

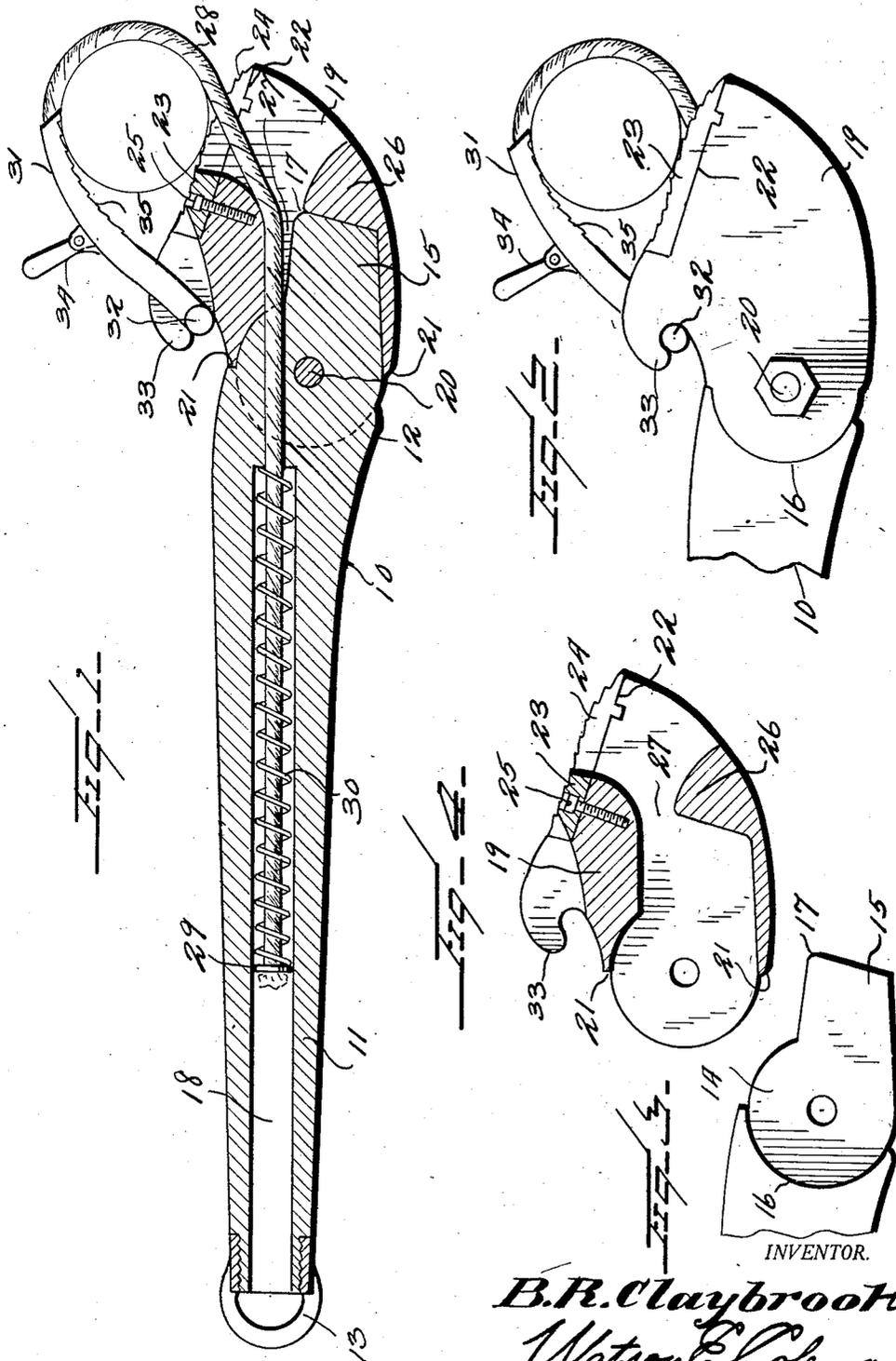
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PIPE WRENCH

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# UNITED STATES PATENT OFFICE.

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## PIPE WRENCH.

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This invention relates to pipe wrenches of that class in which a flexible element is adapted to embrace or to be placed partially around the pipe or other object and engaged with the wrench so that when the wrench is shifted in one direction the flexible element will bind or jam upon the pipe or other work, and that when shifted in the other direction the flexible element will release its binding action so as to permit the wrench to be given a new hold, such wrenches being particularly adapted for use in stringing casing in oil wells and on pipe lines, though entirely capable of use in a large variety of different circumstances.

One of the objects of the present invention is to provide a pipe wrench of the character stated wherein the flexible element is supported by a cable of wire or rope, and provide means whereby a continual tension is placed upon the cable to draw it into the body of the wrench and thus cause it to bear tightly against the exterior face of the work.

A further object is to provide means whereby the cable may be automatically clamped and released as the handle of the wrench is operated to turn the object to which the wrench is applied.

A still further object is to provide a wrench of this character with a handle having a rigid head, the rigid head having mounted thereon a pivoted clamping head or jaw which engages the work, the rigid head on the handle constituting means for automatically clamping the cable when the wrench is shifted to bind the cable upon the object.

Another object is to provide a wrench of this character with a cable having thereon a shiftable jaw, as it may be termed, which embraces the cable and is adapted to be clamped in any adjusted position thereon to engage the work.

Other objects will appear in the course of the following description.

My invention is illustrated in the accompanying drawing, wherein:—

Figure 1 is a longitudinal sectional view of a pipe tong constructed in accordance with my invention;

Figure 2 is a fragmentary elevation of the head of the tongs;

Figure 3 is a fragmentary elevation of the head end of the handle;

Figure 4 is a sectional view through the pivoted portion of the head.

Referring to this drawing, 10 designates the body of the wrench having a hollow or tubular handle 11 and a head portion 12. The handle 11 at one end is screw-threaded for the reception of a cap 13. The opposite end of this member 10 is recessed upon one face or reduced in thickness so as to provide a circular portion 14 and an outwardly projecting extension 15, the circular portion having a circular wall 16 and the extension having a rounded corner 17. The handle is longitudinally bored, as at 18, this bore where it passes through the head 12 being reduced in diameter and emerging upon the inclined or rounded face of the head.

Pivotaly mounted upon the portion 14 for limited swinging movement is the wrench head 19. This is bifurcated to receive the portions 14 and 15 on the body of the wrench and is pivoted upon the head of the handle by means of a transverse bolt 20. Shoulders 21 on the head 19 limit the swinging movement of the head. The end of the head is formed with an oblique face 22, and mounted upon this oblique face 22 is a jaw 23 having a rounded toothed face 24. A bolt 25 connects the jaw to the head.

The head 19 is formed with a transversely extending weight 26 which bears against the end of the extension 15 when the parts are in the position shown in Figure 1, and the head is formed with a passage 27 outwardly flaring at its end for the passage of a cable 28. This cable extends into the hollow interior of the handle and is knotted at one end and provided with a washer 29 which bears against a spring 30, which in turn bears against the end of the hollow interior of the handle so as to assist the outward pull on this cable 28. The jaw 23 is slotted or otherwise formed so as to provide a passage for the cable and the extremity of the cable carries upon it a tubular and slightly curved jaw 31 provided with a cross head or transverse latch bar 32. The head 19 is formed directly back of the jaw 23 with the two rearwardly extending hook-shaped lugs 33 with which said latch bar 32 is adapted to engage. The cable is held within the jaw 31 by means of the cam-shaped clamp 34, which when turned into its proper

position will jam upon the cable and lock the movable jaw thereon. The movable jaw is formed upon its inner, slightly curved face with teeth 35 extending reversely to the teeth 23.

With a construction as thus described, the strain placed upon the cable by swinging the handle in a counter-clockwise direction around the work will act to tighten up upon the cable and the cable cannot slacken by reason of the fact that the rounded end 17 of the extension 15 will bear upon this cable and positively lock it from further outward movement. The jaw 23 will exert a camming action upon the pipe or other article and the pipe will be firmly gripped between the jaw 23 and the jaw 31 and the cable. A movement of the handle in the reverse direction will act to relieve the strain on the cable, thus permitting the wrench to be swung in position to take a new hold. When no pressure is on the handle, the spring will hold the cable pressed against the work. Obviously, the greater the strain upon the cable, the more the cam-like jaw 23 will bite into the work and grip thereon.

A wrench of the character described will never slip, is easily operated and it is stronger than any other wrench of the same character known to me, and particularly it does away with the use of a chain, which chain is very likely to break, particularly in using the wrench as pipe tongs in operating on well casings, large sizes of pipe, etc., and pipe line fittings.

I claim:—

1. A wrench of the character described including a head and a handle, the head being formed with a face inclined to the longitudinal axis of the handle, the head and handle having a longitudinally extending bore opening upon said face, a flexible cable having one end inserted in said bore and the other end formed with a head, a spring within the bore engaging the near end of the cable and urging the cable to a retracted position, there being a cam member on the handle adapted to bear against the cable and clamp the same when the handle is turned in one direction to lock the cable against outward movement through the head, the wrench head having a hook-shaped portion with which the head of the cable is adapted to be engaged.

2. A pipe wrench including a handle, a head pivoted to the handle for limited oscillation in the plane of the handle, the head having a face angular with relation to the longitudinal axis of the handle and head, a flexible element extending through the inclined face of the head and into the handle and having means at its outer end whereby it may be engaged with the head, a spring disposed within the handle and acting to retract the flexible element, the handle having an extension rigid with the handle adapted to bear directly

against and clamp the flexible element inward of the outer end of the head when the handle is shifted in a direction to place strain upon the flexible element and upon the work.

3. A pipe wrench including a handle having a longitudinally extending bore, a head pivoted to one end of the handle for oscillation in the plane of the handle and having an inclined face and a flaring bore opening upon the inclined face and aligning with the bore of the handle, a flexible element having a portion disposed within the bore and extending out through the inclined face of the head, the head and flexible element having means whereby the free end of the flexible element may be detachably engaged with the head to form a bight, said handle having a prolongation rigid with the handle adapted when the handle is shifted in one direction with relation to the head to bear against the flexible element to clamp it, and elastic means disposed within the bore acting to retract the cable.

4. A pipe wrench having a handle and a head pivoted to the handle for limited oscillation in the plane of the handle, the head having an inclined face, a jaw detachably mounted upon said inclined face and having teeth, the handle being longitudinally bored and the head having an opening flaring outward through the jaw, a flexible element disposed within the bore of the handle and extending through the bore of the head and jaw, a spring within the handle acting to retract the flexible element, a second jaw mounted upon the flexible element adjacent its free end and having teeth, and means for detachably engaging the free end of the flexible element with the head.

5. A pipe wrench having a handle and a head pivoted to the handle for limited oscillation in the plane of the handle, the head having an inclined toothed face, the jaw, head and handle being longitudinally bored, said bore flaring at the point where it passes through the head and jaw, a flexible element disposed within the bore of the handle and extending through the bore of the head and jaw, a spring within the handle acting to retract the flexible element, a second jaw mounted upon the flexible element adjacent its free end and having teeth, means for detachably engaging the free end of the flexible element with the head, said second named jaw comprising a tubular portion through which the cable passes, and a clamp mounted thereon for clampingly engaging the cable.

6. A pipe wrench having a handle and a head pivoted to the handle for limited oscillation in the plane of the handle, the head having a face inclined to the longitudinal axis of the handle and having teeth carried by said inclined face, the handle being longitudinally bored and the head having an opening communicating with the bore in the handle and

flaring outward to the outer face of the jaw, handle is turned relative to the head, and  
a flexible element disposed within the bore of means carried upon the head for engaging the  
the handle and extending through the bore free end of the flexible element. 10  
of the head and jaw, means for retracting  
5 said flexible element, means carried by the In testimony whereof I hereunto affix my  
handle and rigid therewith and clamping di- signature.  
rectly against said flexible element when the

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