

J. B. KLINE.

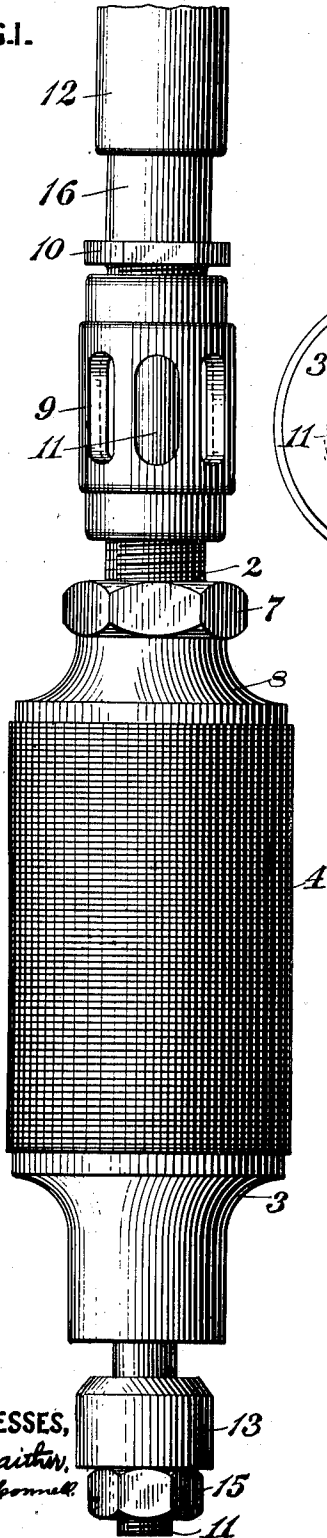
SWAB.

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1,004,280.

Patented Sept. 26, 1911.

FIG. 1.



WITNESSES,
F. E. Gaither,
Attorney at Law

FIG. 2.

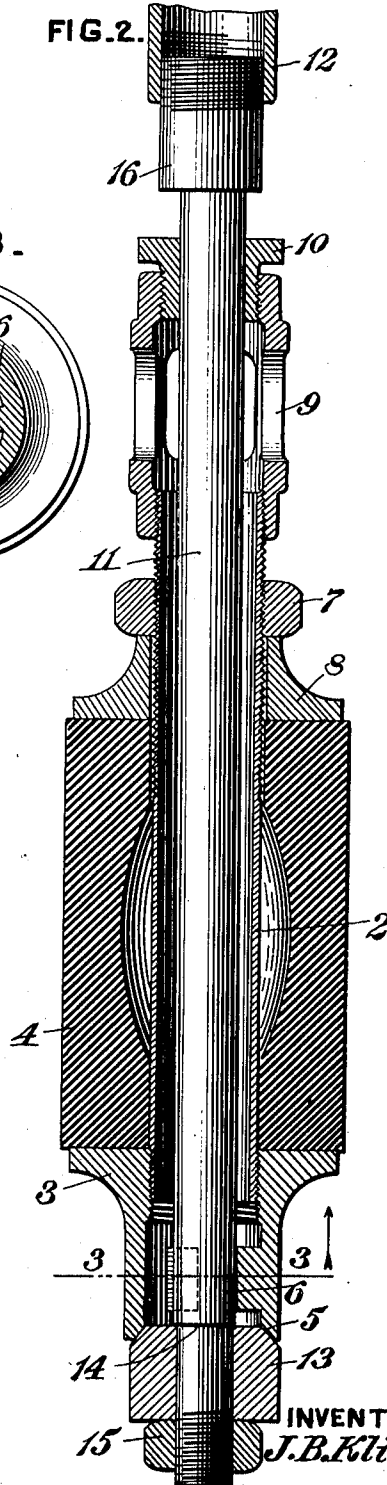
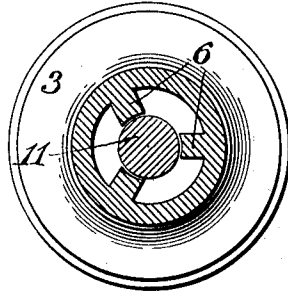


FIG. 3.



INVENTOR,
J. B. Kline,

By J. E. Gaither, Att'y.

UNITED STATES PATENT OFFICE.

JOHN B. KLINE, OF MILTON, WEST VIRGINIA, ASSIGNOR TO HERMAN B. HOGG, OF PARKERSBURG, WEST VIRGINIA.

SWAB.

1,004,280.

Specification of Letters Patent. Patented Sept. 26, 1911.

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To all whom it may concern:

Be it known that I, JOHN B. KLINE, a resident of Milton, in the county of Cabell and State of West Virginia, have invented certain new and useful Improvements in Swabs, of which the following is a specification.

The object of this invention is to provide an improved swab for oil and other deep wells in which the lifting or operating means is connected to the lower end of the swab body, the lifting hold being preferably effected by means of a valve, so that the passage through the swab is held positively closed throughout the upward stroke. Heretofore it has been usual to unite the operating means with the upper portion of the swab by a thread connection, which in many instances does not withstand the great weight and strain, the threads stripping and permitting the swab to drop back into the well. These difficulties are effectively overcome by the present invention.

In the accompanying drawing, Figure 1 is a side elevation of the swab, showing the position of the parts when being lowered in a well, and Fig. 2 is a longitudinal section of the same when being removed. Fig. 3 is a cross-section on line 3—3 of Fig. 2.

Referring to the drawings, 2 designates a body-forming tube having its lower end threaded into the tubular head 3, the flat top surface of the latter forming a fixed bottom abutment for the rubber annulus 4. The open lower end of head 3 is beveled to form valve-seat 5, and above this seat are the inwardly projecting ribs 6 which hold the operating rod centered in the swab. The upper portion of body 2 is threaded externally and adjustable thereon is nut 7 for compressing the freely movable follower 8 against the rubber, as shown. Threaded to the upper end of tube 2 is the laterally open cage 9, with bushing 10 fitting in the upper end thereof.

Extending vertically through the swab is the operating rod 11, and the rope socket or other lowering and lifting device, not shown, may be connected to the rod by socket 12. Rod 11 is of smaller section than the interior of tube 2, being held centered therein by bushing 10 and ribs 6, and secured to the lower end of the rod is the valve-forming head 13 having its upper end beveled to fit seat 5. In the present adapta-

tion, the lower extremity of rod 11 is reduced to form shoulder 14, and the valve head is fitted on this reduced portion and secured by nut 15. The upper end of the rod carries shoulder-forming enlargement 16, and the distance between this enlargement and valve 14 is somewhat greater than the distance between bushing 10 and valve seat 5, thus affording the rod limited longitudinal movement in the swab body.

When the swab is being lowered in a well casing the pressure of the fluid on head 3 forces the swab body upwardly on the operating rod, as in Fig. 1, and the fluid flows upwardly through the valve seat and around the rod through tube 2 and out through cage 9 into the space above the swab. When lowered as far as desired and the fluid is to be withdrawn, rod 11 is lifted, thus raising valve 13 to the valve seat and preventing the fluid from escaping downwardly through the body, and the weight of the fluid on follower 8 compresses the annulus longitudinally and expands it laterally, so that all the water above the swab is lifted out of the well.

It will be noted that the whole lifting force is on the lower end of the swab, and no vulnerable part is exposed to such stripping action as would result in releasing the swab and permitting it to drop back into the well.

I claim:

1. A swab comprising a tubular body open at its upper end, a tubular member secured to and depending beneath the lower end of the body with the upper extremity of said member forming an abutment at the exterior of the body and the lower extremity shaped to form a downwardly facing valve seat, a longitudinally compressible packing sleeve embracing the body and seated on said abutment, a follower adjustable on the body and engaging the upper end of the sleeve, a lifting rod having limited vertical play within the body and depending beneath the lower end of said seat-forming member, a bushing holding the rod centered in the upper portion of the body and inwardly projecting ribs in the bore of said tubular member beneath the lower extremity of said body for holding the lower portion of said rod centered, a valve secured to the lower extremity of the rod and located wholly beneath the said body and the said

forming member and opening downwardly from the seat and when open affording unobstructed upward clearance through the seat and body, and rod operating means.

- 5 2. A swab comprising a body-forming tube threaded at its upper and lower ends, a tubular head threaded to the lower end of the body tube with its upper extremity forming an upwardly facing abutment, projecting ribs in the head cavity and defining a vertical rod passage, the lower extremity of said head formed with a downwardly facing valve-seat, a lifting rod extending through the body-forming tube and through the guide formed by said ribs, a valve on the lower extremity of the rod adapted to

coöperate with said valve-seat, a rubber annulus on the body and bearing on said abutment-forming head, a follower embracing the body and engaging the upper end of the annulus, a nut adjustable on the body for engaging and holding said follower, a laterally open cage having threaded connection with the upper end of the body, and a guide at the upper end of the cage for holding the lifting rod centered therein.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN B. KLINE.

Witnesses:

H. B. VAUGHAN,
J. C. REYNOLDS.