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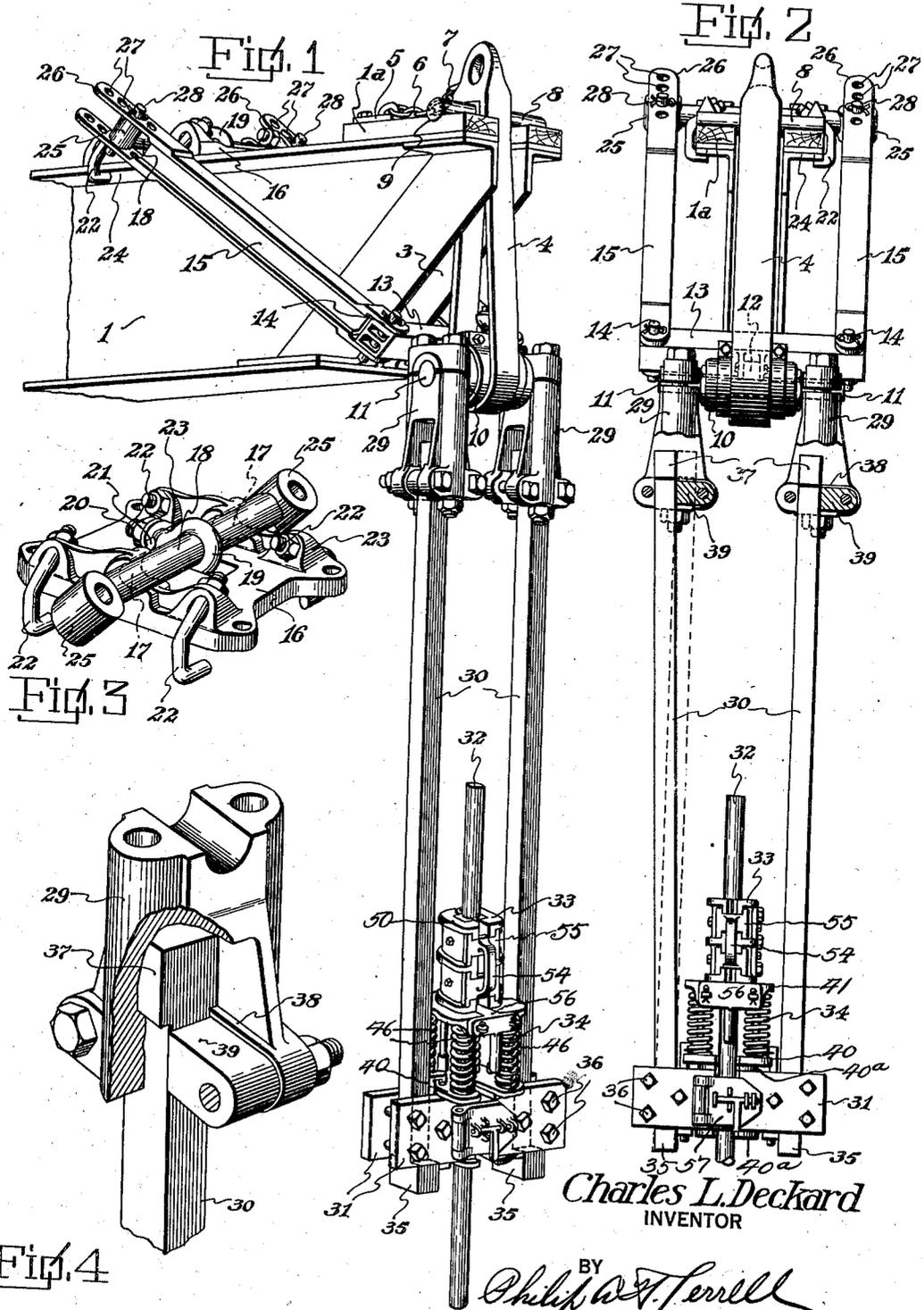
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BEAM HANGER

Filed July 22, 1936

2 Sheets-Sheet 1



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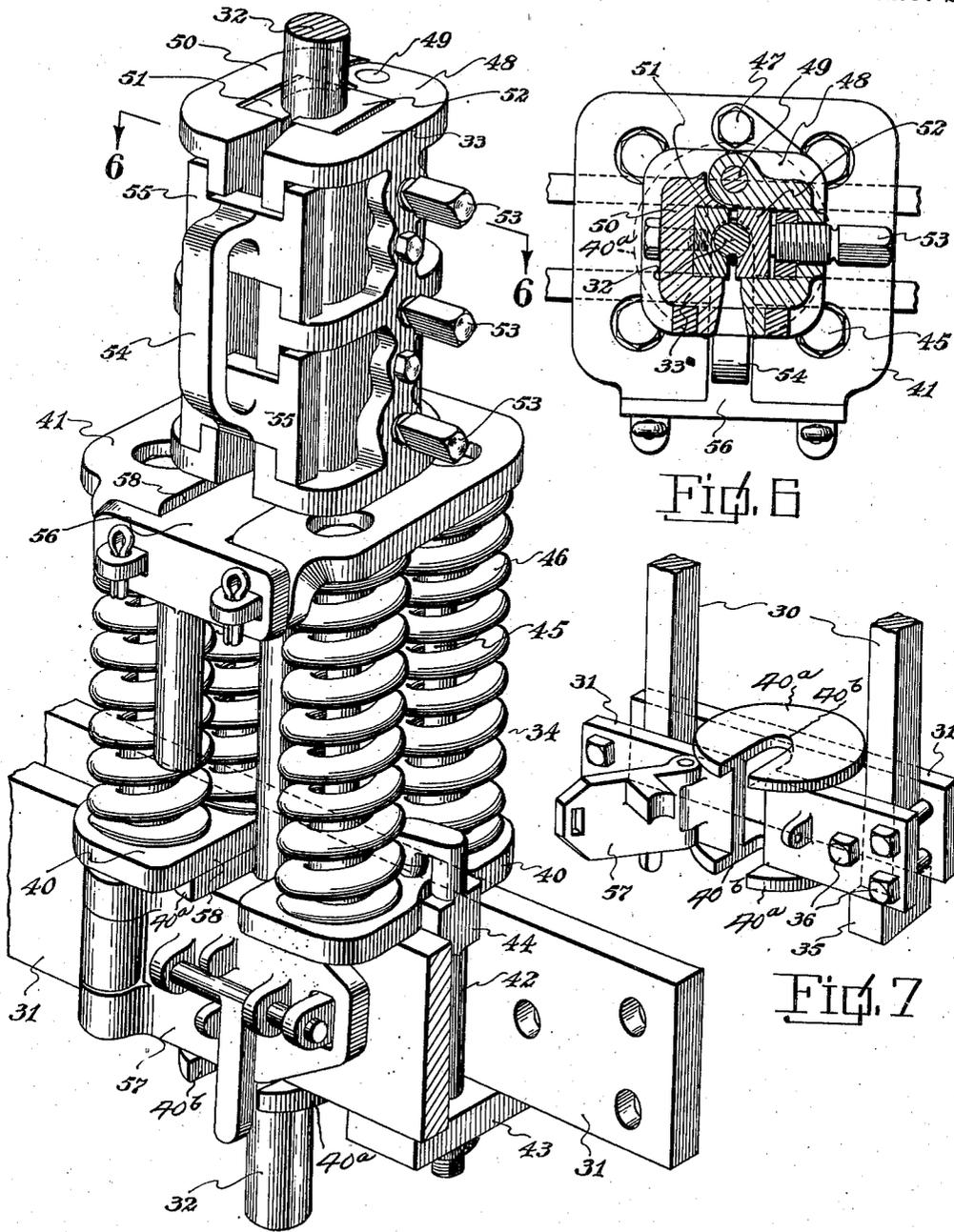


FIG. 5

FIG. 6

FIG. 7

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2,125,861

BEAM HANGER

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Application July 22, 1936, Serial No. 91,955

8 Claims. (Cl. 255—16)

The invention relates to pumping devices and beam hangers to be used in connection with walking beams of deep well pumps, and to which hanger is connected polish rods, said hanger providing means whereby the hanger may be substantially centered over the axis of the well and the polish rod so that the hanger will more nearly follow a vertical position during the rocking of the beam; the centering being preferably when the beam is in a horizontal position.

A further object is to provide an adjustable polish rod hanger for pump beams which will allow the hanger to be centered over the axis of the polish rod and to provide means whereby the hanger may transversely adjust itself in relation to the action of the polish rod, incident to any wobbling or play of the beam during its oscillation, said wobbling also being caused by misalignment or torsional movement.

A further object is to hingedly connect or mount the ends of the hanger braces on the beam end and to a member carried by the hanger loop so that the hanger may be adjusted transversely and to provide the hanger brace arms with adjusting means whereby they may be adjusted forwardly for supporting the hanger in a forward position or in a rearward position for centering the hanger in relation to the axis of the polish rod.

A further object of the invention is to construct the hanger in a manner whereby the side movement of the beam caused by misalignment or torsional movement will not be transferred to the hanger but will be neutralized incident to the braces of the hanger being pivoted at both ends, thereby overcoming the difficulty now experienced where rigid braces are used, consequently heavy and expensive construction necessary to prevent crystallization of the braces incident to side strain.

A further object is to provide the hanger with a two rein feature, into which the upper ends of the reins are mounted and means carried by the fixture members for adjusting and holding the upper ends of the reins apart or for maintaining the reins in parallelism to each other throughout their entire length and means for holding the reins rigidly in adjusted position so that the hanger will impart an upward pull on the polish rod as near on the line of the axis thereof as possible.

A further object is to provide a member clamped on the lower end of the reins and supporting a separable polish rod clamp on the upper side of a shock absorbing device which

rests on the clamping member. Also to provide gate means whereby the rein clamping member, the shock absorber and the polish rod clamp may receive the polish rod without disassembling the parts.

A further object is to provide a beam hanger with means to receive a polish rod, said means comprising a supporting member carried by the hanger; a shock absorber mounted on the supporting member, a clamp for the polish rod mounted on the shock absorber and means carried by all of said member whereby a polish rod may be inserted therein while in position and held in the polish rod clamp.

A further object is to provide the supporting member, the shock absorber and the polish rod clamp with gate means whereby access may be had to said member for placing a polish rod therein and removing the polish rod therefrom.

A further object is to provide adjustment to the shock absorber, whereby the "yield" can be adjusted, and limited to compress to a predetermined point and expand to a predetermined point.

A further object is to provide a polish rod clamp comprising hinged sections having means for clamping a polish rod therein and means for holding the free ends of the hinged sections during the clamping operation.

A further object is to provide the ends of the reins with enlarged heads engaging shoulders of the rein holders of the shock absorber supporting member and forming means whereby the reins are positively held during a pumping operation and also held against disassembling during a rein adjusting operation.

With the above and other objects in view the invention resides in the combination and arrangement of parts as hereinafter set forth, shown in the drawings, described and claimed, it being understood that changes in the precise embodiment of the invention may be made within the scope of what is claimed without departing from the spirit of the invention.

In the drawings:

Figure 1 is a perspective view of the beam hanger showing the same applied to the end of a conventional form of beam.

Figure 2 is a front elevation of the hanger.

Figure 3 is a perspective view of the beam mount.

Figure 4 is a perspective view of a portion of one of the rein holders, part being broken away to better show the structure.

Figure 5 is an enlarged perspective view of the

combined rod support, shock absorber and rod gripping member.

Figure 6 is a horizontal sectional view through the rod gripping device taken on line 6—6 of Figure 5.

Figure 7 is a detail perspective view of the lower ends of the reins and shock absorber support.

Referring to the drawings, the numeral 1 designates the end of a conventional form of walking beam of a pumping rig, and which beam is provided with a bevelled end 2 inclining downwardly and inwardly, as clearly shown in Figure 1, and with an hanger slot 3, in which the hanger loop 4 oscillates during the pumping operation. Mounted on the upper side of the beam 1 is a block 1a which has removably secured thereon a plate 5, to which is connected a chain 6. The chain 6 is connected at 7 to the upper end of the loop 4 above the bearing shaft 8 thereof. The bearing shaft 8 rocks in the bearing 9 of the block 1a when the hanger as a whole is adjusted by means hereinafter set forth.

The loop 4 extends around a bearing 10, which is rockably mounted on a shaft 11. Connected to the rear side of the loop 4 at 12 is a cross bar 13, to the ends of which are hingedly connected at 14 upwardly extending braces 15.

Mounted on the upper side of the beam 1 is a beam mount 16, the opposite sides of which are provided with arcuate bearings 17, in which is held a transversely extending shaft 18. The shaft 18 extends through the eye 19 of an eye bolt 20, and which eye bolt is carried by a bracket 21. The clamping bolts 22, which extend through lugs 23 carried by the beam mount and hook over the flanges 24 of the beam, hold the beam mount rigid on the beam. It will be noted that the shaft 18 may be rotatably adjusted or longitudinally adjusted in the eye 19 of the eye bolt 20 and clamped in adjusted position, the purpose of which will presently appear. The ends of the shaft 18 terminate in apertured bosses 25, which are received in the clevises 26 in the brace arms 27. The clevises 26 are provided with a plurality of apertures 27 for the reception of securing pins 28, and it will be seen by adjusting the pins 28 and the apertured bosses 25 to various positions in the clevises 26, the hanger can be adjusted forwardly for properly centering the same over the axis of the well. When this adjustment takes place the eye bolt 20 is loosened so that the shaft 18 may rock in the eye 19 and the shaft 18 may be transversely shifted for proper centering. When the hanger is shifted or adjusted forwardly the loop shaft 8 rocks in the bearing 9 until the hanger is properly centered. The centering of the hanger is preferably adjusted when the beam is in a horizontal position, so there will be the minimum amount of movement of the hanger during the beam rocking operation in a vertical longitudinal plane, longitudinal in relation to the plane in which the beam rocks. The chain 6 holds the hanger against accidental displacement after it has been assembled on the beam.

Clamped on the ends of the shaft 11 are rein holding members 29 in which are adjustably mounted the upper ends of the spaced reins 30. The lower ends of the reins 30 are clamped between the plates 31 which support the rod 32, the rod grip 33 and the shock absorber 34. The lower ends of the reins 30 are provided with enlarged heads 35 which are engaged by the lower edges of the plates 31, thereby preventing the supporting device from being pulled from the lower ends of

the reins 30 when the hanger is on its upward movement, or on its downward movement, and at the same time allowing either rein member 30 to be angularly adjusted by loosening the bolts 36, said angular adjustment being shown in Figure 2, and at which time the heads 37, carried by the upper ends of the reins 30, may be transversely adjusted on the shoulders 38 and held in adjusted position by means of latching members 39, which may be of any size desired or removed for different sized ones. It will be noted by referring to Figure 2 that the rein bars 30 may be easily adjusted for a transverse adjustment of the axis of the polish rod 32 so as to accommodate the hanger to any misalignment of the beam and pumping rig, or to any slight wobbling of the beam during the oscillation thereof. It will be seen that there is a longitudinal and transverse adjustment of the lower end of the hanger, consequently a hanger is provided which allows alinement to approximate the movement of the hanger in the axis of the well and polish rod.

The shock absorber 34 comprises a lower plate 40 and an upper plate 41. The lower plate 40 rests on the plates 31 of the support and is clamped thereto by means of bolts 42, which extend downwardly between the plates 31 and through bars 43 beneath the plates. The bolts 42 are preferably provided with enlargements 44 for preventing side displacement of the plate 40.

The plates 40 and 41 are connected together by means of headed bolts 45, however the plate 41 is slidably mounted on said bolts, but is maintained spaced by the expansion springs 46, which take up the shock as the beam hanger moves upwardly, and at which time the upward stress is on the plates 31 through the medium of the reins 30. Anchored at 47 to the upper plate 41 is the section 48 of the polish rod clamp 33, and in which the polish rod 32 is held. Hingedly connected to the polish rod clamp section 48 at 49 is a section 50, in which is disposed a channeled block 51 for engaging and gripping one side of the polish rod 32. Slidably mounted in the other gripping section 48 is a block 52 which is adapted to be clamped against the opposite side of the polish rod 32 by the set screws 53. It will be noted that the clamp can be opened so that the polish rod 32 may be inserted through the side thereof. To hold the clamp sections in closed position a removable member 54 is provided which terminates in H-shaped portions 55, which interengage with the sections, and hold the same against clamping action when the set screws 53 are tightened. The upper plate 41 is provided with a removable closure 56 for allowing lateral placement of the polish rod in position, while one of the plates 31 is provided with a hinged closure 57 for allowing the rod to be passed through the plate 31. The plates 40 and 41 of the shock absorber 34 are recessed at 58, therefore it will be seen that it will not be necessary to disassemble the superimposed relation of the parts to place the polish rod in position or remove the same from position.

Welded or otherwise secured to the upper and lower sides of the bars 31 are plates 40a having recesses 40b, which receive the polish rod 32 when it is laterally placed in position. These plates not only brace the bars 31 but prevent, in combination with the closure 57, excessive lateral movement of the polish rod within the device.

If the plates 40 and 41 of the shock absorber are allowed to react from each other the full length of the springs 46, a vibrating action will take place during the stroke. This is overcome

by adjusting the bolts 45, which extend through the plates according to various wells, and conditions. For instance, assume the dead load of the well when it is not in action is fifteen thousand pounds and the springs have a capacity of forty thousand pounds. The differential between the two is to take care of the peak load at the beginning of the up-stroke. If the shock absorber were not in place, and was carrying no load, and the springs had no compression, and the bolts that tie it together were just barely tightened by hand to that point, and allowed that much freedom of movement of the plates from each other, this condition would permit the undesirable vibration during the stroke. To overcome this situation the shock absorber is put in place and everything is hooked up and ready to pump. The full dead load of the well has compressed the springs 46 to a certain point depending on the dead load of the particular well, which load will vary according to the depth of the well. At this time the slidably mounted bolts 45 that hold the plates 40 and 41 in spaced relation are tightened down by the nuts so that the plates will never be any further apart than this compressed position, even when the load is removed. In this way it will act as a self snubber, and the vibrations will be reduced to a minimum and it will not have an extra upward kick at the end of the up-stroke.

By referring to Figures 5 and 6, it will be seen the bolt nuts or heads will have freedom of action in cup shaped recesses in the plates.

From the above it will be seen that a beam hanger is provided which is simple in construction and one wherein the hanger may be easily and quickly adjusted laterally or transversely in relation to the axis of the polish rod. It will also be seen that the polish rod can be laterally placed in position in the rod grip, the shock absorber and supporting member, and that said grip, shock absorber and supporting member may be formed as a unit and maintained as a unit.

The invention having been set forth what is claimed as new and useful is:

1. The combination with a pumping beam, a hanger carried by said beam, said hanger having a supporting bearing, means for adjusting said supporting bearing to various positions longitudinally in relation to the beam, said means comprising brace bars extending rearwardly from the supporting bearing towards the beam, a shaft carried by the beam, said brace bars being hingedly and adjustably connected to the ends of the shaft for movement in the plane of the shaft, said brace bars having hinged connections adjacent the supporting bearing for movement in the plane of the bearing.

2. A beam hanger for polish rods, said hanger comprising a loop pivotally mounted on the beam and movable in a vertical longitudinal plane, a bearing member within the loop, a shaft rockably mounted in the bearing member, rein attaching means carried by the shaft, a transverse bar carried by the loop, upwardly and inwardly extend-

ing arms hingedly connected to the transverse bar, a rockable shaft carried by the beam, the upper ends of the brace members being pivotally and adjustably connected to the rockable shaft whereby the transverse bar may be adjusted outwardly or inwardly for centering the hanger in various positions and means for clamping the rockable shaft against movement.

3. A polish rod hanger for beam ends, said hanger comprising a depending arm pivoted to the beam end, brace members carried by the beam end and adjustable inwardly and outwardly, said brace members extending towards and connected to the depending member, hinged connections carried by the brace members, rein holders pivotally connected to the depending members, reins carried by the rein holders and extending downwardly in spaced relation, a clamp member carried by the lower ends of the reins and adapted to support polish rod clamping means, and means whereby the rein holders may be adjusted to various angular positions in relation to each other for centering the polish rod.

4. A device as set forth in claim 3 including heads carried by the rein members and adjustable transversely in the rein holders and means for holding the reins in adjusted positions.

5. A beam hanger for polish rods, said hanger comprising rein members, a polish rod connected to the lower ends of the rein members, means whereby the upper ends of the rein members may be longitudinally adjusted in relation to the beam and means whereby the upper end of the rein members may be adjusted towards and away from each other whereby their parallel relation may be changed.

6. A device as set forth in claim 5 including brace bars at opposite sides of the beam for the longitudinal adjustment of the hanger, said brace bars being hingedly connected to the hanger and to the beam at opposite sides of the beam.

7. The combination with a beam hanger longitudinally adjustable in relation to the beam of means for longitudinally adjusting the hanger, said means comprising a loop supporting the hanger, said loop being pivotally mounted on the hanger, a transverse bar hingedly connected to the loop, brace arms pivoted to the transverse bar and extending upwardly and rearwardly, a transverse shaft carried by the beam and axially adjustable thereon, the upper ends of the brace bars being hingedly connected to the ends of the transverse shaft and means whereby said last named hinged connection may be varied for adjusting the hanger longitudinally in relation to the beam.

8. The combination with a pumping beam, a polish rod beneath the beam, a hanger pivotally mounted on the beam, said hanger having rein members comprising spaced bars, means for yieldably connecting the hanger to the polish rod and means for varying the position of the rein bars from parallel to angular positions.

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