Sept. 14, 1937.

R. C. PFEIL

2,092,986

POLISH ROD GRIP

Filed Feb. 11, 1936

2 Sheets-Sheet 1

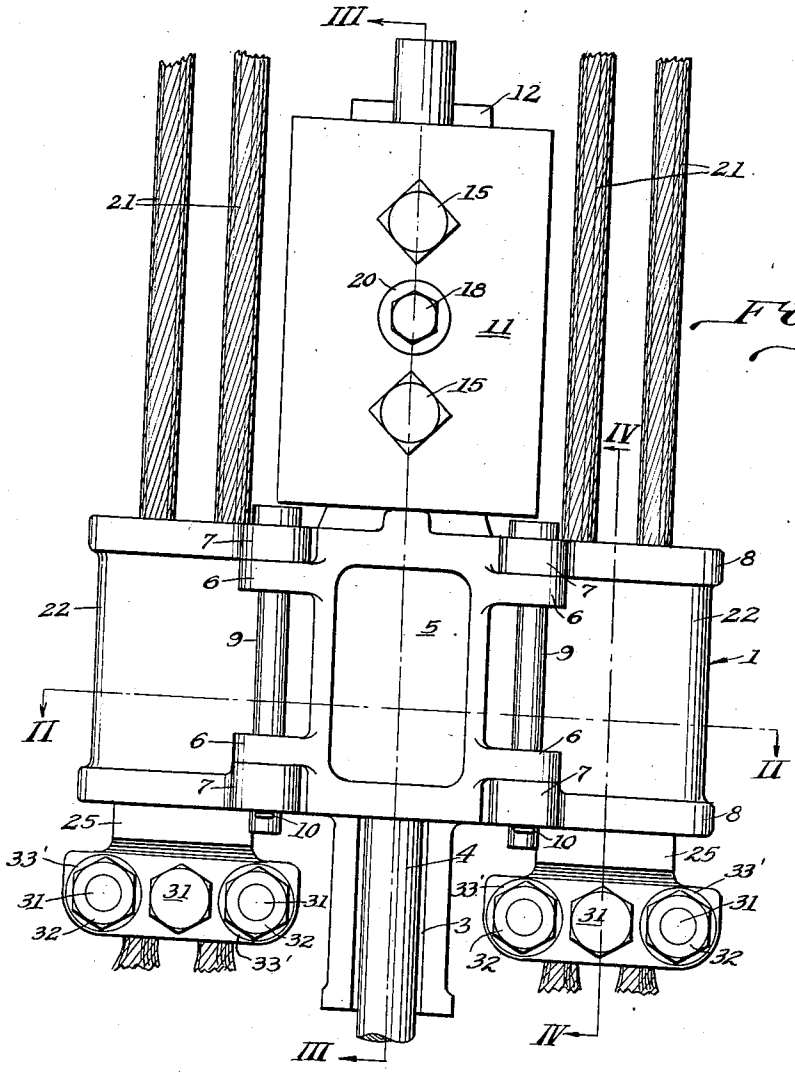

Fig. 1.

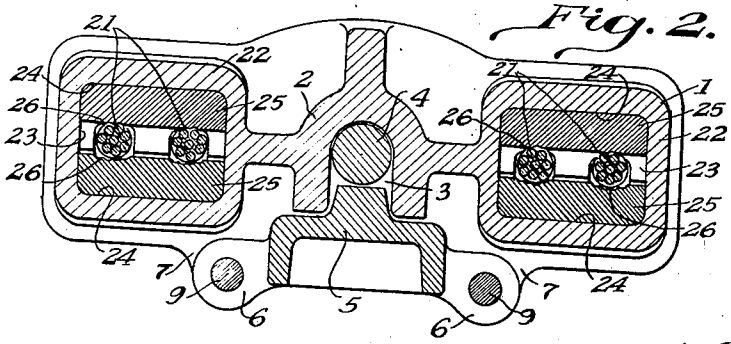

Fig. 2.

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2 Sheets-Sheet 2

Fig. 3.

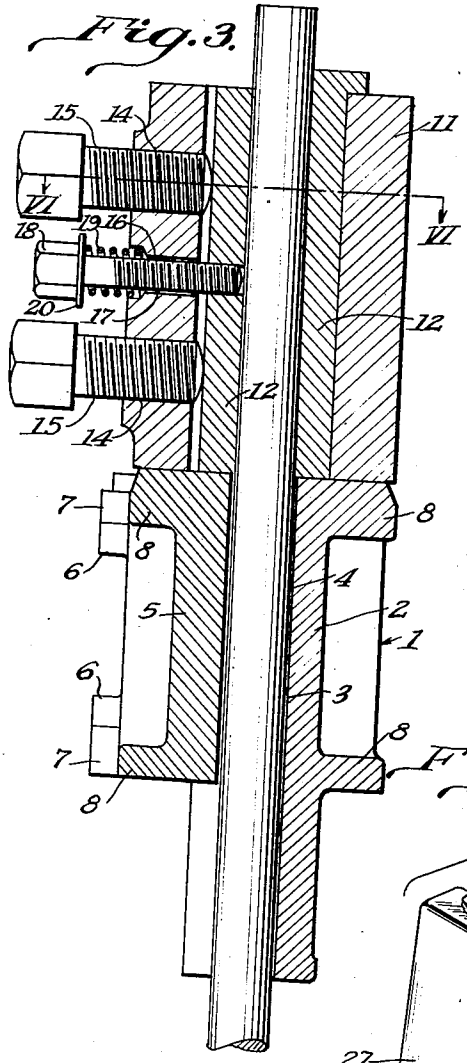


Fig. 4.

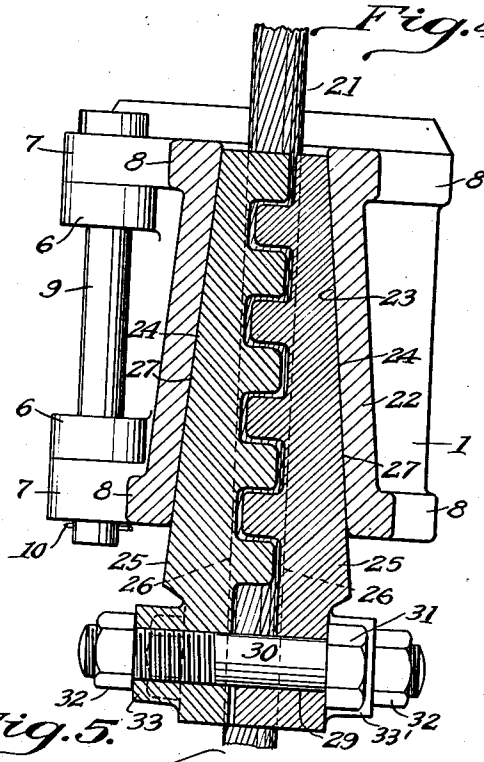


Fig. 5.

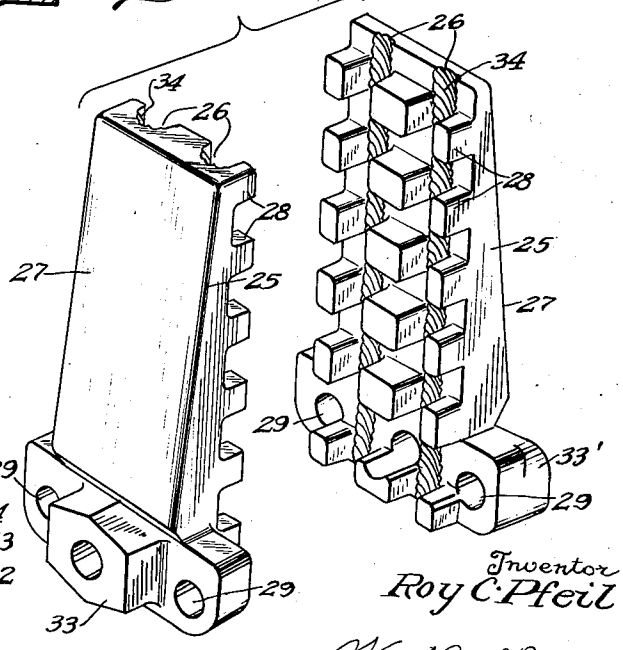
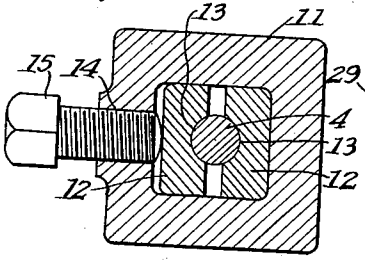


Fig. 6.



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UNITED STATES PATENT OFFICE

2,092,986

POLISH ROD GRIP

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Application February 11, 1936, Serial No. 63,402

7 Claims. (Cl. 24—126)

This invention relates to gripping devices for clamping cables, rods or other members to enable the latter to withstand high tensile forces without slippage.

It is an object of the present invention to provide an improved gripping or clamping device which is primarily constructed to connect the cables of an oscillatory pump beam with the vertically reciprocable polish rod of a well pump. In such a device, enormous strains, particularly in the matter of deep wells, are present in the connections uniting the polish rods with the beam cables, and it is the object of the invention to so construct the clamping or gripping device as to enable the same to successfully absorb and withstand these stresses under operating conditions without injury to the polish rods or cables or permitting slippage thereof when joined with said gripping or clamping device.

With these and other objects in view, which will appear as the description proceeds, the invention consists in the novel features of construction, combination of elements and arrangements of parts hereinafter fully described and pointed out in the appended claims.

In the accompanying drawings:

Fig. 1 is a view in front elevation of the improved cable and rod gripping device comprising the present invention;

Fig. 2 is a horizontal sectional view taken through the device on the plane indicated by the line II—II of Fig. 1;

Fig. 3 is a vertical transverse sectional view on the line III—III of Fig. 1 and disclosing more particularly the polish rod gripping means;

Fig. 4 is a similar view on the line IV—IV of Fig. 1, and disclosing the cable gripping means;

Fig. 5 is a perspective view of the cable gripping jaws, illustrating the latter in separated relationship;

Fig. 6 is a horizontal sectional view on the line VI—VI of Fig. 3.

In the specific embodiment of my invention illustrated in said drawings, my improved cable and rod gripping device comprises a cast metal body 1, formed centrally with a substantially U-shaped web 2, in which is provided a vertically extending open-sided channel 3 of a length equivalent to the full height of the body 1. The channel 3 is adapted to receive the upper portion of the polish rod 4 of a well pumping mechanism, the polish rod and the well pumping appliances carried thereby being supported by and suspended from the body 1. The open side of the channel 3, following the positioning of the polish rod 4 therein, is closed by means of a removable plate 5, the latter, as shown in Figs. 1 and 2, being formed with integral laterally projecting ears 6, which register with corresponding apertured ears 7 formed with and projecting from the upper and lower horizontally disposed flanges 8 of the body 1. Headed pins 9 are passed through the registering apertures provided in the ears 6 and 7 to retain the plate in its position of channel closure, the lower ends of said pins being provided with cotter keys 10, or their equivalents, to prevent displacement of the pins.

As shown more particularly in Figs. 1 and 3, the polish rod is secured in connection with the body 1 by the employment of a frictional gripping means comprising a casing 11 which rests on the top of the central portion of the body 1 and is internally provided with a pair of separable clamping members 12 having the complemental vertical faces thereof grooved as at 13 for the reception of the polish rod. The casing 11 is provided with threaded openings 14 for the reception of set screws 15, the inner ends of which frictionally engage one of said clamping members to force the latter into gripping and supporting contact with the rod 4, when said set screws are tightened by means of suitable wrenches. To facilitate the release or separation of the clamping members, one of the latter may be provided with a threaded bolt 16, which projects through an opening 17, formed in the casing 11 and has its outer end provided with a head 18. A coiled expansion spring 19 is disposed between the outer surface of the casing 11 and a washer 20 provided on the bolt 16 so that the normal tendency of said spring will be to draw the clamping member 12, with which the bolt 16 is connected, away from the polish rod and the other of said clamping members. By thus securing the casing 11 to the upper end of the polish rod, the weight of the latter and the members carried thereby will be transmitted to the body 1 through the clamping members 12 and the casing 11, so that the rise and fall of the body 1, in unison with an associated walking beam, will impart corresponding motion to the pump or polish rod.

Since a walking beam is mounted for swinging movement in a vertical plane about a fixed horizontal turning axis, and since the polish rod is mounted to reciprocate vertically, it is customary in well operating apparatus to connect the polish rod with the operating end of a walking beam through the provision of flexible cables. These cables must have sufficient strength to sustain

the tremendous weights imposed thereon by the polish rod and the pumping mechanism suspended therefrom and the weight of the column of liquid undergoing elevation through the casing of a well by the operation of the pumping appliances. In addition, the cables, by reason of their flexibility, compensate for variations in the relative positions of the arcuately swinging walking beam and the vertically movable polish rod.

In the accompanying drawings, the cables employed for this purpose are indicated at **21**, and it will be understood that the upper ends of said cables are adapted for connection with the operating head of a standard walking beam, not shown. To unite the lower ends of said cables in a secure, effective and non-slipping manner with the clamp body, the latter is formed, as shown more particularly in Figs. 1 and 2, to include on opposite sides of the web **2** a pair of box-like flanges **22**, comprising an integral part of the body **1** and arranged between the upper and lower flanges **8** thereof. The flanges **22** produce cable-receiving sockets **23** in the body **1**, and the wall surfaces **24—24** of each of these sockets are tapered vertically, as shown in Fig. 4, so that the open upper ends of said sockets are narrower than the larger lower end portions thereof.

Arranged to occupy the sockets **23** are cable clamping jaws **25**, there being a pair of such jaws for each of the sockets **23**. The said jaws preferably comprise metallic castings having their inner vertical surfaces grooved as at **26** to receive a pair of the cables **21**. In addition, each of said jaws is provided with an inclined outer surface **27** adapted for engagement with the inclined surfaces **24—24** of the sockets **23**. Integrally projecting from the inner vertical faces of the jaws **25** are interfitting lugs or teeth **28**, so disposed that when said jaws are in cable clamping engagement, relative vertical movement between the complemental jaws will be precluded. To hold these jaws in clamping relationship with the lower ends of the beam cables, the lower portions of said jaws are formed with registering horizontally disposed openings **29** through which pass the threaded shanks **30** of headed bolts **31**, the threaded portions of the shanks **30** being equipped with securing nuts **32**. One of the jaws **25**, as shown in Fig. 5, has its lower portion provided with a nut engaging enlargement **33** which is arranged approximately in the center of the jaw, while the corresponding enlargements **33'** on the other mating jaw are disposed adjacent to the outer sides. By this arrangement, the nuts are relatively offset so that convenience is to be obtained in the matter of applying a wrench thereto.

It will be seen that by the tightening of the nuts **32**, the jaws **25** will be drawn into firm frictional engagement with the cables **21**. In addition, due to the wedge-like surfaces **24** and **27**, when the weight of the polish rod and its associated parts is applied to the body **1**, the latter will tend to press itself downwardly on the inclined surfaces **27** of the jaws **25**, with the result that the latter are pressed together in firm, non-slipping frictional contact with said cables, relieving the threaded connections **31** and **32** of excessive strain.

In applying this clamp head or grip to the polish rod and the beam cables, the polish rod is caused to assume its lowermost position as well as the operating end of the walking beam. The jaws **25** are then clamped by means of threaded connections **31** and **32** on the ends of the cables, and the body **1** is lowered so that the jaws **25** will be received within the sockets **23**. The plate **5** is then applied to the body **1** to retain the polish rod in connection with the channel **3**, and the casing **11** is applied to the polish rod and lowered into contact with the upper surface of the grip body and frictionally clamped, by means of the set screws **15**, in holding engagement with the polish rod. The walking beam may then be rocked in the customary manner to reciprocate the polish rod. As soon as the operating end of the walking beam begins its upward travel, the jaws **25**, by reason of their wedge-like construction, engage with the surfaces **24** of the cable sockets formed in the body **1** and firmly grip said cables to prevent any slippage of the jaws on said cables. This enables the full weight of the polish rod and the materials suspended therefrom to be applied to the body **1** without loss of position on said body by reason of cable slippage. While the grip provides for the secure retention of the cable and rod parts connected therewith in their proper relative order, nevertheless, it has the advantage of being of strong yet simple construction and one which may be readily applied to associated well operating appliances without the use of special tools or other facilities.

The cable grooves **26** may, if desired, be roughened as indicated at **34** to enable the jaws to obtain a firm grip on the cables.

The lugs **28** limit the side spreading or flattening action of the cables when the loads are applied to cause the clamps to grip the cables.

While I have described the preferred form of the present invention, nevertheless it will be appreciated that the same is subject to variation and modification without necessarily departing from the spirit of the invention as defined in the following claims.

What is claimed is:

1. A cable grip comprising a body including a socket having tapering walls, relatively separable cable engaging members positioned in said socket and having tapering outer surfaces conforming to the walls of the socket, and threaded means for maintaining said members in frictional contact with a cable disposed between the same.

2. A cable grip comprising a body formed with a tapered socket, a pair of relatively separable jaws having cable receiving grooves formed in the adjoining surfaces thereof, the outer surfaces of said jaws being tapered to conform with the configuration of said socket, and threaded means disposed exteriorly of said body for initially maintaining said jaws in clamping engagement with a cable positioned in said grooves.

3. A cable grip comprising a body including a socket having opposed relatively converging surfaces, a pair of separable jaw members positioned in said socket, said jaw members having the inner complemental surfaces thereof formed with cable engaging surfaces, the outer surfaces of said jaw members being inclined for wedge-like engagement with the converging surfaces of said socket, means for precluding relative longitudinal movement between said jaw members when the latter are in cable gripping positions, and means disposed exteriorly of said body for frictionally clamping said jaw members in engagement with a cable.

4. In a polish rod grip, a body provided with a socket having opposed converging surfaces, a pair of jaw members positioned in said socket, said jaw members having inclined outer surfaces

formed for wedge-like contact with the converging surfaces of said socket, the inner surfaces of said jaw members being grooved for the reception of a cable, interfitting lugs formed with the inner surfaces of said jaw members, and threaded securing devices passing transversely through said jaw members, exteriorly of said socket to initially tighten the jaw members in frictional contact with a cable positioned therebetween.

5. In a cable clamp, a pair of relatively separable jaw members, the inner mating surfaces of said jaw members being longitudinally grooved for the reception of a cable, interfitting relatively offset lugs integrally formed with and projecting from the inner surfaces of said jaw members and serving to preclude relative longitudinal movement between said jaw members when the latter occupy cable engaging positions, and threaded fastening means passing transversely through said jaw members at one end thereof to draw the latter relatively into frictional clamping engagement with a cable disposed therebetween.

6. In a clamp, a pair of relatively separable jaw members, the mating surfaces of said jaw members being formed with integral interfitting and relatively offset lugs by which relative longitudinal movement between said jaw members is precluded when the latter are in clamping relationship with a member confined therebetween, and securing means passing transversely through said jaw members for maintaining the latter in their clamping positions and against relative transverse separation.

7. In a clamp, a pair of relatively separable jaw members, the mating surfaces of said jaw members being formed with integral interfitting and relatively offset lugs by which relative longitudinal movement between said jaw members is precluded when the latter are in clamping relationship with a member confined therebetween, and securing means passing transversely through said jaw members for maintaining the latter in their clamping positions and against relative transverse separation, the outer surfaces of said jaw members being inclined to taper said jaw members vertically.

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