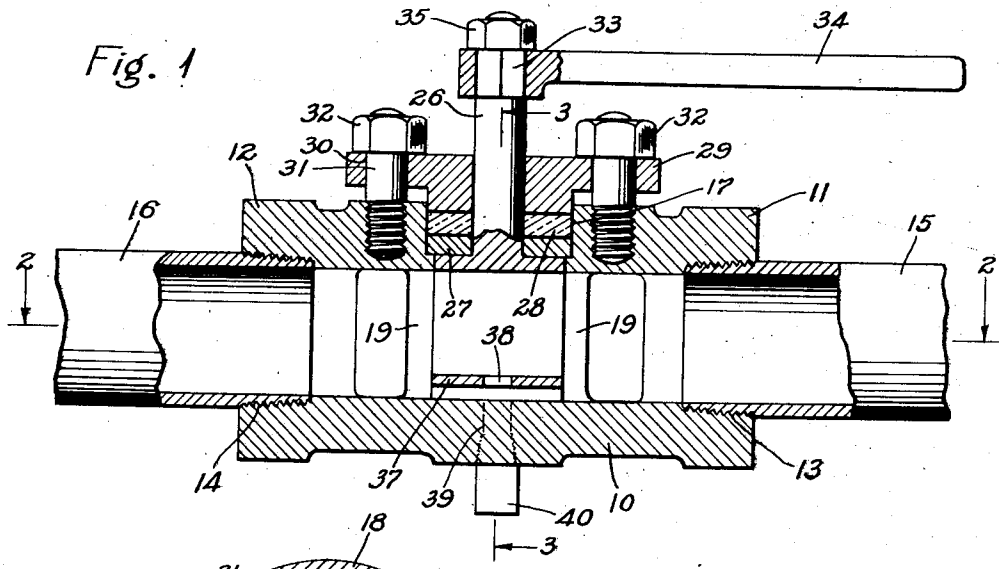
Nov. 17, 1925. 1,562,121

R. W. NEWTON

LINE SAMPLER

Filed Jan. 30, 1925

Fig. 1



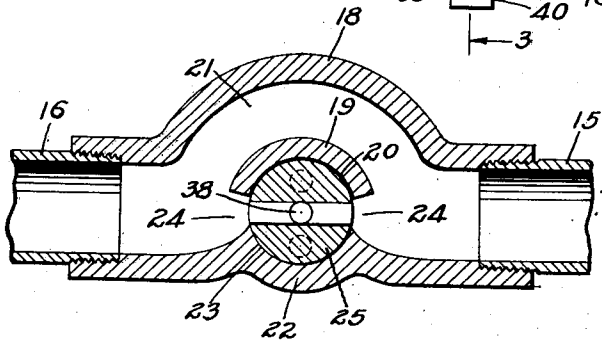


Fig. 2

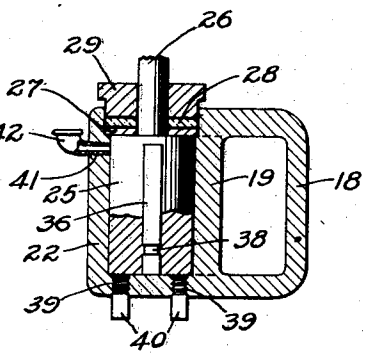


Fig. 3

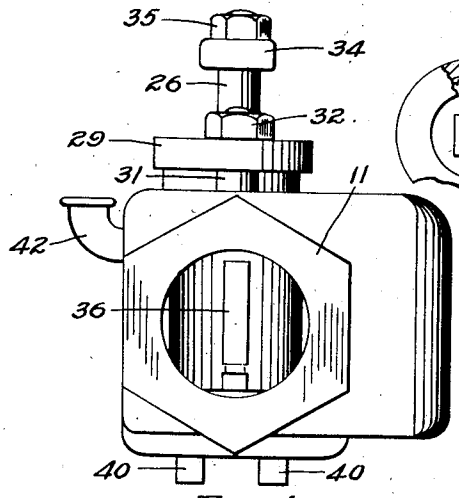


Fig. 4

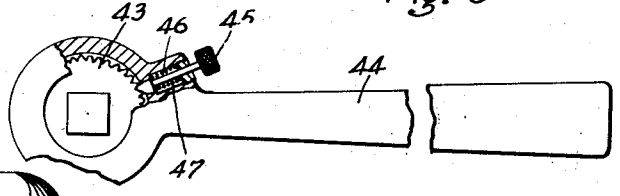


Fig. 5

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Patented Nov. 17, 1925. 1,562,121

UNITED STATES PATENT OFFICE.

RALPH W. NEWTON, OF PLACENTIA, CALIFORNIA.

LINE SAMPLER.

Application filed January 30, 1925. Serial No. 5,793.

To all whom it may concern:

Be it known that I, RALPH W. NEWTON, a citizen of the United States, residing at Placentia, in the county of Orange and State of California, have invented new and useful Improvements in Line Samplers, of which the following is a specification.

This invention relates to improvements in pipe line samplers.

Although the improved pipe line sampler is primarily intended to be used in connection with the oil industry, it is to be understood that it may be used for other purposes as well. In pumping oil either in a pipe line or from a well, the oil carries a certain percentage of water, which with the oil is in the form of an emulsion. Crude oil from various wells has different percentages of water in it, and if desired to pump the oil from a number of wells or a single well into a storage tank, it is frequently desirable that the content of water which is with the oil be known, so that the water which may settle out from the oil while in the storage tank may be determined.

It is an object of this invention to provide a pipe line sampler which is adapted to take a true representative sample of the fluid in a pipe line and remove it from the pipe line without interfering or interrupting the flow through the pipe line.

With the foregoing and other objects in view which will be made manifest in the following detailed description and pointed out in the appended claims, reference is had to the accompanying drawings for an illustrative embodiment of the invention, wherein:

Figure 1 is a vertical section through the improved pipe line sampler shown as applied to a pipe line;

Fig. 2 is a horizontal section taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a vertical section taken on the line 3—3 of Fig. 1;

Fig. 4 is an end elevation of the pipe line sampler; and

Fig. 5 is a plan view, parts being broken away, showing a detail of construction in a modified form of invention.

Referring to the accompanying drawings wherein similar reference characters designate similar parts throughout, the improved pipe line sampler consists of a body 10 which may have its ends hexagonal in form, indicated at 11 and 12 respectively, which ends are interiorly threaded, as at 13 and 14 respectively, to receive the ends of pipe sections 15 and 16 respectively, constituting a part of the pipe line. The top of the body 10 has an aperture 17 formed therein and one side wall of the body 10 is preferably bulged out, as indicated at 18. A web 19 extends from the bottom of the body 10 to the top of the body. This web is preferably arcuate in form so as to provide arcuate surfaces 20 and cooperates with the bulged outside wall 18 to form a by-pass 21. The aperture 17 formed in the top of the body is preferably disposed over the opening formed between the web 19 and a side wall 22. The side wall 22 presents an arcuate surface 23 and is so positioned as to form openings 24 between the ends of the arcuate web 19 and the side wall 22.

Within the opening between the web 19 and the side wall 22 there is disposed a movable or rotatable member 25, preferably cylindrical in form and having its sides bearing upon the arcuate surfaces 20 and 23. A stem 26 is formed integral with the rotatable member 25 and extends upwardly through the aperture 17 formed in the top of the body 10. Upon the top of the rotatable member 25, there is placed a washer 27, upon which rests packing 28, preferably rubber, and a gland member 29 is disposed about the stem 26 and is adapted to compress the packing 28 and urge the washer against the top of the rotatable member 25. The gland member 29 has apertures 30 formed therein through which extend studs 31 which are threaded into the top of the body 10 and which are provided with nuts 32, by which the gland member 29 may be tightened towards the body 10. The upper end of the stem 26 is squared, as indicated at 33, to receive a wrench or handle 34, which is maintained in place by means of a nut 35. By means of the handle 34, the rotatable member 25 may be rotated. An opening 36 is formed in the rotatable member 25 and extends diametrically therethrough. This opening is preferably in height equal to the internal diameter of the pipes 15 and 16. Adjacent the bottom of the opening 36 there is formed a web 37 extending across the opening and an aperture 38 is formed through this web. In the bottom of the body 10 there are preferably

provided two apertures 39 which receive the threaded ends of tubes 40. The apertures 39 are arranged upon diametrically opposite sides of the center of the rotatable member 25, as clearly shown in Fig. 2. An aperture 41 is formed in the side wall 22 of the body 10 and is so located as to be in the same vertical plane which includes the apertures 39. A suitable nipple 42 is threaded into the aperture 41.

The operation of the device is as follows: Oil, which has water mixed therewith or other fluid, continually passes through the pipe line which includes the pipes 16 and 15. The fluid which enters the pipe line sampler from the pipe section 16 may readily pass through the by-pass 21 formed between the web 19 and the side wall 18. When the rotatable member 25 is in that position shown in Fig. 2, a part of the fluid in the pipe line may also readily pass through the opening 36. When it is desired to take a sample of the fluid passing through the line, the handle or wrench 34 is swung around, thereby rotating the rotatable member 25, so that the ends of the opening 36 are closed by the arcuate surfaces 20 and 23. In this manner, the fluid which was passing through the opening 36 is entrapped therein. The rotation of the rotatable member 25 is continued until the bottom of the opening 36 is directly above the apertures 39. At the same time one end of the opening 36 will be caused to be positioned opposite the aperture 41. The fluid which is entrapped in the opening 36 may then readily pass downwardly through the tubes 40 in the apertures 39. That portion of the fluid which is above the web 37 passes through the web through the aperture 38. The nipple 42 provides a vent for the opening 36 so that the fluid which is entrapped therein may readily pass downwardly through the tubes 40. It will be readily understood that while the sample is being taken, the flow of fluid through the by-pass 21 is in no way interfered with or interrupted.

In some cases the water which is in the fluid in the pipe line, because of the fact that it is heavier than oil, will tend to settle to the bottom of the pipe line while flowing therethrough; but having the height of the opening 36 equal to the internal diameter of the pipe line, a true representative sample of the fluid in the pipe line can be obtained, as the opening 36 will then entrap a proportionate amount of water in the bottom of the pipe line together with a proportionate amount of oil which is at the top the pipe line.

The purpose of providing the web 37 is to keep the halves of the rotatable member 25, which are formed by the opening 36, in proper spaced relation to each other. This web will prevent the halves from collapsing toward each other because of the pressure in the pipe line when the rotatable member 25 is rotated so as to deliver its sample.

In some cases the pipe line sampler may be mounted upon the discharge pipe from an oil well. In these cases the wrench or handle 34 is preferably replaced by a ratchet wrench disclosed in Fig. 5. In this ratchet wrench there is a toothed ring 43 which is adapted to be placed upon the squared portion 33 of the stem 26. The ratchet handle 44 is provided with a pawl 45 disposed within a bore 46 and about which there is arranged a coil spring 47, which urges the pawl 45 into engagement with the teeth. The end of the handle 44 is preferably connected by a suitable link mechanism to the polish rod or other removing device which operates the well pump. In this manner every stroke of the polish rod will cause the ring 43 to be advanced the distance of one teeth, and samples of the fluid delivered from the well can in this manner be obtained automatically at regular intervals.

When the sample is obtained from the pipe line sampler, it may be taken to a laboratory and analyzed to determine the exact content of the various substances forming the fluid.

It will be understood that various changes in the detail of construction may be made without departing from the spirit or scope of the invention as defined by the appended claims.

I claim:

1. In combination with a pipe line, means for taking and removing a representative sample of fluid in the pipe line without interrupting the flow therethrough.

2. A pipe line sampler comprising a body, a by-pass formed in said body, a movable member in said body having an opening therein, through which fluid in the pipe line is adapted to pass, and means for moving said movable member so as to entrap a sample of the fluid flowing in the pipe line in said opening and remove it from the line without interrupting the flow therethrough.

3. A pipe line sampler comprising a body, a by-pass formed in said body, a rotatable member in said body having an opening therein, through which fluid in the pipe line is adapted to pass, means for rotating said rotatable member so as to entrap a sample of the fluid in the line in said opening, and means for removing said sample from said opening without interrupting the flow through the line.

4. A pipe line sampler comprising a body, a web disposed within said body and cooperating with a wall of the body to define a by-pass, a rotatable member disposed between said web and another wall of the body, there being an opening formed in said rota-

table member permitting fluid in the line to pass therethrough, means for rotating said member so as to have the fluid in said opening confined therein by said web and wall, and means for withdrawing the fluid confined in said opening therefrom.

5. A pipe line sampler comprising a body, a web disposed within said body and cooperating with a wall of the body to define a by-pass, a rotatable member disposed between said web and another wall of the body, there being an opening formed in said rotatable member permitting fluid in the line to pass therethrough, means for rotating said member so as to have the fluid in said opening confined therein by said web and wall, means for withdrawing the fluid confined in said opening therefrom, and means providing an air vent for said opening to facilitate removal of said fluid.

6. A pipe line sampler comprising a body, a web disposed within said body and cooperating with one wall thereof to define a by-pass, a rotatable member disposed between said web and another wall of said body, there being an opening formed in said member through which fluid in said pipe line may pass, means for rotating said member whereby said web and wall may confine fluid disposed in said opening, there being an aperture formed in said body adapted to be brought into communication with said opening when so rotated so that fluid entrapped therein may be removed therefrom.

7. A pipe line sampler comprising a body, a web disposed within said body and cooperating with one wall thereof to define a by-pass, a rotatable member disposed between said web and another wall of said body, there being an opening formed in said member through which fluid in said pipe line may pass, means for rotating said member whereby said web and wall may confine fluid disposed in said opening, there being an aperture formed in said body adapted to be brought into communication with said opening when so rotated so that fluid entrapped therein may be removed therefrom, there being a second aperture formed in said body adapted to be simultaneously brought into communication with said opening so as to provide a vent facilitating removal of said fluid.

8. A fluid line sampler comprising a body, a rotatable member disposed in said body having an opening therethrough, through which fluid in the pipe line may pass, means for rotating said member whereby fluid in said opening may be entrapped therein, there being an aperture formed in said body adapted to be brought into communication with said opening whereby fluid may be removed therefrom.

9. A fluid line sampler comprising a body, a rotatable member disposed in said body having an opening therethrough, through which fluid in the pipe line may pass, means for rotating said member whereby fluid in said opening may be entrapped therein, there being an aperture formed in said body adapted to be brought into communication with said opening whereby fluid may be removed therefrom, there being a second aperture formed in said body adapted to be simultaneously brought into communication with said opening so as to provide a vent therefor.

10. A fluid line sampler comprising a body, a rotatable member disposed in said body having an opening therethrough, through which fluid in the pipe line may pass, means for rotating said member whereby fluid in said opening may be entrapped therein, there being an aperture formed in said body adapted to be brought into communication with said opening whereby fluid may be removed therefrom, said opening having one dimension substantially equal to the internal diameter of said pipe line.

11. A pipe line sampler comprising a body, a movable member disposed in said body having an opening therethrough, through which fluid in the pipe line may pass, means for moving said movable member so as to entrap fluid in said opening therein, there being an aperture formed in said body adapted to be brought into communication with said opening by such movement so as to withdraw fluid therefrom.

12. A pipe line sampler comprising a body, a movable member disposed in said body having an opening therethrough, through which fluid in the pipe line may pass, means for moving said movable member so as to entrap fluid in said opening therein, there being an aperture formed in said body adapted to be brought into communication with said opening by such movement so as to withdraw fluid therefrom, there being another aperture formed in said body adapted to be brought into communication with said opening by such movement so as to provide a vent for said opening.

In testimony whereof I have signed my name to this specification.

RALPH W. NEWTON.