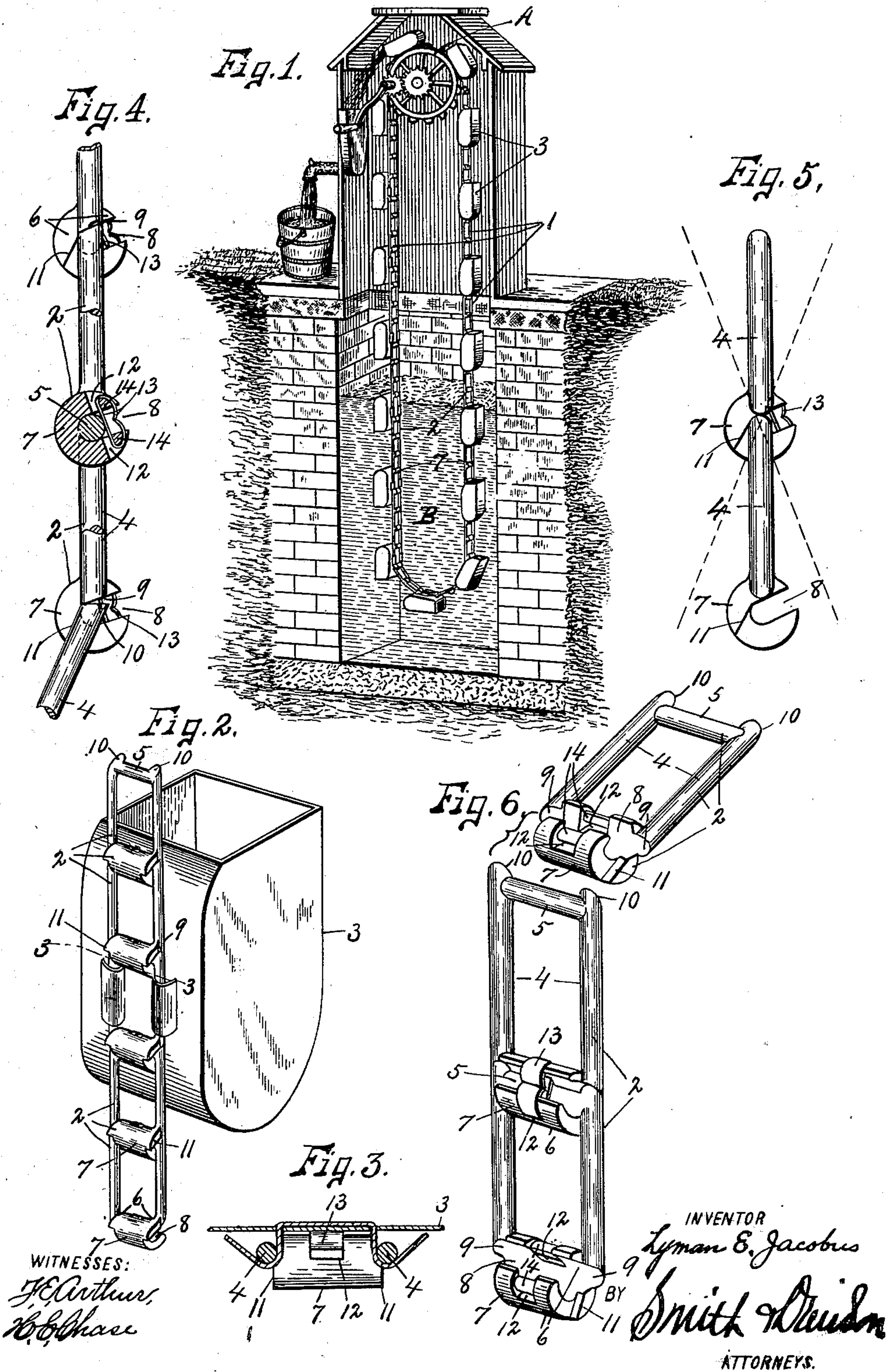


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CHAIN.

(Application filed Sept. 20, 1900.)

(No Model.)





# UNITED STATES PATENT OFFICE.

LYMAN E. JACOBUS, OF ROMULUS, NEW YORK.

## CHAIN.

SPECIFICATION forming part of Letters Patent No. 672,774, dated April 23, 1901.

Application filed September 20, 1900. Serial No. 30,557. (No model.)

*To all whom it may concern:*

Be it known that I, LYMAN E. JACOBUS, of Romulus, in the county of Seneca, in the State of New York, have invented new and useful Improvements in Chains, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

This invention relates to improvements in chains particularly applicable for hoisting and conveying apparatus, in which motion is transmitted to the chain by means of a suitable power driving mechanism, as a sprocket, and in which buckets are employed for any desired purpose and secured at intervals to the links of the chain.

The objects of this invention are, first, to provide a chain the links of which are readily detachable when desired and when in use are not liable to become displaced laterally or become kinked or otherwise rendered unfit for use, and, second, when used in connection with a well for the purpose of elevating water to dispense with all mechanism within the well at the bottom of the chain for maintaining the alinement of the links.

To this end the invention consists in the combination, construction, and arrangement of the component parts of a chain, as hereinafter fully described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective view showing the application of my invention for elevating water from a well. Fig. 2 is a perspective view of my invention, showing the manner of securing the chain to the bucket. Fig. 3 is a sectional view taken in line 3 3, Fig. 2, further showing the application of my invention to a bucket. Fig. 4 is an edge view, partly in section, of a plurality of links interlocked with each other. Fig. 5 is an edge view, similar to Fig. 4, of a slightly-modified form of chain in which the links may be rocked in either direction into and out of alinement with each other. Fig. 6 is a perspective view of a plurality of the links seen in Figs. 1 to 4, inclusive, two of the links being shown as assembled and one being shown as detached.

Similar reference characters indicate like parts in all the views.

It is well known to those skilled in this art

that devices of this character are more or less liable to be rendered inoperative by reason of the fact that the links become displaced when in use and that in order to obviate this difficulty, particularly when the chain is used in a well for hoisting water, it has been customary to suspend a grooved wheel at the lower end of the chain within the well for the purpose of maintaining the alinement of the links with each other, and thereby preventing lateral displacement thereof. This has been demonstrated to be a needless expense by reason of the unnecessary number of parts and also because it is extremely difficult to repair any of the parts of the conveying apparatus without the liability of losing said grooved wheel within the well.

My invention is designed to entirely overcome these various difficulties, and consists, essentially, of a chain 1, formed of a series of links 2, which are so constructed that when assembled they are permitted to have a limited rocking movement one upon the other in one direction in order to conform to the contour of the driving member which supports the chain and are prevented from movement in the other direction by means presently described in order that the opposite vertically-moving parts of the chain may be prevented from inward movement or kinking toward each other, thereby insuring the alinement of the links of said vertically-moving portions of the chain. These links consist each of separated substantially parallel lengthwise bars 4 4, united at their opposite ends by transverse bars 5 6 for forming a substantially centrally rectangular opening therein. The bar 5 is usually formed circular in cross-section, and the end bar 6 is provided with an enlarged intermediate portion 7, which is generally circular in cross-section and is provided with a cut-out 8, extending inwardly and downwardly from its peripheral face at one side of the link to a point in substantial alinement with the opposite face of said link, the inner end of said cut-out being rounded for forming a bearing for the transverse bar 5 of the next adjacent link. The end faces 9 of the side bars 4 adjacent to the transverse bar 6 are usually inclined in the direction of the inclination of the cut-out 8, and the opposite ends of the lengthwise bars 4 are



usually extended a slight distance beyond the transverse bar 5 and are provided with inclined faces 10, also inclined in the direction of the inclination of the cut-out 8 for engaging the inclined faces 9 and preventing the rocking movement of the links in the direction of the said cut-out out of alinement with each other.

The means for limiting the rocking movement of the links 2 in the opposite direction preferably consists of inclined shoulders 11, provided on the lateral faces of the enlarged intermediate portion 7 and projecting into the path of movement of the next adjacent link for engaging the faces of the lengthwise bars opposite to the cut-out 8 of the link supported in said cut-out. The shoulders 11 are arranged at an angle with the lengthwise bars 4 and are preferably arranged substantially tangential to the curved bearing-face of the cut-out 8. In order that the adjacent ends of the links may be detachably interlocked with each other, I provide the enlarged intermediate portion 7 of each link with an aperture 12, extending through the opposite walls of the cut-out 8 for receiving a locking member 13. The apertures 12 are disposed in a plane substantially coincident with the outer face of the transverse bar 5 adjacent to the open end of the cut-out 8 and are usually arranged in alinement with each other at substantially right angles to said cut-out for forming transverse bars 14 at the opposite sides of the cut-out 8.

The locking member 13 may be of any desired material, but preferably consists of a band of pliable metal, which is passed through the apertures 12, and its opposite ends are folded outwardly and toward each other upon the bars 14 for holding said band in operative position. The outer faces of the bars 14 are usually cut away in order that the band 13 when folded thereon may lie entirely within the periphery of the enlarged intermediate portion 7.

When assembling my improved chain, the enlarged intermediate portion of one of the links is registered with the opening between the bars 4, the transverse bar 5 is registered with the cut-out 8 and moved into engagement with the curved bearing-face of said cut-out, the locking member 13 is then inserted through the apertures 12 so that its opposite ends project beyond the bars 14, and said opposite ends of the locking member are then bent outwardly toward each other upon the bars 14 in the manner seen in Fig. 4. It is evident, therefore, that owing to the fact that the cut-out 8 inclines downwardly from the peripheral face of the enlargement 7 and that the locking member 13 engages the adjacent periphery of the transverse bar 5 of the next adjacent link said links are positively locked to each other, and owing to the pliability of the locking member 13 said locking member may be readily removed by unfold-

ing and withdrawing the same from the apertures 12 and the links may be readily detached from each other.

In the operation of my invention the shoulders 9 and 10 prevent the rocking movement of adjacent links out of alinement with each other in the direction of the open end of the cut-out 8, and the shoulder 11 serves to limit the rocking movement of said links in the opposite direction, this latter rocking movement being sufficient to permit the chain to conform to the contour of the driving member, as A, Fig. 1.

At Fig. 1 I have shown a well B, illustrating the use of my improved chain for the purpose of elevating water, and it is apparent from the foregoing description that the upwardly-moving loaded portion of the chain is prevented from buckling or kinking inwardly toward the opposite downwardly-moving portion of the chain by the shoulders 9 and 10, thus forming a substantially rigid supporting means for the loaded buckets, as 3.

Although the above-described construction of links is particularly simple in construction and practical in operation for service in wells and similar uses, it will be noted that said links may be otherwise constructed, and at Fig. 5 I have shown a pair of links as used for the general purpose of transmitting power, in which the links are unprovided with the inclined shoulders 9 and 10 and are adapted to rock in either direction out of alinement with each other, as shown by the dotted lines in said figure. It will be further noted that the shoulder 11 may be inclined at a greater or less angle than that seen in the drawings for permitting the chain to be used in connection with a smaller driving member, if desired.

The operation of my invention will now be readily understood upon reference to the foregoing description and the accompanying drawings, and it will be noted that some change may be made aside from that seen in Fig. 5 in the detail construction and arrangement of the parts of my invention without departing from the spirit thereof, and I do not limit myself to the precise construction and arrangement herein shown and described.

I claim—

1. A chain having its links detachably interlocked with each other and each provided with an inclined shoulder for engaging the next adjacent link and limiting the rocking movement of said links in one direction one upon the other.

2. A chain having its links detachably interlocked with each other, said links being each provided with laterally-projecting inclined shoulders for engaging the next adjacent link and limiting the rocking movement of said links in one direction one upon the other.

3. In a chain the herein-described link having one end formed with an open-sided bear-



ing and a shoulder projecting laterally from one end edge of the bearing opposite its open side for the purpose described.

4. A chain having its links detachably interlocked with each other, and their adjacent ends formed with inclined stop-shoulders movable into and out of engagement with each other for the purpose described.

5. A chain comprising a series of links, each having one end provided with an open-sided bearing for the next adjacent link and with an engaging shoulder projecting into the path of said adjacent link for engaging the face of said adjacent link opposite the open side of the bearing.

6. The herein-described link having its opposite ends provided with beveled engaging shoulders for the purpose described, one of said ends being also formed with a bearing-face for receiving and supporting another link.

7. An open link having one of its transverse bars formed with an open-sided cut-out and an opening in one of the walls of the cut-out, a second link detachably supported in said cut-out, and a locking member movable in said opening across the cut-out for holding the second link in position.

8. A link having one of its transverse bars enlarged and formed with a cut-out and openings in the walls of the cut-out, a second link

having one of its transverse bars movable into and out of said cut-out, and a locking member inserted in said openings for holding the second link in the cut-out.

9. A chain having its links detachably interlocked with each other and each provided with a cut-out and an aperture arranged transversely of the cut-out, and a locking member passed through the aperture for the purpose described.

10. The combination with a link having an open-sided bearing, a second link pivotally mounted in said bearing, and a locking member detachably engaged with the walls of said bearing and extended across the cut-out for preventing the removal of the second link.

11. The combination with a link having an open-sided bearing having engaging shoulders in its opposite walls, a second link pivotally mounted in the bearing, and a locking member consisting of a flexible metal band having its intermediate portion extended across the open end of the bearing and its opposite ends folded upon said shoulders for the purpose set forth.

In witness whereof I have hereunto set my hand this 12th day of September, 1900.

LYMAN E. JACOBUS.

Witnesses:

ANDREW H. BEAVER,  
JOHN W. SNOOK.