Mar. 6, 1923.

L. E. WRIGHT

1,447,456

TEMPER SCREW CLAMP

Filed Apr. 2, 1921

2 sheets-sheet 1

Fig. 1.

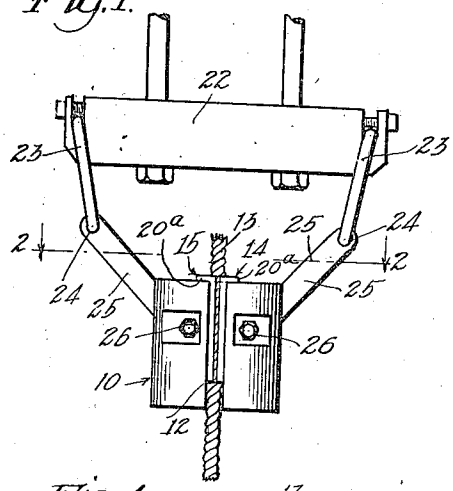


Fig. 2.

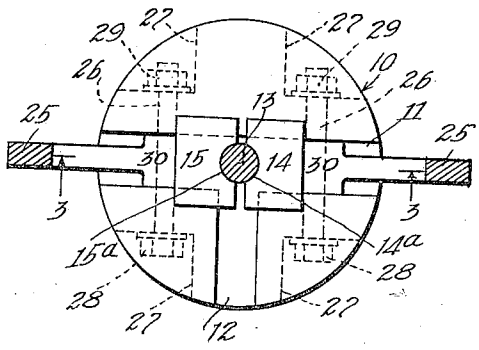


Fig. 4

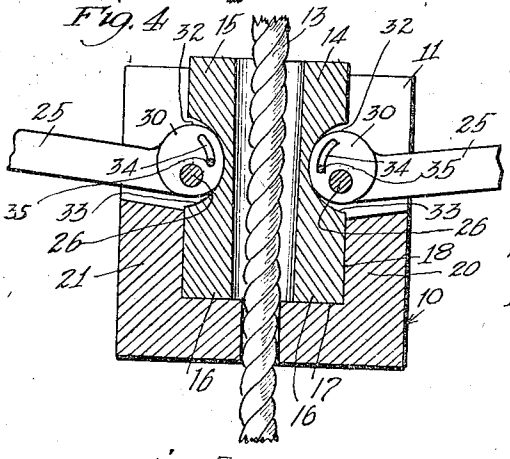


Fig. 3.

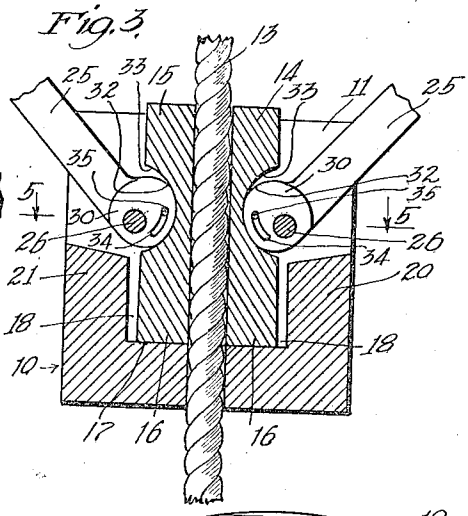


Fig. 5.

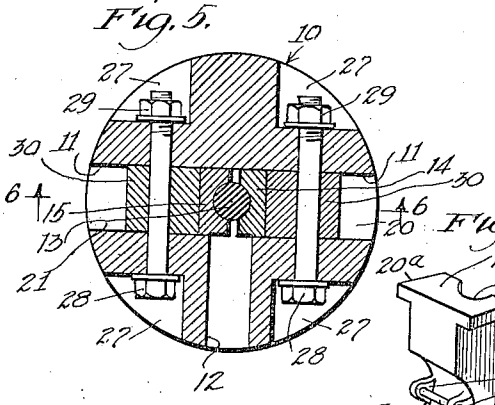


Fig. 6.

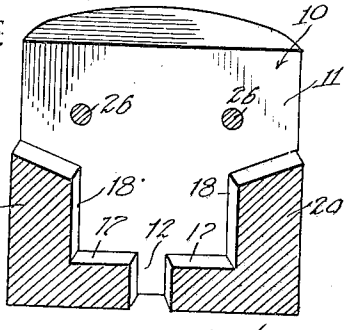
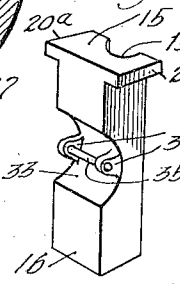


Fig. 7.



Inventor:
Leslie E. Wright
By James T. Bakeless.
his Attorney.

Mar. 6, 1923.

L. E. WRIGHT

1,447,456

TEMPER SCREW CLAMP

Filed Apr. 2, 1921

2 sheets-sheet 2

Fig. 8.

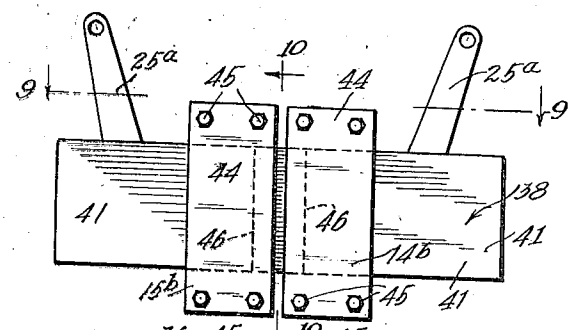


Fig. 9.

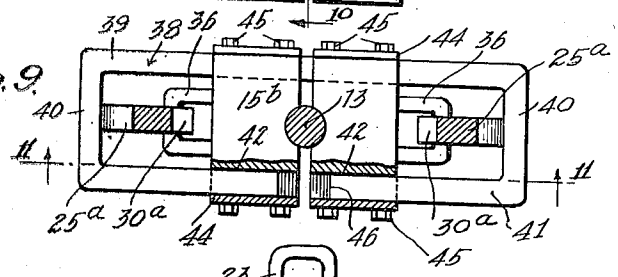


Fig. 10.

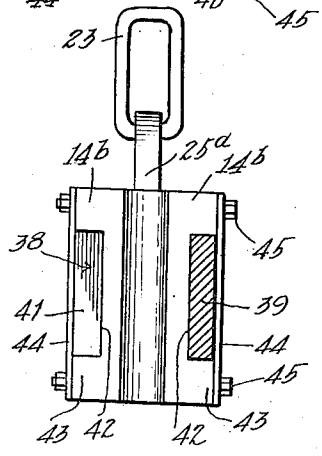
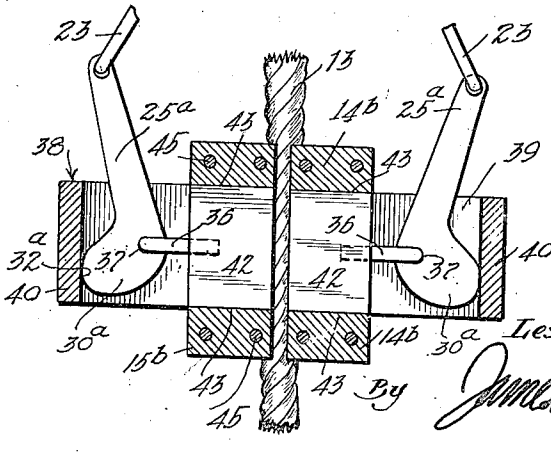


Fig. 11.



Inventor.
Leslie E. Wright
By James I. Mickelson
his Attorney

Patented Mar. 6, 1923. 1,447,456

UNITED STATES PATENT OFFICE.

LESLIE E. WRIGHT, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO FRED L. WRIGHT, OF LOS ANGELES, CALIFORNIA.

TEMPER-SCREW CLAMP.

Application filed April 2, 1921. Serial No. 458,155.

To all whom it may concern:

Be it known that I, LESLIE E. WRIGHT, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Temper-Screw Clamps, and the following is such a full, clear, and exact disclosure of the invention that anyone skilled in the art to which it appertains may make and use the same.

Broadly speaking, the present invention relates to cable clamps; and it specifically relates to a class of clamps commonly used in connection with well drilling apparatus, and generally "temper screw clamps."

While not necessarily limited to such use, the following disclosure will be specifically directed to the application of my invention as a temper screw clamp; and its construction and operation explained, in its preferred specific embodiment, in connection with the work to be performed by such a device.

My foremost object in designing and perfecting the present invention, was to provide a device of this character, whereby a number of objectionable features commonly experienced in the use of devices of this same general character now in common use, could be obviated.

It is well known in the well drilling art that the clamps of this nature, now generally used in connection with such drilling apparatus, are supported on the lower end of the temper screw which, in turn, is carried on the walking beam, to grip and hold the line supporting the drill bits in the well; and these, as far as I know, are all of the screw type. That is, they consist of opposed blocks arranged to be clamped and held about the line, by means of a manually operable screw. Owing to the limitations of strength and wear, such a clamp arrangement has been found to be inefficient in many respects, and very often fails, or lets go of the line, resulting in considerable damage and added expense to the cost of drilling. Furthermore, owing to the particular position of the clamp at the lower end of the temper screw, which is generally some distance above the derrick floor, the clamp screw is in a more or less awkward position to be operated by a workman, to effect the clamping of the blocks about the line; and it is very often difficult for the workman to handle the clamping screw to sufficiently tighten the blocks about the line to hold.

Therefore, I have designed the herein disclosed invention to overcome the defects of the aforementioned type of device, and to provide a construction which is simple, durable, and cheap to manufacture; and which will automatically adjust and clamp itself about the cable, thereby overcoming the necessity for manual adjustment, as in the case of screw clamps.

The merits of my invention will be more fully set forth in the following detailed description, taken in connection with the accompanying drawings, forming a part thereof, and in which—

Fig. 1 is a front elevation of my assembled clamp, showing it suspended from the lower end of a temper screw; Fig. 2 is a plan view of the same, taken on line 2—2 of Fig. 1; Fig. 3 is transverse sectional elevation, taken on line 3—3 of Fig. 2 showing the arrangement in clamped position about a cable; Fig. 4 is a view similar to Fig. 3, only showing the clamping blocks in open or unclamped position; Fig. 5 is a sectional plan view, taken on the line 5—5 of Fig. 3; Fig. 6 is a transverse sectional elevation of the clamping block support; the view being taken on line 6—6 of Fig. 5; Fig. 7 is a perspective view showing one of the clamping blocks as illustrated in Figs. 1 to 4, inclusive; Fig. 8 is a front elevation, similar to Fig. 1 showing a modified form of construction; Fig. 9 is a plan view of the same, taken on line 9—9 of Fig. 8, parts being broken away to show details of construction; Fig. 10 is a transverse sectional view taken as indicated by the line 10—10 of Fig. 8; Fig. 11 is a longitudinal sectional elevation taken as indicated by the line 11—11 of Fig. 9.

Referring now to the drawings, and particularly to Figs. 1 to 7, inclusive, the numeral 10 designates a cylindrical clamp block support, constructed of metal and preferably formed integral. The weight and mass of this element may be varied to suit circumstances, but it is preferably constructed heavy, so its weight will facilitate in its clamping adjustment about the line, as will hereinafter appear. This block 10 has a

diametrical slot extending through it, as indicated by the numeral 11, and extending approximately midway of the depth of the block, as shown in Figs. 3 and 4. A second longitudinal slot 12 extends into the block 10, at substantially right angles to the slot 11, this last mentioned slot extending from top to bottom of the block and beyond the axial center thereof, to permit the insertion of the cable or line 13 thereinto to a point in alignment with the transverse slot 11. While the block 10 is here shown to be cylindrical in cross sectional configuration, and flat at the ends, that is, top and bottom; it may be of any cross-sectional configuration suitable to accomplish the purposes herein set forth.

A pair of substantially rectangular clamping blocks 14 and 15, having complementary opposed grooves 14^a and 15^a in their inner adjacent faces, are loosely mounted in the transverse slot 11; they being preferably of a width to form a sliding fit in the slot, and shorter in length than the depth of the block 10; so their lower ends 16 will extend into and rest upon the bottom 17 of a recess 18, formed by a downward continuation of the transverse slot 11. The width of the recess 18 is slightly greater, in the direction of length of the slot 11, than the total width of the two blocks 14 and 15, to permit their movement relative to the axial center of the block 10, and the juncture of the slots 11 and 12, to open and close about the cable 13, as clearly shown in Figs. 3 and 4. Walls 20 and 21, are formed by the recess 18, which form stops against which the lower ends of the clamping blocks 14 and 15 abut to limit their outward movement.

The blocks 14 and 15 may be provided with flanges 20^a, along their front and rear faces to engage the top of the block 10, as shown in Fig. 2, the action of these flanges in connection with the lower ends 16 sliding on the bottom 17, of the recess 18, is to maintain the blocks 14 and 15 in proper alignment during their movement into and out of clamping engagement with the cable 13.

The block 10 is ordinarily supported upon a yoke 22, carried on the lower end of the temper screw, (not shown) by means of links 23, engaging eyes 24 in the upper ends of the arms 25; the latter being pivotally connected to the block 10 by means of pivot pins 26 passing through their lower ends. The pins 26 may be in the form of bolts (see Fig. 5), extending through suitable apertures transverse to the slot 11, the block 10 being angularly recessed as at 27 to accommodate the heads 28 and suitable nuts 29. Thus it will be seen that the block 10, carrying the clamping blocks 14 and 15, is of some considerable weight; this weight tending to align the links 23 and arms 25, longitudinally with each other, when it is suspended from the yoke 22, and causing the arms 25 to turn about in their pivotal points 26 as shown.

The clamping blocks 14 and 15 are adapted to be moved into clamping engagement with the cable 13, by the action of cams 30, preferably formed integral with the lower or pivoted ends of the arms 25; the cam surfaces 32, of these cam portions 30, being adapted to engage arcuate recesses 33 in the outer faces of the clamping blocks 14 and 15, when sufficient weight is put upon the block 10 to move it downwardly, or away from the yoke 22, and thereby moving the arms 25 to the position shown in Figs. 1 and 3. The cams 30 are preferably arranged on the arms 25, in the manner shown in the drawings, so that when the block 10 is moved relatively closer to the yoke 22, and the arms 25 moved to the position shown in Fig. 4, or approximately thereabout, the cam faces 32 engaging the recesses 33 will move to a position which will permit the blocks 14 and 15 to move outwardly or relatively away from each other, and disengage the cable 13. After the device has been adjusted about the cable 13, and the blocks 14 and 15 brought into engagement therewith, as illustrated in Figs. 1 and 3, any additional weight or pull downwardly on the cable, in the direction indicated by the arrow in Fig. 1, will have a tendency to longitudinally align the links 23 with arm 25, the latter pivoting about the pins 26, and causing a further or tightening engagement of the cam surfaces 32 with the recesses 33, and consequently a tighter clamping of the blocks 14 and 15 about the cable 13.

Under ordinary circumstances when the block 10 is raised or moved relatively closer to the yoke 22, the arms 25 swinging outwardly about pivots 26, will release the inward pressure on the blocks 14 and 15, and consequently the blocks will separate, releasing their clamping hold on the cable 13. In order to make this releasing function of the blocks more positive, I cut slots 34 in the cams 30, eccentric to the pivot pins 26, (see Figs. 3 and 4) and extend a small pin 35 through this slot and through the side walls 36 of the arcuate recesses 33. Thus it will be seen that movement of the arms 25 from the position shown in Fig. 3 to that shown in Fig. 4 will cause a movement of the blocks 14 and 15 outwardly and away from the cable 13.

While the arcuate recesses 33 may be dispensed with, if desired, without impairing the efficient functioning of the clamp, and the cams made to contact with the straight faces of the blocks, I prefer to retain them for the purpose of preventing the blocks from being vertically displaced in their seat. However, other suitable means may be provided for this purpose.

In operation, the clamp is suspended from the yoke 22 of the temper screw, which screw is supported upon the reciprocating end of the walking beam, in the manner well known in well drilling. The drill cable 13 which carries the drill bit at its lower end in the well, is ordinarily suspended from the top of the derrick where it passes over a sheave onto the bull-wheel for the "spudding" operation or starting of the well. After this spudding operation is completed or the well sunk to a certain depth, then the line is connected to the reciprocating or free end of the walking beam, by this clamp arrangement, to complete the drilling of the well. In attaching the clamp about the cable 13 it is brought into a position adjacent the suspended cable, and the block 10 raised toward the yoke 22, so the clamping blocks 14 and 15 will be separated a sufficient distance to receive the cable. The block 10 is then adjusted about the cable by passing the cable into the slot 12 and into alignment with the transverse slot 11, and between the separated blocks 14 and 15; after which the block 10 is dropped, and due to the force of and the action of the links 23 and arms 25, and cams 30, blocks 14 and 15 are forced together to tightly engage the line; which engagement is tightened or made more secure by any added weight on the clamp due to the weight of the line, etc., when the bull wheel brake is taken off. After the full weight of the cable is on the clamp the portion of the cable extending thereabove is then sufficiently slackened to permit the oscillating movements of the walking beam to carry on the drilling operation. When it is desired to release the clamp, it is only necessary to lift it up, or move it towards the yoke 23, and the clamping blocks 14 and 15, due to the outward and downward pivotal movement of the arm 25, will release the cable.

In the modified form of the device shown in Figs. 8 to 11, inclusive, the arms 25^a are suspended from the yoke 22 by means of the links 23, in the same manner as in the aforementioned form. In this case, however, the arms 25^a are turned so the cams 30^a extend outwardly from the clamping blocks 14^b and 15^b, the arms 25^a being pivotally mounted directly on the clamping blocks by means of rings 36, rigidly carried thereon, and extending through eyes 37, in the arms. The block 10 is dispensed with, and instead a rectangularly formed frame 38 having a back portion 39, right angular end portions 40, and front separated portions 41, formed integral, is provided for supporting the clamping blocks 14^b and 15^b.

The blocks 14^b and 15^b are transversely recessed, as at 42, in their front and rear faces, for the reception of the front and rear portions 41 and 39, respectively, of the frame 38, thus forming rails 43, for engaging the longitudinal edges of these portions whereby the blocks are supported longitudinally slidable in the frame 38. The recesses 42 are preferably of a depth equal to the thickness of the frame portions 39 and 41, the blocks being slidingly retained thereon by means of plates 44, secured to their places by means of cap screws 45.

The front portions 41 of the frame 38 are spaced, as at 46, to permit passage of the cable 13 therethrough, when the blocks 14^b and 15^b are separated; this space being preferably not any wider than is necessary for this purpose.

The front recesses 42 and plates 44, not only provide a bearing surface to balance movement of the blocks, but also serve to maintain the frame portions 41 in alignment and prevent springing of the frame by the action of the cams.

The arms 25^a are pivotally mounted on the rings 36 so there is a clearance between their rear faces and the outer end faces of the blocks; and so clamping action of the blocks will be produced by contact of the cam faces 32^a with the inner faces of the end portions 40, this face being transmitted to the blocks through the rings 36.

When the blocks 14^b and 15^b are lowered or raised relative to the yoke 22, the arms 25^a will be moved about their pivotal points on the blocks, by means of the links 23, causing the cam surfaces 32^a to engage or disengage the inner faces of the ends 40, thereby forcing the blocks together or permitting their separation, according to the movement relative to the yoke.

While I have here shown and described a preferred embodiment of my invention, it is nevertheless to be understood that I reserve the right to make any modifications or changes in structure, which properly come within the scope of the appended claims.

Having described a preferred form of my invention, I claim:

1. In a device of the character described, a supporting member, a support for the supporting member, clamping members transversely movably mounted on the supporting member, and means to actuate the clamping members by longitudinal movement of the supporting member relative to its support, said means comprising arms pivotally mounted at their lower ends on the supporting member, cams on said arms adjacent their pivotal points adapted to engage the clamping members, and link connections between the upper ends of said arms and the said support.

2. In a device of the character described, a diametrically slotted supporting member, a support for said supporting member a pair of longitudinally disposed relatively movable clamping members slidably mount-

ed in said slot, and means to actuate said clamping members by movement of the supporting member relative to its support, said means comprising a pair of arms pivotally mounted at their lower ends in said slot adjacent the clamping members, link connections between the upper ends of said arms and said support, and cams on said pivoted ends adapted to engage the clamping members and move them into clamping relation on movement of the supporting member relatively away from its support.

3. In a device of the character described, a diametrically slotted supporting member, a support for said supporting member, a pair of longitudinally disposed relatively movable clamping members slidably mounted in said slot, and means to actuate said clamping members by movement of the supporting member relative to its support, said means comprising a pair of arms pivotally mounted at their lower ends in the said slot adjacent the clamping members, link connections between the upper ends of said arms and the said support, cams on the lower pivoted ends of said arms adapted to engage the clamping members and move them into clamping relation on movement of the supporting member relatively away from its support, and means in connection with said arms to move the clamping members out of clamping relation when the supporting member is moved relatively towards its support.

4. In a device of the character described, a supporting member, a support, relatively movable clamping members movably mounted on said supporting member, and means to move said clamping members into clamping relation on movement thereof relative to said support, said means comprising a pair of arms pivotally mounted adjacent their lower ends on the clamping members, link connections between the upper ends of said arms and the said support, and cams adjacent the lower pivoted ends of said arms adapted to engage said supporting member on movement of the clamping members relatively away from said support.

5. In a device of the character described, a supporting member having a transversely disposed clamp supporting base, a support for the supporting member, clamping members relatively movably supported on said clamp supporting base, and means to actuate said clamping members in their clamping movement by movement of the supporting member relative to its support.

6. In a device of the character described, a supporting member, a support for the supporting member, clamping members mounted on the supporting member, and means to positively move said clamping member in and out of clamping relation by movement of the supporting member relative to its support, said means comprising arms pivotally mounted on the supporting member, link connections between said arm and the support, and eccentric connections between the arms and the clamping members.

7. In a device of the character described, a supporting member, a support for the supporting member, transversely movable clamping members slidably mounted on the supporting member, and means to positively move the said clamping members in and out of clamping relation by movement of the supporting member relative to its support, said means comprising arms pivotally mounted on the supporting member, link connections between said arms and the support, and eccentric connections between the arms and the clamping members.

In witness that I claim the foregoing I have hereunto subscribed my name this 23d day of March, 1921.

LESLIE E. WRIGHT