S. WOOD.

SAND SCREEN FOR PUMPS.

APPLICATION FILED FEB. 27, 1919.

1,310,686.

Patented July 22, 1919.

2 SHEETS—SHEET 1.

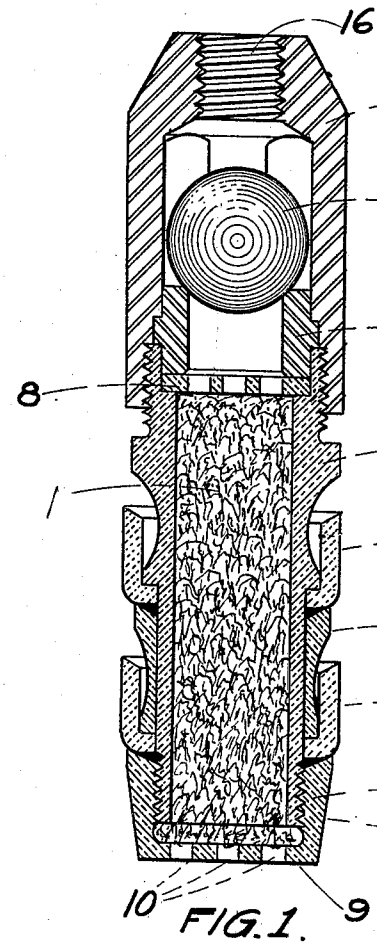


FIG. 1.

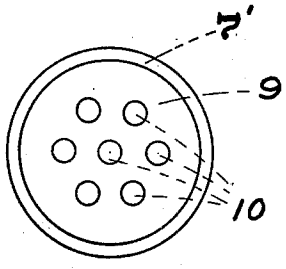


FIG. 2.

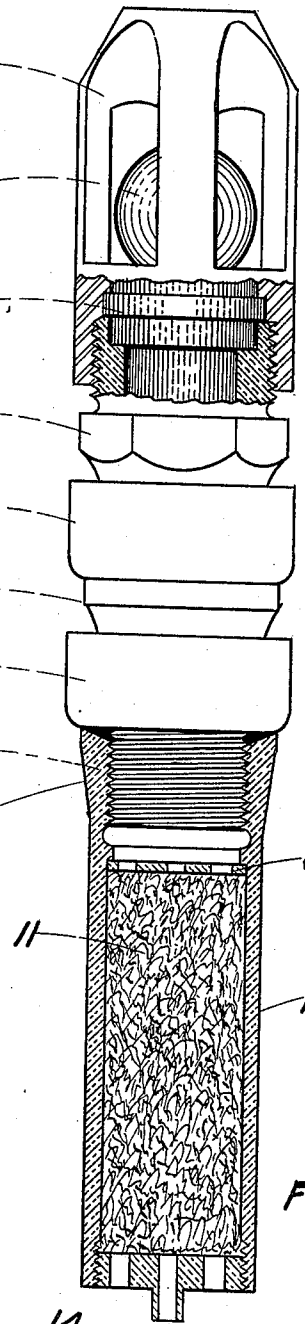


FIG. 3.

Inventor

SAMUEL WOOD

By E. R. Inman

Attorney

S. WOOD.

SAND SCREEN FOR PUMPS.

APPLICATION FILED FEB. 27, 1919.

1,310,686.

Patented July 22, 1919.

2 SHEETS—SHEET 2.

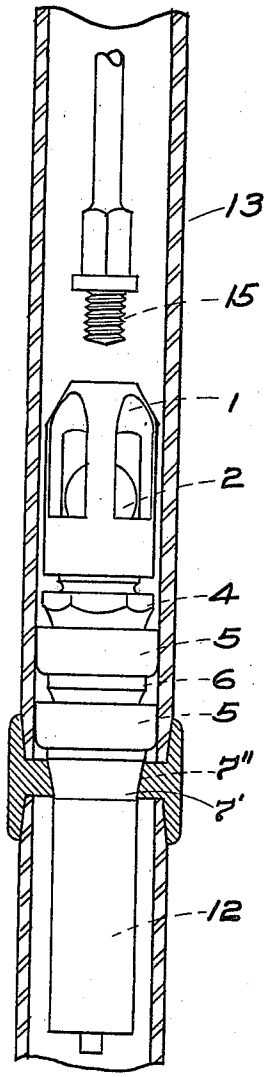


FIG. 4.

Inventor

SAMUEL WOOD

By E. R. Inman

Attorney

UNITED STATES PATENT OFFICE.

SAMUEL WOOD, OF PARKERS LANDING, PENNSYLVANIA, ASSIGNOR OF ONE-THIRD TO THE FRANKLIN VALVELESS ENGINE CO., OF FRANKLIN, PENNSYLVANIA, A CORPORATION OF PENNSYLVANIA.

SAND-SCREEN FOR PUMPS.

1,310,686. Specification of Letters Patent. Patented July 22, 1919.

Application filed February 27, 1919. Serial No. 279,576.

To all whom it may concern:

Be it known that I, SAMUEL WOOD, citizen of the United States, residing at Parkers Landing, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful Improvements in Sand-Screens for Pumps, of which the following is a specification.

This invention relates to sand screens for deep-well pumps, and is particularly adapted for use in oil-producing wells.

The primary object of this invention is, to provide an inexpensive, simple, and easily-applied sand screen for pumps, whereby sand and like material may be strained from the fluid that is being pumped, before it passes the piston and enters the barrel, or pump cylinder, thereby protecting said pumping mechanism from the rapid wear and other injurious action, that would otherwise be caused, in case said sand were not so eliminated.

Another object of my invention is, to provide a sand screen that may be easily withdrawn from the well for inspection, repair and cleaning, without the necessity of also withdrawing the tubing which carries said screen, or with which it coöperates.

With said objects in view I have devised the construction shown in the drawings which form a part hereof, the respective figures of which are as follows:

Figure 1 is a central, longitudinal section of the preferred form of my device.

Fig. 2 is an inverted plan view of Fig. 1.

Fig. 3 is a central, longitudinal section of a modified form of my improved sand screen.

Fig. 4 is an elevation of said modified form, together with a vertical section of the lower portion of the coöperating barrel in which said screen is operatively mounted.

The construction shown in said Figs. 1 and 2 is substantially as follows:

So far as outward appearance is concerned, this construction is the well-known and commonly-used type of lower or check-valve with which most oil well pumps are equipped. It comprises the usual elements, consisting of a cage 1, the ball valve 2, the reversible valve-seat 3, the barrel or body 4, the resilient suction or packing cups 5, the collar 6, and the nut 7; said nut 7 is provided with a conical periphery which forms a seating face 7′ which constitutes a plug to coöperate with the conical seat or opening 7″ (Fig. 4) at or adjacent to the lower end of the working barrel, 13.

In my improved construction, however, my inventive idea is practically embodied in this form of construction, by the provision and insertion of a perforated disk 8 in the upper end of the chamber of said barrel 4, preferably in such a manner that said disk is retained in position by said valve-seat 3. Said nut 7, instead of being open at the bottom, as it is in the usual construction, is also provided with a perforated bottom 9, the perforations in which are indicated by the reference numeral 10. Within the chamber of said barrel between said perforated disk 8 and said bottom wall 9, I place any suitable straining material 11, such as sponge, which prevents sand and like material from passing through the same with the actuated fluid, whereby only strained oil is permitted to enter said barrel 13.

This device may be readily removed from the tubing, in the usual manner, and the operation of such removal is well understood to those skilled in the art of operating oil well pumps.

The modified form shown in Fig. 3, is especially adapted to be applied to the usual valve, as it is found upon the market, and may be so applied by simply removing the nut 7 and substituting in place thereof the extension barrel 12, which is provided with an upper perforated disk 8′ and a lower perforated plug or bottom wall 14. Between said disk 8′ and said bottom wall 14 is inserted the straining medium 11, as and for the purpose above stated.

Said extension barrel 12 is formed, preferably near the upper end thereof into the conical seating portion 7′ which is identical in conformation with the corresponding seating portion of the preferred form, and it coöperates in the same manner with the conical seat 7″ at the lower end of the working barrel, as will be readily seen from an inspection of Fig. 4.

It will be readily noted that, in either form of construction, the barrel which contains the straining material is a portion of the valve structure proper, and is removable from the well in just the same way that

such valves are usually removed. Such removal is usually accomplished by screwing the lower, screw-threaded end of the sucker-rod 15 into the coöperating tapped hole in the top of the cage 1, and withdrawing the valve structure from the tubing and well by means of said rod.

I claim the following:

1. A sand screen for pumps comprising, in combination with a working barrel provided with an annular seat at the lower end thereof, a tubular structure having a portion of its periphery formed to coöperate with said seat, and to removably occupy the same, a perforated closure at each end of the chamber of said tubular structure, and a suitable straining medium within said chamber.

2. A sand screen for pumps comprising in combination, a working barrel, an annular seat within and adjacent to the lower end of said barrel adapted to coöperate with and to carry a check-valve structure, a check valve structure adapted to be carried by and readily removable from said seat, said valve-structure having as a feature thereof a chamber through which the fluid passes to enter said barrel, a straining medium in said chamber, and means for retaining said medium within said chamber.

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

SAMUEL WOOD.

Witnesses:

C. D. ALLISON,

FANNIE M. KELLY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."