April 29, 1924. 1,492,042

C. E. McGEE

PROCESS AND APPARATUS FOR CLEANING WELLS

Filed June 18, 1923

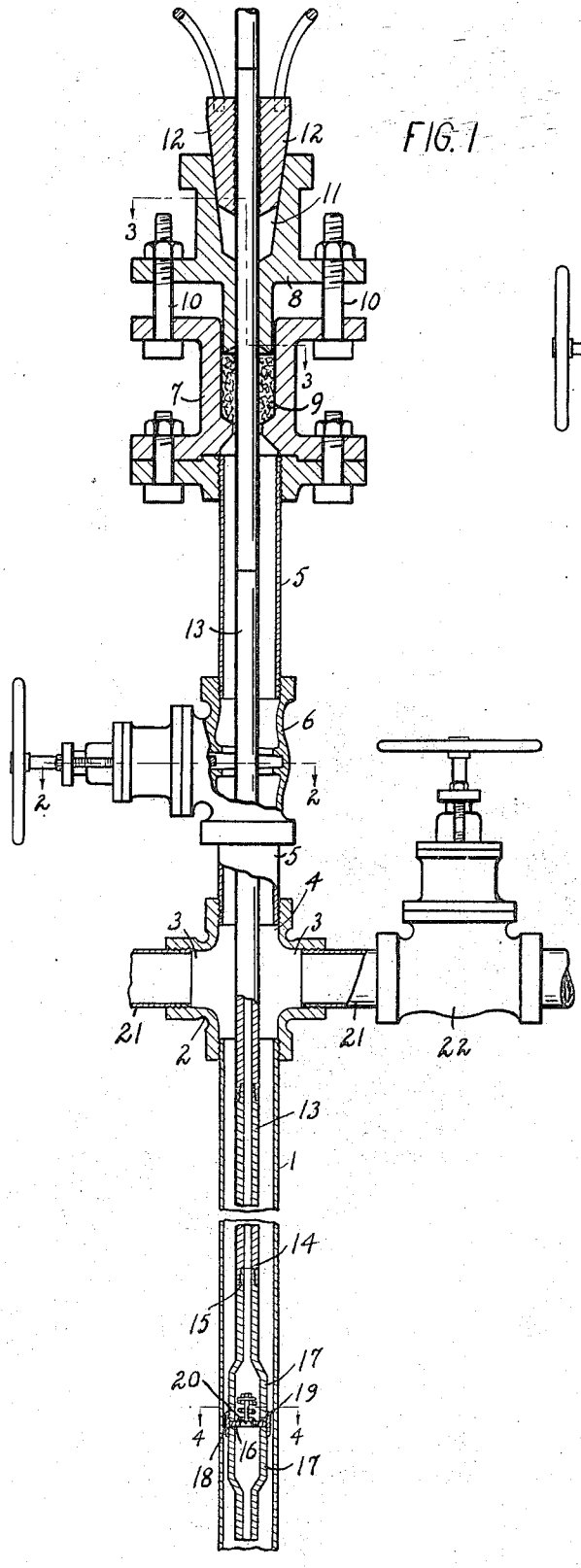


FIG. 1

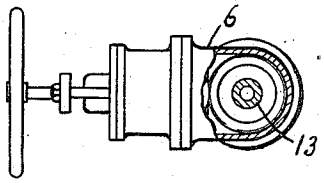
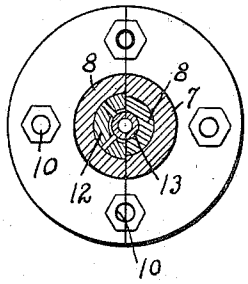


FIG. 2

FIG. 3



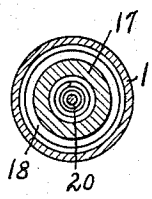


FIG. 4

INVENTOR

CHARLES E. McGEE

BY R. W. Smith.

ATTORNEY.

Patented Apr. 29, 1924. 1,492,042

UNITED STATES PATENT OFFICE.

CHARLES E. McGEE, OF LONG BEACH, CALIFORNIA, ASSIGNOR OF ONE-HALF TO DAVID G. LORRAINE, OF LOS ANGELES, CALIFORNIA.

PROCESS AND APPARATUS FOR CLEANING WELLS.

Application filed June 18, 1923. Serial No. 646,127.

To all whom it may concern:

Be it known that I, CHARLES E. McGEE, a citizen of the United States, residing at Long Beach, county of Los Angeles, State of California, have invented new and useful Improvements in Processes and Apparatus for Cleaning Wells, of which the following is a specification.

It is the object of this invention to provide for cleaning oil wells and the like while the well is flowing and without leakage and waste of the oil, the cleaning of the well being accomplished by discharging a flushing medium such as oil, through a pipe inserted in the well casing, with said pipe adapted to be lowered to any desired depth, while maintaining a leak-proof connection between the pipe and the well casing above the point of oil discharge from the latter.

It is a further object of the invention to provide for cleaning a well by means of a flushing pipe while automatically checking back flow through said pipe.

It is a still further object of the invention to provide for closing the opening through which the flushing pipe is adapted to be inserted in the well casing, said closure means being above the opening in said casing adapted for discharge of the flow from the well; and to provide for placing said flushing pipe in operative position and removing the same without loss of oil from the flowing well, by mounting a stuffing box on the well casing above said closure means, and connecting the sections of the flushing pipe so as to form a pipe of uniform exterior diameter, in order that said flushing pipe may be readily slid through the stuffing box while maintaining a leak-proof connection between said casing and said pipe; the closure means being opened after the pipe is mounted in the stuffing box to permit lowering of said pipe into the well casing, and said closure means being shut off after withdrawal of the pipe past the same and before removal of said pipe from the stuffing box.

Further objects of the invention will be readily understood from the following description of the accompanying drawings, in which:

Fig. 1 is a vertical section through a well casing, with the well cleaning apparatus mounted therein and shown partly in vertical section and partly in elevation.

Figs. 2, 3, and 4 are transverse sections on the lines 2—2, 3—3, and 4—4 of Fig. 1.

The well cleaning apparatus is adapted to be mounted in a well having usual casing 1, the head 2 which is mounted on said casing and which is adapted for discharge of the flow from said well through either of the transverse ports 3 in said head, having a port 4 in the top thereof in alinement with the bore of the well.

A casing 5 is connected to port 4 by a usual threaded connection, and extends upwardly in alinement with the bore of the well, said casing having closure means mounted therein, shown as a usual gate valve 6.

The stationary portion 7 of a usual stuffing box is fixed upon the upper end of casing 5, as by a usual threaded connection, and the follower 8 of said stuffing box, which is adapted to bear against packing 9 in the bore of the stuffing box, is arranged for usual adjustment by bolts 10. The upper portion of the follower has a tapered bore 11 adapted to receive usual slips 12.

A flushing pipe is adapted to be inserted in the well through casing 5, when valve 6 is opened and the stuffing box is mounted on said casing so as to engage the pipe and form a leak-proof connection between the latter and said casing. The pipe is of a diameter permitting free flow of the well through casing 1 and around said pipe, and is of relatively thick material in order that the sections 13 of said pipe may be provided with internal separable connections adapted to form the exterior of said pipe of a uniform diameter throughout its length.

As an instance of this arrangement, the ends of adjacent pipe sections 13 may be formed with tapering threaded sockets 14 and cooperating tapering threaded nipples 15, respectively.

A check valve is preferably mounted in the lower end of the flushing pipe, said valve being shown as comprising a transverse partition 16 mounted between separate lengths 17 of the lowermost section of the flushing pipe, with said lengths preferably of increased diameter and connected by a

threaded collar 18. The partition 16 has a valve seat 19 formed therein, with a spring pressed valve head 20 cooperating therewith and automatically closing against upward flow through the flushing pipe.

When the flushing pipe is removed from the well, valve 6 is closed so that the entire flow of the well is discharged through ports 3 in usual manner, said ports having pipes 21 connected thereto with valves 22 in said pipes for regulating the flow.

When the flushing pipe is to be inserted in a flowing well, the lowermost section of the pipe is positioned in the upper end of casing 5 above closed valve 6, and the stuffing box is received over said pipe and fixed to casing 5, the length of casing 5 between valve 6 and the stuffing box being sufficient to receive the length of the enlargement 17 of the lower section of the pipe, in order that the packing of the stuffing box will engage only the portion of the flushing pipe which is above said enlargement and which is of uniform diameter.

Any desired number of sections 13 may be added to the flushing pipe extending upwardly through the stuffing box, and when valve 6 is opened, the pipe may be lowered to any desired depth in the well, the uniform exterior of the pipe permitting the same to readily slide through the stuffing box, with packing 9 engaging said pipe so as to maintain a leak-proof connection between the same and casing 5.

The flushing pipe is fixed at any desired depth by slips 12 wedged in bore 11 and engaging said pipe, and the check valve in the lower end of the pipe prevents back flow from the well through the same, until the pipe is connected at its upper end to a suitable oil supply, when said oil is discharged through the pipe and past the check valve, so as to wash sand and the like upwardly through casing 1 along with the flow from the well.

The flow from the well having the sand mixed therewith is allowed to settle in usual manner, and a portion of the clean oil above the settled sand may form the supply of flushing oil for the pipe 13.

When it is desired to withdraw the flushing pipe, it is elevated to a point above valve 6 which is then closed, and the stuffing box is then disengaged from the pipe in order that the latter may be removed. In order to raise or lower the flushing pipe, a usual elevator (not shown) may be fixed on the pipe above the stuffing box, the withdrawal of slips 12 permitting of adjustment of said pipe, and the positioning of said slips holding the pipe at any desired depth in the well.

It will thus be seen that I have provided for withdrawing or inserting, or varying the depth of a flushing pipe in a well, while the latter is flowing, without the possibility of leakage or waste of oil during said operation.

It will be apparent that various changes may be made in the construction, combination, and arrangement of parts as thus described, without departing from the spirit of the invention.

What is claimed is:

1. The process of cleaning flowing wells which consists of flushing a well through a pipe inserted therein, and varying the depth of said pipe while maintaining a leak-proof connection between the pipe and the well casing and discharging the flow of said well through said casing at a point below said leak-proof connection.

2. The process of cleaning flowing wells which consists of flushing a well through a pipe inserted therein while automatically checking back flow through said pipe, and varying the depth of said pipe while maintaining a leak-proof connection between the same and the well casing and discharging the flow of said well from said casing at a point below said leak-proof connection.

3. The process of cleaning flowing wells which consists of shutting off the casing of a well above the discharge means therefrom, inserting a flushing pipe in said casing above said shut-off means, forming a leak-proof connection between said pipe and said casing above said shut-off means, opening said shut-off means, and sliding said pipe through said leak-proof connection to any desired depth in said casing, and discharging a flushing fluid through said pipe into said casing.

4. A well cleaning apparatus including a flushing pipe adapted to be inserted in a well casing, and means for maintaining a leak-proof connection between said pipe and casing while varying the depth of said pipe in said casing.

5. A well cleaning apparatus including a flushing pipe adapted to be inserted in a well casing and comprising pipe sections having means for connecting the same so as to form a pipe having a uniform exterior diameter, and means for maintaining a leak-proof connection between said casing and the uniform exterior of said pipe while varying the depth of said pipe in said casing.

6. The combination with a well casing having an open end and means for discharging the flow from said casing below said open end, of means for closing the open end of said casing, and a flushing pipe adapted to be inserted in said casing through said open end when said closure means is opened.

7. The combination with a well casing having an open end and means for discharging the flow from said casing below said

open end, of closure means in said casing between said open end and said discharge means, a flushing pipe adapted to be inserted in said casing through said open end when said closure means is opened, and means for maintaining a leak-proof connection between said pipe and the open end of said casing while varying the depth of said pipe in said casing.

8. A well cleaning apparatus including a flushing pipe adapted to be inserted in a well casing, a check valve in said pipe for preventing back flow through the same, and means for maintaining a leak-proof connection between said pipe and casing while varying the depth of said pipe in said casing.

9. The combination with a well casing having an open end and means for discharging the flow from said casing below said open end, of closure means in said casing between said open end and said discharge means, a flushing pipe having an enlargement at its lower end, a check valve in said enlargement for preventing back flow through said pipe, said pipe being adapted to be inserted in said casing through said open end and past said closure means when the latter is opened, and means for maintaining a leak-proof connection between said pipe and the open end of said casing while varying the depth of said pipe in said casing, said leak-proof connection being spaced from said closure means a distance greater than the length of said pipe between its lower end and the upper end of its enlargement.

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

CHARLES E. McGEE.