April 13, 1937. M. SPENCER ET AL 2,077,022

APPARATUS FOR THE CONTROLLED PLACEMENT OF FLUID IN WELLS

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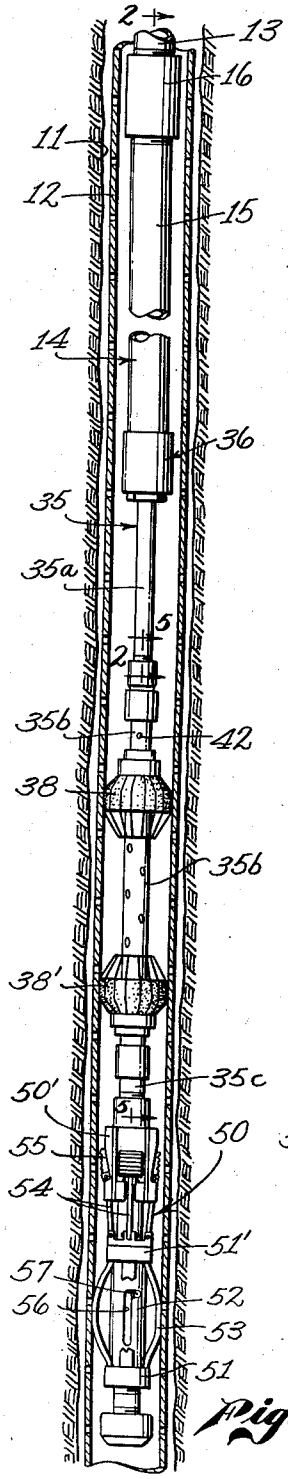


Fig. 1.

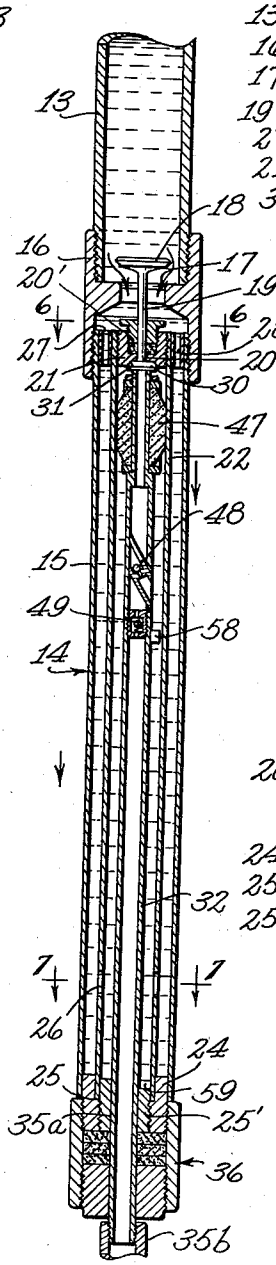


Fig. 2.

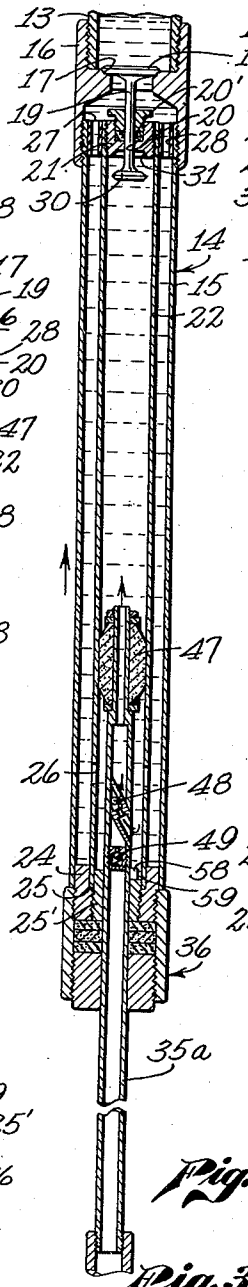


Fig. 3.

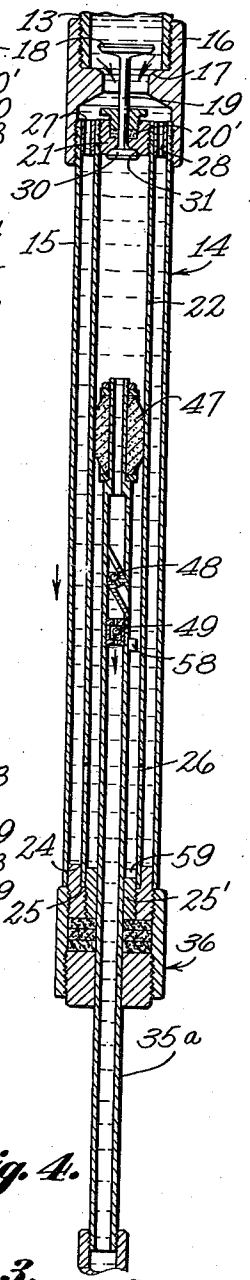


Fig. 4.

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Fig. 5.

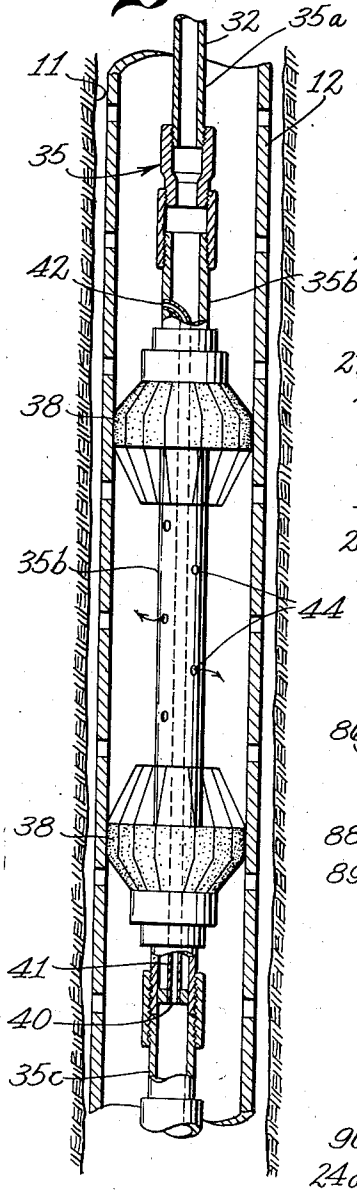


Fig. 8.

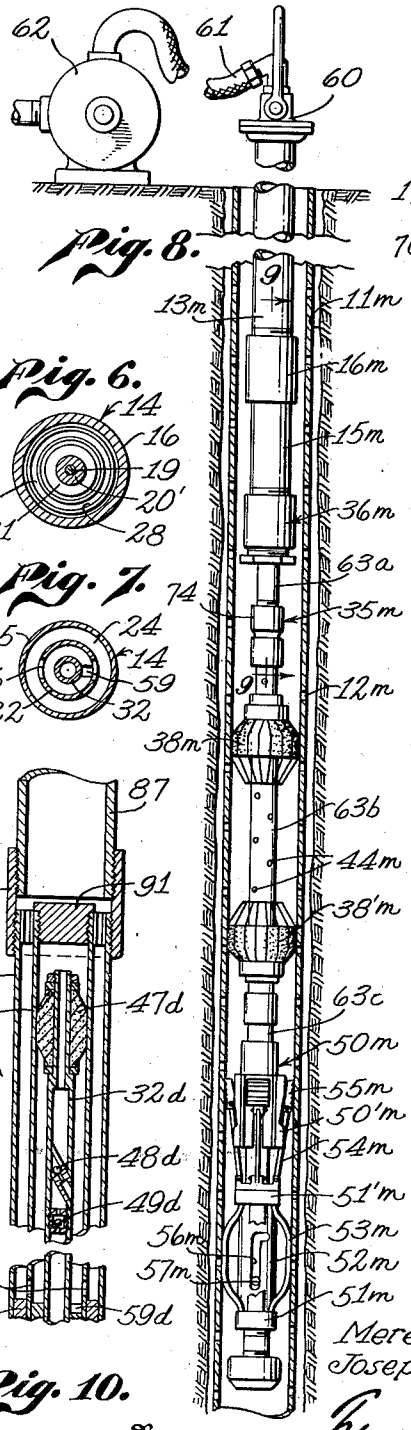
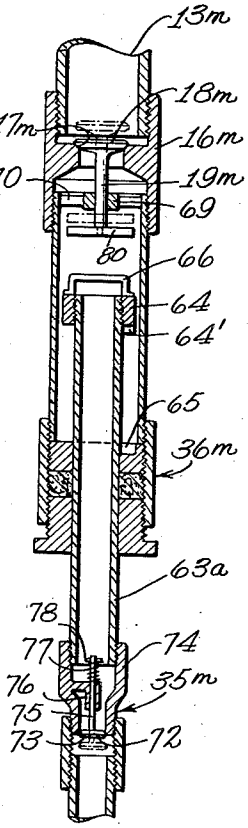


Fig. 6.

Fig. 7.

Fig. 10.

Fig. 9.



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APPARATUS FOR THE CONTROLLED PLACEMENT OF FLUID IN WELLS

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Application June 22, 1936, Serial No. 86,620

20 Claims. (Cl. 166—20)

This invention has to do in a general way with oil well operations and is more particularly related to means for delivering a fluid or fluid mixture into a predetermined zone within a well and contemplates improvements on the apparatus disclosed in patent application of H. C. Yarbrough, Serial No. 678,875, filed July 3, 1933, on Cleaning apparatus for perforated pipe and the like, and assigned to the assignee of the present application.

As is well known to those familiar with the art, perforated casing or screen pipe which is placed in the producing zone of an oil well is, under certain circumstances, subject to corrosive action which clogs the perforations and reduces the production of the well. Also, in certain types of oil carrying a high asphalt content, the perforations become gummed or clogged with asphalt. It is, therefore, necessary in order to maintain the desired production level to clean the perforations from time to time. Various devices have been designed for this purpose and the device contemplated by this invention is particularly applicable to this use since it is designed so that any fluid such, for example, as a solvent for the material which is clogging the perforations or a reagent which will react chemically with such material, may be delivered under pressure into a confined space in the perforated pipe to dislodge and remove the obstructions in the perforations. The device contemplated by this invention also lends itself to use in loosening a "liner" or perforated pipe by forcing a suitable fluid under pressure through the perforations in successive regions of such a pipe with the material surrounding the pipe.

It is a primary object of this invention to produce a device of the class described which can be operated from the surface of the ground so as to control the amount of fluid which is discharged therefrom for each setting or location of the tool.

One preferred embodiment of our invention contemplates the use of pumping means embodied within the tool itself and operated upon vertical reciprocation of the delivery pipe, which carries the tool, to discharge the cleaning fluid in predetermined measured amounts within a confined space in the strainer pipe or the region of the well where the operator desires to place the fluid. Another embodiment of our invention contemplates the use of a pump or other source of pressure fluid at the surface of the ground which maintains a supply of pressure fluid within the delivery pipe at all times and in which the discharge of such fluid into the confined space is controlled by raising or lowering the delivery pipe. Our invention, therefore, in its broader aspect contemplates the formation of a confined space within the well and means for controlling the discharge of pressure fluid into such confined space.

It is a further object of this invention to produce a device of the class described which is of simple form and construction, may be economically manufactured and easily operated with the standard equipment available at the well.

The details in the construction of certain preferred embodiments of our invention, together with other objects attending its production will be best understood from the following description of the accompanying drawings which are chosen for illustrative purposes only and in which

Fig. 1 is a sectional elevation through the perforated casing of an oil well and illustrating one preferred embodiment of our invention suspended therein;

Fig. 2 is an enlarged sectional elevation taken on a plane represented by the line 2—2 of Fig. 1 and illustrating further details in the construction of an initial step in the operation of a preferred embodiment of our invention;

Fig. 3 is a sectional elevation similar to Fig. 1 illustrating a second step in the operation of the tool shown in Fig. 1;

Fig. 4 is a sectional elevation similar to Fig. 1 illustrating a third step in the operation of the tool contemplated by this invention;

Fig. 5 is an enlarged sectional elevation with parts in outside view taken in a plane represented by the line 5—5 of Fig. 1, and illustrating further details in the construction of the packing assembly which forms the confined space within which the pressure fluid is discharged;

Fig. 6 is a plan section taken in a plane represented by the line 6—6 of Fig. 2;

Fig. 7 is a plan section taken in a plane represented by the line 7—7 of Fig. 2;

Fig. 8 is a sectional elevation through an oil well illustrating a modified form of our invention in connection therewith;

Fig. 9 is an enlarged sectional elevation taken in a plane represented by the line 9—9 of Fig. 8; and

Fig. 10 is a fragmentary sectional elevation illustrating a modification in the construction shown in Fig. 2.

More particularly describing the invention as herein illustrated, reference numeral 11 indicates an oil well which contains a perforated casing 12. Suspended within the casing 12 through the medium of what we may term a delivery

pipe 13 is a fluid discharging tool generally indicated by reference numeral 14. The tool 14 in this form of our invention embodies an extension 15 of the delivery pipe connected thereto through the medium of a collar 16, such extension 15 being hereinafter referred to as the fluid control chamber.

The collar 16 is formed with a valve seat 17 upon which a control valve 18 is adapted to rest. The control valve 18 in this form of our invention is shown as being provided with a downwardly extending stem 19 which extends through a passage 20 in a plug member 21 mounted in the top of a working barrel 22 which in turn is mounted in spaced concentric relation with the control chamber 15. The bottom of the control chamber 15 is provided with a bushing or closure fitting 24 which supports the lower end of the working barrel as indicated at 25 and the bottom portion of the working barrel 22 is in open communication with the control chamber 15 through ports 26. Reference numeral 27 indicates a ring or spider member which holds the top of the working barrel 22 in properly spaced relation with the interior of the chamber 15, such member 27 being formed with passages 28.

In this form of our invention as will be seen from the description of the operation to appear hereinafter, it is important that means be provided for sealing the space between the valve stem 19 and the interior of the working barrel 22 during certain stages of the operation. This may be accomplished in various ways and in the form shown in Figs. 2 to 4 inclusive, the lower end of the stem 19 is provided with a second valve 30 adapted to have sealing engagement with a seat 31 formed in the bottom of the plug 21 which constitutes the top of the working barrel. This valve as will appear hereinafter serves a dual purpose in this form of our invention. The valve stem 19 may be further sealed by a stuffing box 20', the use of which is optional when the valve 19 is used. Also, if the stuffing box 20' is used the seal effected thereby may be sufficient and the valve 19, as will appear hereinafter may be replaced with a cross member of any suitable type.

Reference numeral 35 indicates what we have termed a tubular member which is telescopically connected with the flow control chamber 32, the tubular member extending upwardly into the chamber through the stuffing box generally indicated by reference numeral 36. This tubular member 35 which is shown as being comprised of sections 35*a*, 35*b* and 35*c* carries a pair of spaced packers 38 and 38' which are mounted on the section 35*b* and which engage the casing 12 to form a confined space therein. The bottom portion of the section 35*b* is provided with a plug 40 which is shown as containing the lower end of a by-pass pipe 41, the upper end of which opens through the wall of the tubing section 35*b* at a point above the uppermost packer 38 as indicated at 42. The wall portion of the section 35*b* between the packers 38 and 38' is provided with an outlet opening or a plurality of such openings generally indicated by reference numeral 44.

Mounted on the upper end portion of the tubing section 35*a* which telescopes into the flow control chamber 15, and, in this form of our invention, is contained within the working barrel 22, is a plunger member 47. Reference numeral 48 indicates an upwardly opening check valve which is shown as being contained within the top portion of the tubing section 35*a*, such valve being so positioned and arranged as to establish communication between the regions of the working barrel above and below the plunger 47 when such valve is open. Numeral 49 indicates a downwardly opening check valve which is situated between the valve 48 and the discharge ports 44. Reference numeral 50 indicates a slip assembly which is shown as being carried by the lower section 35*c* of the member 35. This slip assembly may be of any conventional construction and is shown as comprising a tapered mandrel member 50' rigidly mounted on the section 35*c* and spaced collars 51 and 51' slidably mounted on such section through the medium of a sleeve 52. The collars 51 and 51' support the ends of pipe engaging friction springs 53 and the upper collar also carries links 54 which have their free ends secured to slips 55 slidably mounted on the mandrel section 50'. The sleeve 52 is provided with a bayonet slot 56 which cooperates with a pin 57 mounted on the section 35*c* to hold the slips in retracted position when the pin is in the offset portion of the bayonet slot and to permit downward movement of the section 35*c* and its associated expanding mandrel 50' when the pin is in the long portion of the bayonet slot. For the purpose of transmitting rotation from the delivery pipe 13 to the tubular member 35 to release the slips, the section 35*a* of this member is provided with a lug 58 adapted for reception in a notch 59 in the closure plug 25' which forms the bottom of the working barrel.

In the operation of the device shown in Figs. 2 to 4 inclusive, the tool is suspended in the well with the slips retracted as shown in Fig. 1 and while in a freely suspended position the telescoping connection comprised of the section 35*a* and the chamber 15 is fully extended with the lug 58 in the notch 59, the plunger 57 being in its lower end of the working barrel and the valve 18 resting on its seat 17. The delivery pipe 13 is made up in the conventional manner as the tool is lowered into the well and when it reaches a point at which it is desired to clean the perforations or to discharge the fluid or fluid mixture into the confined space formed by the packers 38 and 38' the delivery pipe is rotated to release the bayonet lock 56—57 after which the further application of weight will cause the slips to expand into biting engagement with the pipe and through such engagement to support the tubular member 35 at this point within the well. At this time or any time prior thereto the fluid or fluid mixture in any desired quantity is delivered into the delivery pipe 13.

With the slips set in the manner described above and the pipe 13 containing the desired quantity of fluid, the pipe 13 is then lowered, such lowering movement being effective to completely collapse the telescoping connection to the point shown in Fig. 2. At this point it will be observed that the upper end of the tubing section 35*a* has engaged the second valve 30 on the lower end of the valve stem and through such engagement has forced the first valve 18 away from its seat 17. With the parts in this position the fluid contained in the delivery pipe 13 flows downwardly past the valve and through the passages 28 into the space between the plunger barrel 22 and the pipe section 15, through the openings 26 and up into the plunger barrel to a point immediately below the plunger 47.

The next operation is to raise the delivery pipe a distance corresponding to the stroke of the

plunger during which operation the weight of the fluid in the pipe 13 closes the valve 18 and the plunger 47, during its downward movement, creates a suction in the top portion of the plunger barrel which draws the fluid in the bottom portion of the plunger barrel up through the upwardly opening check valve 48 into the top portion of the plunger barrel. This operation is illustrated in Fig. 3.

The next operation in this form of our invention is to again lower the delivery pipe a distance corresponding to the stroke of the plunger. This lowering movement causes the collapse of the telescoping connection and the contraction of the space in the top of the plunger barrel. In the event the pressure in the zone to which the fluid is to be delivered is greater than the weight of the fluid above the valve 18, the contraction in the space in the top portion of the plunger barrel through the operation just described is first effective to press the second valve 30 into engagement with its seat 31, positively sealing the top of the plunger barrel, after which the downwardly opening check valve 49 is depressed away from its seat and the contents of the plunger valve are discharged through the tubing member 35 into the space between the packers 38 and 38'. In the event the operation last described is effective to close the valve 30 it will be seen that this operation simultaneously opens the valve 18 and permits the flow control chamber 15 to fill during the down-stroke. It will thus be seen that with this arrangement our invention provides a device in which a predetermined quantity of fluid is delivered into the confined space between the packers for each stroke of the plunger and the quantity of fluid so delivered can be governed by the size of the control chamber and its associated working barrel and the number of strokes for each setting of the tool.

In the form of our invention shown in Figs. 8 and 9 we provide a somewhat simplified construction which requires the delivery pipe to contain fluid under sufficient pressure to overcome the well pressure at the point of discharge. In this form of our invention the perforated pipe, the packing and slip assemblies and the tubing sections which carry the packing and slip assemblies are identical with those shown in Fig. 1 and are, therefore, indicated by the same reference numerals distinguished by the letter "*m*".

The delivery pipe 13*m* in this form of our invention is shown as being provided at its upper end with a swivel head connection 60 of any conventional type such connection being connected through the medium of a conduit 61 to a pump diagrammatically indicated at 62. The bottom of the delivery pipe 13*m* is connected through a collar 16*m* with a bottom section 15*m* which constitutes the flow control chamber in this form of our invention.

The bottom of the flow control chamber 15*m* carries a stuffing box 36*m* through which a top section 63*a* of the tubular member 35*m* extends. As shown in Fig. 8 the tubing member 35*m* is comprised of sections 63*a*, 63*b* and 63*c* corresponding to sections 35*a*, 35*b* and 35*c* in Fig. 1. The top of the section 63*a* carries a nut member 64 having a boss 64' adapted to fit in a recess 65 for actuating the slip releasing mechanism, such not being shown as provided with a bridge plate 66.

The collar 16*m* is provided with a valve seat 17*m* upon which a valve 18*m* is adapted to rest, the valve 18*m* being provided with a downwardly extending stem 19*m* which is supported in a guide hub 69 formed in a spider member 70.

The tubular member 35*m* is provided with a downwardly opening check valve which in this form of our invention is shown as comprising a disc valve 72 which engages a seat 73 formed in the bottom of a valve housing 74, the valve 72 being supported in pressure engagement with the seat by means of a stem 75 which extends upwardly through a support 76 and carries a compression spring 77 on its upper end between the top of the support 76 and a cross pin 78.

In this form of our invention the tool is lowered into the well and the slips are set in the same manner described above in connection with Figs. 1 to 4 inclusive. After the tool has been set, the washing or cleaning fluid is pumped into the delivery pipe 13*m* at the desired pressure from the pump 62, it being understood that the pressure used must necessarily be in excess of the rock pressure of the particular zone to be cleaned. The delivery pipe is then lowered until the cross fingers 80 on the lower end of the valve stem 19*m* engage the bridge plate 66 at which time the valve 18*m* is raised from its seat to permit the flow of fluid downwardly into the control chamber from which it is admitted to the tubing section 63*a* and is discharged through the valve 72 and the associated connections into the confined space between the packers 38*m* and 38'*m*. The operation of the pump or suitable measuring means associated with the source of pressure fluid at the surface of the ground will indicate the quantity of such fluid that is delivered into the confined space for each setting and as soon as the delivery pipe is raised it will be seen that the pressure of the fluid therein will be effective to close the valve 18*m* and prevent the further discharge of fluid into the confined space.

It will be apparent to those familiar with the art that the complete tool assembly in either embodiment of our invention can be raised to successively higher levels and lowered again to set the slips so that any desired length of casing can be cleaned in the manner described above.

In the form of our invention shown in Fig. 10, we show a slightly modified construction in the control chamber and the working barrel. In this form of our invention it will be observed that the collar member 86 which connects the delivery pipe 87 and the control chamber 88 is not provided with a valve as was the case in Figs. 2 and 9. The working barrel 89 is similar to the working barrel 22 in that it communicates with the chamber 88 at its lower end through openings 90, but the upper end of the working barrel 89 is shown as being provided with a closed plug 91.

The tubular member in this form of our invention together with the plunger and its associated check valves are identical with those shown in Fig. 2 and the parts thereof are indicated by the same reference numerals distinguished by the letter *d*. In the use of this modified form of construction, it is important that the tool be immersed for a substantial distance within the fluid of the well before the cleaning fluid or solution is delivered into the delivery pipe 87 and when such cleaning fluid is delivered into the pipe 87, it is preferable that the level of fluid therein be below the fluid level in the well surrounding the pipe. This prevents the possible loss of cleaning fluid which might otherwise open the check valve 48 and depress the check valve 49 in the event the pressure differential between the space surrounding the ports between the packers and the interior

of the tool was in favor of the liquid in the delivery pipe. Otherwise, the operation of the modification shown in Fig. 10 is the same as was described above in connection with Figs. 2, 3, and 4.

It is to be understood that while we have herein described and illustrated certain preferred embodiments of our invention, that the invention is not limited to the precise forms or applications described above, but includes within its scope whatever changes fairly come within the spirit of the appended claims.

We claim as our invention:

1. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; and a valve in the top of said control chamber adapted to be opened by engagement with the top of said tubular member when said telescoping connection is collapsed.

2. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; slip means for supporting said tubular member in said perforated pipe; a fluid delivery pipe having a control chamber at its lower end telescopically connected to said tubular member; and a valve in the top of said control chamber adapted to be opened by engagement with the top of said tubular member when said telescoping connection is collapsed.

3. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; a valve in the top of said control chamber adapted to be opened by engagement with the top of said tubular member to supply fluid to the control chamber from the delivery pipe when said telescoping connection is initially collapsed; and piston means in said control chamber adapted to force fluid contained in said control chamber downwardly through said tubular member upon a second collapsing movement of said telescoping connection.

4. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; valve means interposed between said flow control chamber and the portion of said delivery pipe thereabove; and means operable upon the collapse of said telescoping connection for opening said valve means.

5. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; valve means interposed between said flow control chamber and the portion of said delivery pipe thereabove; means operable upon the collapse of said telescoping connection for opening said valve means and a downwardly opening check valve positioned between the interior of said control chamber and the portion of said tubular member which communicates with said confined space.

6. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; valve means interposed between said flow control chamber and the portion of said delivery pipe thereabove; means operable upon the collapse of said telescoping connection for opening said valve means; a downwardly opening check valve positioned between the interior of said control chamber and the portion of said tubular member which communicates with said confined space; and means for delivering a pressure fluid into said fluid delivery pipe.

7. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; valve means interposed between said flow control chamber and the portion of said delivery pipe thereabove; means operable upon the collapse of said telescoping connection for opening said valve means; a downwardly opening check valve in said tubular member above the opening which communicates with said confined space; a working barrel within said flow control chamber having inlet openings at its lower end communicating with the interior of said chamber; a plunger on said tubular member within said working barrel; and an upwardly opening check valve in said tubular member between the region of said working barrel below said plunger and the interior of said tubular member.

8. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected to said tubular member; a valve seat positioned between said flow control chamber and said delivery pipe; a valve resting on said seat; a downwardly extending stem on said valve; and means on said stem adapted to be engaged by the upper end of said tubular member upon the collapse of said telescoping connection for opening said valve.

9. In an apparatus for cleaning perforated pipe and the like, the combination of: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space;

a fluid delivery pipe having a flow control chamber at its lower end, telescopically connected with said tubular member; a working barrel mounted in said flow control chamber and having an inlet opening at its lower end communicating with said flow control chamber; and plunger and valve means carried by said tubular member for drawing fluid from the bottom of said working barrel into the upper end thereof during extension of said telescoping connection and forcing fluid downwardly from the upper end of said working barrel through said tubular member during the collapse of said telescoping connection.

10. In an apparatus for cleaning perforated pipe and the like the combination of: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected with said tubular member; a working barrel mounted in said flow control chamber and having an inlet opening at its lower end communicating with said flow control chamber; plunger means carried by said tubular member in said working barrel; an upwardly opening check valve associated with said plunger means and communicating between the regions of said working barrel above and below said plunger; and a downwardly opening check valve in said tubular member above the opening which communicates with said confined space.

11. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected with said tubular member; a working barrel mounted in said flow control chamber communicating with said chamber at its lower end; a valve seat between said delivery pipe and said control chamber above said working barrel; a valve resting on said seat; a stem on said valve extending downwardly through the top of said working barrel; a second valve on said stem within said working barrel; a second valve seat in the top of said working barrel adapted to be engaged by said second valve; and valve and plunger means carried by said tubular member within said working barrel.

12. An apparatus for cleaning perforated pipe and the like embodying: packing means adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packing means and having open communication with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected with said tubular member; a working barrel mounted in said flow control chamber communicating with said chamber at its lower end; a valve seat between said delivery pipe and said control chamber above said working barrel; a valve resting on said seat; a stem on said valve extending downwardly through the top of said working barrel; means on the lower end of said valve stem adapted for engagement with the top of said tubular member upon the collapse of said telescoping connection for opening said valve; sealing means between the top of said working barrel and said valve stem; and valve and plunger means carried by said tubular member within said working barrel.

13. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet port in its wall; packing means mounted on said tubular member above and below said outlet port; slip means for supporting said tubular member in a pipe to be cleaned; valve means interposed between said flow control chamber and said delivery pipe; and means operable upon the collapse of said telescoping connection for opening said valve means.

14. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet port in its wall below said flow control chamber; packing means on said tubular member above and below said outlet port; slip means for supporting said tubular member in a pipe to be cleaned; means operable upon the collapse of said telescoping connection for delivering fluid from said delivery pipe to said chamber; and additional means operable during the collapse of said connection for discharging fluid from said chamber through said tubular member.

15. In an apparatus for the controlled placement of fluid in wells and the like, the combination of a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet port in its wall below said flow control chamber; packing means on said tubular member above and below said outlet port; slip means for supporting said tubular member in a pipe to be cleaned; means operable upon the collapse of said telescoping connection for delivering fluid from said delivery pipe to said chamber, and additional means operable during the collapse of said connection for discharging fluid from said chamber through said tubular member, said last mentioned means including a working barrel mounted in said chamber and communicating therewith at its lower end, and plunger and valve means carried by said tubular member within said working barrel.

16. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet port in its wall below said flow control chamber; packing means on said tubular member above and below said outlet port; slip means for supporting said tubular member in a pipe to be cleaned; means operable upon the collapse of said telescoping connection for delivering fluid from said delivery pipe to said chamber; and additional means operable during the collapse of said connection for discharging fluid from said chamber through said tubular member, said last mentioned means including a working barrel mounted in said chamber and communicating therewith at its lower end, a plunger on said tubular member within said working barrel; and an upwardly opening check valve communicating between the

regions of said working barrel above and below said plunger.

17. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet port in its wall below said flow control chamber; packing means on said tubular member above and below said outlet port; slip means for supporting said tubular member in a pipe to be cleaned; means operable upon the collapse of said telescoping connection for delivering fluid from said delivery pipe to said control chamber; and additional means operable during the collapse of said connection for discharging fluid from said chamber through said tubular member, said last mentioned means including a working barrel mounted in said chamber and communicating therewith at its lower end, a plunger on said tubular member within said working barrel; an upwardly opening check valve communicating between the regions of said working barrel above and below said plunger; and a downwardly opening check valve mounted in said tubular member at a point between said upwardly opening check valve and said discharge port.

18. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet in its wall below said flow control chamber; packing means on said tubular member above and below said outlet port; means for supporting said tubular member in a pipe to be cleaned; means comprising a valve operable upon the collapse of said telescoping connection for controlling the admission of fluid from said delivery pipe to said flow control chamber; and additional means operable during the collapse of said connection for discharging fluid from said chamber through said tubular member.

19. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: a fluid delivery pipe having a flow control chamber at its lower end; a tubular member telescopically connected with said flow control chamber, said tubular member having an outlet port in its wall; packing means mounted on said tubular member above and below said outlet port; slip means for supporting said tubular member in a pipe to be cleaned; valve means interposed between said flow control chamber and said delivery pipe; means operable upon the the collapse of said telescoping connection for opening said valve and means for delivering a pressure fluid to said delivery pipe.

20. In an apparatus for the controlled placement of fluid in wells and the like, the combination of: spaced packers adapted to engage the interior of said pipe and form a confined space therein; a tubular member supporting said packers, said tubular member having a wall port communicating with said confined space; a fluid delivery pipe having a flow control chamber at its lower end telescopically connected with said tubular member; slip means for supporting said tubular member in a pipe to be cleaned; and means associated with said control chamber and operable upon downward movement thereof relative to said tubular member for controlling the discharge of pressure fluid from said control chamber through said tubular member.

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