

No. 751,049.

PATENTED FEB. 2, 1904.

B. L. BRINTON.
WELL PUMPING APPARATUS.
APPLICATION FILED APR. 14, 1903.

NO MODEL.

FIG. 1.

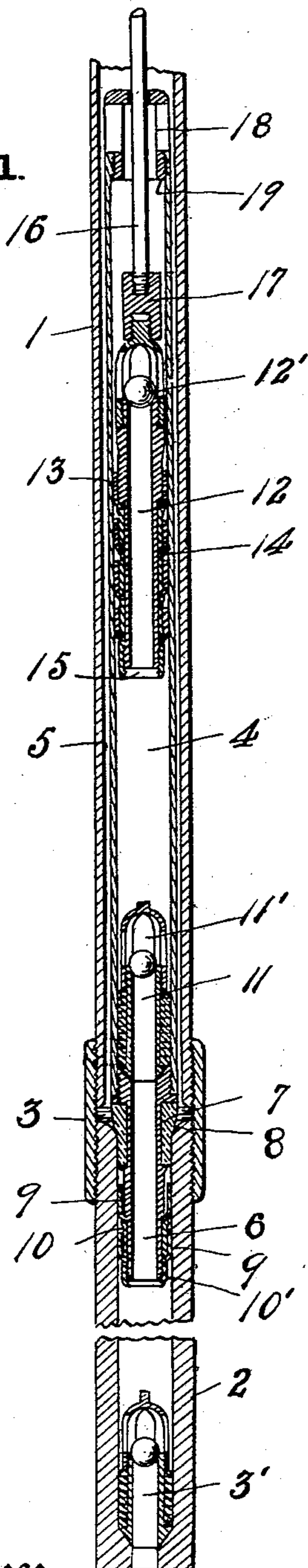
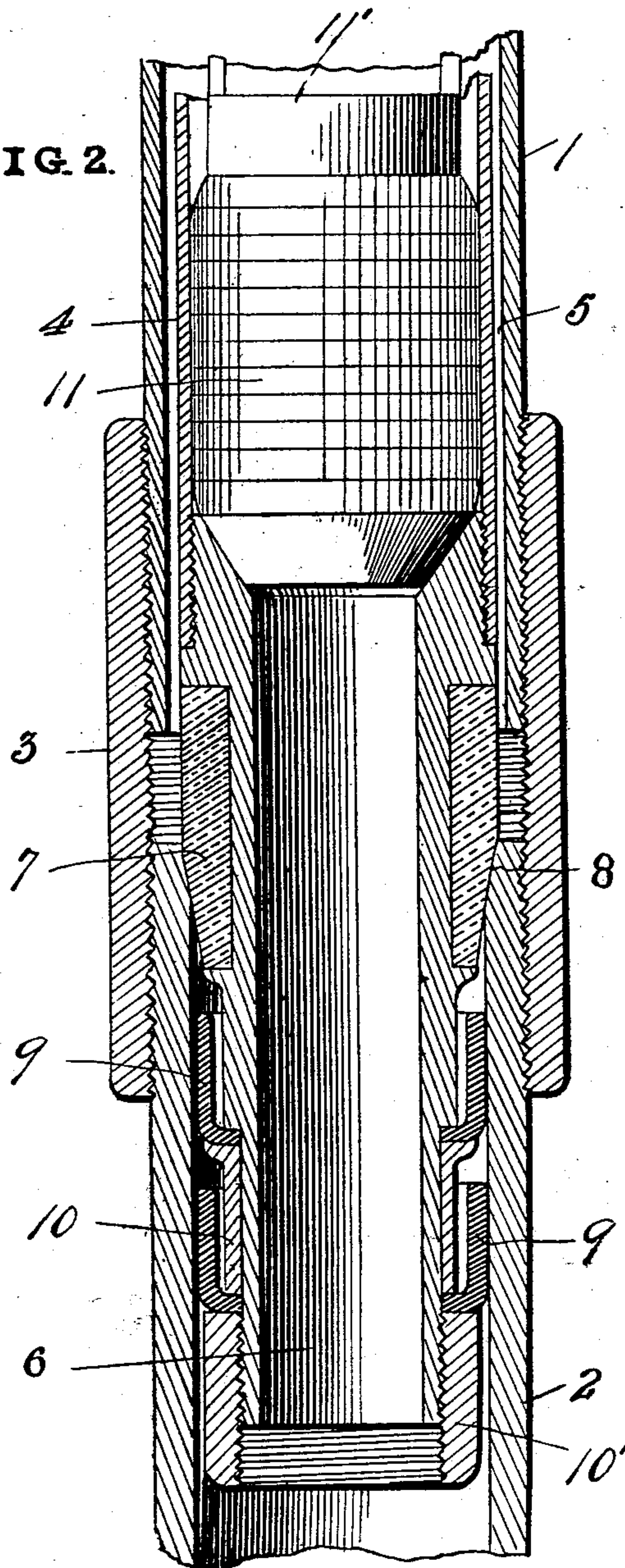


FIG. 2.



Witnesses

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WELL PUMPING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 751,049, dated February 2, 1904.

Application filed April 14, 1903. Serial No. 152,598. (No model.)

To all whom it may concern:

Be it known that I, BURTWIN L. BRINTON, of Bradford, Pennsylvania, have invented a new and useful Improvement in Well Pumping Apparatus, which invention is fully set forth in the following specification.

My invention relates to improvements in pumping apparatus for oil, gas, or water wells, and particularly to an improved working barrel, which may be readily introduced into and removed from the well. As usually arranged, especially in wells of great depth, the working barrel is attached to the lower end of the long string of well-tubing, and removal thereof for repairs or the substitution of a new working barrel necessitates the withdrawal of the entire length of tubing, a laborious and expensive operation. The removable working barrels devised to obviate this difficulty, and notably those known as "liner-barrels," are for the most part adapted to be introduced into the fixed working barrel attached to the lower end of the well-tubing and are necessarily of less diameter than the fixed working barrel. Consequently the plungers, cups, and valves employed in connection therewith are smaller than those of standard size, which are adapted to be used with the fixed working barrel and which are in common use in the oil country. The output of a well employing a removable working barrel thus arranged is accordingly very much less than when the plungers and valves of standard size are employed. A further objection to these liner working barrels is that the packings with which they are supplied and which engage the fixed working barrel are so positioned as to confine the pressure of the fluid which is being pumped on the inside of said liner working barrel, and this arrangement in deep wells is liable to and frequently does result in the splitting of the liner working barrel, which is necessarily made with thin walls.

My invention has as its particular object the elimination of these objectionable features and will best be understood by reference to the accompanying drawings, illustrating one embodiment of the inventive idea, wherein—

Figure 1 is a longitudinal sectional view,

and Fig. 2 is a portion of said longitudinal section on a larger scale.

In the drawings, 1 is the tubing extending to the top of the well, and 2 is the usual fixed working barrel or a tube of like length, which is connected to the tubing 1 in any suitable manner, as by sleeve 3, and which is of less internal diameter than said well-tubing. A standing valve 3' may be attached to the lower end of said fixed tube or working barrel 2, though it may be omitted, if desired. The removable working barrel 4, of steel or other suitable material, preferably about six feet in length, and having an internal diameter equal to that of the fixed working barrel 2 and an external diameter less than the internal diameter of the tubing 1 is inserted within the last-mentioned tubing, leaving an annular space 5 between said removable barrel 4 and said tubing.

To the lower end of the removable working barrel 4 is screwed or otherwise suitably attached a short tube 6, on which is cast or fixed in any suitable manner a packing 7, of lead or other material. This packing 7 is tapered to engage the upper end 8 of the fixed tube or working barrel 2, which is beveled, as shown, to receive the packing. Additional packing means other than that of the packing 7 may be provided, if desired. For example, packing-cups 9 9, of leather or other suitable material, may be secured between shoulders on the tube 6 and a ring 10, the latter being tightly clamped in position by a perforated screw-cap 10', as will be readily understood. At the upper end of tube 6 is attached a suitable standing valve 11 of standard size, the ball-valve herein shown being confined in cage 11'.

Fitting in the removable working barrel 4 is a hollow reciprocating plunger 12, suitably packed in said barrel by cups 13, rings 14 being interposed therebetween, and perforated cap 15 retaining said cups and rings in place. The plunger is provided in its upper portion with a suitable working valve 12' of standard size, here shown as a ball-valve and substantially identical with the standing valve 11, heretofore referred to. A coupling 17 is screwed to the upper end of said plunger 12

and connects the latter with rod 16, which passes through an opening in spider 18, the latter being screwed or otherwise suitably attached to the upper end of the removable working barrel 4. Said spider is provided with a shoulder 19, against which coupling 17 is adapted to contact when it is desired to remove the working barrel 4 from the well.

The operation is as follows: The plunger 12 is connected to and reciprocated in the removable working barrel 4 by the walking-beam (not shown) in the usual manner. The upward stroke of the plunger causes the oil to pass up through fixed tube 2, standing valve 11, and into the removable working barrel 4. The succeeding downward stroke causes the oil to pass through plunger 12 and from thence out into the tubing 1, to the top of which it is raised by the succeeding up-strokes of the plunger.

In oil-wells, for example, in which the standard size tubing employed has an interior diameter of two inches and the standard size fixed working barrel an interior diameter of one and three-fourths inches, it will be readily appreciated that my removable working barrel, having the same interior diameter as the fixed working barrel, may be constructed of very thin material in order to be introduced into the well-tubing and allow the space between the removable working barrel and the tubing. This thinness of the removable working barrel is, however, compensated for by the external pressure of the column of liquid in space 5 on the barrel, which completely obviates all danger of the splitting of the barrel due to the internal pressure developed by raising the fluid to the top of the well-tubing.

It is seen, therefore, that independent of the minimum amount of material required in its manufacture, with a consequent decrease in cost and the facility with which it may be introduced into and removed from wells, my removable working barrel, with its equipment of standard-size valves and plungers, will result in an output as great as could be obtained if

the standard-size plungers and valves were employed in connection with a fixed working barrel in its normal condition.

What is claimed is—

1. In well pumping apparatus, the combination of the well-tubing, a fixed working barrel at the bottom thereof, a removable working barrel having the same internal diameter as the fixed working barrel and an external diameter less than the internal diameter of the tubing.

2. In well pumping apparatus, the combination of the well-tubing, a fixed working barrel at the bottom thereof, a removable working barrel having the same internal diameter as and bearing at its lower end against the fixed working barrel and an external diameter less than the internal diameter of the tubing.

3. In well pumping apparatus, the combination of the well-tubing, a fixed working barrel at the bottom thereof, a removable working barrel having the same internal diameter as the fixed working barrel and an external diameter less than the internal diameter of the tubing, and a packing at the lower end of said removable working barrel adapted to engage the upper end of the fixed working barrel and packing the joints between the two barrels.

4. In well pumping apparatus, the combination of the well-tubing, a fixed working barrel or tube of less internal diameter than and secured to the lower end of said tubing, a removable working barrel of an internal diameter equal to that of the said fixed working barrel or tube, and a packing in the lower portion of said removable working barrel and engaging the upper end of said fixed working barrel or tube and packing the joints between the barrels.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

BURTWIN L. BRINTON.

Witnesses:

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