Dec. 8, 1931. G. F. BELL 1,835,455

WIRE LINE DRILLING CLAMP

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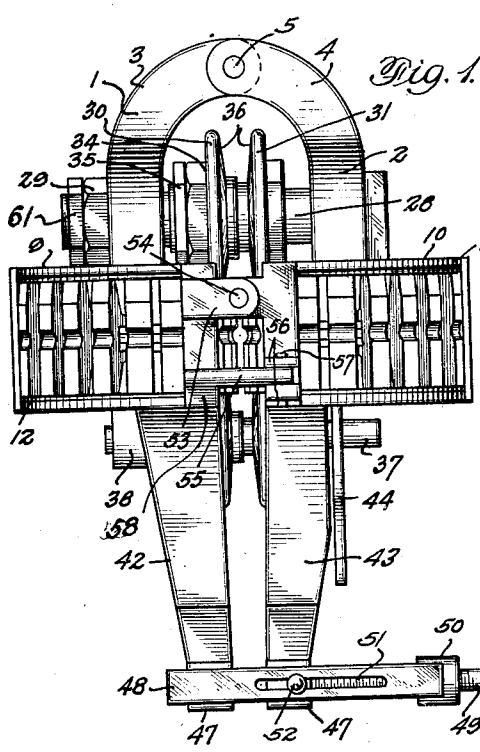


Fig. 1.

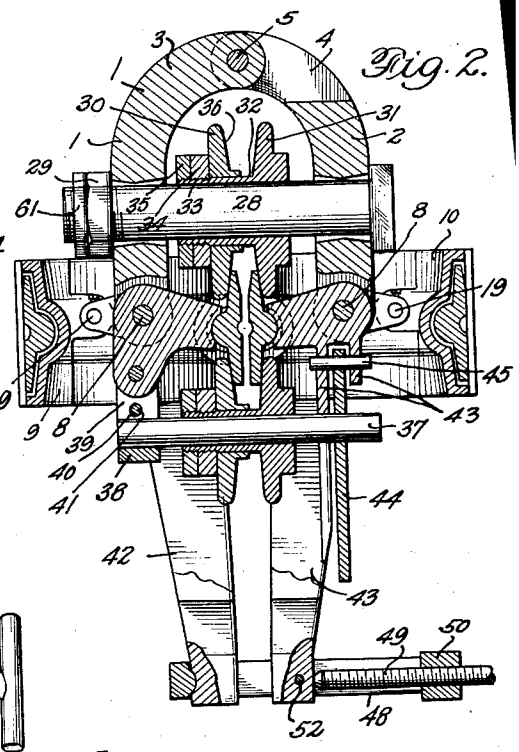


Fig. 2.

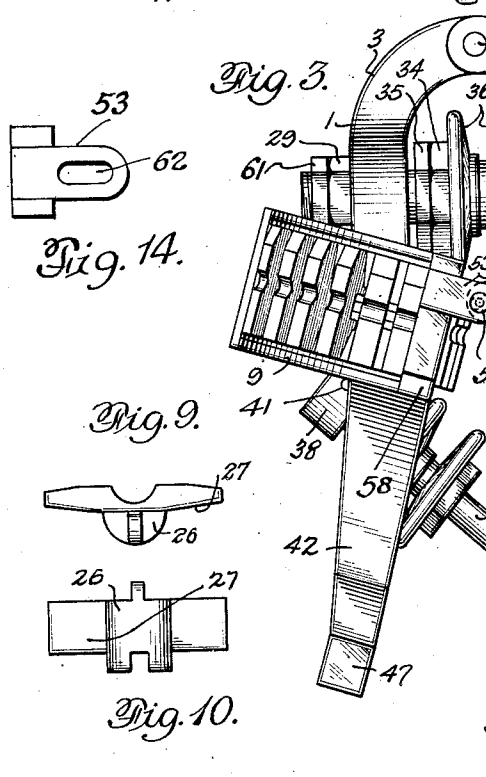


Fig. 3.

Fig. 14.

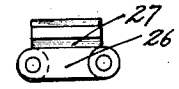


Fig. 11.

Fig. 9.

Fig. 10.

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Fig. 6.

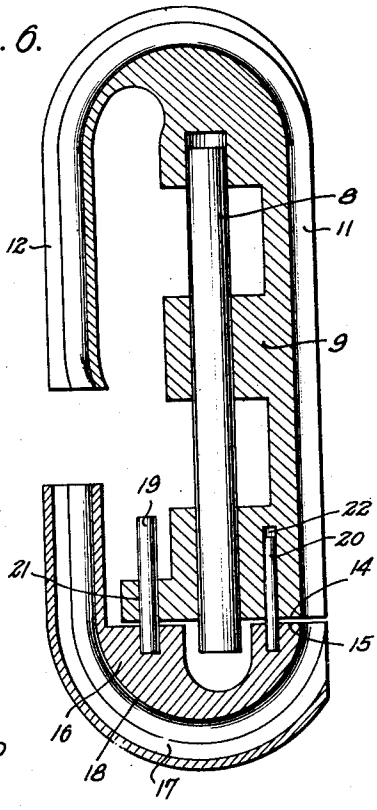
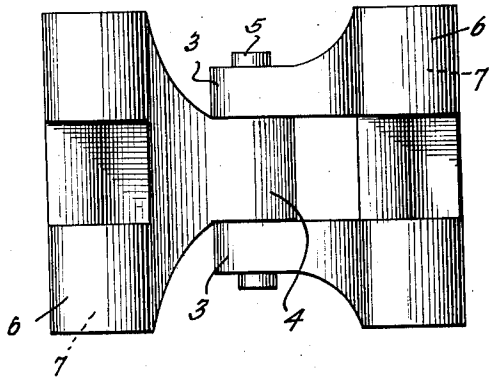


Fig. 7.



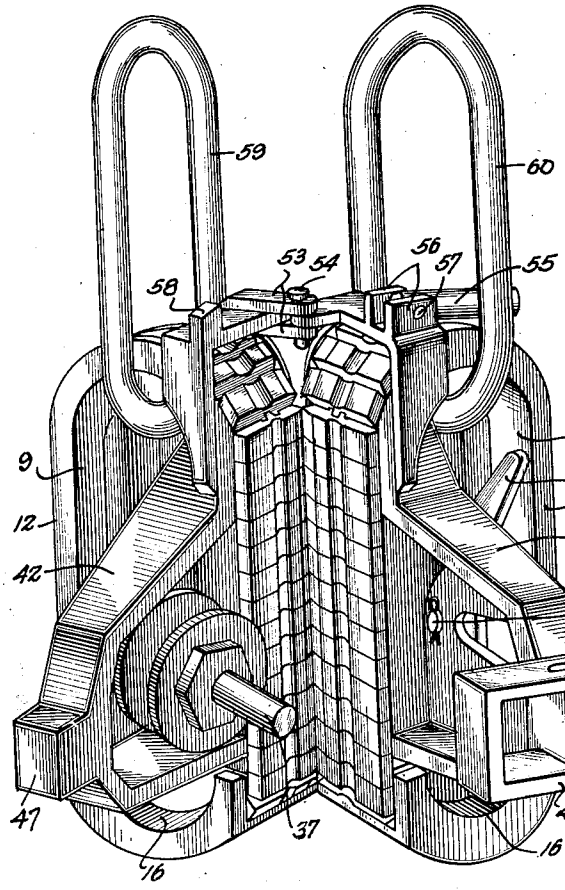


Fig. 8.

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WIRE LINE DRILLING CLAMP

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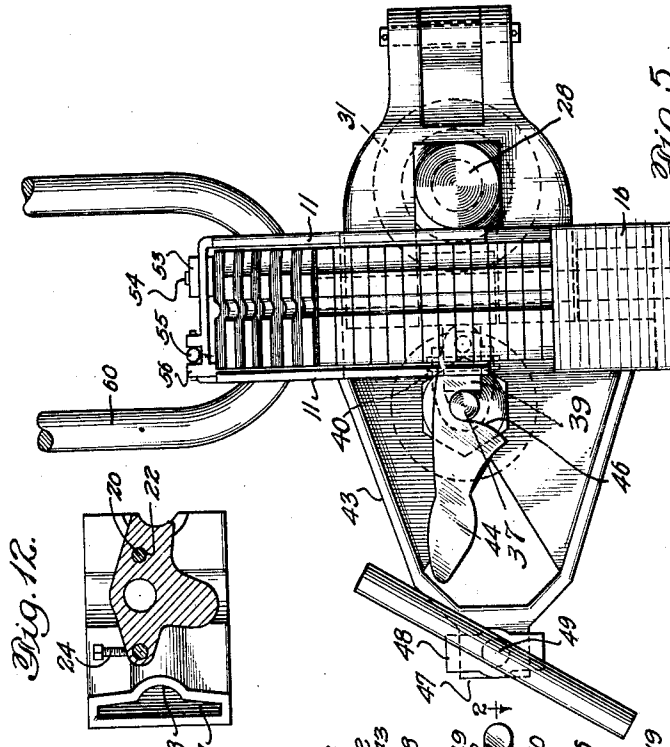


Fig. 5.

Fig. 12.

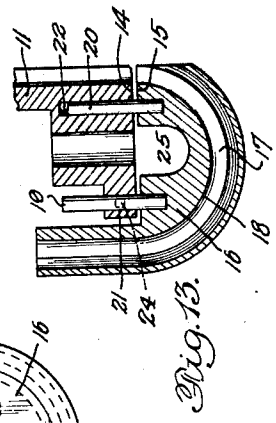


Fig. 13.

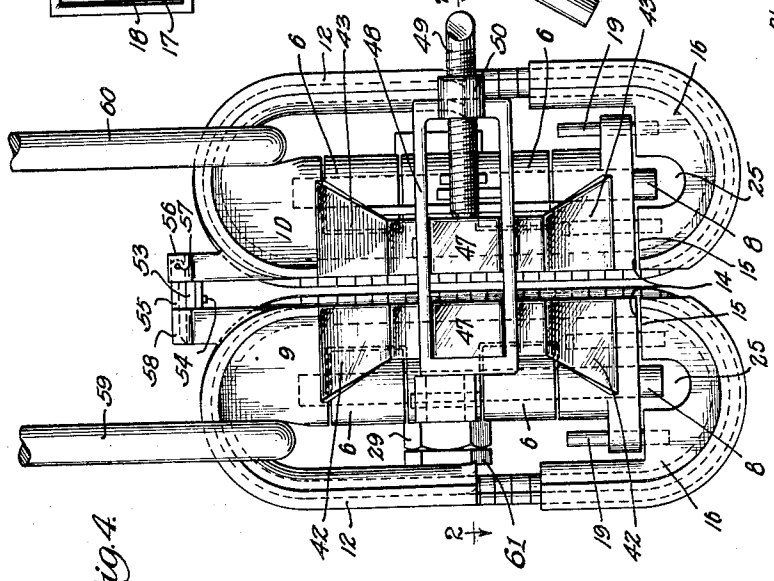


Fig. 4.

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By Ralph D Barnett

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the clamping screw is tightened to prevent further movement. It will be noted at this point that inasmuch as the jaw members which carry the chains, and which are subjected to wear, are adjustable by lowering hook section 16, Fig. 13, and replaceable after first loosening set screw 24, the life of the parts is greatly enhanced. The jaws due to their sectional nature and the take-up means provided, will last for a period heretofore unheard of in the art by making slight adjustments as indicated above.

In disengaging the clamp from the wire line the jaws are unlocked and swung to open position, so as to relieve the pressure of the chains on the rollers.

What I claim is:

1. A wire line clamp comprising hinged jaw members, flexible line clamping means carried by said jaw members, and means independent of the jaw members for causing the normal contact of the clamping means with a line.

2. A wire line clamp comprising hinged jaw members, endless line clamping means carried by said jaw members, and means carried by the jaw members for causing a normal gripping action between the endless line clamping means and the line when the jaws are in closed position.

3. In a wire line clamp, a yoke, jaws hinged to said yoke, endless clamping means carried by the jaws, means for adjustably locking the jaws in closed position, and means for positioning the clamping means in normal gripping position.

4. A wire line clamp including a yoke, jaws hinged to said yoke, flexible engaging means carried by said jaws, means for locking said jaws in adjusted position, and guide rollers for said engaging means.

5. A wire line clamp including a yoke, jaws hinged to said yoke, flexible engaging means carried by said jaws, means for locking said jaws in adjusted position, and rollers for said engaging means retaining same in clamping position.

6. In a wire line clamp, a yoke, jaws hinged to said yoke, endless clamping means carried by said jaws, means for adjustably locking the jaws in closed position, and means for positioning the clamping means in normal gripping position.

7. A wire line clamp including a yoke, jaws hinged to said yoke, flexible engaging means carried by said jaws, means for locking said jaws in adjusted position, and guide rollers for said engaging means.

8. The substance of claim 7 characterized in that the rollers co-act with the flexible engaging means to cause a positive clamping action.

9. A wire line clamp including a yoke, jaws hinged to said yoke and formed with grooved guideways, endless engaging means carried by said jaws and adapted to travel in said guideways, adjustable means for securing said jaws in closed position, and rollers positioned to force said endless engaging means into normal gripping position.

10. In a wire line clamp, a yoke formed of a pair of hinged sections, jaws hinged to said yoke sections, endless clamping means carried by said jaws, means for adjustably locking the jaws in closed position, means carried by said yoke members for positioning one side of the endless clamping means, and means carried by one of the jaw members for positioning the opposite sides of the clamping means.

11. In a wire line clamp, a yoke formed of a pair of hinged sections, jaw members hinged to each of said sections, endless clamping means carried by said jaws, means for adjustably locking the jaws in closed position, and means carried by the yoke member for adjusting the sections comprising an elongated bolt, and means mounted on the bolt and engaging the endless clamping means for positioning the latter.

12. In a wire line clamp, a yoke formed of a pair of hinged sections, adjusting means for said hinged sections, jaws carried by said yoke sections, endless clamping means carried by said jaws, means for locking the jaws in closed position, a roller formed with an annular groove mounted on the adjusting means for the hinged yoke sections and engaging one side of the endless clamping means, and a similar roller carried by one of the jaw sections for engaging the opposite side of the endless clamping means.

13. A wire line clamp comprising a yoke, hinged jaws carried by said yoke, gripping means carried by said jaws, means carried by said yoke for adjusting said jaws, means carried by said yoke for positioning said gripping means, and means for locking the jaws together.

14. The substance of claim 13 characterized in that additional positioning means for the gripping means is carried by one of the jaw members.

15. A wire line clamp comprising a yoke, hinged sectional jaws carried by said yoke, means for adjusting said jaw sections, gripping means caried by said jaws, and means for locking the jaws together.

16. The substance of claim 15 characterized in that the gripping means comprise endless bands.

17. The substance of claim 15 characterized in that the gripping means comprise endless bands and means are provided for positioning these bands with respect to one another.

18. A wire line clamp comprising a yoke formed of a pair of hinged sections, means for adjusting the sections of said yoke, hinged sectional jaws carried by said yoke sections, means for adjusting said jaw sections, flexible

gripping means carried by said jaws, and means for locking said jaws together.

19. A wire line clamp comprising a yoke formed of a pair of hinged sections, means for adjusting the sections of said yoke comprising an elongated bolt, sectional jaw members carried by said yoke sections, means for adjusting said sectional jaws, endless gripping means carried by said jaws, means mounted on said elongated bolt for positioning said gripping means, and means for securing the jaws together.

20. A wire line clamp comprising hinged jaw members, flexible line clamping means carried by said jaw members, and camming means independent of the jaw members for causing the normal contact of the clamping means with a line.

21. A wire line clamp comprising hinged jaw members, endless line clamping means carried by said jaw members, and camming means carried by the jaw members for causing a normal gripping action between the endless line clamping means and the line when the jaws are in closed position.

22. In a wire line clamp, a pair of separable jaw members, endless line clamping means carried by said jaw members, and rotatable means carried by the jaw members and cooperating with the clamping means for causing normal contact of the latter with a line when said jaws are in closed position.

23. In a wire line clamp, a pair of separable jaw members, endless line clamping means carried by said jaw members, and means disposed on opposite sides of the clamping means and alined with each other, for engaging and causing normal gripping action between the clamping means and a line when said jaws are in closed position.

24. In a wire line clamp, a yoke formed of a pair of hinged sections, adjusting means for said hinged sections, jaws carried by said yoke sections, endless clamping means carried by said jaws, means for locking the jaws in closed position, a roller carried by the adjusting means having a groove formed with outwardly diverging walls adapted to engage one side of the clamping means, and a similar roller carried by one of the jaws for engaging the opposite side of the endless clamping means.

25. In a wire line clamp, a yoke formed of a pair of hinged sections, adjusting means for said hinged sections, jaws carried by said yoke sections, endless clamping means carried by said jaws, means for locking the jaws in closed position, a shaft carried by the adjusting means, a pair of disks on said shaft having opposed outwardly diverging faces adapted to engage one side of the clamping means, a shaft carried by one of the jaws, and a pair of similar disks carried by the last named shaft for engaging the opposite side of the endless clamping means.

26. A wire line clamp, comprising a pair of hinged jaw members, movable line clamping means carried by said jaw members, and rotatable means independent of the jaw members for causing normal contact of the clamping means with a line.

27. A wire line clamp, including a pair of movable jaw members, movable line clamping means carried by said jaw members, and rotatable means carried by the jaw members for causing normal contact of the clamping means with a line.

28. In a wire line clamp, a pair of movable jaw members, a pair of cooperating endless line clamping means carried by the jaw members, said means being composed of links having the inner faces of opposed portions tapered toward the side edges thereof, and means carried by the jaws formed to engage the tapered faces of the links for causing normal contact of the clamping means with a line.

29. In a wire line clamp, a pair of movable jaw members, a pair of cooperating endless line clamping means carried by the jaw members, said members being composed of links having the inner faces of opposed portions tapered, and a rotatable member carried by the jaws having a part formed to engage the tapered faces of the links for causing normal contact of the clamping means with a line.

30. In a wire line clamp, movable jaw members, a pair of cooperating flexible line clamping means carried by the jaw members, said means having the inner faces of opposed portions tapered toward the side edges thereof, and means carried by the jaw members having a part formed to engage the tapered faces of the clamping means whereby to cause normal contact of said clamping means with a line.

31. In a wire line clamp, a pair of movable jaw members, an adjustable sectional guide member pivotally mounted on each of said jaw members, a flexible belt in each of said guide members, and means carried by the jaw members for engaging said flexible belts whereby to cause the latter to grip a line therebetween when said jaw members are in closed position.

In testimony whereof I affix my signature.

GEORGE F. BELL.

Patented Dec. 8, 1931 1,835,455

UNITED STATES PATENT OFFICE

GEORGE F. BELL, OF TULSA, OKLAHOMA

WIRE LINE DRILLING CLAMP

Application filed May 19, 1930. Serial No. 453,707.

This invention relates to improvements in wire line drilling clamps of the type shown and described in my former Patent #1,344,476, dated June 22, 1920, and comprehends changes and additions to this structure of such a character that the operation essential to slip the line does not free the grip chains from the line, whereby the travel of the line with the chains is compulsory.

More specifically, the structure embodies the use of spaced rollers, the inner faces of which are tapered to engage the outer tapered faces of the adjacent chain portion, whereby through suitable adjustment the chain portions can be brought together to clamp the wire line.

One of the objects of the present invention is to so mount the parts subjected to wear that this wear can be compensated for by quick adjusting facilities, enabling a longer use of the elements involved.

Other features of construction whereby a compact, strong and efficient assembly is provided, will be apparent by reference to the accompanying drawings, specification and claims, wherein like characters of reference designate corresponding parts throughout the several views, in which:

Figure 1 is a top plan view;

Figure 2 is a horizontal section on line 2—2 of Figure 4;

Figure 3 is a top plan view showing the jaws in open position;

Figure 4 is a front elevation;

Figure 5 is a side elevation;

Figure 6 is a vertical section through one of the jaws;

Figure 7 is an end view showing the hinged joint of the yoke;

Figure 8 is a perspective showing the jaws in open position;

Figure 9 is an end view of one of the links of the gripping member;

Figure 10 is a bottom plan view of a link;

Figure 11 is a side elevation of a link;

Figure 12 is a transverse section through one of the jaw members;

Figure 13 is a partial vertical section through the lower portion of the jaw; and

Figure 14 is a fragmentary view of one of the jaws and tongue carried thereby.

The present invention comprises a yoke member formed of curved sections 1 and 2, Figs. 1–3, having reduced outer hinged extremities 3 and 4, Figs. 3 and 7, formed with registering openings for the reception of the hinge pin 5. The opening accommodating this pin is larger than the pin itself, permitting free movement of this joint for purposes hereinafter outlined. The inner extremities of the yoke section are bifurcated and arranged parallel for supporting the jaw members. The bifurcated extremities 6, Figs. 4 and 7, of the yoke members are formed with alined vertical openings 7 through which extend the pins 8, these pins extending through vertically alined openings in the jaw members 9 and 10 and hinging these parts together.

The jaw members, each of which is substantially identical, comprise in each instance a sectional body. The upper section includes an enlongated grooved wall portion 11 which extends upwardly around the curved extremity and downwardly terminating in a free hook shape portion 12, Fig. 6, which is practically parallel to the wall 11. The lower face of the upper hook section is flat as at 14 to accommodate the adjacent flat portion 15 of the lower hook section 16. The lower channelled section 16 is provided with a passage 17, the inner face 18 of which is grooved to form a continuous trough-shaped guideway alined at both ends with the groove formed in the upper section. It will be seen that the gripping chains will be substantially encased by the wall forming the passage in the lower jaw section. Vertically extending pins 19 and 20 are fixed at spaced intervals in the upper flat face 15 of the lower section and extend into openings 21 and 22 respectively, formed in the lower adjacent section of the upper jaw portion. A set screw 24, Fig. 12, extends through the wall forming the opening 21 and engages the pin 19, locking these parts against vertical movement. The upper face of the lower jaw member is cut away as at 25 to form a space for the extremity

of the pin 8 which hinges the upper jaw section to the corresponding yoke section.

The gripping elements which are in the form of endless chains are preferably formed of bronze or similar material to resist wear of the parts. The chains comprise in cross-section an enlarged central portion 26, Figs. 9–11, off-set and shaped to seat within the groove formed in the jaws. The lateral edges of the chains are reduced and their inner faces are tapered as at 27 to provide adjustment as hereinafter disclosed. The outer faces of the chains are substantially flat and are formed with adjacent longitudinally extending grooves, which when caused to register, form an opening for the passage of the cable.

To bring about the proper engagement of the gripping chains with the cable, suitable friction rollers are provided. The rear roller is mounted on a bolt 28, Figs. 1–3, extending through the yoke portions 1 and 2 and locked in position by suitable nut 29 and lock nut 61. The rear roller, which has a running fit on the bolt 28, is formed in sections 61 and 31, section 31 having an annular hub portion 32 screw threaded as at 33. The roller section 30 is formed with a central opening of sufficient diameter to seat upon the hub portion 32 and is held in place by the nuts 34 and 35, the latter locking the assembly. The inner faces of the roller sections are tapered at 36, the taper conforming to the tapered faces of the gripping chains, indicated by reference character 27, and with which they are arranged to engage.

The front roller is substantially identical in construction with the rear roller and is carried on the pin 37 hinged to an intermediate portion of one of the jaws through the medium of the U-shaped stirrup 38, Figs. 1–3, the extremities of which straddle the extension 39 and are formed with openings 40 aligned with an opening in the extension 39, for the reception of the hinge pin 41. The stirrup 38 straddles the pin 37 and is fixed thereto by welding or otherwise as desired. This mounting of the pin 37 permits the same to be swung outwardly to free the tapered faces of the roller from contact with the adjacent tapered faces of the gripping chains, when the parts are disengaged. Forward extensions 42 and 43 are formed integral with the respective jaws and enclose the forward roller and roller mountings, one of the forward extensions being formed with a slot for the free movement of the pin 37, permitting the latter to be positioned in engagement with the gripping chains. For holding the roller in engaging position with the gripping chains, a hook 44 is provided pivoted to the extension 43 of one of the jaws by pivot pin 45. This hook 44 is slotted at 46 and this slot receives the free extremity of the pin and cams the same into its proper position.

The extremities of the extensions 42 and 43 are reduced to form substantially square portions 47 for cooperation with the locking yoke 48, which comprises an elongated frame in which the portions 47 may be positioned and a clamping screw 49 threaded into an internally threaded boss 50 at one extremity of the yoke 48.

By this arrangement the engagement of the clamping screw with the portions 47 will cause the jaws to be brought together. It will be noted that one of the side walls of the yoke 48 is provided with an elongated slot 51 in which travels the pin 52 extending from one of the jaw extremities. This structure is merely provided to retain the parts in their relative position during operation.

The upper ends of the jaws are hinged together by the interengaging, inwardly extending tongues 53, Figs. 3 and 4, provided with elongated slots 62, Fig. 14, to accommodate the vertical pin 54. This arrangement, while retaining the parts properly in position, permits the opening of the jaws.

A pin 55, Figs. 1, 3 and 4, is hinged to the vertically extending tongues 56 by means of hinge pin 57 and is adapted to be swung to engage the inner face of the boss 58 to aline and position the wire line when in operation.

Links 59 and 60, Fig. 4, are provided for connecting with the temper screw in the usual way.

In using the present invention the clamp jaws are swung open and the clamp is pulled onto the line. The jaws are then brought together and clamped by the means heretofore described with a sufficient grip to hold the same on the line for the regular drilling operation. The open position is illustrated in Fig. 8 of the drawings.

Due to the fact that the gripping chains and the elements cooperating therewith are slightly flexible in their nature and mounting, a centering action takes place between the two rollers as they seat upon the inclined faces of the chains. This automatic positioning and centering of the elements is quite important and advantageous and facilitates in a large way the application and use of the device, particularly in that it avoids the necessity of a great degree of accuracy on the part of the operator.

When it is necessary in the course of the drilling operation to slip the line, the clamping screw is loosened in the usual way which decreases the friction between the chains and the jaws, while at the same time the wheels hold the chains tight on the line, forcing the latter to move with the line, thus transferring the wear and friction from the line, as heretofore common in the art, to the faces of the jaws exposed to wear. When a sufficient length of line has pulled through the clamp,