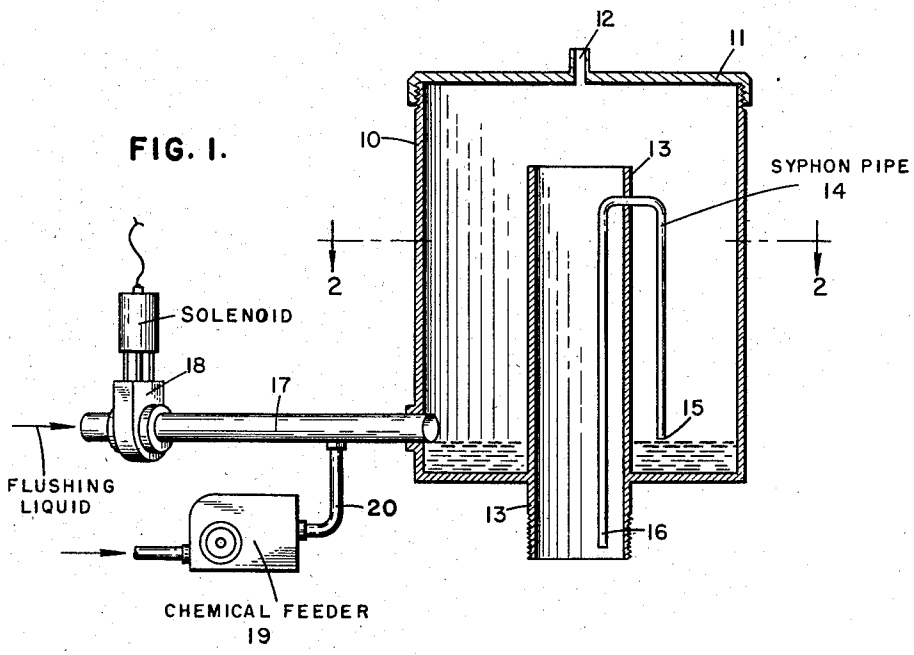
May 5, 1959 J. A. CALDWELL ET AL 2,884,942

APPARATUS FOR USE IN CORROSION INHIBITOR INJECTION

Filed May 6, 1957

FIG. 1.



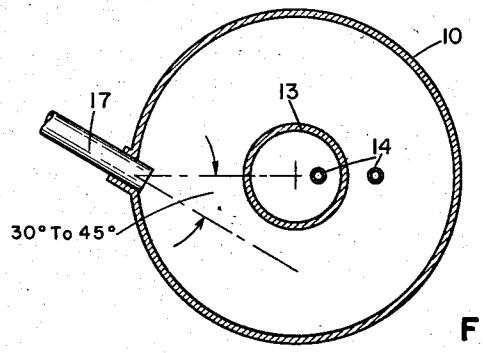


FIG. 2.

INVENTORS.
JOSEPH A. CALDWELL,
CLARENCE NORMAN,
BY
John A. Schneider
ATTORNEY.

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APPARATUS FOR USE IN CORROSION INHIBITOR INJECTION

Joseph A. Caldwell, Houston, and Clarence Norman, Bellaire, Tex., assignors, by mesne assignments, to Jersey Production Research Company, Tulsa, Okla., a corporation of Delaware

Application May 6, 1957, Serial No. 657,234

3 Claims. (Cl. 137—132)

This invention concerns a device for automatically injecting chemical additives into industrial equipment such as oil wells, gas wells, water wells, pipe lines, gasoline plant flow lines and refinery flow lines. The additives may include corrosion inhibitors, emulsion breakers, defoamers, lubricants, and other industrial chemicals.

The invention, in brief, comprises a cylindrical vessel; an outlet conduit extending through the bottom of the vessel, a syphon having the shorter end positioned within the vessel and the longer end positioned in the outlet conduit, an inlet conduit extending through the sidewall of the vessel arranged at an angle of about 30 to 45 degrees to the radius of the tank at the point of entrance of the inlet conduit, a flushing liquid source connected to the inlet conduit, means arranged on the inlet conduit adapted to intermittently supply flushing liquid to the inlet conduit and means adapted to continuously supply liquid additive to the inlet conduit.

One object of this invention is to provide apparatus for injecting liquid additive automatically in batches into desired equipment.

Another object of this invention is to provide thorough wash action during the additive injection.

These and other objects of this invention will be understood from the description taken with reference to the drawing wherein:

Fig. 1 is an elevational view of the apparatus of the invention; and

Fig. 2 is a view taken on lines 2—2 of Fig. 1.

Referring to the drawing in greater detail:

In Figs. 1 and 2 is shown a vessel or tank **10** provided with a removable cover **11** screw threadedly connected thereto; the cover **11** being formed to provide a vent or bleed opening **12**. An outlet or discharge conduit **13** is positioned in tank **10** and extends through the lower end thereof. As seen clearly in Fig. 2, conduit **13** is preferably positioned in the center of tank **10** and it extends to the upper portion of tank **10**. An inverted U-shaped syphon **14** is provided and arranged such that end **15** of the shorter leg is positioned adjacent the bottom of tank **10** and end **16** of the longer leg extends below tank **10** in outlet conduit **13**.

An inlet conduit **17** extends through the wall of tank **10** and fluidly communicates with a source of flushing liquid. A solenoid operated valve **18** is arranged in conduit **17**. This valve is actuated by a timing arrangement such as a clock, not shown, and is adapted to periodically close off flow of additive through conduit **17**. Such valves are known and may be suitably of construction such as shown and described in General Controls Company, Chicago, Ill., Catalog 53G, p. 67. A chemical additive feeder conduit **20** fluidly communicates with conduit **17** between solenoid valve **18** and the connection of conduit **17** to tank **10**. A chemical additive feeder **19**, which may be suitably a pump and reservoir is connected to conduit **20** and is adapted to supply a chemical additive to tank **10**. The conduit **17**, as clearly seen in Fig. 2, connects through the wall of tank **10** at an angle of about 30 to 45 degrees to the radius of the tank **10** at the point of entrance of conduit **17** (indicated by the dashed lines). The lower end of conduit outlet **13** may be connected to any type equipment into which it is desired to inject a chemical additive.

In operation the chemical feeder **19** supplies additive continuously to tank **10** via conduits **20** and **17**. The additive collects in tank **10**. At selected or predetermined times, solenoid valve **18** opens by means of a time clock or other suitable device, not shown, and flushing liquid flows through conduit **17** into tank **10**.

The angular position of inlet conduit **17** causes the flushing liquid to travel generally tangentially thereby effecting a more complete flushing or washing action in tank **10**. The flushing liquid causes the additive collected in tank **10** to overflow through the center outlet **13**. Thus, the additive is batched into a well or other equipment. In addition, the additive is given a thorough washing into the receptacle equipment by means of a relatively large volume of flushing liquid. At another selected or predetermined time solenoid valve **18** closes by means of the time clock or other timing means and the flow of flushing liquid is terminated. However, the syphon, which is already operating because of the initial overflow of the flushing liquid into outlet conduit **13** continues to operate until the level of the liquid in tank **10** is below end **15** of syphon **14**, as shown in Fig. 1. After the syphon is broken, the additive again is collected in the quantity desired and the cycle is repeated.

To assure satisfactory operation, one only has to supply additive to feeder **19** at proper intervals.

The term "liquid" or "additive" as used herein means substantially a liquid phase with or without gaseous or solid phases or both solid and gaseous phases.

Having fully described the nature, objects and operation of the invention, we claim:

1. A device adapted to automatically inject corrosion inhibitor chemical additive intermittently into equipment subject to corrosion comprising a cylindrical tank, a vertically arranged outlet conduit extending through the center of the bottom of said tank to substantially adjacent the top of said tank, an inverted U-shaped syphon conduit having the shorter end positioned adjacent the bottom of said tank and having the longer end positioned in said outlet conduit and extending below the bottom of said tank, the U-shaped portion being arranged adjacent the upper end of said outlet conduit, an inlet conduit extending through the side wall of said tank adjacent the bottom thereof and arranged angularly to the radius of the tank at the point of entrance of the inlet conduit, timed valve means positioned on said inlet conduit adapted to intermittently supply flushing fluid to said tank and a corrosion inhibitor additive feeder connected to said inlet conduit between said tank and said valve means adapted to continuously feed additive to said tank.

2. Apparatus adapted to automatically inject corrosion inhibitor chemical additive intermittently into equipment subject to corrosion utilizing a cylindrical tank, a vertically arranged outlet conduit extending through the center of the bottom of said tank to substantially adjacent the top of said tank, an inverted U-shaped syphon conduit having the shorter end positioned adjacent the bottom of said tank and having the longer end positioned in said outlet conduit and extending below the bottom of said tank, the intermediate portion thereof extending to adjacent the top of said outlet conduit comprising an inlet conduit extending through the side wall of said tank adjacent the bottom thereof and arranged angularly to the radius of the tank at the point of entrance of the inlet conduit, timed valve means positioned on said inlet conduit adapted to intermittently supply flushing fluid to said tank and a corrosion inhibitor additive feeder connected to said inlet conduit

between said tank and said valve means adapted to continuously feed additive to said tank.

3. Apparatus adapted to automatically inject corrosion inhibitor chemical additive intermittently into equipment subject to corrosion utilizing a cylindrical tank, an inlet conduit extending through the side wall of said tank adjacent the bottom thereof and arranged angularly to the radius of the tank at the point of entrance of the inlet conduit, timed valve means positioned on said inlet conduit adapted to intermittently supply flushing fluid to said tank, a corrosion inhibitor additive feeder connected to said inlet conduit between said valve means and said tank adapted to continuously feed additive to said tank comprising a vertically arranged outlet conduit extending through the center to the bottom of said tank to substantially adjacent the top of said tank and an inverted

U-shaped syphon conduit having the shorter end positioned adjacent the bottom of said tank and having the longer end positioned in said outlet conduit and extending below the bottom of said tank, the intermediate portion thereof extending to adjacent the top of said outlet conduit.

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