

(No Model.)

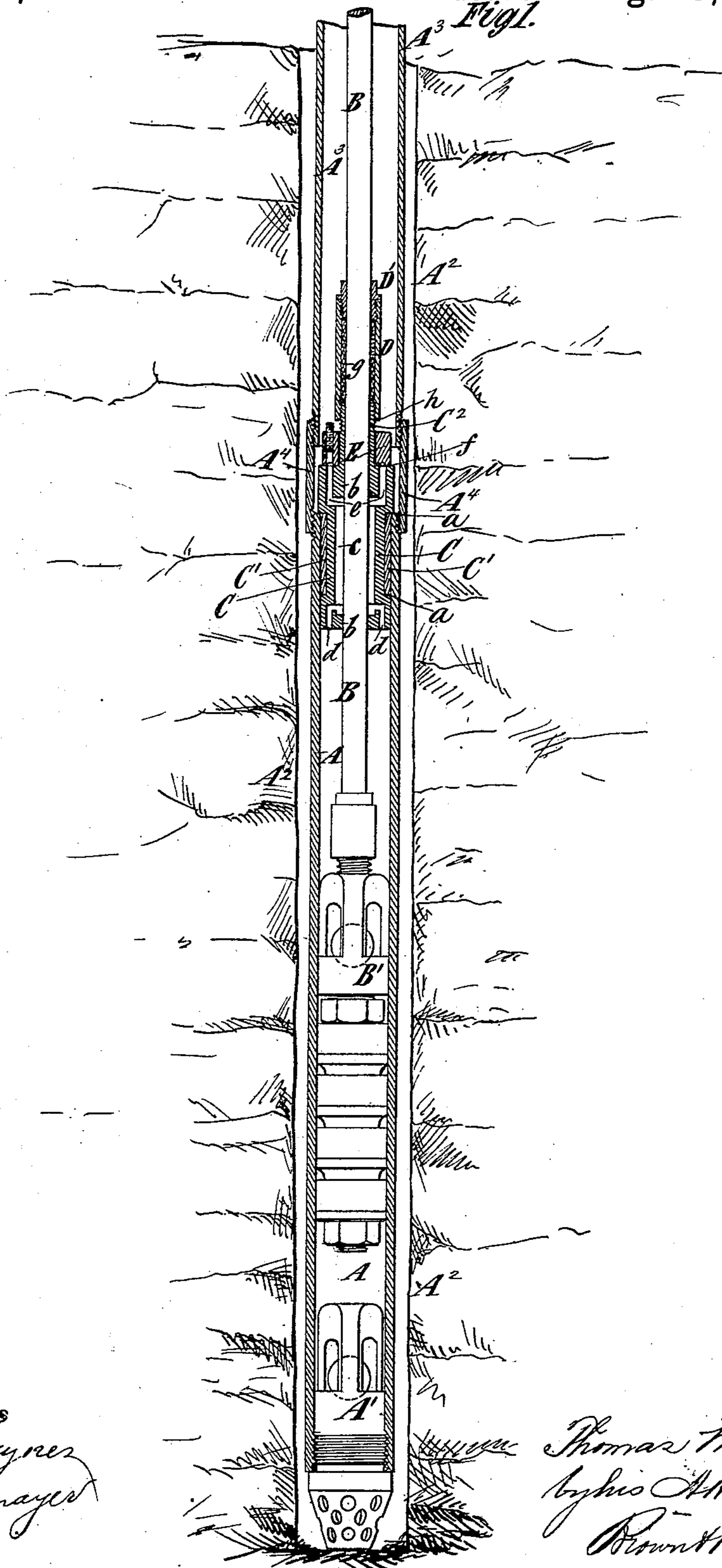
2 Sheets—Sheet 1.

T. W. DAVIES.

PUMP.

No. 246,091.

Patented Aug. 23, 1881.



Witnesses
J. R. Hayes
Ed. Glazmayer

Inventor
Thomas W. Davies
By his Attorneys
Brown & Brown

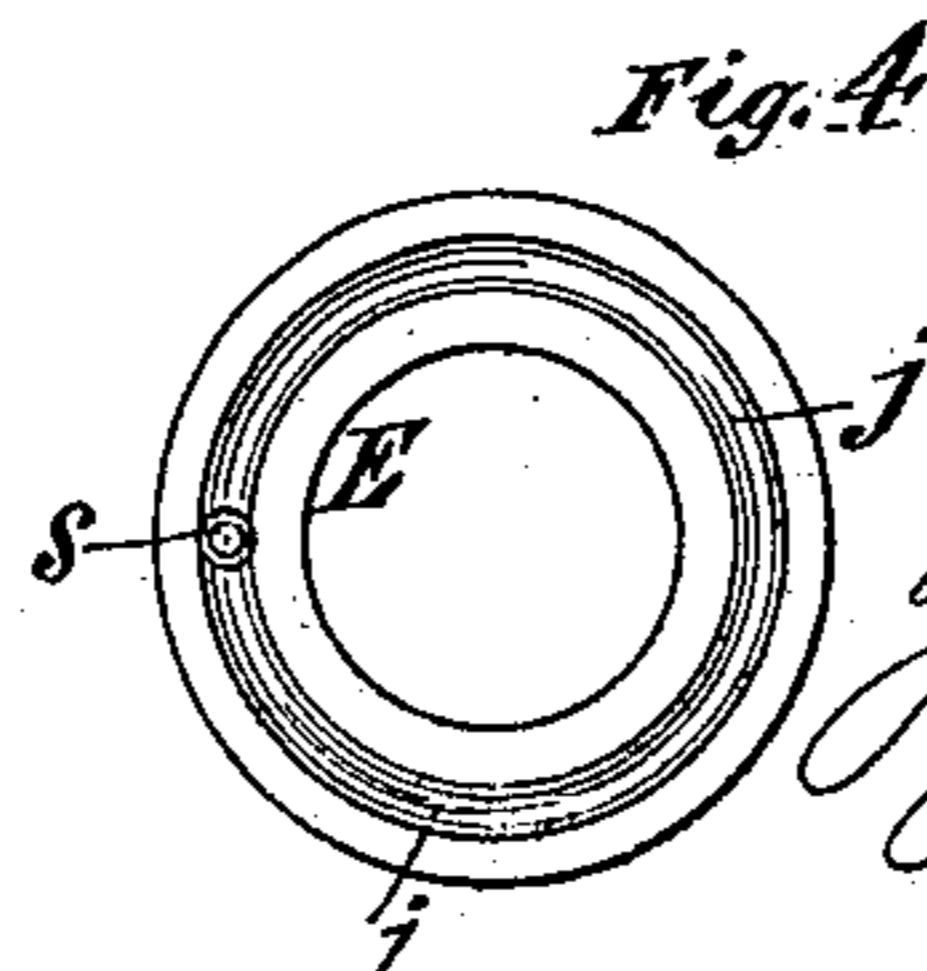
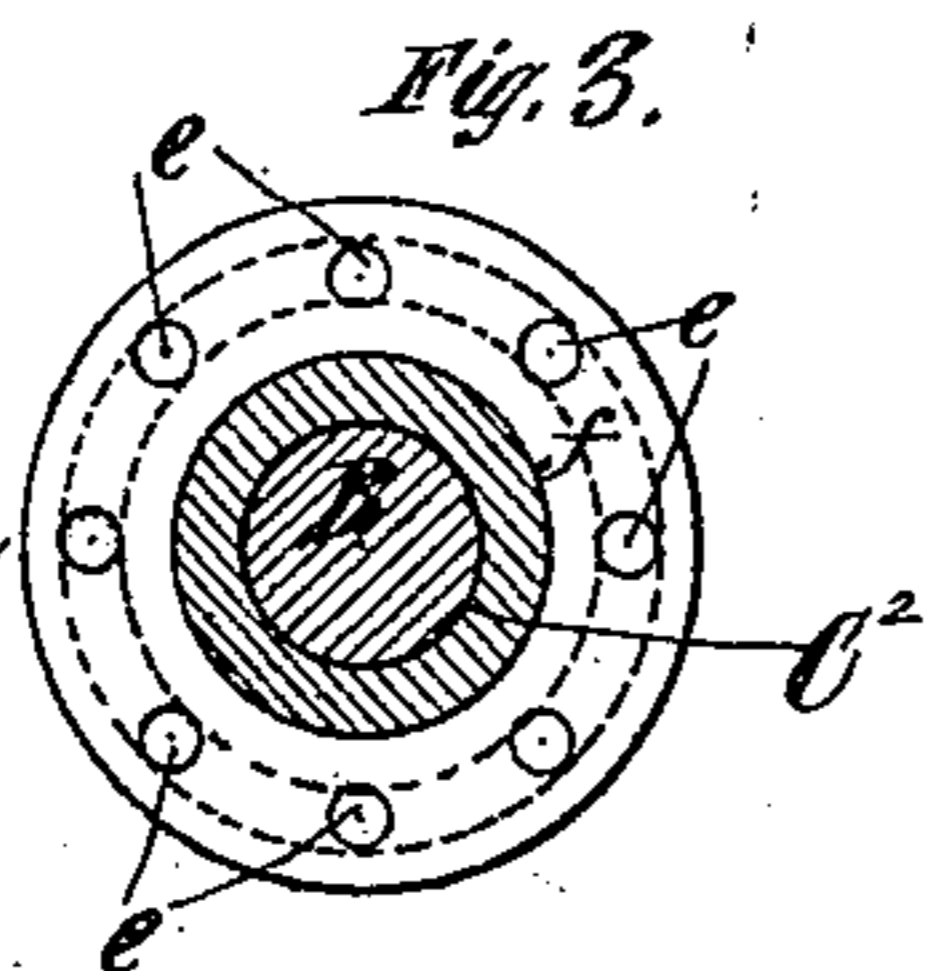
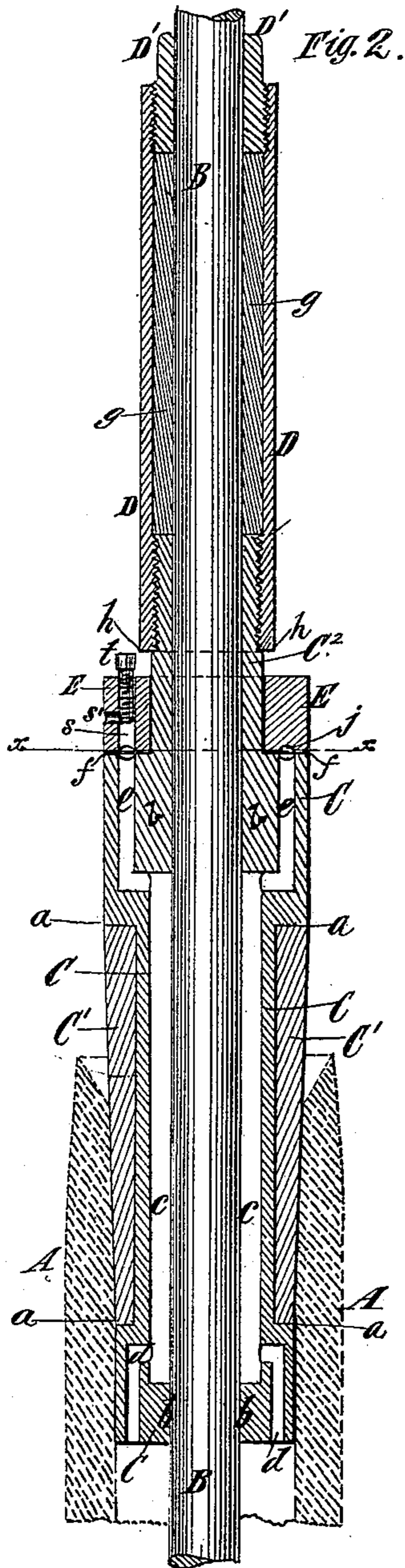
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2 Sheets—Sheet 2.

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Witnesses
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UNITED STATES PATENT OFFICE.

THOMAS W. DAVIES, OF BALDWIN, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO NATHANIEL W. KROUSE AND DAVID R. RODGERS, BOTH OF SAME PLACE.

PUMP.

SPECIFICATION forming part of Letters Patent No. 246,091, dated August 23, 1881.

Application filed May 16, 1881. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. DAVIES, of Baldwin, in the county of Butler and State of Pennsylvania, have invented certain new and
5 useful Improvements in Pumps, of which the following is a specification.

My invention is applicable more particularly to pumps for oil-wells, although it may be embodied in pumps for other purposes.

10 Pumps for oil-wells as commonly constructed are provided at the upper end of the pump or working barrel with a check or sustaining valve which is concentric with the piston-rod, and works up and down thereon to open and
15 close, and is provided with packing to make the piston-rod tight. The packing of such valves is subjected to great wear by the working of the piston-rod, and it is frequently necessary to draw the pump-rods for the purpose
20 of repacking the valve.

The principal object of the invention is to construct the check-valve so that it shall not be subject to wear from the working of the piston-rod; and to this end it consists in the
25 combination, with the working-barrel and piston-rod of a pump, of a head fitted to the barrel, through which the piston-rod works, and which is constructed with a valve-seat, and a socket or neck projecting above said seat and
30 receiving the piston-rod through it, and an annular valve fitting outside said socket or neck and adapted to work up and down thereon to open and close, whereby the valve is relieved of all wear from the movement of the piston-
35 rod.

The invention also consists in the combination, with the above, of a stuffing-box at the upper end of the socket or neck through which the piston-rod works, and in a novel construction
40 of the valve to afford provision for adjusting it so that it will leak slightly to prevent pumping the oil-well in which is the pump completely dry.

In the accompanying drawings, Figure 1
45 represents a central vertical section of the lower portion of an oil-well and a pump arranged therein and embodying my invention. Fig. 2 represents a similar section of the upper portion of the pump upon a larger scale. Fig.

3 represents a transverse section upon the dotted line *xx*, Fig. 2; and Fig. 4 represents a plan of the face of the check or sustaining valve.

Similar letters of reference designate corresponding parts in all the figures.

A designates a pump-barrel, which is usually of brass or copper, and has at its lower end a standing or foot valve, A'.

A² designates the well in which the pump is arranged, and of which the lower or bottom
60 portion only is here shown, and A³ designates the tubing, which is connected with the working-barrel A by a screw-coupling, A⁴. This tubing is continued to the surface of the ground, and the several lengths of which it is composed
65 are all connected by similar couplings.

B designates the piston or pump rod, which has at its lower end the working-valve B', and is composed of sections to extend it to the surface of the ground. The pump-rod may be
70 operated by mechanism commonly employed for such purpose.

Referring, now, more particularly to Fig. 2, it will be seen that the upper end of the barrel A is closed by a head composed of a casting, C, forming a body, and an outer packing
75 or sleeve, C', of leather, Babbitt metal, or any other suitable material which will fit tightly within the barrel. The middle portion of the body C, upon which is the packing C', is
80 smaller in diameter than the two end portions, and the packing is thereby retained in place, it being held between shoulders *aa*. The body C is constructed so as to snugly fit the piston-rod B at its two ends, *b*, and between the bearings *b* it has an internal chamber, *c*, into which
85 the oil passes through ports *d*, and from which it is delivered through ports *e* extending upward through the valve-seat *f*. The ports *d* and *e* should be sufficient in number so that
90 combined they will give the required area of opening for the passage of oil. The body C is prolonged above the valve-seat *f*, so as to form a neck, C², which receives the piston or pump rod B through it, and has screwed upon its
95 upper end a tube, D, which forms the stuffing-box, and in which packing *g* is compressed by a gland, D'. This stuffing-box may be made

of any desired length to contain a large quantity of packing and render frequent repacking unnecessary.

The ports *e*, through which the oil is delivered into the tube *A*³, rising above the pump, are controlled by an annular valve, *E*, made of metal, and having a ground joint with the seat *f*. The valve *E* fits snugly upon the neck *C*², and is free to work up and down thereon, its upward movement being limited by the shoulder *h*, formed by the lower end of the tube *D*.

It is very desirable in oil-well pumping not to pump the well dry, because when pumped dry the surface of the rock would become dry and the rock clogged by the coagulation of the oil by the atmospheric air. To prevent this the valve *E* should leak a little, and I have represented the valve as provided with a port, *s*, extending through it, and a side port, *s'*, communicating with the port *s*.

In the port *s* is fitted an adjusting-screw, *t*, which may be screwed down to more or less cut off the communication of the side port, *s'*, with the port *s*, and thus regulate the amount of leakage.

The valve *E* has in its face an annular groove, *j*, which is coincident with the ports *e*, and the parts of the face on both sides of said groove are ground down on the seat *f*, making it tight. The annular groove *j* permits of the fluid leaking through the port *s* and the ports *e*, in whatever position the valve may be.

It will be seen that when constructed according to my invention the valve *E* is entirely out of contact with the piston-rod, and is only subject to the wear produced by working upon the neck *C*².

It will be understood that whenever the pump is stopped the tubing *A*³, extending clear to the surface of the ground, is filled with oil, and the construction of the valve *E*, with

its waste-passages *s s'*, causes the oil left in the tube to flow back into the pump-barrel, and as the foot-valve and working-valve will never be absolutely tight, such oil will leak down through them and keep the oil-flowing surface of the rock clean and fresh.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with the working-barrel and piston-rod of a pump, of a head fitting the barrel through which said piston-rod works, and which is constructed with a valve-seat and a neck projecting above the seat and receiving said piston-rod through it, and an annular valve fitting said seat outside said neck, and adapted to work upon said neck, substantially as and for the purpose specified.

2. The combination, with the working-barrel and piston-rod of a pump, of a head fitting said barrel through which said piston-rod works, and which is constructed with a valve-seat and a neck provided with a stuffing-box through which said piston-rod works, and an annular valve fitting said seat and adapted to work upon said neck, substantially as specified.

3. The combination of the head *C*, having the valve-seat *f*, containing ports *e*, and also having the neck *C*², the piston-rod *B*, and the annular valve *E*, grooved upon its under side, substantially as specified.

4. The combination of the head *C*, having the valve-seat *f*, containing ports *e*, and also having the neck *C*², the piston-rod *B*, and the annular valve *E*, having the ports *s s'*, and the adjusting-screw *t*, for controlling the said ports *s s'*, substantially as specified.

THOMAS W. DAVIES.

Witnesses:

W. C. ADAMS, Jr.,
N. W. KROUSE.