Aug. 30, 1927. 1,640,655

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MECHANICAL MOVEMENT

Filed May 11, 1925

Fig. 1.

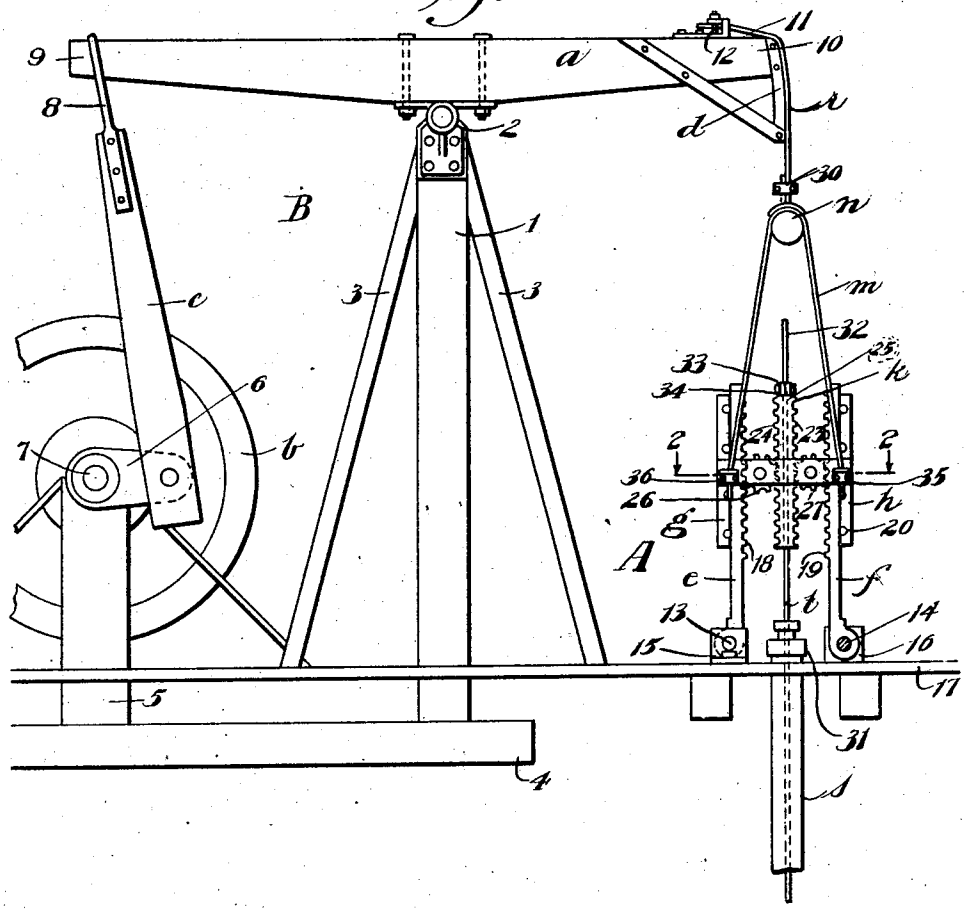


Fig. 2.

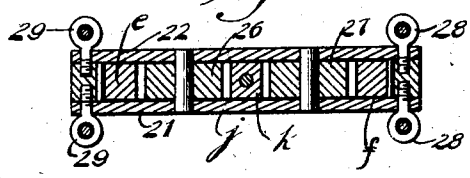
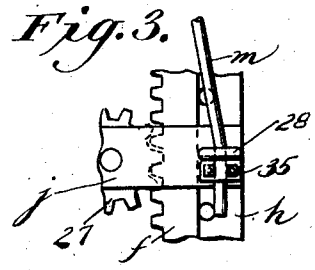


Fig. 3.



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Patented Aug. 30, 1927. 1,640,655

UNITED STATES PATENT OFFICE.

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MECHANICAL MOVEMENT.

Application filed May 11, 1925. Serial No. 29,488.

This invention relates to mechanical movements, and particularly to a mechanical movement adapted for well practice, whether it be oil or water.

At the present time, by what is known as the standard method of pumping, it is customary to insert within a well hole various pump rods having included in their lengths standing and bottom valve members and which rods through the medium of a polish rod are adapted to be reciprocated by means such as a walking beam, for the purpose of pumping oil or water to the surface of the well hole. An object of the present invention is to increase the pumping stroke of the polish rod without increasing the distance of reciprocation of the walking beam.

The invention has among its objects an improved mechanical movement which is superior in point of relative simplicity and inexpensiveness of construction, taken in conjunction with durability and general serviceability.

With the above and other objects in view, the invention consists in the novel and useful provision, formation, construction, association and relative arrangement of parts, members and features, all as shown in certain of its embodiments in the accompanying drawing, described generally, and more particularly pointed out in claims.

In the drawing:

Figure 1 is a fragmentary side elevation showing the improved mechanical movement in operative connection with the walking beam and its associated elements;

Figure 2 is a cross sectional view on the line 2—2 of Figure 1, the said figure being on an enlarged scale from the showing of Figure 1; and,

Figure 3 is a fragmentary detail on an enlarged scale of one of the racks and pinions and a link, which elements are used in practicing certain embodiments of the invention.

Corresponding parts in all the figures are designated by the same reference characters.

Referring with particularity to the drawing, the improved mechanical movement is designated as an entirety and in one embodiment by A, which mechanical movement is adapted to be associated with well apparatus designated generally as B. The well apparatus B includes a walking beam *a* carried on a Samson post 1 through the medium of center irons 2, and which Samson post is braced in the usual manner by braces 3. The Samson post is mounted upon sills 4 and likewise mounted upon such sills is a jack post 5 which, through the medium of bearings and a shaft, carries a bull wheel *b*. A crank arm 6 is keyed to the shaft 7 upon which the bull wheel is mounted and such crank is likewise connected with a pitman *c* which pitman through the medium of a stirrup 8 is connected to an end 9 of the walking beam. The opposite end 10 of the walking beam carries an arc *d* and the top 11 of the walking beam has bolted thereto a clamp 12.

The improved mechanical movement A includes two racks *e* and *f* spaced apart and with their lower ends hinged by means of shafts 13 and 14 to bearing blocks 15 and 16 mounted upon a derrick flooring 17. The rack teeth 18 and 19 of the racks *e* and *f* face each other, and adapted for sliding engagement with the backs or the sides opposite the rack teeth of such racks, are guides *g* and *h*, and which guides carry anti-friction means 20 for lessening the frictional contact between the guides and the backs of the racks. Carried by the guides *g* and *h* and intermediate such guides and extending between the same, is a pinion guide frame *j*. Said pinion guide frame includes a pair of spaced members 21 and 22 straddling opposite sides of the racks *e* and *f*, so as to enclose the said racks and the guides *g* and *h*. Adapted to be centrally received between the guides *g* and *h* and likewise between the members 21 and 22 of the pinion guide frame *j* is a rack *k*. This rack is provided on opposite sides with teeth 23 and 24, the teeth 24 facing the teeth 18 of the rack *e*, and the teeth 23 facing the teeth 19 of the rack *f*. This rack is provided with a longitudinal bore 25. The pinion frame *j* has journaled between the members 21 and 22 thereof, a pair of spaced pinions 26 and 27. The pinion 26 has its teeth in mesh with the rack teeth 18 and 24 and the pinion 27 is in mesh with the rack teeth 19 and 23. The pinion frame *j* carries adjacent its ends oppositely disposed eye members 28 and 29, and stirrup-shaped links designated generally as *m* have their ends passed through said members 28 and 29 and are secured by means of clamps 35 and 36 immediately below said members; the said links are likewise secured at their

bight portions by an attachment *n*. A link *r* is secured to the clamp 12 carried by the walking beam, which in turn engages the arc *d* and then is secured to the attachment *n* by a suitable clamp 30.

Well tubing *s*, secured through the medium of the usual casing head 31, is in alignment with the rack *k*, and a polish rod *t* associated with the pump rod is passed through such tubing and upwardly through the longitudinal bore 25 of the rack *k* where it projects beyond the top surface of such rack, as indicated at 32, and such polish rod is secured to the rack by a suitable clamp 33 which grips said polish rod and bears against the top surface 34 of the rack *k*.

The operation of the device is as follows:

It is no doubt evident upon inspection of the drawing that by providing two fixed rack members and a movable rack member with pinions between the fixed racks and the movable rack, that for each stroke of the walking beam the movable rack will move double the length of such walking beam stroke. The purpose of the present invention is simply to increase the pumping stroke and so that ordinary walking beams as used at wells may still be used and the only change necessary would be the installation of our improved mechanical movement for increasing the pumping stroke. The arc *d* will normally hold the link *r* where it is joined with the attachment *n* in alignment with the polish rod during the working stroke of the walking beam, so that no other compensation for change of radius is necessary. However, we have suitably mounted the members *e* and *f* so that they may swing slightly to compensate for any change in radius that might occur due to movement of the walking beam. The device is compact, has nothing to get out of order, and will increase the pumping efficiency of any well.

It is obvious that various changes and modifications may be made in practicing the invention, in departure from the particular showing of the drawing, without departing from the true spirit of the invention.

Having thus disclosed our invention, we claim and desire to secure by Letters Patent:

1. In means of the character disclosed, a pair of spaced fixed rack members, guides slidable upon said fixed rack members, a pair of pinions in mesh with the teeth of the fixed rack members, and a pinion frame joined with the guides and enclosing the fixed rack members and the pinions.

2. In means of the character disclosed, a pair of spaced fixed rack members, guides slidable upon said fixed rack members, a pair of pinions in mesh with the teeth of the fixed rack members, and a pinion frame joined with the guides and enclosing the fixed rack members and the pinions; there being a movable rack member between the pinions.

In testimony whereof, we have signed our names.

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