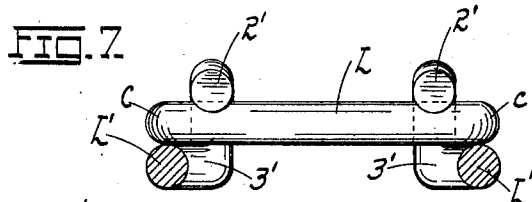
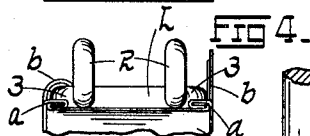
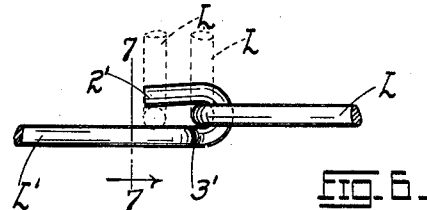
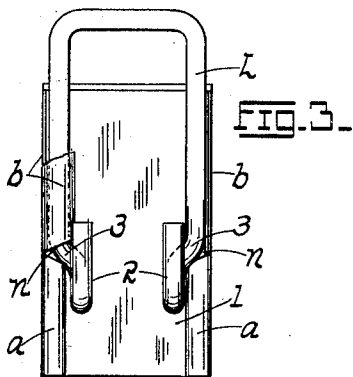
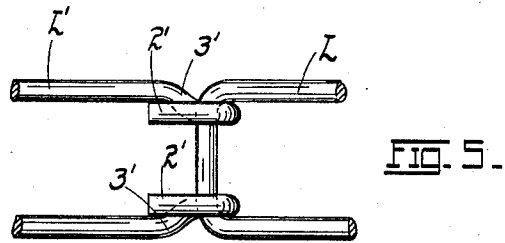
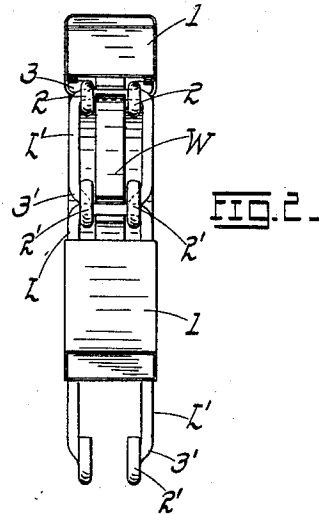
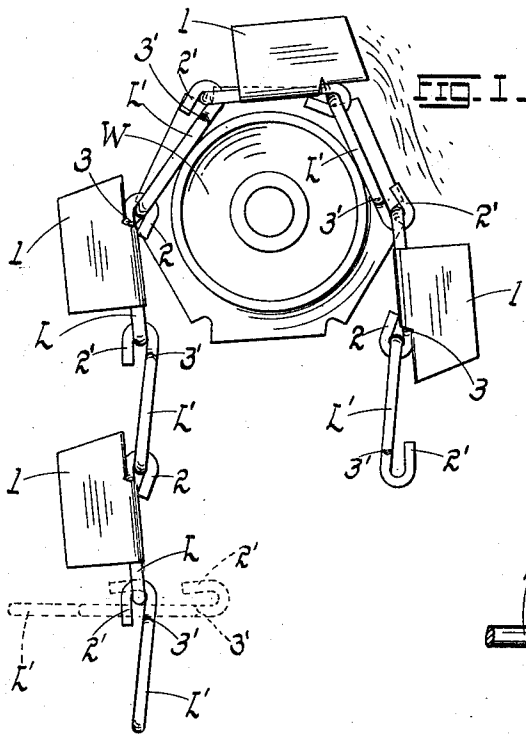


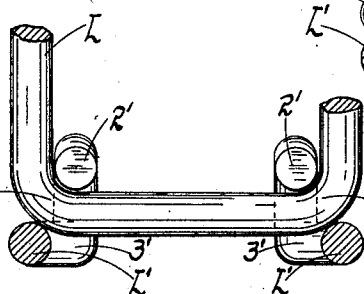
E. A. MURRAY.
 BUCKET CHAIN.
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1,005,282.

Patented Oct. 10, 1911.



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BUCKET-CHAIN.

1,005,282.

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To all whom it may concern:

Be it known that I, ELLSWORTH A. MURRAY, citizen of the United States, residing at St. Louis, State of Missouri, have invented certain new and useful Improvements in Bucket-Chains, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in bucket-chains for water elevators and purifiers; and it consists in the novel construction of chain more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a side elevation of a section of a bucket-chain, and sprocket wheel for actuating the same; Fig. 2 is a front view of the chain and edge view of the sprocket; Fig. 3 is a rear view of a descending bucket; Fig. 4 is an end view, partly broken away; Fig. 5 is a face view of two links coupled together; Fig. 6 is an edge view of Fig. 5; Fig. 7 is a cross-section (enlarged) on the line 7-7 of Fig. 6; and Fig. 8 is a similar section with the links at right angles to one another, showing position for coupling or uncoupling the same.

The object of my invention is to construct a bucket-chain for water elevators, the same being composed of a series of readily separable sections, each section comprising a bucket with its complement of chain links, the several links being so constructed as to produce when coupled together, a chain of uniform width throughout.

A further object is to construct the links in such manner as to permit their attachment to the buckets without the use of solder, clips or other extraneous devices, the connection being made herein directly between the bucket wall and the sides of the links.

The invention presents further and other advantages better apparent from a detailed description thereof, which is as follows:—

Referring to the drawings, 1 represents a sheet metal cup or bucket of conventional shape and design, the same being composed of sections of metal bent to the required shape, the edges of the sections being doubled and interlocked and properly seamed at the joints. In the bucket here shown the seaming is preferably on the sides of the back wall (Figs. 3, 4). A portion of this seam is formed as stated, by doubling the edges of the respective sheets and interlocking the same, thus forming a seam *a* of

four thicknesses of metal. At the lower end of the seam *a*, the engaging portions of the sheets are left projecting beyond the back wall of the bucket in the shape of a flange or wing *b*, a V-shaped notch *n* being cut in the sheets to make this possible, after which the flange *b* is folded over and pressed into firm contact with the sides of the U-shaped link *L*, (for convenience termed the bucket-link). The arms of the link terminate in open loops 2 bent in a plane at right angles to the general plane of disposition of the link, the loops being connected to the main body of the link by offsets or shoulders 3 inclining inwardly so as to make an obtuse angle with the side members of the link. The offsets are however, maintained in the general plane of disposition of the link, so as to engage the bucket wall when the link is secured to the bucket.

In applying the link to the bucket for purposes of attaching the same, the sides of the link are placed against the inner faces of the wings *b* (right hand side Fig. 3) the link being pushed inward or toward the open end of the bucket until the offsets 3 strike the inner ends of the seams *a*, *a*, said seam ends arresting further movement in that direction and thus serving as abutments for the offsets 3. Then the wings *b* are folded over the sides of the link, the inner ends of the wings thus folded coming (by reason of the V-shape cut or notch *n*) in engagement with the opposite sides of the offsets 3, and serving as abutments therefor, thereby arresting any movement or shifting of the links in the opposite direction. It follows therefore that the offsets or shoulders 3, when the link *L* is in place on the bucket, are engaged by an abutment or ridge on either side, making it impossible for a link to slip away from its bucket. The clenching of the flanges *b* moreover about the sides of the link insures a frictional hold on the latter so that a rigid connection is the result. The links are so proportioned as to bring the bases or cross-members thereof, a short distance beyond the bottoms of the buckets, to permit the engagement of this member with the proper tooth of the sprocket-wheel *W* by which the bucket-chain is rotated or advanced.

No claim is made for the wheel *W*, but obviously the peripheral formation thereof should be such as to engage the several links of the series, and allow the backs of the buckets to be properly supported as they are

carried around the wheel. The loops 2 of the bucket link L are passed over the base or cross-member of the link L' which for convenience will be referred to as the sprocket-link, this link being a sprocket-link pure and simple as no bucket is attached thereto. Once the link L' is passed behind the loops 2, the ends of the loops are bent toward the body of the link L to prevent the link L' from dropping out, the connection between the link L of any bucket and its immediate sprocket link L' being a permanent one, a bucket and two (or more if necessary) links being considered as a "section" of the chain. These sections are made separable or detachable from one another for any purpose, as for example for purpose of packing or shipping the chain, for lengthening or shortening the same, for repairing, and the like; and while readily detachable from one another, the several sections remain linked while in service, and while passing around the wheel W. This is made possible by reason of the following construction:—The link L' is on the order of the link L, except that it is coupled to the link L with its terminal loops 2' turned in the opposite direction to the loops 2; that is to say, the loop 2 is turned from the bucket, whereas the loop 2' is turned toward the bucket. The ends of the loops 2' are spaced from a plane tangent to the adjacent side of the body of the link L' a distance slightly less than the diameter of the cross-section of the wire of which the link is constructed, (Figs. 6, 7). On the other hand, the curvatures of the corners *c* of the link L (Fig. 8) are such that when said link is held at right angles to the plane of the link L', the peripheral points of contact between the sides of the link L, and said corners are below the tangent plane referred to, so that the cross-member of the link L is brought sufficiently away from the free ends of the loops 2' to clear them, permitting said link L to be passed behind the loops 2'. When the links L, L', straighten out however (Fig. 1), or assume the proper angle to pass over the sprocket W, the curvature of the corners *c* is no longer available to permit the base of the link L to drop below the tangent plane, the cross-member of the link L resting on the shoulders 3' (the space between which will not permit of the drop referred to) which lift the cross-member of the link L the full depth of the diameter of the cross-section of the wire above the tangent plane aforesaid (Figs. 6, 7) so that the link L can not now pass through the space between the free ends of the loops 2' and the main body of the link L'. The effect of placing the links into parallelism or to an angle such as they assume in pass-

ing around the sprocket W, is to cause their superposition to the full depth of the diameter of the cross-section of the wire, and hence prevent the slipping of the link past the loops 2'. Should it be desirable however, to uncouple one chain section from another, the link L' of one section is swung at right angles to the bucket link L of an adjacent section (dotted position Fig. 1, and Fig. 8) when the cross-member of the link L will drop into the space between the sides of the link L' sufficiently to pass the loops 2' and thus be uncoupled. The shoulders 3 serve as a means for permitting the connection described between a bucket-link L and the bucket; the shoulders 3' of the links L' serve to support the cross-members of the links L and maintain them on one side of the plane tangent to the adjacent face of the link L' so that said cross members can not pass by the loops 2', except when the link L is swung at right angles to said plane or to the link L'.

The offsets or shoulders 3, 3', converging inwardly as they do, to an extent represented by the thickness of the wire, it follows that when the several links are assembled, the chain will be of uniform width throughout.

Having described my invention, what I claim is:—

1. In combination with a U-shaped link having parallel side members provided with inwardly deflected shoulders, a bucket having a back wall provided with formations abutting against one side of each shoulder, and with formations abutting against the opposite sides of the shoulders, whereby shifting of the link along the bucket wall is prevented.

2. In combination with a bucket composed of sheet metal and having a back seamed to the sides of the bucket, said seams extending a suitable distance along the sides of the back, wings severed from the seamed sections and extending over the balance of the side portions of the back, a U-shaped link having parallel side arms engaging the inner sides of the wings, the latter being folded over said arms, offsets or shoulders leading from said arms and engaged on one side by the inner ends of the folded wings, and on the opposite side by the inner ends of the seamed portions of the bucket-walls whereby the link is secured to the bucket.

In testimony whereof I affix my signature, in presence of two witnesses.

ELLSWORTH A. MURRAY.

Witnesses:

EMIL STAREK,
A. W. POWELL.