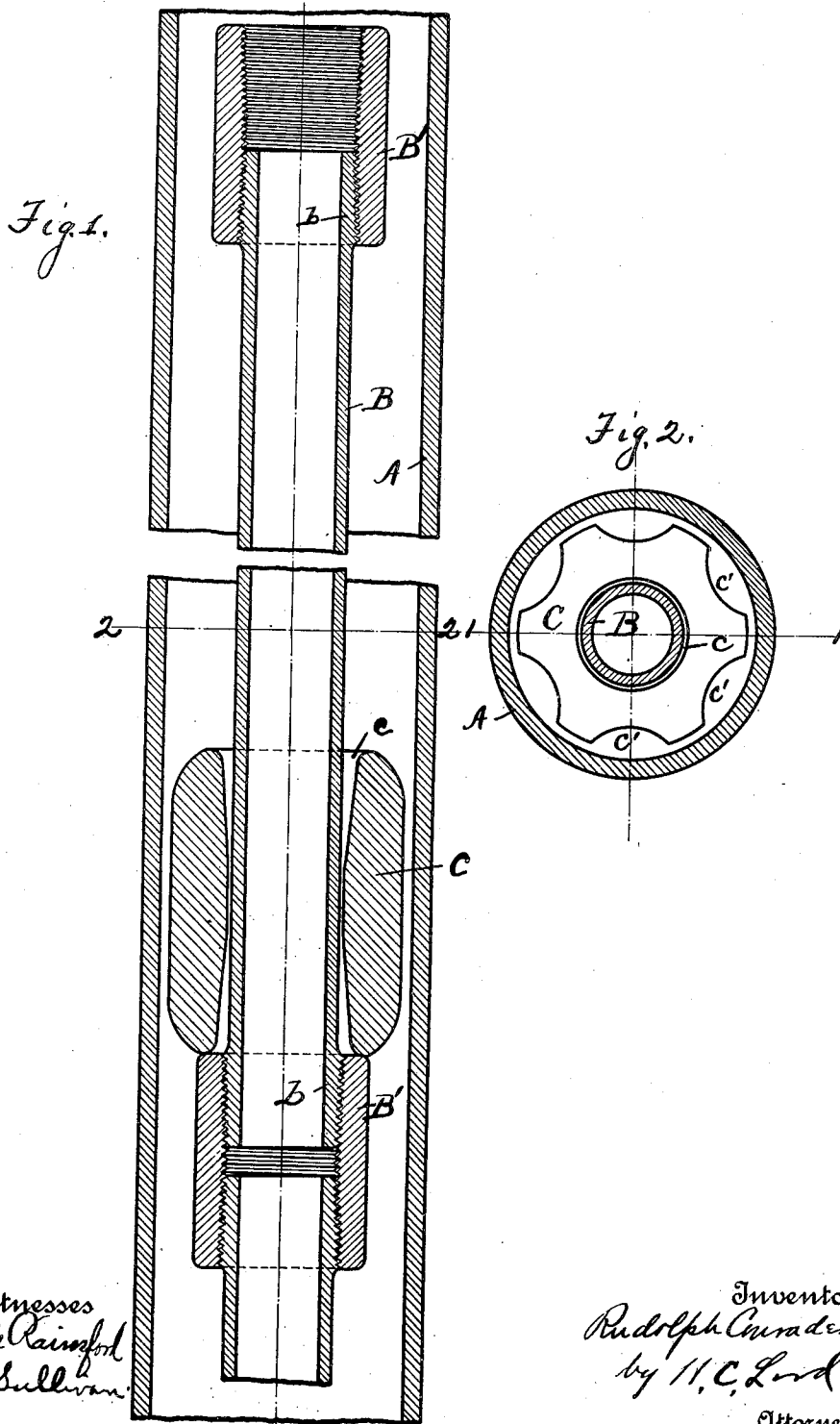


No. 831,143.

PATENTED SEPT. 18, 1906.

R. CONRADER.  
PUMPING APPARATUS.  
APPLICATION FILED DEC. 14, 1905.



# UNITED STATES PATENT OFFICE.

RUDOLPH CONRADER, OF ERIE, PENNSYLVANIA.

## PUMPING APPARATUS.

No. 831,143.

Specification of Letters Patent.

Patented Sept. 18, 1906.

Application filed December 14, 1905. Serial No. 291,717.

*To all whom it may concern:*

Be it known that I, RUDOLPH CONRADER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented new and useful Improvements in Pumping Apparatus, of which the following is a specification.

This invention relates to pumping apparatus; and it consists in certain improvements in the construction thereof, as will be hereinafter fully described, and pointed out in the claims.

Heretofore considerable difficulty has been encountered in pumping deep wells by reason of the bending or twisting of the sucker-rods when on the downward stroke or, in other words, when the sucker-rod is put under compression. This has been particularly troublesome with metallic sucker-rods, and as a result of this twisting or bending the tubing has often been worn entirely through.

The object of this invention is to obviate this difficulty.

The invention is illustrated in the accompanying drawings as follows:

Figure 1 shows a section on the line 1 1 in Fig. 2; Fig. 2, a section on the line 2 2 in Fig. 1.

A marks the tubing; B, the sucker-rod. The sucker-rod shown is a hollow one, and in order to get the full strength of the rod at the ends it is upset at *b*, so as to compensate for what is cut away with the thread. The rods are joined together by an ordinary threaded coupling B'.

A sleeve C is threaded to the sucker-rod B, the opening *c* through the sleeve being smaller than the enlargement *b*. In the manufacture of the sucker-rod the sleeve is put in place prior to the upsetting of the rod. The sleeve has the recesses *c'* to permit of movement of liquid past the sleeves. One of these sleeves is placed on each sucker-rod. It will be noted that it is free to move relatively to the tubing and to the sucker-rod, so that the sucker-rod will move through the sleeve if it presents less friction than the tub-

ing, or the sleeve will move in the tubing with the sucker-rod if there is less friction on the tubing than the weight of the sleeve.

What I claim as new is—

1. In a pumping apparatus, the combination with a sucker-rod and surrounding tube of a sleeve within the tubing around the rod for guiding the rod and through which the rod is free to move.

2. In a pumping apparatus, the combination with a sucker-rod; of a sleeve surrounding the rod and free to move relatively to the rod.

3. In a pumping apparatus, the combination of a sucker-rod and surrounding tube; of a sleeve arranged within the tube and around the rod for guiding the rod, said sleeve being free to move relatively to the tube and to the rod.

4. In a pumping apparatus, the combination with a sucker-rod having upset ends; of a sleeve surrounding the rod between the upset ends, the opening through the sleeve being smaller than the upset end.

5. In a pumping apparatus the combination with a sucker-rod having upset ends; of a sleeve surrounding the rod between the upset ends, the opening through the sleeve being smaller than the upset end.

6. In a pumping apparatus, the combination with a sucker-rod; of a recessed sleeve surrounding the rod and free to move relatively to the rod.

7. In a pumping apparatus the combination with a sucker-rod having upset ends; of a sleeve surrounding the rod between the upset ends, the opening through the sleeve being smaller than the upset end, said sleeve being provided with recesses.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

RUDOLPH CONRADER.

Witnesses:

H. C. LORD,  
G. M. RAINSFORD.