June 3, 1930. J. U. DAVIS 1,761,330

LONG STROKE PUMPING MECHANISM

Filed Jan. 2, 1930

FIG. 1

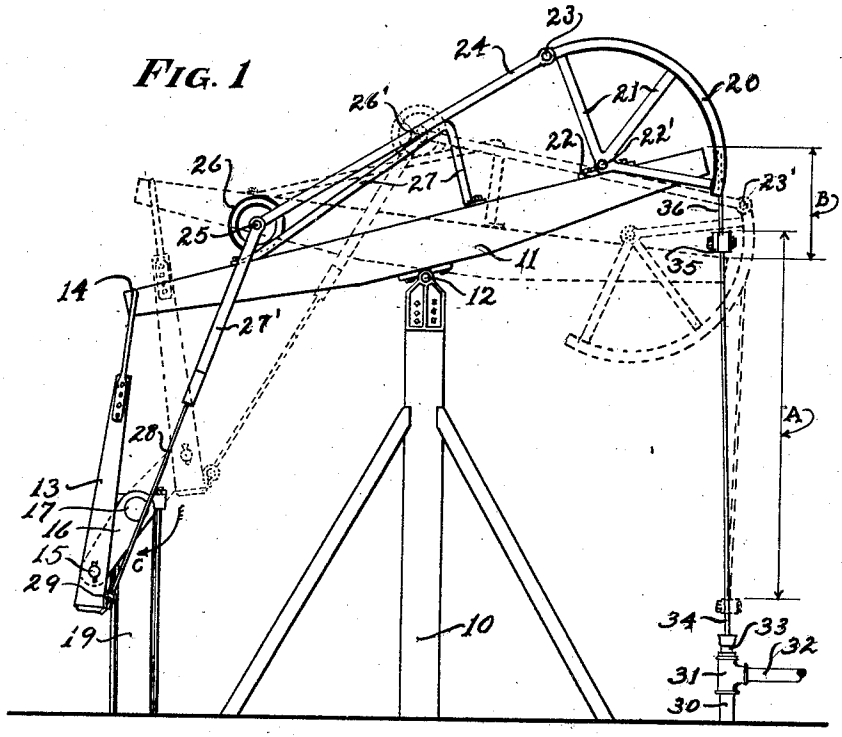
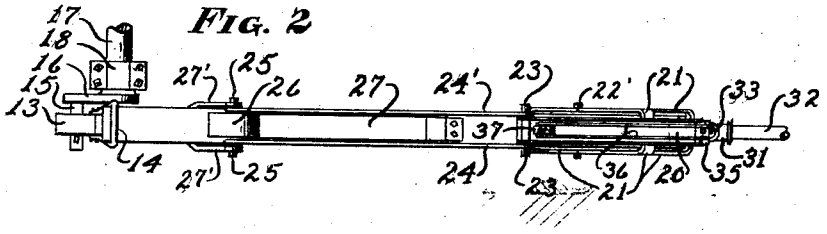


FIG. 2



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UNITED STATES PATENT OFFICE

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LONG-STROKE PUMPING MECHANISM

Application filed January 2, 1930. Serial No. 417,987.

This invention relates to a long stroke mechanism for pumping oil wells and the like.

The object of this invention is to provide a long stroke mechanism that can be easily and quickly attached to the walking beam and pitman of an oil well rig, without changing or altering the details of construction of either the walking beam or pitman, so that the walking beam may be readily used for purposes other than pumping as is usual.

Another object of this invention is to provide a simple mechanism which when employed, will provide a pumping stroke several times longer than the stroke developed by the normal rocking movement of the walking beam as it is ordinarily used.

Referring to the drawings, Fig. 1 is a side view of the invention as applied to an oil well rig. Fig. 2 is a plan view of Fig. 1.

In the drawings is shown the typical Samson post 10 supporting the walking beam 11 on a pivotal bearing 12 as usual. At 13 is the pitman hingedly connected to the walking beam at 14 and mounted on the wrist pin 15 on the crank 16. The crank 16 is rigidly mounted on the shaft 17, said shaft being rotatably mounted in a bearing 18 rigidly mounted on the upper end of the jack post 19. All of the parts above described are those found on any standard oil well rig and to these parts I attach my invention.

At 20 is a curved sector preferably a channel member supported on spokes 21 and pivotally mounted in a bearing block 22 rigidly mounted on the walking beam 11 where shown. At 23 is a pin passing through the curved member 20 and projecting on either side of said member, and on this pin, on each side of the member 20 is a pivoted link 24 and 24′, the opposite ends of these links 24 and 24′ are mounted on an axle shaft 25 in the roller 26. At 27 is an inclined member, (with respect to the walking beam) preferably a channel iron, which is rigidly attached to the walking beam where shown and forming a guide and track on which the roller 26 will travel. At 27′ is a U shaped member, the upper ends of which are pivotally mounted on the roller axle shaft 25. At 28 is a rod rigidly attached to the lowermost portion of the member 27′ and pivotally attached to the pitman 13 at the point 29. At 30 is the usual tubing provided with a T fitting 31 and a pipe 32 leading to an oil storage tank. At 33 is the usual stuffing box through which the polish rod 34 passes. At the upper end of the polish rod is a clamp 35 rigidly affixed to the polish rod and supported by a cable or other suitable flexible material 36 and the ends of said cable 36 being rigidly affixed to the clamp 35 by any suitable means. The said cable 36 being passed over the curved surface of the member 20 and looped over the hook member 37 which is rigidly attached to the member 20 as shown.

In Fig. 1 the solid lines show approximately the extreme position of the parts at the end of the up stroke, and the dotted lines show approximately the extreme position of the parts at the end of the down stroke which shows a long pump stroke A as obtained by the use of my device. The stroke length B is the maximum length stroke ordinarily obtained by attaching the polish rod 34 to the end of the walking beam 11.

By comparing the length of the pump strokes A and B it is plain that the stroke A is several times longer than the stroke B which is the result of using my device and the main object of my invention.

The operation of this device is as follows: the crank 16 rotates in the direction of the arrow C, imparting a rocking motion to the walking beam 11 through the medium of the pitman 13 as shown by the dotted position and simultaneously the curved member 24 is allowed to rock forward to the position shown by dotted lines in Fig. 1. During the operation just described, the roller 26 rolls up the incline member 27 positioning the members 24 and 24′ and 27′ and 28 as shown, the object of which is to keep the points 26′, 22′ and 23′ out of line so that there will be no dead center to cause a lock, therefore the members 28, 27′, 26, 25, 24, 24′ and 23 will function to impart a rocking motion to the member 20 during the rotation of the crank 16. The member 36 being attached to the upper part of the member 20 and also being rigidly at-

tached to the polish rod 34, a long pumping stroke A is imparted to the polish rod and likewise to the pump in the well.

Such modifications may be employed as lie within the scope of the appended claims without departing from the spirit of this invention. Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:

1. The combination of an oil well crank, pitman, walking beam, and Samson post, said walking beam being pivotally mounted on the Samson post, one end of said walking beam being connected to the said crank by means of said pitman, a curved sector pivotally mounted on the said walking beam and members to connect said curved sector to the pitman as an actuating means for said curved sector.

2. The combination of an oil well crank, pitman, walking beam, and Samson post, said walking beam being pivotally mounted on the Samson post, one end of said walking beam being connected to the said crank by means of said pitman, a curved sector pivotally mounted on the walking beam, an inclined track rigidly mounted on the walking beam, a roller having an axle, said roller adapted to travel on said track, links connecting between said roller axle and said curved sector, a U shaped member and rod rigidly connected thereto, the upper ends of said U shaped member being pivotally mounted on said roller axle, and the lower end of said rod being hingedly attached to said pitman substantially as shown and for the purpose described.

3. The combination of an oil well crank, pitman, walking beam, and Samson post, said walking beam being pivotally mounted on the Samson post, one end of said walking beam being connected to the said crank by means of said pitman, a curved sector pivotally mounted on said walking beam, means on said curved sector to receive a flexible member and clamping means on said flexible member as a means of connection to an oil well polish rod, means to connect said curved section to said pitman for the purpose of rocking said sector by the motion of said crank during its revolution.

4. The combination of an oil well crank, pitman, walking beam, and Samson post, said walking beam being pivotally mounted on the Samson post, one end of said walking beam being connected to the said crank by means of said pitman, a curved sector, said curved sector being pivotally mounted on the walking beam, one end of said curved sector being connected to the said pitman through a series of connecting members as an actuating means for said curved sector, means to rock both the walking beam and curved sector simultaneously for the purpose of combining the rocking motion of the curved sector and the rocking motion of the walking beam to produce a long stroke for pumping purposes.

In testimony whereof I affix my signature.

JOHN U. DAVIS.