The invention relates to vehicles such as freight or material handling wagons, and it is concerned more particularly with an improved draft rigging for such vehicles.

Wagons for handling freight have heretofore been known, in which a draft tongue has a handle portion for application of manual draft thereto, and also a lug portion for application of draft to the tongue from a power driven conveyor system, the lug portion being engageable in draft transmitting relation with a floor embedded power propelled chain of the conveyor system by lowering of the draft tongue about a horizontal pivot axis on the wagon, and the lug being disengageable from the conveyor chain by upward swinging of the tongue about said pivot axis. Such wagons, as heretofore constructed, are believed to have not been entirely satisfactory, particularly in the matter of steerability of the wagon while the draft tongue is coupled with the conveyor chain, and also in the matter of positioning the tongue in desirable relation to the wagon body while it is coupled with the conveyor chain. The present invention contemplates the provision of a wagon which may be propelled alternatively by hand or by a power driven conveyor system, and which avoids the aforementioned and other shortcomings and inadequacies of the prior art in a practical and fully satisfactory manner.

One of the objects of the invention is to provide an improved wagon of the above mentioned character, in which the draft tongue is mounted on a swivel truck of the wagon and in such a manner that positive steering movement will be applied to the swivel truck when the wagon is propelled on an arcuate course by the conveyor chain.

A further object of the invention is to provide an improved draft rigging for wagons, and more particularly one in which a draft tongue is adjustable endwise and angularly to different positions, and in which adjustment of the tongue to at least one of said positions will automatically secure it against endwise movement in one direction and also against angular movement in both directions or at least one direction.

A further object of the invention is to provide an improved draft rigging of the hereinabove mentioned character incorporating a draft tongue adapted for alternative application of draft thereto either by hand or from a floor embedded conveyor chain, and in which the draft tongue when coupled with the conveyor chain will be retained in a vertical or otherwise out of the way position.

A further object of the invention is to provide an improved draft rigging of the hereinabove mentioned character, in which the draft tongue will be prevented from dropping to the floor when it is out of cooperative engagement with the conveyor chain.

A further object of the invention is to provide an improved draft rigging incorporating a floatingly mounted draft tongue which will be readily adjustable to an operative conveyor chain engaged position, and to another operative conveyor chain disengaged position, and which draft rigging will permit maneuvering of a wagon by manual pull as well as push on the draft tongue while the latter is disengaged from the conveyor chain.

A further object of the invention is to provide an improved draft rigging of the hereinabove mentioned character, which may be incorporated in a conventional type of wagon either by altering the draft rigging of such wagon, or by replacing the draft rigging of the conventional type wagon with an improved draft rigging incorporating the invention.

A further object of the invention is to provide an improved draft rigging of the hereinabove mentioned character, which will be simple and foolproof; which will not be liable to get out of order or cause accidents; and whose manufacturing costs will not be materially higher than those of a conventional draft rigging for the same type of wagon.

These and other objects and advantages are attained by the present invention, various novel features of which will be apparent from the description herein and the accompanying drawings disclosing an embodiment of the invention, and will be more particularly pointed out in the appended claims.

Referring to the drawings:

Fig. 1 is a side view of a platform wagon in coupled relation with a floor embedded conveyor chain, the near front wheel of the wagon being omitted for purposes of exposure;

Fig. 2 is a front view of the wagon shown in
in Fig. 1, the floor embedded conveyor chain and parts associated therewith being shown in section on line II—II of Fig. 1.

Fig. 3 is an enlarged side view of part of the draft rigging of the wagon shown in Fig. 1, the lower end of the draft rigging being shown in operative, conveyor chain engaged position.

Fig. 4 is a section on line IV—IV of Fig. 3;

Fig. 5 is a top view of the parts of the draft rigging shown in Fig. 3.

Fig. 6 is an enlarged top view of part of the conveyor chain, part of the wagon tongue being shown in section on line VI—VI of Fig. 3; and

Figs. 7 and 8 are views illustrating different positions of adjustment of the draft rigging shown in Fig. 3.

Referring to Figs. 1 and 2, the platform wagon shown in these figures comprises a frame structure generally designated by the reference character 1, a pair of rear wheels 2, and a wheeled front swivel truck generally designated by the reference character 3. A supporting axle 4 for the front wheels 5 is mounted in depending brackets 6 of the frame structure 1, and a pair of front wheels 6 of the front swivel truck are mounted on an axle 7 at the opposite ends of the latter, as best shown in Fig. 2. A mounting structure for the axle 4 comprises an inverted channel 8 and a pair of supporting brackets 9 on which the axle 7 is mounted and which depend from the channel 8 at the opposite ends of the latter at the inner sides of the wheels 6. The swivel truck 3 is steerable connected with the frame structure 1 by means of a fifth wheel mounting which comprises a fifth wheel plate 11, a bolster 12, and a pivot bolt 13, as best shown in Fig. 1. The fifth wheel plate 11 is secured, as by welding, to the top surface of the channel 8, and the bolt 13 extends through a bottom plate of the bolster 12 and through aligned holes in the fifth wheel plate 11 and in the channel 8, and carries a nut 14 at the inner side of the channel 8. The bolt 13 determines the pivot center about which the swivel truck 3 is swingable horizontally relative to the frame structure 1 of the wagon.

Referring to the draft rigging of the wagon, a pair of fore and aft extending, horizontally spaced supporting beams, in the form of straight and bent iron 16 and 17 (see Figs. 2 and 5) are adapted to be supportedly connected at their rear ends to the swivel truck in draft transmitting relation thereto, the angle irons being secured at their rear ends to the channel 8 and to the fifth wheel plate 11 of the swivel truck, preferably by welded seams along the straight vertical rear edges of the angle irons and by welded seams along the horizontal edges of the angle irons below the fifth wheel plate 11. Secured between the angle irons 16 and 17, as by welding, is a rearward post 18, which is made of rectangular bar stock, and which depends from the angle irons 16 and 17 at a short distance ahead of the channel 8. Forwardly of the post 18, the angle irons 16 and 17 straddle a draft tongue 19, and the elongation of the draft rigging being shown in operative, conveyor chain engaged position.

The tongue 19 is made of flat bar stock and has a handle portion in the form of a cross tube 21 at its upper end, and a lug portion 22 of enlarged cross section, as shown in Fig. 6, at its lower end, the lug portion 22 being engageable in draft transmitting relation with a conveyor chain 23, as shown in Figs. 1, 2, 3 and 6.

A link structure comprising a pair of duplicate links 24 and 26 (see Figs. 1 and 2) has a first pivot center 27 on the lower end of the post 18, and a second pivot center 28 on the tongue 19 below the supporting beams 16 and 17. The links 24 and 26 extend at opposite sides of a laterally recessed lower portion of the rearward post 18, the thickness of said lower portion of the post 18 being the same as the thickness of the bar stock forming the draft tongue 19. A bolt affording the first pivot center 27 extends through rearward portions of the links 24 and 26 and through the laterally recessed lower portion of the post 18, and another bolt affording the second pivot center 28 extends through forward portions of the links 24 and 26 and through the draft tongue 19. A pair of guide plates 29 and 31 for the tongue 19 are secured to and extend upwardly from the angle irons 16 and 17, respectively, at opposite sides of the draft tongue 19. The guide plates 29 and 31 are arranged in overlapping relation with the vertical flanges of the angle irons 16 and 17, respectively, and are secured thereto preferably by welding. The guide plates 29 and 31 are connected together by a vertical spacer strip 32 which is secured, as by welding, to the guide plates along their vertically extending rear edges. A vertical slot 33, which is open at its upper end, is formed in the portion of the guide plate 29 above the angle iron 16, the slot terminating at its lower end approximately in alignment with the horizontal flange of the angle iron 16. A similar slot 34 (Fig. 4) is formed in the guide plate 31 and in registry with the slot 33. The slots 33 and 34 are adapted to receive a cross pin 35 which is rigidly secured, as by welding, to the tongue 19, and which may be lowered into and raised from said slots by endwise downward and upward movement, respectively, of the draft tongue 19, as illustrated by Figs. 3 and 7.

As mentioned herebefore, the lug portion 22 of the draft tongue 19 is intended for engagement in draft transmitting relation with a conveyor chain 23, and preparatory to such engagement the wagon is manipulated into a straddling position with reference to the conveyor chain 23, as shown in Fig. 2. The conveyor chain 23 is arranged to move in a suitable guide way 37 below the floor level 38, and forms part of a generally conventional conveyor system including a drive mechanism, not shown, for the chain 23, and which continuously operates to move the chain 23 in the direction of arrow "A" in Fig. 1 at a relatively low speed, such as, for instance, a slow walking speed. The conveyor chain 23 comprises a series of alternating single links 39 and double links 41, which are connected in a conventional manner by hinge pins 42, as best shown in Figs. 3 and 6. Each of the single links 39 comprises a pair of horizontally spaced side bars 43 and 44 (see Fig. 6), and the lug portion 22 of the draft tongue is adapted to be lowered into and raised from the space between the side bars 43 and 44 of any of the links 39. A conveyor chain engaging front edge 46 and a conveyor chain engaging rear edge 47 of the lug portion 22 extend longitudinally of the tongue 19, as shown in Fig. 3, and the side faces of the lug 22 are beveled to form a pair of convex curvatures portions 48 and 49 thereon, as shown in Figs. 6 and 7, which extend longitudinally of the tongue 19 at opposite sides, respectively, of the latter intermediate the longitudinally extending front and rear edges 46 and 47.
In the illustrated embodiment of the invention, the edges 46 and 47 are formed by surface portions of the lug 22 which extend transversely of the side bars 43 and 44 of the link 39 when the tongue 19 is in the position as shown with the conveyor chain as shown in Figs. 3 and 6. It will be understood that the conveyor system comprising the chain 23 is laid out to pull the wagon not only in a straight ahead direction but also around curves and portions of travel for the wagon may also include more or less steep inclines. Assuming that the draft rigging is adjusted to the position in which it is shown in Figs. 1 and 3, and that the conveyor chain 23 is moving in the direction of arrow “A” in Fig. 1; under these conditions, the rear edge 47 of the lug portion 22 of the draft tongue 19 will be engaged with the rearward pin boss of the link 39 with which the lug 22 is coupled, and as a result the draft tongue will be subjected to thrust which tends to swing the handle end of the draft tongue 19 rearwardly about the second pivot center 28. Such rearward swinging movement of the draft tongue is prevented by engagement of the cross pin 36 with the rear edges of the slots 33 and 34 of the tongue 19. The cross pin 36 will be propelled in the direction of arrow “A’” in Fig. 1. During such propulsion, the swivel truck 3 of the wagon will be positively steered when the wagon passes around any curves or corners because the point of draft application to the wagon tongue 19 by the conveyor chain 23 is well in advance of the pivot center at 13 of the swivel truck 3. It will further be noted that the ridges 48 and 49 on the lug portion 22 provide for ready angular displacement of the link 39 relative to the draft tongue when the wagon is being pulled on a curve or around a corner.

On a downward incline of the floor, the wagon may tend to overtravel the chain 23, but as long as the lug 22 of the draft tongue is engaged with the chain 23, and the pin 36 is seated in the slots 33 and 34, such overtraveling of the wagon is positively prevented by contact of the pin 36 with the forward edges of the slots 33 and 34.

The lower end face of the lug portion 22 is beveled, as best shown in Fig. 3, to form an end ridge 51 on the draft tongue between the opposite sides of the latter. That is, the lug portion 22 has an end surface which extends downwardly and rearwardly from the lower end of the front edge 46. While the wagon is pulled by the conveyor chain 23, the lug 22 may encounter minor obstructions on the bottom of the guideway 37, and the purpose of beveling the lug portion 22 so as to form the mentioned rearwardly and downwardly inclined end surface is to assist the tongue in riding over such minor obstructions.

In order to disconnect the wagon from the conveyor chain 23, the lug portion 22 of the tongue may be moved out of its operative conveyor chain engaged position in which it is shown in Fig. 3 by endwise upward movement of the tongue 19 to the position in which it is shown in Fig. 7. Such endwise upward movement of the tongue will raise the cross pin or stud 35 from the seats afforded by the lower ends of the slots or notches 33 and 34, and the upward endwise movement of the tongue is limited by engagement of the links 24 and 26 with the lower horizontal edges of the guide plates 29 and 31 and of the vertical flanges of the angle irons 16 and 17. It will be noted that when the links 24 and 26 strike the said lower edges, the cross pin 36 of the draft tongue 19 is lifted entirely out of the notches 33 and 34. The draft tongue may then be swung forwardly into another operative, but conveyor chain disengaged position, such, for instance, as illustrated in Fig. 8, and in which position the draft tongue is forwardly inclined so that manual draft may conveniently be applied to handle the end of the draft tongue in order to manipulate the wagon in conventional manner. The forward edges of the guide plates 29 and 31 extend forwardly and downwardly, and the links 24 and 26 tend a short distance beyond the front edges of the guide plates, as best shown in Fig. 3. In the position of the tongue, as shown in Fig. 8, the cross pin 36 rests on the forwardly extending portions of the angle irons 16 and 17, and the handle end of the tongue is prevented from dropping to the floor by engagement of the links 24 and 26 with the angle irons 16 and 17.

It will be noted that in Fig. 8 the cross pin 36 engages a first seat forwardly of and substantially in horizontal alignment with the second seat afforded by the lower ends of the slots 33 and 44, and that the pin 36 is cooperative with the front edges of the guide plates 28 and 31 to transmit rearward push from the tongue 19 to the swivel trucks 3, while the will be propelled by hand and while the tongue is adjusted to any convenient forwardly inclined position.

In order to couple the wagon with the conveyor chain, the draft tongue is swung upwardly to the position in which it is shown in Fig. 7, after the wagon has been manipulated into a suitable position over the conveyor chain, and the draft tongue is then pushed downwardly to engage the lug portion 22 with any of the conveyor links 24. In order to facilitate entry of the lug into the aperture of the conveyor link 29, the 36 and rear corners and the side corners at the lower end of the lug 22 are rounded as indicated at 52 in Fig. 7 and at 53 in Fig. 4.

In general terms, the herein disclosed draft rigging comprises first connecting means between the link 24 and the wagon truck, which pivotally secure said link at one of its ends on a first center, at 27, in horizontally and vertically fixed relation to said truck; second connecting means between the link 24 and the tongue 19, which pivotally secure said link at its other end on a second center, at 28, in longitudinally and transversely fixed relation to the tongue, the latter having an end portion 22 which extends radially from said second center; and third connecting means between the tongue and truck, which are selectively adjustable to a first operative condition as illustrated, by way of example, in Fig. 1, and to a second operative condition as illustrated, by way of example, in Fig. 8. In the first operative condition, the third connecting means are effective to determine a first position of pivotal adjustment of the link 24 about the first center, at 27, in which the second center, at 28, is spaced horizontally from the vertical pivot axis, at 13, of the tongue 19 to maintain the tongue 19 in a first position of pivotal adjustment about the second pivot center, at 28, in which the end portion 22 of the tongue extends downwardly from the second center for engagement of said end portion 22 in horizontal thrust transmitting relation with the floor embedded conveyor chain.

In the second operative condition of the third connecting means, the latter are effective to maintain the link 24 in a second position of pivotal adjustment about the first pivot center, at 27, and the tongue 19 in a second position of pivotal adjustment about the second pivot center,
at 28, which will preclude cooperative engagement of the end portion 22 of the tongue with the conveyor chain.

In the illustrated embodiment of the invention, the third connecting means comprises a first stationary abutment element as represented by the slotted part of either of the side plates 29, 31; a second stationary abutment element, as represented by the seat at the forward ends of the beams 16 and 17, on which the cross pin 36 may rest as shown in Fig. 8; and a complementary movable abutment element, as represented by the cross pin 36, which is selectively engageable with said first and second stationary abutment elements, as shown in Figs. 1 and 6, respectively; the end portion 22 and an arm portion of the tongue on which the cross pin 36 is mounted, extending radially in opposite directions from the second center at 28.

The portion of the link 24 and the portion of the beam 16 which are abuttable with each other as shown in Fig. 5, represent means for limiting swinging movement of the link 24 on the first pivot center, at 27, in an upward direction relative to the wagon truck.

In the condition of the mechanism as shown in Figs. 1 and 3, the portion of the beam 15 is abuttable by the conveyor chain at a thrust point below the pivot center at 28, such thrust point being represented by the point at which the end portion 22 of the tongue contacts one of the pin bosses of the conveyor links 41. Further, in the condition of the mechanism as shown in Fig. 1, the load transmitting element represented by the cross pin 36, reacts upon the support which is represented by the beams 16, 17 and associated parts, at a connecting point in radially spaced relation to the pivot center at 28, so that draft applied by the conveyor chain at the mentioned thrust point to the end portion 22 of the tongue will be taken up at the pivot center 28 of the link 24, and at the mentioned connecting point, that is, at the point at which the cross pin 36 bears against the slot 33.

The mentioned seat at the forward ends of the beams 16, 17 on which the cross pin 36 rests in the condition of the mechanism as shown in Fig. 8, generally represent thrust transmitting means which react upon the load transmitting elements represented by the cross pin 36, while the tongue 18 occupies an upwardly adjusted position in which its end portion 22 is out of cooperative engagement with the conveyor chain, so as to preclude movement of the tongue to the downwardly adjusted position in which its end portion 22 engages the conveyor chain.

It should be understood that it is not intended to limit the invention to the heretofore described forms and details, and that the invention extends to other forms and modifications as are embraced by the scope of the appended claims.

It is claimed and desired to secure by Letters Patent:

1. The combination of a wheeled wagon truck adapted for swivel movement on a vertical axis, and a draft rigging comprising a pair of supporting beams rigidly connected with said truck so as to extend transversely of said axis in horizontally spaced parallel relation to each other, a rearwardly secured to and extending downwardly from said beams a draft tongue straddled by said beams forwardly of said post, a link having a first pivot center on said post and a second pivot center on a portion of said tongue below said supporting beams, a pair of guide plates for said tongue secured to and extending upwardly from said supporting beams, respectively, at opposite sides of said draft tongue, each of said guide plates having a vertical slot and a top and bottom end, and a cross pin mounted on said tongue and adapted to be lowered into and raised from said slots by endwise downward and upward movement, respectively, of said draft tongue.

2. The combination set forth in claim 1, in which said draft tongue has a top and bottom end and a cross pin mounted on said tongue and adapted to be lowered into and raised from said slots by endwise downward and upward movement, respectively, of said draft tongue.

3. The combination set forth in claim 1, in which said guide plates have downwardly extending front edges cooperating with said cross pin to transmit endwise rearward thrust from said draft tongue to said guide plates.

4. The combination set forth in claim 3, in which said supporting means extend forwardly beyond said forwardly and downwardly inclined front edges of said guide plates.

5. In combination with the swivel truck of a wagon, a draft rigging comprising a vertically and a horizontally extending supporting member rigidly connected with said truck, a draft tongue, a link, first connecting means between said link and said vertically extending supporting member pivotally securing said link at one of its ends on a first center in horizontally and vertically fixed relation to said truck, second connecting means between said link and tongue pivotally securing said link at its other end on a second center in longitudinally and transversely fixed relation to said tongue, said tongue having an arm portion and an end portion extending radially in opposite directions from said second center, and said third connecting means being effective in said second operative condition thereof, to place said link and tongue in positions relative to said supporting members, which will preclude cooperative engagement of said end portion of said tongue with said wagon truck.

6. In combination with a wheeled wagon truck adapted for swivel movement on a vertical axis, a draft rigging comprising a draft tongue, a link, first connecting means between said truck and link pivotally securing said link at one of its ends on a first center in horizontally and vertically fixed relation to said truck, second connecting means between said link and supporting members, in which said supporting members pivotally secure said link at one of its ends on a second center in longitudinally and transversely fixed relation to said truck, said tongue having an arm portion and an end portion extending radially in opposite directions from said second center, first and second stationary abutment elements operatively connected with said truck, and a complementary movable abutment element opera-
tively connected with said arm portion of said tongue and selectively engageable with said stationary abutment elements, respectively, so that cooperative engagement of said movable abutment element with said first stationary abutment element will be effective to determine a first position of pivotal adjustment of said link about said first center in which said second center is spaced horizontally from said vertical axis, and to maintain said tongue in a first position of pivotal adjustment about said second center in which said end portion of said tongue extends downwardly from said second center for engagement of said end portion in horizontal thrust transmitting relation with a floor embedded conveyor chain, and so that cooperative engagement of said movable abutment element with said second stationary abutment element will be effective to determine a second position to pivotal adjustment of said link about said first center, and a second position of pivotal adjustment of said tongue about said second center, which will preclude cooperative engagement of said end portion of said tongue with said conveyor chain.

7. A draft rigging as set forth in claim 6, and further comprising means for limiting swiveling movement of said link on said first pivot center in an upward direction relative to said truck.

8. In combination with a wheeled wagon truck adapted for swivel movement on a vertical axis, a draft rigging comprising a draft tongue, a link, first connecting means between said truck and link pivotally securing said link at one of its ends on a first center in horizontally and vertically fixed relation to said truck, second connecting means between said link and tongue pivotally securing said link at its other end of a second center in longitudinally and transversely fixed relation to said tongue, said tongue having an end portion extending radially from said second center, and third connecting means between said tongue and truck selectively adjustable to a first and to a second operative condition, said third connecting means being effective in said first operative condition thereof to determine a first position of pivotal adjustment of said link about said first center in which second center is spaced horizontally from said vertical axis, and to maintain said tongue in a first position of pivotal adjustment about said second center in which said end portion of said tongue extends downwardly from said second center for engagement of said end portion in horizontal thrust transmitting relation with a floor embedded conveyor chain, and said third connecting means being effective, in said second operative condition thereof, to maintain said link in a second position of pivotal adjustment about said first center, and said tongue in a second position of pivotal adjustment about said second center, which will preclude cooperative engagement of said end portion of said tongue with said conveyor chain.

9. A mechanism for selectively coupling a wheeled wagon truck with and uncoupling it from a floor embedded conveyor chain, said mechanism comprising a support, a link pivoted at one of its ends on said support for up and down movement of its other end relative to said support, a tongue having a pivot center on said link at the other end of the latter and an end portion abuttable in horizontal thrust transmitting relation with said conveyor chain at a thrust point below said pivot center, a load transmitting element connected with said tongue for movement therewith relative to said support and reacting upon said support at a connecting point in radially spaced relation to said pivot center while said tongue occupies a downwardly adjusted position relative to said support, so that draft applied by said conveyor chain at said thrust point to said end portion of said tongue will be taken up at said pivot center and connecting point, and thrust transmitting means connected with said support and reacting upon said load transmitting element while said tongue occupies and upwardly adjusted position relative to said support in which said end portion of said tongue is out of cooperative engagement with said conveyor chain, so as to preclude movement of said tongue to said downwardly adjusted position.

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WALTER H. RUTHER.

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Certificate of Correction

Patent No. 2,576,178

EARL W. HILES ET AL. November 27, 1951

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 9, line 19, for "to" read of; line 37, for "of" read on; column 10, line 32, for "and" read an;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 4th day of March, A. D. 1952.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.