

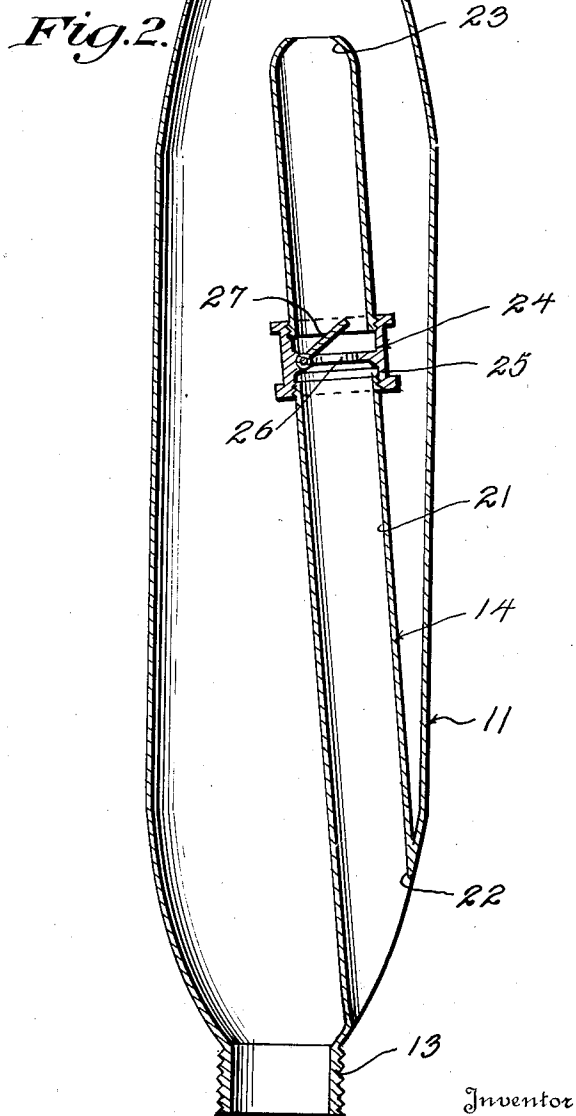
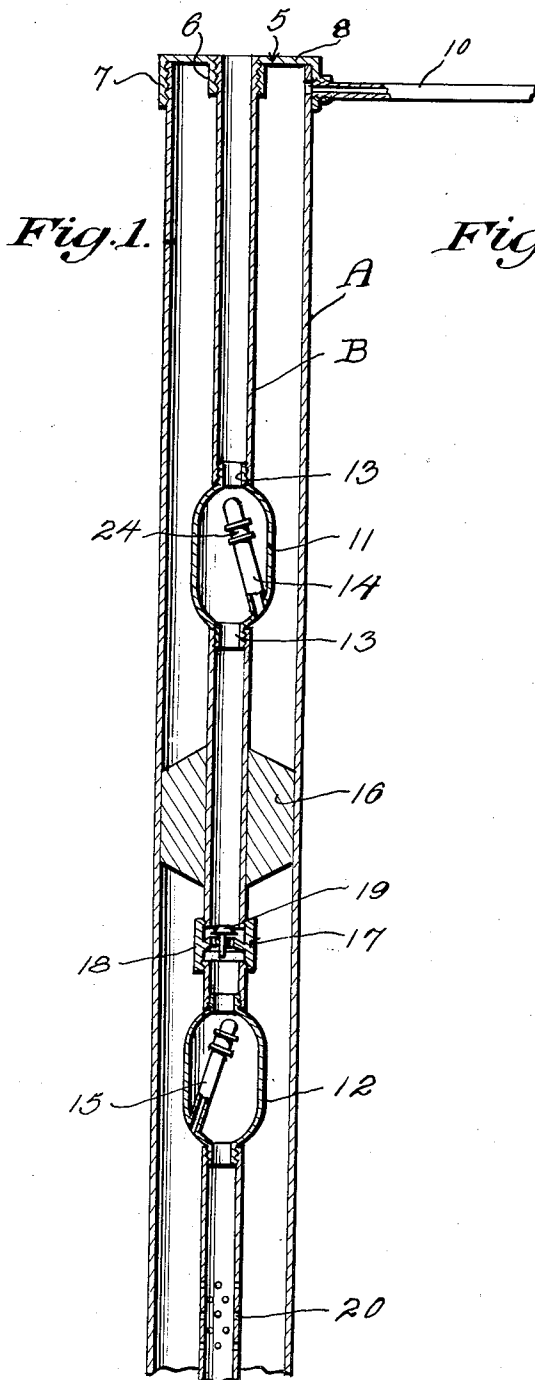
Sept. 29, 1925.

1,555,232

C. S. STRAIT

OIL LIFTING DEVICE

Filed Dec. 27, 1922



Inventor
Charles S. Strait,

By *Richard B. Allen*

Attorney

Patented Sept. 29, 1925.

1,555,232

UNITED STATES PATENT OFFICE.

CHARLES S. STRAIT, OF RANGER, TEXAS.

OIL-LIFTING DEVICE.

Application filed December 27, 1922. Serial No. 609,244.

To all whom it may concern:

Be it known that I, CHARLES S. STRAIT, a citizen of the United States, residing at Ranger, in the county of Eastland and State of Texas, have invented certain new and useful Improvements in an Oil-Lifting Device, of which the following is a specification.

This invention relates to wells and the primary object of the invention is to provide novel means for elevating in a deep well, a column of liquid such as oil or water, said means employing pressure to lift the liquid column in lieu of a pump structure.

Another object of the invention is to provide an inner casing arranged within the ordinary well casing provided with a plurality of inlet jets, the jets forming means for permitting the entrance of pressure into the inner casing for forming means for lifting the liquid column.

A further object of the invention is to provide an inner casing disposed in concentric relation to the outer well casing embodying an upper inlet jet and a lower inlet jet and a packing disposed in fluid tight engagement with the inner and outer casings between the upper and lower jets, the jets forming means for permitting the utilization of external pressure and internal pressure for lifting a fluid or liquid column.

A further object of the invention is the provision of novel valve means carried by the inner casing and the jets for controlling the flow of the liquid column through the inner casing and the flow of the pressure through the jets.

A still further object of the invention is to provide an improved device for elevating a liquid column in a deep well of the above character, which will be durable and efficient in use, one will be simple and easy to manufacture, and one which can be incorporated with a deep well at a minimum expense.

With these and other objects in view the invention consists in the novel construction, arrangement and formation of parts, as will be hereinafter more specifically described, claimed and illustrated in the accompanying drawings, forming a part of this specification, in which drawings:

Figure 1 is a longitudinal section through a well casing showing the improved means for lifting a liquid column incorporated therewith.

Figure 2 is an enlarged detail longitudinal section through one of the jets utilized for permitting the entrance of pressure into the inner casing for facilitating the lifting of the liquid column.

Referring to the drawings in detail, wherein similar reference characters designate corresponding parts throughout the several views the letter A generally indicates the outer or ordinary well casing and B an inner casing through which the liquid column is adapted to flow. As clearly shown in Figure 1 of the drawings the inner casing B is disposed in concentric relation to the outer casing A and has connection with the outer casing A by means of a head or cap 5, which establishes fluid tight connection between the upper ends of the inner and outer casings B and A. As is also clearly shown in Figure 1 of the drawings the inner casing B extends through the head or cap 5 and this forms means for permitting the exit of the liquid column from out of the well casing. The head 5 as shown includes inner and outer spaced collars 6 and 7 and a connecting annular portion 8. The inner and outer collars 6 and 7 can be provided with threads for engaging the inner and outer casings B and A. The upper end of the casing A is adapted to protrude from out of the well and has communicating therewith a pressure pipe 10, by means of which external pressure is introduced into the outer casing A, for a purpose, which will be hereinafter more fully described.

The inner casing B has interposed in its length upper and lower enlarged housings 11 and 12 which are disposed in spaced relation to one another. These housings 11 and 12 are of substantially the same construction and each terminates in upper and lower screw-threaded collars 13 for engaging the sections of the inner casing B. The upper casing 11 supports an inlet jet 14, which will be known as the compound jet and the lower casing 12 supports a similar inlet jet 15, which will be known as the simple jet. The jets however are of substantially the same construction and function practically in the same manner.

It is desirable to establish fluid tight connection between the outer and inner casings A and B between the upper and lower housings 11 and 12 and in order to accomplish this any suitable preferred type of packing 16 is provided. This packing 16 engages

the inner casing B and the inner surface of the outer casing A. Directly below the packing 16 the inner casing B has interposed therein a check valve 17 which as shown includes a valve casing 18 and an upwardly opening valve 19. This check valve 17 is located above the lower housing 12. The lower end of the casing A is provided with a plurality of perforations 20 for permitting the entrance of liquid into the same and this end of the pipe is known as the inlet tube or anchor.

As each of the inlet jets 14 and 15 are of substantially the same construction a description of one is deemed sufficient for both. As clearly shown in Figure 2 of the drawings the inlet jets each include a tubular body 21 having communication with its respective housing adjacent to the lower end thereof as at 22. This body 21 can be connected with the housing in any preferred manner or can be formed integral therewith. The tubular body 21 extends inwardly at an angle from the lower end of this housing and terminates substantially in alignment with the axial center thereof slightly below the upper collar thereof. As clearly shown the upper end of the tubular body 21 is slightly contracted as at 23 in order that the jets of compressed air or other fluids under pressure will flow with considerable force into the housing. If so desired the tubular body 21 can have interposed in its length a suitable check valve 24. This valve 24 as shown includes a valve casing 25 having formed intermediate its ends a valve seat 26 on which is adapted to normally seat a pivoted flat valve 27.

The lower inlet jet 15 is adapted to make use of the internal pressure in the well, if there be such, while the upper inlet jet 14 is adapted to make use of external pressure introduced into the well through the pipe 10.

In operation of the improved liquid lifting device compressed air or other fluid under pressure is introduced into the well casing A through the pipe 10. As shown this compressed air or other fluid under pressure will flow down the casing and into the jet 14 with considerable force and then flow up into the inner casing B. It is evident that the inflowing compressed air or other fluid under pressure will create a suction below the housing 11 and thus suck the liquid into the casing A through the openings 20 and permit lifting the liquid

column. The suction will of course unseat the check valve 17 and permit the free flow of the liquid past the same. In case the compressed air should fail it is evident that the weight of the liquid will automatically close the check valve 17 and the check valve 24 in the inlet jet 14. It has been found that often there is considerable pressure within a well, especially an oil well. It is evident that if there is any internal pressure within the well that this pressure will flow into the inlet jet 15 thus creating a suction in the casing B above the inlet tube or anchor thereof and thus will suck in the oil or the liquid being elevated and elevate the liquid column to the top of the well. Thus it can be seen that these two jets 14 and 15 will co-operate with one another to lift the liquid column.

While any arrangement of the jets 14 and 15 can be had, as shown in Figure 1 of the drawings the same may extend in opposite diagonal relation to one another.

From the foregoing description it can be seen that an improved means has been provided for elevating a liquid column by external and internal pressure.

Changes in details may be made without departing from the spirit or the scope of this invention.

Having thus described my invention what I claim as new is:—

A means for lifting a liquid column in a deep well comprising inner and outer spaced casings, the lower end of the inner casing having liquid inlets formed therein, a head connecting the inner and outer casings together in fluid tight relation, a packing disposed about the inner casing and establishing fluid tight connection between the inner and outer casings, means for introducing pressure into the outer casing above said packing, a tubular housing disposed within the length of the inner casing above said packing having an inwardly extending inlet pressure jet communicating with the interior and exterior thereof for permitting the flow of pressure from the outer casing into the inner casing, and a tubular housing disposed within the length of the inner casing below said packing having an inwardly extending inlet jet communicating with the interior and the exterior thereof for permitting the flow of liquid from the outer casing into the inner casing.

In testimony whereof I affix my signature.

CHARLES S. STRAIT.