative so long as it communicates with the lower end of said tank.

This invention consists of a tank 2 and of the devices for admitting the milk from the tank 1 into the tank 2 and for allowing it to run from the tank 2. It is preferable to hang this tank 2 from the upper tank, and this manner of supporting it will be adopted where it is feasible.

In the bottom of the tank 1 is an outlet-port 3, situated over the tank 2 and controlled by the valve 4, the stem 5 of which extends downwardly near the lower end of the port 3, and a slot 6 is made in the side of the port 3, through which a lever 7 can project to be connected with the lower end of the stem 5. On the opposite side of the tank 2 and at its upper end are two sockets 8 to receive the lower depending ends of an arched bar 9, and these ends are secured in place by set-screws 10. This arched bar 9 is made adjustable, so that when setting up the machine it can be regulated according to the available space. Mounted upon one limb of this arched bar is a cross-piece 11, one end of which is provided with an eye and set-screw to receive and hold the pipe leading from the port of the upper tank, thus making it adjustable for the purposes referred to. The other end of the cross-piece 11 is provided with a loop 12 and set-

screw 13 to receive the upper end portion of the valve-actuating tube to be described hereinafter.

Between the ends of the cross-piece 11 is a slot 14, and connected within this slot is a hanger 15, to the lower end of which is pivoted the lever 7, that operates the valve 4. The end portion 16 of this lever 7 is bent or turned down at the end, where it is connected with the stem to prevent the milk from running along the lever and over the sides of the tank. This lever 7 is also provided with a weight 17 adjacent to the valve, so that it will normally hold the valve closed.

In the lower end of the tank 2 is an outlet-port 18, communicating with the pipe 19. This port is controlled by a valve 20, having a depending stem 21, which is pivoted to a lever 22, extending through a slot 23 in said tube 19. This lever 22 is pivoted to a bracket 24, secured to the bottom of the tank. Around the tube and below the slot 23 is a cup-shaped receptacle 25 to catch the milk that passes through the slot 23. The end of the lever 22 is also bent or turned down to prevent the milk from running along the same.

Situated within the tank 2 is a float 26, held in position by guides 27 and guide-rods 28. This float has a stem 29 rising centrally from the same and passing through a guide-bar 30, fastened to the top of the tank and extending over and on the outside of the tank and having a downwardly-projecting limb 31. This stem 29 has a coupling 32 close to the float, whereby it can be removed to permit the removal of a float when it is necessary to clean it. The connection between said float and stem is made by providing an upright opening 33 through the center of the float, through which the stem passes, and providing two plates 34 above and below the float to be held in place by a nut 35, as shown, while to keep the float in shape and prevent it from bending a plurality of arms 36 bear against the upper face of the same. These arms extend from the stem 29.

The device for controlling and regulating the operation of the valves will now be described. Situated adjacent to the lower tank in an upright position are two tubes 37 and 38. The tube 37 extends from a point a little above the top of the tank 2 almost to the lower end of this tank, while the tube 38 extends from a point a little above the lower end of tube 37 to a little distance below the lower end of this tank 2. The adjacent ends of these tubes are connected together as a convenient construction and are suitably supported from the tank 2, as shown. The upper tube 37 is termed the "inlet-valve-operating" tube and the lower tube the "outlet-valve-operating" tube. On the outside of tube 37 are a plurality of openings corresponding in number to the different quantities of milk that the machine is to measure. It is usually ten pounds, twenty-five pounds, fifty pounds, and one hundred pounds. These

openings *a*, *b*, *c*, and *d* in the tube 37 are to receive different-sized balls that serve to operate the machine. These balls are placed in the hopper 40, the lower end of which is located over the outer ends of a series of tracks A, B, C, and D. The other ends of these tracks terminate adjacent to the openings *a*, *b*, *c*, and *d*, respectively. The different tracks are intended to assort the balls. For this purpose the upper track D is made wide enough to allow all the balls except the one intended for this track to pass between the sides of the same, and the different tracks are graduated and so vary in size that they will only stop the ball intended for that particular track.

The hopper 40 is angular, so that it will be impossible to throw a ball straight onto any one of the tracks, the shape of said hopper causing the balls to fall vertically. Just below each of the openings *a*, *b*, *c*, and *d* and on the opposite side of the tube are other openings *a'*, *b'*, *c'*, and *d'*. Fastened to the tube 37, adjacent to these openings *a'*, *b'*, *c'*, and *d'*, is an upright guide 41, having a series of slides *a*², *b*², *c*², and *d*². These slides are arranged to control the openings next to which they are located and are arranged and constructed in the following manner: The width of the guide 41 varies according to the number of holes which are controlled by it. For instance, the guide has four different widths, and consequently the slides *a*², *b*², *c*², and *d*² correspond therewith. The different portions of the guide are separated by upwardly-facing shoulders 42, so that, for instance, the slide *d*² cannot pass below the shoulder at the lower end of this portion of the guide, and so on with the others. The slides are so arranged that when they rest upon their respective shoulders the openings which they control are closed, and the upper and lower edges of these slides are cut away, so that when they come together they form an opening through which a ball can pass—for instance, the lower cut-away edge of the slide *d*² and the upper cut-away edge of the slide *c*². When these slides are brought together, they form an opening that will register with the opening *d'*. The other slides are similarly arranged, with the exception that the lowest or slide *a*² simply passes sufficiently about the opening *a'* to clear the same. The shoulders 42 form stops to limit the lower movement of these slides, while the upper ends of tube 38 form a stop for slide *a*². The upper end of tube 38 is open and just below the openings in tube 37, so that when the balls roll out through the openings in said tube 37 they will drop into the upper end of tube 38, guide-rods 43 being preferably used to direct the falling of a ball.

The lower end of the tube 38 is provided at one side with a slot 44, through which the outer end of lever 22 projects and stands across this tube 38. The outer face of the tube 38, about opposite the slot 44, is provided

with an opening 45, which is controlled by a slide 46, having an opening 47 therein. When this slide 46 is at the upper limit of its movement, the opening 45 is closed, and is opened 5 by the descent of the slide.

Referring again to the tube 37, through the side of this tube and just below each of the openings *a*, *b*, *c*, and *d* are pairs of slots 48. The lever 7 extends outwardly adjacent to the tube 37 and is pivotally connected with the upper end of a rod 49, that extends the entire length of the tube and is connected at its lower end with slide 46. This rod 49 is provided with a plurality of arms 50, in the case illustrated four in number, which extend 15 into the slots 48, and consequently across the tube 37.

As shown in detail, within the tube 37 are arranged deflecting-fingers 51 and 52. The 20 finger 51 is secured to the interior of the tube, near the lower edge of the openings *a'*, *b'*, *c'*, and *d'*, while the finger 52 is secured to the tube on the opposite side thereof and at the lower edge of openings *a*, *b*, *c*, and *d*. It will 25 thus be seen that these fingers serve to guide the balls outwardly and prevent them from accidentally remaining in the tube.

The connection between the upper end of rod 49 and lever 7 is adjustable, being secured 30 by making a plurality of openings in said rod 49 to receive a pin on the lever 7.

The depending limb 31, carried by the float, is provided with a lateral projection 54, that engages a hook or eye 55 on the lower slide 35 *a*² of the tube 37.

To arrange an alarm to give notice when the tank is empty, I attach upon the cross-plate 30 a bell 56. The stem of this bell is pivotally supported by two ears upon the 40 plate 30 and has a spring-arm 57 to hold the bell down. An operating-finger 58 is mounted upon the same pivot as the bell-stem to engage the bell-stem when it is pressed downwardly, but to rise without contact therewith. The 45 projection 56' of the float in descending will press the operating-finger downwardly, and when it releases the same the spring-arm 57 will throw the bell back and ring it.

The parts of my invention being arranged 50 and constructed as described, the operation is as follows: We will suppose, for instance, that the tank 1 contains milk and the tank 2 is empty and it is desired to deliver fifty pounds of milk. The operator would place in the 55 hopper a ball that would pass by track D and fall upon track C. This ball passing down track C will enter the tube 37 through openings *c*, and, falling in said tube upon the finger 50, extending across the same, will press said 60 finger down the length of the slot 48, thereby opening the valve and allowing the milk to flow into the lower tank. The valve in the lower tank normally stands closed. As the milk flows into the lower tank it will raise the 65 float 26, and this float carries with it the lower slide *a*². As the float continues to rise the slide *a*² will come in contact with the lower edge of

slide *b*², which in turn comes in contact with slide *c*², and then when the continued rising of the float brings the cut-away portion of 70 slides *b*² and *c*² opposite the opening *c'* in tube 37, the ball which has been retained in this tube will now roll out through the opening and fall into the tube 38. As soon as this ball leaves the tube 37 the mechanism for op- 75 erating valve 3 being released, this valve will close immediately, while the ball falling into the lower tube 37 will strike the inner end of lever 22 and open the valve 20 of the lower tank. The ball is retained in the lower tube 80 by reason of the fact that when it passes out of the tube 37 and permits the finger 50 to rise the rod 49 rises also and lifts the slide 46 to close the opening 45. The milk will now pass out through the pipe 19 of the lower 85 tank and the float will descend gradually until all the milk is drained off, when the parts will be in their original positions. When another ball is placed in the hopper 40, it will operate the valve 4 in the same manner as 90 already described, while it will be noticed that as it presses the rod 49 downwardly it will also move the slide 46 downwardly and bring the opening 47 therein opposite the opening 45 of the tube 38 and allow the first 95 ball to pass out of the same.

Having now fully described this invention, what I claim as new is—

1. The combination with a tank having an inlet controlled by a valve, a finger connected 100 with said valve and extending into a tube or passage, an outlet for said tank having a valve controlled by a finger extending into another tube or passage, openings into the upper tube or passage for the passage of a 105 ball, a slide controlling the outlet-passage of said ball, and a float situated within said tank and connected with said slide, substantially as described.

2. The combination with a tank having an 110 inlet provided with a valve 4, an outlet provided with a valve 20, an upright tube or passage 37 having a plurality of openings in opposite sides thereof, a plurality of slides controlling one set of said openings, a float in 115 said tank connected with the said slides, an upright rod 49 having a plurality of fingers extending into said tube 37 and connected with said valve 4 to operate the same, a tube 38 open at its upper end and located adjacent 120 to said tube 37, a lever 22 connected with the valve 20 and extending into said tube or passage 38, and a slide 46 controlling an opening 45 therein, said slide being connected with the said rod 49, substantially as described. 125

3. In a machine of the kind specified, in combination with the float and valve-operating mechanism, of a hopper 40, a plurality of tracks varying in size leading from said hopper 40 to a series of openings in the tube 37, 130 a series of openings in the other side of said tube 37, a guide adjacent to said latter set of openings, said guide being provided at intervals with stops, a plurality of slides situated

within said guide and adapted to rest upon said stops, the lower slide being connected with said float, substantially as described.

4. In a machine of the kind specified, the
5 combination with the tank, inlet and outlet
valves and a device for controlling said inlet-
valve, of a tube or passage having a lever ex-
tending into the same and connected with the
outlet-valve, an opening into said tube adja-
10 cent to said lever and controlled by a slide,

said slide being connected with the mechanism for operating the upper valve, substantially as described.

In testimony whereof I have signed this
specification in the presence of two subscrib- 15
ing witnesses.

AUGUST C. JACOBI.

Witnesses:

L. W. KARBERG,
W. F. PIERSTORFF.