

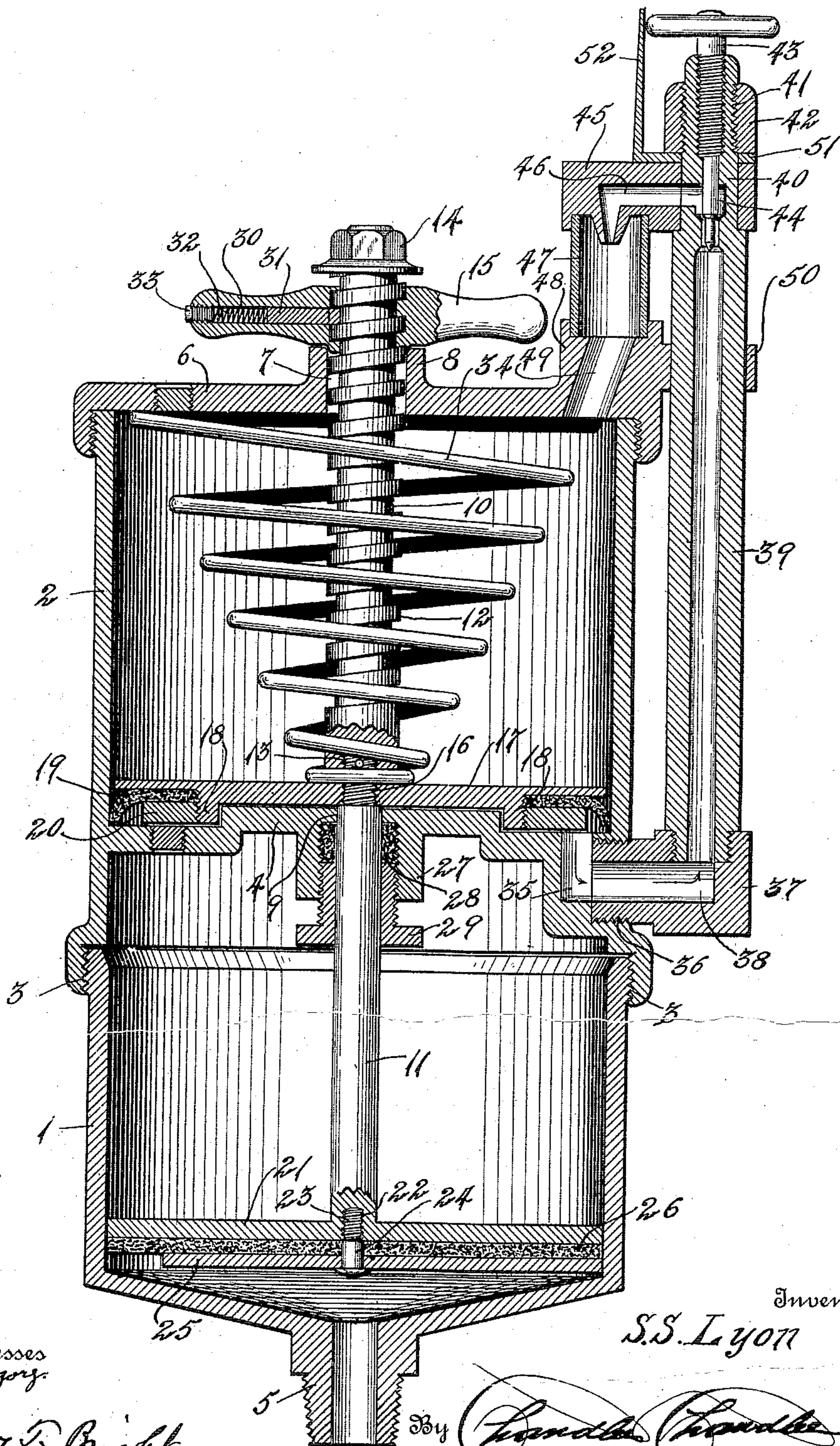
S. S. LYON.

LUBRICATOR.

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983,071.

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To all whom it may concern:

Be it known that I, SAMUEL S. LYON, a citizen of the United States, residing at Lake Charles, in the parish of Calcasieu, State of Louisiana, have invented certain new and useful Improvements in Lubricators; 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.

This invention relates to lubricators and particularly that type wherein a follower is employed to eject the lubricant therefrom.

The invention is particularly designed to feed a lubricant having such a consistency that it will not readily flow; to control the rate of feed of such lubricant and to provide means whereby the rate of feed will always be known.

To this end the invention comprises two superimposed cylinders having the same diameter, one of which constitutes the gage cylinder and the other the oil feed cylinder; said cylinders having a piston rod extending longitudinally therethrough and a pair of pistons or followers mounted on said piston rod, one of which is contained within the gage cylinder and the other in the oil feed cylinder; the position of the followers on said piston rod being such that during their reciprocation in the operation of feeding the lubricant they will constantly occupy substantially corresponding positions in their respective cylinders.

The invention further consists in providing a by-pass communicating at its terminals with the top and bottom respectively of the gage cylinder, and in the provision of a valve in said by-pass for opening and closing same.

In describing the invention in detail reference will be had to the accompanying drawing which represents a vertical longitudinal section of a lubricator constructed in accordance with the invention.

Referring to the drawings, the lubricator is shown as comprising an oil feed cylinder 1 and a gage cylinder 2 disposed in superimposed relation and detachably connected together by a threaded connection as at 3. Disposed transversely across the cylinder 2 a slight distance above the threaded connection 3 is a partition 4 of staggered formation which constitutes in common the base

of the gage cylinder and the top of the oil feed cylinder. The bottom of the oil feed cylinder 1 is provided centrally with an externally threaded discharge mouth 5, whereby the lubricator as a whole may be attached to any desired piece of machinery. The top of the gage cylinder 2 is closed through the medium of a cap 6 adapted for detachable threaded engagement therewith; said cap being provided centrally with an aperture 7 surrounded by an upwardly extending flange 8. The partition 4 is likewise provided with a central aperture 9 disposed in alinement with the aperture 7 but of considerably less diameter than the latter. Adapted for a longitudinal movement in the cylinders 1 and 2 with the walls of the apertures 7 and 9 as bearings is a piston rod formed of an upper section 10 and a lower section 11. Said upper section 10 is of a diameter considerably in excess of the section 11 and has its outer face threaded as at 12 while its lower end is provided with a longitudinally disposed threaded recess 13 and its upper end with a reduced threaded portion for the reception of a nut 14, which serves to prevent the release of a handle 15 which is screwed on the threads 12 at the upper end of the section 10. The upper end of the section 11 is provided with a reduced threaded portion 16 adapted to screw in the recess 13 in the lower end of the section 10. A follower plate 17 is provided with a central aperture through which the threaded end 16 of the section 11 projects so that when the last named section is assembled with the section 10 said follower plate will be bound between said sections so as to move in unison therewith when the same are reciprocated. The follower 17 which it will be noted is disposed above the partition 4, has formed on its under face a centrally disposed externally threaded cylindrical lug 18 around which is fitted a cupped leather washer 19 which is held in place against the follower plate 17 by means of an internally threaded binding ring 20 which screws on the lug 18.

Formed integrally on the lower end of the section 11 and disposed in the cylinder 1 is a follower plate 21 and passing through said plate centrally and into the section 11 is a threaded recess 22 which is adapted to receive the threaded shank 23 of a binding screw 24, which latter also passes through

an aperture in the binding plate 25 so that a leather washer 26 may be secured between the plates 21 and 25 to force said washer outwardly and produce a tight joint between the same and the inner wall of the cylinder 1 so that during the feeding of the grease from the cylinder 1 none of the same will be allowed to pass from beneath the plates 21 and 25 to the upper portion of the cylinder.

The under face of the partition 4 is provided centrally with a tubular projection 27 surrounding the section 11 and threaded internally. Disposed within the projection 27 around the section 11 is a raw hide packing 28 which is adapted to be compressed by a follower 29 having a threaded engagement with the internal threads of the projection 27 and surrounding the section 11. The construction just described serves as a stuffing box through the instrumentality of which the escape of any product from the cylinder 1 to the cylinder 2 or vice versa, by way of the aperture 9 is prevented.

The handle 15 has formed in one wing thereof a channel 30 which opens at one end into the aperture through which the section 10 projects and at its other end through the exterior surface of said wing. Mounted in the channel 30 for longitudinal movement is a friction pin 31, the inner end of which is adapted to bear against and frictionally grip the threaded exterior surface of the section 10. Said friction pin 31 is normally forced into engagement with the section 10 by a spring 32 also disposed in the channel 30 and having one end bearing against the outer end of the pin 31 and the other end against the inner end of a screw plug 33 mounted in the outermost portion of the channel 30. The function of the structure just described is to prevent rotation of the handle 15 upon the section 10 as the result of jarring when the lubricator is mounted upon a piece of machinery; it being evident that such rotation of the handle would alter its position with respect to the longitudinal axis of the section 10 and thereby vary the extent of movement of the piston rod formed by the sections 10 and 11 in the operation of feeding the contents of the lubricator. The downward movement of the piston rod and the follower plates carried thereby is automatically effected by a conical coil spring 34 which encircles the section 10 and has one end disposed against the upper face of the plate 17 and the other end against the cap 6.

In order to convey the liquid contained in cylinder 2 from the under side of the plate 17 to the upper side thereof during the operation of the lubricator the partition 4 is stepped at one side so as to form a channel 35 which communicates with a threaded opening 36 in the wall of the cylinder. This

opening 36 has mounted therein a plug 37 provided with a bore 38; the outer end of said bore being enlarged and threaded to form a seat for the lower threaded end of a vertically disposed pipe 39, the bore of which communicates with the bore 38 of the plug 37. The upper end of the pipe 39 is provided with a reduced portion 40 having its outer extremity threaded externally as at 41 upon which is adapted to be screwed a nut 42 for a purpose to be presently described. The bore of said pipe 39 is also threaded at its upper end for engagement with the threaded portion of the shank of a needle valve 43, the lower extremity of which, when said valve is fully screwed into the bore closes communication between said bore and a laterally extending duct 44 formed in the pipe 39. A bracket 45 is interlockingly mounted on the reduced upper end of the pipe 39 by means of the nut 42 and has formed therein a bore 46, the horizontal portion of which communicates with the duct 44 and the vertical portion of which is tapered downwardly so as to produce a nozzle mouth of comparatively small cross section. A circular recess is cut in the under face of the bracket 45 around the vertically disposed tapering nozzle portion to form a seat for the upper end of a tubular glass sight feed 47; the lower end of which is seated in a circular recess formed in the top face of the upward extension 48 of the cap 6. Communication between the cylinder 2 and the bore of the sight feed 47 is had by means of a channel 49 cut through the extension 48 and the cap 6. The extension 48 is provided with a laterally extending ring portion 50 which is adapted to surround the pipe 39 and assist in supporting the same in its vertical position.

A friction spring comprising a base member 51 and a vertically disposed engaging arm 52 has its base member provided with an aperture through which the reduced upper end of the pipe 39 projects so that when said friction spring is assembled upon the reduced upper end of the pipe 39 by means of the nut 42 its base member will be disposed upon the upper face of the bracket 45 and its engaging arm in contact with the periphery of the operating hand wheel of the needle valve 43; such engagement serving to prevent the rotation of the valve 43 during the operation of the lubricator when mounted upon a machine.

The operation of the lubricator is as follows: Assuming the parts to be in the position shown in the drawing and the gage cylinder 2 filled with a liquid of such consistency that it will readily flow, the handle 15 is grasped, the valve 43 having been previously closed, and the piston rod and follower plates carried thereby drawn up-

wardly against the influence of the spring 34. This upward movement of the follower plate 17 will cause the liquid contained in the cylinder 2 to press upon the upper face of the cupped washer 19 and move the outer edge of said washer away from the inner wall of the cylinder so that the liquid can pass to the under side of the follower plate 17. When the follower plate 17 has been moved to the top of cylinder 2 and the liquid in said cylinder disposed beneath said plate, the handle 15 is released. The spring 34 then tends to move the follower plate and piston downwardly, but as the outer edge of the cupped washer 19 is disposed downwardly the upward pressure of the liquid beneath the plate 17 will cause said washer to be forced outwardly against the inner wall of the cylinder, thus preventing the passage of the liquid to above the plate 17 and substantially locking the follower plate against movement under the influence of the spring so long as the valve 43 closes the bore of pipe 39. When the lubricator is in this state the cylinder 1 is detached and filled with the usual lubricating grease and then again attached to the cylinder 2. The lubricator is then attached to the bearing of a desired machine and the operation thereof controlled through manipulation of the valve 43; said valve controlling the passage of the liquid from beneath the follower plate 17 to above said follower plate by way of pipe 39 and sight feed 47. As the follower plates in cylinders 1 and 2 have the same movement it will be apparent that the product contained in cylinder 1 will be fed at exactly the same rate as the liquid is forced from the under side of the follower plate 17 to the upper side thereof by way of pipe 39 and the passage of the liquid through said pipe is effectually controlled by the valve 43 and observed through the instrumentality of the sight feed 47 so that the rate of feed of the product from cylinder 1 will always be known to the operator.

It will be noted that after the lubricator has become exhausted the piston or followers may be moved to the opposite end of the chamber in which they are disposed by screwing the handle 15 on the threads 12 against the flange 8. This operation will, as is apparent, move the piston or followers as is desired. During this operation the liquid disposed above the piston or followers 17 will pass by the washer 19 to below said piston or follower. When this is done the handle 15 is then moved to the other end of the section 10 and the lubricator is again ready for use.

What is claimed is:—

1. A lubricator comprising an oil-feed cylinder and a liquid-gage cylinder, a follower mounted in each cylinder, means for actuating said followers in unison; and

means for conveying the liquid in the gage cylinder from one side of the follower therein to the other side during the descent thereof.

2. A lubricator comprising an oil-feed cylinder and a liquid-gage cylinder, a follower mounted in each cylinder, means for actuating said followers in unison and a pipe line communicating with the interior of said gage cylinder at the top and bottom thereof for conveying the liquid from one side of the follower thereof to the other side during the descent thereof.

3. A lubricator comprising an oil-feed cylinder and a liquid-gage cylinder, a follower mounted in each cylinder, means for actuating said followers in unison, a pipe line communicating with the interior of said gage cylinder at the top and bottom thereof for conveying the liquid in the gage cylinder from one side of the follower therein to the other side during the descent thereof; and means for controlling the rapidity of flow of said liquid through said pipe line.

4. A lubricator comprising an oil-feed cylinder and a liquid gage cylinder, a follower mounted in each cylinder, means for actuating said followers in unison, a pipe line communicating with the interior of said gage cylinder at the top and bottom thereof for conveying the liquid in the gage cylinder from one side of the follower thereof to the other side during the descent thereof; and a sight feed in said pipe line.

5. A lubricator comprising an oil feed cylinder and a liquid gage cylinder, a follower mounted in each cylinder, means for actuating said followers in unison, a pipe line communicating with the interior of said gage cylinder at the top and bottom thereof for conveying the liquid in the gage cylinder from one side of the follower therein to the other side during the descent thereof, a sight feed in said pipe line; and means for controlling the rapidity of flow of said liquid through said pipe line.

6. A lubricator comprising an oil feed cylinder and a liquid gage cylinder, having their top and bottom in common respectively, a piston extending through said cylinders and mounted for reciprocation therein, a follower mounted on said piston for movement in the oil feed cylinder, a follower mounted on said piston for movement in the gage cylinder, means constantly tending to move said piston and follower downwardly, a pipe line communicating with the interior of said cylinders at the top and bottom thereof for conveying the liquid therein from one side of the follower to the other during the descent thereof, and means for controlling the rapidity of flow of said liquid through said pipe line, whereby the rapidity of descent of said follower is controlled.

7. A lubricator comprising an oil feed cylinder and a liquid gage cylinder, a follower mounted in each cylinder, means for actuating said followers in unison, a pipe line communicating with the interior of said gage cylinder at the top and bottom thereof for conveying the liquid in said cylinder from one side of the follower to the other side during the descent thereof; said gage cylinder follower including a cupped washer adapted to permit the passage of the liquid from the top of said follower to the bottom thereof during the ascent of the follower.
8. A lubricator comprising an oil feed cylinder and a liquid gage cylinder, a piston mounted for reciprocation in said cylinders, a follower mounted on said piston for reciprocation in the liquid gage cylinder, a follower mounted on said piston for recip-

rocation in the oil feed cylinder, a spring interposed between the top of the follower in the liquid gage cylinder and the inner face of the top of the liquid gage cylinder for forcing said piston and followers downwardly, and a pipe line communicating with said gage cylinder at the top and bottom thereof for conveying the liquid in the gage cylinder from one side of the follower therein to the other side during the ascent thereof, a sight feed in said pipe line, and means for controlling the rapidity of flow of said liquid through said pipe line.

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

SAMUEL S. LYON.

Witnesses:

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