R. L. BURNS AND F. F. WINGER.
SUCKER ROD ATTACHMENT TO PREVENT SANDING UP OF WELL PUMPS.
APPLICATION FILED JULY 12, 1920.

1,379,165. Patented May 24, 1921.
To all whom it may concern:

Be it known that we, ROBERT LEE BURNS and FRED FREAMOND WINGER, citizens of the United States, residing at Taft, in the county of Kern and State of California, have invented certain new and useful Improvements in Sucker-Rod Attachments to Prevent Sanding-Up of Well-Pumps, of which the following is a specification.

Our invention relates, in general, to oil and other well-pumps, and particularly to an attachment to the sucker-rods, the object of which is to automatically lift the pump plunger out of the working-barrel whenever sand enters the pump in sufficient quantity to prevent its operation.

By thus lifting the plunger when beginning to sand up, the loss of a working barrel and parting of the rods are prevented.

Our present invention is an improvement on that device or attachment for this same purpose, which is disclosed in our Letters Patent of the United States No. 1,327,611, granted to us January 13, 1920. The object of our improvement is to adapt the device for the smooth or plain surfaced, polished rods now commonly in use, and thereby simplify and cheapen the cost of manufacture, as well as to provide for greater facility in adjustment and better maintenance, in comparison with the special construction contemplated and required by the pawl and ratchet form of grip of our previous patent.

To this end our invention consists in the novel attachment which we shall now fully describe by reference to the accompanying drawings, in which—

Figure 1 is an elevation, broken, of our attachment.

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

Fig. 3 is a vertical central section, enlarged, of the operative portion of the attachment.

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

1 is the body or stock of the attachment which is in the form of a tube, to the top of which is welded the cross bar 2 for the walking-beam (not shown) or other source of reciprocative motion usually employed in the operation of well pumps. At the lower end of the tubing 1 is welded or otherwise secured, the foot 3, which is split or made in two sections in the plane of its axis and is adapted to receive the smooth surfaced, polished rod 4 which passes axially through it and through the tube 1. Within the foot 3 is formed the downwardly tapering seat cavity 3' for the wedge slips 5, the backs 60 of which conform to and coat with the walls of the seat-cavity 3', while their faces conform to the surface of the rod 4, and are best provided with teeth 5'. The slips 5, in their movement in the foot are guided by cap screws 6 set into them, and which play in slots 8 made in the foot 3.

In the top of the slips are made small recesses 9 for seating the spring 7, the upper end of which bears against the roof of the seat cavity 3'.

10 is a clamp which embraces the split foot 3, being secured to one-half by the cap screws 11, and engaging the other half by means of a tightening screw 12.

By loosening the clamp 10, the halves of the foot 3 may separate to allow the rod 4 to be moved downward for setting it when desired, and in practice the tubing stock 1 will be split up a sufficient distance, as shown in Fig. 1 at 1' to allow the foot to be sprung apart, for inserting the slips.

The lower end of the rod 4 is adapted for connection, as indicated at 13, in Fig. 1, with the sucker-rod string extending to the pump-plunger.

The operation of the device is as follows:—It is suspended from the walking-beam or other source of reciprocative motion, by means of the cross bar 2 of the tubing stock 1. The lower end of the rod 4 is made fast at 13 to the sucker-rods, and then the walking-beam is set in motion. As long as the pump works normally the rod 4 is gripped by the slips 5 and does not change its position relatively to the foot 3 nor to the walking-beam. But as soon as the pump begins to sand up, the sucker-rods vary their stroke, being then supported and limited by the sand in the working barrel of the pump, with the result that on the down stroke, the said rods and the rod 4 remain stationary, while the foot 3 drops along the rod 4 the length of the pump stroke, the slips 5 rising in their seat and slipping along said rod. But at the end of the down-stroke, the slips 5 catch the rod 4 lower down and upon the up-stroke they descend and wedge in their seat and lift said rod together with the sucker-rods, so
that the pump-plunger is raised out of the barrel. This condition continues until the plunger is clear of the sand.

We claim:

1. A sucker-rod attachment for the described purpose comprising a stock adapted for suspension from a source of reciprocative motion, said stock having a split foot; a smooth rod fitted through said foot for relative linear movement therein and adapted for connection with the sucker-rod; a wedge slip housed within said foot and adapted to positively engage the smooth rod on the upward stroke of the stock and to slip it in the reverse direction; and a regulatable clamp embracing said foot whereby the smooth rod may be adjusted therein.

2. A sucker-rod attachment for the described purpose comprising a stock adapted for suspension from a source of reciprocative motion, said stock having a split foot with a downwardly tapered seat-cavity and a plurality of slots in its side walls leading into said cavity; a smooth rod fitted through said foot for relative linear movement therein and adapted for connection with the sucker-rod; a plurality of wedge slips housed within and costing with the seat-cavity of said stock, said slips being adapted to positively engage the smooth rod on the upward stroke of the stock and to slip it in the reverse direction; a guide member secured in said slip and playing in the slot of the foot; and a regulatable clamp embracing said foot, whereby the smooth rod may be adjusted therein.

3. A sucker-rod attachment for the described purpose comprising a stock adapted for suspension from a source of reciprocative motion, said stock having a split foot with a downwardly tapered seat-cavity and a plurality of slots in its side walls leading into said cavity; a smooth rod fitted through said foot for relative linear movement therein and adapted for connection with the sucker-rod; a plurality of wedge slips housed within and costing with the seat-cavity of said stock, said slips being adapted to positively engage the smooth rod on the upward stroke of the stock and to slip it in the reverse direction; a guide member secured to each slip and playing in its corresponding slot of the foot; a spring housed within the seat-cavity of the foot and bearing on the slips therein; and a regulatable clamp embracing said split foot, whereby the smooth rod may be adjusted therein.

In testimony whereof we have signed our names to this specification.

ROBERT LEE BURNS.
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