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WIRE LINE DRILLING CLAMP

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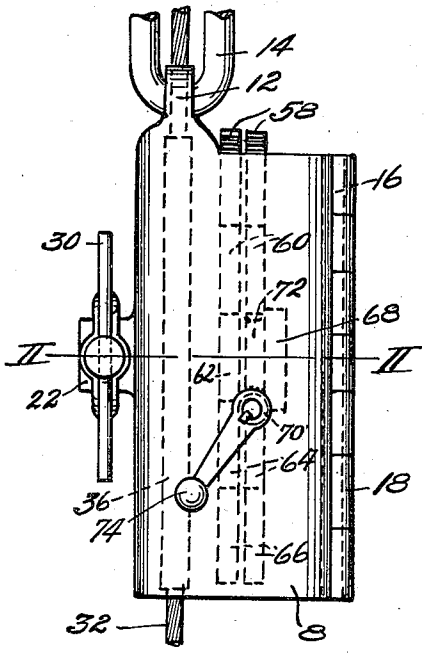


Fig. 1

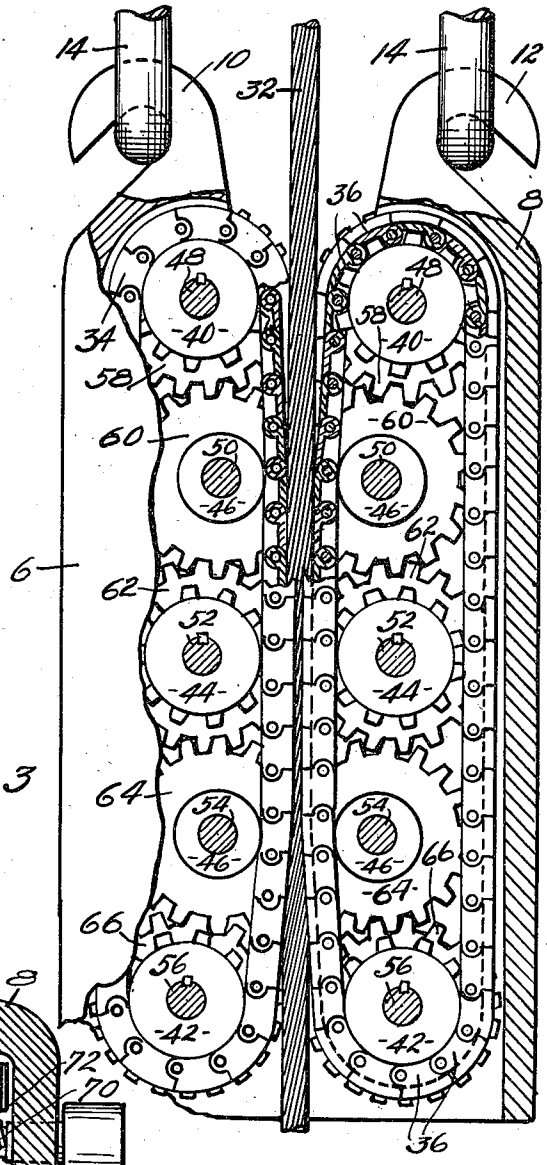
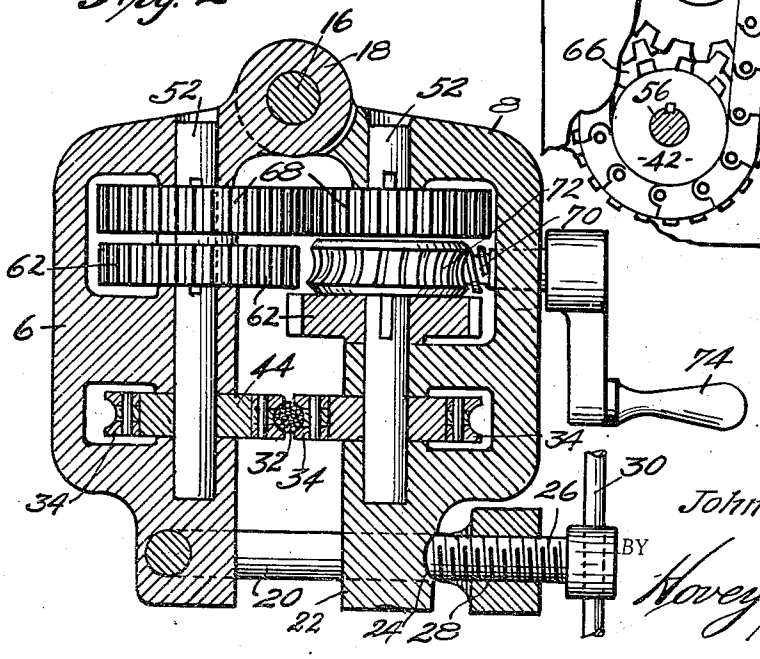


Fig. 3

Fig. 2



INVENTOR,
John E. Neptune.
BY
Harvey & Hamilton,
ATTORNEYS.

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WIRE LINE DRILLING CLAMP

John E. Neptune, Rich Hill, Mo.

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7 Claims. (Cl. 255—15)

This invention relates to clamps especially adapted for use in connection with drilling rigs and has for a primary object, the provision of a novel, unique and sturdy clamp for the drilling cable which presents comparatively large gripping surfaces that may be moved to feed the cable through the clamp while the latter is in the operative position and without disengaging the cable and clamp.

One of the important aims of the invention is to provide a cable clamp having opposed gripping surfaces that may be moved to advance the cable through the clamp as the latter is in the operative position, and which are positively driven by unique trains of gears forming a part of the clamp per se.

Heretofore in the drilling art it has been necessary to manipulate the cable clamp to allow movement of the cable therethrough in such a fashion that the cable oftentimes became worn and the clamp itself failed to function after extended use. During drilling it is desired to progressively feed out the cable line, yet securely clamp the same to the operating mechanism of the drill rig to impart reciprocating motion thereto for the purpose of actuating the drilling tool.

A clamp embodying the present invention accomplishes all that is desired in securely holding and progressively feeding the cable when desired, and one exemplification of such a clamp is illustrated in the accompanying drawing, wherein:

Figure 1 is a side elevation of a cable clamp embodying the present invention.

Fig. 2 is an enlarged, detailed, cross section through the clamp, taken on line II—II of Fig. 1, and,

Fig. 3 is a broken-away, side elevation of another face of the clamp showing the opposed relation and function of the endless chains.

The parts of this clamp are preferably formed of metal hardened to withstand the strains and the jaws 6 and 8 should be formed to present a hook 10 and 12 respectively, which are employed to engage the links 14 forming a part of the connection to the drilling mechanism. These jaws 6 and 8 are hinged along one edge thereof through the medium of hinge pintle 16 passing through hinge barrels 18 formed by jaws 6 and 8. The other edges of jaws 6 and 8 are held together in the proper adjusted position by a coupling 20 in the form of a loop which is pivoted to jaw 6 and embraces lug 22 of jaw 8 which has a socket 24 formed therein.

A screw 26 passes through internally threaded opening 28 in coupling 20 for the purpose of engaging socket 24 and the handle 30 may be manually manipulated to tighten or loosen screw 26, whereby the free edges of jaws 6 and 8 are drawn tightly together. This action, as will presently be seen, varies the gripping of cable 32 which extends longitudinally through the clamp structure between endless chains 34, each of which are composed of a number of articulated links 36. Each of these chains is engaged by suitable sprockets that are driven by appropriate gear trains and the gear trains and series of sprockets of each chain has substantially the same relation to its respective endless chain. Sprockets 40 and 42 are disposed at the top and bottom end of the clamp respectively and an intermediate sprocket 44 engages one length of chain 34, as shown in Fig. 3. Idler rollers 46 assist intermediate sprocket 44 in holding one length of the chain against cable 32 and each of these idlers 46 and sprockets 40, 42 and 44 is mounted upon a shaft. Shaft 48 carries sprocket 40, shaft 50 carries idler 46, shaft 52 carries sprocket 44, shaft 54 carries the other idler 46, and shaft 56 carries sprocket 42.

These shafts are all journalled in jaws 6 or 8, as the case may be, and a train of gears for each set of shafts and associated chain on each link respectively insures an even drive and proper direction of travel. Shaft 48 has a gear 58 thereon, shaft 50 has a gear 60 thereon, shaft 52 has a gear 62 thereon, shaft 54 has a gear 64 thereon, and shaft 56 has a gear 66 thereon. While it may be possible to allow one chain to be an idler, it is preferable in this clamp construction to positively drive both trains of gears, each of which comprises meshing gears 58, 60, 62, 64 and 66. All of the aforementioned gears, sprockets and idlers should be keyed or otherwise rigidly secured to their respective shaft and to insure that both trains of gears travel together, they should be joined by meshing gears 68, one of which is carried by shaft 52 journalled in jaw 8 while the other is carried by shaft 52 journalled in jaw 6. This interconnection between the two separate trains of gears insures simultaneous operation thereof and when jaws 6 and 8 are moved apart about hinge pintle 16, these gears will be moved to and from a completely meshing condition.

Means to drive chains 34 preferably consists of manually operable mechanism in the nature of a worm gear 70 and a worm pinion 72 in mesh so that when gear 70 is rotated by handle 74, both of the aforesaid trains of gears will be driven. Worm gear 72 is keyed to shaft 52 and since one of gears 68 and gear 62 of one of the trains is likewise keyed thereto, the rotation of worm pin-

ion 72 by gear 62 will obviously drive both sets of gears and the appropriate associated sprockets and idlers so that chains 34 will move to carry cable 32 through the clamp, while the cable is tightly gripped between the proximal lengths of these chains. The faces of chains 34 which engage cable 32 are arcuate so as to conform to the contour of the cable and tightening screw 26 will establish an exceptionally positive grip upon cable 32, especially since the faces of chains 34 extend along an appreciable amount of the length of the cable. The gripping force is thereby distributed over a relatively large part of the cable.

Besides the novel and efficient manner in which cable 32 is gripped and selectively fed, this clamp is desirable in that the placement and removal from its operative position with cable 32 is quickly accomplished. The operation of the entire structure has been made clear during the course of the specification, and while the preferred embodiment has been illustrated and described, it is understood that such changes and modifications might be made as fairly fall within the scope of the appended claims.

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is:

1. A cable clamp of the character described comprising a pair of hingedly interconnected jaws; an endless chain carried by each jaw respectively in opposed relation to each other and adapted to grip the cable therebetween; means to releasably hold the chains against the said cable; and means for simultaneously driving the chains to feed the cable through the clamp as the chains are gripping the cable comprising a train of gears associated with one of the chains, a shaft supporting each gear of the train respectively journalled in one of the jaws, a worm pinion mounted on one of said shafts, a worm gear in mesh with said pinion, and means to rotate the said worm gear.

2. A cable clamp of the character described comprising a pair of hingedly interconnected jaws; an endless chain carried by each jaw respectively in opposed relation to each other and adapted to grip the cable therebetween; means to releasably hold the chains against the said cable; and means for simultaneously driving the chains to feed the cable through the clamp as the chains are gripping the cable comprising a train of gears associated with each chain respectively, a shaft supporting each gear respectively of each train, the shafts for one train of gears being journalled in one of said jaws, the shafts for the other of said trains being journalled in the other of said jaws, a pair of meshing gears for transmitting power from one of said train of gears to the other when the jaws are together and said chains are in opposed relation against the cable, and means for driving the gears of one train, the other of said trains being simultaneously driven by the said pair of power transmitting gears.

3. A cable clamp of the character described comprising a pair of hingedly interconnected jaws; an endless chain carried by each jaw respectively in opposed relation and adapted to clamp the cable therebetween when said jaws are in closed relation; a train of meshing gears each mounted on a shaft journalled in one of the jaws; means for driving all the gears of said train to rotate the said shafts; and sprockets mounted on certain of said shafts in engagement with said endless chain to move the same when the gears train is driven whereby to advance the cable as the clamp is in engagement therewith.

4. A cable clamp of the character described comprising a pair of hingedly interconnected jaws; an endless chain carried by each jaw respectively in opposed relation and adapted to clamp the cable therebetween when said jaws are in closed relation; a train of meshing gears each mounted on a shaft journaled in one of the jaws; means for driving all the gears of said train to rotate the said shafts; sprockets mounted on certain of said shafts in engagement with said endless chain to move the same when the gear train is driven whereby to advance the cable as the clamp is in engagement therewith; and idlers mounted on the other shafts to force the said chain against the cable.

5. A cable clamp of the character described comprising a pair of hingedly interconnected jaws; an endless chain carried by each jaw respectively in opposed relation and adapted to clamp the cable therebetween when said jaws are in closed relation; a train of gears carried by each jaw respectively, each train of gears having a shaft for each gear respectively journalled in the respective jaw; sprockets mounted on each of certain of said shafts and in engagement with the respective chain to drive the same when the train of gears is driven; idlers on certain of the remaining shafts to bear against the chain to hold the same against the cable; gears in mesh, when the jaws of the clamp are closed, to cause simultaneous movement of both trains of gears; and manually operable means for driving one of the trains of gears.

6. In a cable clamp of the character described, a pair of opposed endless chains in clamping engagement with the cable; a gear train for each chain respectively; sprockets carrying each chain respectively operatively connected to the respective gear train; means to operably interconnect the said trains of gears to insure simultaneous movement thereof; and means to drive one of the gear trains.

7. In a cable clamp of the character described, a pair of opposed endless chains in clamping engagement with the cable; a gear train for each chain respectively; sprockets carrying each chain respectively operatively connected to the respective gear train; means to operably interconnect the said trains of gears to insure simultaneous movement thereof; means to drive one of the gear trains; and means to secure both trains of gears against movement.

JOHN E. NEPTUNE.