June 12, 1951 F. H. ZEITZ 2,556,384

SELF-ALIGNING WELL PUMP BASE

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Fig. 1.

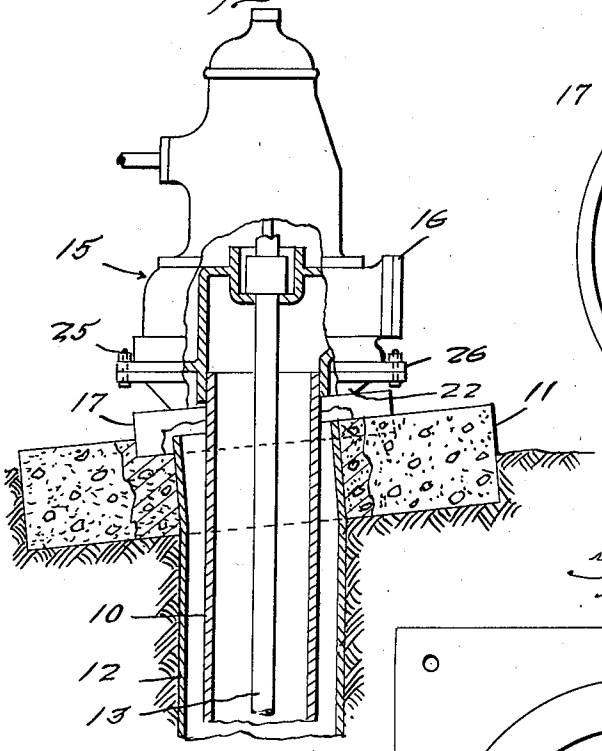


Fig. 3.

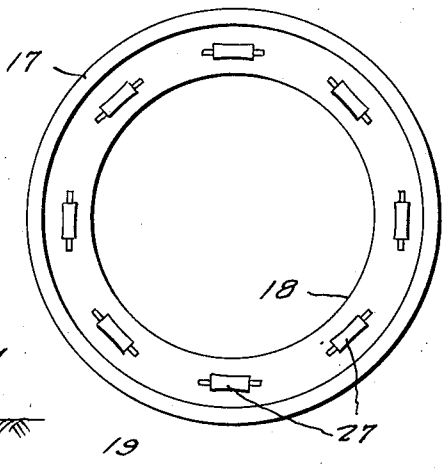


Fig. 4.

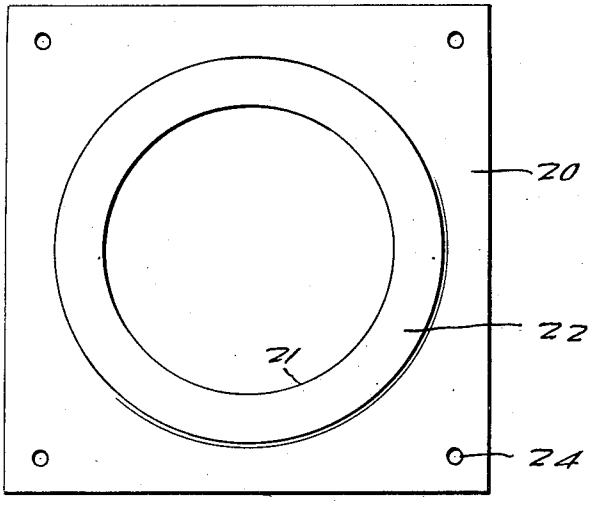
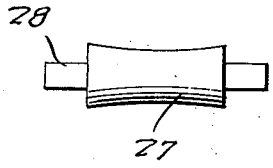


Fig. 5.



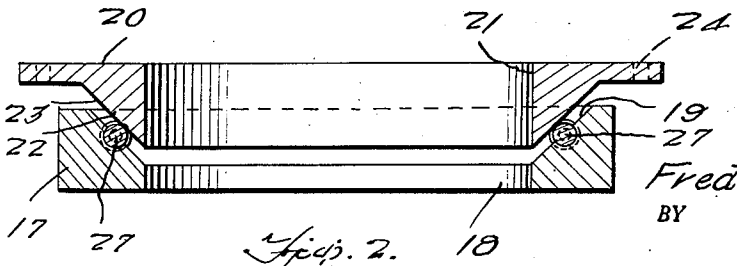


Fig. 2.

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SELF-ALIGNING WELL PUMP BASE

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2 Claims. (Cl. 103—219)

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This invention relates to deep well turbine pump bases, and more particularly to a well pump base which supports the pump in a substantially vertical, upright position regardless of uneven settling of the base-supporting platform.

It is among the objects of the invention to provide an improved supporting base for a well pump, which base is mountable on a base-supporting platform or foundation of concrete or other suitable material, and will support the pump in a substantially vertical, upright position regardless of tilting of the platform due to uneven settling or improper construction of the platform, to avoid bending of the well pipe and pump shaft by inclination of the pump head relative to the bore of the well, which base can be applied to a conventional well pump without modification of the pump head, and will effectively support the pump on the platform or foundation, does not interfere in any way with the pipe connections of the pump or the normal operation of the pump, is easy to install on various types of conventional pumps, and is simple and durable in construction, and economical to manufacture.

Other objects and advantages will become apparent from a consideration of the following description and the appended claims in conjunction with the accompanying drawing, wherein:

Figure 1 is an elevation of a pump head and platform with a portion of the well diagrammatically shown in cross-section below the platform, showing the application thereto of a pump-supporting base illustrative of the invention;

Figure 2 is a transverse cross-section through the pump-supporting base illustrated in Figure 1;

Figure 3 is a top plan view of the lower member of the base;

Figure 4 is a bottom plan view of the upper member of the base;

Figure 5 is an elevation of an anti-friction bearing roller, several of which are interposed between the upper and lower members of the pump-supporting base.

With continued reference to the drawing, the well is provided with a casing 12 which extends longitudinally of the well bore and somewhat above the surface of the ground at the upper end of the bore. A platform or foundation 11, illustrated as formed of concrete, but which may be formed of other suitable materials, such as wood or masonry, if desired, rests upon the ground and surrounds the upper end of the well casing 12. The pump head, generally indicated

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at 15, is of conventional construction and is supported by the platform 11. A column pipe 10 extends downward from the pump head to the pump bowls, not illustrated, disposed in the lower portion of the well below the water level in the latter, and a pump shaft 13 extends downwardly from the pump head 15 to the pump bowls. The water discharged from the pump flows upwardly through column pipe 10 attached at its upper end to the lower portion of the pump head, which head is provided with an outlet fitting 16 to which is connected one end of the water supply pipe leading from the pump to a suitable reservoir or other facility for receiving the water discharged by the pump.

According to the present practice, the platform or foundation 11 is constructed with its upper surface as nearly level as can be provided within practical limitations, the bore of the well being assumed to be perpendicular, and the bottom end of the pump is secured directly to the platform 11, usually by seating the bottom end of the pump head in a recess provided in the platform around the upper end of the well casing, and then grouting or cementing the head to the platform. Frequently reinforcing structures are provided in the platform to which the bottom of the pump head is securely attached.

Even though the platform 11 is initially constructed with its upper surface substantially level, it frequently happens that because of soft ground at the upper end of the well, frequent wetting of the ground, the action of deep frost or other causes, the platform settles unevenly and becomes tilted to somewhat the condition illustrated in Figure 1. When the platform or foundation is tilted, the pump head will be correspondingly tilted or inclined and will no longer be in alignment with the column pipe and the pump shaft.

The improved pump-supporting base of the present invention enables the pump to remain in an upright position, even though the upper surface of the pump-supporting platform or foundation becomes inclined due to uneven settling of the platform. This base comprises a lower annular member 17 rigidly mounted in the platform 11, preferably by being seated in a recess in the upper surface of the platform surrounding the upper end of the well casing and securely grouted or cemented into the platform. The annular member 17 has a centrally disposed circular opening 18 of a size somewhat greater than the well casing, and is provided, surrounding the opening 18, with an upwardly and outwardly-

beveled surface 19, such surface being preferably disposed at an angle of substantially 45° to the horizontal. An upper, annular member 20 has a circular, central opening 21 of substantially the same size as the opening 18 in the lower member 17, and has a boss 22 surrounding the opening 21 and provided with a beveled outer surface 23 which has an angle of inclination to the horizontal substantially the same as the inclination of the beveled surface 19 of the lower annular member, so that the boss is receivable in the beveled portion of the lower annular member, as is particularly illustrated in Figure 2. The upper annular member 20 is made square or circular in plan form, or given such other shape as may be necessary, to conform to the shape of the bottom end of the pump head 15, and is provided with apertures 24 for clamp bolts 25 which extend through the apertures 24 in the upper annular member of the base, and through registering apertures in the bottom flange 26 of the pump head to rigidly secure the upper annular member 20 of the base to the bottom end of the pump head.

A plurality of angularly-spaced-apart bearing rollers 27 are disposed between the beveled surfaces of the lower and upper annular members 17 and 20, so that the upper annular member is freely tiltable relative to the lower annular member. Each of the rollers 27 is longitudinally concave, as particularly illustrated in Figure 5, to fit the conical, outer surface of the boss 22 of the upper, annular member 20, and has respective arbors 28 projecting outwardly from its opposite ends. The beveled surface 19 of the lower, annular member 17 is provided with recesses receiving respective rollers 27, these recesses being reduced at the ends to provide bearings for the arbors 28, so that the rollers are journaled in the lower member 17 and support the upper member 20.

The bottom end of the pump head is rigidly attached to the upper end of the column pipe 10, so that the pump head is urged to its upright position by the weight of the column pipe. With the compensating base of the present invention supporting the weight of the pump, the pump will be supported in upright position regardless of uneven settling or tilting of the platform 11, and the pump shaft and column pipe will not be thrown out of alignment.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiment is, therefore, to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are, therefore, intended to be embraced therein.

What is claimed is:

1. A self-aligning well pump base comprising a first annular member mountable on a pump-supporting platform and having a circular opening larger than the well casing and an upwardly and outwardly beveled surface around said opening, a second annular member attachable to the bottom end of a pump head and having a circular opening of substantially the same size as the opening in said first annular member, a beveled boss on said second annular member surrounding the opening in the latter and receivable in the beveled opening of said first annular member, and angularly-spaced-apart bearing rollers disposed between said boss and the beveled surface of said first annular member to render said annular members tiltable relative to each other, the beveled opening of said first annular member being formed with respective recesses rotatably receiving the bearing rollers.

2. A self-aligning well pump base comprising a first annular member mountable on a pump-supporting platform and having a circular opening larger than the well casing and an upwardly and outwardly beveled surface around said opening, a second annular member attachable to the bottom end of a pump head and having a circular opening of substantially the same size as the opening in the first annular member, a beveled boss on said second annular member surrounding the opening in the latter and receivable in the beveled opening of said first annular member, and angularly-spaced-apart bearing rollers disposed between said boss and the beveled surface of said first annular member to render said annular members tiltable relative to each other, each of said rollers having a longitudinally-concave intermediate portion fitting the conical outer surface of the boss of said upper annular member, the beveled surface of said first annular member being formed with respective recesses rotatably receiving the bearing rollers, said recesses being disposed along a circle concentric with the first annular member.

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