W. RORRISON.

LIQUID SAMPLER.

APPLICATION FILED MAR. 7, 1914.

1,166,717.

Patented Jan. 4, 1916.

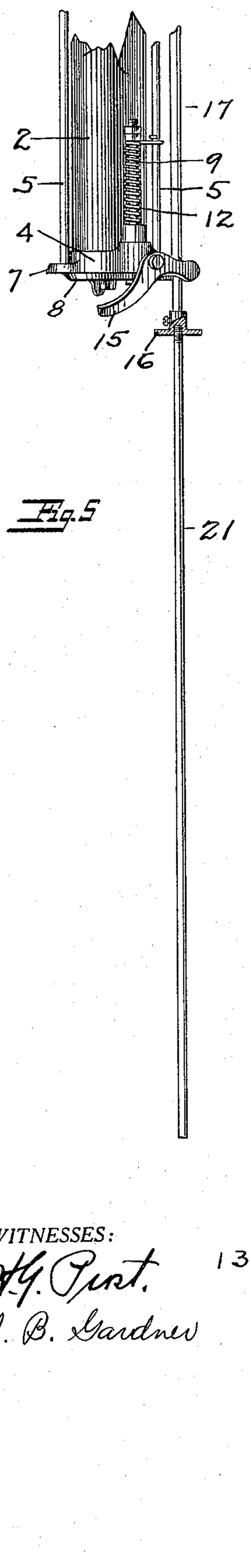

Fig. 5

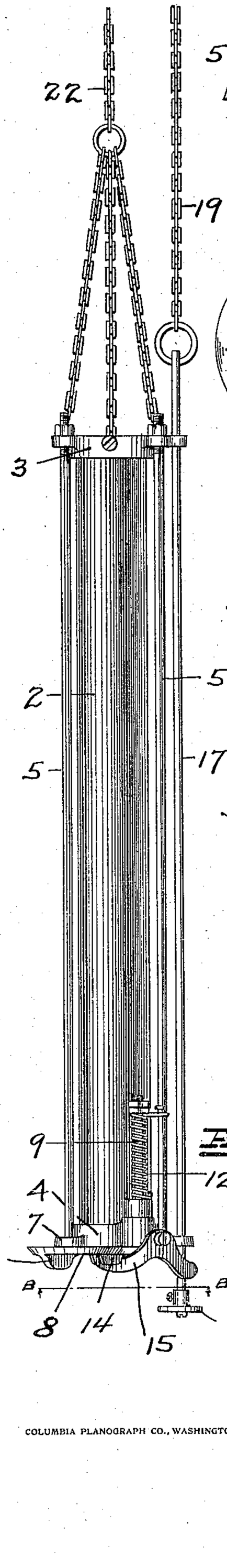

Fig. 1

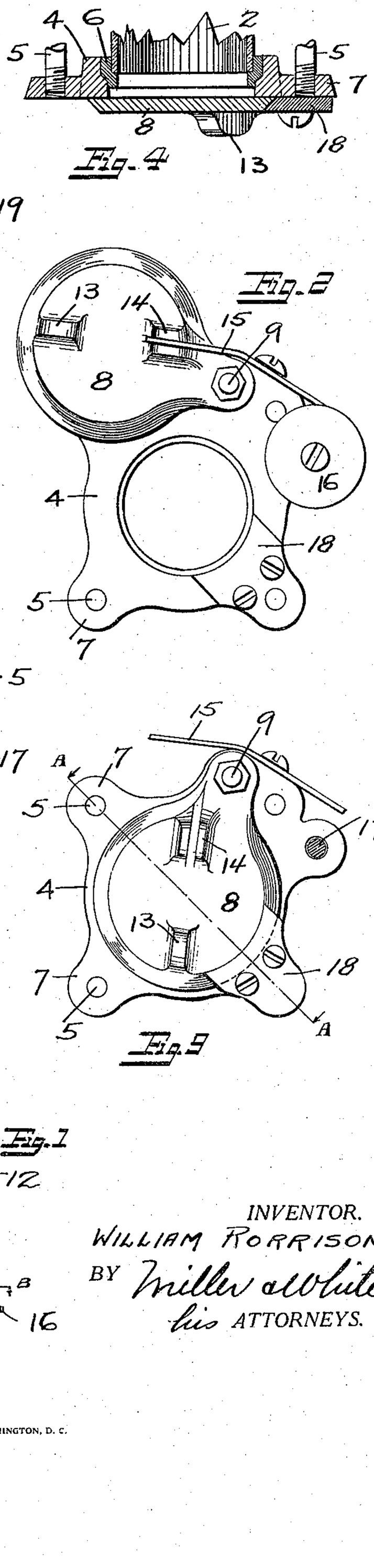

Fig. 4

Fig. 2

Fig. 9

WITNESSES:

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LIQUID-SAMPLER.

1,166,717. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed March 7, 1914. Serial No. 823,150.

To all whom it may concern:

Be it known that I, WILLIAM RORRISON, a citizen of the United States, and a resident of Los Angeles, county of Los Angeles, State of California, have invented certain new and useful Improvements in Liquid-Samplers, of which the following is a specification.

The invention relates to devices which are employed for the purpose of taking samples of liquid from tank cars, storage tanks, or other containers at points below the surface of the liquid and preferably at the bottom of the tank or container.

The object of the invention is to provide a device which will take a correct sample of the liquid from the bottom of the container.

Another object of the invention is to provide a device which will take a correct sample of the liquid at any depth of the liquid.

Another object of the invention is to provide a device in which the sample may be gaged without the necessity of pouring the liquid into another vessel.

The invention possesses other advantageous features, which, with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in the drawings accompanying and forming part of the present specification. The novelty of the invention will be included in the claims succeeding said description. From this it will be apparent that I do not limit myself to the showing made by said drawings and description, as I may adopt many variations within the scope of my invention as set forth in said claims.

Referring to said drawings: Figure 1 is an elevation of the device, showing the valve open; the chains being broken away to reduce the size of the figure. Fig. 2 is a view of the bottom of the device from below, the valve being in the open position. Fig. 3 is a view taken on the line B—B Fig. 1, with the valve in the closed position. Fig. 4 is a vertical section through the bottom of the device taken on the line A—A Fig. 3. Fig. 5 is an elevation of the lower part of the device showing one form of the means employed for operating the valve at points above the bottom of the container.

The device is used for the purpose of taking samples of liquid from containers below the level of the liquid therein, and is particularly adapted for sampling oil in tank cars and storage tanks, although it may be used for sampling any liquid or substance which will flow. Tanks of oil usually contain an amount of water and sludge which settles to the bottom of the tank, and by means of this device the exact amount of the foreign matter in the tank may be readily determined. The device is so constructed that it may be lowered into very close proximity to the bottom of the container so that a correct sample of the material at the bottom of the tank may be obtained, or the device may be set so that it will take a sample at any desired distance from the bottom.

The device consists of an open ended cylinder 2 of glass which will withstand hot liquids, which is provided at the top and bottom with metal ends 3—4 which are held together by metallic rods 5. Packing or cushion rings 6 are arranged between the ends of the cylinder and the metal ends to prevent a shattering of the glass. Secured to the upper end 3 is a chain 22 or other flexible structure, by which the device is lowered into and withdrawn from the liquid, the chain being of sufficient length to allow the device to be lowered to the bottom of the container.

The metallic ends 3—4 are substantially ring-shaped with the exception of the ears 7 through which the rods 5 pass and are provided with openings concentric with and substantially of the same diameter as the cylinder, to permit the liquid to enter and to be discharged from the cylinder. The lower end 4 is provided with a transversely movable valve 8 which controls the opening at the bottom of the cylinder. The valve is secured to a rod 9 rotatably mounted in and extending upward through an ear in the lower end 4. The rod 9 is arranged parallel to the axis of the cylinder, so that the valve moves transversely of the cylinder to open and close the lower end there of. Surrounding the rod 9 is a spring 12, connected at one end to the rod 9 and at the other end to one of the rods 5, which operates to move the valve to the closed position or hold it in such position. The valve is provided on its under side with an ear 13 by which it may be moved to the open position, and with a slotted ear 14 which is adapted to be engaged, when the valve is in the open position, by

a trip lever 15, which holds the valve in the open position. The trip lever is fulcrumed on the lower end 4 and the end thereof which does not engage the valve lies in the path of movement of the collar 16 secured to the vertically movable rod 17 which is arranged in ears upon the upper and lower ends 3—4. Secured to the under side of the lower end 4 is a stop 18, beveled in accordance with the bevel on the valve, which stops the movement of the valve at the proper closed position.

When it is desired to obtain a sample of the liquid at the bottom of a container, the valve is set in the open position and the device lowered into the liquid. When the lower end of the rod 17 contacts with the bottom of the container, it remains stationary while the device moves downward, and the collar 16 coming into contact with the trip lever 15, releases the valve. The device is then drawn out of the liquid and the contents of the cylinder may be viewed. In sampling oil, the cylinder will show a clearly defined line between the water, sludge and oil, so that by reference to a chart, the amount of water and sludge in the container may be directly determined. By arranging the valve to swing transversely, the cylinder may be lowered into close proximity to the bottom of the container before the valve is tripped, so that a sample of the liquid at the bottom of the container may be obtained.

Attached to the upper end of the rod 17 is a chain 19 by means of which the valve may be tripped at any desired depth to obtain a sample of the liquid at that depth. When it is desired to obtain a sample at a given distance from the bottom of the container, an extension rod 21 of the desired length is attached to the rod 17, preferably by screwing into the collar 16, and when this extension rod contacts with the bottom of the container, the valve is tripped. When the device is to be used exclusively for taking samples from a point above the bottom of the container, the rod 17 may be made so that it extends below the collar the proper distance to trip the valve at the desired distance above the bottom.

I claim:

1. In an apparatus of the character described, a glass cylinder, metal ends arranged at the top and bottom of said cylinder, tie rods extending through and connecting said ends, supporting means attached to the upper end, a transversely movable valve bearing a slotted lug arranged on the lower end of said cylinder, a lever adapted to engage said slotted lug when said valve is in the open position, a vertically movable rod carried in said metal ends and a collar on said rod adapted to engage said lever and move it out of said slotted lug.

2. In an apparatus of the character described, a glass cylinder, a transversely movable valve pivoted to said lower end, a slotted ear on said valve, a lever pivoted to the lower end arranged to seat in said slot to hold the valve in the open position, a vertically movable rod and a collar on said rod adapted to engage said lever and release the valve.

3. In an apparatus of the character described adapted to take liquid from containers, a transparent cylinder, metal ends on said cylinder, a valve swinging transversely upon a stem, said valve bearing a slotted lug and adapted to be pressed into its closed position by a spring disposed on the said stem, a lever adapted to engage said slotted lug when said valve is in its open position, an actuating rod slidable in said metal ends and adapted to contact with the bottom of the container, and a collar on said rod adapted to engage and trip said lever to release said valve.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 27th day of February, 1914.

WILLIAM RORRISON.

In presence of—
OSCAR C. BEACH,
J. P. A. CONCANNON.