

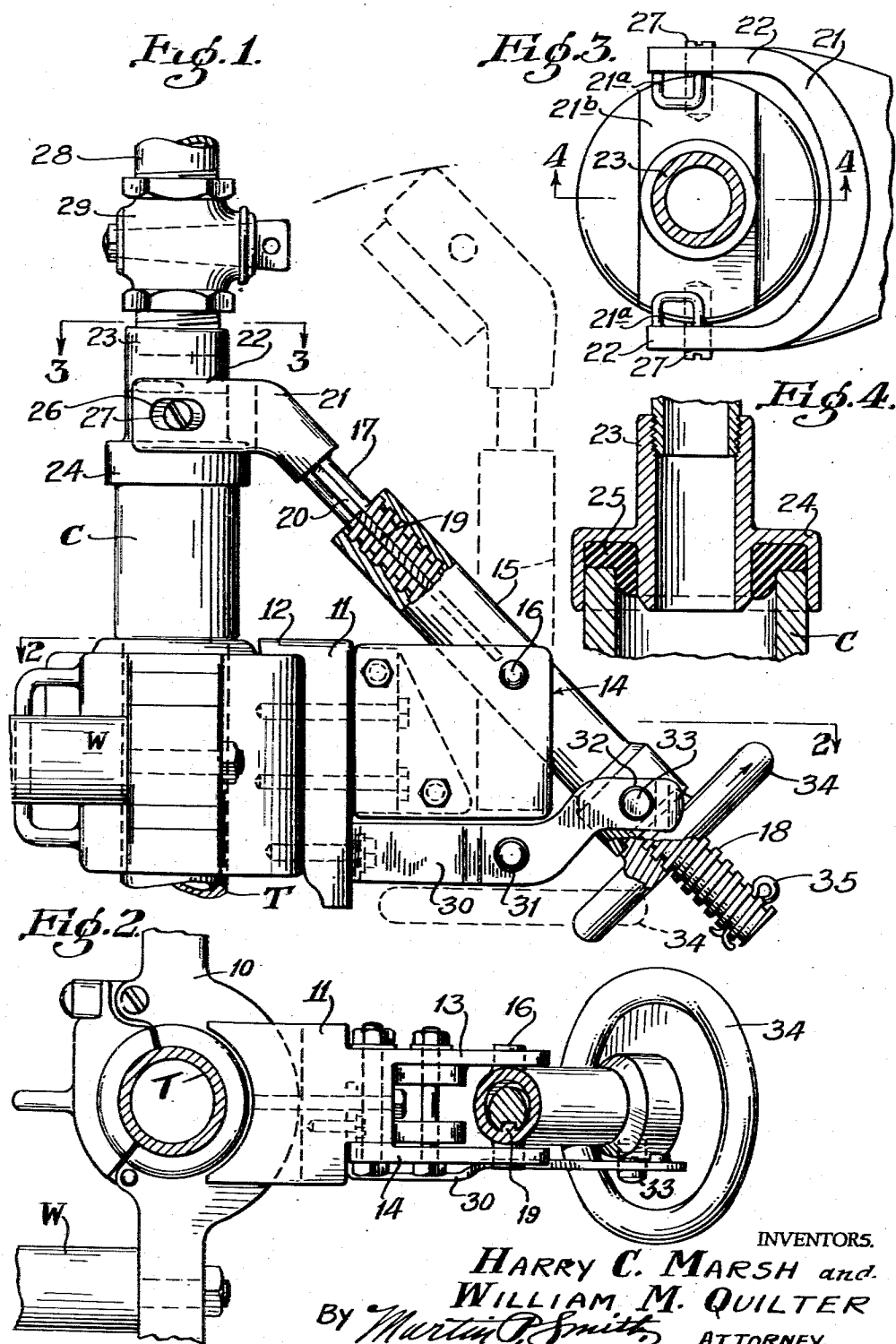
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H. C. MARSH ET AL

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TUBING PLUG

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INVENTORS.

HARRY C. MARSH and
WILLIAM M. QUILTER

By *Martin P. Smith*

ATTORNEY.

UNITED STATES PATENT OFFICE

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TUBING PLUG

Harry C. Marsh and William M. Quilter,
Long Beach, Calif.

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Our invention relates to a tubing plug and has for its principal object to provide a relatively simple, practical, and inexpensive device, that may be conveniently used for plugging tubes, particularly oil well tubes, so as to effectively close said tubes against the flow of gas, oil, water, and the like, and said plug being also applicable for use in the testing of tubing before the same is lowered into the well.

Further objects of our invention are, to provide a tubing plug that is mounted on the elevator utilized in raising and lowering the tubing, said plug normally occupying an out-of-the-way position and capable of being quickly shifted into position and actuated so as to plug the upper end of the tubing carried by the elevator and further, to combine with the plug relatively simple and readily operated means whereby the plug may be firmly secured in position upon the upper end of the tubing so as to cut off the flow of fluid pressure therethrough.

With the foregoing and other objects in view, our invention consists in certain novel features of construction and arrangement of parts that will be hereinafter more fully described and claimed and illustrated in the accompanying drawing in which:

Fig. 1 is a side elevational view of our improved tubing plug and showing the same associated with a conventional tubing elevator.

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

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

Fig. 4 is a vertical section taken on the line 4—4 of Fig. 3.

Referring by numerals to the accompanying drawing which illustrates a preferred embodiment of our invention, 10 designates a conventional tubing elevator of the type having two main parts hinged to each other so as to be clamped around a tube T just below the coupling member C that is mounted on the upper end of the tube and which is internally threaded for the reception of the next tube section, and suitably secured to one side of the elevator by means of bolts or otherwise is a plate 11 provided at its upper end with a horizontally disposed flange 12 that overlies that part of the elevator that carries the plug and formed integral with the upper portion of said plate adjacent one side thereof is an outwardly projecting vertically disposed plate 13.

A separately formed plate 14 that is practically identical with plate 13 is secured to plate 11

in spaced relation with respect to plate 13. A tube 15 is provided intermediate its ends with outwardly projecting trunnions 16 that are journaled in bearings formed in the plates 13 and 14 adjacent their upper outer corners and thus said tube is mounted to swing through a vertical plane.

Arranged to slide freely lengthwise through tube 15 is a rod 17, the lower portion of which is threaded as designated by 18. Rod 17 is held against rotary movement relative to tube 15 by means of a rib or key 19 that is arranged within said tube and which engages in a longitudinally disposed slot or keyway 20 in rod 17. Formed integral with or fixed to the upper end of rod 17 is a yoke 21, the parallel arms 22 of which are disposed on opposite sides of a short tube 23 and carried by the lower end of said tube is a cap 24. Seated within the upper portion of cap 24 around the lower portion of tube 23 is a packing ring or gasket 25 of rubber or flexible material and which is adapted to directly engage the upper end of the wall of the tubing or the coupling member C on the upper end thereof.

Formed in the arms 22 of yoke 21 are short horizontally disposed slots 26 that receive trunnions 27 that project from opposite sides of the tube 23 and thus said tube and cap 24 are permitted a limited amount of backward and forward movement when the cap is adjusted on the upper end of the tubing or coupling member carried thereby.

In order to limit the swinging movement of the cap carrying tube 23 on the arms 22 of yoke 21, ears 21a project inwardly from the arms 22 above the slots 26 and which ears overlie lugs 21b that are formed on top of the cap 24 to the sides of tube 23.

Seated in the upper end of tube 23 is the lower end of a tube 28 fitted with a valve 29 for controlling the discharge of fluid pressure from the tubing when the plug is positioned thereupon.

Secured to the lower portion of plate 11 is the inner end of an outwardly projecting latch 30 formed of resilient metal and formed in this latch in vertical alignment with the bearings for the trunnions 16 is an aperture 31. The outer end portion of latch 30 is extended upward a short distance and formed in the upwardly extended portion is an aperture 32.

Projecting from the side of the lower portion of tube 15 is a stud 33 which when the tube 15 and parts carried thereby are in an inclined position with the cap 24 seated on the upper end of the tubing, occupies aperture 32, and when

the tube 15 is not in service it occupies a substantially vertical position as illustrated by dotted lines in Fig. 1 and is retained in such position by the engagement of stud 33 in the aperture 31. The resilience of latch 30 enables it to be drawn outwardly away from the lower portion of tube 15 when the latter is swung from one position to another and to enable the stud 33 to enter the apertures in said latch.

Mounted for rotation in the lower end of tube 15 is the hub portion of a hand wheel 34 and said hub being threaded for engagement with the thread on rod 17 so that as the hand wheel is rotated, the threaded rod will be moved upwardly or downwardly depending upon direction of rotation of the hand wheel. A cotter pin 35 passes through the lower end of threaded rod 17 to prevent same from being screwed entirely through the hand wheel when the latter is rotated so as to move the threaded rod upwardly.

To counterbalance the weight of the plug, weights such as W are suitably secured to the end portions of the elevator and project outwardly therefrom on the side opposite that to which the plate 11 is secured.

When the elevator is in use for raising and lowering tubing, the tube 15 that carries the cap 24 occupies a substantially vertical position as illustrated by dotted lines in Fig. 1 with the stud 33 engaged in aperture 31 of the latch so that all parts of the plug occupy out-of-the-way positions.

To position the plug on the upper end of the tubing, the free end of latch 30 is flexed outwardly so that stud 33 is disengaged from aperture 31 and the tube 15 is then swung on its axis, the trunnions 16, and cap 24 is applied to the upper end of the wall of the tubing or the coupling member C on the upper end thereof.

Hand wheel 34 is now rotated so as to draw rod 17 downwardly through tube 15 and thus yoke 21 and its arms 22 will position cap 24 on the upper end of the tubing or coupling member carried thereby and as the packing 25 is compressed, a fluid pressure tight joint is produced between the plug and tubing.

Prior to the application of the plug to the tubing as just described, valve 29 is closed and thus when the plug is properly applied the escape of gas, oil, and water under pressure from the tubing is effectually prevented.

Obviously, the fluid pressure prevailing in the tubing may be permitted to escape by proper manipulation of valve 29.

It is to be noted that our improved tubing plug is mounted on the tubing elevator and thus the plug is positioned so that it may be quickly applied to the upper end of the tubing to cut off the flow of gas, oil or water therethrough.

It is the present general practice to provide tubing plugs that are stored in the upper portions of the oil well derrick and such practice is attended by danger that the plugs will accidentally fall, thereby endangering the workmen upon the platform around the rotary table at the base of the derrick, and this danger is entirely eliminated by our improved plug which is attached to and carried by the elevator.

To test tubing, the plug is applied to the upper end of a tube section and the elevator carrying the plug and the tube is now elevated and suitable connections are made to the lower end of the suspended tube so as to apply fluid pressure thereto and thus ascertain whether or not the tube is in useful condition.

Thus it will be seen that we have provided a tubing plug that is relatively simple in construction, inexpensive of manufacture and very effective in performing the functions for which it is intended.

It will be understood that minor changes in the size, form and construction of the various parts of our improved tubing plug, may be made and substituted for those herein shown and described, without departing from the spirit of our invention, the scope of which is set forth in the appended claims.

We claim as our invention:

1. The combination with an oil well tubing elevator, of a support secured to said elevator, a tube pivotally mounted on said support, a member passing through said tube, manually operable means for moving said member lengthwise through said tube and a cap loosely mounted on the upper end of said member for engaging the upper end of the tubing carried by said elevator.

2. In a tubing plug, the combination as set forth in claim 1 and with a latch for holding said tubular member in different positions.

3. In a tubing plug, the combination as set forth in claim 1 and with a valve connected to said cap.

4. An oil well tubing plug comprising a bracket adapted to be secured to a tubing elevator, a tubular member pivotally mounted on said bracket, a rod extending through said tubular member, a cap loosely mounted on the upper portion of said rod for engaging the upper end of the tubing carried by said elevator and manually operable means for moving the rod through said tube.

5. An oil well tubing plug as set forth in claim 4 and with a latch mounted on said bracket for engaging and maintaining said pivoted tube and parts carried thereby in different positions.

HARRY C. MARSH.

WILLIAM M. QUILTER.