Dec. 15, 1925. 1,565,518

E. D. SMYSER

TUBING BLEEDER

Filed June 12, 1925 2 Sheets-Sheet 1

Fig. 1.

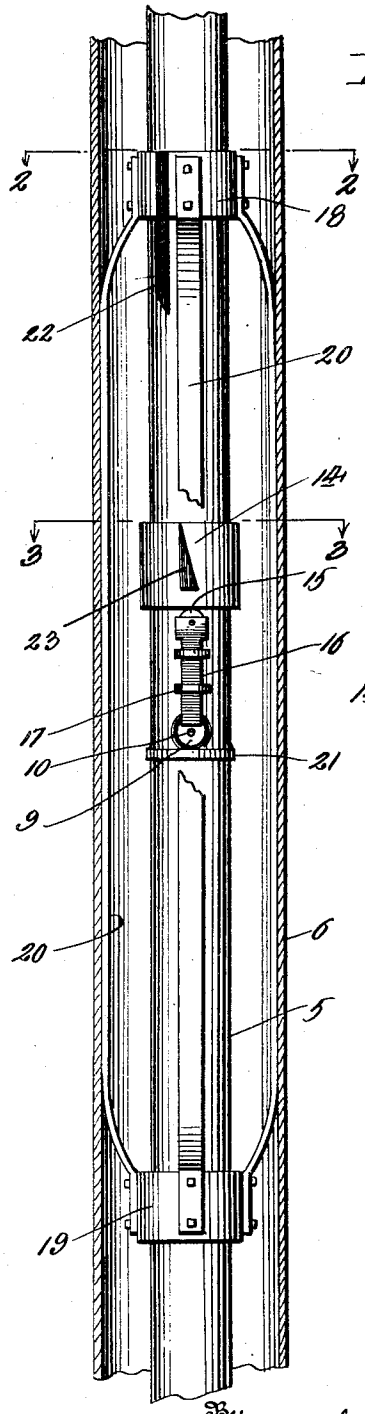


Fig. 2.

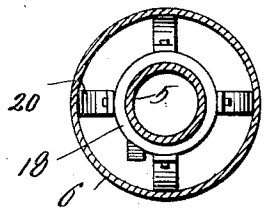
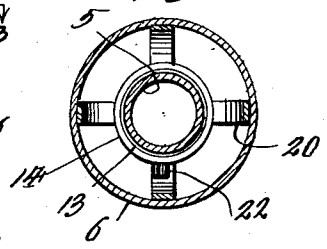


Fig. 3.



WITNESSES

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Filed June 12, 1925 2 Sheets-Sheet 2

Fig. 4.

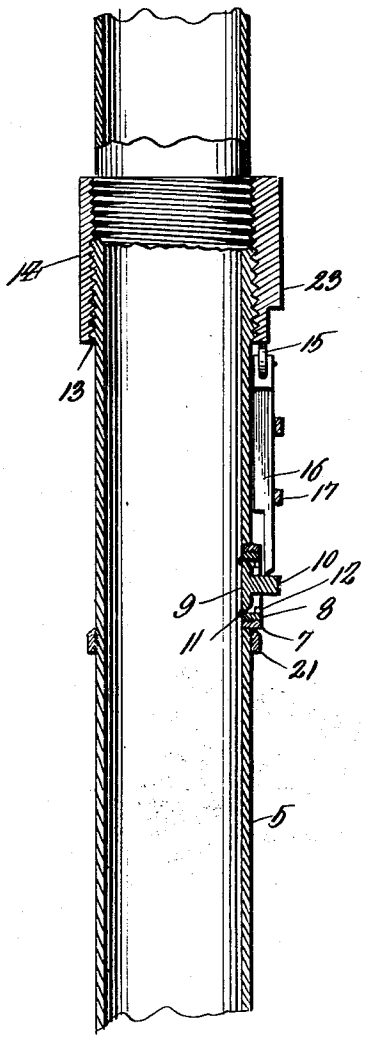


Fig. 5.

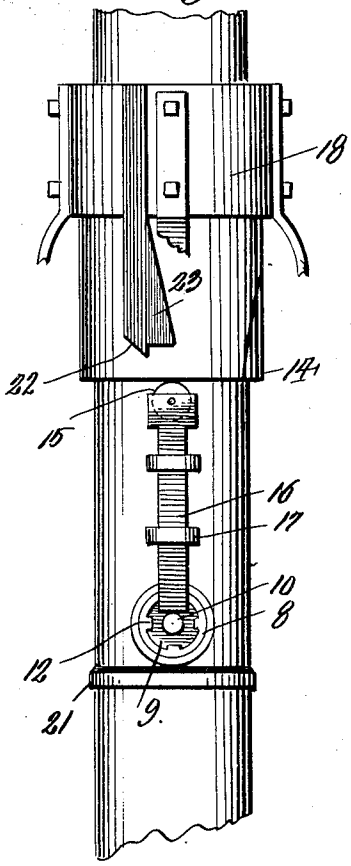
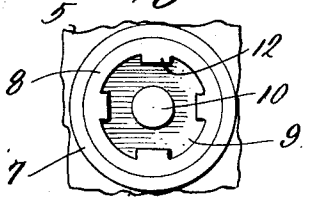


Fig. 6.



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UNITED STATES PATENT OFFICE.

ELMER D. SMYSER, OF FELLOWS, CALIFORNIA, ASSIGNOR OF ONE-THIRD TO ROY M. SMITH AND ONE-THIRD TO PERL E. WILLIAMS, BOTH OF FELLOWS, CALIFORNIA.

TUBING BLEEDER.

Application filed June 12, 1925. Serial No. 36,733.

To all whom it may concern:

Be it known that I, ELMER D. SMYSER, a citizen of the United States, residing at Fellows, in the county of Kern and State of California, have invented certain new and useful Improvements in Tubing Bleeders, of which the following is a specification.

This invention relates to certain new and useful improvements in tubing bleeders for oil wells and the like, and has particular reference to improvements in tubing bleeders of the type set forth in my copending application, Serial No. 19,744, filed March 31, 1925.

The primary object of the invention is to provide an improved and simplified form of tubing bleeder by means of which liquid may be drained from well tubes with facility and ease prior to removal of the tubes from the well casing for repairs or the like.

A further object of the invention is to provide a tubing bleeder of the above character which is extremely simple and durable in construction as well as efficient in operation so as to meet with all of the requirements for a successful commercial use.

A further object is to provide a tubing bleeder which is inexpensive to manufacture and install and which may be placed into operation without the requirement of special skill or tools.

With the above general objects in view, and others that will become apparent as the nature of the invention is better understood, the same consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawings and claimed.

In the drawings, wherein like reference characters indicate corresponding parts throughout the several views.

Figure 1 is a fragmentary elevational view, partly broken away, of a well tubing equipped with a bleeder constructed in accordance with the present invention, the tubing and bleeder being illustrated in operative position within a well casing shown in central longitudinal section,

Figure 2 is a transverse sectional view taken substantially upon line 2—2 of Figure 1,

Figure 3 is a view similar to Figure 2 taken substantially upon line 3—3 of Figure 1,

Figure 4 is a fragmentary longitudinal sectional view, partly in elevation, showing the well tubing and bleeder with parts of the latter in section and in side elevation,

Figure 5 is an elevational view of the device shown in Figure 4 looking to the left of the latter figure and illustrating other parts in operative association with parts shown in Figure 4 and,

Figure 6 is an enlarged fragmentary elevational view showing the bleeder valve or plug and its seat.

Referring more in detail to the drawings, 5 indicates the lower section of well or pump tubing which is arranged within the well casing 6 in the usual way, the tubing 5 being of considerably lesser size than the pump casing 6 and disposed concentrically within the latter so as to leave a cylindrical space between the tubing and the casing as clearly shown in Figures 2 and 3.

In accordance with the present invention the lower tubing section 5 is formed with an opening in the side thereof, and the wall of this opening is thickened to provide an outwardly projecting annular rib or flange 7 which acts as a reenforcement. This annular rib 7 is preferably produced by securing a ring in the bleeder tube opening and permanently by welding or the like as clearly shown in Figure 4, the ring being internally threaded for detachable reception of a removable annular seat member 8 whose opening is closed by the head 9 of a bleeder valve or plug which also includes a rigid outwardly projecting stem 10 preferably formed integral with the head 9. The head 9 of the bleeder plug or valve is preferably secured in place to close the opening of the seat member 8 by soldering or the like as indicated at 11 so that leaking is prevented under normal conditions, but whereby the bleeder plug or valve may be forcibly detached or dislodged from the seat member 8 when it is desired to drain the fluid from the pump tubing 5 above the bleeder valve opening. In other words, the solder at 11 constitutes a fragile means for securing the bleeder plug or valve in the seat member 8 so as to close the opening through the latter and prevent accidental dislodgement of the bleeder plug or valve from its seating position.

As shown clearly in Figures 5 and 6, the

seat member 8 is provided with a plurality of inwardly projecting lugs 12 for facilitating threading of said seat member 8 into the threaded opening of the pump tubing 5 by the use of a suitable tool or wrench. It is thus apparent that the seat member 8 and its plug or valve normally constitute a renewable unit which may be readily threaded into the opening of the pump tubing, and, after the plug or valve has been unseated, another unit may be put in place by removing the original seat ring 8.

The pump tubing 5 is formed with an external annular enlargement 13 above the bleeder opening as shown clearly in Figure 4, and this enlargement is externally threaded. Adjustably threaded upon the enlargement 13 is a sleeve 14 whose lower edge is engaged by an anti-friction roller 15 journaled in the upper end of a sliding bar which is mounted in guide loops 17 at one side of the well tubing 5 for movement longitudinally of the latter. The lower end of the sliding bar 16 engages the outwardly projecting stem of the bleeder plug or valve, and it is thus apparent that when the sleeve 14 is rotated in the direction for causing its downward movement relative to the tube 5, or when the tube 5 is rotated for causing downward movement of the sleeve 14 providing the latter is held from rotation, the bar 16 will be forced downwardly so as to cause displacement of the bleeder plug or valve from the seat member 8 so that the opening in the latter will be opened for allowing the fluid to pass out of the pump tubing 5 into the portion of the well casing 6 disposed therebelow.

In the operation of the device the sleeve 14 is preferably held against rotation while permitted to freely lower, while the pump tubing 5 is rotated. This operation is effected preferably by the means shown which includes a pair of collars 18 and 19 respectively slidably disposed upon the pump tubing 5 above and below the bleeder plug as shown clearly in Figure 1, which collars 18 and 19 are connected by a plurality of spaced longitudinally extending resilient strips or leaf springs 20 which are normally outwardly bowed or effective frictional engagement with the inner surface of the well casing 6. The pump tubing 5 is provided with an annular enlargement or collar 21 directly below the bleeder plug or valve, and this collar or enlargement forms an external stop which is engaged by the lower sleeve 19 when the pump tubing is lowered into the well casing so that the sleeve 19 will not engage the bleeder plug or valve and displace the same from its seat member 8.

The upper sleeve 18 is provided with a rigid depending arm 22, and the threaded sleeve 14 is provided with an outwardly projecting lug 23 as clearly shown in Figures 1 and 5. The arm 22 is of such length as to normally have its lower end spaced above the lug 23 as shown in Figure 1, but when the tubing 5 is elevated until the threaded sleeve 14 engages the sliding sleeve 18 as shown in Figure 5, the lug 23 will be disposed to engage the arm 22. In other words, when the pump tubing 5 is thus elevated, turning of said tubing will effect the movement of the lug 23 into engagement with the arm 22. Upon further turning of the tube 5, the arm 22 will engage the lug 23 for preventing turning of the threaded sleeve 14 so that the latter will remain stationary while the tubing 5 is threaded upwardly therethrough. When this takes place there is a relative sliding movement between the tube 5 and the bar 16 so that the sleeve 14 forces said bar 16 downwardly and effects displacement of the bleeder plug or valve. As soon as the bleeder plug or valve is displaced, the fluid will pass outwardly through the opening in the seat member 8 and thus be drained from the pump tubing. The sleeves 18 and 19 and spring strips 20 thus constitute a frame slidably mounted on the pump tube 5 and adapted to frictionally engage the well casing 6 with sufficient friction as to be restrained from rotation so that when the arm 22 is engaged with the lug 23 the sleeve 14 will be restrained from rotation upon rotation of the pump tubing 5, whereby the sleeve 14 is fed longitudinally of the pump tubing 5 for causing movement of the sliding rod 16 whereby the latter unseats the bleeder valve.

From the foregoing description it is believed that the construction and operation as well as the advantages of the present invention will be readily understood and appreciated by those skilled in the art.

Minor changes may be made without departing from the spirit and scope of the invention as claimed.

What I claim as new is:—

1. A tubing bleeder for wells including a tubing section having a side opening, a bleeder valve closing said opening, fragile means retaining said valve in closed position, and means operable upon turning of the tubing section for releasing said valve by destruction of said fragile means.

2. A tubing bleeder for wells including a tubing section having a side opening, a bleeder valve closing said opening, fragile means retaining said valve in closed position, and means operable upon turning of the tubing section for displacing said valve against the action of said fragile means.

3. In a tubing bleeder for wells, a bleeder valve unit including a seat member having an opening and adapted to be detachably secured in an opening of a tubing section, a valve plug closing the opening of said seat

member, and fragile means securing said valve plug in said seat member.

4. In a tubing bleeder for wells, a tubing section having a side opening provided with a threaded wall, a valve seat ring removably threaded in said opening, and a valve head closing said ring and having an outwardly projecting stem, and fragile means retaining said valve head in said ring.

5. A tubing bleeder for wells including a tubing section having a side opening, a bleeder valve closing said opening and having an outwardly extending projection, fragile means retaining said valve in closed position, a member engaged with the valve projection and displaceable relative to the tubing section for displacing the valve against the action of said fragile means, and means for displacing said member.

6. A tubing bleeder for wells including a tubing section having a side opening, a bleeder valve closing said opening and having an outwardly extending projection, fragile means retaining said valve in closed position, a member engaged with the valve projection and displaceable relative to the tubing section for displacing the valve against the action of said fragile means, and means for displacing said member, said member displacing means including a sleeve threaded on the tubing section and engaged with said displaceable member, an outwardly projecting lug on said threaded sleeve, a frame rotatably and slidably mounted on the tubing section and adapted for frictional engagement with the inner surface of a well casing whereby the frame is held against rotation when the tubing section is rotated, and an arm rigid with the frame and disposed to engage the lug on the threaded sleeve when the tubing section is elevated whereby turning of the tubing section will effect movement of the threaded sleeve on the tubing section and displacement of the displaceable member and the valve.

7. A tubing bleeder for wells including a tubing section having a side opening, a bleeder valve closing said opening and having an outwardly extending projection, fragile means retaining said valve in closed position, a member engaged with the valve projection and displaceable relative to the tubing section for displacing the valve against the action of said fragile means, and means for displacing said member, said displaceable member including a rod slidably mounted on the tubing section for movement longitudinally of the latter.

8. A tubing bleeder for wells including a tubing section having a side opening, a bleeder valve closing said opening and having an outwardly extending projection, fragile means retaining said valve in closed position, a member engaged with the valve projection and displaceable relative to the tubing section for displacing the valve against the action of said fragile means, and means for displacing said member, said member displacing means including a sleeve threaded on the tubing section and engaged with said displaceable member, an outwardly projecting lug on said threaded sleeve, a frame rotatably and slidably mounted on the tubing section and adapted for frictional engagement with the inner surface of a well casing whereby the frame is held against rotation when the tubing section is rotated, and an arm rigid with the frame and disposd to engage the lug on the threaded sleeve when the tubing section is elevated whereby turning of the tubing section will effect movement of the threaded sleeve on the tubing section and displacement of the displaceable member and the valve, and means for limiting upward movement of the frame relative to the tubing section for preventing displacement of the valve by said frame when the tubing section is lowered into the well casing.

In testimony whereof I affix my signature.

ELMER D. SMYSER.