M. E. LAYNE.

BELT TIGHTENER FOR PUMPS.

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1,218,192.

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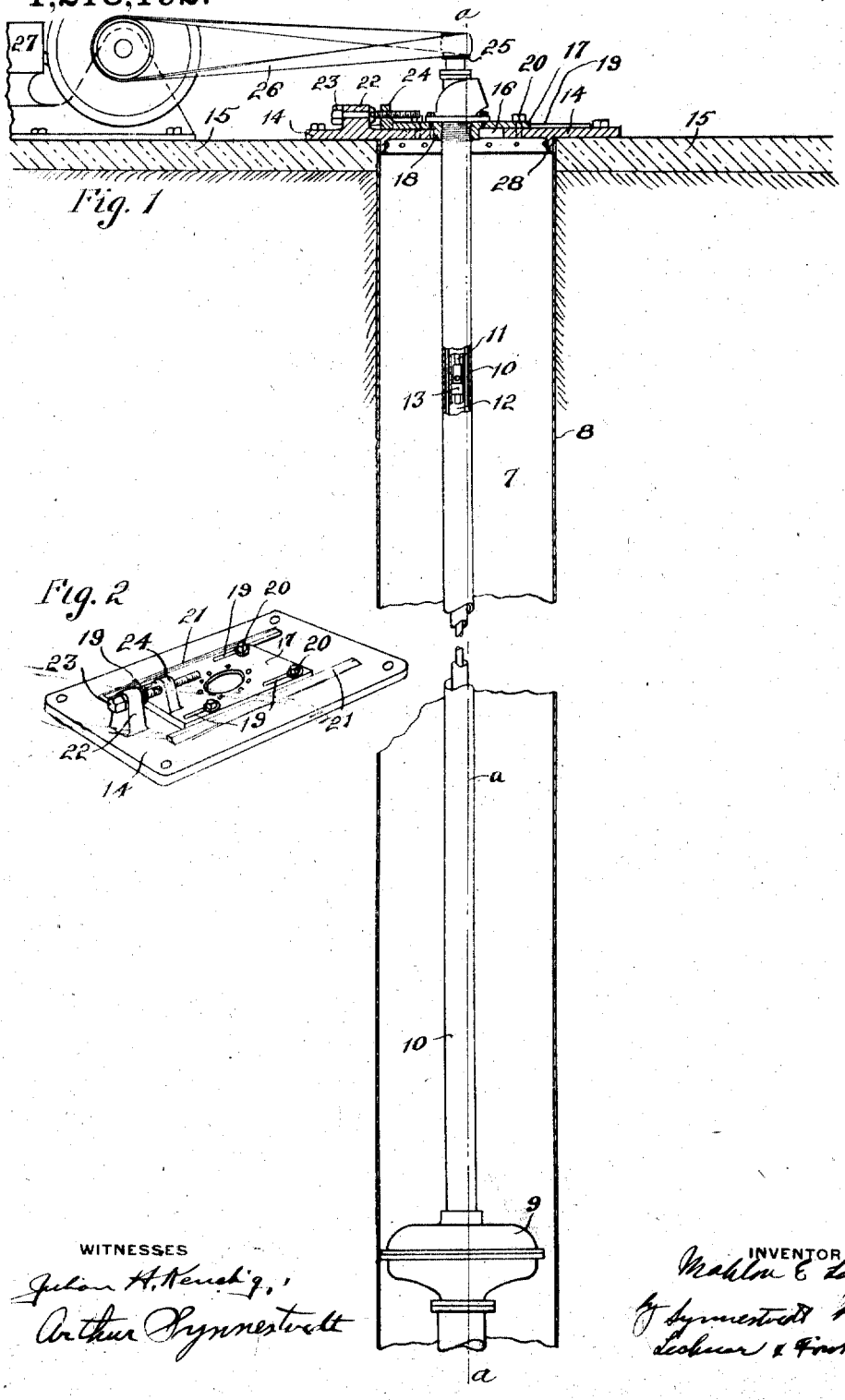


Fig. 1

Fig. 2

WITNESSES

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UNITED STATES PATENT OFFICE.

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BELT-TIGHTENER FOR PUMPS.

1,218,192. Specification of Letters Patent. Patented Mar. 6, 1917.

Application filed May 12, 1915. Serial No. 27,493.

To all whom it may concern:

Be it known that I, MAHLON E. LAYNE, a citizen of the United States, residing at Houston, in the county of Harris and State of Texas, have invented certain new and useful Improvements in Belt-Tighteners for Pumps, as set forth in the following specification.

This invention relates to belt tighteners for pumps and it has reference primarily to the provision of a movable pump head by means of which the vertical axis of the pump shafting may be varied so as to adjust the tension on the driving belt. The foregoing, together with such other objects as may hereinafter appear or are incident to my invention, I attain by means of a construction which I have illustrated in preferred form in the accompanying drawings, wherein;

Figure 1 is a sectional view illustrating the application of my invention to a well pump; and Figure 2 is a perspective showing of the movable portion of the pump head.

In order that a better understanding may be had of my invention, I will first describe the form of pump mechanism which I have shown in the drawings in order to afford a specific illustration of the application of my invention. The well chamber 7 is provided with the usual well chamber casing 8 which is closed at the top by means of the pump head hereinafter to be described. The pump shown is of the centrifugal type and comprises the runner casing 9 which is adjustably supported in any desired position in the bottom of the well by means of the pipe or discharge casing 10 through which the water is elevated. Within the discharge casing 10 is the line shaft or pump shaft 11 which turns the runner blades in the casing 9, the shaft 11 being inclosed in a line shaft casing 12 provided for purposes of lubrication and support. At a plurality of points throughout the line shaft casing the shaft 11 is provided with bearings 13, the casings being broken away in the drawings to illustrate one of such bearings. The pump head comprises the plate 14 which is bolted to the foundation structure 15 surrounding the well chamber and provided in its central portion with a slot 16, and the movable plate 17 which is provided with the centrally located downwardly projecting threaded flange 18 into which the upper portion of the discharge casing 10 is threaded. The plate 17 is provided with four slots 19 located adjacent the corners of the plate and through which the bolts 20 which fasten the plate 17 to the plate 14 pass. The plate 14 is provided with grooved guide ways or ribs 21 with which the edges of the plate 17 have sliding engagement. Adjacent one end, the plate 14 is provided with the upstanding lug 22, in which is rotatably mounted a bolt 23, the shank of which is threaded at its extremity and has threaded engagement with a similar upstanding lug 24 formed on the plate 17. The line shaft 11 is provided at the top with the usual driving pulley 25 around which passes the driving belt 26, driven from the engine 27. The engine frame may be bolted to a foundation 15 in the usual manner. In ordinary practice, the runner casing 9 is of a diameter usually three or more inches less than the internal diameter of the well chamber casing.

In order to adjust the tension on the driving belt 26, the operation is as follows: The bolts 20 are loosened and the bolt 23 turns so as to advance or retract the plate 17, as the case may require. When the plate 17 has been adjusted to the desired position, the bolts 20 are tightened. The shifting of the plate 17 with respect to the plate 14 of course shifts the pump casing and its associated parts and adjusts the tension on the belt 26. The line *a—a* indicates the center line of the well casing and it will be apparent that the runner casing 9 may be shifted approximately an inch and a half to either side of the center line of the well casing with a corresponding increased range of movement at the top of the pump casing at the pump head and it has been found in practice that a three inch movement to either side of the center line of the well casing at the pump head has been found to be entirely practical and to afford a sufficient range of adjustment which does not interfere with the successful driving of the pump shaft. The slight angular inclination of the discharge casing is not sufficient to cause any trouble, and it will be apparent that inasmuch as the line shaft 11 is supported at a plurality of points throughout the length of the casing, line shaft and the whole is self-contained and supported as a unit, the line shaft will not bow or sag; and therefore the adjustment at the pump head will not cause any binding of the operating parts.

It will be clear that the device is simple and easy to manipulate and is capable of a considerable range of adjustment such as to meet all ordinary conditions of service. The device is of considerable advantage inasmuch as it is a difficult matter to provide for adjustment of the belt, owing to the weight not only of the engine, but also of the pump apparatus. It will be obvious that the force required to move the top of the pump casing will be comparatively small. It will be clear also that the plate or frame 14 will be securely held in position not only by its bolts, but also by the downturned annular flange 28 which engages the inner surface of the well casing 8.

What I claim is:

1. In a well mechanism, the combination of a pump shaft, a belt for driving said shaft, and a pump head carrying the shaft, said head being movable to adjust the tension on the belt.

2. In well mechanism, the combination of a pump shaft, a belt for driving said shaft, a pump head carrying the shaft, and means for shifting the pump head to adjust the tension on the belt.

3. In well mechanism, the combination of a pump shaft, a belt for driving said shaft, an engine for driving the belt, and a pump head carrying the shaft slidably mounted for adjustment toward and from the engine to adjust the tension on the belt.

4. In well mechanism, the combination of a pump shaft, a relatively fixed engine, a driving belt, and means at the top of the well for shifting the vertical axis of the shaft to effect adjustment of the tension of the belt.

5. In well mechanism the combination of a pump shaft, an engine, a driving connection between the engine and the shaft, a means for supporting the shaft from the top of the well, said means being shiftable toward and from the engine to provide for adjustment of the driving connection.

6. In well mechanism, the combination of a pump shaft, a driving belt therefor, and an adjustable support for the pump shaft, comprising a relatively fixed plate, a second plate slidably mounted on the fixed plate and carrying the pump shaft, and means for adjustably securing the second plate to the fixed plate, the adjustment of the former effecting adjustment of the tension on the driving belt.

7. In well mechanism, the combination of a pump shaft, a driving belt therefor, and an adjustable support for the pump shaft, comprising a relatively fixed plate, a second plate slidably mounted on the fixed plate and carrying the pump shaft, and a horizontally disposed screw for adjusting the second plate with respect to the fixed plate.

8. In well mechanism, the combination of a pump shaft, a belt for driving the shaft, and an adjustable pump head carrying the shaft and shiftable to vary the tension on the driving belt, said pump head comprising a relatively fixed plate provided with guide ways and having an aperture of larger dimensions than the shaft, a second plate slidably mounted in the guide ways and carrying the shaft, means for releasably fastening the second plate to the fixed plate, and a screw carried on the fixed plate and having threaded engagement with the second plate.

9. In well mechanism, the combination of a pump shaft, a belt for driving said shaft, a pump head carrying the shaft, a support for the pump shaft, comprising a fixed plate and a plate mounted to slide on said fixed plate and carrying the shaft, and a screw for moving the said sliding plate back and forth with respect to the fixed plate to vary the tension of the driving belt.

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

MAHLON E. LAYNE.

Witnesses:
W. B. MARTINE,
ERNEST SPENCER.