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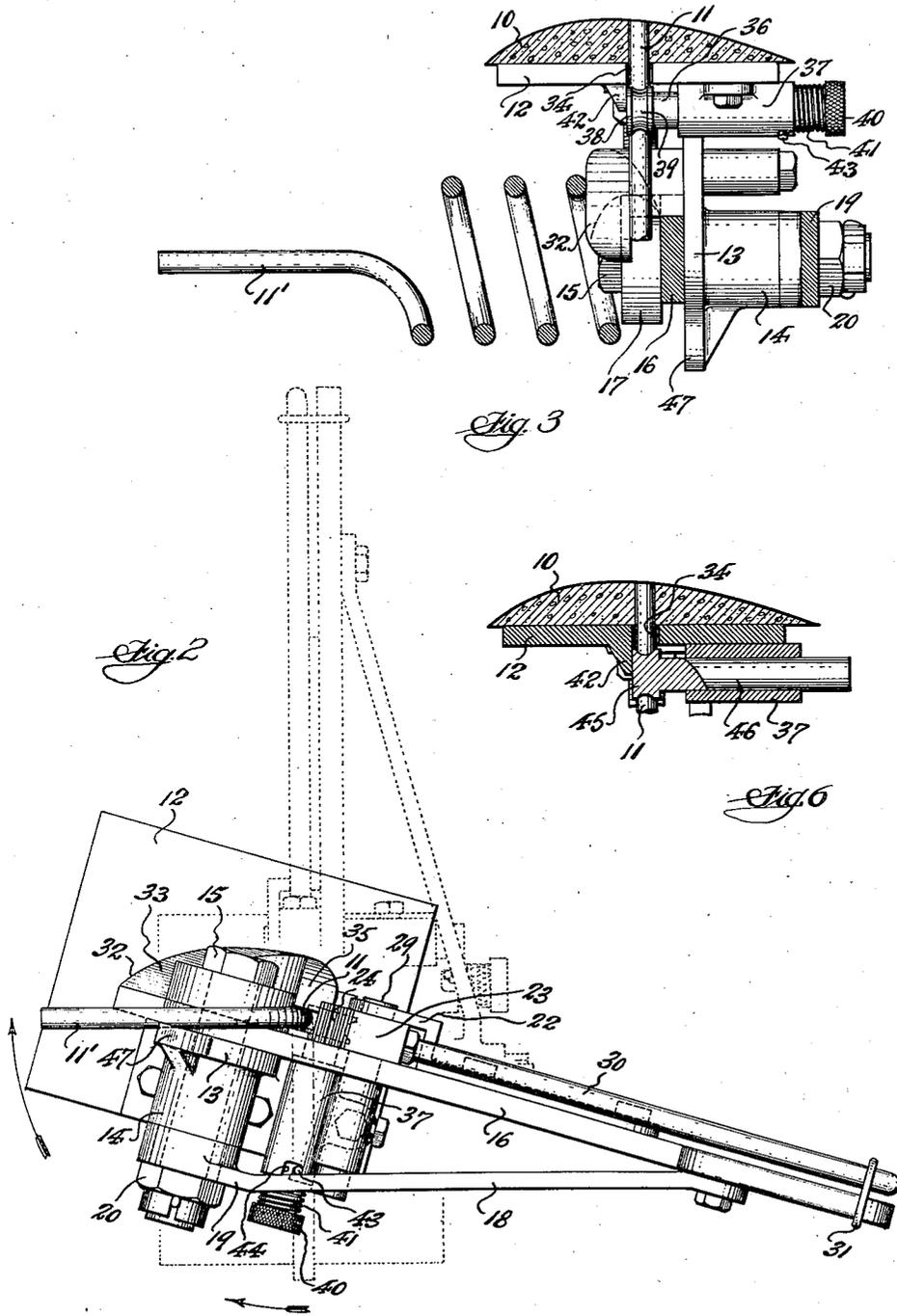
S. S. COLT

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FORM TIE EXTRACTING MEANS

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INVENTOR.
Samuel S. Colt,
BY *George S. Richards*
ATTORNEY.

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FORM TIE EXTRACTING MEANS

Samuel S. Colt, West Orange, N. J.

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6 Claims. (Cl. 254-77)

This invention relates to an improved device for extracting form wall tie rods, wires and the like from cast concrete, and for other rod and wire pulling operations; and the invention has reference, more particularly, to improvements in that type of device, for serving the purposes aforesaid, which is shown in my co-pending application for United States Letters Patent Serial No. 205,698, filed on or about May 3, 1938, patented May 2, 1939 as Patent No. 2,156,528.

The present invention has for an object to provide a simple, effective and easily operated tool for the purposes stated comprising, a winch-roll means and cooperative rod or wire gripping and manipulating means, a shear cam means for coiling the outwardly drawn rod or wire, means for both fulcruming the tool upon the rod or wire subject to bodily turning of the tool about the latter as well as to serve as a controlling guide for the outwardly drawn rod or wire together with means to engage and bend the free end portion of the wire or rod, when the tool is laterally turned about the latter as a fulcrum, to thereby dispose said free end portion in lateral extension from the winch-roll means preparatory to extracting and coiling operations, and thus in position which avoids impeding operative manipulation of the tool during said extracting and coiling operations.

Another object of this invention is to provide a reversible rod or wire gripping means, whereby when one portion thereof is worn, it may be quickly removed and reversed to bring into service position an unused portion thereof.

Other objects of this invention, not at this time more particularly enumerated, will be understood from the following detailed description of the same.

An illustrative embodiment of this invention is shown in the accompanying drawings, in which:

Fig. 1 is a side elevation of the rod or wire extracting tool according to this invention as operatively applied to the work for the performance of its functions; Fig. 2 is a front elevation of the tool moved to a position whereby the end portion of the rod is bent thereby into a laterally extending position preparatory to completing the extracting operation; Fig. 3 is a horizontal sectional view, taken on line 3-3 in Fig. 1; Fig. 4 is a transverse vertical sectional view, taken on line 4-4 in Fig. 1; Fig. 5 is a perspective view of the rod or wire gripping device; and Fig. 6 is a fragmentary sectional view, similar to that of Fig. 4, but showing a modified

form of tool fulcruming and rod guiding means.

Similar characters of reference are employed in the above described views, to indicate corresponding parts.

Referring to the drawings, the reference character 10 indicates a cast concrete mass from the face of which projects the end portion of a tie rod 11 desired to be extracted therefrom.

The improved tool, according to the instant invention, comprises, a foot plate 12 from the front of which projects a bearing bracket 13 having a laterally disposed bearing hub 14 projecting from one side thereof. Mounted in said bearing hub is a pivoting means, preferably in the form of a journal bolt 15. Fulcrumed on said journal bolt 15 is a hand lever 16. Rotatably mounted on said journal bolt 15, adjacent to said hand lever 16, is a winch-roll 17. Affixed to said hand lever is a reenforcing member or yoke bar 18 having an offset leg portion 19 which abuts the bearing hub end, and through which the journal bolt 15 extends, the assembly being retained in place by a nut 20 engaged on the projecting journal bolt end.

Affixed to said hand lever 16, in parallel spaced relation thereto above said winch roll 17, is a strap member 21, the lower end portion 22 forms with said hand lever a bifurcate mounting for the support of a rod or wire gripper cam adapted to cooperate with said winch-roll. Said gripper cam comprises a cam block 23 of a thickness approximating the width of the winch-roll. Said cam block 23 is provided with a substantially semi-circular lower end having transverse gripper serrations or teeth 24 on its periphery. Extending transversely through the cam block 23 are selectively usable bearing openings 25 and 26, respectively oppositely outwardly offset relative to the central axis of said cam block. Also provided in said cam block 23, to extend downwardly into the body thereof, from its top end, are internally screw-threaded sockets 27 and 28. These sockets are also respectively oppositely outwardly offset relative to the central axis of said cam block. The cam block 23 is pivotally mounted on a transverse pivot pin 29, which is supported by and between the hand lever 16 and strap member 21, by engaging said pivot pin 29 through a selected bearing opening, such, e. g., as 25. Due to the offset relation of the bearing openings relative to the central axis of said cam block, the latter will be eccentrically mounted, so that, when outwardly turned, it will be caused to grip a rod or wire between the same and the winch-roll. It will be obvious that, under such

circumstances approximately but the outwardly extending half of its gripping serrations or teeth 24 will be in use. If, therefore, such serrations or teeth, thus in use, become worn, the cam block may be removed and reversed by engaging the pivot pin 29 through the opposite bearing opening 26, thereby bringing the opposite half or previously unused serrations or teeth into operative position for use. Affixed to the cam block, by selective engagement in a corresponding socket 27 or 28, is an upwardly extending lever arm 30 for manipulating the cam block. If it be desired to obtain greater leverage than the length of said lever arm provides, a piece of pipe, of suitable length, may be telescopically engaged over the arm to thereby extend its length. To dispose and maintain the cam block 23 in out of service position, the lever arm 30 is upswung to a position parallel to the hand lever 16 (as shown by full lines in Fig. 1), and is secured by a retaining link 31 which is pivotally carried by said hand lever 16.

Cooperating with said winch-roll 17 is a sheer cam block 32, the same being supported by the bracket 13 between said winch-roll 17 and the foot plate 12, preferably so as to be adjustably disposed relative to the former. The outer side of said sheer cam block is formed to provide a sheer cam face 33 in the shape of an upwardly and outwardly inclined spiral plane.

Provided in the upper end portion of the foot plate 12 is a downwardly indented slot or way 34 through which the exteriorly projecting end of a tie rod 11 may extend to pass over the top of the sheer cam block 32 and thence outwardly over the winch-roll 17. Said sheer cam block 32 is further provided at its upper end with a guide projection 35 by which the outwardly extending tie rod portion is retained against displacement as it passes to and over the winch-roll 17.

Cooperating with the foot plate 12 is a means for both fulcruming the tool upon the exteriorly projecting portion of the tie rod 11, so that it may be turned bodily about the latter for purposes subsequently disclosed, and also to serve as a controlling guide for the outwardly drawn rod or wire, which comprises, in one form thereof, a tail piece 36 which is both slidably and rotatably supported in a transverse bearing member 37 suitably affixed to the face of said foot plate adjacent to one side of said slot or way 34. Rotatably mounted on the inner extremity of said tail piece 36 is a roller 38 having a peripheral groove or channel 39 to receive the tie rod 11. At its outer end said tail piece 36 is provided with an annularly enlarged head or finger piece 40. Mounted around the tail piece 36 between said head or finger piece 40 and the adjacent end of the bearing member 37 is a compression spring 41, which normally moves said tail-piece 36 outwardly so as to retract the roller 38 from operative aligned relation to said slot or way 34. Connected with said foot-plate adjacent to the opposite side of said slot or way 34 is a stop lug or projection 42 which is adapted to be abutted by the roller 38, whereby the operative aligned relation of the latter relative to the slot or way 34 is determined. To hold the roller 38 in operative position, the tail piece 36 is provided with a laterally projecting lock pin 43 which cooperates with a bayonet slot 44 with which the bearing member 37 is provided. Another and simpler arrangement of fulcruming and guide means is shown in Fig. 6, comprising a channeled roller 45

having a tail shaft 46 which is slidably and rotatably journaled in the bearing member 37.

Projecting outwardly from the bearing bracket 13, to extend beyond the front side or face of the winch-roll 17 is a bender lug or nose 47.

In the use and operation of the tool, after a form wall has been removed from the concrete mass 10, and the outwardly projecting end portion of a tie rod 11 is thereupon rendered accessible, the novel tool is applied to the latter. This is accomplished by abutting the foot plate 12 against the face of the concrete mass 10 in such manner that the tie rod extends through the slot or way 34, and thence outwardly over the winch-roll 17. The fulcruming and guide roller 38 or 45, as the case may be, is adjusted to operatively overlie the tie rod 11 so that the latter is embraced by the channeled periphery thereof. When the tool is thus positioned, the gripper cam is released and is swung downwardly to engage the tie rod with its serrations or teeth 24, thus gripping the tie rod between the same and the winch-roll 17. The lever arm 30 is now swung down so that the free end portion of the tie rod 11 is turned downwardly and across the bender lug or nose 47 (see Fig. 1). After the free end portion of the tie rod is thus positioned, the operator thereupon turns the tool bodily about the tie rod in a clockwise direction, the roller 38 serving to fulcrum the tool on the tie rod for such turning movement. This bodily lateral turning movement of the tool carries the bender lug or nose 47 into engagement with the down-turned end portion of the tie rod; and, as such turning movement of the tool is continued, bends upwardly said tie rod end portion to a horizontally offset position indicated by the reference character 11' in Figs. 2 and 3. By such manipulation said tie rod end portion 11' is so disposed as to assure its clearance of the tool parts and adjacent face of the concrete mass 10, when, by further operation of the tool, the oiling or winding of the tie rod occurs coincident with the extracting movement thereof. When the end portion 11' of the tie rod is disposed in the horizontally offset position described, the tool is swung back to normal initial position, shown by dotted lines in Fig. 2. After the tool is returned to normal initial position, the lever arm 30 is oscillatingly swung back and forth, thereby drawing outward the tie-rod from the concrete mass, while at the same time bending the same about the winch-roll 17. As this bending of the rod continues, the bent portions will be carried into engagement with the sheer face 33 of the sheer block 32 so that, as moved in contact therewith, the bending rod will be caused to sheer outwardly in a spiral path, thus progressively coiling the tie rod as it is extracted (see Fig. 3) and until it is entirely withdrawn from said concrete mass, after which the tool is removed, and the coiled tie rod is detached therefrom thus freeing the tool for further use.

In some cases it may be desired to use the tool to extract rods or wires before the form wall structure is removed from the cast concrete. Under such circumstances, the tool is footed against the form structure, and after preparatory operation and when positioned for completing the extracting operation the tool may be fixed to the form structure by nails driven through the openings 48 provided in the foot plate for that purpose.

I am aware that various changes could be made in the construction of the above described

tool, and many apparently widely different embodiments of the novel features thereof could be made without departing from the scope of the present invention as defined by the following claims. It is therefore intended that all matter contained in the above description and shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I claim:

1. In a tool for the purposes described, a foot plate structure having a way for the extension of a tie rod or the like therethrough, supporting means fulcrumed in connection with said foot plate structure, a winch-roll axially aligned with the fulcrum of said supporting means, gripper means pivotally carried by said supporting means for cooperation with said winch-roll, lever means for actuating said gripper means and supporting means relative to said winch-roll, a sheer cam block cooperative with said winch-roll, means engageable with a tie rod extending through said foot plate structure operative to fulcrum the tool on said tie rod for lateral bodily turning movement, and bender means carried by said foot plate structure to engage and bend an angularly downturned end portion of the tie rod to a horizontally laterally projecting position when the tool is bodily turned laterally.

2. In a tool for the purposes described as defined in claim 1 wherein the tie-rod engaging means for fulcruming the tool for lateral turning movement comprises a roller having a channeled periphery to embrace said tie rod, and means to support said roller for movement to and from tie rod engaging position.

3. In a tool for the purposes described, a foot plate structure, supporting means fulcrumed in connection with said foot plate structure, a winch-roll axially aligned with the fulcrum of said supporting means, and a reversible gripper means having a toothed operative portion opposed to said winch-roll for gripping a tie rod end portion between the same and said winch-roll, selective means for eccentrically

pivoting said gripper means on said supporting means optionally in one or a reversed position, and a lever arm for actuating said gripper means and supporting means relative to said winch-roll.

4. In a tool for the purposes described, a foot plate structure, supporting means fulcrumed in connection with said foot plate structure, a winch-roll axially aligned with the fulcrum of said supporting means, and a reversible gripper means having a toothed operative portion opposed to said winch-roll for gripping a tie rod end portion between the same and said winch-roll, selective means for eccentrically pivoting said gripper means on said supporting means optionally in one or a reversed position, a lever arm for actuating said gripper means and supporting means relative to said winch-roll, and selective means to operatively connect said lever arm with said gripper means in correspondence with a given selected operative position in which the latter is assembled.

5. In a tool for the purposes described, a foot plate structure having a way for the extension of a tie rod or the like therethrough, supporting means fulcrumed in connection with said foot plate structure, a winch-roll axially aligned with the fulcrum of said supporting means, a roller having a channeled periphery to embrace said tie rod, means to support said roller for movement to and from an operative tie rod engaging position intermediate said way and said winch-roll, a sheer cam block cooperative with said winch-roll, gripper means pivotally carried by said supporting means, and lever means for actuating said gripper means and supporting means relative to said winch-roll.

6. A reversible gripper means having a serrated operative portion for gripping work to which it is applied, selective means for eccentrically pivoting said gripper means on a support optionally in one or a reversed position, and lever means for actuating said gripper means.

SAMUEL S. COLT.