

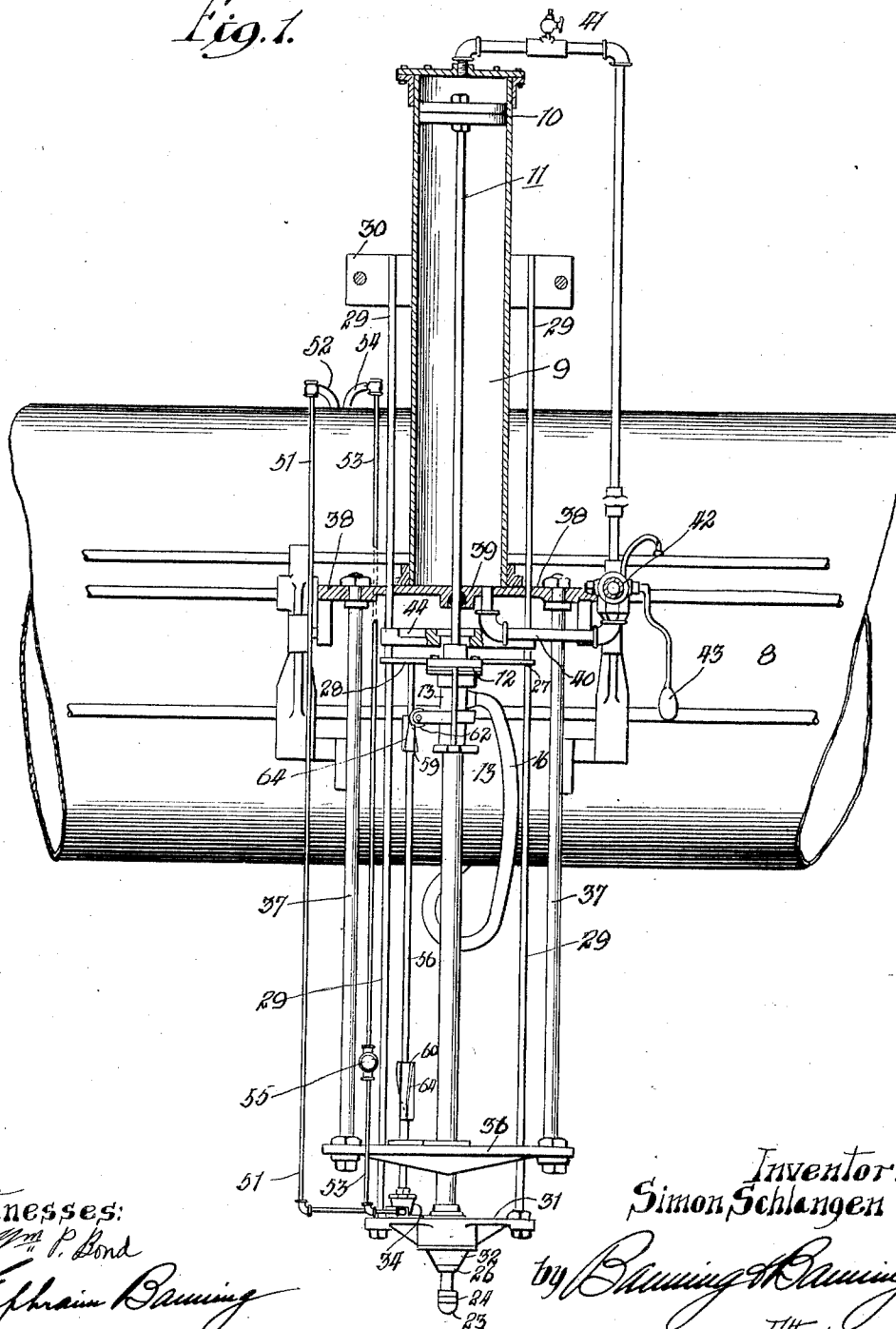
S. SCHLANGEN.
BEER RACKING MACHINE.
APPLICATION FILED OCT. 4, 1909.

1,009,695.

Patented Nov. 21, 1911.

3 SHEETS—SHEET 1.

Fig. 1.



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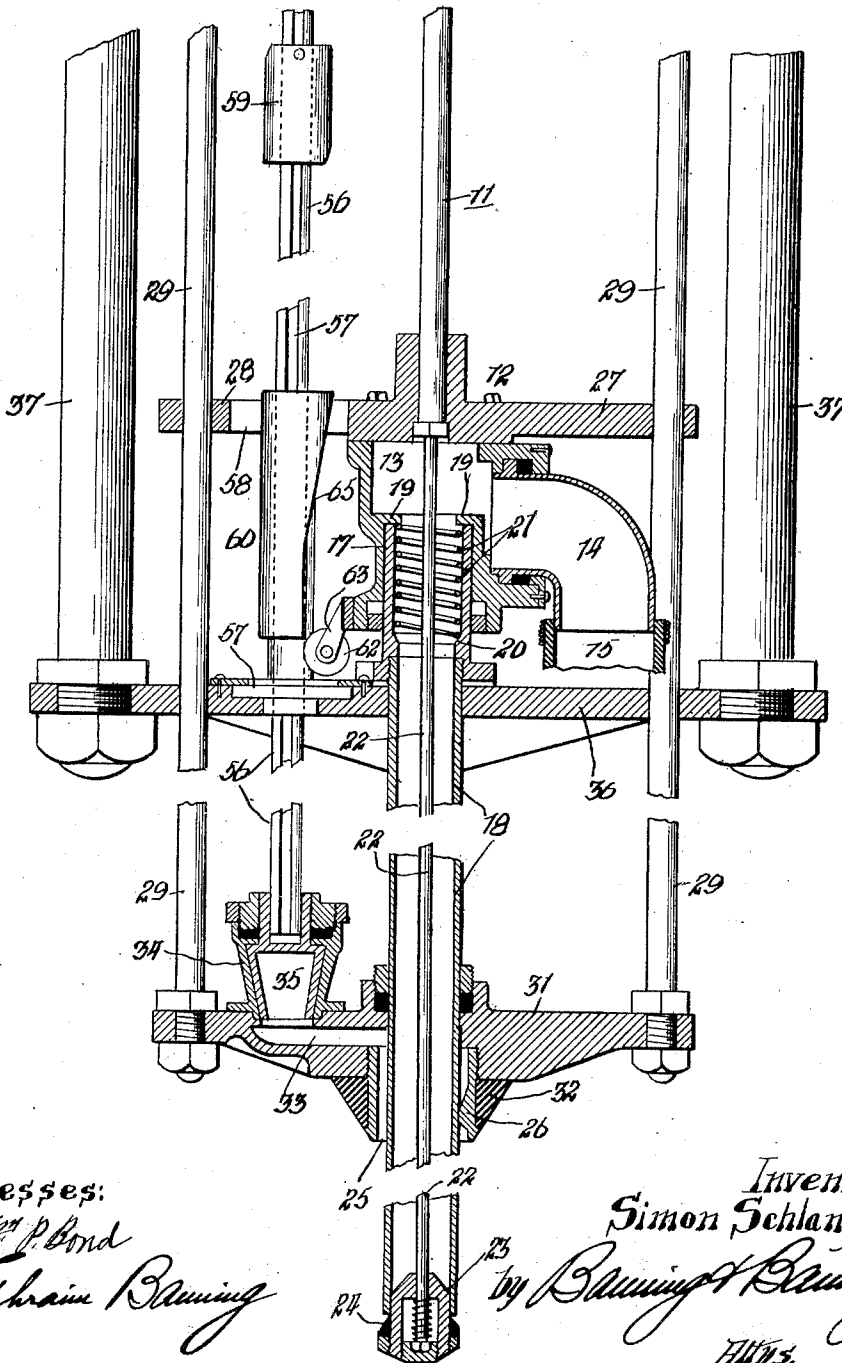
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Fig. 2.



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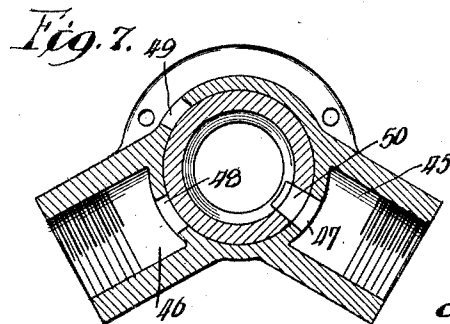
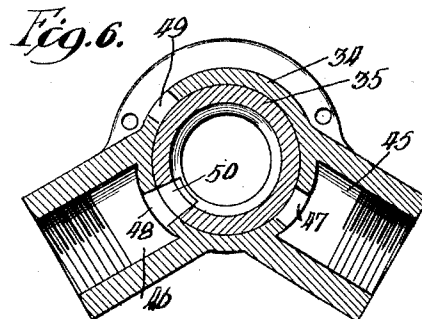
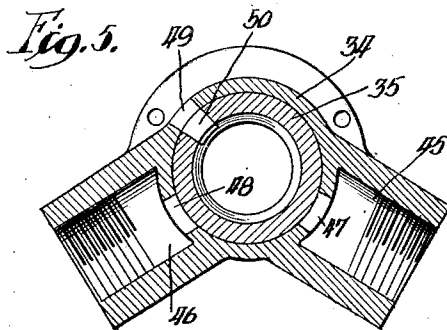
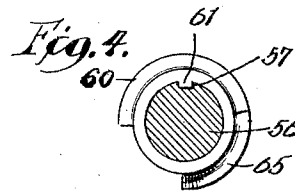
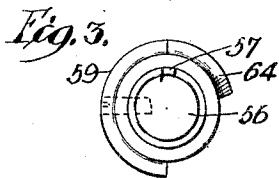
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

SIMON SCHLANGEN, OF CHICAGO, ILLINOIS, ASSIGNOR TO SCHLANGEN RACKER COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

BEER-RACKING MACHINE.

1,009,695.

Specification of Letters Patent.

Patented Nov. 21, 1911.

Application filed October 4, 1909. Serial No. 520,910.

To all whom it may concern:

Be it known that I, SIMON SCHLANGEN, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Beer-Racking Machines, of which the following is a specification.

The present invention relates to racking machines of the general type shown in my Patent, No. 940,366, patented November 16, 1909; and the object of the present invention is to improve the construction of such machine in certain particulars, so that the entire racking operation can be performed without the loss of any beer and under the most advantageous conditions.

The invention relates particularly to the means provided for permitting the withdrawal of the filling tube under conditions of equalized pressure and to the means provided for creating atmospheric pressure within the barrel prior to the breaking of the seal, in order to prevent a violent explosion when the seal is broken.

In certain prior constructions, and in the application above referred to, no provision has been made for equalizing the pressure in the tank and in the barrel during the withdrawal of the filling tube, with the result that, as the tube was withdrawn from the liquid under pressure within the barrel or package, the pressure within the barrel or package would be decreased prior to the breaking of the seal by reason of the in-flow into the space previously occupied by the filling tube. As a result of this decrease in pressure, the beer under pressure would have an opportunity to expand prior to the breaking of the seal, so that when the seal was broken, the beer would flow out in greater or less volume prior to the driving of the bung.

The object of the present invention is to supply pressure to the barrel as the filling tube is withdrawn, so that a full head of pressure will be maintained on the liquid until the proper time for establishing atmospheric conditions, at which time communication will be established with the atmosphere in preparation for the breaking of the seal. By maintaining these conditions, the filling head can be raised and the bung driven before the beer has had an opportunity to expand sufficiently to flow

out of the bung-hole, with the result that a full package of clear beer will be secured, without foaming, and without waste.

A further object of the invention is to provide a single valve so constructed and automatically controlled that it will regulate all of the operations to be performed in the equalizing and venting of pressure without care or attention on the part of the operator, thereby enabling the operator to confine his attention to the manipulation of the operating lever, which controls the flow of pressure to the motor cylinder.

Further objects will appear from a detailed description of the invention, which consists in the features of construction and combination of parts hereinafter described and claimed.

In the drawings, Figure 1 is a front elevation of the mechanism of a racking machine, showing the motor cylinder in section, and showing the tank broken away at the ends; Fig. 2, an enlarged sectional detail of the valve mechanism, filling tube, and adjacent portions of the filling mechanism, showing the operating cams and certain other portions of the structure in elevation; Fig. 3, a detail of the upper or fixed cam; Fig. 4, a detail of the lower or slidable cam; and Figs. 5, 6 and 7, cross sectional views of the equalization valve, showing the valve plug in various positions of adjustment.

The racking mechanism of the present invention is attached to a tank 8, which may be of any suitable length to support the desired number of racking mechanisms as is usual in the art. The racking mechanism embodies a motor cylinder 9, provided with a piston 10, to which is secured a piston rod 11, which latter is secured to a cross head 12, from which depends a casing 13, which receives the inner end of a packed elbow 14, the outer end of which elbow receives a liquor supply hose 16. The casing 13 has slidably mounted therein a sleeve 17, which has screw-threaded thereunto an upper section of a filling tube 18, the lower section of which is of a size and length to enter the barrel, keg, or other package which it is intended to fill. The casing 13 is provided, with a circular flange 19, and the sleeve 17 is provided near its lower end with a shoulder 20, and interposed between the flange 19 and the shoulder 20 is a spring

21, which keeps a constant spring tension downwardly upon the sleeve 17. The piston rod 11 is provided, at its lower end, with a stem 22, which extends through the interior of the filling tube and is provided, at its lower end, with an outlet valve 23, having a sealing ring 24 of suitable size to seal the lower end of the filling tube, and the seal is constantly maintained by the spring 21 holding the tube downward under spring tension until the movement of the filling tube is arrested by the sleeve 17 contacting the cross head 36, after which the continued descent of the piston rod will break the contact of the filling tube with the sealing ring 24, allowing the liquor to flow out.

The cross head is provided with laterally extending arms 27 and 28, which embrace movable guide rods 29, which carry a weight 30 at their upper ends and have their lower ends entered into and rigidly held within a movable cross head 31, from which depends the sealing head 26. The latter is surrounded by a tapered sealing plug 32, which is adapted to be pressed into the bung-hole of the barrel or package when the seal is made. The movable cross head is provided, on its interior, with a chamber 33, which communicates with the annular channel 25, and the cross head has mounted thereon a valve casing 34, which furnishes, on its interior, a tapered chamber, within which is mounted a hollow valve plug 35, the construction of which forms the gist of the present invention. The movable guide rods 29 are themselves entered through and guided by a fixed cross head 36, which is supported from a pair of fixed supporting rods 37, the upper ends of which are entered through lugs or flanges 38, which form part of and outwardly project from a base 39 of the motor cylinder. Obviously, other means for supporting the working parts of the mechanism might be provided.

The raising and lowering of the piston 10 is accomplished by pressure admitted through lower and upper pressure supply pipes 40 and 41 respectively, which are controlled by a suitable valve mechanism 42, operated by means of a main operating lever 43, by which the attendant can regulate the flow of pressure either below or above the piston, as the case may be. In order that the formation and operation of the valve mechanism 34 may be fully understood, a brief description of the method of raising and lowering the filling head and associated parts will now be given.

With the parts in raised position, as shown in Fig. 1, pressure will be admitted through the pipe 41 to the top of the cylinder, thereby forcing down the piston 10 and with it the cross head 12 and the valve casing 13, which carries with it, the filling

tube, by reason of the contact of the circular flange 19 with the sleeve 17, allowing the filling tube to descend into the barrel or package. The movable guide rods 29 are connected by a cross connection 44, which is adapted to rest upon and be held against the cross head 12 by the pressure of the weight 30, save only when the descent of the sealing head has been arrested by contact with the bung-hole of a barrel, after which the cross head 12 will drop away from the cross connection 44. It will be understood that the movable guide rods 29 and the movable cross head 31, together with the valve 34 and parts associated therewith, will all descend until the seal has been made, since these portions of the mechanisms are not positively connected with the piston rod, but only move therewith under the influence of gravity, so long as such movement is unimpeded by the contact of the sealing head with the barrel. After the seal has thus been made, the cross head 12, valve casing 13, and filling tube, will continue to descend until the lower end of the filling tube is in close proximity to the bottom of the barrel, at which point the movement of the filling tube will be arrested by the engagement of the lower end of the upper section 17 of the filling tube with the face of the cross head 36. A slight additional movement of the piston rod and cross head 12 serves to break the connection between the filling tube and the seal 24, opening the valve controlling the out-flow of beer at the lower end of the filling tube, so that the beer can flow down into the barrel.

The construction of the valve 34 will be more readily understood when its function has been fully explained. The valve is intended, on its first movement, to establish communication between the interior of the tank and the barrel or package to be filled; on its second movement, to cut off such communication and open communication between the sight glass and the barrel or package, in order to permit the beer retained in the sight glass after the previous filling operation to flow back into the barrel or package under conditions of equalized pressure; on its third movement, to establish communication between the interior and the package, to permit the in-flow of medium under pressure to compensate for the withdrawal of the filling tube; and on its fourth movement, to establish communication with the atmosphere in order to prevent an explosion when the seal is broken.

In order to perform the various operations above noted, the valve is constructed as shown in Figs. 5, 6 and 7. The valve casing 34 is provided with a pair of nipples 45 and 46, the centers of which are spaced about 120 degrees apart, which nipples communicate with the interior of the valve cas-

ing and with the hollow plug therein through ports 47 and 48 respectively. The casing is further provided with a vent hole 49, diametrically opposite to the port 47. The hollow valve plug is provided, on one side, with a slot or opening 50, adapted to register with any one of the holes or slots in the valve casing previously referred to. The nipple 46 has entered therein the end of an equalization pipe 51, which leads up to and communicates with the top of the tank through a hose 52 or other channel of communication. The nipple 45 has entered therein the end of an overflow pipe 53, which leads up to and communicates with the top of the tank through a hose or other channel of communication 54. The overflow pipe has located therein a sight glass 55, which is adapted to indicate the presence of beer after the package or receptacle has been filled.

With the parts in the position shown in Fig. 5, which is the venting position, the first movement of the plug valve, in a counterclockwise direction, will serve to establish communication between the sealing head and the equalization pipe, which establishes equalized conditions in the barrel, as indicated in Fig. 6. The next movement in the same direction serves to cut off such equalizing communication and open communication with the sight glass, to allow the beer previously trapped in the sight glass to flow back under equalized conditions to the barrel. The next, or return, movement of the valve, in a clockwise direction, will serve to bring the parts again in a position, shown in Fig. 6, to reestablish equalizing conditions; and the next movement, in clockwise direction, will bring the plug to the venting or initial position. Automatic means for effecting these four movements are provided and will now be explained.

The valve plug is provided with an elongated, vertically extending stem 56, having in one side a slot or channel 57. The rod is slidably and rotatably mounted through a bearing ring or collar 57 in the fixed cross head 36, and its upper end registers with a hole 58 in the upper movable cross head 12, which hole affords clearance, allowing the upper movable cross head to descend after the valve stem has reached its lowest position of movement. It will be understood that the valve stem rises and falls with the lower movable cross head, which movement, however, is restricted to the movement necessary to lower the sealing head into sealing position, after which the upper movable cross head will have a very considerable degree of movement as the filling tube is lowered. The valve stem is provided with a fixedly mounted upper cam sleeve 59 and a slidably mounted lower cam sleeve 60, which latter is provided with an inwardly extending spline 61, which engages the groove or

channel 57, whereby the stem and the cam sleeve are held against independent rotary movement, and the stem is allowed to have a vertical movement independently of the cam sleeve, which rests upon the bearing ring 57, through which the valve stem extends. The operating movements are imparted to the upper and lower cam sleeves by means of a roller 62, which is journaled in a bracket 63, which outwardly extends from one side of the valve casing 13, the arrangement being one whereby the vertical movements of the valve sleeve will cause the roller to ride upon the spirally extending cam surfaces 64 and 65 in the lower and upper cam sleeves respectively, thereby imparting the necessary rotary movements to the stem for actuating the valve plug in the manner previously indicated.

When the parts are in raised position, the roller will bear against the upper end of the upper cam sleeve, and during the initial descent of the parts, and prior to the time when the lower movable cross head is arrested by the sealing operation, the roller and cam sleeve will move down in unison. As soon as the seal has been made, however, the continued movements of the roller will initially operate the upper cam sleeve, and thereafter operate the lower cam sleeve immediately before the roller comes to rest. The return movements of the roller will produce similar operations in reverse direction and order of sequence.

The operation of the device will be understood from the foregoing description, from which it will be seen that the operation of the equalizing valve mechanism is entirely automatic and out of the control of the attendant, whose sole duty is to operate the controlling valve in a manner to lower the piston when a barrel or package has been placed in position beneath the filling tube, and to raise the piston after the filling operation is complete and the beer has arisen in the sight glass. All of the equalizing operations will be performed automatically between these two controlling operations, so that no beer will be admitted to the package, save under conditions of equalized pressure, which is especially important as regards the admission of the previously trapped beer in the sight glass. In some prior constructions this beer was blown back out of the sight glass before equalized pressure conditions had been established, which caused foaming and loss of beer as a result. The arrangement is one which maintains equalized conditions until immediately before the breaking of the seal, at which time atmospheric conditions are established and the excess of pressure vented in an easy and natural manner, and without any explosion due to the breaking of a seal. As a result of the present arrangement, the

sealing head can be raised and swung out of the way and the bung driven before the beer has expanded sufficiently to flow out and waste, so that there will be no foaming from the bung-hole and no blowing or other disturbances within the barrel or package, tending to produce foam during the filling operation.

The valve arrangement for controlling the discharge from the filling tube is such that the filling tube when raised will be full of beer, so that the next opening of the valve will release the beer near the bottom of the barrel or package without any falling of beer, which would tend to cause foaming.

The construction of the entire device is such that the racking operation can be performed by unskilled persons without the loss of any beer and without the disagreeable and unsanitary conditions which are frequently occasioned in breweries when beer is wasted during the racking operation.

In my Patent, No. 940,366, the packing ring 24 is described as also contacting and sealing the opening 25 in the sealing head. In the present construction I do not desire this to be the case, since communication must be established between the valve and the interior of the package even after the filling tube has risen. I, therefore, intend in the present construction to time the movement of the filling tube so that it will stop before the packing ring 24 has traveled high enough to contact the opening 25.

I claim:

1. In a racking machine, a filling tube, means for raising and lowering the filling tube, a slidable cross head, a casing secured to the cross head into which the filling tube is entered, a valve on the end of the filling tube, a tension member within the casing acting against the filling tube to maintain a continual downward pressure on the valve, whereby a seal is made at the end of the filling tube to prevent the escape of liquid therefrom during the raising and lowering

of said filling tube, and a pipe leading from the source of liquid supply to said casing, substantially as described.

2. In a racking machine, a filling tube, means for raising and lowering the filling tube, a valve on the end of the filling tube, a slidable cross head, a casing secured to the cross head into which the filling tube is entered, a flange in the interior of the casing projecting into the chamber therein, a shoulder on the interior of the filling tube, a spring interposed between said flange and shoulder, said spring acting against the filling tube to maintain a continual downward pressure on the valve, whereby a seal is made at the end of the filling tube to prevent the escape of liquid therefrom during the raising and lowering of said filling tube, and a pipe leading from the source of said liquid supply to said casing, substantially as described.

3. In a racking machine, in combination with filling mechanism, valve mechanism for controlling the passage of air and overflow liquid into the package, comprising a fixed valve casing having three ports therein, a rotatable valve plug having a single port, means operatively connected for oscillating said valve plug, whereby its passage registers once at each operation with the outer ports of the casing and twice with the middle port, whereby the pressure between the package and tank is twice equalized, communication established once between the receptacle for overflow liquid and the package, and communication established once between the outside air and the interior of the package, said latter communication taking place prior to the breaking of the seal, the valve plug and casing remaining in fixed relation to the package at all times, substantially as described.

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Witnesses:

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