Oct. 11, 1932. O. R. HUMPHREYS ET AL 1,882,147

DRAG LINE EXCAVATING BUCKET

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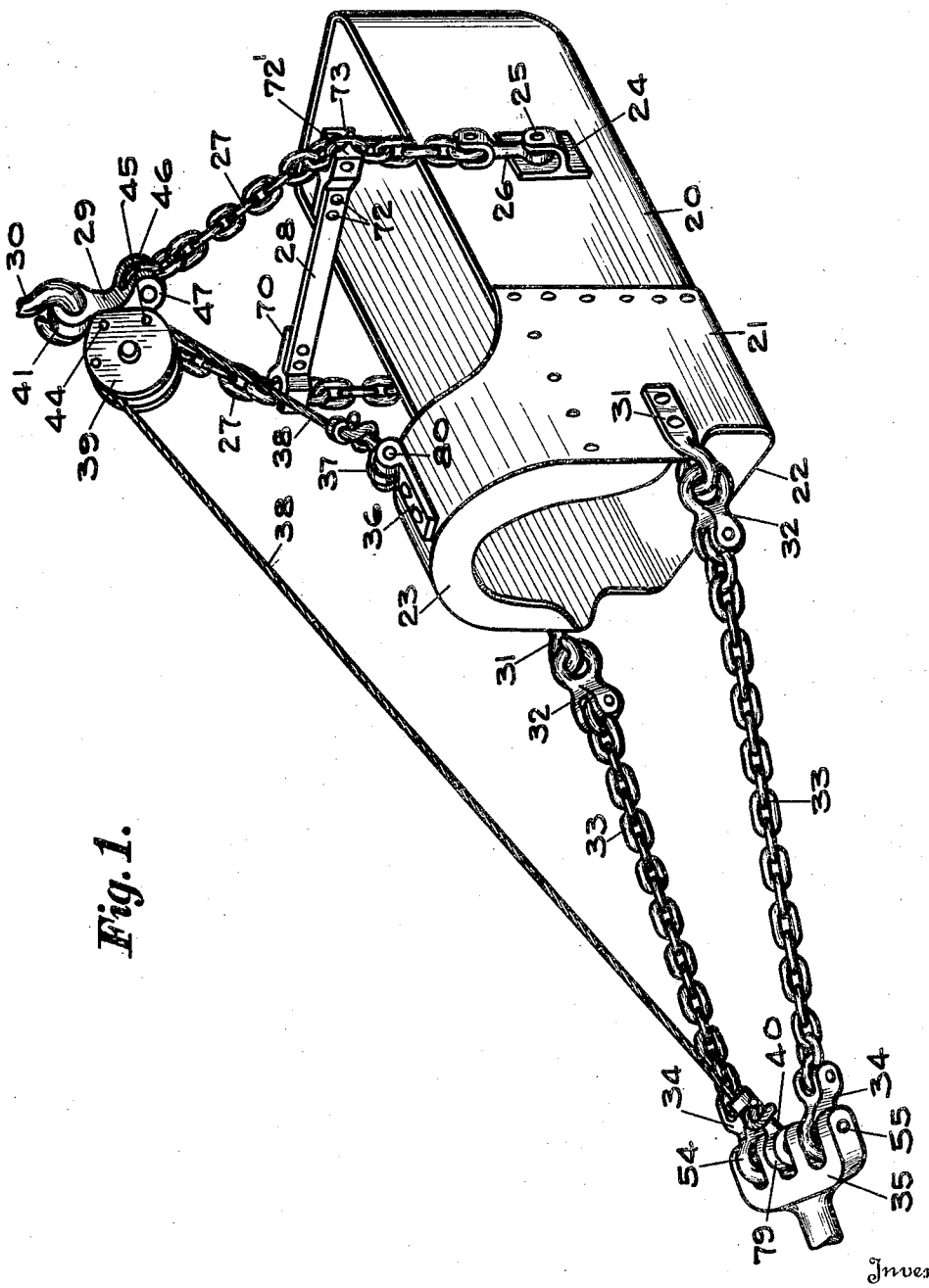

Fig. 1.

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DRAG LINE EXCAVATING BUCKET

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Fig. 2.

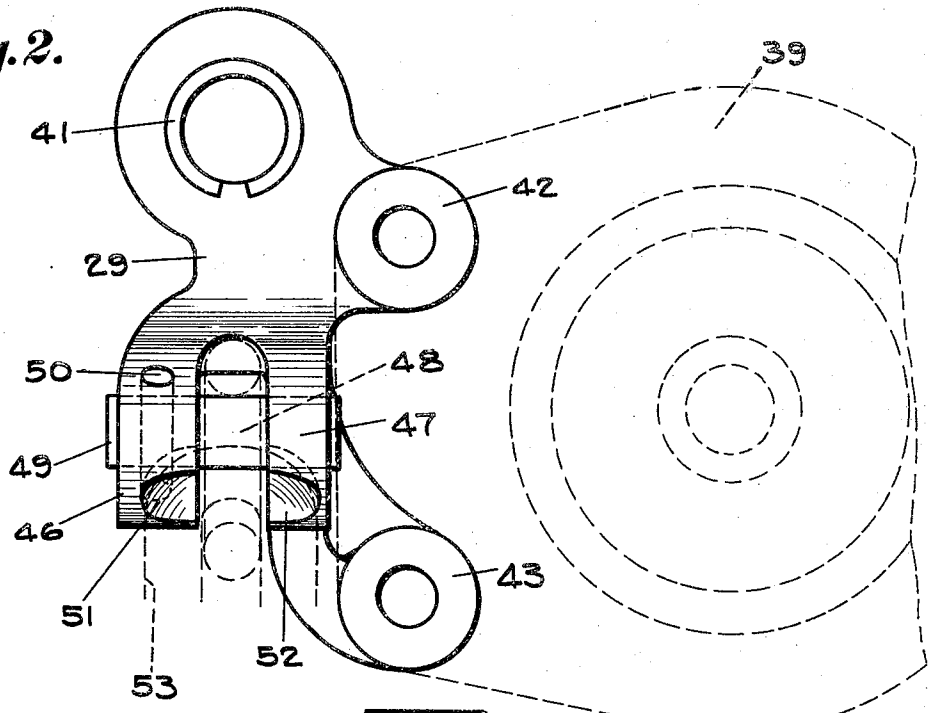
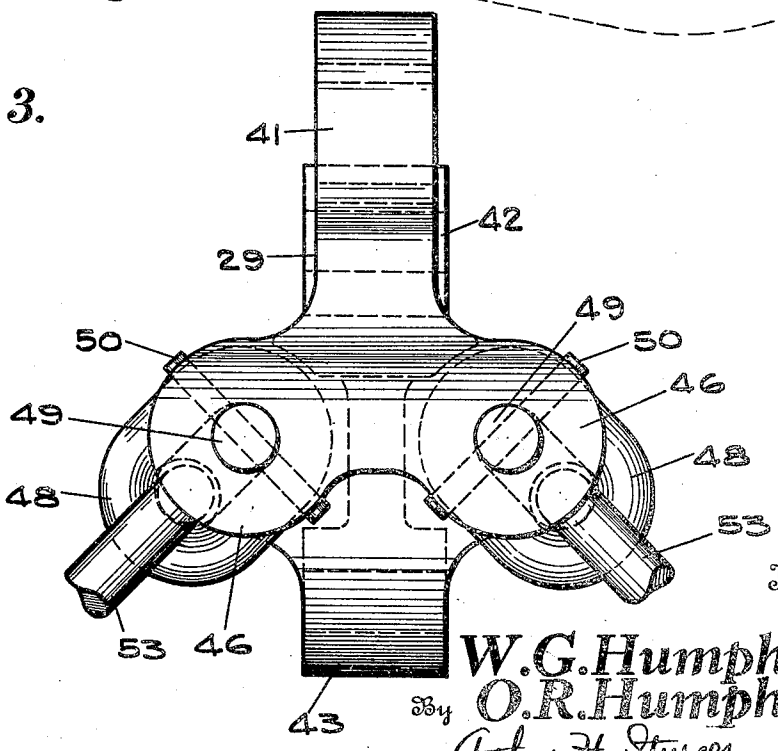


Fig. 3.



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DRAG LINE EXCAVATING BUCKET

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Fig.4.

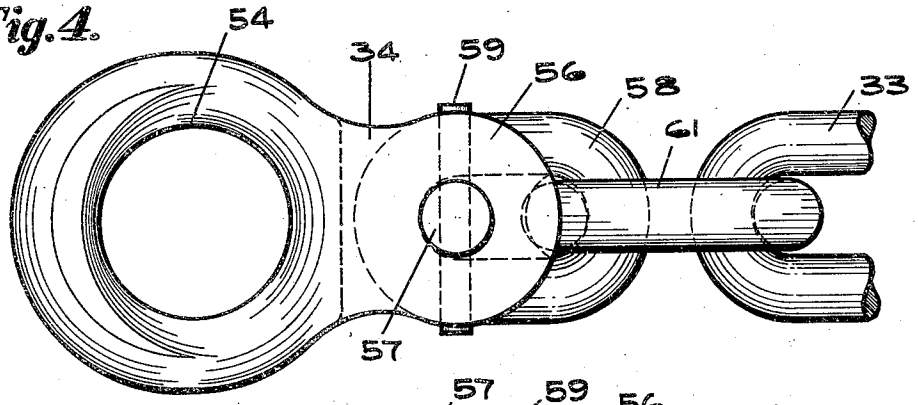


Fig.5.

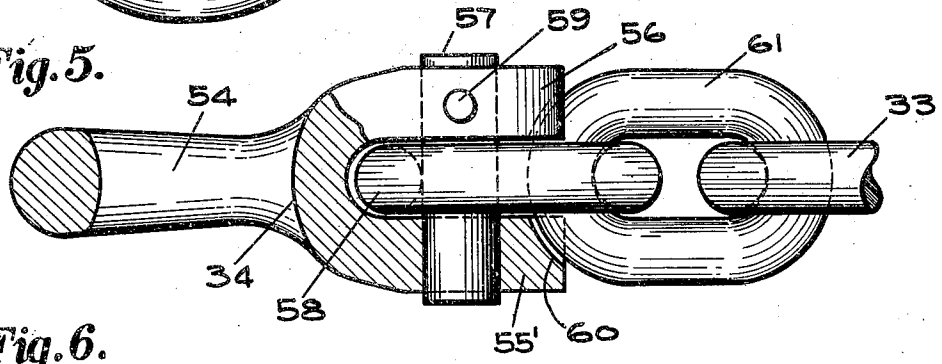
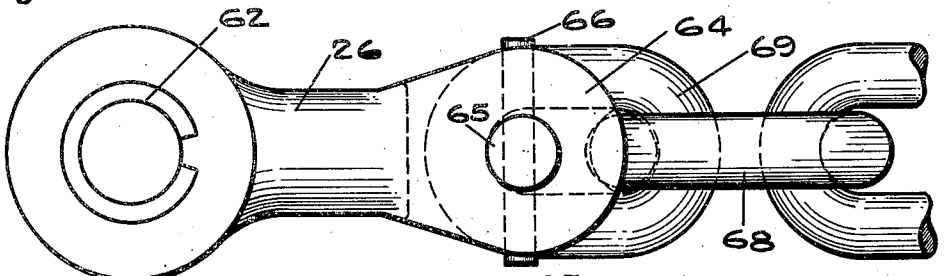


Fig.6.



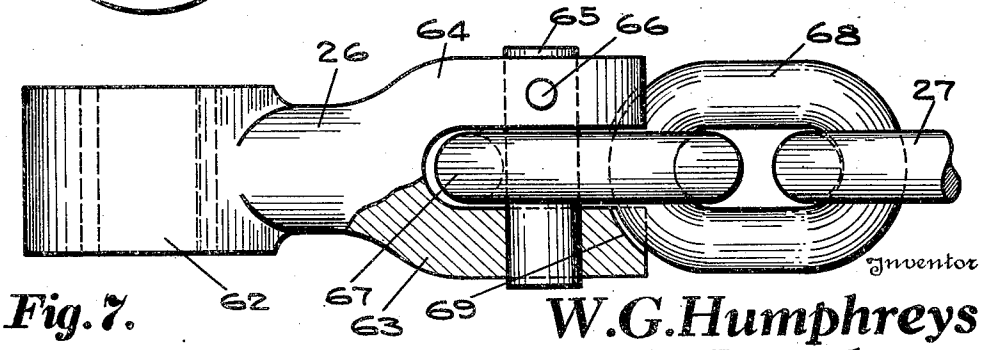


Fig.7.

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DRAG LINE EXCAVATING BUCKET

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Fig.8.

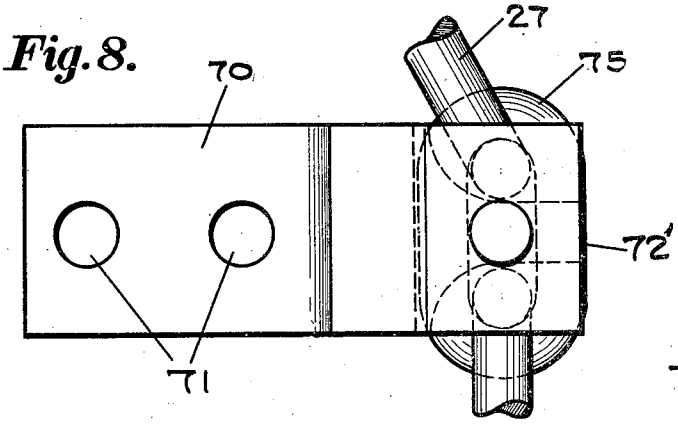


Fig.9.

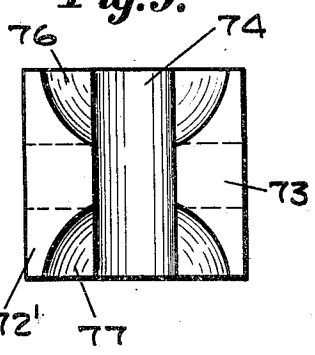


Fig.10.

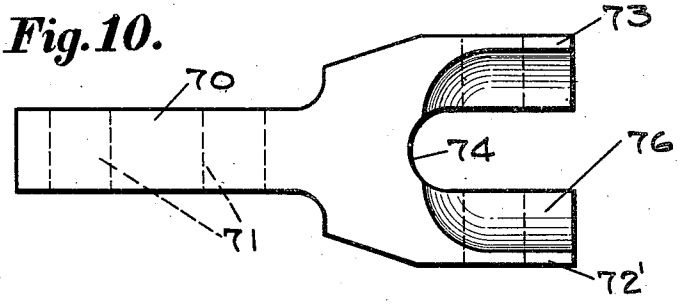


Fig.11.

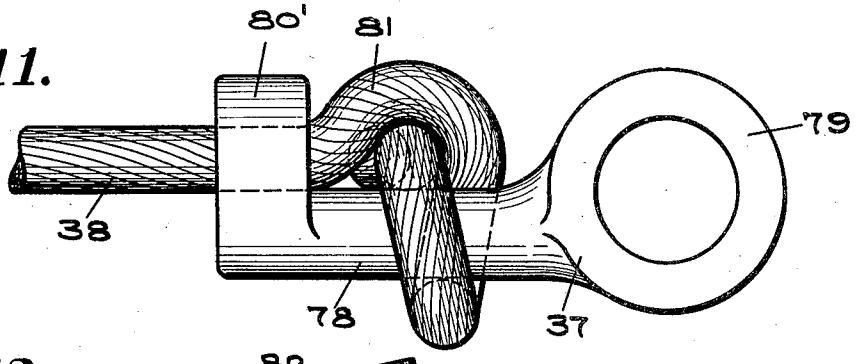
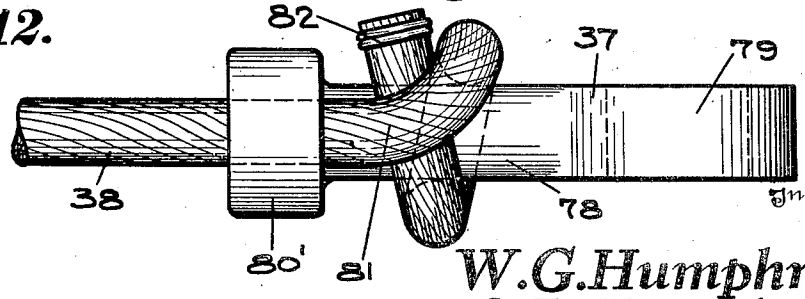


Fig.12.



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UNITED STATES PATENT OFFICE

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DRAG-LINE EXCAVATING BUCKET

Application filed September 5, 1928. Serial No. 304,128.

The present invention relates to improvements in drag line bucket excavators and refers more particularly to the chain and cable connectors therefor.

An object of the invention is to provide improved connectors whereby chains of stock sizes may be attached to the bucket without requiring welding, blacksmithing or any labor further than simply attaching the chains to the bucket.

Another object of the invention resides in providing an improved means whereby a cable may be attached to the bucket without the use of the U-shaped clips.

A further object of the invention resides in providing an improved spreader bar in conjunction with the bail chain of the bucket whereby the chains may be operatively associated with the bar without the use of welding or other processes.

A still further object of the invention is to provide improved means whereby stock-size chains may be attached to the dump line sheave or pulley without undue labor.

With the foregoing and other objects in view, the invention will be more fully described hereinafter, and will be more particularly pointed out in the claim appended hereto.

In the drawings, wherein like symbols refer to like or corresponding parts throughout the several views,

Figure 1 is a perspective view of a drag line bucket with the improved connectors and spreader bar.

Figure 2 is a side view of the improved sheave connectors.

Figure 3 is an end view of the same.

Figure 4 is a plan view of a drag-line chain connector.

Figure 5 is an edge view thereof with parts broken away.

Figure 6 is a plan view of a bail chain connector.

Figure 7 is an edge view of the same with parts broken away.

Figure 8 is a side view of a spreader bar connector.

Figure 9 is an end view of the same.

Figure 10 is a top plan view of the device shown in Figure 8.

Figure 11 is a side view of a cable connector, and

Figure 12 is a top plan view of the same.

Referring more particularly to the drawings and for the present to Figure 1, 20 designates a bucket formed of sheet iron or other material and possessing substantial weight.

The bucket is provided with the open ended hood 21 having the cutting edge 22 at its lower portion and the rounded arch 23 at its upper portion. The hood 21 is open at both ends so as to receive material therethrough for deposit in the bucket and to permit of the dumping of the bucket through said hood.

Bail ears 24 are mounted at the sides of the bucket 20, preferably rearwardly of the central portion of the bucket so as to give the bucket a tendency to tilt forwardly about the pins 25 which pivotally secure the chain connectors 26 in the bail ears. The connectors are coupled to the ends of the bail chains 27. The bail chains are kept apart by the spreader bar 28.

The upper ends of the bail chains 27 are secured in the sheave connector 29 which receives the hook 30 for supporting and for raising and lowering the bucket. At the sides of the hood 21 are eyes 31 for receiving the drag chain connectors 32. The drag chains are shown at 33 and are coupled to the connectors 32 at their rear ends and to other similar connectors 34 at their forward ends. The connectors 34 are attached to the three-way drag clip 35, the latter being attached to a drag-line (not shown).

Upon the arch 23 of the hood 21 is disposed a clip 36 for pivotally holding a cable connector 37 having secured thereto a cable 38 which is trained about the sheave 39 carried by the sheave connector 29. The dump line cable 38 extends forwardly from the sheave 39 to a cable connector 40, similar in construction to the connector 37. This forward connector 40 is pivotally mounted in the drag clip 35.

Referring now to Figures 2 and 3 the

sheave connector 29 is shown as having an eye 41 at its upper end to receive the hook 30 illustrated in Figure 1. Other laterally extending eyes 42 and 43 are carried by the connector member for the purpose of fitting within the plates of the sheave to receive the pins 44 and 45 by which the sheave is secured to the connector member 29.

The lower portion of this connector member is provided with downwardly divergent portions, each of which is bifurcated and formed with the parallel spaced arms 46 and 47 to each receive therebetween the upper link 48 of one of the bail chains.

The arms 46 and 47 are perforated to receive the pin 49 which passes also through the link 48 and serves to hold the chain in the connector member. A cross locking pin 50 extends through one of the arms 46 and through the pin 49. The free exposed ends of the arms 46 and 47 are provided with the recesses or cut away portions 51 and 52. These cut away portions are rounded and shaped to conform to the end of the links 53 of the bail chains which are coupled with the end links 48. The sides of the recesses 51 and 52 will engage the side portions of the links 53 and avoid turning movement of the links or twisting strain exerted upon the end links 48.

In Figures 4 and 5 a similar construction is shown in connection with the chain connectors 32 and 34. These connector members are provided with the eyes 54 for receiving a pin 55 which extends through the drag clip 35 and by which the connectors are pivoted to the clip.

The portions of the connectors which receive the chains are bifurcated or in other words provided with the spaced parallel arms 55′ and 56 which are perforated to receive the pin 57 passing through the arms and through the end link 58 of the drag chain which is received between the arms 55′ and 56. At 59 is shown the locking pin passing through the pivotal pin 57. The ends of the arms 55′ and 56 are provided with the curved and rounded recesses or cut away portions 60 to conform to and receive the convex end portion of the link 61 of the drag chain which is next adjacent the end link 58.

In Figures 6 and 7 the connectors 26 at the side portions of the bucket are shown to follow a similar construction. These connectors 26 are provided with the eyes 62 to fit within the bails 24 and receive the pivotal pins 25. The upper portions of the connectors 26 are bifurcated or provided with the spaced arms 63 and 64 and with the removable pins 65 which are locked in place by the locking pins 66. The end links of the bail chains are represented at 67 and the next adjacent links at 68. The recesses or cut away portions in the ends of the arms 63 and 64 are shown at 69 as receiving the adjacent end portion of the link 68.

In Figures 8, 9 and 10, the end members of the spreader bar 28 are shown. These members are formed with the shanks 70 having the openings or perforations 71 to receive the rivets or other fastenings 72 by which the end connectors are fastened to the spreader bar 28. The free terminal portions of the connectors 70 are bifurcated, as shown in Figure 10.

The bifurcated arms 72′ and 73 are peculiarly shaped. In the innermost portion between the arms, a vertically elongated socket 74 is provided to receive one side of the chain link 75 forming part of one of the bail chains 27. At the upper and lower portions of the arms 72′ and 73 are cut away portions or recesses 76 and 77 for the purpose of receiving the rounded convex adjacent end portions of the links of the bail chain which connects with the link specified at 75.

Referring more particularly to Figures 11 and 12 one of the cable connectors 37 or 40 is shown in which the shank portion is represented at 78. This shank portion is provided with an eye 79 at one end which is the eye which receives the pivot pin 80 passing through the clip 36. At the other end of the shank 78 is an upstanding eye 80′ having its axis disposed at substantially right angles to the eye 79 and this eye 80′ extends above the shank 78 to admit of receiving the cable 38. After passing through the eye the cable is wound one or more times about the shank 78 and the terminal end of the cable is inserted beneath the longitudinal portion 81 thereof and such terminal end of the cable is provided with a binding or enlargement 82. When a pull is exerted upon the cable 38, the looped-up portion 81 will tend to bind down upon the inserted end portion and thus the cable will be constrained to more tightly grip the shank 78.

In the operation of the invention the cable (not shown) which is attached to the hook 30 at the top of the bail chains 27 is rove over the pulley of a swinging boom on a traveling derrick platform. Also the drag line cable (not shown) which is attached to the clip 35 is a rove over a pulley and winding drum on the traveling derrick. By this means the bucket 24 may be drawn forward to load it, employing its great weight and its cutting edge 22. The bucket and hood will normally be inclined downwardly since the center of gravity of the bucket is forwardly of the supporting bail chain connections. Because of this point of support, the bucket will more readily scoop and load the earth or other material.

After loading, the bucket is raised through the hook 30 and its connection. So long as the drag line cable at the end of the three-

way clip 35 is taut, the bucket will not dump even when raised by the hook 30, since the dump line 38 will also be held taut, thereby sustaining the heavy hood end of the bucket. When it becomes desirable to dump the bucket, the cable connected with the clip 35 is slackened, thereby slackening also the dump line cable 38. The heavier end 21 of the bucket will promptly tilt and deposit its contents.

The various chain connectors enable stock-size chains to be attached thereto. Unless the recesses or cut away portions were provided in the ends of the bifurcated arms, stock size chains could not be attached unless a sufficient elongated link were first welded to the chain as a substitute for the end link. These elongated links and the job of welding are expensive and require time and skilled labor. It will also be noted that the construction, as for instance shown in Figure 5, provides for great thickness of the lower arm 55′ adjacent the recess 60 to withstand the stresses set up in the chain links. With the invention no additions or alterations to the usual chain are necessary.

We do not wish to be restricted to the size, form, and proportions of the various parts, and obviously changes could be made in the construction herein described without departing from the spirit of the invention, it being only necessary that such changes fall within the scope of the following claim.

What is claimed is:—

A spreader bar for a drag line excavating bucket with ears on opposite sides and bail chains pivotally mounted in said ears and extending upwardly at the sides of the bucket for supporting the same, comprising a bar adapted to extend between said chains in spaced relation above the bucket, end members for the bar, each of said end members having a shank adapted to lie against the side of the bar, rivets securing the shanks to the bar, each end member having a forked portion extending beyond the bar to receive a chain link in edgewise relation therethrough and having inwardly facing recesses in the upper and lower edges of the forked portion to accommodate the rounded ends of the adjacent links of the chain, each forked portion also having an intermediate transverse opening for receiving a pin therethrough for passage through the edgewise disposed link to hold the spreader bar to the chains.

In testimony whereof, we have affixed our signatures.

OMAR R. HUMPHREYS.
WALTER G. HUMPHREYS.