

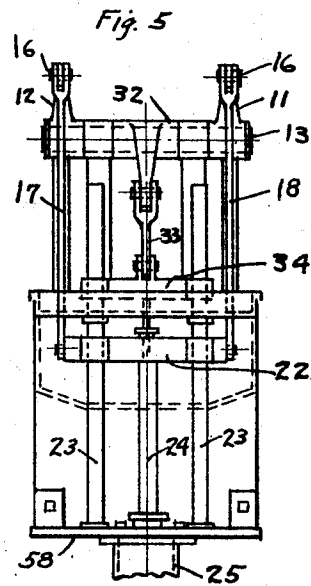
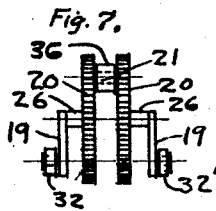
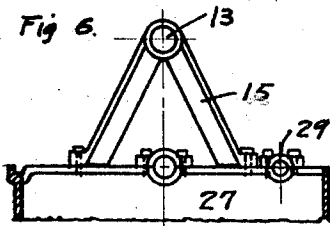
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T. R. MINERT
PUMPING APPARATUS

Filed Feb. 5, 1923

2 Sheets-Sheet 2



Inventor,
Theodore R. Minert.

UNITED STATES PATENT OFFICE.

THEODORE R. MINERT, OF MILWAUKEE, WISCONSIN.

PUMPING APPARATUS.

Application filed February 5, 1923. Serial No. 617,073.

To all whom it may concern:

Be it known that I, THEODORE R. MINERT, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented a new and useful Improvement in Pumping Apparatus, of which the following is a specification.

The object of this invention is to produce a simple and efficient pump which will lift water or other liquids from wells, or compress or exhaust liquids or gases in substantially a continuous stream. A further object is the production of a double plunger pump, having a double overlapping stroke, with the moving parts enclosed and running in oil.

A further object is the production of a pump that is compact, simple to manufacture, one that will operate quietly and without vibration, and one which is adaptable to either small or large wells.

With these and other objects in view my invention comprises the features of construction and combination of parts herein-after more particularly described and claimed.

In the accompanying drawing forming part of this specification—

Fig. 1 is a side elevation of my invention.

Fig. 2 is a rear elevation.

Fig. 3 is a sectional elevation taken on line 2—2 of Fig. 2 with cover removed.

Fig. 4 is a section on line 1—1 of Fig. 1.

Fig. 5 is a front elevation with the cover removed.

Fig. 6 is a side elevation of the frame supporting the bell cranks.

Fig. 7 is a detail elevation of the main crank shaft and gears.

In the drawings let 11 and 12 indicate a pair of outside bell cranks which are journaled to rotate in their angles as shown on shaft 13 which is secured in the vertical frames 14 and 15. These bell cranks are similar and the forward ends of their upper arms are attached by pivots 16 to the outside connecting rods 17 and 18 and their lower ends connected to roller ends of the crank members 19 of the gears 20 and center crank 21. The connecting rods 17 and 18 are secured to the lower crosshead 22 which is slidably mounted to move vertically on the guide rods 23. This lower crosshead

is rigidly connected to outside plunger shaft 24 which has a plunger connected to its lower end in well cylinder or casing 25. The crank shaft 26 is journaled in the bearing supports 27 and 28 and is co-axial with the driving gears 20. Disposed to the side of the gears and journaled in said supports 27 and 28 is the main drive shaft 29, which carries the main driving pulley 30, and a pair of pinions 31, the teeth of which mesh with the teeth of said gears which revolve on the ends of the crank elements 19, at the same time bearing on the lower arms of the bell cranks 11 and 12. As the crank elements revolve, the outside bell cranks are rocked to reciprocate their outside connecting rods, and their connected plunger, by the rolling action of the crank rollers on the lower arms of said bell cranks.

Arranged between the gears 20 and the frames 14 and 15 is the center bell crank 32 which is also journaled on shaft 13. The forward end of the upper arm of this bell crank is connected by the link 33 to the crosshead 34 which is in turn connected to the inside plunger shaft 35 which has connected to its lower end a plunger in the well cylinder or casing 25, said crosshead sliding vertically on the pair of guide rods 23. The lower arm of the center bell crank is reciprocated by the roller 36 on center crank member 21, which bears against said arm. By this construction the center bell crank 32 is reciprocated by the rotating action of said crank and rolling action of said roller against said bell crank. The main supporting frame 39 consists of a single casting, the upper part of which forms the oil receptacle and the two webbed beams 27 and 28 which form the bearing supports. This form of a frame has many advantages, both in the way of increased strength and simplicity of manufacture. Fitted to the frame are the detachable covers 40 and 41, which completely enclose the working parts. 58 is a detachable frame element for attaching the casing 25 to the main frame 39.

The cranks produce an overlapping stroke and therefore assist in pumping a continuous stream, due to the fact that two tangents drawn from point 13 to opposite sides of the crank circle divide the crank circle in two unequal portions, so that the stroke in

one direction is produced by more than half a revolution of the crank pin and in the opposite direction by less than half a revolution of the crank pin. Since this is true of
5 each of the diametrically disposed crank pins, the two actuated pistons overlap at the ends of their respective strokes. As a safeguard the crank rollers 32' and 36 are held in place by the bars 37 and 38 respectively.
10 Among the chief advantages attained by my invention are: a simple, compact, enclosed and automatically lubricated pump which produces a substantially continuous stream of water or other liquid, since there
15 is no dead center, and the column of water or other liquid is always in motion; the pump frame is self-contained, and unbalanced forces are avoided; the lubricating chamber is so placed that the lubricating oil will not
20 get into the well or liquid being pumped; the frame is composed of less parts than other types of machines, thereby reducing the manufacturing cost.

In accordance with the patent statutes, I
25 have described the principles of operation of my invention together with the apparatus which I now consider to be the best embodiment thereof, but I desire to have it understood that the construction shown is
30 only illustrative and that the invention can

be carried out by other means and applied to other uses than those set forth within the scope of the following claim.

Having described my invention, what I claim is new and desire to secure by Letters 35 Patent is:

A pumping apparatus comprising in combination, an oil receptacle formed by a supporting frame, a plurality of parallel webs formed therein, a crankshaft journaled to
40 revolve in bearings thereon, vertical side frames mounted thereon, carrying the horizontal supporting shaft of the bell cranks, a plurality of rocking bell cranks coaxially
45 arranged on said shaft, a plurality of crank pins on said crank shaft arranged diametrically opposite slidably and pivotally connected to the vertical arms of said bell cranks, a plurality of plunger pump shafts
50 pivotally connected to the other end of said bell cranks by means of connecting rods, actuating means whereby said crank shaft is rotated, and said plunger pump shafts
55 are made to reciprocate together in one direction a small part of each stroke and alternately the remainder of each stroke.

In witness whereof I hereunto affix my signature.

THEODORE R. MINERT.