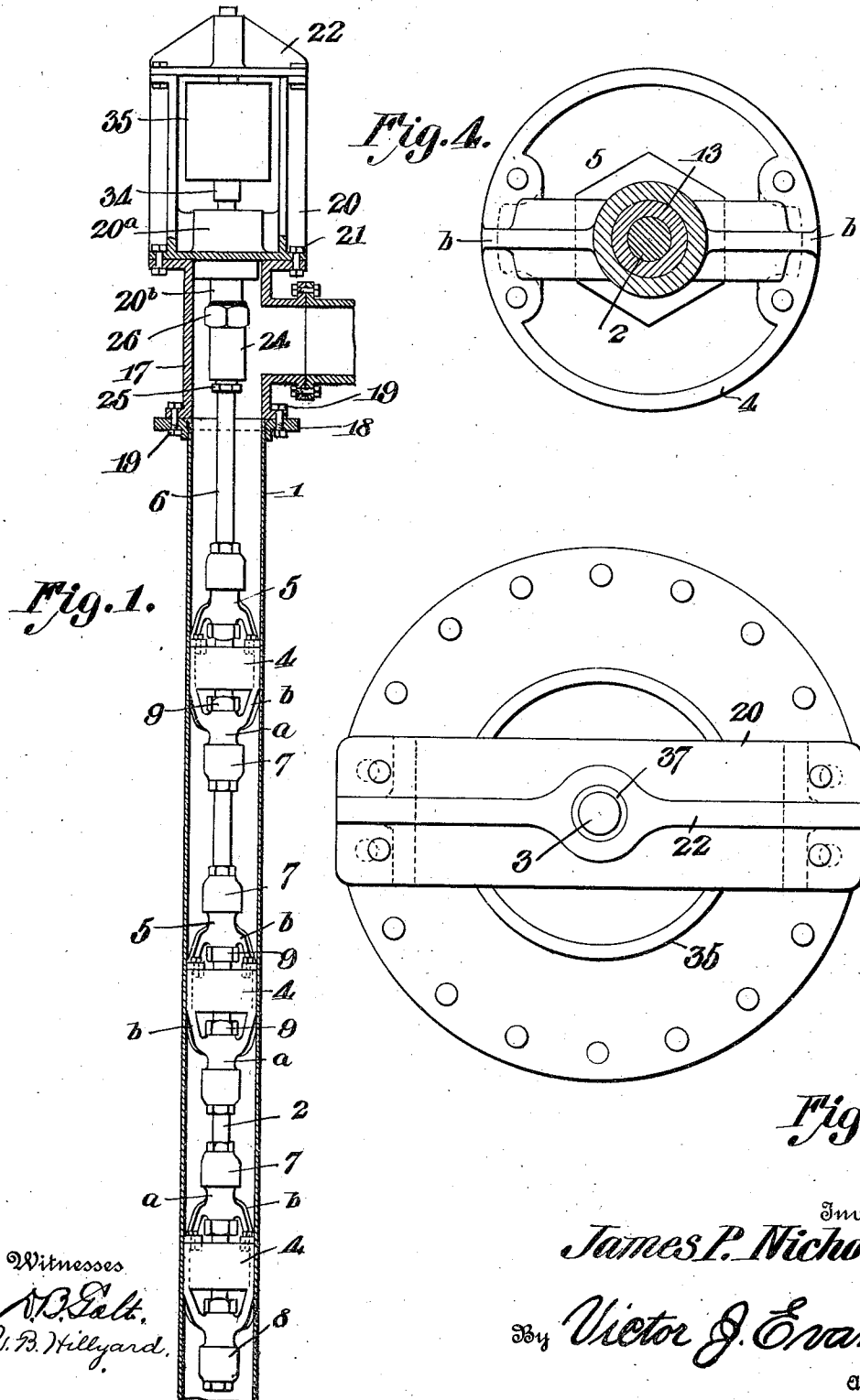


J. P. NICHOLAS.
WELL PUMP.
APPLICATION FILED OCT. 12, 1910.

1,008,858.

Patented Nov. 14, 1911.

3 SHEETS—SHEET 1.



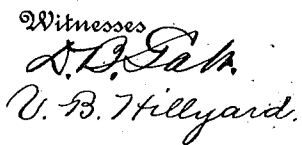
Witnesses
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WELL PUMP.

1,008,858.

3 SHEETS—SHEET 2.



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WELL PUMP.

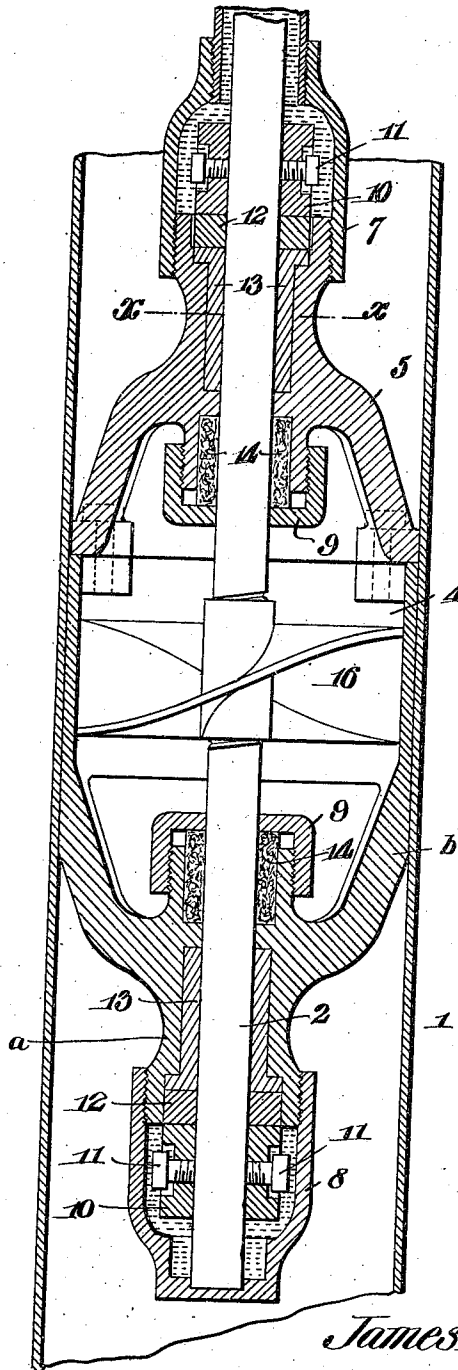
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3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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WELL-PUMP.

1,008,858.

Specification of Letters Patent. Patented Nov. 14, 1911.

Application filed October 12, 1910. Serial No. 586,746.

To all whom it may concern:

Be it known that I, JAMES P. NICHOLAS, well contractor, a citizen of the United States, residing at Weiner, in the county of Poinsett and State of Arkansas, have invented new and useful Improvements in Well-Pumps, of which the following is a specification.

The primary object of the present invention is the provision of a pump for lifting water from great depths, although the invention may be readily adapted for Artesian or other wells for elevating water, oil or other elements.

The invention supplies a pump which will overcome the necessity for providing a casing in addition to the ordinary well tubing and which will separate the water from the working parts and at the same time insure an ample supply of lubricant to the several bearings and moving parts, thereby reducing the wear to a minimum and prolonging the period of service of the pump and at the same time enabling the pump to be operated by a minimum expenditure of power.

The pump embodies in its organization a series of lifting elements located at different levels, each of said elements consisting of a rotary lifter comprising inclined planes which operate by a screw action, the several parts being supported in a manner to equalize the load and prevent straining of the line of shafting which would cause separation of the parts when the pump had been in service for a comparatively short length of time.

The invention consists of the novel features, details of construction and combination of parts, which hereinafter will be more particularly set forth, illustrated in the accompanying drawings, and pointed out in the appended claims.

Referring to the drawings, forming a part of the application, Figure 1 is a view in elevation of a pump embodying the invention. Fig. 2 is a vertical central section of the upper portion of the pump showing the parts on a larger scale. Fig. 3 is a vertical central section of the lower portion of the pump illustrating the parts on a larger scale. Fig. 4 is a horizontal section on the line *x-x* of Fig. 3. Fig. 5 is a top plan view of the pump.

Corresponding and like parts are referred to in the following description, and indi-

cated in all the views of the drawings, by the same reference characters.

A pump tubing 1 lines the well and is provided at its upper end with a plate 18 which is secured to the timbers or framing at the mouth of the well and upon which the pump head is mounted. A T-fitting 17 is bolted or otherwise secured to the plate 18 and its horizontal member is of a size corresponding with the diameter of the pump tubing and is flanged to enable a line of piping to be bolted thereto. A frame 20 is secured to the upper end of the T-fitting 17 and comprises a base and uprights, the latter being connected at their upper ends by means of a cross-piece 22 in which is formed a central bearing to receive the upper end of the shaft. The bearing of the cross-piece 22 has a bushing or lining 37 and is adapted to be lubricated by means of an oil opening 36 extending through the side thereof. The shaft comprises an upper portion 3 and a main portion 2, the latter being formed in sections which are coupled in the manner presently to be described. The upper portion 3 of the shaft is of larger diameter than the main portion 2 and is coupled to the latter by means of a sleeve 27 which is threaded to the adjacent ends of the parts 2 and 3 and further secured by means of pins. A pulley 35 is secured to the upper portion of the shaft section 3 and is prevented from downward displacement by means of a set collar 34. The pump head 20 has a tubular portion at its lower end embodying an upper extension 20^a and a lower extension 20^b, the latter forming a bearing for the lower portion of the shaft section 3 and having a bushing or lining 29. A shoulder is formed at the base of the upper part 20^a of the tubular portion and supports a bearing plate 31 in the upper face of which is formed an annular groove constituting the lower part of a ball race. A collar 32 is secured, by means of set screws 33, to the shaft section 3 and its lower end is outwardly flanged and formed in its lower face with an annular groove matching the annular groove formed in the plate 31, and forming therewith a race to receive the balls 30. The upper portion 20^a of the tubular part of the pump head forms a guide and serves as a cup or receptacle to receive oil for lubricating the parts. The lower portion 20^b is externally threaded and the pipe 6 is connected thereto by means of a coupling 26, sleeve 24 and nut

25. A packing 28 is interposed between the upper end of the sleeve 24 and the lower end of the part 20^b to insure a tight joint. The T-fitting 17 is flanged at its upper and lower ends and the flanges have openings through which bolts 21 and 19 pass for connecting the fitting to the head 20 and plate 18.

Elevating devices 16 are located at intervals in the length of the shaft and well tubing and serve to lift the water or other liquid to be raised. Each of the water elevators comprises a hub portion and spiral flights or wings. The hubs of each of the elevating devices 16 are internally threaded and the ends of adjacent sections of the shaft 2 are screwed therein, thereby fixing the position of the parts. Pins pass through the hubs of the elevating devices 16 and the threaded ends of the shaft sections screw therein to prevent any possible loosening of the joints. The elevating devices 16 operate by a rotary action to raise the water or other liquid to be lifted. A casing 4 incloses each of the elevating devices and is of a diameter to fit snugly within the well tubing 1. A tubular portion *a* is connected by means of arms *b* with the lower end of each casing 4 and forms a bearing for shaft 2 and means for coupling the pipe sections 6. The tubular portion *a* extends above and below the lower ends of the arms *b* and is externally threaded at each of its ends. A packing 14 is located in the upper portion of the part *a* and is retained in place by means of a nut 9. A bushing or lining 13 is fitted within the lower portion of the part *a* and snugly fits the shaft 2. A bearing plate 12 is located within the lower end of the part *a* and sustains an upward thrust of the set collar 10 secured to the shaft 2 by means of set screws 11. A coupling 7 is threaded upon the lower end of the part *a* and has the upper end of the pipe section 6 next below threaded thereto and the coupling 7 incloses the set collar 10 and the joint formed between said set collar and the part *a* and part 12. The upper end of the casing 4 has a head 5 bolted thereto, said head being similar in construction to the parts *a* and *b*. The head 5 consists of a tubular portion *a* and arms *b*, the ends of the part *a* being threaded to receive parts 7 and 9 and also receiving a packing 14 and a bushing or lining 13. A bearing plate 12 is fitted within the upper end of the part *b* and sustains the thrust of the set collar 10 which is secured by means of set screws 11 to the shaft 2. The pipe sections 6 are threaded into the reduced ends *c* of the couplings 7. The shaft 2 extends through the sections of the pipe 6 and through the casings 4 and the end bearing portions thereof. Lubricant fills the pipe sections 6 and is supplied to the moving parts as needed. The pipe sections are filled with oil prior to coupling the several

sections together. The part 8 fitted to the lower end of the lowermost casing 4 is similar in formation to the couplings 7 with the exception that its lower end is closed and forms a support for the lower end of the shaft 2, thereby preventing any water or other liquid from passing from the well tubing into the lowermost bearing between the shaft 2 and pipe 6.

It is to be understood that the shaft 2 may comprise any number of sections according to the depth of the well and the number of elevating devices to be located therein, the several sections being threaded to the elevating devices and the latter and the pipe 6 being lowered until the desired length of pipe and shaft is obtained. The pipe 6 and the several casings 4 are held stationary whereas the shaft 2 and the elevating devices 16 carried thereby are rotated, thereby causing the water or other liquid to be drawn upward into the well tubing and discharged through the horizontal member of the T-fitting 17. The linear strain upon the shaft 2 is relieved at each elevating device by means of the bearing plates 12 and the set collars 10, as will be readily understood from the foregoing taken in connection with the accompanying drawings.

The pump is comparatively simple in construction and effective in operation and capable of raising water from a great depth and it is not necessary to employ the casing generally used for inclosing the well tubing as required by deep wells in general operation.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim as new is:—

1. In a pump, the combination of a shaft, a rotary elevating device secured to the shaft, a casing encircling the rotary elevating device, tubular portions at opposite ends of said casing and having the shaft mounted therein, and packing at the inner ends of the tubular portions adjacent the rotary elevating device.

2. In a pump, the combination of a shaft, a rotary elevating device secured to the shaft, a casing encircling the rotary elevating device, tubular portions at opposite ends of said casing and having the shaft mounted

therein, packing at the inner ends of the tubular portions adjacent the rotary elevating device, other packing at the outer ends of the tubular portions, bearing plates for confining the last mentioned packing, and set collars secured to the shaft and in contact with said bearing plates.

3. In a pump, the combination of a shaft, rotary elevating devices secured at intervals to the shaft, casings encircling the rotary elevating devices, tubular portions connected by arms to the ends of the respective casings and forming bearings for the shaft, and pipe sections receiving the shaft and connected to the adjacent ends of the tubular portions of the casing.

4. In a well pump, the combination of a well tubing, a pump head fitted thereto and having lateral discharge, a shaft extending through the well tubing, rotary elevating devices secured to the shaft at intervals, casings encircling the several elevating devices, pipe sections connecting the casings and having the shaft passing therethrough, and means for imparting rotary movement to the end of the shaft.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES P. NICHOLAS.

Witnesses:

WM. SCHECK,

H. P. DOWNING.