No. 817,543. PATENTED APR. 10, 1906.

R. E. BOLE.

OIL WELL PUMP.

APPLICATION FILED MAR. 10, 1905.

Fig. 1.

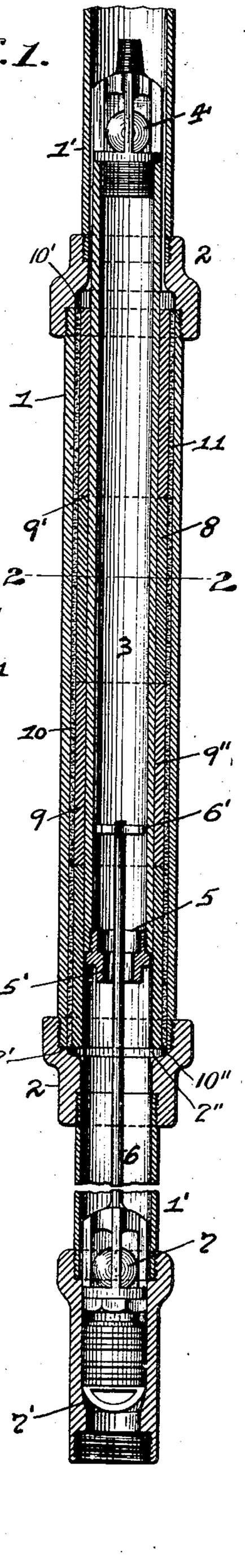


Fig. 2.

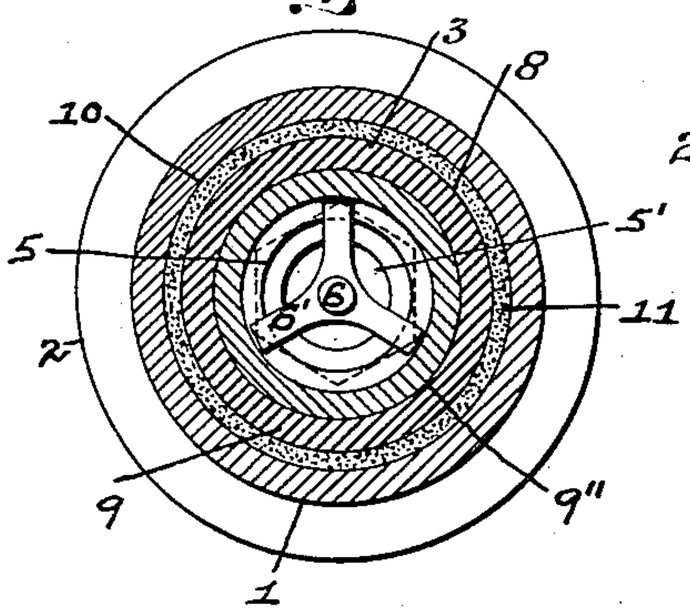


Fig. 4.

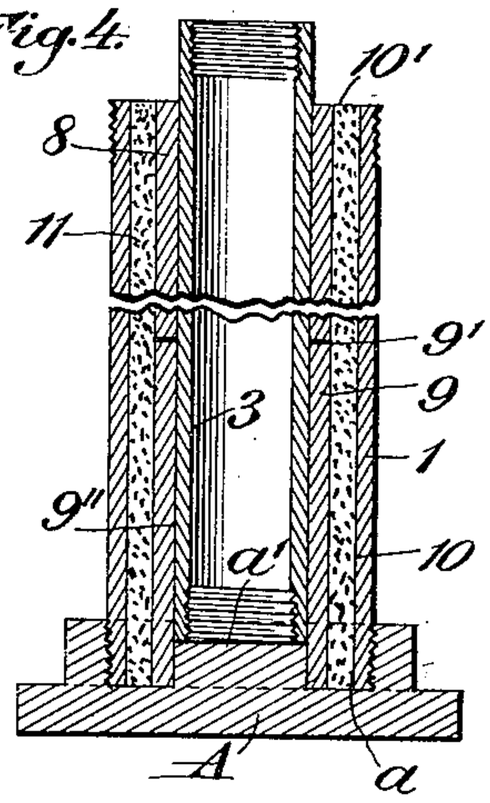


Fig. 3.

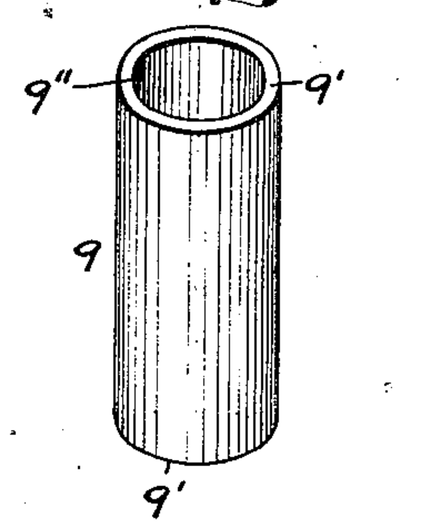
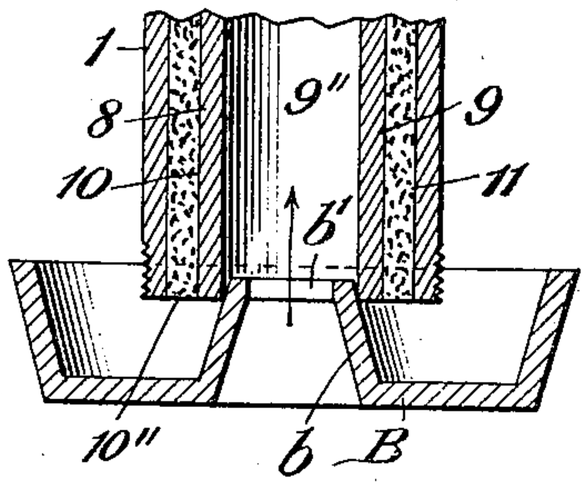


Fig. 5.



WITNESSES

Walter Samaries

R. S. Applehelm

INVENTOR

Robert E. Bole.

By J. N. Cooke,

Attorney.

UNITED STATES PATENT OFFICE.

ROBERT E. BOLE, OF BAKERSFIELD, CALIFORNIA.

OIL-WELL PUMP.

No. 817,543. Specification of Letters Patent. Patented April 10, 1906.

Application filed March 10, 1905. Serial No. 249,365.

To all whom it may concern:

Be it known that I, ROBERT E. BOLE, a citizen of the United States, residing at the city of Bakersfield, in the county of Kern and the State of California, have invented a new and useful Pump for Oil-Wells, of which the following is a specification.

My invention relates to a pump and has special reference to such a pump as is used in the pumping of oil and other like Artesian wells.

Heretofore the working barrel of the ordinary oil-well pump has been simply bored out as true as a lathe or boring-mill would permit and the plunger has been fitted with leather, canvas, or other cups which would conform to any unevenness in the barrel or pump, and where a well was clean and free from sand or grit such a device has been in satisfactory use and has answered in the usual or ordinary cases. It has been found, though, in many localities where oil is found in loose or open sands that the above-mentioned device was inadequate and utterly useless on account of such sand coming in with the oil and other methods have been called for, the most efficient of which has been a barrel or pump of ordinary length and a wrought or steel pipe-plunger of about the same length as the barrel, which plunger is turned and fitted closely and of such a perfect fit in the barrel that it is without the slightest vibration and being shoved from end to end without sticking or becoming clogged. Such a perfect fit will thus prevent the sand or grit from getting between the barrel or pump and plunger, and so long as it can be kept in this condition it will prevent the barrel or pump and plunger from wearing out and the well will pump until said barrel or pump and plunger are worn out and become unfit for use. Such a device has, however, been found to be much trouble in getting these barrels or pumps bored out perfectly true and straight, for should the bar for boring out these barrels or pumps spring out or a hard or soft place in barrel or pump develop it would allow the bar to spring away from or dig into this hard or soft place, thereby making an unevenness opposite to it, and the plunger when turned to fit the barrel would have to be turned to fit into the smallest part of said barrel, which would leave the plunger to fit only at the said tight place or point, so that when it is put into the well and in pumping it will allow the sand and grit to get between the plunger and lining of the barrel or pump, thereby grinding the plunger and pump out very rapidly, as such sand and grit acts like emery and will in many cases wear out a pump in less than a day, although in other and unusual cases where an almost perfect fit was secured from end to end of barrel the plunger and pump have lasted for many weeks in the same well.

In order to secure a perfectly-fitting barrel or plunger at all times and secure a perfect fit from end to end of the same, and thus prevent the sand pumped with the oil from getting in between the barrel and plunger of the pump, is what my improved pump is designed for, and it consists in boring out a number of sectional rings of about a foot in length so that they are perfectly true on their inner faces and also turning or facing each end of said sections so that they are perfectly true at this part. The plunger is turned to a perfect fit for these sections of rings, and a cage formed of a casing or pipe is provided of a proper length and of a size sufficiently large to allow the inserting or pouring of a molten liquid or other suitable material in the space between the rings and casing, which will become set and hard within said space when packed or cooled. The ring-sections are placed over the plunger and when so placed are inserted in the casing in proper position against each other, after which the hardening material is placed between said rings and casing, and thus said rings are quickly and securely held in place in order to secure a perfectly-true pump and a perfect fit from end to end thereof, and when at any time the pump becomes worn out the hardening material can be heated, so as to melt out and new sectional rings inserted and run up again in like manner from time to time.

Therefore to enable those skilled in the art to which my invention appertains to construct and use my improved pump, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a longitudinal central section of my improved pump in its completed form and ready for operation. Fig. 2 is a cross-section of the same on the line 2 2, Fig. 1. Fig. 3 is a perspective view of one of the sectional rings. Figs. 4 and 5 are views show-

ing the manner of inserting and removing the filling material in forming the pump.

Like symbols of reference herein indicate like parts in each of the figures of the drawings.

As illustrated in the drawings, 1 represents the outer pipe or casing, which is provided with a reducing-collar 2 at its upper and lower ends and into which said casing is screwed in the ordinary manner, while into the opposite ends of these collars the usual tubing 1′ is also secured in the usual manner. Within this casing 1 is the plunger 3, which is cylindrical in cross-section and preferably formed of steel tube or pipe, which plunger has its outer face turned and is of the same character and material and does its work in the same manner as the plungers in this class of work now in use. At the upper end of this plunger 3 is the upper valve 4, which is secured thereto in the usual manner, and the lower end of the plunger is provided with a bushing or nut 5, having an opening 5′ in the lower end of the same, through which the drawing rod or stem 6 passes, and is provided with the head 6′ at its upper end for the purpose of withdrawing the standing valve 7 at its lower end from the well when the plunger is taken out of the well, while said lower or standing valve 7 is held stationary when in operation within a valve-seat 7′, secured at the lower end of the casing 1.

Within the casing 1 and fitting perfectly around the plunger 3 is the lining 8, which is formed of a series of sectional rings 9 and preferably of cast metal of about one foot in length and smoothly faced or surfaced at each of their ends 9′, and such rings are also bored out on their inner faces 9″ in order to form a perfect fit around said plunger.

When my improved pump is to be formed, the casing 1 is held within a recess or seat *a* of a block A, resting upon the ground or floor, and the plunger 3 is run down said casing and onto a head *a′* in the center of said block. After this is done the liners 9 are placed around said plunger 3 and above each other, with the lower one resting in the seat *a′* of said block, so that an annular space 10 is formed between the casing 1 and said liners. The liners 9 will form a perfect and smooth connection with each other in forming the lining 8 by their abutting ends 9′ when in position, and the plunger 3 will form a perfect fit and connection with the inner faces 9″ of said liner, so that a filling 11, of Babbitt or other molten metal or other metal or material, can be inserted, packed, or poured into the space 10 through the open upper end 10′ thereof to form what is known as a complete "working barrel," and thus making said liners or rings 9 forming said lining absolutely stationary and immovable in a true and correct position. The plunger 3 can now be removed, and the other parts ready for use are removed from the block A, so that the collars 2 can be placed around the casing 1 and connected to the tubing 1′ within the well, after which the plunger can be inserted within the lining 8 and operated in the usual manner in working the pump. In case the plunger 3 and lining 8 become worn out through the operations of said plunger within the same the rings 9 forming such lining can be removed by simply lifting out the plunger and disconnecting the collars 2 from the casing 1 and tubing 1′, so that the pump can be removed and set upon and around a cone-shaped portion *b* in a pan B to allow a flame from any suitable source to pass up through an opening *b′* in said cone and into the lining 8, thereby heating the parts to a sufficient degree, which will allow the metal or material forming the filling 11 to run out of the space 10 between the casing and lining, through the open lower end 10″ of said space, and into the pan and around said cone. The liners 9, forming the lining 8, can then be removed and new rings or liners inserted around the plunger and within the casing, after which the space 10 can again be filled up by molten metal or material, as before described, to form another filling within said space and a new and complete working barrel or pump for use in the well.

It will be obvious that plaster-of-paris or any material can be inserted in the space between the lining and casing as a filling, and such material can be removed therefrom when desired by hammering the casing or by other means as desired in order to take out the lining when the same has become worn or for any other purpose.

It will thus be seen that my improved pump can be constructed easily, cheaply, and when in use will be found efficient for the purposes intended. The lining will be absolutely true and correct when in position and being true and free from friction with the plunger working within the same will not interfere with the operations of said plunger and will therefore add length of life to the pump. The pump can be finished in a shorter space of time than those ordinarily used, and it requires no skill or certainty in getting a perfect and true working barrel. The cost of production of the fluid to be pumped is greatly lessened, and when the pump wears and needs repairing all of the pump can be utilized at all times with the exception of the worn parts. It will also be seen that my improved pump will do away with any bands, collars, or any connections around or between the ends of the sections of liners or rings forming the lining. Such means must be absolutely true or else the working barrel is untrue, and any such liners must also receive great care and skill in making the same true and to the slightest detail or else when the pump needs repairing the whole pump must be discarded.

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

1. In a pump, the combination with a plunger, of a cylinder which consists of an outer casing, a series of lining-sections in said casing fitted to each other and to the exterior of the plunger but having external dimensions such as to leave a space between them and the outer casing, the parts being constructed to permit fluid to flow into and out of said space, and a filling of fusible material which when molten, can be introduced into or allowed to run from said space.

2. In a pump-cylinder, the combination with an outer casing, of a series of lining-sections therein fitted endwise to each other and adapted to fit the plunger but having external dimensions such as to leave a space between them and the outer casing, the parts being constructed to permit fluid to flow into or out of said space, and a filling of fusible material which when molten can be introduced into or allowed to run from said space.

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

ROBERT E. BOLE.

Witnesses:

J. R. WILLIAMS,

BEDELL SMITH.