

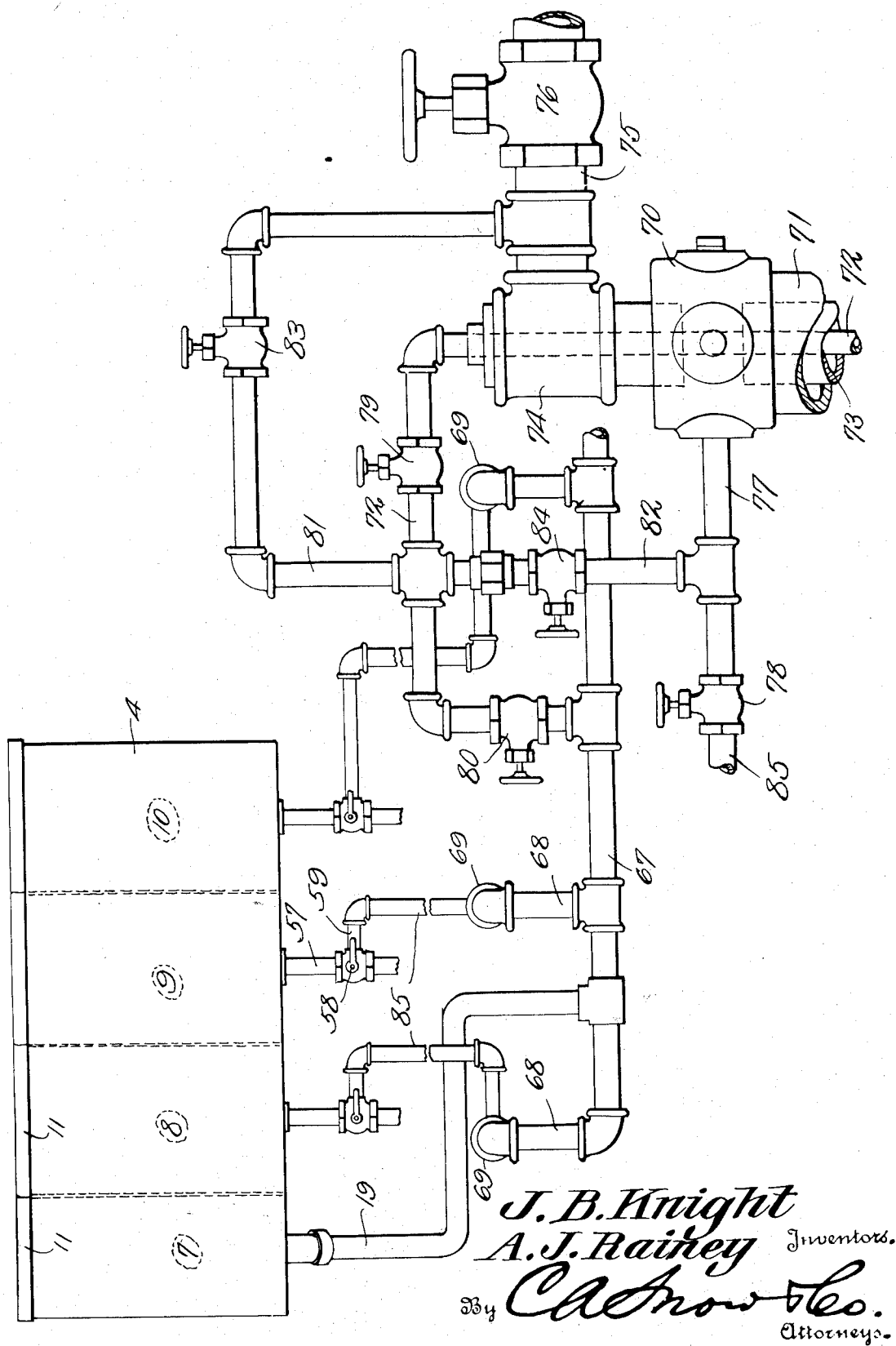
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TREATMENT APPARATUS

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TREATMENT APPARATUS

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1 Claim. (Cl. 166—1)

This invention relates to apparatus for use in the treatment of oil, gas, water, and other fluids whether in wells or open streams. The invention is more particularly an improvement on the apparatus for conserving gas, oil, and other fluids, disclosed in Patent 1,472,009, issued to James B. Knight, on October 23, 1923.

One of the objects is to provide apparatus which is particularly useful where it is desired to inject substances into wells, pipe lines, etc., for the purpose of sealing cracks, fissures, etc. present therein.

A still further object is to provide apparatus which can be used for directing treating substances into wells and the like for the purpose of cleaning them from undesirable deposits.

Another object is to provide apparatus having a novel arrangement of valves and pipe connections by means of which the direction of flow of fluids through the system can be reversed at will, it being possible, during a continuous operation of the apparatus, to change the volume, direction and velocity of the flow of fluids, change the character of the fluids used, vary the temperature of the fluids, and perform other operations desirable in carrying out the treatment of fluids and of the wells, etc., from which they are being drawn. A further object is to provide a novel arrangement of pipes and valves whereby treatment material can be directed into the well and caused to flow in either of two directions at will, the operation being effected without admission of air to the circuit.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the arrangement and combination of parts and in the details of constructions hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed may be made within the scope of what is claimed without departing from the spirit of the invention.

The accompanying drawing is a view, in diagram, showing the pipe connections between the treatment apparatus and a casing head such as used in a compound open circuit as illustrated in the patent hereinbefore mentioned.

Referring to the figure by characters of reference, 4 is a housing which can be divided into non-communicating compartments 7, 8, 9, and 10, respectively. Each compartment has a cover 11 for sealing the top thereof.

Located beneath compartment 7 is a delivery pipe 19 and arranged beneath each of the com-

partments 8, 9, and 10, is a pipe 57 extending to the bottom of the compartment thereover. This pipe 57 is provided with a valve 58 which, when turned in one direction, will establish communication with the bottom of the compartment thereabove and, when moved to another position, will close communication. The valve can also be turned to a third position for the purpose of establishing communication between the bottom of the compartment thereabove and an outlet nipple 59.

The treatment apparatus has been shown in the diagram connected to a compound open circuit system such as disclosed, for example, in the patent heretofore mentioned. In this drawing a manifold has been indicated at 67, the same being connected by branch pipes 68 to gas wells or the like such as indicated at 69 where fluid is to be drawn out or where treatment is to be effected.

At 70 there has been shown the casing head of a well to be treated, the casing 71 of which contains an injector pipe 72 about which is arranged a tubular shell 73. The well tubing is located around the shell and within the casing and the preferred construction of this part of the invention corresponds with that disclosed in the patent to Knight heretofore described. A T-fitting is connected to the casing head 70 as shown at 74 and has an outflow pipe 75 provided with a valve 76. A pipe 77 opens into the casing head 70 and has a valve 78. The injector pipe 72 communicates with the manifold 67 and has spaced valves 79 and 80. Between the valves are branch pipes 81 and 82. The pipe 81 opens into the outflow pipe 75 between the T fitting 74 and the valve 76 and has a valve 83 for controlling the flow of fluid. Pipe 82 connects the pipe 77 to the injector pipe 72 at a point between the valves 79 and 80 and this pipe 82 also has a controlling valve 84.

The direction of flow through each well of fluid with treatment material, is controlled by the valves 79, 83, and 84. By means thereof the flow into the well can be quickly reversed and at the same time the admission of air with its deteriorating effects is prevented.

Under certain conditions it is desirable to provide pipe connections between the valves 58 and the casing heads 69. Such connections have been indicated at 85. Pipe 77 can constitute an extension of one of the pipes 85. Obviously all of the pipes 85 can be connected to one compartment 8, 9, or 10, or they can be connected to different compartments, this depending upon the nature

of the treatments to which the well or the like is to be subjected.

It is intended to place in the compartments 7, 8, 9, and 10, materials to be used for treating gas, oil, or other fluids, in wells, pipe lines, etc. It is intended to place finely comminuted bulk material in the compartment 7 while the remaining compartments can contain fluids of different viscosities and having different properties as sealing, and treating substances.

By closing communication between the several compartments and the wells of the system, the compound open circuit system can be operated as has been described in the patent before mentioned. In other words, it is possible to convey gas or other fluid under pressure from active wells or the like to inactive or only partly active wells where the pressure can be used to operate the wells without the use of pressure which would otherwise have to be provided for that purpose by auxiliary means.

Should it be desired to use the preparation contained in any one of the compartments, for the purpose of treating the contents of a well or seal-

ing fissures therein, it merely becomes necessary to actuate the proper valve 58 to cause a portion of the material to flow from the selected compartment to the well to be treated.

What is claimed is:

A compound open circuit system including a manifold for distributing fluid under pressure, a well casing, a casing head, a shell suspended in the casing and head, a fluid discharge line in communication with the upper end of the shell, an injector pipe extending from the manifold downwardly within the shell for conducting gas under pressure to the casing, spaced valves in said pipe, branch pipes extending from the injector pipe between said valves and opening into the outflow pipe and the casing head respectively, a valve in each branch pipe, and a valved inlet pipe opening into the manifold, the valves in said injector pipe and its branch pipes constituting means for quickly changing the direction, volume and velocity of flow to the casing from the manifold.

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