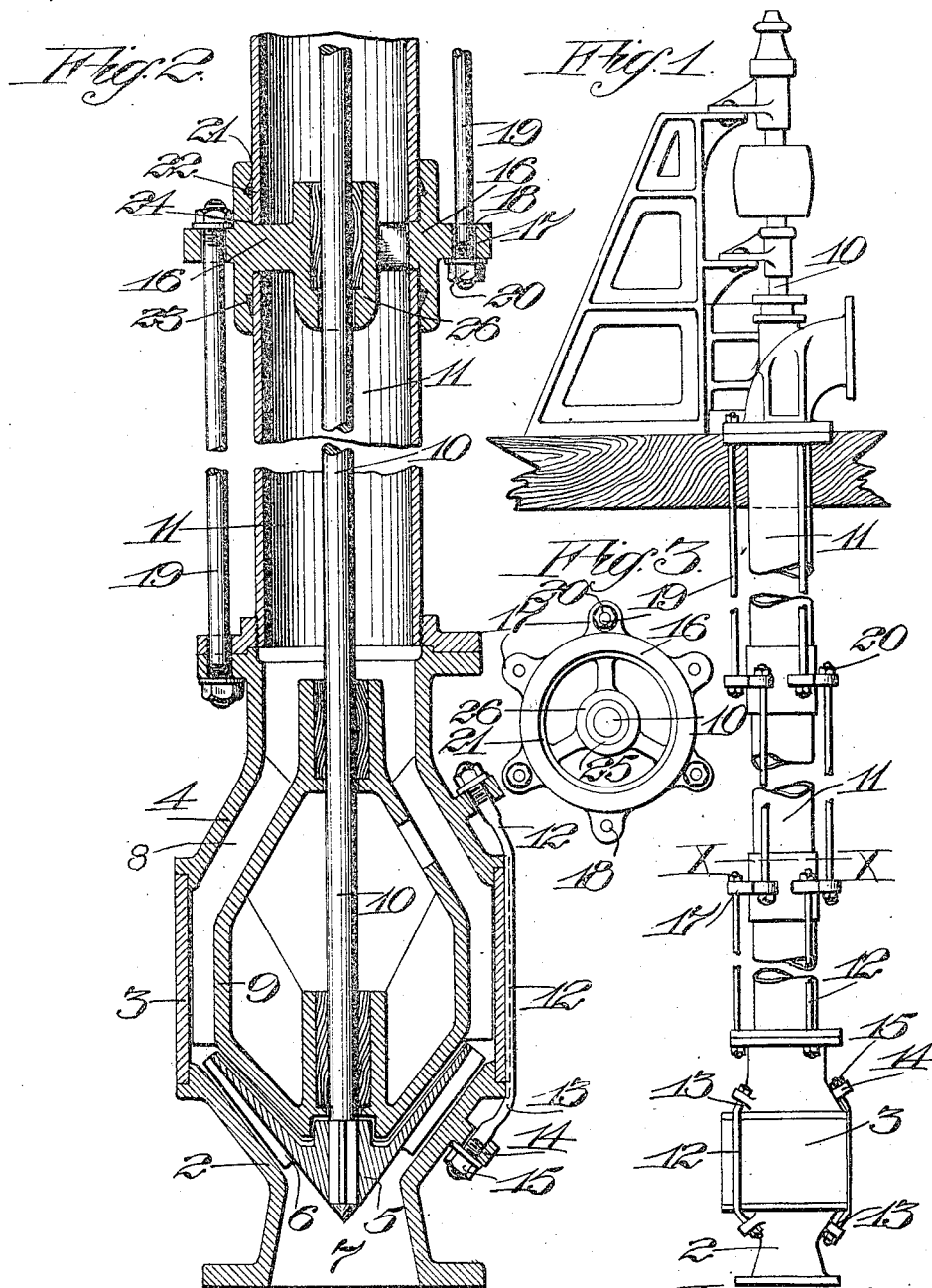


W. L. FORWARD.
DEEP WELL PUMP.
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1,060,244.

Patented Apr. 29, 1913.



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UNITED STATES PATENT OFFICE.

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DEEP-WELL PUMP.

1,060,244.

Specification of Letters Patent.

Patented Apr. 29, 1913.

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To all whom it may concern:

Be it known that I, WALTER L. FORWARD, a citizen of the United States, residing at Berkeley, in the county of Alameda and State of California, have invented new and useful Improvements in Deep-Well Pumps, of which the following is a specification.

This invention relates to deep well pumps.

The object of this invention is to provide a deep well pump embodying details of construction whereby the cost of manufacture and the cost of erection of the pump are greatly reduced over other pumps of the same class; to provide means whereby a pump may be erected in wells of small diameter with great facility and of such construction that the diameter of the pump proper can be nearly as large as the diameter of the well.

It is a particular object of the invention to provide means whereby the several sections of the pump casing may be rigidly, practically and effectually jointed so as to form a substantial, continuous structure of great rigidity thereby forming a strong support or journal for the revolving elements.

The invention consists of the parts and construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings in which—

Figure 1 is a side elevation of an erected pump. Fig. 2 is a detail sectional view of the lower end of the pump. Fig. 3 is a transverse section on the line X—X of Fig. 1.

This pump comprises a pumping head or member 2 upon which rests a distance piece in the form of a cylindrical band or spacer 3, against which is abutted a bonnet member 4. Within this pump head is mounted a suitable impeller 5 having impelling blades 6, which when rotated, create a vacuum in the suction chamber 7 and force the fluid being pumped upwardly through an annular passageway 8 formed between the spacer band 3 and an inner wall 9 of the bonnet 4. The impeller 5 is fastened upon a driving shaft 10 which is supported at suitable points in the discharge column of the pump which is formed by a plurality of superposed tubular sections 11.

One of the distinctive features of my invention is a means whereby the several column sections 11 are firmly jointed so as to

be substantially water-tight and rigid; and also a particular point of importance is the means whereby the pump head sections 2, 3 and 4 are jointed in such a manner that the joining means occupies a minimum amount of space within the well, thus permitting the use of a pump in the well of maximum diameter. This jointing device is here shown as comprising tie rods 12 placed at suitable intervals around the circumference of the pump body and having their ends 13 bent at an angle parallel to the converging members 2 and 4, which are provided with slotted lugs 14, into which the threaded ends 13 of the rods 12 may be inserted and clamped therein by nuts or other equivalent locking devices 15. By this means the pump head sections 2, 3 and 4 may be firmly and effectually clamped together and form a substantial bearing for the revolving members of the pump.

An important advantage gained by the use of the bent rods 12 is that the pump members can be assembled quickly and reliably without the use of devices projecting beyond the diameter of the pump member 3, and the entire strength of the tie rods 12 is conserved since by bending their ends 13 toward the center of the pump and threading them it is not necessary to weaken by cutting the tie rods 12. As shown in Fig. 2, the bent rods 12 lie close up to the outside wall of the pump proper in such a manner as to throw the nuts on the ends of the rods into such a position that they will clear the inner wall of the well into which the pump drops and operates, thus taking up a minimum amount of space and making it possible to utilize almost the total diameter of the well for the body of the pump.

The means by which the discharge column sections 11 are jointed comprise collars 16, provided on their periphery with lugs or flanges 17, perforated as at 18 to receive tie rods 19 which extend from collar to collar projecting through the perforations 18 and being provided on their ends with locking nuts 20 so as to draw the collars through which the rods 19 pass tightly toward one another. As shown in Fig. 2, these collars are bored, as at 21, to receive the turned down ends of the column sections 11, which are adapted to be inserted into the collars 16, and in order to prevent the leakage of fluid past the inserted ends of the sections 11

the collars are provided with grooves 22 to receive packing rings 23 which are preferably rings of round rubber or other suitable material. These packing grooves 22 are purposely placed about midway the length of the counterbored portion of the collar 16 so that the sections 16 slip well past the packing ring 23 before striking the shoulder 24 against which they abut, thus preventing the gasket or ring from getting between the end of the discharge sections and the shoulder 24, which would result, if it should occur, in throwing out of alinement the superposed discharge column. The collars 16 not only form means for receiving and supporting the column sections 11 but each collar is also provided with a central hub portion 26 provided with suitable bearing material 25 in which is supported the driving shaft 10 of the pump.

It will be seen then that by this form of structure the pump head members 2, 3 and 4 are firmly jointed by the bent tie rods 12; and the first superposed section 11 of the discharge column is clamped to the pump head by a plurality of tie rods 19; and that all of the remaining superposed sections 11 are each firmly jointed by successive supporting collars 16 and their respective tie rods 19; and that the discharge elbow is also connected to the pump discharge column with similar tie rods 19.

By the joint between the several sections 11 afforded by my particular design I obviate the necessity of threading the ends of

the sections and the collars 16, thus saving in manufacturing cost and further saving in cost of erection at the place of operation of the pump, and obtaining by the use of these several tie rods 19 a more substantial structure than would be obtained if the sections 11 were screwed to their respective collars 16.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is—

A deep well pump comprising a pump head casing, a rotary piston mounted in said pump head casing, a vertical shaft for driving said rotary piston, tubular sections extending upwardly from said pump head casing, spider collars between each of said tubular sections, said spider collars being counter-bored to receive the ends of said tubular sections and to form a seat for the same, spiders extending inwardly from said collars, bearings for said shaft carried by said spiders in substantially axial alinement with the axis of said tubular sections, the exterior of said collars being provided with apertured extensions, and supporting tension rods adapted to form the entire support for said pump head.

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

WALTER L. FORWARD.

Witnesses:

G. H. STRONG,

CHARLES EDELMAN.