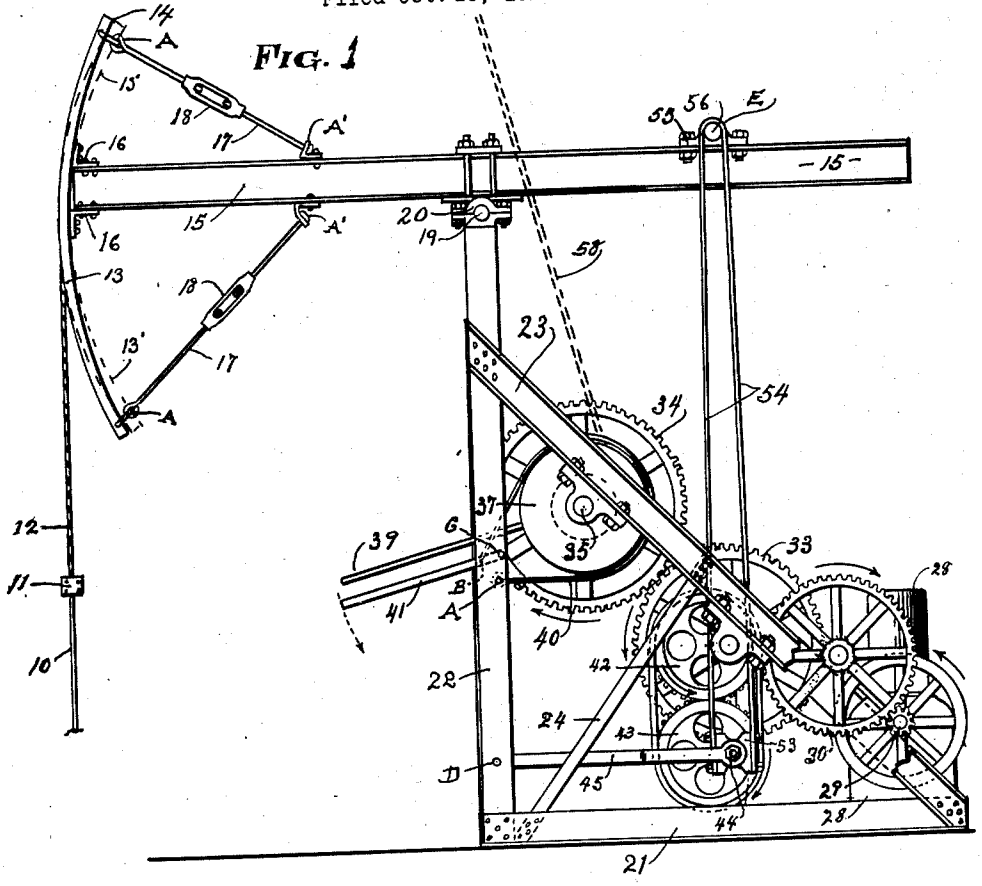
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W. F. RESCHKE

PUMPING MECHANISM FOR OIL WELLS

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FIG. 1



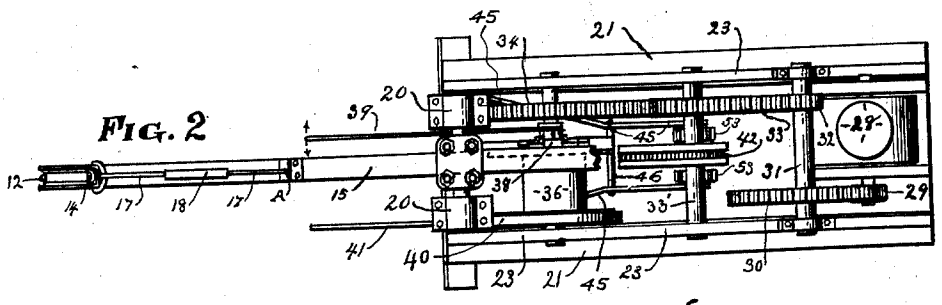


FIG. 2

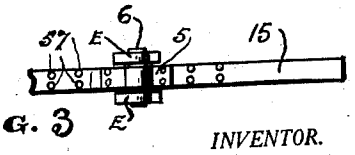


FIG. 3

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FIG. 4

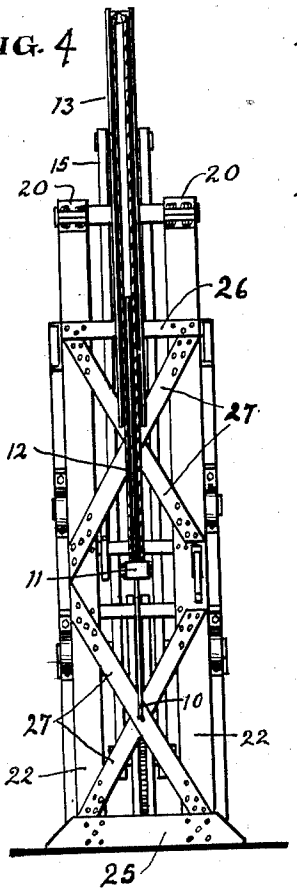



FIG. 5

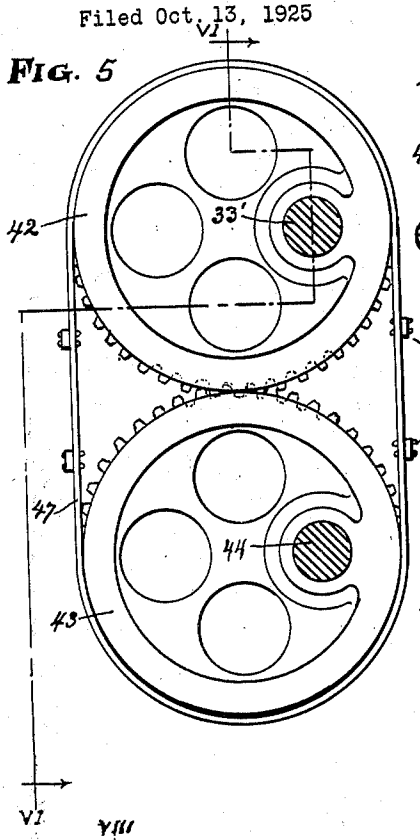



FIG. 6

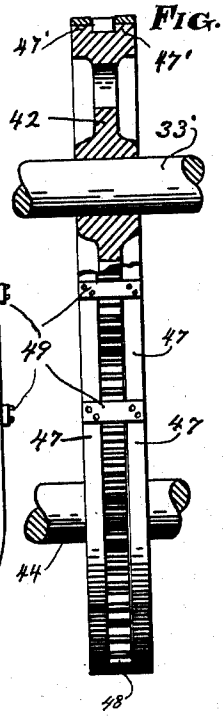



FIG. 7

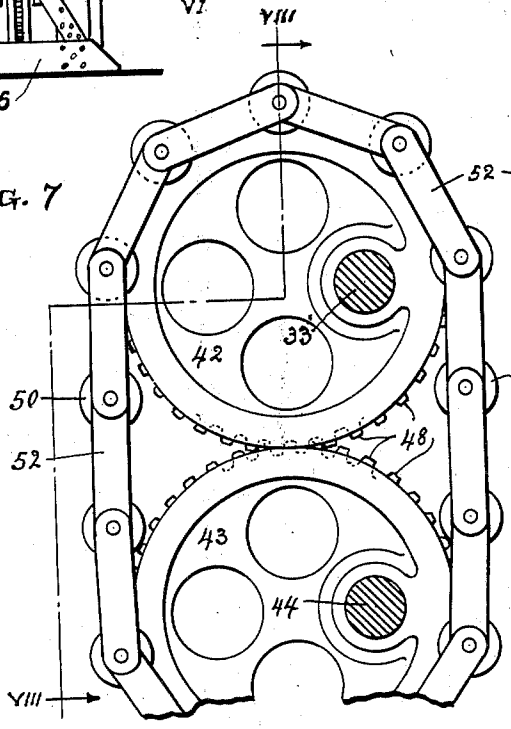
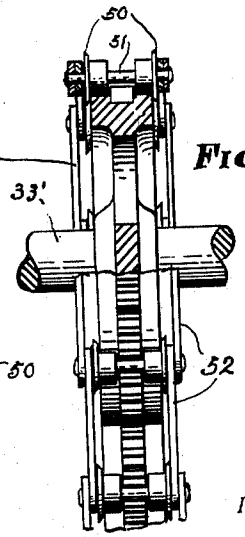



FIG. 8




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Patented Jan. 22, 1929. 1,699,675

# UNITED STATES PATENT OFFICE.

WILLIAM F. RESCHKE, OF WICHITA, KANSAS.

## PUMPING MECHANISM FOR OIL WELLS.

Application filed October 13, 1925. Serial No. 62,288.

My invention relates to a pump mechanism and has for its chief objects as follows:

First; to provide a machine having a variable stroke mechanism.

Second; to provide a pumping machine for rectilinear reciprocations of the pump rod.

Third; to provide a pumping machine in which the stroke of the walking beam may be varied by the position of the cross head to which the actuating element is attached, the same being an independent adjustment of the variable stroke mechanism but functioning therewith.

Fourth; to provide a pump machine in which the mechanism and motive power are supported by a frame as one unit.

Fifth; to provide a pumping machine having sufficient power to perform all duties in connection with oil well manipulation.

Referring to the drawings:

Fig. 1 is a side view of the pumping machine.

Fig. 2 is a plan view of Fig. 1.

Fig. 3 is a top view of the end of the walking beam, same being broken away as in Fig. 2.

Fig. 4 is a front view of Fig. 1.

Fig. 5 is a side view of the variable gears.

Fig. 6 is a sectional view taken along the lines VI—VI in Fig. 5.

Fig. 7 is a duplicate view of the variable gears showing a modified form of the stay band.

Fig. 8 is a sectional view taken along the lines VIII—VIII in Fig. 7.

The polish rod 10 is firmly connected by a clamp 11, to a cable 12, the said cable engaging in the channel of an arcuate member 13, and firmly fastened to the upper end of said member as at 14.

The said arcuate member is firmly attached to the end of the walking beam 15, by means of angle irons 16 riveted firmly thereto. The arc of the member 13 is varied by tension rods 17 which are firmly attached to the end of the arcuate member and to the walking beam as shown at A', the said rods having turn buckles 18 centrally positioned by which means the radius of the arc may be varied as shown by dotted lines 13', and the change of the curvature will be subject to the position of the pivot point 19. The said walking beam is adjustably mounted thereon by means of a bearing 20 firmly attached thereto substantially as shown.

The mechanism herein disclosed for supporting the walking beam above described is supported by a structure consisting of a steel frame having a base member 21 and an upright 22, the said members being braced by a member 23, which is approximately positioned at an angle of 45 degrees, a member 24 laterally extending from said brace member and intersecting near the intersection of the said base and upright members, all of said members being firmly riveted together, and forming two similar frames as above described. These are connected at the front by means of a base member 25, a top member 26, and intermediate diagonal braces 27, all of which are firmly riveted together as shown.

On said frame is a train of gears rotatably mounted functioning as follows: on the rear end of the frame is firmly positioned an engine 28, on the drive shaft of said engine is a pinion 29, the said pinion driving a gear 30 which is mounted on a shaft 31 and on said shaft is a pinion 32 in mesh with a gear 33 which is mounted on a shaft 33', the said gear being in mesh with a gear 34, which is actuating means for the shaft 35 on which is loosely mounted a cable drum 36, and a brake drum 37. The said drums are energized by any standard make of clutch as 38, the said clutch being operated by moving a lever 39 horizontally as shown by an arrow at the end thereof. The brake drum is controlled by a brake band 40, one end of which is attached to the frame as at A, and the opposite end to a lever 41 as at B, the said lever being pivotally connected to the frame as at C. By a downward movement of said lever as indicated by the arrow at the end of the lever, the brake band is tensioned on the drum as controlling means for the rotation thereof.

On shaft 33' is eccentrically mounted a gear 42 and a similar gear 43 is eccentrically mounted on a bearing 44, the said bearing being supported by arms 45, having a brace member 46. The said arms are pivotally mounted on the frame members 22 as at D, while the said eccentric gears are held in mesh by means of stay bands 47 engaging on the shrouds 47' between which are positioned the gear teeth 48. The peripheries of the shrouds are positioned on the pitch line of the teeth so that the faces of the shrouds will engage while the teeth are in full mesh, the said bands being two in number are positioned parallel to each other and spaced properly for the teeth to engage between

them freely. To hold the said bands in parallel alignment I have placed cross-bars 49 spaced apart and centrally disposed on the straight portion of the bands.

I have provided a modification for the construction of the stay bands in which there are a plurality of flanged rollers 50 rigidly mounted on a shaft 51 the said shafts pivotally connecting link members 52 and trunnioned thereby. The flanges on the rollers are the guiding means for proper engagement of said rollers with the peripheries of the shrouds. By this construction the stay band may travel with the rotations of the eccentric gears or remain stationary, in which latter event the rotation of the rollers will reduce the friction occasioned by the first said band slidably engaging on the shrouds.

It will be understood that the said band is the supporting means for the lower gear 43, holding it in mesh with gear 42, the lower gear being free to rotate supported in said bands, the said arms 45 are means to prevent a lateral movement of the eccentric bearing 44 and to said bearing are attached cross heads 53, one being on each side of gear 43. The said cross heads are attached to a pair of reins 54, functioning as a connecting member to the walking beam 15 by means of a block 55 having a stub 56 transversely positioned thereon. The protruding ends of this stub are adapted to engage the looped end of the reins as at E, while the said block is adjustable longitudinally on the walking beam and firmly attached thereto by means of bolts engaging in apertures 57 positioned in the top flange of said beam, the object of which is to vary the stroke length of the polish rod.

The reciprocations of the walking beam are produced by the eccentrically mounted gears actuated by the train of gears heretofore described, the principle of which is as follows:

The gear 42 is eccentrically mounted on its shaft and the gear 43 is also eccentrically mounted but free to reciprocate vertically simultaneous with the first said gear. The eccentricity of both gears therefore is equal to four times the radius of either eccentric, when the axis of both gears are positioned as shown in Fig. 5. Therefore, by varying the axis relation to the eccentric positions the length of stroke is varied. For example, if the eccentric position of 43 was reversed to that shown in Fig. 5, the revolutions thereof would be an equalization that would stationarily retain the walking beam in one position.

It will be understood that great power will be had by the train of gears for actuating the cable drum 36, in the event of drawing the casing from the well or other heavy draft, by means of a cable wound thereon and extending upward as shown by dotted lines 58, said cable extending to the top of the derrick and engaging over a pulley mounted thereon which is the usual arrangement, though not shown in the drawings. While the invention herein described pertains to oil well maneuvers I do not care to confine myself strictly to this alone, as the mechanism may be applied to water well drilling or mining purposes, or soundings of any kind. Furthermore, such modifications may be employed in the construction thereof as lie within the scope of the appended claims.

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

1. In a pumping mechanism for oil wells, an eccentrically mounted gear having a stay band positioned thereon, a second gear pendantly positioned beneath first said gear and held to engagement therewith by said stay band, means for supporting last said gear in vertical alignment with first said gear, the said means eccentrically connected to the last said gear, a frame, a walking beam pivotally mounted on said frame, reins connecting said beam to the eccentric connection in last said gear so that the revolutions of both of said gears will co-act in their eccentric movement actuating the reciprocation of said walking beam, and a train of gears positioned in said frame actuating the rotation of the eccentrically mounted gears for the purpose described.

2. In a pumping mechanism for oil wells, eccentrically mounted gears 42 and 43 in combination with a series of gear as actuating means for first said gears, a frame supporting said gears, and a beam rockably mounted on said frame, shrouds on both sides of the teeth of the first said gears for rolling engagement simultaneous with the teeth engagement thereof, a stay band to engage on the shrouds of said gears as pendent supporting means for gear 43, a bearing eccentrically positioned in last said gear, cross heads and a brace member rotatably mounted on the bearing, the brace member pivotally connected to the frame, reins connecting said cross heads to the walking beam as reciprocating means therefor, all as, and for the purpose described.

WILLIAM F. RESCHKE