July 14, 1925. 1,545,943

E. E. CRANE

TRENCH MACHINE BUCKET

Filed June 28, 1923

Fig. 1

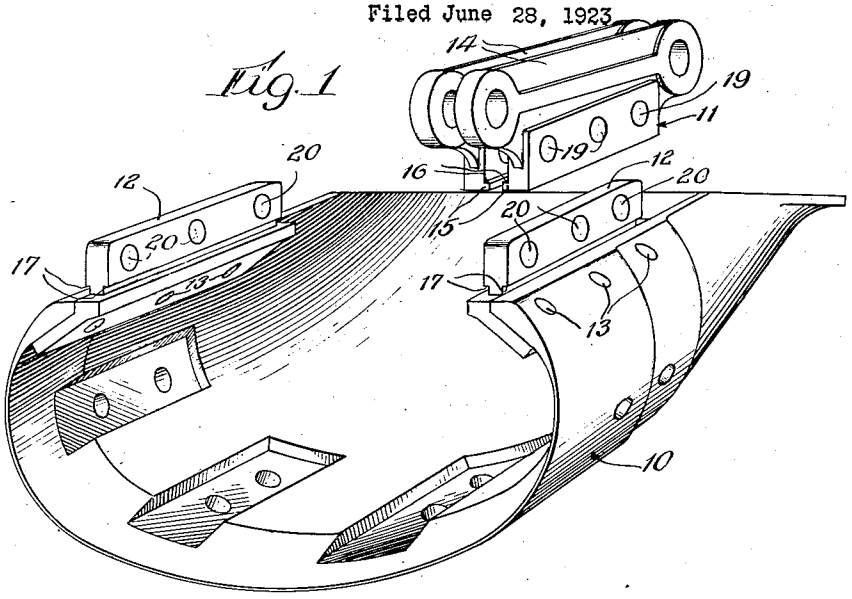


Fig. 2

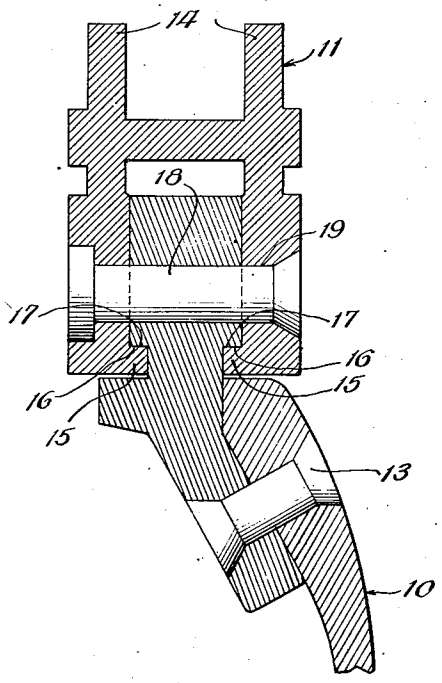
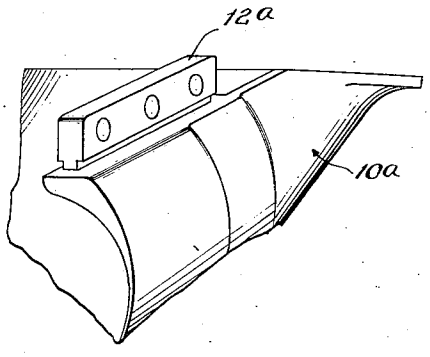


Fig. 3



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UNITED STATES PATENT OFFICE.

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TRENCH-MACHINE BUCKET.

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To all whom it may concern:

Be it known that I, ERNEST EDGAR CRANE, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Trench-Machine Buckets, of which the following is a specification.

The main object of my invention is to provide a trench machine bucket mounting of improved construction, the improvement in this construction having to do with the means whereby the bucket is operatively secured to the trench machine chain.

Trench machine buckets of the type which I have shown and will describe are usually secured to sprocket chains trained over a plurality of sprocket wheels carried by the trench machine with which the buckets are associated. Thus a trench machine is usually provided with a pair of sprocket chains running in parallel paths. The common practice is to rivet the buckets to the chains, each bucket having each of its sides riveted to a link in one of the chains. The construction employed heretofore has proved unsatisfactory as the rivets are oftentimes sheared off when the trench machine is engaged in some particularly heavy work. And not only do the rivets shear off at times, but the metal or the plates through which the rivets are driven fail and the rivet is torn away from either the bucket or the link. Shearing of the rivets or failure of the plates through which the rivets are driven necessitates a lay-up of the machine in order to make the needed repairs. In some cases it is necessary to replace either the bucket or the link depending upon which of them has been injured.

One specific object of my invention is to construct the bucket-carrying links of an excavator chain and the hangers for suspending buckets therefrom in such a manner that stresses imposed upon the hangers by the buckets, whether in the nature of vertical loading, longitudinal tipping, twisting, or lateral weaving stresses, will be transmitted to the chain links wholly or mainly through interlocking link and hanger construction without imposing shearing, head stripping, or tearing out strains upon the rivets; and to this end, one feature of the invention consists in adapting the link and bucket hanger to interlock through means of a pair of spaced side bars formed on one of said members and provided with vertically presented supporting shoulders upon their inner faces, and a lug formed on the other member, having opposed vertical shoulders on its exterior faces; the lug snugly fitting between the side bars whereby it is held against torsional or lateral displacement relatively to the side bars; and vertical loads being assumed by the shoulders on opposite sides of the lug so that rivets, each of which is passed through two side bars and the intervening lug, will be free from shearing strains. Preferably, the side bars are carried by the links which comprise spaced longitudinal members from which the side bars integrally depend, and the lug is on the bucket hanger and has a reduced plate-like shank depending between the shoulders of the side bars and connected, either integrally or through rivets, with the bucket.

Another specific object of the invention is to support each bucket through a plurality of means such as above described, one located at either side of the bucket, and spaced apart by the width of the bucket so as to leave the bucket entirely open above; and, accordingly, another feature of the invention consists in providing upon a pair of spaced excavator chains, mountings consisting of links and hangers of the kind already described, each of which is positioned above one side of the bucket.

Still another object of the invention is to so construct the link and hanger embodying the features already described, that the hanger will become an element of strength to the link. Accordingly, another feature of the invention consists in constructing the link of a pair of spaced side members and having a pair of lug-embracing rails depending integrally from these side members, and so fitting the lug between the rails and drawing the two rails and intervening lug together by means of rivets or equivalent elements, that the rails and side members of the link will be held together as a rigid unit and better enabled to withstand stresses imposed in the digging operation of the bucket.

Other objects of my invention will become apparent as the detail description progresses, reference being had to the accompanying drawings, wherein

Fig. 1 is a perspective view of my im-

proved trench machine bucket shown in connection with a link of a sprocket chain to which the bucket is adapted to be rigidly secured, the link being shown detached from the bucket.

Fig. 2 is a transverse section taken through the link shown in Fig. 1 and a portion of the trench machine bucket shown in Fig. 1, the bucket being shown rigidly secured to the link, and

Fig. 3 is a fragmentary perspective view of a trench machine bucket illustrating another form which my invention may take.

Referring for the present to Figs. 1 and 2, the reference character 10 designates my improved trench machine bucket, the bucket being of the type commonly employed in trench machines and the like. The trench machine bucket 10 is adapted to be rigidly secured to certain links of the bucket carrying sprocket chains which ordinarily form a part of the trench machine. At 11 I have shown a link which is particularly adapted to be employed in connection with my improved trench machine bucket 10. It will be readily understood that the link 11 may form a part of one of the sprocket chains to which the bucket 10 may be secured.

The means for securing the bucket 10 to the link 11 preferably comprises a separable lug 12 which is rigidly secured to the bucket 10 by a plurality of rivets 13. Of course, each bucket is provided with a pair of lugs 12 so that the bucket may be secured to two aligned links 11, but as the lugs 12 are identical in construction, it will only be necessary to described the particular lug 12 which is shown directly below the link 11 in Fig. 1. It will be noted that this lug 12 is adapted to be inserted by an end-wise movement into the space between the two side bars 14 of the link 11, the side bars 14 being designed to permit such inter-engagement between themselves and the lug 12 without any attending encroachment into the space usually provided between the bars of the link for the teeth of the sprocket wheels over which the link must pass. Each of the bars 14 is provided with an inwardly projecting flange 15 forming a shoulder 16 upon which rests one of a pair of shoulders 17 formed upon the lug 12. The abutting shoulders 16 and 17 of the link 11 and the lug 12, respectively, prevent withdrawal of the lug, and of course, its bucket 10, in a direction normal to the longitudinal axis of the link. It is apparent that this construction will prevent shearing of the rivets 18 which are provided to rigidly secure the lug 12 to the side bars 14. As shown in the drawing, the side bars 14 are provided with a plurality of apertures 19 and the lug 12 is provided with a plurality of apertures 20 which register with the apertures 19 in the side bars. The registering apertures 19 and 20 are adapted to receive the rivets 18.

Besides preventing shearing of the rivets 18, my improved construction for trench machine buckets is advantageous in that there is very little possibility that the metal of the lug 12 surrounding the rivets 18 will be torn out when the buckets are drawn through earth, rock, and the like. However, should one of the lugs 12 fail it may be readily replaced if the rivets 13 which secure it to the bucket are withdrawn. Withdrawal of the rivets 13 will, of course, necessitate destruction thereof.

In Fig. 3 I have shown in perspective view, a portion of a trench machine bucket 10^a which resembles the trench machine bucket 10 of Figs. 1 and 2, but which has a lug 12^a formed integral therewith, the lug 12^a being adapted to be used in the same manner as the lug 12 of Figs. 1 and 2 to secure the bucket 10^a to the link 11. That portion of the lug 12^a which is adapted to cooperate with the link 11 is identical in form with the corresponding portion of the lug 12 of Figs. 1 and 2. It will be readily understood that a majority of the advantages attending the construction illustrated in Figs. 1 and 2 will also attend the construction illustrated in Fig. 3.

I am aware that changes in the form, construction and arrangement of parts may be made without departing from the spirit and without sacrificing the advantages of the invention and I reserve the right to make all such changes as fairly fall within the scope of the following claims.

I claim—

1. In endless chain excavating apparatus, bucket supporting link and hanger members, one of which is constructed with a pair of spaced side bars having vertically presented load bearing shoulders on their opposed inner faces, and the other of which is provided with a lug fitting the space between said shoulders and constructed upon its outer faces with vertically presented shoulders engaging the shoulders on the side bars; the lug being embraced between the side bars to hold it against turning relatively thereto; and securing means being passed through both side bars and the intervening lug.

2. In endless chain excavating apparatus, a bucket mounting comprising link and hanger members positioned above one side of the bucket; one of said members being constructed with a pair of embracing rails having upon their inner opposed faces vertically presented longitudinal load bearing shoulders, and the other of said members being constructed with a lug having upon its outer faces vertically presented load bearing shoulders in position to engage the shoulders of the rails, and having a shank

extending from between said rails; and rivets passing through a pair of the rails and the intervening lug.

3. In endless chain excavating apparatus, means for mounting buckets upon the chains, comprising chain links, each having a pair of depending rails in position to receive one side of a bucket, said rails being constructed with upwardly presented longitudinal shoulders upon their opposed inner faces, and a hanger constructed with a lug fitting between said rails and gripped thereby to resist turning movement and with a reduced shank depending between said rails into position to receive one side of a bucket, and securing means passed through both rails and the intervening lug and drawing the rails against the sides of the lug.

4. In endless chain excavating apparatus, a pair of chains spaced apart approximately to correspond to the two sides of an excavating bucket, each chain containing a bucket supporting link related to one side of the bucket which it is to support, and each of said links being constructed of a pair of spaced longitudinal side members and with a pair of gripping rails depending from said side members and a hanger extending upwardly from each side of the bucket, each hanger being constructed with a lug fitting snugly between the gripping rails of a link, each pair of gripping rails and the intervening lug being constructed with vertically engaging load bearing shoulders, and each pair of gripping rails being drawn together upon the intervening lug by rivets passing through the pair of rails and the lugs.

ERNEST EDGAR CRANE.